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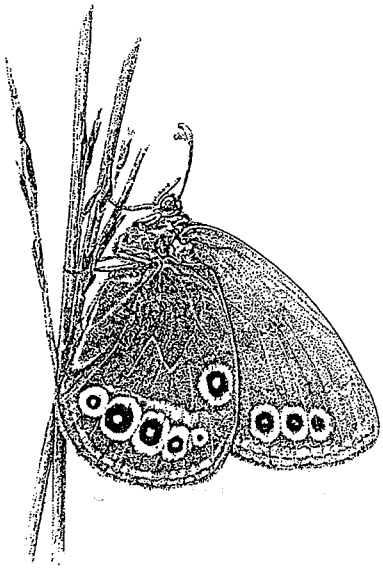
The Distribution Atlas of European Butterflies

OTAKAR KUDRNA



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Key words: Lepidoptera: Rhopalocera (butterflies); Europe; annotated checklist of species, distribution maps, conservation.

Abstract: The present publication is the result of Mapping European Butterflies (MEB), a joint project of the Naturschutzbund Deutschland and the Gesellschaft für Schmetterlingsschutz. It contains 451 dot distribution maps (European mainland) and distribution tables (Atlantic Islands) of 486 European butterflies, based upon 228931 data records provided by 252 contributing recorders or extracted from all major data banks. Recommendations for the conservation of European butterflies made in the present publication are based on the evaluation of distribution data.

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The Distribution Atlas of European Butterflies

is dedicated to the memory of the late
RUSSELL F. BRETHERTON, C.B.,
in appreciation of his contribution
to the study of European butterflies

Table of contents

1	Introduction	7
1.2	Aims and scope	7
1.3	Methods	8
1.3.1	Computer background	8
1.3.2	Map grid	9
1.3.3	Reference locality system	10
1.3.4	Abbreviations, acronyms and definitions	11
1.4	Acknowledgements	11
1.4.1	Credits	11
1.4.2	Disappointments	12
2	Contributing recorders	14
3	Checklist of species	17
4	Gazetteer of reference localities	32
5	Distribution maps	73
6	Discussion	301
6.1	Evaluation of country relevant data	301
6.2	Evaluation of species relevant data	308
6.3	Implications for conservation	328
6.4	Outlook	336
7	Literature cited	338
8	Zusammenfassung	340

1 Introduction

1.1 Aims and scope

The butterflies – probably the best known group of invertebrates – are sensitive to environmental changes and therefore serve as most valuable indicators by providing indispensable information on the state of the environment in Europe under the impact of changing land use practices and other anthropogenic pressures. Numerous butterfly species are considered to be threatened by such pressures and many have been given legal protection on a regional, national, European or even worldwide scale. In spite of such conservation measures, until 1996 there had been no European data bank or adequate distribution maps enabling scientists and European authorities to assess the biogeographical status and the degree of threat to the indigenous butterfly species. The distribution maps available in some field guides and similar books (e.g. HIGGINS & RILEY 1970 and subsequent editions) featuring roughly the western half of Europe reduced to the miniature size of 23 x 37 mm are useless because of their small scale alone; in addition to this they are hopelessly inaccurate. National data banks and distribution maps are no substitute for a European solution; quite apart from the fact that, even at the time of writing these lines in the summer of 2001, they are only available for some European countries and their standard differs to a great extent from case to case. The first attempt to assess the status of European butterflies (HEATH 1981) was commissioned by the Council of Europe – and inevitably failed in every way (KUDRNA 1986). The European Invertebrate Survey (EIS) has never come near to fulfilling its 25 years-old pledge to produce a distribution atlas of European butterflies; the only attempt (HEATH & LECLERQ 1981) contains distribution maps of only 10 of nearly 500 species (i.e. just over 2 % of species) and these contain so many obvious errors, that they are also useless. The irresponsible approach of EIS towards its declared aims is most deplorable. Many governmental and non-governmental authorities throughout Europe are still taking EIS seriously, believing or assuming that EIS maintain comprehensive data banks and can provide expert advice on all questions concerning the distribution of European butterflies. Moreover, representatives of EIS are members of scientific committees regularly consulted by governments and European conservation authorities. In some countries, the existence of EIS alone serves as a convenient excuse for the state authorities not to support national recording schemes on the grounds that they would duplicate the work already carried out by the EIS. These facts are, particularly in view of many international conventions and EU legislation, very hard to believe but are sadly true.

Against this background the Naturschutzbund Deutschland e.V. (NABU) and the Gesellschaft für Schmetterlingsschutz e.V. (GfS) resolved in 1995 to start the project 'Mapping European Butterflies' (MEB) with the following main objectives:

1. The setting-up of a distribution data bank for European butterflies.
2. The publication of a distribution atlas of European butterflies (dot maps).
3. The assessment of the conservation status of European butterfly species.
4. The identification of high priority areas for the conservation of European butterflies.
5. The identification of priorities in the conservation of European butterflies.

It was decided to achieve these five goals by the evaluation of the present distribution patterns of the European butterfly species.

Originally, it was intended to complete the project not later than in the spring of 2000. The great complexity of the project, building-up a team of recorders, the enormous amount of data received for processing and the time needed for their processing, soon proved the original timetable to be unrealistic. Despite the two years delay in the publication of the Atlas it must be pointed out that the project has been completed effectively and in a very short time.

For this project the following definition of Europe was adopted: Europe is the westernmost extremity of the Euroasiatic landmass, bordered to the west by the Atlantic Ocean or adjacent off-shore seas and including adjacent off-shore islands. Included are all three Atlantic Ocean island groups: the Azores, Madeira and Canary Islands; excluded is Iceland which has no resident butterflies. The eastern border of Europe is marked by the Ural Mountains. The south-eastern border of Europe is (as usual) somewhat arbitrary: Ural Mts. – Ural River – northern and western Caspian Sea coast

southwards to the town of Makhachkala – railway, road and oil pipe-lines from Makhachkala to the town of Mineralnye Vody – Nevinnomyssk – Armavir – Kropotnik – Krasnodar – Novorossiysk – northern Black Sea Coast south-westwards (including the Crimea) – eastern coast of European Turkey and Greece. Included are all Greek islands (regardless of how close to Asiatic Turkey they may be), Cyprus, Malta and all Mediterranean islands forming any part of the territory of any European country. Excluded is Asiatic Turkey (i.e. Asia Minor) and all African territories, including those under the administration of any European country.

The butterflies (Rhopalocera) are understood to comprise the superfamilies Papilionoidea and Hesperioidea. All European butterfly species recognised for the purpose of this project are listed separately, alphabetically arranged in an annotated catalogue. Records of exceptional or incidental migrants are not considered.

Three recording periods are covered:

1. Before and including 31 December 1950 (map symbol = open circle) ○
2. Between 01 January 1951 and 31 December 1980 (map symbol = half dot) ◒
3. After and including 01 January 1981 (map symbol = full dot) ●

As the most recent records – in the first place those of the 3rd period and in the second place those of the 2nd period – are more important for conservation purposes than old records, the most recent record determines the symbol on the map. As there is no standard chronological classification of butterfly records in Europe, data banks of some countries extracted for MEB had to be adjusted to correspond with the above periods; these include those of the following countries: Austria, Finland, France and Switzerland.

1.2 Methods

1.2.1 Computer background

The first computer-aided distribution atlas of butterflies (HEATH 1970) was published about 30 years ago. The subsequent utilisation of modern computers has opened new ways in the use, application and interpretation of distribution data. Essentially, inter-linked applications of two programs comprising a distribution data input program and a graphic program drawing distribution maps are necessary. Back in 1996, Microsoft Access for Windows 95 as the data input program and the DMAP for Windows (by A. MORTON) as the graphic program were selected for MEB. About two years later the Access application proved unstable, quite difficult to use and the link to the DMAP never worked properly. In the end the author of the Access application became unavailable. After a few heavy crashes, followed by some loss of data, a new way had to be sought. Following consultations with M. MAIER (MEB recorder M29 and a professional IT) contact was made with K. LUX (another MEB recorder, L20, and a professional program developer), who most kindly wrote a completely new distribution data input program and linked it to the DMAP and continues to maintain both applications. K. LUX and A. MORTON describe the MEB computer background as follows:

Practically all data delivered by recorders were to be fed manually into a database to facilitate computer-aided evaluation. The manual input of the anticipated huge amount of data is only possible if robust software can be used. There is no standard software on the market which could meet all the specific requirements of such mass data input. Therefore, the decision was made to develop a new tailor-made software package. O. KUDRNA contributed the ideas and requirements for this software, which is called Mapping European Butterflies (MEB).The main requirements for the MEB software were as follows:

1. The software should be clear and easy to use. The complete operation should be possible both with the keyboard and with the mouse. Inadvertently pressed keys must not result in deletion, change or insertion of records.

2. Many of the records differ from each other only in a few items like reference locality or period, the recorder and country being the same. The software should remember the data of the last inserted record. This data can be entered automatically in new records as required.
3. The search for a species or a certain record (identified by country and/or recorder) must be possible at any time.
4. Plotting the distribution maps based upon the records stored is to be done by DMAP – a software package written by A. MORTON. Thus, the MEB software must export the data in a structure which is supported by DMAP.
5. Printing of subsets of records must be possible for any species selected.

The MEB software was developed in April 1999 by K. LUX and is being improved continuously. The initial development was made possible in a very short time with the help of modern software tools: Borland Delphi 3 was the first choice. It is a graphical software developing environment for Microsoft Windows programs. It was decided to use a common database Paradox for storing the anticipated more than 100 000 records. Paradox also facilitates import and export of data from/to other databases such as Microsoft Access or dBase.

DMAP is a Windows program written by A. MORTON for the production of high-quality distribution maps. It can produce distribution maps of any area at any scale using a variety of symbol types to display the distributions. In addition to distribution maps, it can produce frequency maps and coincidence maps which can be used in biodiversity analyses and studies. The maps can be printed at high resolution in full colour or black and white, and the maps can be exported in a variety of image formats to other software. Data for DMAP can be entered into a simple text file, a spreadsheet, a general database, or a biological recording base. The data can consist of latitude/longitude co-ordinates or a variety of metric co-ordinates such as UTM or national grid references. The projection of the DMAP map is equidistant cylindrical with the standard parallel at 51°N.

Regrettably, the DMAP version used in this project does not fulfil the following requirements important in the course of producing the camera-ready copy of the atlas:
1. DMAP cannot print two distribution maps on one A4 sheet of paper.
2. It cannot position the caption (e.g. the species name) in the place desired.
3. The bottom line of (longitude) co-ordinates cannot be deleted if desired.

These drawbacks had to be compensated by time-consuming manual operations: the paper had to be twice passed through the printer (a few attempts were often necessary to align two maps more or less exactly!), the labels had to be pasted and the latitude co-ordinates 'erased' by hand.

1.2.2 Map grid

Another essential problem had to be solved before MEB could be started: the map grid. Since the first computer-aided distribution atlas (HEATH 1970) the UTM grid has been utilised in all British atlas projects and recommended by the European Invertebrate Survey for European distribution maps. The UTM grid consists of squares of scaleable side size, e.g. 1 km, 10 km, 50 km or 100 km. It would be a wonderful universal system if the Earth were flat, which it is not. Because the Earth is round compensating triangles are necessary to counterbalance the squares. This means that the ideally shaped square, the only true reason for using this system, is not generally available on the map. In Great Britain almost every good map sports the UTM grid and this makes its use convenient; furthermore problems with interposed compensation triangles are in the UK negligible. In Europe the UTM grid is only exceptionally found on maps; the last map of Europe containing the UTM grid – the *Series 1404 Military Map of the World* – has been completely out of print since about 1975, but already, some 5-10 years prior to 1975, maps were no longer available for many European countries. Should a standard map be used, it must be made available to all recorders, which would be both a difficult and a very costly undertaking. Apart from this, the UTM grid is not a standard European system. In many European countries distribution maps of both plant and animal species are based on topographical maps (mostly 1:25.000 or 1:50.000).

In national or regional maps small 'squares' are necessary to express the distribution of a species and its changes; thus one dot could indicate, for instance, a 'square' of the size of approximately 10 × 10 km. Such dots scaled down to fit a European map of the size of some 17 × 13 cm would become almost invisible and the quantity of records would reach intolerable proportions. For the purpose of this project 'squares' based upon the latitude and longitude expressed in grades and minutes are utilised, one MEB basic recording field (BRF) – i.e. grid unit or 'square' – measuring 30' × 60'. It appears that an area of 30' × 60' makes the ideal grid on a European scale.

The standard grid units in map-making are latitude and longitude, expressed in geographical co-ordinates measured in grades, minutes and seconds, and utilised in all maps regardless of scale and projection. The only drawback of this system is that the 'squares' (i.e. BRF) determined by the same number of grades, minutes or seconds are not of the same size. Whereas the latitude remains constant (30'measures about 55 km) on the European scale, the longitude of 60' varies according to the latitude. It measures in southern Europe at 40° N (e.g. Sicily) about 85 km, in central Europe at 50°N (e.g. Germany) about 72 km and in northern Europe at 60°N (e.g. Sweden) only about 52 km. There is no rational way of compensating for this drawback. It is occasionally argued that placing the dot indicating a locality exactly on the spot of the site can help; this is not true as the dots are generally too large to indicate a single site and they tend to overlap and obscure the map. The only way of avoiding the overlap is by use of a suitable grid. The projection of the map utilised for MEB is equidistant cylindrical with the standard parallel at 51°N.

The next point to be considered was the form of data input. In view of the vast amounts of data to be expected an effective, simple method of data input had to be invented. Of course, it would have been possible to work directly with co-ordinates but their use would have made the data subject to many errors and their input very awkward, and certainly subject to further errors. Furthermore, it is much easier to check any record under the name of a reference locality than under impersonal geographical co-ordinates. In Czechia, where detailed topographical maps were forbidden for general use from 1949 until 1989, a useful system of pre-selected localities referring to map 'squares' was devised by NOVAK (1989) and (after some minor corrections and additions) utilised by KUDRNA (1994). Although good quality detailed topographical maps are now easily obtainable, the above system is still being widely used in Czechia. A similar system is also being used in Norway and possibly in other European countries. A simple system based on these lines was needed for MEB. After thorough consideration the Reference Locality System (RLS) was conceived.

1.2.3 Reference locality system

A Reference Locality (RL, plural RLs) is a geographical name contained in the *Times Atlas of the World* (preferably 9th Comprehensive edition of 1994 or later) unequivocally referable to a certain place on an atlas map by means of geographical co-ordinates given in the gazetteer of the Atlas. One RL represents one or several sites of observation, capture or occurrence of a butterfly species situated in its vicinity and is represented on a distribution map by a dot or blend together with adjacent RL/RLs into a single dot. Because of the scale of the present maps one RL could cover an area of up to about 50 × 50 km but a higher density of RLs is advantageous, especially in areas of higher concentrations of butterflies and their sites. *The Times Atlas of the World* (9th Comprehensive edition of 1994 or later) was selected because its gazetteer contains geographical co-ordinates, the maps are up-dated to show borders of new and resurrected European states (after the disintegration of the Communist block in 1989) and is generally the best geographical atlas available at present. *The Times Atlas of the World* is available in all major public and many private libraries, and thus enables full reproducibility of RLs. A simplified alphabetic index of about 8000 RLs was made available to recorders in the MEB handbook (KUDRNA 1996) and a final gazetteer containing 9145 pre-selected RLs with their geographical co-ordinates appears in a separate chapter of this book.

For the communication of data by recorders, two sizes of standard Recording Sheets (RS, plural RSs) were devised and guidelines published (KUDRNA 1996). The standard RSs proved satisfactory

as long as recorders followed the instructions provided and filled them in legibly. Special internal RSs were devised in co-operation with the recorder concerned for the transfer of extensive data banks (e.g. converted national data banks) and formatted as necessary from case to case. These special RSs have proved most successful, saved much time and prevented many errors. A few recorders insisted on a direct input of digital data. From sheer necessity and as a test case, two sets of such data banks were converted and imported by K. LUX. Both files proved to contain many errors, the correcting of which has probably taken up more time than the input of the data banks from RSs would have taken. In principle, it is impossible to check such data sets thoroughly.

1.2.4 Abbreviations, acronyms and definitions

The abbreviations of journals cited in this work follow the *World List of Scientific Periodicals*. The acronyms of European countries are listed in the gazetteer of reference localities.

BAG = Bundesarbeitsgruppe in NABU (German Federal Working Group).
BFA = Bundesfachausschuss in NABU (German Federal Committee).
BRF = Basic recording field (plural BRFs) or grid unit.
CI = class interval.
Class interval. Coincidence maps display the number of species recorded in a particular grid unit by means of a series of nine quantity symbols using numerals 1 – 9. For coincidence totals greater than 9 the totals need to be classified into up to nine classes by setting class intervals.
Coincidence map is a distribution map showing the number of species recorded in a particular grid unit or location; coincidence maps indicate the species diversity.
Complex is a collective term denoting a group of closely related (similar) species which could not have been recognised as distinct in their own right for the purpose of MEB.
cpx. = v. complex.
EIS = European Invertebrate Survey.
Endemic are species confined and exclusive to Europe or a part thereof.
EU = European Union (formerly European Economic Community or EEC).
Genus is a taxonomic category containing a single species or a monophyletic group of species which is separated from other related taxa of the same rank by a decided gap. (MAYR 1969):
GfS = Gesellschaft für Schmetterlingsschutz e.V. (Society for Butterfly & Moth Conservation).
Hot spots are areas of high species diversity (cf. coincidence map).
IUCN = International Union for the Conservation of Nature.
MEB = Mapping European Butterflies.
NABU = Naturschutzbund Deutschland e.V. (German Union for Nature Conservation).
RDB = Red Data Book.
RL = Reference locality (plural RLs).
RLS = Reference locality system.
RS = Recording sheet (plural RSs).
SCI = Species of Community Interest
Semispecies v. superspecies.
SPEC = Species of European Conservation Concern.
Species is a group of actually or potentially interbreeding populations which are reproductively isolated from other such groups (MAYR 1969).
Species of Community Interest are species which within the territory of the European Union are endangered, vulnerable, rare or endemic. These species occur in restricted geographical regions of the Union's territory and require particular attention owing to their habitat requirements. Excluded are all those species which inhabit marginal zones of the Union's territory.
Species of European Conservation Concern are restricted to (i.e. endemic) or concentrated in Europe (v. SWAAY & WARREN 1999 for details).
Superspecies is a monophyletic group of closely related and largely or entirely allopatric species. The component species of the superspecies – essentially geographical isolates – may be conveniently called semispecies (MAYR 1969).

UTM = Universal Transverse Mercator – a grid system developed in the USA for military maps and widely used in the UK, rarely in the "rest" of Europe; following the British butterfly mapping project, UTM was adopted by EIS for their European projects.

1.3 Acknowledgements

1.3.1 Credits

Two preconditions had to be fulfilled if MEB was to be accomplished successfully. The first precondition was finding suitable project bearers; the second precondition was finding recorders. Without the support of the NABU and the GfS as project bearers, MEB could never have been started; without the collaboration of the recorders, the project would have never been successfully accomplished.

The Gesellschaft für Schmetterlingsschutz (GfS) alone is too small a society for such an ambitious project; the gaining of the support of the Naturschutzbund Deutschland (NABU) was therefore decisive for its launch. I have great pleasure in thanking the NABU BFA Internationales, BFA Entomologie and BAG Schmetterlinge and particularly Dr. H.-C. MITTAG, Prof. G. MÜLLER-MOTZFELD, H. OPITZ and V. WACHLIN for their invaluable help and support. I have great pleasure thanking the Gesellschaft für Schmetterlingsschutz and especially mentioning J.F. BURTON, Dr. G. FEICHTINGER, S. GREUBEL, R. MATHES, E.J.M. WARREN and the late Dr. E.M. WOLFRAM.

I also have great pleasure in thanking the more than 250 recorders who have contributed 228931 data records for the MEB data bank. All contributing recorders are listed under their alphabetically arranged recorder's code elsewhere. Some recorders have made more important contributions than others, for instance in setting-up, extracting or converting major national, regional or private data banks and deserve special acknowledgement: Z. BALINT, E. BALLETTO, J. BUSZKO, J.G. COUTSIS, R.L.H. DENNIS, K. DÖRBANDT, K. EFETOV, G. EMBACHER, J. ENGDAL, P. GARCIA-PEREIRA, the late D. GASKIN, P. GOFFART, P. GORBUNOV, H. GUYOT, P. JAKSIC, M.K. JANTUNEN, E. JOHN, H. KINKLER, J. KLEINEKUHLE, K. KONECNY, W. KRAUS, T.N. KRISTENSEN, L. LIZEC, D. MAES, E. MARVALHAS, J.M. MOLINA, S. OEHMIG, A. OLIVIER, A. PAVLICKO, J. PIBERNAT-VINIETS, D. VAN DEN POORTEN, L. RAKOSY, A. REIPRICH, N. RYRHOLM, M.R. TARRIER, K. VELING, J. VIIDALEPP, M. WIEMERS and L. WINOKUR.

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Last, but not least, I have especially great pleasure in thanking the author of the MEB computer data input program, K. LUX, who was always available to help in every way; he also experimentally converted data from Hessen (Germany) and Sweden to the MEB format. Also A. MORTON has always been available to volunteer advice on his DMAP program an I am very grateful to him.

1.3.2 Disappointments

It has always been my policy to acknowledge gratefully any kind of help received in the course of my work. To be fair I wish to record the following negative cases, too.

Until recently German nature conservation legislation forbade the importation and holding of butterflies (a few common *Pieris*, *Nymphalis* and *Vanessa* species excepted) from any European country, including the EU countries, for all purposes, including research. The EU has recently obliged the German government to adjust German legislation to the EU law; Germany has no right to "protect" butterflies outside the country. So as to be able to verify the identification of reference specimens of critical species, should this become necessary in the course of MEB, I applied in 1996 to the German Federal Agency for Nature Conservation (Bundesamt für Naturschutz) for a permit to import such specimens. This agency declined to grant permission, pronounced MEB as unscientific in the opinion of the agency's own expert, and even claimed that MEB is not a project of NABU. Shortly before that decision was made, I received a telephone call from Dr. I SPROTTE, representing the above agency, who in the course of a lengthy conversation with me, exhibited unbelievable incompetence and ignorance in questions of research and the conservation of insects, while also making reference to the advice provided by P. PRETSCHER, the agency's butterfly expert. This negative attitude of the German Federal Agency for Nature Conservation did not surprise me, but it greatly inconvenienced my work. I have reasons to believe that the German Federal Agency for Nature Conservation acted on purpose, the aim being to stop MEB. However, thanks to the excellent cooperation of the recorders, it did not prevent the realisation of the project.

Comprehensive, reliable national data banks naturally proved most important as a source of data for MEB. I anticipated this at an early stage. The converting or extracting of national data banks always required special measures (every national data bank is different!). In order to obtain Danish and Swiss data I undertook two special journeys to Copenhagen (DK) and Neuenburg (CH). Both Dr. M. STOLTZE (DK) and Dr. Y. GONSETH agreed to provide their national data in the necessary form but neither of them fulfilled their promise; these most disappointing failures caused considerable problems and delays, not to mention both waste of time and money.

Monthly meetings of Belgian, Dutch and French lepidopterists are held at the Zoology Museum in Amsterdam on certain Saturdays when the museum is normally closed. To enter the museum on Saturday and participate in the meeting, a permission granted by the director, Dr. S. ULENBERG, is necessary. In order to meet several recorders on 17.04.1999 I asked the director to grant me this permission, but sadly I was not allowed to attend the meeting.

None of the above disappointments could stop MEB. None of them can now spoil my great pleasure from the accomplished work.

2 Contributing recorders

A total of 465 recorders have joined MEB. Every recorder has been given a personal recorder's code consisting of the first letter of the recorder's surname followed by a consecutive number commencing with 01, e.g. K01, K02 and so on. Several recorders have been given an additional (internal) recorder's code for special tasks, such as converting or extracting data banks, consisting again of the first letter of the recorder's surname and followed by a regressive serial number commencing with 99, e.g. K99, K98 etc., in order to distinguish between data banks and original data. From the total of 465 registered recorders only 254 (54 %) have contributed to MEB. In a few instances the recorder's effort to contribute to MEB was viewed generously even if the quality of data was unsatisfactory and these could not therefore be used. In the following list of contributing recorders every name appears only once, under the original code, regardless of whether the recorder concerned has been given an additional internal code or not. All recorders listed below will receive a complimentary copy of the Atlas stamped with the personal code. All recorder's codes (i.e. including the codes given to recorders who have failed to contribute any data and are therefore not included in the list above) remain valid for the planned second edition of the Atlas.

A few recorders have returned their recording sheets without any code or with thoroughly unintelligible codes. One recorder, for example, used the code of 'J01' on his first sheet and continued adding one to reach 'J52' on his last sheet. Data from such recording sheets could not be utilised and the so far unknown recorders are not listed here as contributing recorders. Naturally, they do not qualify to receive their complimentary copy of the Atlas.

A02 ARTEMYEVA, Dr. Elena
A04 ASKEW, Dr. Richard R.
A06 ARTMANN, Dr. Georg
A08 ARZANOV, Yuriy
A09 ABBEELE, Diederik van den
A13 ASHER, Dr. Jim
A16 AUGUSTIN, Alfred
B01 BUSZKO, Prof. Jaroslaw
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B03 BALINT, Dr. Zsolt
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B11 BEREZHNOI, Yuri
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B19 BESKOKOTOV, Yuriy
B20 BLINUSHOV, Aleksander
B21 BOGUNSKI, Gerd
B22 BALLETTO, Prof. Emilio
B23 BENES, Jiri
B24 BOSSI, Dr. Stefano
B27 BUONO, Sergio
B28 BESNARD, Giles
B29 BESNARD, Sylvie
B34 BOYD, Gavin
B36 BADER, Gerhard
B39 BALTRUWEIT, Walter
B40 BERG, Oistein
C01 CORLEY, Martin F.V.
C04 CORDUNEANU, Constantin
C09 CONRAD, Reinhard
C10 COOMBES, Simon
C11 COUTSIS, John G.
C14 CROZIER, Jacqueline
D01 DENNIS, Dr. Roger L.H.
D02 DESCIMON, Prof. Henri
D04 DUVIOLS, Olivier
D05 DIEZ, Alberto
D06 DARCEMONT, Christian
D07 DOBERITZ, Dr. Gerhard
D08 DOBROVSKY, Tomas
D09 DAPKUS, Dalius
D13 DUNKIN, Don
D14 DÖRBANDT, Klaus
E01 EFETOV, Dr. Konstantin A.
E04 EMBACHER, Gernot
E05 ECKWEILER, Dr. Wolfgang
E06 ENGDAL, Jostein
E07 ELMQUIST, Hakan
E09 ESSAYAN, Roland
F03 FEICHTINGER, Dr. Gerhard
F05 FRANZ, Jindrich
F06 FORTI, Livio
F07 FREUDE, Rolf
F09 FABIANO, Filippo
F14 FEIK, Vlastislav
F17 FISCHER, Ralph
F20 FOX, Richard
G01 GROENEN, Frans
G02 GREUBEL, Siegwald
G03 GASKIN, Prof. David E.
G04 GANTZHORN, Dietrich
G05 GARDINER, Adrian J.
G06 GORBUNOV, Pavel
G08 GROS, Patrick

G11 GOTTWALD, Albert
G17 GOSSLING, Nigel
G18 GRAUL, Dipl.-Mus. Mario
G19 GRUNEWALD, Dr. Theo
G21 GOFFART, Philippe
G23 GUYOT, Herve
G25 GARCIA-PEREIRA, Dr. Patricia
H01 HERMANSEN, Klaus
H02 HANISCH, Heribert
H03 HRNCIR, Jan
H04 HEER, Jan de
H05 HOLLOWAY, Dr. Jeremy D.
H06 HEIRAMO, Tuomas
H07 HYTTINEN, Juha
H08 HARDY, Peter B.
H09 HAASE, Erik
H10 HAVELDA, Ing. Zbynek
H13 HIRSCHFELD, Gerd
H15 HAUPT, Dr. Joachim
H18 HERMAN, Petr
H20 HJELM, Marina
H22 HÖTTINIGER, Dr. Helmut
I01 ILONEN, Janne
I03 ILONCZAI, Zoltan
J01 JAKSIC, Dr. Predrag
J02 JELINEK, Karl-Heinz
J05 JAKES, Ing. Oldrich
J06 JANTUNEN, Matti K.
J08 JUTZELER, David
J10 JOHN, Eddie
K01 KUDRNA, Dr. Otakar
K02 KULFAN, Dr. Jan
K03 KORB, Stanislav
K04 KINKELE, Jörg
K05 KINKLER, Helmut
K06 KRISTENSEN, Dr. Tom N.
K09 KUNICK, Dipl.-Biol. Uwe
K10 KALABZA, Miloslav
K11 KONECNY, Karel
K12 KOCMAN. Ing. Stanislav
K15 KRIEBEL, Peter
K16 KRONSHAGE, Dipl.-Geogr. Andreas
K17 KELLNER, Jörg
K18 KROGEN, Runar
K20 KRAUS, Werner
K21 KOSCHWITZ, Dr. Udo
K22 KIRSCH, Franz
K23 KONVICKA, Martin
K25 KREUTZER, Ib
K28 KOMAROV, Dimitriy A.
K33 KAZDA, Vladimir
K34 KORYNTA, Josef
K36 KOLAR, Ivan
K38 KERN, Peter
K39 KLEINEKUHLE, Dipl.-Biol. Jens
K44 KLEPIKOV, Maxim A.
K46 KOVACS, Zoltan P.
K49 KÖHLER, Jochen
L01 LIZEC, Ladislav
L02 LUCKENS, Dr. Christopher
L05 LAUSMANN, Anton
L10 LEHMANN, Manfred
L11 LOWE, Dr. Norman R.
L12 LEITGEB, Ing. Vladimir
L15 LEVENTE, Dr. Szekely
L16 LANG, Andreas
L20 LUX, Kristian
L21 LANGE, Andreas C.
M01 MAES, Dirk
M03 MOLINA, Dr. Jose M.
M04 MRACEK, Dr. Zdenek
M05 MÄKINEN, Jussi
M06 MATHES, Rainer
M08 MÜLLER, Dr. Reimund
M09 MAECHLER, Jean
M10 MOLGAARD, Morton S.
M11 MALINKA, Dr. Zdenek
M14 MATEO-LOZANO, Jose M.
M16 MARK, Dr. Hans-Georg
M19 MATSUDA, Shinpei
M20 MIKHAILOV, Alexander G.
M21 MADDOCKS, John
M24 MOULIGNIER, Francois
M25 MARIK, Ing. Martin
M26 MIHUT, Sergiu
M27 MEEUS, Guido
M29 MAIER, Mario
M30 MEYER, Marc
M31 MAGRO, Rafael
M35 MASEK, Ing. Josef
M36 MAIER, Andreas
M37 MASCHLER, Dr. Reinhold
M38 MARAVALHAS, Ernestino
M39 MÜLLER-KÖLLGES, Karl-Heinz
N01 NECHVILE, Dipl.-Ing. Tomas
N02 NIEMINEN, Marko
N05 NAGYPAL, Tony
N06 NIEDERKOFLER, Klaus
N07 NOWOTSCHYN, Martin
N08 NÄSSIG, Dr. Wolgang
N09 NEMETH, Lajos
O02 OEHMIG, Dipl.-Ing. Steffen
O03 OCHSE, Michael
O05 ODENDAHL, Rolf
O09 OGER, Prof. Bruno
O10 OLIVIER, Alain
O13 OSWALD, Rudolf Dipl.-Ing.
P01 PAVLICKO, Dipl.-Ing. Alois

P02 PARKER, Rob
P03 PRINS, Willy de
P06 PITZ, Stanley
P10 PIBERNAT-VINIETS, Joan
P12 PÜHRINGER, Dr. Franz
P13 PÖLL, Norbert
P14 PLÖSSL, Bernard
P17 PALIK, Edward
P18 PIZZETTI, Lorenzo
P19 PEGOUD, Joseph
P22 PETRU, Ing. Miloslav
P25 PFEUFFER, Dr. Eberhard
P28 POORTEN, Dirk van der
P29 POPOV, Sergey G., Alexanor
R01 RUCKDESCHEL, Dr. Walter
R03 ROHLFS, Ole
R04 RAES, Dirk
R06 ROBERTSON, Thomas S
R13 RUF, Josef
R14 ROLDAN-MONFERRER, Miguel
R15 REIPRICH, Prof. Andrej
R17 RETTIG, Klaus
R18 RIES, Sylvia
R19 RICL, David
R20 RYRHOLM, Dr. Nils
R21 RAKOSY, Dr. Laszlo
R28 ROLOFF, Jörg
S04 SLOT, Johannes
S05 STIMPFL, Gerhard
S06 SCHÖN, Walter
S08 STANGELMAIER, Ing. Günter
S11 SIMEK, Dr. Karel
S12 STERBA, Prof. Vladimir
S13 STIOVA, Dr. Lubomir
S15 STANTA, Radovan
S18 SEGERER, Dr. Andreas
S20 SCHUMANN-TEUBNER, Michael
S22 SCHULZ, Christian
S24 SCHULZE, Bernd
S25 SVESTKA, Dr. Milan
S27 SCHÜNEMANN, Joachim
S29 SHCHUROV, Valeri I.
S30 SAMMUT, Paul M.
S32 SUNYER-BOVER, Xavier
S36 SALA, Dr. Giovanni
S37 SZABO, Attila
S39 SCHILLER, Dipl.-Biol. Ronald
S40 STEVENS, Graham B.
S44 SCALERCIO, Dr. Stefano
S50 SAVAGE-DUBOURG, Marie-Jo
S51 SAVENKOV, Nikolay
S52 SBIESCHNE, Heinz
S53 SCHMITT, Dr. Thomas
S55 STÜBINGER, Rudolf
T02 TATARNIKOV, Dr. Andrej
T04 TARRIER, Michel R.
T07 TEOBALDELI, Dr. Adriano
T10 TITZ, Antonin
T11 TURCANI, Mgr. Marek
T12 TUREK, Bohumil
T14 THIESEN, Björn
U02 ULRICH, Rainer
U03 ULMANN, Norbert
V02 VIITANEN, Esko
V05 VIIDALEPP, Dr. Jaan
V08 VISETTI, Giovanni
V09 VELING, Kars
V10 VANHOLDER, Bart
W01 WARREN, Elizabeth J.M.
W02 WACHLIN, Volker
W03 WULF, Dipl.-Phys. Jürgen
W04 WINOKUR, Dr. Leonard
W05 WEIHRAUCH, Dipl.-Biol. Florian
W06 WEIDENHOFFER, Dipl.-Ing. Zdenek
W09 WAKEHAM-DAWSON, Dr. Andrew
W11 WIEMERS, Dipl.-Biol. Martin
W16 WITHRINGTON, David
Y01 YELA, Dr. Jose L.
Z03 ZEMLICKA, Miroslav
Z07 ZONNEVELO, Dr. Cor

3 Checklist of species

There is no standard checklist of the scientific names of European butterfly species. KARSHOLT & RAZOWSKI (1996) made an attempt to standardise the names of European Lepidoptera species, but numerous obvious mistakes in the classification of several genera and many species are simply unacceptable.

In compiling a checklist, two aspects must be considered: the classification of the taxon (i.e. taxonomy) and the selection of its valid name (i.e. the nomenclature). The nomenclature is governed by the International Commission on Zoological Nomenclature issuing from time to time a new or updated edition of *The International Code of Zoological Nomenclature*; at present it is the 4th edition, valid since 1st January 2000. Nonetheless, the selection of the valid name of a species is often a matter of opinion, particularly concerning names of the genus group. Any taxon can be viewed from two different angles: that of a 'lumper' on the one hand and that of the 'splitter' on the other. As the names of species are binominal, different views on the application of each and every genus and species group name are possible; subspecies are not considered in this work.

The original MEB working checklist of butterflies contained a number of 'minor' species as recognised by some 'splitters'. The purpose of including 'minor' species was to find out more about their ranges and, perhaps, the zones of overlap of these closely related but potentially specifically distinct taxa. A majority of recorders ignored the 'minor species' and followed the classification adopted by one of the widespread field guides, such as one of the editions of HIGGINS & RILEY (1984), TOLMAN & LEWINGTON (1997) or a recorder's own classification. Thus, for example, *Iphiclides feisthamelii* (DUPONCHEL, 1832) had to be treated as a synonym of *I. podalirius* whereas a similar case, *Coenonympha iphioides,* is accepted by most recorders as a species distinct from *C. glycerion*. The 'field guide type' of classification of European butterfly species is often biased and illogical.

In the present checklist the lumper's view of the generic classification has been adopted. The genera of butterflies were 'atomised' throughout the last century. The splitting of genera produced numerous 'micro-genera' lacking constant characters of any kind and ignoring the phylogenetical approach. It is only too easy to describe a new genus and add thus yet another 'discovery' to the author's successes. As butterflies are gradually more and more used as instruments in nature conservation, voluntary restrictions on the number of generic names used – i.e. the use of 'major genera' – makes their understanding by conservationists and other users easier. A taxonomist can easily add a subgeneric name to specify an infrageneric group to which he is making reference. The system of 'major genera' has been adopted where possible in this atlas.

It must be admitted, however, that the monophyly of many butterfly genera recognised at present is questionable due to the lack of taxonomic revisions of the group concerned. For instance, some genera of Polyommatinae recognised here, especially *Plebejus* and *Polyommatus*, are a provisional compromise and strictly speaking cannot be justified from either phenetical or phylogenetical points of view. The 'major genera' *Hipparchia*, *Maniola* and *Pararge* are accountable to *Satyrus*, *Maniola* and *Pararge* series as defined and described by MILLER (1968); there is no doubt that these three 'major' genera are monophyletic, which is impossible to claim concerning the 'minor' genera.

The definition and understanding of species has changed very much since the term was introduced by C. LINNAEUS back in 1758. The only natural units are the individual and a group of interbreeding individuals; the species is an artificial, man-invented, category. This applies also to the genus and any other taxonomic category.

The International Code of Zoological Nomenclature recognises specifically only two taxonomic categories of the species group: the species and the subspecies. The immense inflation of new subspecific names proposed for butterflies over the last hundred years has gradually devalued this category until it has become almost useless. Placing stress upon the biological aspects in the recognition of nominate species group taxa would help, provided the additional information necessary was available across the board, but this is very rarely the case. Very often it is not known whether supposed species are reproductively isolated. Subsequently, in the classification of butterflies reproduc-

tive isolation is very often taken for granted on account of certain features of a biological, morphological or anatomical nature, usually subjectively interpreted by the author concerned.

To distinguish between 'major' and 'minor' species two auxiliary taxonomic categories can be utilised where necessary: the superspecies and the semispecies.

Thus semispecies is a substitute for the term species under certain circumstances. Subsequently, various authors utilised the term semispecies to cover all sorts of borderline cases in speciation (e.g. incomplete speciation), which, according to some criteria, appear to be species, and according to others, subspecies (e.g. LORKOVIC 1958).

Whoever accepts the existence of the process of evolution must realise that in nature there must exist numerous cases of incomplete speciation for which the terms superspecies and semispecies may conveniently be used. It may also be claimed that superspecies and semispecies are substitutes for the scientifically questionable, and, owing to the inflation of names, almost valueless subspecies. In the present publication both the terms superspecies and semispecies are used for some island isolates in their original sense. It should be mentioned that the *International Code of Zoological Nomenclature* neither specifically recognises the taxonomic status of these categories nor forbids their use. Thus both superspecies and semispecies can be claimed to be of species rank, but semispecies could also be considered of subspecies rank by some old-fashioned taxonomists.

The MEB data input program automatically arranges genera and species alphabetically and a systematic rearrangement would be time-consuming. For reasons of convenience, an alphabetical checklist of species was therefore adopted for the whole atlas and families are not recognised within this checklist. As the atlas is also intended for a wide audience, including general naturalists and conservationists, the alphabetical arrangements of genera and species could even prove more convenient than a traditional systematic treatment. The reduction of generic names due the adoption of 'major' genera serves the same purpose. To enable a quick location of species belonging to the same family, an alphabetically arranged index of genera recognised within each family follows:

Hesperiidae: *Borbo, Carcharodus, Carterocephalus, Erynnis, Gegenes, Hesperia, Heteropterus, Ochlodes, Pyrgus, Spialia, Syrichtus, Thymelicus*

Lycaenidae: *Aricia, Azanus, Cacyreus, Callophrys, Celastrina, Chilades, Cigaritis, Cupido, Cyclyrius, Favonius, Glaucopsyche, Hamearis, Iolana, Laeosopis, Lampides, Leptotes, Lycaena, Maculinea, Neolycaena, Plebejus, Polyommatus, Satyrium, Scolitantides, Tarucus, Thecla, Tomares, Turanana, Zizeeria*

Nymphalidae (Apaturinae, Danainae, Libytheinae, Nymphalinae): *Apatura, Araschnia, Argynnis, Argyronome, Boloria, Brenthis, Charaxes, Danaus, Euphydryas, Hypolimnas, Issoria, Libythea, Limenitis, Melitaea, Neptis, Nymphalis, Thaleropis, Vanessa*

Nymphalidae (Satyrinae): *Aphantopus, Coenonympha, Erebia, Hipparchia, Maniola, Oeneis, Melanargia, Pararge, Proterebia, Triphysa, Ypthima*

Papilionidae: *Archon, Iphiclides, Papilio, Parnassius, Zerynthia*

Pieridae: *Anthocharis, Aporia, Catopsilia, Colias, Colotis, Euchloe, Gonepteryx, Leptidea, Pieris, Zegris.*

For the convenience of readers not thoroughly familiar with the generic classification of European butterflies adopted here, the subgenera and a few often used synonyms of all 'major' genera are listed below in alphabetical order (for simplicity without the names of their authors):

Agriades: Plebejus
Agrodiaetus: Polyommatus
Albulina: Plebejus
Arethusana: Hipparchia
Artogeia: Pieris
Brintesia: Hipparchia
Chazara: Hipparchia
Cyaniris: Polyommatus
Hipparchia: Hipparchia
Hyponephele: Maniola
Idata: Maniola
Kanetisa: Hipparchia
Kirinia: Pararge
Kretania: Plebejus

Lasiommata: Pararge
Lopinga: Pararge
Lysandra: Polyommatus
Meleageria: Polyommatus
Minois: Hipparchia
Neohipparchia: Hipparchia
Neolysandra: Polyommatus
Parahipparchia: Hipparchia
Pararge: Pararge
Pieris: Pieris
Plebicula: Polyommatus
Pontia: Pieris
Pseudophilotes: Scolitantides
Pyronia: Maniola
Satyrus: Hipparchia
Synchloe: Pieris
Vacciniina: Plebejus

Explanations of abbreviations used in the following checklist:

FA (Family): HE = Hesperiidae, LY = Lycaenidae, NY = Nymphalidae: Nymphalinae, Libytheinae, Danainae; PA = Papilionidae, PI = Pieridae, SA = Nymphalidae: Satyrinae

TS (Taxonomic status): Reference to an optional numbered note on the status and treatment of the taxon at the end of the alphabetical checklist.

EC (European Continent): Indication that the species inhabits the European mainland and/or one or more adjacent islands including Cyprus, but excluding the Atlantic Islands.

AI (Atlantic Islands): Indication that the species occurs in one or more of the following island groups: The Azores (p. 73), Canary Islands (p. 74) and Madeira Islands (p. 74).

MP (Map on page): Indication of the page number containing the distribution map of the taxon.

Species	**FA**	**TS**	**EC**	**AI**	**MP**
Anthocharis cardamines (LINNAEUS, 1758)	PI		+		75
Anthocharis damone (BOISDUVAL, 1836)	PI		+		75
Anthocharis euphenoides STAUDINGER, 1869	PI		+		76
Anthocharis gruneri HERRICH-SCHÄFFER, 1851	PI		+		76
Apatura ilia (DENIS & SCHIFFERMÜLLER, 1775)	NY		+		77
Apatura iris (LINNAEUS, 1758)	NY		+		77
Apatura metis (FREYER, 1829)	NY		+		78
Aphantopus hyperantus (LINNAEUS, 1758)	SA		+		78
Aporia crataegi (LINNAEUS, 1758)	PI		+		79
Araschnia levana (LINNAEUS, 1758)	NY		+		79
Archon apollinus (HERBST, 1798)	PA		+		80
Argynnis adippe (DENIS & SCHIFFERMÜLLER, 1775)	NY		+		80
Argynnis aglaja (LINNAEUS, 1758)	NY		+		81
Argynnis elisa (GODART, 1823)	NY		+		81
Argynnis niobe (LINNAEUS, 1758)	NY		+		82
Argynnis pandora (DENIS & SCHIFFERMÜLLER, 1775)	NY		+	+	82
Argynnis paphia (LINNAEUS, 1758)	NY		+		83
Argyronome laodice (PALLAS, 1771)	NY		+		83
Aricia agestis (DENIS & SCHIFFERMÜLLER, 1775)	LY	19	+		84
Aricia anteros (FREYER, 1839)	LY		+		84
Aricia artaxerxes (FABRICIUS, 1793)	LY	19	+		85
Aricia cramera (ESCHSCHOLTZ, 1821)	LY		+	+	85
Aricia eumedon (ESPER, 1780)	LY		+		86
Aricia montensis (VERITY, 1928)	LY	19	+		86
Aricia morronensis (RIBBE, 1910)	LY		+		87
Aricia nicias (MEIGEN, 1830)	LY		+		87
Azanus ubaldus (CRAMER, 1782)	LY			+	
Boloria alaskensis (HOLLAND, 1900)	NY		+		88
Boloria angarensis (ERSCHOFF, 1870)	NY		+		88

Species	FA	TS	EC	AI	MP
Boloria aquilonaris (STICHEL, 1908)	NY		+		89
Boloria chariclea (SCHNEIDER, 1794)	NY		+		89
Boloria dia (LINNAEUS, 1767)	NY		+		90
Boloria eugenia (EVERSMANN, 1847)	NY		+		90
Boloria eunomia (ESPER, 1799)	NY		+		91
Boloria euphrosyne (LINNAEUS, 1758)	NY		+		91
Boloria freija (BECKLIN, 1791)	NY		+		92
Boloria frigga (BECKLIN, 1791)	NY		+		92
Boloria graeca (STAUDINGER, 1870)	NY		+		93
Boloria improba (BUTLER, 1877)	NY		+		93
Boloria napaea (HOFFMANSEGG, 1804)	NY		+		94
Boloria pales (DENIS & SCHIFFERMÜLLER, 1775)	NY		+		94
Boloria polaris (BOISDUVAL, 1829)	NY		+		95
Boloria selene (DENIS & SCHIFFERMÜLLER, 1775)	NY		+		95
Boloria selenis (EVERSMANN, 1837)	NY		+		96
Boloria thore (HÜBNER, 1806)	NY		+		96
Boloria titania (ESPER, 1793)	NY		+		97
Boloria tritonia (BOEDER, 1812)	NY		+		97
Borbo borbonica (BOISDUVAL, 1833)	NY		+		98
Brenthis daphne (BERGSTRÄSSER, 1780)	NY		+		98
Brenthis hecate (DENIS & SCHIFFERMÜLLER, 1775)	NY		+		99
Brenthis ino (ROTTEMBURG, 1775)	NY		+		99
Cacyreus marshalli (BUTLER, 1898)	LY		+		100
Callophrys avis CHAPMAN, 1909	LY		+		100
Callophrys rubi (LINNAEUS, 1758)	LY		+		101
Callophrys suaveola (STAUDINGER, 1881)	LY		+		101
Carcharodus alceae (ESPER, 1870)	HE		+		102
Carcharodus baeticus (RAMBUR, 1840)	HE		+		102
Carcharodus flocciferus (ZELLER, 1847)	HE		+		103
Carcharodus lavatherae (ESPER, 1783)	HE		+		103
Carcharodus orientalis (REVERDIN, 1913)	HE		+		104
Carcharodus stauderi (REVERDIN, 1913)	HE		+		104
Carterocephalus palaemon (PALLAS, 1771)	HE		+		105
Carterocephalus silvicolus (MEIGEN, 1829)	HE		+		105
Catopsilia florella (FABRICIUS, 1775)	PI			+	
Celastrina argiolus (LINNAEUS, 1758)	LY		+		106
Charaxes jasius (LINNAEUS, 1767)	NY		+		106
Chilades galba (LEDERER, 1855)	LY		+		107
Chilades trochylus (FREYER, 1844)	LY		+		107
Cigaritis acamas (KLUG, 1834)	LY		+		108
Coenonympha amaryllis (STOLL, 1782)	SA		+		108
Coenonympha arcania (LINNAEUS, 1761)	SA		+		109
Coenonympha corinna (HÜBNER, 1806)	SA	11	+		109
Coenonympha dorus (ESPER, 1782)	SA		+		110
Coenonympha gardetta (PRUNNER, 1798)	SA	02	+		110
Coenonympha glycerion (BORKHAUSEN, 1788)	SA	29	+		111
Coenonympha hero (LINNAEUS, 1761)	SA		+		111
Coenonympha iphioides STAUDINGER, 1870	SA	29	+		112
Coenonympha leander (ESPER, 1784)	SA		+		112
Coenonympha oedippus (FABRICIUS, 1787)	SA		+		113

Species	FA	TS	EC	AI	MP
Coenonympha pamphilus (LINNAEUS, 1758)	SA		+		113
Coenonympha rhodopensis ELWES, 1900	SA		+		114
Coenonympha thyrsis (FREYER, 1846)	SA		+		114
Coenonympha tullia (MÜLLER, 1764)	SA		+		115
Colias alfacariensis RIBBE, 1905	PI		+		115
Colias aurorina (HERRICH-SCHÄFFER, 1850)	PI		+		116
Colias balcanica REBEL, 1903	PI		+		116
Colias chrysotheme (ESPER, 1780)	PI		+		117
Colias crocea (GEOFFROY, 1785)	PI		+	+	117
Colias erate (ESPER, 1805)	PI		+		118
Colias hecla LEFEBVRE, 1836	PI		+		118
Colias hyale (LINNAEUS, 1758)	PI		+		119
Colias myrmidone (ESPER, 1780)	PI		+		119
Colias palaeno (LINNAEUS, 1758)	PI		+		120
Colias phicomone (ESPER, 1780)	PI		+		120
Colias werdandi ZETTERSTEDT, 1840	PI	03	+		121
Colotis evagore (KLUG, 1829)	PI		+		121
Cupido alcetas (HOFFMANSEGG, 1804)	LY		+		122
Cupido argiades (PALLAS, 1771)	LY		+		122
Cupido carswelli STEMPFFER, 1927	LY		+		123
Cupido decoloratus (STAUDINGER, 1886)	LY		+		123
Cupido fischeri (EVERSMANN, 1843)	LY		+		124
Cupido lorquinii (HERRICH-SCHÄFFER, 1847)	LY		+		124
Cupido minimus (FUESSLY, 1775)	LY		+		125
Cupido osiris (MEIGEN, 1829)	LY		+		125
Cyclyrius webbianus (BRULLE, 1840)	LY			+	
Danaus chrysippus (LINNAEUS, 1758)	NY		+	+	126
Danaus plexippus (LINNAEUS, 1758)	NY		+	+	126
Erebia aethiopella (HOFFMANSEGG, 1806)	SA		+		127
Erebia aethiops (ESPER, 1777)	SA		+		127
Erebia alberganus (PRUNNER, 1798)	SA		+		128
Erebia arvenensis OBERTHÜR, 1908	SA	04	+		128
Erebia calcaria LORKOVIC, 1953	SA		+		129
Erebia cassioides (REINER & HOHENWARTH, 1792)	SA		+		129
Erebia christi RÄTZER, 1890	SA		+		130
Erebia claudina (BORKHAUSEN, 1789)	SA		+		130
Erebia cyclopius (EVERSMANN, 1844)	SA		+		131
Erebia dabanensis ERSCHOFF, 1871	SA		+		131
Erebia disa (BECKLIN, 1791)	SA		+		132
Erebia discoidalis KIRBY, 1837	SA		+		132
Erebia edda MENETERIES, 1854	SA		+		133
Erebia embla (BECKLIN, 1791)	SA		+		133
Erebia epiphron (KNOCH, 1783)	SA		+		134
Erebia epistygne (HÜBNER, 1819)	SA		+		134
Erebia eriphyle (FREYER, 1836)	SA		+		135
Erebia euryale (ESPER, 1805)	SA		+		135
Erebia fasciata BUTTLER, 1868	SA		+		136
Erebia flavofasciata HEYNE, 1895	SA		+		136
Erebia gorge (ESPER, 1805)	SA		+		137
Erebia gorgone BOISDUVAL, 1833	SA		+		137

Species	FA	TS	EC	AI	MP
Erebia hispania BUTTLER, 1868	SA		+		138
Erebia jeniseiensis TRYBOM, 1887	SA		+		138
Erebia lefebvrei BOISDUVAL, 1828	SA		+		139
Erebia ligea (LINNAEUS, 1758)	SA		+		139
Erebia manto (DENIS & SCHIFFERMÜLLER, 1775)	SA		+		140
Erebia medusa (DENIS & SCHIFFERMÜLLER, 1775)	SA		+		140
Erebia melampus (FUESSLI, 1775)	SA	34	+		141
Erebia melas (HERBST, 1796)	SA		+		141
Erebia meolans (PRUNNER, 1798)	SA		+		142
Erebia mnestra (ESPER, 1805)	SA		+		142
Erebia montana (PRUNNER, 1798)	SA		+		143
Erebia neoridas (BOISDUVAL, 1828)	SA		+		143
Erebia nivalis LORKOVIC & LESSE, 1954	SA		+		144
Erebia oeme (ESPER, 1805)	SA		+		144
Erebia orientalis ELWES, 1900	SA		+		145
Erebia ottomana (HERRICH-SCHÄFFER, 1847)	SA		+		145
Erebia palarica CHAPMAN, 1905	SA		+		146
Erebia pandrose (BORKHAUSEN, 1788)	SA		+		146
Erebia pharte (HÜBNER, 1804)	SA		+		147
Erebia pluto (PRUNNER, 1798)	SA		+		147
Erebia polaris STAUDINGER, 1861	SA		+		148
Erebia pronoe (ESPER, 1780)	SA		+		148
Erebia rhodopensis NICHOLL, 1900	SA		+		149
Erebia rossii (CURTIS, 1834)	SA		+		149
Erebia scipio BOISDUVAL, 1832	SA		+		150
Erebia serotina DESCIMON & LESSE, 1954	SA	05	+		150
Erebia sthennyo GRASLIN, 1850	SA		+		151
Erebia stiria (GODART, 1824)	SA		+		151
Erebia styx (FREYER, 1834)	SA		+		152
Erebia sudetica STAUDINGER, 1861	SA	34	+		152
Erebia triaria (PRUNNER, 1798)	SA		+		153
Erebia tyndarus (ESPER, 1781)	SA		+		153
Erebia zapateri OBERTHÜR, 1875	SA		+		154
Erynnis marloyi (BOISDUVAL, 1834)	HE		+		154
Erynnis tages (LINNAEUS, 1758)	HE		+		155
Euchloe ausonia (HÜBNER, 1806)	PI	06	+		155
Euchloe belemia (ESPER, 1798)	PI		+	+	156
Euchloe charlonia (DONZEL, 1842)	PI			+	
Euchloe crameri BUTLER, 1869	PI	06	+		155
Euchloe insularis STAUDINGER, 1861	PI		+		156
Euchloe penia (FREYER, 1852)	PI		+		157
Euchloe simplonia FREYER, 1829	PI	06	+		155
Euchloe tagis (HÜBNER, 1804)	PI		+		157
Euphydryas aurinia (ROTTEMBURG, 1775)	NY	07	+		158
Euphydryas cynthia (DENIS & SCHIFFERMÜLLER, 1775)	NY		+		158
Euphydryas desfontainii (GODART, 1819)	NY		+		159
Euphydryas glaciegenita VERITY, 1928	NY	07	+		159
Euphydryas iduna (DALMAN, 1816)	NY		+		160
Euphydryas intermedia (MENETRIES, 1859)	NY		+		160
Euphydryas maturna (LINNAEUS, 1758)	NY		+		161

Species	FA	TS	EC	AI	MP
Favonius quercus (LINNAEUS, 1758)	LY		+		161
Gegenes nostrodamus (FABRICIUS, 1793)	HE		+		162
Gegenes pumilio (HOFFMANSEGG, 1804)	HE		+		162
Glaucopsyche alexis (PODA, 1761)	LY		+		163
Glaucopsyche melanops (BOISDUVAL, 1828)	LY		+		163
Glaucopsyche paphos (CHAPMAN, 1920)	PI		+		164
Gonepteryx cleobule (HÜBNER, 1825)	PI	27		+	
Gonepteryx cleopatra (LINNAEUS, 1767)	PI		+		164
Gonepteryx farinosa ZELLER, 1847	PI		+		165
Gonepteryx maderensis FELDER, 1862	PI			+	
Gonepteryx rhamni (LINNAEUS, 1758)	PI		+		165
Hamearis lucina (LINNAEUS, 1758)	LY		+		166
Hesperia comma (LINNAEUS, 1758)	HE		+		166
Heteropterus morpheus (PALLAS, 1771)	HE		+		167
Hipparchia actaea (ESPER, 1780)	SA		+		167
Hipparchia amalthea (FRIVALDSZKY, 1845)	SA	30	+		168
Hipparchia amymone (BROWN, 1976)	SA	08	+		168
Hipparchia anthelea (LEFEBVRE, 1831)	SA	30	+		169
Hipparchia arethusa (DENIS & SCHIFFERMÜLLER, 1775)	SA		+		169
Hipparchia aristaeus (BONELLI, 1826)	SA		+		170
Hipparchia autonoe (ESPER, 1783)	SA		+		170
Hipparchia azorina (STRECKER, 1899)	SA	09		+	
Hipparchia bacchus HIGGINS, 1967	SA	10		+	
Hipparchia blachieri (FRUHSTORFER, 1908)	SA	01	+		171
Hipparchia briseis (LINNAEUS, 1764)	SA		+		171
Hipparchia christenseni KUDRNA, 1977	SA		+		172
Hipparchia cingovskii (GROSS, 1973)	SA	08	+		172
Hipparchia circe (FABRICIUS, 1775)	SA		+		173
Hipparchia cretica (REBEL, 1916)	SA		+		173
Hipparchia cypriensis (HOLIK, 1949)	SA		+		174
Hipparchia dryas (SCOPOLI, 1763)	SA		+		174
Hipparchia euxina (KUSNEZOV, 1909)	SA		+		175
Hipparchia fagi (SCOPOLI, 1763)	SA		+		175
Hipparchia fatua (FREYER, 1845)	SA		+		176
Hipparchia ferula (FABRICIUS, 1793)	SA		+		176
Hipparchia fidia (LINNAEUS, 1767)	SA		+		177
Hipparchia geyeri (HERRICH-SCHÄFFER, 1845)	SA		+		177
Hipparchia gomera HIGGINS, 1967	SA	10		+	
Hipparchia graeca (STAUDINGER, 1870)	SA		+		178
Hipparchia hermione (LINNAEUS, 1764)	SA		+		178
Hipparchia hippolyte (ESPER, 1784)	SA		+		179
Hipparchia leighebi KUDRNA, 1976	SA		+		179
Hipparchia maderensis (BETHUNE-BAKER, 1891)	SA			+	
Hipparchia mersina (STAUDINGER, 1871)	SA		+		180
Hipparchia neomiris (GODART, 1823)	SA		+		180
Hipparchia orestes (PRINS & POORTEN, 1981)	SA	08	+		181
Hipparchia pellucida (STAUDER, 1923)	SA		+		181
Hipparchia persephone (HÜBNER, [1805])	SA		+		182
Hipparchia prieuri (PIERRET, 1837)	SA		+		182
Hipparchia sbordonii KUDRNA, 1984	SA		+		183

Species	FA	TS	EC	AI	MP
Hipparchia semele (LINNAEUS, 1758)	SA	28	+		183
Hipparchia senthes (FRUHSTORFER, 1908)	SA		+		184
Hipparchia statilinus (HUFNAGEL, 1766)	SA		+		184
Hipparchia syriaca (STAUDINGER, 1871)	SA		+		185
Hipparchia tilosi (MANIL, 1984)	SA	10		+	
Hipparchia tisiphone (BROWN, 1980)	SA	08	+		185
Hipparchia volgensis (MAZOCHIN-PORSHNYAKOV, 1952)	SA	28	+		186
Hipparchia williamsi (ROMEI, 1927)	SA	12	+		186
Hipparchia wyssii (CHRIST, 1889)	SA	10		+	
Hypolimnas misippus (LINNAEUS, 1764)	NY			+	
Iolana iolas (OCHSENHEIMER, 1816)	LY		+		187
Iphiclides podalirius (LINNAEUS, 1758)	PA	13	+		187
Issoria lathonia (LINNAEUS, 1758)	NY		+	+	188
Laeosopis roboris (ESPER, 1793)	LY		+		188
Lampides boeticus (LINNAEUS, 1767)	LY		+	+	189
Leptidea duponcheli (STAUDINGER, 1871)	PI		+		189
Leptidea morsei (FENTON, 1881)	PI		+		190
Leptidea reali REISSINGER, 1990	PI	14	+		190
Leptidea sinapis (LINNAEUS, 1758)	PI	14	+		190
Leptotes pirithous (LINNAEUS, 1767)	LY		+		191
Libythea celtis (LAICHARTING, 1782)	NY		+		191
Limenitis camilla (LINNAEUS, 1764)	NY		+		192
Limenitis populi (LINNAEUS, 1758)	NY		+		192
Limenitis reducta (STAUDINGER, 1901)	NY		+		193
Lycaena alciphron (ROTTEMBURG, 1775)	LY		+		193
Lycaena candens (HERRICH-SCHÄFFER, 1844)	LY		+		194
Lycaena dispar (HAWORTH, 1803)	LY		+		194
Lycaena helle (DENIS & SCHIFFERMÜLLER, 1775)	LY		+		195
Lycaena hippothoe (LINNAEUS, 1761)	LY		+		195
Lycaena ottomana (LEFEBVRE, 1830)	LY		+		196
Lycaena phlaeas (LINNAEUS, 1761)	LY		+	+	196
Lycaena thersamon (ESPER, 1784)	LY		+		197
Lycaena thetis (KLUG, 1834)	LY		+		197
Lycaena tityrus (PODA, 1761)	LY		+		198
Lycaena virgaureae (LINNAEUS, 1758)	LY		+		198
Maculinea alcon (DENIS & SCHIFFERMÜLLER, 1775)	LY	15	+		199
Maculinea arion (LINNAEUS, 1758)	LY		+		199
Maculinea nausithous (BERGSTRÄSSER, 1779)	LY		+		200
Maculinea teleius (BERGSTRÄSSER, 1779)	LY		+		200
Maniola bathseba (FABRICIUS, 1793)	SA		+		201
Maniola cecilia (VALLANTIN, 1894)	SA		+		201
Maniola chia (THOMSON, 1987)	SA		+		202
Maniola cypricola (GRAVES, 1928)	SA		+		202
Maniola halicarnassus (THOMSON, 1990)	SA		+		203
Maniola jurtina (LINNAEUS, 1758)	SA		+	+	203
Maniola lupina (COSTA, 1836)	SA		+		204
Maniola lycaon (KÜHN, 1774)	SA		+		204
Maniola megala (OBERTHÜR, 1909)	SA		+		205
Maniola nurag (GHILIANI, 1852)	SA		+		205
Maniola telmessia (ZELLER, 1847)	SA		+		206

Species	FA	TS	EC	AI	MP
Maniola tithonus (LINNAEUS, 1771)	SA		+		206
Melanargia arge (SULZER, 1776)	SA		+		207
Melanargia galathea (LINNAEUS, 1758)	SA		+		207
Melanargia ines (HOFFMANSEGG, 1804)	SA		+		208
Melanargia lachesis (HÜBNER 1790)	SA		+		208
Melanargia larissa (ESPER, 1784)	SA		+		209
Melanargia occitanica (ESPER, 1793)	SA		+		209
Melanargia pherusa (BOISDUVAL, 1833)	SA		+		210
Melanargia russiae (ESPER, 1784)	SA		+		210
Melitaea aetherie (HÜBNER, 1826)	NY		+		211
Melitaea arduinna (ESPER, 1784)	NY		+		211
Melitaea asteria (FREYER, 1828)	NY		+		212
Melitaea athalia (ROTTEMBURG, 1775)	NY		+		212
Melitaea aurelia (NICKERL, 1850)	NY		+		213
Melitaea britomartis (ASSMANN, 1847)	NY		+		213
Melitaea cinxia (LINNAEUS, 1758)	NY		+		214
Melitaea deione (GEYER, 1832)	NY		+		214
Melitaea diamina (LANG, 1789)	NY		+		215
Melitaea didyma (ESPER, 1779)	NY		+		215
Melitaea nevadensis (OBERTHÜR, 1904)	NY	16	+		216
Melitaea parthenoides (KEFERSTEIN, 1851)	NY		+		216
Melitaea phoebe (DENIS & SCHIFFERMÜLLER, 1775)	NY		+		217
Melitaea trivia (DENIS & SCHIFFERMÜLLER, 1775)	NY		+		217
Melitaea varia (MEYER-DÜR, 1851)	NY		+		218
Neolycaena rhymnus (EVERSMANN, 1832)	LY		+		218
Neptis rivularis (SCOPOLI, 1763)	NY		+		219
Neptis sappho (PALLAS, 1771)	NY		+		219
Nymphalis antiopa (LINNAEUS, 1758)	NY		+		220
Nymphalis c-album (LINNAEUS, 1758)	NY		+		220
Nymphalis egea (CRAMER, 1775)	NY		+		221
Nymphalis ichnusa (BONELLI, 1826)	NY		+		221
Nymphalis io (LINNAEUS, 1758)	NY		+		222
Nymphalis l-album (ESPER, 1780)	NY		+		222
Nymphalis polychloros (LINNAEUS, 1758)	NY		+		223
Nymphalis urticae (LINNAEUS, 1758)	NY		+		223
Nymphalis xanthomelas (ESPER, 1781)	NY		+		224
Ochlodes sylvanus (ESPER, 1777)	HE	35	+		224
Oeneis bore (SCHNEIDER, 1792)	SA		+		225
Oeneis glacialis (MOLL, 1785)	SA		+		225
Oeneis jutta (HÜBNER, 1806)	SA		+		226
Oeneis magna GRAESER, 1887	SA		+		226
Oeneis melissa (FABRICIUS, 1775)	SA		+		227
Oeneis norna (BECKLIN, 1791)	SA		+		227
Oeneis oeno (BOISDUVAL, 1832)	SA		+		228
Oeneis polixenes (FABRICIUS, 1775)	SA		+		228
Oeneis tarpeia (PALLAS, 1771)	SA		+		229
Papilio alexanor ESPER, 1799	PI		+		229
Papilio hospiton GENE, 1839	PI		+		230
Papilio machaon LINNAEUS, 1758	PI		+		230
Pararge achine (LINNAEUS, 1763)	SA		+		231

Species	FA	TS	EC	AI	MP
Pararge aegeria (LINNAEUS, 1758)	SA		+	+	231
Pararge climene (ESPER, 1784)	SA		+		232
Pararge deidamia (EVERSMANN, 1851)	SA		+		232
Pararge maera (LINNAEUS, 1758)	SA		+		233
Pararge megera (LINNAEUS, 1767)	SA		+		233
Pararge paramegaera (HÜBNER, 1824)	SA		+		234
Pararge petropolitana (FABRICIUS, 1787)	SA		+		234
Pararge roxelana (CRAMER, 1777)	SA		+		235
Pararge xiphia (FABRICIUS, 1775)	SA			+	
Pararge xiphioides (STAUDINGER, 1871)	SA			+	
Parnassius apollo (LINNAEUS, 1758)	PA		+		235
Parnassius mnemosyne (LINNAEUS, 1758)	PA		+		236
Parnassius phoebus (FABRICIUS, 1793)	PA		+		236
Pelopidas thrax (HÜBNER, 1821)	HE		+		237
Pieris brassicae (LINNAEUS, 1758)	PI		+	+	237
Pieris bryoniae (HÜBNER, 1791)	PI		+		238
Pieris callidice (HÜBNER, 1800)	PI		+		238
Pieris cheiranthi (HÜBNER, 1808)	PI			+	
Pieris chloridice (HÜBNER, 1813)	PI		+		239
Pieris daplidice (LINNAEUS, 1758)	PI	17	+	+	239
Pieris edusa (FABRICIUS, 1777)	PI	17	+		239
Pieris ergane (GEYER, 1828)	PI		+		240
Pieris krueperi (STAUDINGER, 1860)	PI		+		240
Pieris mannii (MAYER, 1851)	PI		+		241
Pieris napi (LINNAEUS, 1758)	PI	18	+		241
Pieris rapae (LINNAEUS, 1758)	PI		+	+	242
Plebejus aquilo (BOISDUVAL, 1832)	LY		+		242
Plebejus argus (LINNAEUS, 1758)	LY		+		243
Plebejus argyrognomon (BERGSTRÄSSER, 1779)	LY		+		243
Plebejus bellieri (OBERTHÜR, 1910)	LY		+		244
Plebejus dardanus (FREYER, 1832)	LY		+		244
Plebejus eurypilus (FREYER, 1852)	LY		+		245
Plebejus glandon (PRUNNER, 1798)	LY		+		245
Plebejus hespericus (RAMBUR, 1839)	LY		+		246
Plebejus idas (LINNAEUS, 1761)	LY		+		246
Plebejus loewi (ZELLER, 1847)	LY		+		247
Plebejus optilete (KNOCH, 1781)	LY		+		247
Plebejus orbitulus (PRUNNER, 1798)	LY		+		248
Plebejus psyloritus (FREYER, 1845)	LY		+		248
Plebejus pylaon (FISCHER, 1832)	LY		+		249
Plebejus pyrenaicus (BOISDUVAL, 1840)	LY		+		249
Plebejus sephirus (FRIVALDSZKY, 1835)	LY		+		250
Plebejus trappi (VERITY, 1927)	LY		+		250
Plebejus zuellichi (HEMMING, 1933)	LY		+		251
Polyommatus admetus (ESPER, 1785)	LY		+		251
Polyommatus ainsae (FORSTER, 1961)	LY		+		252
Polyommatus albicans (HERRICH-SCHÄFFER, 1851)	LY		+		252
Polyommatus amandus (SCHNEIDER 1792)	LY		+		253
Polyommatus aroaniensis (BROWN, 1976)	LY		+		253
Polyommatus bellargus (ROTTEMBURG, 1775)	LY		+		254

Species	FA	TS	EC	AI	MP
Polyommatus caelestissimus (VERITY, 1921)	LY	20	+		254
Polyommatus caucasicus (LEDERER, [1870])	LY		+		255
Polyommatus coelestinus (EVERSMANN, 1848)	LY		+		255
Polyommatus coridon (PODA, 1761)	LY	31	+		256
Polyommatus cyane (EVERSMANN, 1837)	LY		+		256
Polyommatus damocles (HERRICH-SCHÄFFER, 1844)	LY		+		257
Polyommatus damon (DENIS & SCHIFFERMÜLLER, 1775)	LY		+		257
Polyommatus damone (EVERSMANN, 1841)	LY		+		258
Polyommatus daphnis (DENIS & SCHIFFERMÜLLER, 1775)	LY		+		258
Polyommatus dolus (HÜBNER, 1823)	LY	21	+		259
Polyommatus dorylas (DENIS & SCHIFFERMÜLLER, 1775)	LY		+		259
Polyommatus eroides (FRIVALDSZKY, 1835)	LY		+		260
Polyommatus eros (OCHSENHEIMER, 1808)	LY		+		260
Polyommatus escheri (HÜBNER, 1823)	LY		+		261
Polyommatus exuberans (VERITY, 1926)	LY		+		261
Polyommatus fabressei (OBERTHÜR, 1910)	LY		+		262
Polyommatus galloi (BALLETTO & TOSO, 1979)	LY		+		262
Polyommatus gennargenti (LEIGHEB, 1987)	LY	20	+		263
Polyommatus golgus (HÜBNER, 1813)	LY		+		263
Polyommatus hispanus (HERRICH-SCHÄFFER, 1851)	LY		+		264
Polyommatus humedasae (TOSO & BALLETTO, 1976)	LY		+		264
Polyommatus icarus (ROTTEMBURG, 1775)	LY		+	+	265
Polyommatus iphigenius (HERRICH-SCHÄFFER, 1847)	LY		+		265
Polyommatus menalcas (FREYER, 1837)	LY		+		266
Polyommatus nephohiptamenos (BROWN & COUTSIS, 1978)	LY		+		266
Polyommatus nivescens (KEFERSTEIN, 1851)	LY		+		267
Polyommatus poseidon (HERRICH-SCHÄFFER, 1851)	LY		+		267
Polyommatus ripartii (FREYER, 1830)	LY		+		268
Polyommatus semiargus (ROTTEMBURG, 1775)	LY	22	+		268
Polyommatus thersites (CANTENER, 1834)	LY		+		269
Polyommatus violetae (GOMEZ-BUSTILLO et al., 1979)	LY		+		269
Proterebia afra (FABRICIUS, 1787)	SA		+		270
Pyrgus accretus (VERITY, 1925)	HE	23	+		270
Pyrgus alveus (HÜBNER, 1803)	HE	23	+		270
Pyrgus andromedae (WALLENGREN, 1853)	HE		+		271
Pyrgus armoricanus (OBERTHÜR, 1910)	HE		+		271
Pyrgus bellieri (OBERTHÜR, 1910)	HE		+		272
Pyrgus cacaliae (RAMBUR, 1840)	HE		+		272
Pyrgus carlinae (RAMBUR, 1840)	HE		+		273
Pyrgus carthami (HÜBNER, 1813)	HE		+		273
Pyrgus centaureae (RAMBUR, 1840)	HE		+		274
Pyrgus cinarae (RAMBUR, 1840)	HE		+		274
Pyrgus cirsii (RAMBUR, 1840)	HE		+		275
Pyrgus malvae (LINNAEUS, 1758)	HE	24	+		275
Pyrgus malvoides (ELWES & EDWARDS, 1897)	HE	24	+		275
Pyrgus onopordi (RAMBUR, 1840)	HE		+		276
Pyrgus serratulae (RAMBUR, 1840)	HE		+		276
Pyrgus sidae (ESPER, 1782)	HE		+		277
Pyrgus trebevicensis (WARREN, 1926)	HE	23	+		270
Pyrgus warrenensis (VERITY, 1928)	HE		+		277

Species	FA	TS	EC	AI	MP
Satyrium acaciae (FABRICIUS, 1787)	LY		+		278
Satyrium esculi (HÜBNER, 1804)	LY		+		278
Satyrium ilicis (ESPER, 1779)	LY		+		279
Satyrium ledereri (BOISDUVAL, 1848)	LY		+		279
Satyrium pruni (LINNAEUS, 1758)	LY		+		280
Satyrium spini (DENIS & SCHIFFERMÜLLER, 1775)	LY		+		280
Satyrium w-album (KNOCH, 1782)	LY		+		281
Scolitantides abencerragus (PIERRET, 1837)	LY		+		281
Scolitantides barbagiae (PRINS & POORTEN, 1982)	LY		+		282
Scolitantides baton (BERGSTRÄSSER, 1779)	LY		+		282
Scolitantides bavius (EVERSMANN, 1832)	LY		+		283
Scolitantides orion (PALLAS, 1771)	LY		+		283
Scolitantides panoptes (HÜBNER, 1813)	LY		+		284
Scolitantides vicrama (MOORE, 1865)	LY		+		284
Spialia orbifer (HÜBNER, 1823)	HE		+		285
Spialia phlomidis (HERRICH-SCHÄFFER, 1845)	HE		+		285
Spialia sertorius (HOFFMANSEGG, 1804)	HE		+		286
Spialia therapne (RAMBUR, 1832)	HE		+		286
Syrichtus cribrellum (EVERSMANN, 1841)	HE		+		287
Syrichtus proto (OCHSENHEIMER, 1808)	HE		+		287
Syrichtus tessellum (HÜBNER, 1803)	HE		+		288
Tarucus balcanicus (FREYER, 1845)	LY		+		288
Tarucus theophrastus (FABRICIUS, 1793)	LY		+		289
Thaleropis ionia (EVERSMANN, 1851)	NY		+		289
Thecla betulae (LINNAEUS, 1758)	LY		+		290
Thymelicus acteon (ROTTEMBURG, 1775)	HE	26	+	+	290
Thymelicus hyrax (LEDERER, 1861)	HE		+		291
Thymelicus lineola (OCHSENHEIMER, 1806)	HE		+		291
Thymelicus sylvestris (PODA, 1761)	HE		+		292
Tomares ballus (FABRICIUS, 1787)	LY		+		292
Tomares callimachus (EVERSMANN, 1848)	LY		+		293
Tomares nogelli (HERRICH-SCHÄFFER, 1852)	LY		+		293
Triphysa phryne (PALLAS, 1771)	SA		+		294
Turanana panagea (HERRICH-SCHÄFFER, 1852)	LY		+		294
Vanessa atalanta (LINNAEUS, 1758)	NY		+	+	295
Vanessa cardui (LINNAEUS, 1758)	NY		+	+	295
Vanessa virginiensis (DRURY, 1773)	NY		+	+	296
Vanessa vulcania (GODART, 1819)	NY			+	
Ypthima asterope (KLUG, 1832)	SA		+		296
Zegris eupheme (ESPER, 1805)	PI		+		297
Zerynthia caucasica (LEDERER, 1864)	PA	25	+		297
Zerynthia cerisyi (GODART, 1822)	PA	25	+		298
Zerynthia cretica (REBEL, 1904)	PA	25	+		298
Zerynthia polyxena (DENIS & SCHIFFERMÜLLER, 1775)	PA		+		299
Zerynthia rumina (LINNAEUS, 1767)	PA		+		299
Zizeeria knysna (TRIMEN, 1862)	LY	33	+	+	300

Taxonomic notes:

01 *Hipparchia ballettoi* KUDRNA, 1984, is a junior synonym of *H. neapolitana*, (STAUDER, 1921), which in turn is considered to be a junior synonym of *H. blachieri*.

02 *Coenonympha darwiniana* STAUDINGER, 1871, is a junior synonym of *C. gardetta* with which it interbreeds freely but which it replaces in the south-western Alps. *C. gardetta* and *C. arcania* have a parapatric distribution; there is a very narrow hybrid zone between *C. gardetta darwiniana* and *C. arcania*: Lago Maggiore and Col de Larche (M. WIEMERS pers. comm.).

03 *Colias werdandi* is treated as a distinct species following the recommendation made by J. HAUGUM (pers. comm.). *C. werdandi* is morphologically distinct from both *C. nastes* BOISDUVAL, 1832, and *C. tyche* (BOEBER, 1812), and the biological relationships of these three taxa are not known. *C. hecla* is provisionally treated as a polytypic circumpolar species.

04 *Erebia carmenta* FRUHSTORFER, 1909, of Italy, is provisionally considered to be conspecific with *E. arvenensis* OBERTHÜR, 1908, of France, the taxonomic status of which within the *E. tyndarus* species-group is by no means definitely established.

05 *Erebia serotina* is a very rare natural hybrid. To judge from anatomical and morphological points of view, the parent species could be *E. epiphron* with *E. pronoe* or *E. manto*. DNA studies have not been completed (H. DESCIMON pers. comm.).

06 *Euchloe ausonia, E. crameri* and *E. simplonia* are three distinct species. *E. ausonia* is deemed to be the eastern species, *E. crameri* the western species and *E. simplonia* the alpine species; all three species occur in south-eastern France and in northern Italy. The nomenclature of all three taxa is at present fluid and confused (particularly in France), not fixed by name-bearing types. The available MEB data cannot always be related to a single species. The only possible solution is to lump all three species as the *E. ausonia* complex.

07 *Euphydryas aurinia* is provisionally treated as a polytypic species; the distribution data available have not facilitated more exact treatment. *E. debilis* (OBERTHÜR, 1909) is nomen nudum (KUDRNA 1983) often used to denote *E. glaciegenita*, which is provisionally treated as a distinct species. Apart from the Alps, *E. glaciegenita* is known to occur in the Eastern Pyrenees, but there are only records of *E. aurinia* in the MEB data bank from that area, probably because *E. glaciegenita* is not being generally recognised.

08 *Hipparchia amymone* reported on at least two occasions from a single locality in Greece is provisionally considered to be a very rare natural hybrid and not a distinct species. *Hipparchia cingovskii, H. orestes* and *H. tisiphone* appear to be very closely related and could even prove to be conspecific (this applies particularly to the two latter-named taxa); all three taxa are provisionally treated as distinct species (A. WAKEHAM-DAWSON pers. comm.). According to WAKEHAM-DAWSON & DENNIS (2001), there is no satisfactory evidence of *H. tisiphone* being a subspecies of *H. mniszechii* (HERRICH-SCHÄFFER, 1852) and of *H. amymone* being a subspecies of *H. mamurra* (HERRICH-SCHÄFFER, 1846).

09 *Hipparchia azorina* is provisionally considered to be a complex (superspecies?) represented by more or less distinct allopatric forms (subspecies or semispecies?) inhabiting different islands. Morphological and anatomical differences within the complex do not appear constant enough (overlapping individual variation) to justify splitting *H. azorina* into probably about two, possibly three or even more distinct species – *H. azorina, H. miguelensis* (LE CERF, 1935) and *H. occidentalis* SOUSA, 1982. The overlapping variation could well be suggestive of ineffective reproductive and geographical isolation.

10 *Hipparchia wyssii* is considered to be a superspecies represented by four distinct allopatric semispecies inhabiting different islands: *H. bacchus, H. gomera, H. tilosi, H. wyssii.*

11 *Coenonympha elbana* STAUDINGER, 1871, is considered a synonym of *C. corinna* because it does not differ from the latter in any constant anatomical or morphological character and their individual variation overlaps whereas their biological relationship is unknown.

12 The eastern *Hipparchia hippolyte* of Russia and *H. williamsi* of S. Spain are doubtless closely related, but they differ both morphologically and anatomically, and their ranges are widely disjunct; therefore they are here provisionally treated as two distinct species.

13 Only a few records from the Iberian Peninsula refer to *Iphiclides feisthamelii* (DUPONCHEL, 1832); most recorders reported *I. podalirius*. Therefore the former taxon could not be recognised and all records are treated as *I. podalirius*.

14 *Leptidea reali* and *L. sinapis* are sibling species but not much more than 50 % of specimens can be identified by means of morphological and anatomical characters and only a small proportion of MEB data can be referred without doubt to each one of these species. It was therefore necessary to combine all data and produce a map including both species as *Leptidea sinapis* complex.

15 There is no satisfactory evidence suggesting that the taxon usually called *Maculinea rebeli* is specifically distinct from *M. alcon*, but there is clear evidence that the true *M. rebeli* (HIRSCHKE, 1904) is distinct from the xerothermophilous ecological race of *M. alcon*.

16 *Melitaea nevadensis* is usually treated as a subspecies of *M. athalia*. *M. nevadensis* is a very rare and extremely local species endemic to high mountains of S. Spain, probably much closer to *M. deione* than to *M. athalia* and usually misidentified by lepidopterists.

17 The western *Pieris daplidice* and the eastern *P. edusa* are considered to be biologically distinct sibling species. As they cannot be distinguished from each other by any traditional means, both migrate and their ranges probably overlap, they are 'lumped' here as *P. daplidice* complex.

18 *Pieris adalwinda* FRUHSTORFER, 1909, is considered to be conspecific with *P. napi*; it is not recognised by most of the distribution data available from Sweden and Norway, and common transitional forms suggest that both taxa interbreed freely in nature. There is no evidence satisfactorily suggesting that *P. adalwinda* could be conspecific with *P. bryoniae*. The taxonomic status of *P. balcana* LORKOVIC, 1970, is by no means clear, as the late Z. LORKOVIC (pers. comm.) confirmed a few years before his death. Apart from a few exceptions, no records referring specifically to *P. balcana* have been received.

19 The taxonomic status of many taxa of the *Aricia agestis* complex is by no means clear: *A. artaxerxes* could prove to be a synonym of *A. agestis* or a complex of as many as four, probably allopatric, distinct species, including *A. montensis*.

20 Contrary to the recommendations made by E. BALLETTO (per. comm.), *Polyommatus asturiensis* (SAGARRA, 1924), as recognized by MANLEY & ALLCARD (1970), is treated as conspecific with *P. coridon*. Thanks to A. DIEZ (D05) I could examine a series of specimens of the so-called *P. asturiensis* from the Provinces of Burgos, Palencia and Leon. To judge from their habitus, they appear to be very closely related to *P. coridon* and could prove to be biologically conspecific with it. The taxonomic status of *P. asturiensis manleyi* Lesse, 1962, as recognized by MANLEY & ALLCARD (1970), from the Province of Huesca (e.g. Jaca vic., Sierra de la Pena, Pena de Oroel) remains uncertain; the taxon is for the purpose of MEB provisionally treated as *P. coridon*. *P. gennargenti* appears to be very closely related to *P. caelestissimus* and could even prove conspecific with it; conclusions made by MARCHI et al. (1996) are very difficult to accept.

21 *Polyommatus dolus* and *P. virgilius* (OBERTHÜR, 1910) could prove to be two distinct species (E. BALLETTO pers. comm.); because the latter species is not generally recognised, they are both treated here as *P. dolus* complex.

22 The taxonomic status of *Polyommatus helena* (STAUDINGER, 1862) is uncertain: it could prove to be anything from a distinct species to a synonym of *P. semiargus*; only records from the mainland of S. Greece are referable to *P. helena*.

23 *Pyrgus accretus, P. alveus* and *P. trebevicensis* are three closely related species. Because many recorders and some data banks cannot distinguish between them, therefore, it has become necessary to 'lump' them together as *P. alveus* complex.

24 *Pyrgus malvae* and *P. malvoides* are closely related distinct species. Because they cannot be distinguished by many recorders incl. some data banks and their ranges overlap, it has become necessary to 'lump' both together as *P. malvae* complex.

25 *Zerynthia caucasica, Z. cretica* and *Z. cerisyi* are morphologically very closely related and their biological relationship is unknown; they are provisionally treated as distinct species.

26 Some authors threat *Thymelicus acteon* from the Canary Islands as a distinct species *T. christi* (REBEL, 1894).

27 It can be argued that *Gonepteryx palmae* STAMM, 1963, and *G. eversi* REHNELT, 1974, are distinct species; the former taxon especially appears to be a morphospecies slightly distinct from *G. cleobule*. As anatomical differences of these taxa are slight not constant I prefer to treat *G. cleobule* as a polytypic species until reproductive isolation of the three taxa can be demonstrated.

28 The distribution of *H. semele* and *H. volgensis* in Eastern Europe (the Ukraine, Moldova, Russia) is inadequately known as both species are being thoroughly confused with each other by most lepidopterists in those countries. The records of *H. semele* from the southern Balkan countries are all presumably referable to *H. semele muelleri* KUDRNA, 1975, the taxonomic status of which requires further clarification. The occurrence of *H. volgensis* in Corfu requires confirmation.

29 *Coenonympha glycerion* and *C. iphioides* are taxonomically distinct but very closely related and some forms appear to be transitional; they may prove to be conspecific.

30 *Hipparchia amalthea* and *H. anthelea* are taxonomically distinct morphospecies; they are very closely related and may prove to be conspecific from a biological point of view (cf. WAKEHAM-DAWSON & DENNIS 2001).

31 *Polyommatus coridon nufrellensis* (SCHURIAN, 1977) was described from Corsica, where it was collected on one occasion only. The type series looks very much like *P. coridon* from C. Europe. The occurrence of *P. coridon* in Corsica requires reliable confirmation; until then, the type series is for the purpose of MEB treated as mislabelled *P. coridon,* probably from C. Europe. Further comments on *P. coridon* are to be found under note no. 20.

32 *Spialia therapne* is taxonomically closely related to *S. sertorius* and both taxa are considered to be conspecific by some authors.

33 *Zizeeria karsandra* (MOORE, 1865) is provisionally considered to be conspecific with *Z. knysna.*

34 *Erebia melampus* and *E. sudetica* are very closely related and could prove to be conspecific, despite the anatomical differences discovered by WARREN (1961).

35 *Ochlodes sylvanus* is the valid name for the distinct Western-Palaearctic species formerly considered conspecific with the Easter-Palaearctic *O. venatus* (BREMER & GREY, 1853).

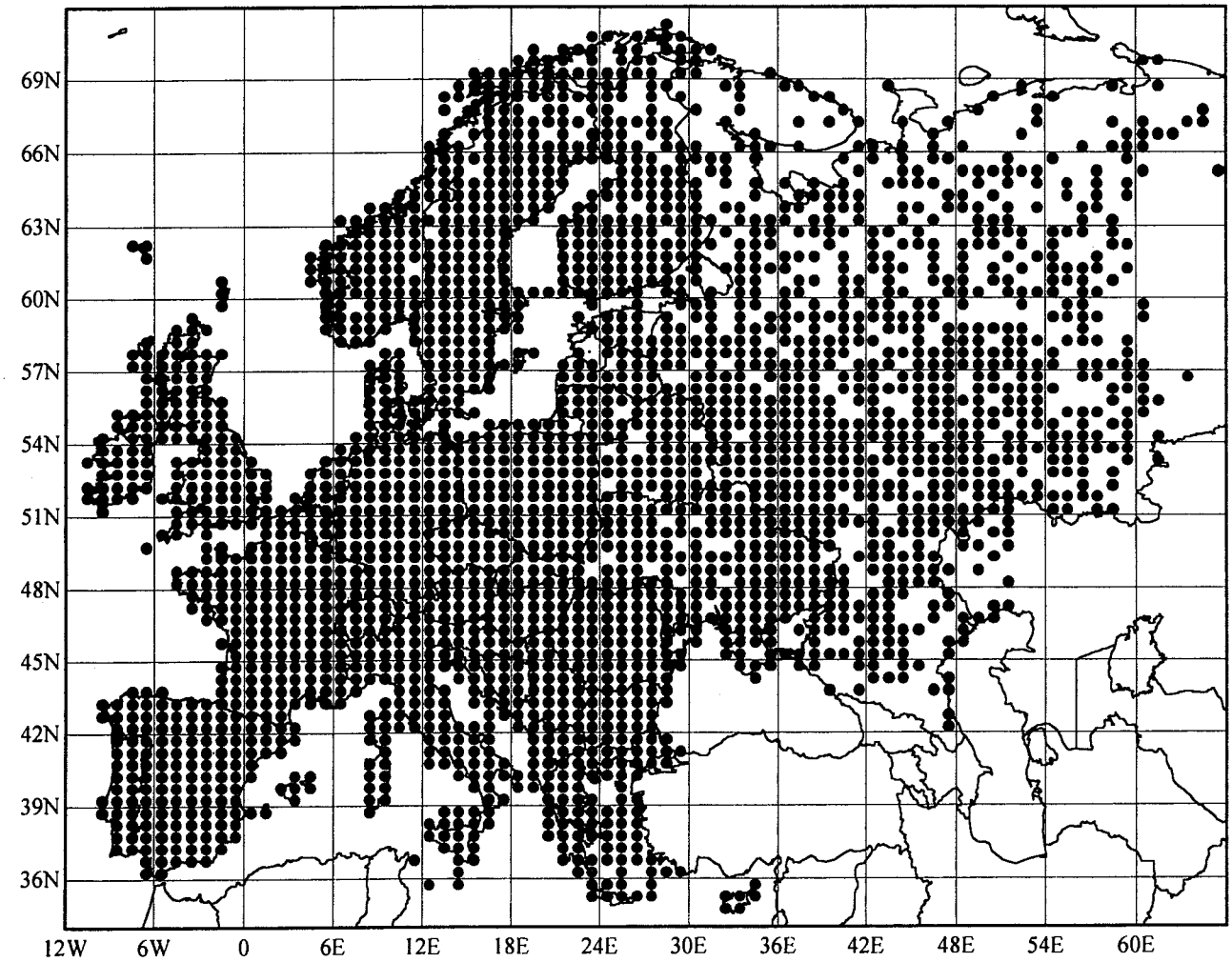
Closing remarks

Stable, universal names of genera and species are the first precondition for communication amongst the parties involved with the study of butterflies including their conservation. Publications concerned solely or mainly with butterfly conservation usually demonstrate their authors' hair-raising incompetence in systematics and nomenclature; reading works of such authors is often very amusing, but they contribute highly negatively to the stability of zoological names and thus obscure the communication of information amongst conservation biologists. As both the principles of systematic zoology and the contents of the *International Code of Zoological Nomenclature* usually seem to be totally unknown to the majority of authors of publications on butterfly conservation and distribution (i.e. butterfly faunistics), the more conscientious of these authors often make reference to field guides considered 'standard' by them or they prefer to use vernacular names, as they are known to them. When asked why they do so, they usually offer the most amazing answers. Under these circumstances, a standard checklist of European butterflies is most urgently needed to supplement the *International Code of Zoological Nomenclature.* Voluntary acceptance of such a standard checklist by the vast majority of lepidopterists, conservationists, entomological (s.l.) and other relevant societies, editors of books and journals, and government agencies across Europe is the precondition for the success of such a standard checklist. In North America, the standard checklist compiled by MILLER & BROWN (1981) has been a success.

4 Gazetteer of reference localities

This gazetteer contains 9145 reference localities (RLs) arranged alphabetically under countries the countries are arranged alphabetically according to their acronyms. It has proved necessary to omit accents and diacritical marks except those used in German (Ää Öö Üü and ß). An apology is due to all recorders for ignoring their peculiar 'national' accents; the English language is to be highly praised for its simplicity. Names not referring to human settlements (mostly mountains) are marked with an asterisk (*) following the name. Names of RLs followed by ° are not listed in *The Times Atlas of the World*; the use of these non-standard RLs (situated mostly in Russia) could not have been avoided. The spelling of names follows *The Times Atlas of the World* – except in a few cases of obvious errors which were corrected; even such a magnificent work as *The Times Atlas of the World* contains some errors. In multilingual countries only the name in the main language of the country, as used in *The Times Atlas of the World,* has been utilised as reference locality; for example: 'Bozen' situated in Südtirol, the predominantly German-speaking part of Italy, is listed as 'Bolzano'. Transcription of geographical names from Cyrillic, Greek and Russian alphabets follows *The Times Atlas of the World.*

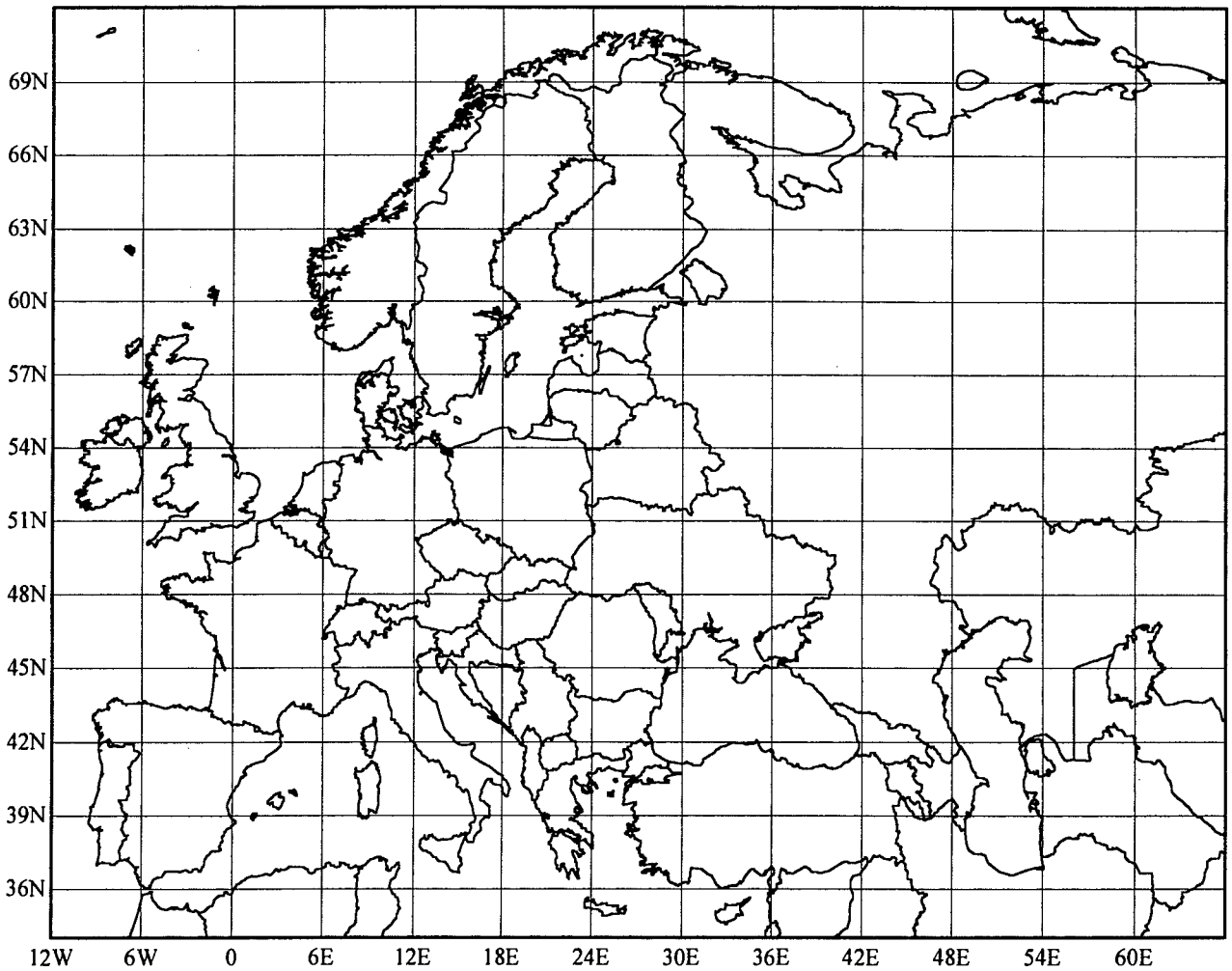
The following map shows all reference localities (N = 9145) plotted on the MEB map of Europe, the total number of MEB basic recording fields (BRF) covered by reference localities being 2620. The potential maximum of BRF amounts to about 3100.



The following table shows the number of standard reference localities (N = 9145 RLs) for each European country; countries are arranged in alphabetical order, followed by their acronyms. Special RLs used occasionally for the conversion of distribution maps or data banks are not counted.

Albania (AL)	39	Great Britain (GB)	309	Norway (N)	279
Andorra (AND)	2	Greece (GR)	372	Poland (PL)	320
Austria (A)	158	Netherlands (NL)	108	Portugal (P)	156
Belarus (BY)	83	Hungary (H)	125	Rumania (RO)	212
Belgium (B)	48	Ireland (IRL)	110	Russia (RUS)	1315
Bosnia-H. (BIH)	84	Italy (I)	797	San Marino (RSM)	1
Bulgaria (BG)	110	Kazakhstan (KAZ)	23	Slovakia (SK)	80
Croatia (HR)	145	Latvia (LV)	41	Slovenia (SLO)	48
Cyprus (CY)	31	Liechtenstein (FL)	1	Spain (E)	775
Czechia (CZ)	206	Lithuania (LT)	36	Sweden (S)	363
Denmark (DK)	93	Luxembourg (L)	9	Switzerland (CH)	145
Estonia (EST)	25	Macedonia (MK)	42	Turkey (TR)	28
Finland (FIN)	230	Malta (M)	6	Ukraine (UKR)	275
France (F)	925	Moldova (MD)	39	Vatican (V)	1
Germany (D)	577	Monaco (MC)	1	Yugoslavia (YU)	165

The following blank map shows the country boundaries of all European states as recognised for the purpose of the present project:



A Austria

Admont 47.35 14.28e
Allensteig 48.42 12.50e
Altenmarkt 47.44 14.39e
Amstetten 48.08 14.52e
Aschach 48.05 14.45e
Bad Ischl 47.43 13.38e
Baden 48.01 16.14e
Badgastein 47.07 13.09e
Birkfeld 47.22 15.42e
Bischofshofen 47.25 13.13e
Bleiberg 46.38 14.32e
Bleiburg 46.35 14.49e
Braunau am Inn 48.16 13.03e
Bruck (Salzburg) 47.18 12.49e
Bruck an der Leitha 48.02 16.47e
Bruck an der Mur 47.25 15.17e
Dachstein* 47.29 13.36e
Deutsch Landsberg 46.49 15.10e
Dornbirn 47.25 09.46e
Ebensee 47.49 13.47e
Eferding 48.19 14.02e
Eggenburg 48.39 15.49e
Eibiswald 46.42 15.15e
Eisenerz 47.33 14.53e
Eisenhut* 46.58 13.56e
Eisenstadt 47.51 16.31e
Enns 48.13 14.28e
Fehring 46.57 16.01e
Feldkirch 47.15 09.38e
Feldkirchen 46.44 14.06e
Feuchten 47.02 10.46e
Fluchthorn* 46.54 10.14e
Fohnsdorf 47.13 14.40e
Freistadt 48.31 14.31e
Friesach 46.57 14.25e
Fürstenfeld 47.03 16.05e
Fuschlsee* 47.48 13.18e
Gänserndorf 48.21 16.43e
Gerlos 47.14 12.02e
Gleisdorf 47.07 15.43e
Gmünd (Kärnten) 46.55 13.33e
Gmünd (Niederösterreich) 48.47 14.59e
Gmunden 47.56 13.48e
Graz 47.05 15.22e
Greimberg* (Wölzer Tauern) 47.15 14.10e
Gröbming 47.28 13.55e
Grosser Priel* (Totes Geb.) 47.40 14.05e
Grossglockner* 47.05 12.44e
Gschnitz 47.03 14.21e
Güssing 47.03 16.19e
Gutenstein 47.53 15.53e
Hainburg 48.09 16.57e
Hallein 47.41 13.06e
Hartberg 47.18 15.58e
Hermagor 46.38 13.22e
Hochschwab* 47.37 15.08e
Hohentauern 47.26 14.30e
Hollabrunn 48.34 16.05e
Horn 48.40 15.40e
Huben (Osttirol) 46.56 12.34e
Huben (Tirol) 47.03 10.59e
Illmitz 47.46 16.48e
Imst 47.14 10.45e
Innsbruck 47.17 11.25e
Jenbach 47.24 11.47e
Judenburg 47.10 14.40e
Kirchdorf 47.55 14.08e
Kitzbühel 47.27 12.23e
Klagenfurt 46.38 14.20e
Knittelfeld 47.14 14.50e
Köflach 47.04 15.04e
Kötschach 46.41 13.01e
Krems 48.25 15.36e
Kufstein 47.36 12.11e
Laa an der Thaya 48.44 16.23e
Lambach 48.06 13.52e
Landeck 47.09 10.35e
Langau 48.51 15.43e
Lech (Arlberg) 47.13 10.09e
Leoben 47.23 15.06e
Leonfelden 48.32 14.18e
Lermoos 47.24 10.53e
Lienz 46.51 12.50e
Liezen 47.35 14.15e
Linz 48.19 14.18e
Lofer 47.36 12.42e
Lunz am See 47.52 15.02e
Mallnitz 46.59 13.11e
Mariazell 47.47 15.20e
Martinsberg 48.23 15.10e
Matrei am Brenner 47.08 11.28e
Matrei in Osttirol 47.01 12.32e
Mattsee 47.58 14.08e
Mauterndorf 47.09 13.41e
Mayrhofen 47.10 11.52e
Melk 48.14 15.21e
Mistelbach 48.35 16.35e
Mittersil 47.18 12.29e
Mödling 48.06 16.18e
Murau 47.08 14.10e
Mürzzuschlag 47.37 15.41e
Nauders 46.54 10.31e
Neulengbach 48.12 15.55e
Neunkirchen 47.44 16.05e
Neusiedel am See 47.58 16.51e
Ober Vellach 46.57 13.13e
Ötz 47.13 10.54e
Peuerbach 48.22 13.47e
Pinkafeld 47.23 16.08e
Prägarten 47.02 22.23e
Raabs 48.52 15.31e
Radkersburg 46.42 16.00e
Radstadt 47.23 14.28e
Rappottenstein 48.32 15.05e
Retz 48.46 15.58e
Ried 47.03 10.39e
Rohrbach 48.35 13.59e
Salzburg 47.54 13.03e
Sankt Johann 47.32 12.26e
Sankt Pölten 48.13 15.37e
Sankt Veit 46.56 12.26e
Scheibbs 48.01 15.11e
Schruns 47.06 09.56e
Schwarzenau 48.45 15.16e
Schwaz 47.21 11.44e
Seewiesen 47.38 15.17e
Sellrain 47.13 11.14e
Selzthal 47.33 14.19e
Sillian 46.46 12.26e
Sölden 46.58 11.00e
Spielfeld 46.43 15.38e
Spital am Pyhrn 47.41 14.22e
Spital am Semmering 47.36 15.45e
Spittal an der Drau 46.48 13.30e
Stanzach 47.24 10.35e
Staus 47.23 11.43e
Steinach 47.06 11.28e
Steyr 48.04 14.25e
Stockerau 48.24 16.13e
Strasswalchen 47.59 13.15e
Tulln 48.20 16.03e
Turnitz 47.57 15.30e
Venediger* 47.07 12.20e
Villach 46.37 13.51e
Vöcklabruck 48.01 13.40e
Völkermarkt 46.40 14.38e
Waidhofen 48.50 15.18e
Weitersfelden 48.28 14.45e
Weitra 48.43 14.55e
Wels 48.10 14.02e
Wien 48.13 16.22e
Wiener Neustadt 47.49 16.15e
Wildon 46.53 15.30e
Windischgarsten 47.44 14.20e
Wolfsberg (Kärnten) 46.50 14.50e
Wörgl 47.29 12.04e
Ybbs 48.11 15.05e
Zwettl 48.28 14.17e

AL Albania

Berat 40.43 19.46e
Bicaj 42.00 20.25e
Blinisht 41.52 20.01e
Burrel 41.36 20.01e
Corovode 40.31 20.14e
Dhermi 40.10 19.35e
Durres 41.18 19.28e
Elbasan 41.07 20.05e
Fier 40.44 19.33e
Frasher 40.23 20.26e
Gjirokaster 40.05 20.10e
Gusmar 40.13 19.53e
Kallmet 41.51 19.41e
Kamenice 40.32 20.44e
Kavaje 41.11 19.33e
Konispol 39.42 20.10e
Koplikisiperm 42.14 19.29e
Korce 40.38 20.44e
Kruja 41.31 19.35e
Krume 42.12 20.24e
Kukes 42.05 20.24e
Leskovik 40.10 20.34e
Libohove 40.02 20.25e
Librazhd 41.12 20.20e
Likmetaj 41.33 19.34e
Moglice 40.44 20.24e
Nicaj Shale 42.18 19.45e
Permet 40.15 20.21e
Pogradec 40.55 20.37e
Prosek 41.43 19.55e
Puke 42.02 19.53e
Raje 42.16 20.01e
Sarande 39.53 20.00e
Shkoder 42.03 19.01e
Sinanaj 40.22 19.52e
Tirane 41.20 19.49e
Tropoje 42.23 20.10e
Vlore 40.29 19.29e
Zerqan 41.30 20.20e

AND Andorra

Andorra la Vella 42.30 01.30w
Soldeu 42.34 01.30w

B Belgium

Aalst 50.47 05.12e
Antwerpen 51.13 04.25e
Arlon 49.41 05.49e
Bastogne 50.00 05.43e
Bertrix 49.52 05.15e
Brugge 51.13 03.14e
Brussel 50.50 04.21e
Charleroi 50.25 04.27e
Chimay 50.03 04.20e
Diepenbeek 50.54 05.25e
Diest 50.58 05.03e
Dinant 50.16 04.55e
Durbuy 50.22 05.28e
Eeklo 51.11 03.34e
Eupen 50.38 06.02e
Florenville 49.42 05.19e
Geel 51.10 05.49e
Gent 51.02 03.42e
Geradsbergen 50.47 03.53e
Hechtel 51.21 05.22e
Ieper 50.51 02.53e
Kortrijk 50.50 03.17e
La Roche en A. 50.11 05.35e
Landen 50.45 05.05e
Leuven 50.53 04.42e
Liege 50.38 05.35e
Maaseik 51.05 05.48e
Malmedy 50.26 06.02e
Marche 50.29 04.58e
Mechelen 51.02 04.29e
Mons 50.37 05.28e
Namur 50.28 04.52e
Nieuvpoort 51.08 02.45e
Nivelles 50.36 04.20e
Oudenaarde 50.50 03.37e
Philippeville 50.12 04.33e
Rijkevorsel 51.21 04.46e
Rochefort 50.10 05.13e
Roeselare 50.57 03.08e
Saint Hubert 50.02 05.22e
Saint Martens Voeren 50.45 05.48e
Saint Niklaas 51.10 04.09e
Saint Truiden 50.49 05.11e
Tielt 51.00 03.20e
Tournai 50.36 03.24e
Vielsalm 50.17 05.55e
Virton 49.34 05.32e
Wavre 50.43 04.37e

BG Bulgaria

Ardino 41.34 25.09e
Asenovgrad 42.00 24.53e
Aytos 42.41 27.15e
Balchik 43.24 28.10e
Bansko 41.50 23.30e
Belogradchik 43.37 22.40e
Berkovitsa 43.15 23.05e
Bezhanovo 43.13 23.26e
Blagoevgrad 42.01 23.05e
Blatnitsa 43.41 28.32e
Bobovdol 42.21 22.59e
Botevgrad 42.55 23.47e
Bregovo 44.08 22.39e
Burgas 42.30 27.29e
Byala 42.53 27.55e
Byala Slatina 43.29 22.55e
Chernichevo 41.22 25.49e
Chirpan 42.10 25.19e
Dermantski 43.08 24.17e
Devin 41.44 24.24e
Dimitrovgrad 42.03 25.34e
Dobrinishta 41.50 23.31e
Dolna Banya 42.18 23.44e
Draganovo 43.12 25.48e
Dragoman 42.56 22.52e
Dulovo 43.48 27.09e
Etropole 42.50 24.00e
Gabrovo 42.52 25.19e
General Toshevo 43.42 28.06e
Glavinitsa 43.55 26.48e
Gramada 43.49 22.39e
Gramatikovo 42.03 27.38e
Grozdovo 43.01 27.33e
Grudovo 42.21 27.10e
Ivaylovgrad 41.32 26.08e
Kaloyanovo 42.20 24.43e
Karlovo 42.28 24.49e
Kavarna 43.26 28.22e
Kazanluk 42.37 25.23e
Kermen 42.30 26.16e
Khaskovo 41.57 25.32e
Khrojna 41.50 24.40e
Klisura 42.40 24.28e
Kresna 41.43 23.10e
Kubrat 43.49 26.31e
Kyustendil 42.16 22.40e
Levski 43.21 25.11e
Lom 43.50 23.12e
Lovech 43.08 24.45e
Lyubimets 41.50 26.05e
Malomir 42.16 26.30e
Maritsa 42.01 25.50e
Medkovets 43.37 23.10e
Melnik 41.30 23.22e
Michurin 42.09 27.51e
Mikhaylovgrad 43.25 23.11e
Most 41.45 25.31e
Nesebur 42.39 27.43e
Novi Pazar 43.20 27.12e
Omurtag 43.05 26.27e
Opaka 43.28 26.10e
Orekhovista 43.37 24.27e
Orekhovo 43.44 23.56e
Orizare 42.44 27.40e
Panagyurishte 42.29 24.10e
Pavlikeni 43.14 25.20e
Pelovo 43.26 24.17e
Pernik 42.36 23.03e
Pleven 43.25 23.40e
Plovdiv 42.08 24.45e
Popovo 43.20 26.14e
Preslav 43.09 26.50e
Prespa* 41.42 24.52e
Provadiya 43.10 27.29e
Radnevo 42.17 25.58e
Razgrad 43.31 26.33e
Razlog 41.53 23.28e
Rilski Monastir 42.07 23.19e
Rish 42.57 26.57e
Rositsa 43.57 27.57e
Sandanski 41.35 23.16e
Sevlievo 43.00 27.07e
Shumen 43.17 26.55e
Simitli 41.51 23.09e
Sliven 42.40 26.19e
Smolyan 41.34 24.42e
Sofiya 42.40 23.18e
Sozopol 42.23 27.42e
Stanke Dimitrov 42.15 23.18e
Stara Zagora 42.25 25.37e
Staro Oryakhovo 42.59 27.49e
Suvorovo 43.20 27.36e
Svilengrad 41.45 26.14e
Svishtov 43.36 25.22e
Telish 43.20 24.15e
Tervel 43.45 27.28e
Teteven 42.54 24.18e
Tolbukhin 43.34 27.51e
Topolovgrad 42.05 26.20e
Trun 42.50 22.37e
Vakarel 42.35 23.40e
Varna 43.12 27.57e
Veliko Turnovo 43.04 25.39e
Velingrad 42.01 23.59e
Vidin 44.00 22.50e
Vikhren Mt.* 41.47 23.22e
Vratsa 43.12 23.32e
Yambol 42.28 26.30e
Zlatograd 41.22 25.07e
Zvezdets 42.06 27.26e

BIH Bosnia-Hercegovina

Banja Koviljaca 44.30 19.07e
Banja Luka 44.47 17.11e
Bihac 44.49 15.53e
Bijeljina 44.46 19.14e
Bjelasnica* 43.10 18.21e
Bosanska Gradiska 45.09 17.15e
Bosanska Krupa 44.53 16.10e
Bosanski Brod 45.09 18.00e
Bosanski Novi 45.02 16.22e
Bosanski Petrovac 44.35 16.21e
Bosanski Samac 45.03 18.29e
Brcko 44.59 18.49e
Bugojno 44.03 17.28e
Cajnice 43.34 19.05e
Cazin 44.59 15.57e
Cemerno 43.15 18.35e
Derventa 44.59 17.56e
Doboj 44.44 18.05e
Donji Vakuf 44.08 17.24e
Drvar 44.21 16.23e
Foca 43.30 18.48e
Fojnica 44.00 17.51e
Gacko 43.10 18.33e
Glamoc 44.03 16.51e
Gorazde 43.41 18.59e
Gornij Vakuf 43.57 17.34e
Gracanica 44.43 18.18e
Gradacac 44.52 18.26e
Ivancici 44.00 18.33e
Jahorina* 43.41 18.36e
Jajce 44.20 17.16e
Jezero 44.20 17.10e
Kalinovik 43.31 18.29e
Kladanj 44.14 18.42e
Kljuc 44.32 16.48e
Konjic 43.40 17.59e
Konjuh* 44.18 18.32e
Kotor Varos 44.38 17.22e
Kresevo 43.52 18.02e
Lasva 44.08 17.56e
Licko Petrovo Selo 44.52 15.44e
Lipa 44.42 16.03e
Livno 43.50 17.00e
Ljubija 44.55 16.35e
Ljubinje 42.57 18.05e
Ljubuski 43.12 17.34e
Maglaj 44.33 18.09e
Modrica 44.56 18.14e

Mostar 43.20 17.50e
Mrkonjic Grad 44.26 17.04e
Nevesinje 43.15 18.07e
Olovo 44.07 18.35e
Orasje 45.01 18.42e
Posusje 43.29 17.20e
Pribinic 44.39 17.39e
Prijedor 45.00 16.41e
Prnjavor 44.54 17.40e
Prozor 43.50 17.36e
Ravno 42.54 17.58e
Sarajevo 43.52 18.26e
Sator* 44.09 16.37e
Siroki Brijeg 43.21 17.36e
Srebrenica 44.06 19.20e
Srnetica 44.26 16.40e
Stolac 43.04 17.56e
Tesanj 44.37 18.00e
Tomislavgrad (= Duvno) 43.42 17.14e
Travnik 44.13 17.40e
Trebinje 42.44 18.20e
Tuzla 44.33 18.41e
Ugljevik 44.38 19.01e
Ulog 43.24 18.19e
Vares 44.18 18.20e
Visegrad 43.47 19.20e
Visoko 44.00 18.10e
Vitina 43.17 17.29e
Vlasenica 44.11 18.59e
Vran* 43.40 17.30e
Vrnograc 45.10 15.56e
Zaba* 42.58 17.42e
Zavidovici 44.27 18.09e
Zenica 44.11 17.53e
Zepce 44.26 18.03e
Zvornik 44.22 19.07e

BY Belarus

Baranovichi 53.09 26.00e
Beshenkovichi 55.04 29.26e
Bobruysk 53.08 29.10e
Borisov 54.09 28.30e
Braslav 55.34 27.06e
Brest 52.08 23.40e
Bykhov 53.30 30.15e
Chausy 53.49 30.57e
Chechersk 52.54 30.54e
Cherven 53.40 28.28e
Disna 55.31 28.11e
Dokshitsy 54.51 27.40e
Dolginovo 54.38 27.28e
Dovsk 53.07 30.29e
Dretun 55.41 29.11e
Dubrovno 54.35 30.44e
Dyatlovichi 52.08 30.49e
Gantsevichi 52.49 26.29e
Glubokoye 55.07 27.42e
Glussk 52.51 28.40e
Gomel 52.25 30.00e
Gorodishche 53.40 29.45e
Gorodok 55.28 29.29e
Grodno 53.40 23.50e
Ivanovo 52.10 25.31e
Kamen 55.01 28.50e
Kholopenichi 58.30 28.58e
Khotimsk 53.24 32.36e
Khoyniki 51.52 29.59e
Klimovichi 53.36 31.58e
Kossovo 52.40 25.18e
Kostyukovichi 53.20 32.01e
Krugloye 54.16 29.50e
Krupki 54.19 29.05e
Kublichi 55.10 28.24e
Lelchitsy 51.48 28.20e
Lepel 54.48 28.40e
Lida 53.50 25.19e
Lyushcha 52.38 26.41e
Malorita 51.50 24.08e
Minsk 53.51 27.30e
Mogilev 53.54 30.20e
Motol 52.25 25.05e
Mozyr 52.02 29.10e
Mstislavl 54.02 31.44e
Nesvizh 53.16 26.40e
Novogrudok 53.35 25.50e
Orsha 54.30 30.23e
Oshmyany 54.22 25.52e
Osipovichi 53.19 28.36e
Osveya 55.59 28.08e
Ozarichi 52.28 29.12e
Parichi 52.48 29.25e
Petrikov 52.09 28.30e
Pinsk 52.08 26.01e
Pleshchenitsy 54.24 27.52e
Polotsk 55.30 28.43e
Postoli 52.30 28.00e
Pruzhany 52.33 24.28e
Ryasna 54.00 31.14e
Senno 54.50 29.43e
Sharkovshchina 55.19 27.30e
Slavgorod 53.25 31.00e
Slonim 53.05 25.21e
Slutsk 53.02 27.31e
Stara Dorogi 53.02 28.18e
Starobin 52.40 27.29e
Stolin 51.52 26.51e
Svisloch 53.28 29.00e
Terekhovka 52.13 31.28e
Tolochin 54.25 29.42e
Turov 52.04 27.40e
Ulla 55.10 29.14e
Vasilevichi 52.19 29.48e
Vereche 55.36 30.22e
Vidzy 55.23 26.32e
Vileyka 54.30 26.50e
Vitebsk 55.10 30.14e
Volkovysk 53.10 24.28e
Voronovo 54.09 25.19e
Yelsk 51.50 29.10e
Zaslavl 54.00 27.15e
Zherdnoye 51.40 30.11e

CH Switzerland

Aarau 47.24 08.04e
Adelboden 46.29 07.34e
Airolo 46.32 08.37e
Albula-Pass* 46.35 09.50e
Altdorf 46.53 08.38e
Andermatt 46.38 08.36e
Appenzell 47.20 09.25e
Arosa 46.47 09.41e
Bad Ragaz 47.01 09.30e
Baden 47.28 08.19e
Balsthal 47.18 07.42e
Basel 47.33 07.36e
Bellinzona 46.12 09.02e
Bern 46.57 07.26e
Bex 46.16 07.01e
Biasca 46.22 08.58e
Biel 47.09 07.16e
Bignasco 46.21 08.36e
Binn 46.22 08.12e
Brassus, le 46.35 06.13e
Brienz (Bern) 46.46 08.02e
Brienz (Graubünden) 46.41 09.36e
Brig 46.19 08.00e
Brugg 47.29 08.31e
Buchs 47.24 08.04e
Bulle 46.37 07.04e
Burgdorf 47.03 07.38e
Chiasso 45.51 09.02e
Chur 46.52 09.32e
Davos-Dorf 46.48 09.52e
Davos-Platz 46.47 09.50e
Delemont 47.22 07.21e
Dietikon 47.24 08.25e
Disentis 46.43 08.51e
Einsiedeln 47.07 08.45e
Elm 46.56 09.11e
Engelberg 46.49 08.25e
Engelburg 47.27 09.21e
Evolene 46.07 07.30e
Filisur 46.14 09.42e
Finhaut 46.05 06.59e
Fionnay 46.03 07.18e
Fleurier 46.55 06.36e
Flüela-Pass* 46.46 09.57e
Frasco 46.21 08.48e
Frauenfeld 47.34 08.54e
Fribourg 46.50 07.10e
Frutigen 46.36 07.49e
Fusio 46.27 08.40e
Gemmi-Pass* 46.24 07.37e
Geneve 46.13 06.09e
Glarus 47.03 09.04e
Gletsch 46.33 08.22e
Gondo 46.13 08.08e
Goppenstein 46.23 07.46e
Grabs 47.11 09.27e
Grenchen 47.13 09.24e
Grindelwald 46.38 08.03e
Gstaad 46.28 07.17e
Herisau 47.23 09.17e
Huttwil 47.07 07.51e
Ilanz 46.47 09.13e
Interlaken 46.42 07.52e
Jungfrau* 46.33 07.58e
Kandersteeg 46.30 07.41e
Klosters 46.54 09.54e
Kreuzlingen 47.38 09.12e
Kriens 47.03 08.17e
Lausanne 46.32 06.39e
Lenzerheide 46.44 09.34e
Leuk 46.19 07.39e
Leukerbad 46.23 07.38e
Linthal 46.55 09.00e
Locarno 46.10 08.48e
Lugano 46.01 08.57e
Lukmanier-Pass* 46.34 08.48e
Luzern 47.03 08.17e
Maloja-Pass* 46.25 09.45e
Martigny 46.07 07.05e
Martigny-Bourg 46.07 07.05e
Martigny-Ville 46.07 07.05e
Matterhorn* 45.59 07.39e
Meiringen 46.44 08.12e
Montana 46.19 07.29e
Montreux 46.27 06.55e
Mörel 46.22 08.03e
Morges 46.31 06.30e
Münster 46.30 08.17e
Mürren 46.33 07.54e
Murten 46.56 07.07e
Müstair 46.38 10.28e
Näfels 47.06 09.04e
Neuchatel 46.59 06.55e
Nyon 46.23 06.15e
Ofen-Pass* 46.38 10.18e
Olten 47.22 07.55e

Piano 46.18 08.37e
Pontresina 46.30 09.54e
Porrentruy 47.25 07.06e
Poschiavo 46.19 10.04e
Rapperswil (Bern) 47.04 07.26e
Rapperswil (Schwyz) 47.14 08.50e
Romont 46.42 06.56e
Saanen 46.30 07.16e
Saas-Fee 46.07 07.56e
San Bernardino, Pass* 46.28 09.13e
Sankt Bernard, Pass* 45.50 07.12e
Sankt Gallen 47.25 09.23e
Sankt Gotthard, Pass* 46.34 08.34e
Sankt Moritz 46.30 09.51e
Sarnen 46.54 08.15e
Schaffhausen 47.42 08.38e
Schwyz 47.02 08.39e
Scuol 46.48 10.18e
Sierre 46.18 07.33e
Simplon, Pass* 46.15 08.03e
Sion 46.14 07.22e
Solothurn 47.13 07.32e
Sonogno 46.22 08.47e
Spiez 46.42 07.41e
Splügen-Pass* 47.30 09.15e
Stans 46.57 08.23e
Sursee 47.11 08.07e
Thun 46.46 07.38e
Thusis 46.42 09.27e
Tiefencastel 46.40 09.35e
Tramelan 47.13 07.07e
Uster 47.21 08.49e
Vevey 46.28 06.15e
Visp 46.18 07.53e
Weesen 47.08 09.06e
Weggis 47.02 08.26e
Weinfelden 47.33 09.07e
Wengen 46.37 07.56e
Wildhorn* 46.22 07.22e
Will (Aargau) 47.34 08.09e
Will (St. Gallen) 47.28 09.03e
Will (Zürich) 47.37 08.31e
Winterthur 47.36 08.45e
Yverdon 46.47 06.38e
Zermatt 46.01 07.45e
Zernez 46.43 10.06e
Zinal 46.08 07.38e
Zofingen 47.18 07.57e
Zürich 47.23 08.33e

CY Cyprus

Akanthou 35.22 33.45e
Akrotiri 34.35 32.57e
Alethriko 34.50 33.30e
Dhavlos 35.25 33.55e
Dheftera 35.05 33.17e
Famagusta 35.07 33.57e
Kalavasos 34.46 33.18e
Kato Pyrgos 35.11 32.41e
Khionistra (Olympus)* 34.55 32.52e
Kyrenia 35.20 33.20e
Kythrea 35.14 33.30e
Lapithos 35.20 33.11e
Larnaca 34.54 33.39e
Lefkoniko 35.15 33.45e
Leonarisso 35.27 34.09e
Limassol 34.40 33.03e
Nicosia (Lefkosia) 35.09 33.21e
Nikitari 35.05 33.00e
Olymbos (Kyrenia) 35.20 33.45e
Paleokhorio 34.55 33.06e
Paphos 34.45 32.25e
Platres 34.53 32.52e
Polis 35.02 32.25e
Prastio 35.10 33.45e
Rizokarpaso 35.35 34.24e
Sina Oros 35.22 33.52e
Skilloura 35.15 33.10e
Spilia 34.47 32.58e
Troödos (Troödos) 34.55 32.53e
Yialousa 35.32 34.12e
Yioulu 35.25 32.28e

CZ Czechia

As 50.15 12.10e
Becov nad Teplou 50.05 12.51e
Bela nad Radbuzou 49.35 12.43e
Benesov u Prahy 49.48 14.43e
Beroun 49.58 14.05e
Blansko 49.22 16.40e
Blatna 49.26 13.53e
Blatno 50.06 13.24e
Bochov 50.09 13.04e
Bor 49.43 12.47e
Boubin* 48.59 13.48e
Breclav 48.45 16.50e
Breznice 49.32 14.00e
Brno 49.13 16.40e
Bruntal 50.00 17.27e
Bucovice 49.10 17.00e
Caslav 49.56 15.24e
Ceska Lipa 50.43 14.35e
Ceska Trebova 49.54 16.27e
Ceske Budejovice 49.00 14.30e
Cesky Brod 50.04 16.25e
Cesky Krumlov 48.49 14.20e
Cheb 50.04 12.20e
Chlumec nad Cidlinou 50.10 15.26e
Chocen 50.00 16.15e
Chomutov 50.28 13.25e
Chotebor 49.44 15.41e
Chrudim 49.57 15.47e
Decin 50.48 14.15e
Dobris 49.47 14.10e
Dolni Dvoriste 48.41 14.28e
Domazlice 49.26 12.54e
Duchcov 50.37 13.54e
Dvur Kralove n.L. 50.27 15.50e
Frydlant nad Ostravici 50.56 15.05e
Frymburk 48.40 14.11e
Havlickuv Brod 49.38 15.35e
Hodonin 48.52 17.10e
Holysov 49.36 13.06e
Horazdovice 49.20 13.43e
Horice 50.24 15.40e
Horovice 49.55 13.50e
Horsovsky Tyn 49.32 12.55e
Hradec Kralove 50.13 15.50e
Humpolec 49.32 15.22e
Ivancice 49.06 16.23e
Jablonec nad Nisou 50.44 15.10e
Jablonne nad Orlici 50.02 16.37e
Jablonne v Podjestedi 50.47 14.45e
Jablunkov 49.35 18.45e
Jachymov 50.22 12.55e
Janovice 49.21 13.14e
Jaromer 50.22 15.55e
Jemnice 49.02 15.35e
Jesenik 50.15 17.10e
Jevicko 49.38 16.45e
Jicin 50.27 15.20e
Jihlava 49.24 15.35e
Jilove u Prahy 49.55 14.30e
Jindrichuv Hradec 49.10 15.00e
Kadan 50.23 13.15e
Kamenice nad Lipou 49.18 15.05e
Kaplice 48.45 14.30e
Karlovy Vary 50.14 12.53e
Karvina 49.50 18.30e
Kasperske Hory 49.09 13.34e
Kdyne 49.24 13.03e
Kladno 50.10 14.05e
Klatovy 49.24 13.17e
Kojetin 49.22 17.20e
Kolin (nad Labem) 50.02 15.10e
Koskovice 49.30 16.39e
Kostelec 50.00 14.52e
Kraliky 50.06 16.45e
Kralovice 50.00 13.00e
Kraslice 50.20 12.30e
Krivoklat 50.03 13.53e
Krnov 50.05 17.40e
Kromeriz 49.19 17.27e
Kutna Hora 49.57 15.15e
Kyjov 49.00 17.10e
Lanskroun 49.55 16.38e
Liberec 50.48 15.05e
Lipnik n.B. 49.31 17.30e
Litomerice 50.33 14.10e
Litomysl 49.52 16.20e
Litvinov 50.37 13.36e
Louny 50.22 13.47e
Lovosice 50.31 14.02e
Lubenec 50.08 13.20e
Luby 50.15 12.25e
Lysa nad Labem 50.12 14.50e
Marianske Lazne 49.59 12.40e
Melnik 50.22 14.30e
Mikulov 48.58 16.40e
Milevsko 49.27 14.22e
Mlada Boleslav 50.26 14.55e
Mnisek pod Brdy 49.52 14.17e
Mohelnice 49.47 16.56e
Moravska Trebova 49.47 16.40e
Moravske Budejovice 49.04 15.50e
Most 50.31 13.39e
Nachod 50.26 16.10e
Namest nad Oslavou 49.13 16.10e
Nepomuk 49.29 13.35e
Nove Hrady 48.48 14.47e
Nove Mesto na Morave 49.35 16.05e
Novy Bydzov 50.15 15.30e
Novy Jicin 49.37 18.00e
Nymburk 50.12 15.00e
Nyrsko 49.18 13.10e
Olomouc 49.48 17.15e
Opava 49.58 17.55e
Ostrava 49.50 18.15e
Pacov 49.29 15.01e
Pardubice 50.03 15.45e
Pelhrimov 49.26 15.15e
Pisek 49.19 14.10e
Plana nad Luznici 49.22 14.43e
Plasy 49.56 13.24e
Plzen 49.45 13.25e
Pobezovice 49.30 12.47e
Pocatky 49.16 15.15e
Podborany 50.15 13.25e
Podebrady 50.10 15.05e
Pohorelice 48.59 16.32e
Policka 49.49 16.16e
Prachatice 49.00 14.00e
Praded* 50.05 17.15e
Praha 50.05 14.25e
Prerov 49.28 17.30e
Prestice 49.34 13.20e

Pribram 49.42 14.00e
Pribyslav 49.34 15.44e
Primda 49.40 12.40e
Prostejov 49.30 17.10e
Rakovnik 50.07 13.44e
Rataje 49.51 14.58e
Ricany 49.59 14.40e
Rokycany 49.45 13.36e
Rouchovany 49.05 16.07e
Roudnice n.L. 50.26 14.40e
Rozmberk nad Vltavou 48.39 16.23e
Rychnov 50.10 16.17e
Rymarov 49.56 17.15e
Sedlcany 49.40 14.25e
Slavonice 49.01 15.22e
Sobeslav 49.11 14.16e
Sokolov 50.10 12.30e
Sternberk 49.45 17.20e
Stod 49.38 13.10e
Strakonice 49.16 13.54e
Straz nad Nezarkou 49.04 14.54e
Straznice 48.54 17.20e
Stribro 49.45 13.00e
Sumperk 49.57 16.59e
Susice 49.14 13.30e
Svitavy 49.45 16.30e
Tabor 49.25 14.40e
Tachov 49.48 12.38e
Telc 49.12 15.30e
Teplipce 50.40 13.49e
Tisnov 49.22 16.24e
Trebic 49.13 15.55e
Trebon 49.01 14.50e
Trhove Sviny 48.51 14.40e
Trutnov 50.34 15.55e
Turnov 50.36 15.10e
Tyn nad Vltavou 49.13 14.25e
Uherske Hradiste 49.05 17.30e
Uhersky Brod 49.01 17.40e
Unicov 49.48 17.05e
Usti nad Labem 50.41 14.00e
Usti nad Orlici 50.00 16.25e
Velka Bites 49.18 16.14e
Velke Kralovice 49.20 18.15e
Velke Mezirici 49.22 16.02e
Velky Osek 50.07 50.11e
Veseli nad Luznici 49.12 14.43e
Veseli nad Moravou 48.59 17.25e
Vimperk 49.03 13.45e
Vizovice 49.15 17.55e
Vlasim 49.44 14.55e
Vodnany 49.10 14.10e
Vojtanov 50.10 12.19e
Volary 48.55 13.55e
Volyne 49.10 13.50e
Votice 49.38 14.38e
Vranov nad Dyji 48.54 15.48e
Vrchlabi 50.38 15.35e
Vsetin 49.20 18.00e
Vyskov 49.19 17.00e
Vysoke Myto 49.59 16.10e
Vyssi Brod 48.38 14.20e
Zabreh 49.53 16.55e
Zamberk 50.05 16.27e
Zatec 50.20 13.35e
Zbytiny 48.57 13.59e
Zdanice 49.04 17.02e
Zdar nad Sazavou 49.34 15.57e
Zdice 49.55 14.00e
Zelezna Ruda 49.10 13.15e
Zelnava 48.49 13.58e
Zlin 49.14 17.40e
Zlutice 50.06 13.10e
Znojmo 48.52 16.05e

D Germany

Acronyms of Bundesländer (used only if necessary): BB = Brandenburg & Berlin; BW = Baden-Württemberg; BY = Bayern; HE = Hessen; MV = Mecklenburg-Vorpommern; NI = Niedersachsen & Bremen; NW = Nordrhein-Westfalen; RP = Rheinland-Pflaz; SH = Schleswig-Holstein & Hamburg; SL = Saarland; SN = Sachsen; ST = Sachsen-Anhalt; TH = Thüringen.

Aachen 50.46 06.06e
Adenau 50.23 06.57e
Adorf 50.19 12.15e
Ahaus 52.04 07.01e
Ahrweiler 50.32 08.16e
Alfeld (Bayern) 49.26 11.33e
Alfeld (Niedersachsen) 51.59 09.50e
Alsfeld 50.45 09.17e
Altenberg 50.46 13.46e
Altenberge 52.02 07.29e
Altenburg 50.49 12.27e
Altomünster 48.22 11.15e
Alzey 49.44 08.07e
Amberg 49.26 11.52e
Angermünde 53.01 14.01e
Anklam 53.52 13.42e
Annaberg-Buchholz 50.35 13.10e
Ansbach 49.18 10.36e
Apolda 51.02 11.31e
Arendsee 52.54 11.30e
Arnstadt 50.50 10.57e
Arnstein (Bayern) 49.59 09.59e
Aschaffenburg 49.58 09.10e
Aschersleben 51.46 11.28e
Augsburg 48.21 10.54e
Aumühle 53.32 10.20e
Aurich 53.28 07.29e
Bad Aibling 47.51 12.01e
Bad Berleburg 51.03 08.24e
Bad Doberan 54.06 11.55e
Bad Ems 50.20 07.42e
Bad Hersfeld 50.53 09.43e
Bad Kissingen 50.12 10.05e
Bad Kreuznach 49.51 07.52e
Bad Lippspringe 51.47 08.49e
Bad Mergentheim 49.29 09.46e
Bad Münstereifel 50.34 06.49e
Bad Muskau 51.33 14.43e
Bad Neustadt 50.20 10.12e
Bad Pyrmont 51.59 09.16e
Bad Reichenhal 47.43 12.53e
Bad Salzungen 50.49 10.15e
Bad Segeberg 53.56 10.17e
Bad Tölz 47.45 11.34e
Bad Wildungen 50.08 09.09e
Bad Windsheim 49.30 10.27e
Baden-Baden 48.45 08.15e
Baltrum 53.44 07.23e
Bamberg 49.54 10.54e
Barth 54.23 12.44e
Bassum 52.52 08.43e
Bautzen 51.11 14.29e
Bayreuth 49.27 11.35e
Bederkesa 53.38 08.51e
Beeskow 52.10 14.15e
Belzig 52.08 12.35e
Benediktbeuren 47.44 11.28e
Bensheim 49.41 08.38e
Benz auf Usedom 53.57 14.05e
Berchtesgaden 47.38 13.00e
Bergen (Bayern) 47.48 12.36e
Bergen (Niederschasen) 52.48 09.58e
Bergen auf Rügen 54.26 13.27e
Berlin 52.32 13.25e
Bernburg 51.49 11.43e
Bernkastel-Kues 49.55 07.05e
Biedenkopf 50.55 08.33e
Bielefeld 52.02 08.32e
Bingen 49.58 07.55e
Bischofsheim (Hessen) 49.59 08.22e
Bischofsheim a. d. Rhön 50.24 10.01e
Bischofswerda 51.08 14.13e
Bitburg 49.58 06.32e
Bitterfeld 51.37 12.20e
Blankenheim (NW) 50.26 06.39e
Blankenheim (ST) 51.31 11.26e
Blaubeuren 48.25 09.47e
Bocholt 51.49 06.37e
Boizenburg 53.23 10.44e
Bonn 50.44 07.06e
Boppard 50.13 07.35e
Borkum 53.35 06.40e
Brandenburg 52.25 12.34e
Braunschweig 52.15 10.30e
Bredstedt 54.38 08.57e
Breisach 48.02 07.36e
Bremen 53.05 08.48e
Bremerhaven 53.33 08.35e
Bremervörde 53.29 09.09e
Brilon 51.24 08.34e
Buchholz (Brandenburg) 52.09 12.55e
Buchholz (Niedersachsen) 53.20 09.53e
Buchloe 48.04 10.45e
Bückeburg 52.16 09.03e
Büdingen 50.17 09.07e
Burghausen (Bayern) 48.08 12.50e
Burglengenfeld 49.12 12.03e
Burgsteinfurt 52.09 07.21e
Burow 53.47 13.17e
Büsum 54.08 08.52e
Buxtehude 53.29 09.42e
Calau 51.45 13.57e
Calw 48.42 08.44e
Celle 52.37 10.05e
Chemnitz 50.50 12.55e
Clausthal-Zellerfeld 51.48 10.20e
Cloppenburg 52.52 08.02e
Coburg 50.15 10.58e
Cochem 50.08 07.10e
Coesfeld 51.57 07.10e
Cottbus 51.43 14.21e
Crailsheim 49.09 10.06e
Cuxhaven 53.52 08.42e
Dahme (Brandenburg) 51.52 13.26e
Dahme (Schleswig-Holstein) 54.13 11.06e
Dannenberg 53.06 11.06e
Darmstadt 49.52 08.39e
Daun 50.11 06.50e
Deggendorf 48.50 12.58e
Demmin 53.55 13.03e
Dessau 51.51 12.15e
Diepholz 52.37 08.22e
Dietfurt 49.02 11.36e
Dillenburg 50.44 08.16e
Dillingen 49.21 06.44e
Dillingen an der Donau 48.33 10.30e
Dinkelsbühl 49.04 10.21e
Dömitz 53.09 11.16e
Donaueschingen 47.58 08.30e
Donauwörth 48.44 10.48e
Donnersberg* 48.44 10.48e
Dornbusch-Hiddnesee 54.37 13.08e
Dortmund 51.32 07.27e
Dresden 51.03 13.45e
Duderstadt 51.32 10.15e
Dülmen 51.49 07.17e
Düren 50.48 06.30e
Düsseldorf 51.13 06.47e
Eberswalde 52.50 13.50e
Ebingen 48.31 09.02e
Edenkoben 49.17 08.09e

Eichstätt 48.54 11.13e
Eilenburg 51.28 12.38e
Eilsleben 52.09 11.14e
Eisenach 50.59 10.19e
Eisleben 51.32 11.33e
Eitorf 50.46 07.27e
Ellwangen 48.58 10.10e
Elmshorn 53.46 09.40e
Elsterwerda 51.28 13.32e
Elzach 48.11 08.05e
Emden 53.23 07.13e
Emlichheim 52.37 06.51e
Engen 47.51 08.46e
Eppingen 49.08 08.55e
Erbes Kopf* 49.42 07.07e
Erfurt 50.58 11.02e
Erkelenz 51.05 06.18e
Erlangen 49.36 11.02e
Eschwege 51.11 10.03e
Eslarn 49.35 12.32e
Essen 51.27 06.57e
Euskirchen 50.40 06.47e
Finnentrop 51.10 07.57e
Finsterwalde 51.38 13.43e
Fladungen 50.32 10.09e
Flensburg 54.47 09.27e
Forchheim 49.43 11.05e
Frankfurt am Main 50.06 08.41e
Frankfurt an der Oder 52.20 14.32e
Freiberg (BW) 48.56 09.15e
Freiberg (Sachsen) 50.55 13.21e
Freiburg (Niederschachsen) 53.49 09.17e
Freiburg im Breisgau 48.00 07.52e
Freising 48.24 11.45e
Freudenstadt 48.28 08.25e
Freyung 48.49 13.34e
Friedberg (Hessen) 50.20 08.45e
Friedland (MV) 53.41 13.34e
Friedland (Niedersachsen) 51.25 09.55e
Friedrichshafen 47.39 09.30e
Fulda 50.33 09.41e
Fürstenau 52.32 07.41e
Fürstenberg 53.11 13.10e
Fürstenfeldbruck 48.10 11.15e
Fürstenwalde 52.22 14.04e
Furtwangen 48.03 08.14e
Gadebusch 53.42 11.07e
Gaildorf 49.00 09.46e
Garmisch-Partenkirchen 47.30 11.05e
Garz (BB) 53.04 12.06e
Garz (MV) 54.19 13.21e
Geesthacht 53.26 10.23e
Geilenkirchen 50.58 06.08e
Gemünden am Main 50.03 09.42e
Gera 50.51 12.11e
Germersheim 49.13 08.23e
Gerolstein 50.13 06.40e
Giessen 50.35 08.42e
Gifhorn 52.28 10.33e
Göppingen 48.43 09.39e
Görlitz 51.09 15.00e
Goslar 51.55 10.25e
Gotha 50.54 10.43e
Göttingen 51.32 09.57e
Gräfenberg 49.38 11.15e
Greifswald 54.06 13.24e
Grevesmühlen 53.53 11.11e
Grimmen 54.07 13.04e
Gronau (Niedersachsen) 52.05 09.46e
Gronau (NW) 52.13 07.02e
Grünstadt 49.34 08.10e
Guben 51.59 14.42e
Gunzenhausen 49.07 10.46e
Güstrow 53.48 12.11e
Hachenburg 50.40 07.50e
Hagen (NW) 51.22 07.27e
Hagenow 53.27 11.12e
Halberstadt 51.54 11.04e
Haldensleben 52.18 11.25e
Halle (NW) 52.04 08.22e
Halle (ST) 51.28 11.58e
Hamburg 53.33 10.00e
Hameln 52.07 09.22e
Hamm (NW) 51.40 07.49e
Hamm (RP) 50.46 07.42e
Hammelburg 50.07 09.53e
Hanau 50.08 08.56e
Hannover 52.23 09.44e
Haselünne 52.41 07.30e
Hassfurt 50.02 10.46e
Havelberg 52.50 12.05e
Heidenheim (BW) 48.41 10.10e
Heidenheim (Bayern) 49.01 10.46e
Heilbronn 49.08 09.14e
Heiligenstadt (Bayern) 49.52 11.11e
Heiligenstadt (Thüringen) 51.23 10.09e
Helgoland (Helgoland) 54.09 07.52e
Hellenthal 50.29 06.26e
Herford 52.07 08.40e
Herzberg (Cottbus) 51.42 13.14e
Herzberg (Harz) 51.40 10.20e
Herzberg (Potsdam) 52.54 12.58e
Hildesheim 52.09 09.58e
Hillesheim 50.17 06.40e
Hockenheim 49.19 08.34e
Hof 50.19 11.56e
Hofheim in Ufr. 50.08 10.32e
Holzkirchen 47.52 11.42e
Holzminden 51.49 09.26e
Horb 48.27 08.41e
Horka 51.19 14.55e
Höxter 51.47 09.22e
Hoyerswerda 51.28 14.17e
Hünfeld 50.41 09.45e
Husum 54.29 09.04e
Idar-Oberstein 49.43 07.19e
Illmenau 47.53 09.25e
Immenstadt 47.34 10.14e
Ingolstadt 48.46 11.27e
Itzehoe 53.46 09.32e
Jena 50.56 11.35e
Jever 53.35 07.54e
Juist 53.41 07.01e
Jüterborg 51.59 13.06e
Kahla 50.48 11.35e
Kaiserslautern 49.27 07.47e
Kalbe 52.40 11.24e
Kall 50.33 06.33e
Kallmünz 49.09 11.59e
Kamenz 51.17 14.08e
Kandel 49.05 08.12e
Karlshafen 51.38 09.26e
Karlshaven 51.38 09.26e
Karlsruhe 49.00 08.24e
Karlstadt 49.58 09.47e
Karow 53.33 12.17e
Kassel 51.18 09.30e
Kehl am Rhein 48.35 07.50e
Kempten (Bayern) 47.44 10.19e
Kempten (Rheinland-Pflaz) 49.58 07.57e
Kiel 54.20 10.08e
Kitzingen 49.45 10.11e
Koblenz 50.21 07.36e
Köln 50.56 06.57e
Königs Wusterhausen 52.18 13.37e
Königshofen im Grabfeld 50.18 10.30e
Königswinter 50.41 07.11e
Konstanz 47.40 09.10e
Köthen (ST) 51.46 11.59e
Krefeld 51.20 06.32e
Kronach 50.14 11.20e
Kulmbach 50.06 11.28e
Kusel 49.32 07.25e
Kyritz 52.57 12.33e
Lahnstein 50.18 07.37e
Lahr 48.21 07.52e
Landau (Bayern) 48.40 12.43e
Landau (Rheinland-Pfalz) 49.12 08.07e
Landsberg (Sachsen-Anhalt) 51.32 12.11e
Landsberg am Lech 48.03 10.54e
Landshut 48.31 12.10e
Langeoog 53.45 07.29e
Lauenburg an der Elbe 53.23 10.35e
Leer 53.14 07.27e
Leipzig 51.20 12.25e
Lengerich (Niedersachsen) 52.33 07.31e
Lengerich (NW) 52.12 07.52e
Lenggries 47.41 11.35e
Leverkusen 51.02 06.59e
Liebenwalde 52.53 13.25e
Limburg 50.23 08.04e
Lindau (Bodensee) 47.33 09.41e
Lindau (Magdeburg) 52.02 12.06e
Lingen 52.32 07.19e
Linz am Rhein 50.34 07.18e
Lipstadt 51.41 08.20e
Löbau 51.06 14.42e
Lobenstein 50.27 11.38e
Löcknitz 53.28 14.13e
Lohr am Main 50.00 09.35e
Lörrach 47.37 07.40e
Lübben 51.57 13.54e
Lübeck 53.52 10.40e
Lübtheen 53.19 11.05e
Lüchow 52.58 11.11e
Luckenwalde 52.05 13.11e
Lüdenscheid 51.13 07.38e
Lüdinghausen 51.46 07.27e
Ludwigslust 53.20 11.30e
Lüneburg 53.15 10.24e
Lychen 53.13 13.19e
Magdeburg 52.08 11.37e
Mainz 50.00 08.16e
Malchin 53.45 12.45e
Mannheim 49.30 08.28e
Marburg 50.49 08.36e
Mayen 50.19 07.14e
Meerane 50.50 12.28e
Meiningen 50.34 10.25e
Meissen 51.10 13.28e
Melle 52.13 08.20e
Melsungen 51.08 09.32e
Memmingen 47.59 10.11e
Meppen 52.41 07.18e
Merseburg 51.22 12.00e
Merzig 49.26 06.39e
Miesbach 47.47 11.50e
Miltenberg 49.42 09.16e
Minden 52.18 08.54e
Mittweida 50.59 12.59e
Mölln (MV) 53.36 13.06e
Mölln (SH) 53.37 11.42e
Mönchengladbach 51.12 06.25e
Monschau 50.33 06.15e
Moosburg 48.27 11.57e
Mosbach 49.21 09.10e
Mühlhausen 49.45 10.47e
Mühlhausen in Thüringen 51.13 10.28e
Müllheim 47.48 07.37e
München 48.08 11.35e
Münnerstadt 50.15 10.12e
Münster 51.58 07.37e
Murnau 47.40 11.13e
Nauen 52.37 12.53e
Naumburg (Hessen) 51.15 09.10e
Naumburg (ST) 51.09 11.48e
Nebel (Amrun) 54.37 08.22e
Neuhardenberg 52.36 14.15e
Neumark (Sachsen) 50.39 12.21e
Neumark (Thüringen) 51.05 11.15e
Neumarkt (Bayern) 49.17 11.29e
Neumünster 54.05 09.59e
Neunkirchen (Saar) 49.21 07.12e
Neuruppin 52.56 12.49e
Neustadt a.d. Wienstraáe 49.21 08.09e
Neustrelitz 53.22 13.05e
Neuwied 50.26 07.28e
Niebüll 54.47 08.50e
Nienburg (Niedersachsen) 52.38 09.13e
Nienburg (ST) 51.51 11.45e
Norden 53.36 07.13e
Norderney 53.43 07.09e
Norderstedt 53.43 09.59e

Nordhausen 51.31 10.48e
Nordhorn 52.27 07.05e
Nördlingen 48.51 10.31e
Nürnberg 49.27 11.05e
Oberhausen (BW) 49.15 08.29e
Oberhausen (Bayern) 47.46 11.09e
Oberhausen (NW) 51.27 06.50e
Oberhof 50.42 10.44e
Ochsenfurt 49.40 10.04e
Odenbüll (Nordstrand) 54.30 08.51e
Offenburg 48.29 07.57e
Ohrdruf 50.50 10.45e
Oldenburg (Niedersachsen) 53.08 08.13e
Oldenburg (SH) 54.17 10.52e
Olpe 51.02 07.52e
Oranienburg 52.46 13.15e
Osnabrück 52.17 08.03e
Osterburg (Altmark) 52.48 11.45e
Osterburken 49.25 09.26e
Osterode am Harz 51.44 10.15e
Ottersberg 53.07 09.08e
Paderborn 51.43 08.44e
Papenburg 53.05 07.25e
Pappenheim (Bayern) 48.56 10.59e
Pappenheim (Thüringen) 50.48 10.59e
Parchim 53.26 11.51e
Pasewalk 53.30 14.00e
Passau 48.35 13.28e
Passow 53.08 14.08e
Peenemünde 54.09 13.46e
Peine 52.19 10.13e
Penzberg 47.45 11.23e
Perleberg 53.05 11.52e
Pfaffenhofen 48.31 11.31e
Pforzheim 48.53 08.41e
Pfullendorf 47.56 09.16e
Pinneberg 53.49 09.49e
Pirmasens 49.12 07.37e
Pirna 50.58 13.58e
Plaue 50.47 10.54e
Plauen 50.29 12.08e
Potsdam 52.24 13.04e
Pottenstein 49.45 11.26e
Prenzlau 53.19 13.52e
Prettin 51.41 12.55e
Prien 47.51 12.21e
Pritzwalk 53.09 12.11e
Prüm 50.12 06.25e
Puttgarten (Fehmarn) 54.30 11.13e
Quakenbrück 52.41 07.57e
Rastadt 48.51 08.13e
Rathenow 52.37 12.21e
Ratzeburg 53.42 10.46e
Ravensburg 47.47 09.37e
Recklinghausen 51.37 07.11e
Regensburg 49.01 12.07e
Remscheid 51.10 07.11e
Rendsburg 54.19 09.39e
Reutlingen 48.30 09.13e
Rheine 52.17 07.26e
Ribnitz-Damgarten 54.15 12.26e
Riedenburg 48.57 11.42e
Riedlingen 48.09 09.29e
Rieneck 50.05 09.39e
Riesa 51.18 13.18e
Röbel 53.24 12.37e
Rodach 50.20 10.48e
Rosenheim 47.51 12.09e
Rostock 54.06 12.09e
Rothenburg 49.23 10.13e
Rothenburg ob der Tauber 49.23 10.13e
Rottweil 48.10 08.38e
Rudolstadt 50.44 11.20e
Saarbrücken 49.15 06.58e
Saarburg 49.36 06.33e
Saarlouis 49.19 06.45e
Salzgitter 52.13 10.20e
Salzgitter-Bad 52.02 10.21e
Salzwedel 52.51 11.48e
Sangerhausen 51.29 11.18e
Sankt Blasien 47.46 08.08e
Sankt Peter-Ordning 54.18 08.37e
Sassnitz 54.32 13.40e
Schleswig 54.32 09.34e
Schlieben 51.44 13.24e
Schlüsselfeld 49.45 10.38e
Schmalkalden 50.43 10.28e
Schongau 47.49 10.54e
Schotten (Vogelsberg) 50.30 09.08e
Schwäbisch Hall 49.07 09.45e
Schwabmünchen 48.10 10.45e
Schwandorf in Bayern 49.20 12.07e
Schwarmstedt 52.41 09.37e
Schweinfurt 50.03 10.16e
Schwenningen 48.03 08.32e
Schwerin 53.38 11.25e
Siegen 50.52 08.02e
Sigmaringen 48.05 09.13e
Solingen 51.10 07.05e
Soltau 52.59 09.50e
Sonthofen 47.31 10.18e
Speyer 49.18 08.26e
Spiekeroog 53.47 07.43e
Spremberg 51.35 14.22e
Staffelstein 50.06 11.00e
Starnberg 48.00 11.20e
Stassfurt 51.51 11.35e
Steinach (Bayern) 49.27 09.17e
Steinach (Thüringen) 50.25 11.10e
Stendahl 52.36 11.52e
Sternberg 54.43 11.50e
Stralsund 54.18 13.06e
Straubing 48.53 12.35e
Strausberg 52.34 13.53e
Stuttgart 48.37 09.12e
Syke 52.55 08.49e
Tauberbischofsheim 49.38 09.41e
Taufstein* 50.31 09.16e
Tegernsee 47.42 11.46e
Templin 53.07 13.30e
Teterow 53.47 12.35e
Tirschenreuth 49.53 12.20e
Torgau 51.34 13.01e
Traunstein 47.52 12.39e
Trebbin 52.13 13.13e
Triebsees 54.06 12.45e
Trier 49.45 06.39e
Tübingen 48.32 09.04e
Tuttlingen 47.59 08.49e
Uchte 52.31 08.54e
Ueckermünde 53.45 14.03e
Uelsen 52.30 06.54e
Uelzen 52.58 10.34e
Uffenheim 49.32 10.15e
Ulm 48.24 10.00e
Uslar 51.39 09.38e
Varel 53.24 08.08e
Vechta 52.44 08.17e
Verden 52.56 09.14e
Vilseck 49.36 11.50e
Wadern 49.32 06.54e
Waldbröl 50.52 07.37e
Waldmünchen 49.23 12.43e
Waldshut 47.37 08.14e
Walsrode 52.52 09.35e
Wangerooge 53.47 07.54e
Warburg 51.28 09.10e
Waren 53.32 12.42e
Warendorf 51.47 08.00e
Weiden in der Oberpfalz 49.40 12.16e
Weilheim (Bayern) 47.50 11.10e
Weilheim (Freiburg) 47.39 08.14e
Weilheim (Stuttgart) 48.37 09.33e
Weingarten (Mannheim) 49.02 08.32e
Weingarten (Ravensburg) 47.49 09.40e
Weingarten (RP) 49.15 08.18e
Weissenburg in Bayern 49.02 11.00e
Wendel 49.28 07.10e
Wendelstein* 47.42 12.01e
Wernigerode 51.51 10.48e
Wertheim 49.45 09.32e
Wesel 51.39 06.37e
Westerland (Sylt) 54.54 08.19e
Wieren 52.52 10.41e
Wildeshausen 52.54 08.26e
Wilhelmshaven 53.32 08.07e
Winterberg 51.14 08.32e
Winterburg 49.48 07.35e
Winterfeld 52.45 11.15e
Wismar 53.54 11.28e
Wittenberge 52.59 11.45e
Wittingen 52.43 10.45e
Wittstock 53.10 12.30e
Woldegkl 53.27 13.36e
Wolfenbüttel 52.10 10.33e
Wolfratshausen 47.55 11.25e
Wolfsburg 52.27 10.49e
Wolgast 54.03 13.46e
Wunsiedel 50.02 12.01e
Wuppertal 51.15 07.10e
Würzburg 49.48 09.57e
Wurzen 51.23 12.45e
Wyk (Föhr) 54.42 08.34e
Xanten 51.40 06.27e
Zella-Mehlis 50.40 10.41e
Zerbst 51.58 12.06e
Zeulenroda 50.39 11.59e
Zeven 50.55 14.50e
Ziesar 52.16 12.18e
Zittau 50.55 14.50e
Zweibrücken 49.15 07.22e
Zwickau 50.43 12.30e
Zwiesel 49.01 13.15e

DK Denmark

Abenra 55.03 09.26e
Aby 57.11 09.46e
Alborg 57.03 09.56e
Anholt 56.43 11.34e
Arhus 56.10 10.13e
Asa 57.09 10.25e
Baekke 55.34 09.08e
Bagenkop 54.45 10.32e
Braedstrup 55.58 09.38e
Brande 55.57 09.08e
Bronderslev 57.16 09.58e
Dalby 55.31 10.40e
Esbjerg 55.28 08.28e
Fakse 55.16 12.08e
Famien (Faeroes) 61.32 06.52w
Fjerritslev 57.06 09.17e
Fredericia 55.34 09.47e
Frederikshavn 57.28 10.33e
Gedser 54.35 11.57e
Grindsted 55.46 08.56e
Haderslev 55.15 09.30e
Hadsund 56.43 10.08e
Haldersvik (Faeroes) 62.16 07.06w
Hansted 57.07 08.37e
Harboor 56.38 08.12e
Harby 55.13 10.07e
Haslev 55.20 11.59e
Hattarvik (Faeroes) 62.20 06.14w
Helsingor 56.03 12.38e
Hirtshals 57.36 09.58e
Hjorring 57.28 09.59e
Hobro 56.39 09.49e
Hojer 54.58 08.58e

Holstebro 56.22 08.38e
Horsens 57.07 10.07e
Hvam 56.40 09.31e
Jyderup 55.40 11.25e
Kalundborg 55.42 11.06e
Kalvehave 55.00 12.08e
Karby 56.46 08.34e
Karup 56.19 09.10e
Klakring 55.43 09.58e
Kobenhavn 55.43 12.34e
Koge 55.28 12.12e
Kolding 55.29 09.30e
Kunoy (Faeroes) 62.18 06.39w
Logstor 56.59 09.16e
Logumkloster 55.04 08.58e
Naestved 55.14 11.47e
Nakskov 54.50 11.10e
Nordborg 55.04 09.41e
Nyborg 55.19 10.48e
Nykobing (Strostrom) 54.47 11.53e
Nykobing (Vestjaelland) 55.56 11.41e
Nykobing (Viborg) 56.48 08.52e
Odense 55.24 10.25e
Orsted 55.20 10.03e
Randers 56.28 10.03e
Ribe 55.20 08.47e
Ringkobing 56.06 08.15e
Ringsted 55.28 11.48e
Rodbyhavn 54.39 11.24e
Rodvig 55.16 12.23e
Ronne (Bornholm) 55.07 14.43e
Roskilde 55.39 12.07e
Rudkobing 54.57 10.43e
Sandur (Faeroes) 61.50 06.48w
Sandvik (Bornholm) 55.18 14.48e
Silkeborg 56.10 09.39e
Skagen 57.44 10.47e
Skanderborg 56.02 09.57e
Skive 56.34 09.02e
Slagelse 55.24 11.23e
Slangerup 55.51 12.11e
Sonderborg 55.49 08.18e
Stege (Moen) 54.59 12.18e
Stovring 56.30 10.12e
Svaneke (Bornholm) 55.08 15.10e
Svendborg 55.04 10.38e
Svinoy (Faeroes) 62.17 06.18w
Tarm 55.55 08.32e
Thisted 56.58 08.32e
Tinglev 54.57 09.15e
Tommerup 55.19 10.13e
Torshavn (Faeroes) 62.02 06.47w
Trustrup 56.21 10.47e
Ulbjerg 56.38 09.22e
Vamdrup 55.26 09.18e
Varde 55.38 08.30e
Vejle 55.43 09.43e
Viborg 56.28 09.25e
Vojens 55.15 09.19e
Vordingborg 55.01 11.55e

E-1 Spain: Mailnland

Abejar 41.48 02.47w
Ademuz 40.04 01.17w
Adra 36.45 03.01w
Agramunt 41.48 01.06e
Agreda 41.51 01.55w
Agudo 38.59 04.52w
Aguilar de Bureba 42.35 03.20w
Aguilar de Campoo 42.47 04.15w
Ainsa 42.25 00.08e
Alaraz 40.45 05.17w
Alarcon 39.32 02.05w
Alayor (Menorca) 39.56 04.08e
Alba de Tormes 40.50 05.30w
Albacete 39.00 01.52w
Albaida 38.51 00.31w
Albalate de Zorita 40.18 02.51w
Albanchez 37.46 03.28w
Albarracin 40.25 01.26w
Alberique 39.07 00.31w
Alburquerque 39.13 06.59w
Alcala de Chivert 40.19 00.13e
Alcala de Henares 40.28 03.22w
Alcala de la Selva 40.22 00.43w
Alcala de los Gazules 36.29 05.43w
Alcala del Jucar 39.12 01.25w
Alcala la Real 37.28 03.55w
Alcanices 41.41 06.21w
Alcaniz 41.03 00.09w
Alcantara 39.44 06.54w
Alcaraz 38.40 02.29w
Alcazar de San Juan 39.24 03.12w
Alcira 39.10 00.27w
Alcoy 38.42 00.29w
Alcudia (Mallorca) 39.51 03.06e
Aldeadavila de la Ribera 41.13 06.38w
Alfacar 37.15 03.34w
Alfaro 42.11 01.45w
Algeciras 36.08 05.27w
Alhama de Almeria 36.57 02.34w
Alhama de Aragon 41.18 01.54w
Alhama de Granada 37.00 03.59w
Alhama de Murcia 37.51 01.25w
Aliaga 40.40 00.42w
Alicante 38.21 00.29w
Almaden 38.47 04.50w
Almansa 38.52 01.06w
Almarza 41.57 02.28w
Almazora 39.57 00.04w
Almenar de Soria 41.41 02.12w
Almendralejo 38.41 06.25w
Almeria 36.50 02.26w
Almodovar del Campo 38.43 04.10w
Almodovar del Pinar 39.44 01.55w
Almodovar del Rio 37.49 05.10w
Almonte 37.16 06.31w
Almorox 40.14 04.24w
Almunecar 36.44 03.41w
Almunia de Dona Godina 41.28 01.23w
Alora 36.50 04.43w
Alsasua 42.54 02.10w
Alustante 40.36 01.40w
Ametlla de Mar 40.54 00.48e
Andujar 38.02 04.03w
Antequera 37.01 04.34w
Anzanigo 42.24 00.39w
Aoiz 42.47 01.22w
Aracena 37.54 06.33w
Aragoncillo 40.56 02.03w
Aranda de Duero 41.40 03.41w
Aranda de Moncayo 41.34 01.47w
Aranjuez 40.02 03.37w
Aras 42.34 02.21w
Arcos de la Frontera 36.45 05.49w
Arcos de las Salinas 40.00 01.03w
Arevalo 41.04 04.44w
Arguedas 42.11 01.36w
Arroyo de Cuellar 41.20 04.22w
Arroyo de la Luz 39.28 06.35w
Arroyo de San Servan 38.51 06.28w
Arta (Mallorca) 39.42 03.20e
Arzua 42.55 08.10w
Atauta 41.31 03.13w
Atienza 41.12 02.52w
Aveinte 40.45 04.50w
Avila 40.39 04.42w
Ayamonte 37.13 07.24w
Ayerbe 42.16 00.41w
Ayna 38.34 02.05w
Ayora 39.04 01.04w
Aznalcollar 37.31 06.16w
Azuaga 38.16 05.40w
Azuara 41.15 00.53w
Badajoz 38.53 06.58w
Baena 37.37 04.20w
Baeza 38.00 03.28w
Bailen 38.06 03.46w
Balaguer 41.48 00.48e
Baneza, La 42.18 05.54w
Banolas 42.06 02.46e
Banos de Panticosa 42.45 00.14w
Barbastro 42.03 00.07e
Barcarrota 38.31 06.51w
Barcelona 41.25 02.10e
Barrachina 40.54 01.08w
Barrax 39.04 02.12w
Bayona 42.07 08.51w
Baza 37.30 02.45w
Beas 37.26 06.48w
Beas de Segura 38.15 02.53w
Becerrea 42.51 07.10w
Bejar 40.24 05.45w
Belchite 41.18 00.45w
Belorado 42.25 03.11w
Benabarre 42.06 00.29e
Benasque 42.36 00.31e
Benavente 42.00 05.40w
Berga 42.06 01.50e
Berja 36.51 02.56w
Berlanga 38.17 05.50w
Berlanga de Duero 41.28 02.51w
Bermillo de Sayago 41.22 06.08w
Besalu 42.12 02.42e
Betanzos 43.17 08.13w
Bielsa 42.38 00.13e
Bilbao 43.15 02.56w
Blanes 41.41 02.48e
Bohonal de Ibor 39.47 05.28w
Boltana 42.27 00.05w
Bonilla 40.11 02.33w
Bonillo, El 38.57 02.32w
Borja 41.50 01.32w
Briviesca 42.33 03.19w
Bronchales 40.30 01.35w
Bujaraloz 41.29 00.10w
Bunol 39.25 00.47w
Burgos 42.21 03.41w
Burguete 42.59 01.20w
Cabeza del Buey 38.44 05.14w
Cabreiros 43.24 07.46w
Caceres 39.29 06.23w
Cadiz 36.32 06.18w
Calahorra 42.19 01.58w
Calamocha 40.54 01.18w
Calanda 40.56 00.15w
Calar Alto* 37.13 02.31w
Calatanazor 41.42 02.50w
Calatayud 41.21 01.39w
Caldas de Reyes 42.36 08.39w
Callosa de Ensarria 38.40 00.08w
Callosa de Segura 38.07 00.53w
Calpe 38.39 00.03e
Calzada de Calatrava 38.42 03.46w
Calzada de Oropesa 39.52 05.16w
Camarena 40.06 04.08w
Camarena de la Sierra 40.09 01.03w
Campillo de Altobuey 39.36 01.49w
Campillo de la Jara, El 39.36 05.03w
Campillo de Llerena 38.30 05.50w
Campillos 37.04 04.51w
Campillos Paravientos 39.58 01.34w
Campo de Criptana 39.25 03.07w
Canaveras 40.20 02.24w
Canelles 42.00 00.40e
Canfranc 42.42 00.31w
Cangas de Narcea 43.10 06.32w
Cangas de Onis 43.21 05.08w
Caniles 37.27 02.42w
Cantillana 37.36 05.50w

Caravaca de la Cruz 38.06 01.51w
Carballino 42.26 08.05w
Carballo 43.13 08.41w
Carboneras 37.00 01.53w
Cardona 41.55 01.41e
Carinena 41.20 01.13w
Carmona 37.28 05.38w
Cartagena 37.36 00.59w
Caspe 41.14 00.03w
Castellon de la Plana 39.59 00.03w
Castellon de Rugat 38.53 00.24w
Castellote 40.48 00.20w
Castillo de Locubin 37.32 03.56w
Castrocalbon 42.12 06.00w
Castrojeriz 42.17 04.09w
Castuera 38.44 05.33w
Cazorla 37.55 03.00w
Ceclavin 39.48 06.47w
Celanova 42.09 07.58w
Cella 40.27 01.18w
Centellas 41.48 02.14e
Cercedilla 40.44 04.04w
Cervera de Pisuerga 42.51 04.30w
Cervera del Rio Alhama 42.00 01.58w
Chantada 42.36 07.46w
Chiclana de la Frontera 36.26 06.09w
Chinchon 40.08 03.26w
Chullo* 37.06 03.00w
Cierva, La 40.03 01.52w
Cieza 38.14 01.25w
Cistierna 42.47 05.08w
Ciudad Real 38.59 03.55w
Ciudad Rodrigo 40.36 06.33w
Ciudadela (Menorca) 40.00 03.50e
Cogolludo 40.56 03.06w
Coin 36.40 04.45w
Colmenar 36.54 04.20w
Colmenar de Oreja 40.06 03.25w
Colmenar del Arroyo 40.25 04.12w
Colmenar dela Sierra 41.04 03.24w
Colmenar Viejo 40.40 03.46w
Constantina 37.54 05.36w
Cordoba 37.53 04.46w
Coria 39.59 06.32w
Coria del Rio 37.18 06.04w
Corrales 41.22 05.44w
Cortegana 37.55 06.49w
Crevillente 38.15 00.48w
Cuellar 41.24 04.19w
Cuenca 40.04 02.08w
Cuevas de Vinroma 40.18 00.07e
Curtis 43.07 08.02w
Daroca 41.07 01.25w
Denia 38.51 00.07e
Diezma 37.19 03.19w
Donamaria 43.06 01.40w
Duenas 41.52 04.33w
Durcal 37.00 03.34w
Ecija 37.33 05.04w
Ejea de los Caballeros 42.07 01.09w
El Grado* (Embalse) 42.10 00.14e
El Portalet* 42.49 00.24w
Elche 38.16 00.41w
Epila 41.36 01.17w
Escalona (Toledo) 40.10 04.24w
Escorial, El 40.34 04.08w
Estella 42.41 02.02w
Estepona 36.26 05.09w
Esterri de Aneu 42.38 01.07e
Ezcaray 42.19 03.00w
Fernan Nunez 37.40 04.44w
Figueras 42.16 02.57e
Finana 37.10 02.50w
Fonsagrada 43.08 07.04w
Fornells (Menorca) 40.04 04.07e
Fortuna 38.11 01.07w
Foz 43.34 07.15w
Fraga 41.32 00.21e
Fregenal de la Sierra 38.10 06.39w
Fuencaliente 38.25 04.18w
Fuengirola 36.32 04.38w
Fuenteguinaldo 40.26 06.41w
Fuenteheridos 37.54 06.39w
Fuente-Obejuna 38.15 05.25w
Fuentes 39.57 02.02w
Fuentes de Andalucia 37.28 05.20w
Fuentes de Jiloca 41.14 01.32w
Fuentes de Leon 38.05 06.32w
Fuentes de Nava 42.05 04.48w
Fuentes de Valdepero 42.04 04.30w
Fuentes Onoro 40.35 06.49w
Fuentesauco 41.14 05.30w
Gador 36.56 02.29w
Galera 37.45 02.33w
Gergal 37.07 02.31w
Gerona 41.59 02.49e
Gijon 43.32 05.40w
Gironella 42.02 01.53e
Gradefes 42.37 05.14w
Grado 43.23 06.04w
Grado, El 42.09 00.13e
Granada 37.10 03.35w
Graus 42.11 00.20e
Griegos 40.26 01.43w
Guadalajara 40.37 03.10w
Guadalaviar 40.23 01.44w
Guadalcanal 38.06 05.49w
Guadalcazar 37.46 04.56w
Guadalupe 39.27 05.19w
Guadarrama* 40.40 04.06w
Guadix 37.19 03.08w
Gudar 40.26 00.44w
Güesa 42.48 01.05w
Guijuelo 40.34 05.40w
Hecho 42.45 00.45w
Hellin 38.31 01.43w
Herencia 39.22 03.21w
Herrera 37.22 04.50w
Herrera de Alcantara 39.39 07.15w
Herrera de los Navarros 41.12 01.04w
Herrera de Pisuerga 42.35 04.20w
Herrera del Duque 39.10 05.03w
Herrera* 41.10 01.06w
Honrubia 39.36 02.17w
Honrubia de la Cuesta 41.31 03.41w
Horcajo de los Montes 39.20 04.39w
Horcajo de Santiago 39.50 03.01w
Horcajo-Medianero 40.38 05.25w
Hoyos 40.10 06.43w
Huelago 37.25 03.15w
Huelamo 40.16 01.49w
Huelma 37.39 03.28w
Huelva 37.15 06.56w
Huercal Overa 37.23 01.56w
Huesca 42.08 00.25w
Huescar 37.49 02.32w
Ibiza (Ibiza) 38.54 01.26e
Igualada 41.35 01.37e
Illana 40.11 02.54w
Illescas 40.08 03.51w
Iniesta 39.27 01.45w
Irun 43.20 01.48w
Isaba 42.52 00.55w
Izarra 42.57 02.55w
Iznajar 37.15 04.19w
Jaca 42.34 00.33w
Jadraque 40.55 02.55w
Jaen 37.46 03.48w
Jaraicejo 39.40 05.49w
Jarandilla 40.08 05.39w
Javalambre* 40.05 01.02w
Jerez de la Frontera 36.41 06.08w
Jerez de los Caballeros 38.20 06.45w
Jerez del Marquesado 37.12 03.09w
Jodar 37.50 03.21w
Jumilla 38.29 01.19w
La Coruna 43.22 08.24w
La Escala 42.08 03.08e
La Granja 40.52 04.02w
La Linea de la Concepcion 36.10 05.21w
La Mola* (Formentera) 38.40 01.34e
La Puebla de Montalban 39.52 04.22w
La Robla 42.48 05.38w
La Roda 39.13 02.10w
Lage 43.13 09.00w
Laguarres 42.13 00.28e
Laguarta 42.25 00.08w
Lalin 42.40 08.06w
Landete 39.54 01.22w
Lanjaron 36.55 03.29w
Lecinena 41.47 00.37w
Lecumberri 43.00 01.54w
Ledesma 41.05 06.00w
Leon 42.36 05.34w
Lerida 41.37 00.38e
Lerma 42.02 03.46w
Letur 38.22 02.06w
Lillo (Leon) 42.47 06.37w
Lillo (Toledo) 39.43 03.19w
Linares 38.05 03.38w
Llagostera 41.50 02.54e
Llanaves dela Reina 43.04 04.49w
Llanes 43.26 04.45w
Llansa 42.21 03.09e
Lobon 38.51 06.38w
Lodosa 42.26 02.05w
Loeches 40.23 03.25w
Logrono 42.28 02.26w
Loja 37.10 04.09w
Lorca 37.40 01.41w
Los Navalmorales 39.43 04.38w
Los Yebenes 39.35 03.53w
Lovios 41.55 08.05w
Luarca 43.35 06.31w
Lucena 37.25 04.29w
Lucena de Jalon 41.32 01.18w
Lucena del Cid 40.09 00.17w
Lucena del Puerto 37.18 06.44w
Lucillo 42.26 06.18w
Lugo 43.00 07.33w
Lumbier 42.39 01.19w
Lumbrales 40.56 06.44w
Lumbreras 42.06 02.38w
Madrid 40.25 03.43w
Madrigal de la Vera 40.09 05.22w
Madrigal de las Altas Torres 41.05 05.00w
Maella 41.07 00.09e
Maello 40.48 04.31w
Mahon (Menorca) 39.54 04.15e
Malaga 36.43 04.25w
Mampodre* 43.02 05.11w
Manacor (Mallorca) 39.35 03.12e
Mancha Real 37.47 03.37w
Manlleu 42.00 02.17e
Manresa 41.43 01.50e
Manzanares 39.00 03.23w
Manzanera 40.04 00.50w
Maranchon 41.02 02.11w
Marbella 36.31 04.53w
Marchena 37.20 05.24w
Marin 42.23 08.42w
Martorell 41.29 01.55e
Martos 37.44 03.58w
Matapozuelos 41.24 04.48w
Mataro 41.32 02.27e
Mayals 41.22 00.30e
Mazarron 37.36 01.19w
Medina de Pomar 42.55 03.29w
Medina de Rioseco 41.53 05.03w
Medina del Campo 41.18 04.55w
Mequinenza 41.22 00.17e
Merida 38.55 06.20w
Miajadas 39.10 05.54w
Minas de Riotinto 37.42 06.35w
Miranda de Ebro 42.40 02.57w
Miravalles* 42.53 06.46w
Molina de Aragon 40.50 01.54w
Molina de Segura 38.03 01.11w
Moncayo* 41.47 01.50w
Monesterio 38.05 06.16w
Monreal 42.42 01.31w
Monreal del Campo 40.47 01.20w
Monroyo 40.47 00.03w

Montalban 40.50 00.48w
Montanchez 39.14 06.09w
Montblanch 41.23 01.10e
Montealegre del Castillo 38.47 01.20w
Montefrio 37.19 04.00w
Montoro 38.02 04.23w
Montoro de Mezquita 40.40 00.36w
Montseny* 41.45 02.25e
Monzon 41.54 00.12e
Mora 39.40 03.46w
Mora de Ebro 41.05 00.38e
Mora de Rubielos 40.15 00.45w
Moratalla 38.11 01.53w
Morella 40.37 00.06w
Morella* 41.17 01.55e
Moron de Almazan 41.25 02.24w
Moron de la Frontera 37.07 05.27w
Moscardon 40.20 01.33w
Mota del Cuervo 39.30 02.52w
Mota del Marques 41.38 05.11w
Motilla del Palancar 39.34 01.55w
Motril 36.45 03.31w
Mugia 43.06 09.13w
Mula 38.02 01.29w
Mulhacen, Cerro de* 37.04 03.19w
Munera 39.03 02.29w
Muniesa 41.02 00.49w
Murcia 37.59 01.08w
Murias de Paredes 42.51 06.11w
Muros 42.47 09.04w
Muros de Nalon 43.32 06.06w
Najera 42.25 02.45w
Navalcarnero 40.17 04.01w
Navalmoral 40.27 04.45w
Navalmoral de la Mata 39.54 05.33w
Neda 43.29 08.09w
Negreira 42.54 08.45w
Nerja 36.45 03.53w
Nerpio 38.09 02.18w
Nijar 36.58 02.11w
Novelda 38.24 00.45w
Nules 39.52 00.10w
Ocana 39.57 03.30w
Ojos 38.09 01.20w
Ojos Albos 40.41 04.31w
Ojos Negros 40.44 01.30w
Oliana 42.04 01.19e
Olite 42.29 01.40w
Oliva 38.55 00.09w
Oliva de dela Frontera 38.17 06.54w
Oliva de Merida 38.47 06.08w
Oliva de Plasencia 40.06 06.05w
Olivenza 38.41 07.06w
Olot 42.11 02.30e
Olvera 36.56 05.15w
Ona 42.43 03.26w
Onda 39.58 00.16w
Onteniente 38.49 00.37w
Ontur 38.37 01.30w
Orduna 43.00 03.00w
Orense 42.20 07.52w
Orgaz 39.39 03.52w
Orgiva 36.54 03.25w
Oria 37.30 02.17w
Orihuela 38.05 00.56w
Oropesa (Castellon) 40.06 00.07e
Oropesa (Toledo) 39.55 05.10w
Ortigueira 43.41 07.50w
Osorno 42.24 04.22w
Oviedo 43.21 05.50w
Padilla* 37.17 02.46w
Padron 42.44 08.40w
Pajares, Puerto de* 43.00 05.46w
Palafrugell 41.55 03.10e
Palas de Rey 42.51 07.52w
Palazuelo Empalme 39.55 06.05w
Palencia 42.01 04.32w
Palma de Mallorca (Mall.) 39.35 02.39e
Pamplona 42.49 01.39w
Pedrafita, Puerto de* 42.43 07.00w
Pego 38.51 00.08w
Penaranda de Bracamonte 40.54 05.13w
Penaranda de Duero 41.40 03.29w
Petilla de Aragon 42.27 01.05w
Piedrabuena 39.02 04.10w
Piedrafita, Puerto de* 42.43 07.00w
Piedrahita 40.27 05.20w
Piedras Luengas, Puerto de* 43.04 04.27w
Pineda 41.38 02.42e
Pineda de Ciguela 40.05 02.34w
Pineda de la Sierra 42.13 03.17w
Pinoso 38.25 01.22w
Plasencia 40.02 06.05w
Plasencia del Monte 42.14 00.34w
Pobla de Segur 42.15 00.58e
Pola de Laviana 43.15 05.33w
Pola de Lena 43.10 05.49w
Pola de Siero 43.24 05.39w
Ponferrada 42.33 06.35w
Pons 41.55 01.12e
Ponton, Puerto del* 43.07 05.01w
Porcuna 37.52 04.11w
Potes 43.10 04.37w
Pozo Alcon 37.43 02.55w
Pozoblanco 38.23 04.51w
Pozohondo 38.44 01.55w
Priego 40.26 02.19w
Puebla de Alcocer 38.59 05.14w
Puebla de Don Fadrique 37.58 02.26w
Puebla de Sanabria 42.04 06.38w
Puente del Arzobispo, El 39.48 05.10w
Puente Genil 37.24 04.46w
Puerto Lumbreras 37.35 01.49w
Puigcerda 42.26 01.55e
Quintanar de la Orden 39.36 03.03w
Quintanar de la Sierra 41.59 03.02w
Quintanar del Rey 39.21 01.56w
Quiroga 42.28 07.15w
Ramales de la Victoria 43.15 03.28w
Redondela 42.17 08.36w
Reinosa 43.01 04.09w
Requena 39.29 01.08w
Retamal 38.35 05.50w
Reus 41.10 01.06e
Riano 42.59 05.00w
Riaza 41.16 03.29w
Ribadavia 42.17 08.08w
Ribas de Fresser 42.18 02.10e
Riopar 38.30 02.26w
Ripoll 42.12 02.12e
Roa 41.42 03.55w
Ronda 36.45 05.10w
Rosas 42.15 03.11e
Rubielos de Mora 40.11 00.40w
Sabadell 41.33 02.07e
Sabinanigo 42.31 00.22w
Sacedon 40.29 02.44w
Sadaba 42.17 01.16w
Saelices 39.55 02.49w
Saelices del Mayorga 42.13 05.12w
Saelices del Rio 42.30 05.00w
Sagunto 39.40 00.17w
Salamanca 40.58 05.40w
Salas de los Infantes 42.00 03.17w
Saldana 42.31 04.44w
San Antonio Abad (Ibiza) 38.59 01.19e
San Clemente 39.24 02.25w
San Esteban de Bas 42.07 02.28e
San Juan de las Abadesas 42.13 02.18e
San Lorenzo de la Parrilla 39.51 02.22w
San Lorenzo de Morunys 42.08 01.35e
San Martin de Valdeiglesias 40.21 04.24w
San Mateo 40.28 00.10e
San Pedro del Pinatar 37.50 00.46w
San Pedro Pescador 42.12 03.05e
San Roque 36.13 05.23w
San Roque de Riomiera 43.14 03.41w
San Sebastian 43.19 01.59w
Sanlucar de Barrameda 36.46 06.21w
Sanlucar de Guadiana 37.29 07.28w
Santa Amalia 39.00 06.01w
Santa Cruz de Mudela 38.39 03.28w
Santa Eugenia Ribeira 42.33 08.59w
Santa Eulalia 40.34 01.20w
Santa Olalla 40.02 04.25w
Santa Olalla del Cala 37.54 06.14w
Santander 43.28 03.48w
Santany (Mallorca) 39.22 03.07e
Santiago de Compostela 42.52 08.33w
Santiago de la Espada 38.06 02.33w
Santisteban del Puerto 38.15 03.11w
Santona 43.27 03.26w
Sarinena 41.47 00.10w
Sarrion 40.09 00.49w
Sedano 42.42 03.44w
Segorbe 39.51 00.30w
Segovia 40.57 04.07w
Segura de los Banos 40.56 00.57w
Seo de Urgel 42.22 01.27e
Setcaces 42.23 02.18e
Sevilla 37.24 05.59w
Sineu (Mallorca) 39.39 03.00e
Socuellamos 39.18 02.48w
Soller (Mallorca) 39.46 02.42e
Solsona 42.00 01.31e
Somport* 42.48 00.31w
Sorbas 37.06 02.07w
Soria 41.46 02.28w
Sos del Rey Catolico 42.30 01.13w
Sta. Marta (Albacete) 39.09 02.18w
Sta. Marta (Badajoz) 38.37 06.39w
Tabara 41.49 05.57w
Tabuenca 41.42 01.32w
Tafalla 42.32 01.41w
Talavera de la Reina 39.58 04.50w
Tamames 40.40 06.06w
Tamarite de Litera 41.52 00.25e
Tarancon 40.01 03.01w
Taravilla 40.42 01.59w
Tarazona (Salamanca) 41.10 05.15w
Tarazona (Zaragoza) 41.54 01.44w
Tarazona de la Mancha 39.16 01.55w
Tardienta 41.59 00.33w
Tarifa 36.01 05.36w
Tarna, Puerto de 43.05 05.12w
Tarragona 41.07 01.15e
Tarrasa 41.34 02.00e
Tarrega 41.39 01.09e
Tauste 41.55 01.15w
Teleno* 42.20 06.24w
Teruel 40.21 01.06w
Tineo 43.20 06.24w
Toledo 39.52 04.02w
Tolosa 43.09 02.04w
Tomelloso 39.09 03.01w
Tordesillas 41.30 05.00w
Tordesilos 40.40 01.35w
Torla 42.37 00.06w
Toro 41.31 05.24w
Torrecilla en Cameros 42.15 02.38w
Torrejoncillo 39.54 06.28w
Torrelaguna 40.50 03.33w
Torrelavega 43.21 04.03w
Torrevieja 37.59 00.40w
Tortosa 40.49 00.31e
Tozal de Guara 42.18 00.14w
Tragacete 40.21 01.51w
Tramacastilla 40.25 01.35w
Tremp 42.10 00.54e
Trespaderne 42.47 03.24w
Trevelez 37.00 03.15w
Trevino 42.44 02.45w
Trillo 40.42 02.35w
Trujillo 39.28 05.53w
Tudela 42.04 01.37w
Turleque 39.36 03.37w
Ubeda 38.01 03.22w
Ubierna 42.30 03.41w
Ubrique 36.41 05.27w
Ugijar 36.58 03.03w
Uleila del Campo 37.11 02.11w
Ulldecona 40.36 00.27e
Una 40.14 01.59w

Utiel 39.33 01.13w
Utrera 37.10 05.47w
Valdealgorfa 40.59 00.02w
Valdemoro 40.12 03.40w
Valdemoro del Rey 40.15 02.38w
Valdemoro-Sierra 40.06 01.46w
Valdepenas 38.46 03.24w
Valdepenas de Jaen 37.36 03.50w
Valderrobres 40.53 00.09e
Valencia 39.29 00.24w
Valencia de Alcantara 39.25 07.14w
Valencia de Don Juan 42.17 05.31w
Valladolid 41.39 04.45w
Valle de Cabuerniga 43.14 04.18w
Valmaseda 43.11 03.11w
Valverde del Camino 37.35 06.45w
Vega de Tera 42.00 06.08w
Vejer de la Frontera 36.15 05.58w
Velez Blanco 37.41 02.05w
Velez Malaga 36.47 04.06w
Velez Rubio 37.39 02.04w
Vendrell 41.13 01.33e
Vera 37.15 01.51w
Vergara 43.07 02.25w
Viana 42.31 02.22w
Vich 41.56 02.16e
Viella 42.41 00.47e
Vilchez 38.13 03.30w
Villabona 43.27 05.49w
Villada 42.15 04.59w
Villafranca de los Barros 38.34 06.20w
Villafranca del Bierzo 42.36 06.49w
Villafranca del Cid 40.26 00.16w
Villafranca del Penedes 41.20 01.42e
Villalon de Campos 42.05 05.03w
Villamanrique 38.34 03.00w
Villamanrique de Tajo 40.04 03.15w
Villamanrique dela Condesa 37.15 06.18w
Villamartin 36.52 05.38w
Villamayor de Santiago 39.44 02.56w
Villanueva de Cordoba 38.20 04.38w
Villanueva de la Serena 38.58 05.48w
Villaodrid 43.20 07.11w
Villar del Rey 39.07 06.50w
Villarcayo 42.56 03.34w
Villarluengo 40.39 00.32w
Villarrobledo 39.16 02.36w
Villasayas 41.20 02.36w
Villaviciosa de Cordoba 38.05 05.02w
Villena 38.39 00.52w
Vinaroz 40.29 00.28e
Viso del Marques 38.32 03.34w
Vitigudino 41.00 06.26w
Vitoria-Gasteiz 42.51 02.40w
Viver 39.55 00.36w
Yecla 38.36 01.07w
Yeste 38.22 02.19w
Zafra 38.25 06.25w
Zamora 41.30 05.45w
Zaorejas 40.45 02.13w
Zaragoza 41.39 00.54w
Zorita (Caceres) 39.18 05.42w
Zorita (Guadalajara) 40.20 02.54w
Zubia, la 37.07 03.34w

E-2 Spain: Canary Islands

Adeje (Tenerife) 28.08 16.44w
Arafo (Tenerife) 28.20 16.25w
Arrecife (Lanzarote) 28.57 13.33w
Arure (Gomera) 28.08 17.19w
Betancuria (Fuertevent.) 28.24 14.05w
Caleta (Lanzarote) 29.13 13.31w
Carrizal (Gran Canaria) 27.55 15.24w
Corralejo (Fuerteventura) 28.43 13.53w
El Charco (La Palma) 28.31 17.51w
El Risco (Gran Canaria) 28.03 15.45w
Fasnia (Tenerife) 28.14 16.27w
Galdar (Gran Canaria) 28.09 15.40w
Garajonay* (Gomera) 28.07 17.14w
Gran Tarajal (Fuerteven.) 28.12 14.02w
Granadilla de Abona (Tener.) 28.09 16.26w
Guatiza (Lanzarote) 29.05 13.29w
Haria (Lanzarote) 29.09 13.30w
Jandia* (Fuerteventura) 28.03 14.21w
La Antigua (Fuertevent.) 28.24 14.02w
La Caldera* (La Palma) 28.45 17.45w
La Caleta (Lanzarote) 29.06 13.35e
La Estrella (Gran Canaria) 28.02 15.22w
La Laguna (Tenerife) 28.29 16.19w
La Matilla (Fuertevent.) 28.33 13.58w
La Oliva (Fuerteventura) 28.36 13.53w
La Rajita (Gomera) 28.04 17.18w
La Tinosa (Lanzarote) 28.54 13.42w
Las Palmas de Gran Canaria 28.08 15.27w
Los Sauces (La Palma) 28.47 17.46w
Maspalomas (Gran Canaria) 27.46 15.34w
Oliva (Fuerteventura) 28.36 13.53w
Orzola (Lanzarote) 29.13 13.26w
Pico de Teide* (Tenerife) 28.23 16.38w
Playa Blanca (Lanzarote) 28.51 14.01w
Puerto de la Cruz (Tenerife) 28.24 16.33w
Puerto de Mogan (Gran Canaria) 27.48 15.47w
Puerto Lajas (Fuerteventura) 28.32 13.50w
Puntagorda (La Palma) 28.47 17.59w
Restinga (Hierro) 27.38 17.39w
Sabinosa (Hierro) 27.45 18.06w
San Juan dela Rambla (Ten.) 28.23 16.39w
San Sebastian de la Gomera 28.06 17.06w
Santa Cruz de la Palma 28.41 17.46w
Santa Cruz de Tenerife 28.28 16.15w
Sardina (Gran Canaria) 27.52 15.26w
Tae (Lanzarote) 29.02 13.38w
Taganana (Tenerife) 28.33 16.12w
Tazacorte (La Palma) 28.38 17.56w
Tegueste (Tenerife) 28.31 16.20w
Tejeda (Gran Canaria) 27.59 15.35w
Telde (Gran Canaria) 28.01 15.25w
Teseyerague (Fuertevent.) 28.15 14.07w
Tigalate (La Palma) 28.32 17.46w
Toto (Fuerteventura) 28.20 14.06w
Valle Gran Rey (Gomera) 28.07 17.19w
Vallehermoso (Gomera) 28.12 17.15w
Valverde (Hierro) 27.48 17.55w

EST Estonia

Haapsalu 58.58 23.32e
Kärdla 59.00 22.42e
Kilingi-Nõmme 58.08 24.58e
Kohila 59.09 24.48e
Kunda 59.30 26.30e
Muhu 58.32 23.20e
Mustvee 58.51 26.29e
Narva 59.22 28.17e
Paldiski 59.22 24.08e
Pärnu 58.28 24.30e
Poltsamaa 58.40 26.00e
Räpina 58.01 27.29e
Rapla 58.59 24.49e
Risti 58.59 24.01e
Sääre 57.55 22.08e
Tallinn 59.22 24.48e
Tapa 59.16 25.50e
Tartu 58.20 26.44e
Torva 58.00 26.00e
Türi 58.48 25.28e
Väike-Marja 59.10 26.20e
Vasalemma 59.15 24.18e
Viljandi 58.22 25.30e
Viru-Jaagupi-Lisaku 59.10 26.20e
Voru 57.48 26.54e

F France

Abbeville 50.06 01.51e
Agen 44.12 00.38e
Aignan 43.42 00.06e
Aignay-le-Duc 47.41 04.43e
Aigoual, Mt.* 44.08 03.53e
Aigre 45.53 00.01e
Aiguilles 44.48 06.52e
Airaines 49.58 01.56e
Airvault 46.50 00.08w
Aix 45.37 02.22e
Aix d'Angillon 47.12 02.34e
Aix-en-Othe 48.14 03.45e
Aix-en-Provence 43.31 05.27e
Aix-les-Bains 45.41 05.55e
Ajaccio (Corsica) 41.55 08.43e
Albertville 45.40 06.24e
Albi 43.56 02.08e
Alencon 48.25 00.05e
Ales 44.08 04.05e
Alet-les-Bains 42.59 02.16e
Allevard 45.23 06.05e
Allogny 47.14 02.18e
Allos 44.14 06.38e
Amberieu-en-Bugey 45.57 05.21e
Ambert 45.33 03.45e
Amiens 49.54 02.18e
Andelot-Blancheville 48.15 05.17e
Andelot-en-Montagnes 46.51 05.56e
Angers 47.29 00.32w
Angerville 48.19 02.00e
Angouleme 45.40 00.10e
Annecy 45.54 06.07e
Annonay 45.15 04.40e
Annot 43.58 06.42e
Antignac 42.50 00.36e
Antony 48.45 02.17e
Anzat-le-Luguet 45.20 03.02e
Apt 43.52 05.23e
Arbois 46.50 05.48e
Arc-en-Barrois 47.57 05.01e
Argeles-sur-Mer 42.33 03.02e
Argentan 48.45 00.01w
Argentat 45.06 01.56e
Argentiere 45.58 06.55e
Argenton 48.32 04.45w
Argenton-Chateau 46.59 00.26w
Argenton-sur-Creuse 46.36 01.30e
Arles 43.41 04.38e
Arnay-le-Duc 47.08 04.30e
Arpajon 48.35 02.15e
Arpajon-sur-Cere 44.54 02.27e

Arras 50.17 02.46e
Arras-en-Lavedan 42.59 00.08w
Arreau 42.55 00.21e
Artenay 48.05 01.53e
Arthes 43.57 02.12e
Arthez 43.28 00.36w
Arudy 43.06 00.25w
Aspres-sur-Buech 44.31 05.45e
Aubenas 44.37 04.24e
Aubigny-en-Artois 50.21 02.36e
Aubigny-sur-Nere 47.29 02.26e
Aubusson 45.58 02.10e
Auch 43.40 00.36e
Audierne 48.01 04.33w
Aulnay 46.01 00.20w
Aulus-les-Bains 42.48 01.19e
Aunay-en-Bazois 47.07 03.42e
Aunay-sur-Odon 49.01 00.38w
Aups 43.38 06.13e
Aurignac 43.14 00.53e
Aurillac 44.56 02.26e
Auxerre 47.48 03.35e
Auxonne 47.12 05.23e
Availles-Limouzine 46.07 00.39e
Avignon 43.56 04.48e
Avranches 48.42 01.21w
Ax-les-Thermes 42.43 01.49e
Baccarat 48.27 06.45e
Bagneres-de-Bigorre 43.04 00.09e
Bagneres-de-Luchon 42.48 00.35e
Bagnols 45.30 02.37e
Bagnols-en-Foret 43.33 06.43e
Bagnols-les-Bains 44.30 03.40e
Bagnols-sur-Ceze 44.10 04.36e
Bain-de-Bretagne 47.50 01.40w
Barbazan 43.02 00.37e
Barbezieux-St.-Hilaire 45.28 00.09w
Barcelonette 44.24 06.46e
Bargemon 43.28 06.36e
Barjols 43.33 06.01e
Bar-le-Duc 48.46 05.10e
Bar-sur-Seine 48.07 04.23e
Bastelica (Corsica) 42.00 09.04e
Bastia (Corsica) 42.41 09.26e
Baud 47.53 03.00w
Bauge 47.33 00.06w
Baume 46.43 05.38e
Baume, la 46.18 06.36e
Bayeux 49.16 00.42w
Bayon 48.29 06.19e
Bayonne 43.30 01.28w
Bazas 44.26 00.12w
Beaugency 47.47 01.38e
Beaumont-sur-Oise 49.09 02.17e
Beaumont-sur-Sarthe 48.13 00.07e
Beaune-la-Rolande 48.05 02.25e
Beaupreau 47.12 00.59w
Beauvais 49.26 02.05w
Beauvoir-sur-Mer 46.55 02.02w
Beauvoir-sur-Niort 46.11 00.28w
Belfort 47.38 06.52e
Belgodere (Corsica) 42.35 09.01e
Belin-Beliet 44.29 00.47w
Bellegarde (Gard) 43.45 04.30e
Bellegarde (Loiret) 48.00 02.28e
Belleme 48.22 00.34e
Belley 45.46 05.41e
Benestroff 48.54 06.48e
Bergerac 44.50 00.29e
Bernay (Eure) 49.05 00.36e
Bernay (Sarthe) 48.05 00.04w
Besancon 47.14 06.02e
Besseges 44.16 04.05e
Beziers 43.21 03.13e
Biarritz 43.29 01.33w
Bischwiller 48.46 07.53e
Bitche 49.03 07.26e
Blangy-le-Chateau 49.14 00.17e
Blangy-sur-Bresle 49.56 01.38e
Blangy-sur-Ternoise 50.25 02.09e
Blois 47.36 01.20e
Bocognano (Corsica) 42.05 09.05e
Bolbec 49.34 00.28e
Bologne 48.12 05.08e
Bonifacio (Corsica) 41.23 09.10e
Bonnetable 48.10 00.26e
Bonneval 48.11 01.24e
Bonneval-en-Diois 44.38 05.35e
Bonneval-sur-Arc 45.22 07.03e
Bonneville 46.05 06.25e
Bordeaux 44.50 00.34w
Borderes-Louron 42.53 00.24e
Borderes-sur-l'Echez 43.16 00.03e
Bordes (Haut.-Pyr.) 43.12 00.13e
Bordes (Pyr.-Atl.) 43.14 00.16w
Bormes-les-Mimosas 43.10 06.21e
Boulogne-sur-Mer 50.43 01.37e
Bourbon l'Archambault 46.36 03.03e
Bourges 47.05 02.23e
Bourg-Madame 42.26 01.55e
Bourg-Neuf 47.37 00.19w
Bourgneuf-en-Mauges 47.18 00.50w
Bourgneuf-en-Retz 47.03 01.56w
Boussac (Creuse) 46.21 02.12e
Brando (Corsica) 42.46 09.27e
Brest 48.23 04.30w
Bretenoux 44.55 01.50e
Breteuil-sur-Iton 48.50 00.55e
Breteuil-sur-Noye 49.38 02.18e
Briancon 44.53 06.39e
Briare 47.38 02.44e
Bricon 48.05 04.58e
Bricquebec 49.28 01.38w
Brignoles 43.25 06.03e
Brioude 45.18 03.23e
Brive-la-Gaillarde 45.05 01.32e
Broons 48.12 02.15w
Brou 48.13 01.10e
Bugeat 45.36 01.55e
Caen 49.11 00.22w
Cahors 44.28 01.26e
Calacuccia (Corsica) 42.20 09.00e
Calais 50.57 01.52e
Calenzana (Corsica) 42.30 08.51e
Calvi (Corsica) 42.34 08.44e
Camaret 48.16 04.37w
Cambo-les-Bains 43.22 01.24w
Cambrai 50.10 03.14e
Campitello (Corsica) 42.32 09.18e
Canari (Corsica) 42.50 09.19e
Candas 50.07 02.17e
Canigou, Mt.* 42.30 02.27e
Cannes 43.33 07.00e
Captieux 44.18 00.15w
Carbonne 43.18 01.12e
Carcassonne 43.13 02.21e
Cargese (Corsica) 42.08 08.36e
Carmaux 44.03 02.09e
Carnoules 43.18 06.12e
Carpentras 44.03 05.03e
Cassagnes-Begonhes 44.10 02.33e
Casteljaloux 44.19 00.06e
Castellane 43.50 06.30e
Castelnaudary 43.18 01.57e
Castelnau-Magnoac 43.18 00.30e
Castelnau-Montratier 44.17 01.21e
Castirla (Corsica) 42.23 09.27e
Castres 43.36 02.14e
Castres-Gironde 44.43 00.27w
Castriers 43.41 03.59e
Cateau, le 50.07 03.33e
Caussade 44.10 01.32e
Cauterets 42.53 00.06w
Cavaillon 43.50 05.02e
Cavalaire-sur-Mer 43.12 06.32e
Caylar, le 43.51 03.20e
Ceret 42.30 02.44e
Cerisiers 48.08 03.30e
Cerizay 46.49 00.40w
Cervione (Corsica) 42.40 09.28e
Chaise-Dieu, la 45.19 03.42e
Chalons-sur-Marne 48.58 04.22e
Chalon-sur-Saone 46.47 04.51e
Chambery 45.34 05.55e
Chamonix-Mont-Blanc 45.55 06.52e
Chanac 44.28 03.21e
Chantilly 49.12 02.28e
Chantonnay 46.41 01.03w
Chaource 48.03 04.08e
Charenton-du-Cher 46.44 02.38e
Charenton-le-Pont 48.49 02.25e
Charny (Yonne) 47.54 03.06e
Charny-sur-Meuse (Meuse) 49.12 05.21e
Charolles 46.26 04.17e
Chartres 48.23 01.30e
Chateau Chinon 47.04 03.56e
Chateau Gontier 47.49 00.42w
Chateau Salins 48.49 06.30e
Chateaubriant 47.43 01.22w
Chateau-du-Loir 47.42 00.25e
Chateaulin 48.12 04.07w
Chateaumeillant 46.34 02.11e
Chateauneuf de Randon 44.38 03.40e
Chateauneuf sur Cher 46.52 02.18e
Chateauneuf-du-Faou 48.11 03.50w
Chateauneuf-en-Thymerais 48.35 01.16e
Chateauneuf-les-Bains 46.01 02.53e
Chateauneuf-sur-Loire 47.52 02.13e
Chateauroux 44.37 06.32e
Chatillon-sur-Indre 46.59 01.11e
Chatillon-sur-Seine 47.52 04.35e
Chaumont 48.07 05.08e
Chaumont* 47.02 06.25e
Cherbourg 49.38 01.37w
Chinon 47.10 00.15e
Cholet 47.04 00.53w
Cinto, Mont* (Corsica) 42.23 08.57e
Civray (Cher) 46.57 02.09e
Civray (Vienne) 46.09 00.18e
Clairvaux 48.09 04.47e
Clairvaux-d'Aveyron 44.26 02.24e
Clairvaux-les-Lacs 46.34 05.46e
Clamecy 47.27 03.31e
Clermont-Creans 47.43 00.01w
Clermont-Ferrand 45.47 03.05e
Clisson 47.05 01.16w
Cloyes-sur-le-Loir 48.03 01.15e
Cognac 45.42 00.19w
Cognac-le-Froid 45.50 01.00e
Coligny 46.23 05.20e
Collobrieres 43.15 06.20e
Colmar 48.05 07.21e
Colmars 44.13 06.37e
Colomiers 43.37 01.20e
Combeaufontaine 47.43 05.53e
Combourg 48.25 01.45w
Commercy 48.46 05.36e
Compiegne 49.25 02.50e
Conca (Corsica) 41.44 09.20e
Concarneau 47.53 03.55w
Conches 48.58 00.57e
Condom 43.58 00.23e
Contres (Cher) 46.52 02.28e
Contres (Loir-et-Cher) 47.26 01.26e
Contreuve 49.22 04.38e
Contrexeville 48.10 05.54e
Corbeil-Essonnes 48.37 02.29e
Corbigny 47.15 03.40e
Cordes 44.04 01.56e
Corlay 48.18 03.04w
Cornus 43.54 03.10e
Corte (Corsica) 42.18 09.08e
Cosne-Cours-sur-Loire 47.25 02.55e
Cosne-d'Allier 46.28 02.46e
Cote-Saint-Andre 45.23 05.15e
Coucy-le-Chateau-Auffrique 49.32 03.20e
Couhe 46.18 00.12e
Coulommiers 48.49 03.05e
Coutras 45.02 00.07w
Craonne 49.26 03.46e
Craponne-sur-Arzon 45.20 03.50e
Cremieu 45.43 05.15e
Creon 44.47 00.20w

Creot 46.56 04.37e
Crest 44.44 05.02e
Creusot, le 46.48 04.27e
Cruseilles 46.02 06.06e
Cuiseaux 46.31 05.23e
Culoz 45.51 05.47e
Cunlhat 45.38 03.34e
Cussac 45.42 00.52e
Cussac-Fort-Medoc 45.07 00.43w
Dax 43.43 01.03w
Decazeville 44.34 02.15e
Decize 46.50 03.28e
Delle 47.31 06.59e
Die 44.45 05.23e
Dienne 45.10 02.46e
Dienville 48.22 04.32e
Dieppe 49.55 01.05e
Dieulefit 44.31 05.04e
Digne 44.05 06.14e
Digny 48.33 01.11e
Digoin 46.29 03.54e
Dijon 47.20 05.02e
Dinan 48.27 02.02w
Dole 47.05 05.30e
Domfront 48.35 00.39w
Donjon, le 46.21 03.47e
Donon, Mont* 48.31 07.10e
Dormans 49.05 03.39e
Doulevant-le-Chateau 48.23 04.56e
Draguignan 43.32 06.28e
Dreux 48.44 01.23e
Dun-le-Palestel 46.18 01.39e
Dun-sur-Meuse 49.23 05.12e
Eauze 43.51 00.06e
Ecommoy 47.50 00.16e
Embrun 44.33 06.30e
Entrains-sur-Nohain 47.28 03.15e
Entraunes 44.12 06.45e
Epinal 48.10 06.28e
Ernee 48.18 00.57w
Erstein 48.25 07.40e
Espalion 44.32 02.46e
Esparron 43.34 05.49e
Essoyes 48.03 04.32e
Estagel 42.46 02.41e
Etang de Sigean 43.05 03.00e
Etrepagny 49.19 01.37e
Evaux-les-Bains 46.10 02.28e
Evian-les-Bains 46.24 06.35e
Evreux 49.03 01.11e
Evron 48.09 00.24w
Eymoutiers 45.44 01.44e
Falaise 48.54 00.11w
Fauquembergues 50.35 02.06e
Felletin 45.53 02.10e
Feurs 45.44 04.13e
Fiennes 50.49 01.48e
Figari (Corsica) 41.29 09.08e
Figeac 44.37 02.01e
Florac 44.20 03.35e
Foix 42.57 01.35e
Fontainebleau 48.24 02.42e
Fontenay-le-Comte 46.28 00.48w
Fontenay-Tresigny 48.42 02.53e
Forcalqueiret 43.20 06.05e
Forcalquier 43.56 05.46e
Formerie 49.39 01.45e
Fougeres 48.21 01.12w
Frasne 46.51 06.09e
Frasne-le-Chateau 47.27 05.53e
Frejus 43.26 06.46e
Fruges 50.31 02.08e
Fumay 49.59 04.42e
Gaillac d'Aveyron 44.22 02.55e
Galeria (Corsica) 42.24 08.38e
Gan 43.14 00.23w
Gap 44.33 06.05e
Gardanne 43.27 05.27e
Garlin 43.34 00.15w
Gavarnie 42.44 00.01e
Gedre 42.47 00.02e
Gerardmer 48.04 06.53e
Gex 46.20 06.03e
Gignac (Herault) 43.39 03.33e
Gignac (Vaucluse) 43.55 05.23e
Giscos 44.16 00.10w
Gisors 49.17 01.47e
Givet 50.08 04.49e
Givry 46.47 04.45e
Gondrecourt-Aix 49.15 05.45e
Gondrecourt-le-Chateau 48.31 05.31e
Gourin 48.08 03.37w
Gouzon 46.11 02.14e
Grand Veymont* 44.53 05.30e
Grandcamp-Maisy 49.23 01.01w
Grandrieu 44.47 03.38e
Grandvilliers 49.40 01.56e
Granville 48.50 01.35w
Grasse 43.40 06.56e
Graulhet 43.45 01.58e
Grave, La 45.03 06.18e
Gray 47.27 05.35e
Grenoble 45.11 05.43e
Guer 47.54 02.06w
Guerche-de-Bretagne 47.57 01.13w
Guerche-sur-l'Aubois 46.57 02.56e
Gueret 46.10 01.52e
Gueugnon 46.36 04.03e
Guignen 47.55 01.51w
Guingamp 48.34 03.09w
Hagondange 49.16 06.11e
Haguenau 48.49 07.47e
Ham 49.45 03.05e
Hendaye 43.22 01.46w
Hirson 49.56 04.05e
Huelgoat 48.22 03.45w
Ile-de-Porquerolles (Hyeres) 43.00 06.10e
Ile-de-Prot-Cros (Hyeres) 43.00 06.20e
Ile-du-Levant (Hyeres) 43.05 06.30e
Ingwiller 48.52 07.29e
Isle-Jourdain (Gers) 43.37 01.05e
Isle-Jourdain (Vienne) 46.14 00.41e
Issarles 44.50 04.03e
Issoire 45.33 03.15e
Issoudun 46.57 02.00e
Jarnac 45.41 00.10w
Joinville 48.27 05.08e
Joyeuse 44.29 04.15e
Jussac 44.59 02.25e
Jussey 47.49 05.55e
Labastide-Cezeracq 43.22 00.32w
Labastide-Clairence 43.26 01.15w
Labastide-Murat 44.39 01.36e
Labastide-Rovairoux 43.28 02.39e
Labrede 44.42 00.31w
Labrit 44.06 00.32w
Lacaune 43.42 02.41e
Laignelet 48.22 01.09w
Laignes 47.51 04.22e
Laissac 44.23 02.49e
Lamastre 44.59 04.35e
Lamotte-Beuvron 47.32 02.01e
Landivisiau 48.30 04.06w
Langeac 45.05 03.30e
Langogne 44.43 03.51e
Langres 47.53 05.20e
Lannemezan 43.08 00.22e
Lanslebourg 45.17 06.53e
Lapalisse 46.15 03.44e
Laragne-Monteglin 44.19 05.49e
Laruns 42.59 00.25w
Latronquiere 44.48 02.04e
Laubrieres 47.57 01.04w
Laumes, les 47.33 04.28e
Lauzerte 44.16 01.08e
Laval 48.07 00.45w
Le Havre 49.30 00.06e
Le Mans 48.00 00.12e
Le Monastier 44.31 03.15e
Le Puy 45.03 03.53e
Lectoure 43.56 00.38e
Lempdes 45.23 03.16e
Lencloitre 46.49 00.20e
Lens 50.26 02.50e
Leon 43.53 01.18w
Lesneven 48.35 04.20w
Lesparre-Medoc 45.19 00.56w
Lessay 49.13 01.32w
Levie (Corsica) 41.42 09.07e
Levroux 46.59 01.31e
Lezignan-Corbieres 43.12 02.46e
Libourne 44.55 00.14w
Lignieres-Orgeres 48.32 00.12w
L'Ile-Rousse (Corsica) 42.37 08.56e
Lille 50.39 03.05e
Lillers 50.34 02.29e
Limoges 45.50 01.15e
Lisieux 49.09 00.14e
Livron-sur-Drome 44.46 04.51e
Loches 47.08 01.00e
Lods 47.03 06.14e
Lombez 43.29 00.54e
Longuyon 49.27 05.36e
Lorient 47.45 03.21w
Loudeac 48.11 02.45w
Loudun 47.01 00.05e
Louhans 46.37 05.13e
Lourdes 43.06 00.02w
Louviers 49.13 01.11e
Lucca (Corsica) 42.27 08.48e
Lunas 43.42 03.12e
Luneville 48.35 06.30e
Lure 47.42 06.30e
Lure, Montagne de* 44.06 05.46e
Lussan 44.08 04.22e
Luxeuil-les-Bains 47.49 06.24e
Luzarches 49.07 02.26e
Lyon 45.46 04.50e
Machault 49.21 04.30e
Machecoul 46.59 01.49w
Macon 46.18 04.50e
Magnac-Bourg 45.37 01.25e
Magnac-Laval 46.13 01.10e
Maiche 47.15 06.47e
Malaucene 44.10 05.08e
Malestroit 47.49 02.23w
Manosque 43.50 05.47e
Marcenat 45.18 02.49e
Marcigny 46.17 04.03e
Mareuil (Dordogne) 45.27 00.28e
Mareuil-sur-Ay 49.03 04.03e
Mareuil-sur-Lay 46.32 01.16w
Marle 49.44 03.47e
Marmande 44.30 00.10e
Marseillan 43.22 03.32e
Marseille 43.18 05.22e
Mars-la-Tour 49.06 05.54e
Martel 44.56 01.35e
Marvejols 44.33 03.18e
Matha 45.52 00.18w
Maubeuge 50.18 03.57e
Mauriac (Cantal) 45.13 02.19e
Mauriac (Gironde) 44.45 00.02w
Mauron 48.05 02.17w
Mauroux 44.28 01.03e
Maurs 44.43 02.12e
Mayenne 48.18 00.37w
Mazamet 43.29 02.22e
Mazieres 47.23 00.25e
Mazieres-en-Gatine 46.32 00.19w
Mees, les 44.01 05.58e
Mende 44.32 03.30e
Mery-les-Bois 47.19 02.20e
Mery-sur-Siene 48.31 03.55e
Metz 49.07 06.11e
Meymac 45.32 02.08e
Mezidon-Canon 49.04 00.03w
Mezieres 49.46 04.44e
Mezieres-en-Brenne 46.50 01.12e
Mezieres-sur-Issoir 46.07 00.55e
Mezieres-sur-Seine 48.58 01.47e
Mezos 44.05 01.10w
Migliacciaro (Corsica) 42.00 09.24e

Millas 42.42 02.42e
Millau 44.06 03.05e
Miramas 43.33 05.02e
Mirambeau 45.23 00.34w
Miramont-de-Guyenne 44.36 00.22e
Miramont-Sensacq 43.37 00.20w
Mirecourt 48.18 06.08e
Mirepoix 43.05 01.51e
Modane 45.12 06.40e
Moissac 44.07 01.05e
Moissac-Bellevue 43.39 06.10e
Monein 43.19 00.34w
Monsols 46.13 04.31e
Montauban 44.01 01.20e
Montbard 47.38 04.20e
Montbeliard 47.31 06.48e
Montbozon 47.28 06.15e
Montcornet 49.42 04.01e
Mont-de-Marsan 43.54 00.30w
Montdidier 49.39 02.35e
Mont-Dore, le 45.35 02.48e
Montelimar 44.33 04.45e
Montereau 47.51 02.34e
Montignac 45.05 01.10e
Mont-Louis 42.30 02.08e
Montlucon 46.20 02.36e
Montmelian 45.30 06.04e
Montmoreau-Saint-Cybard 45.24 00.08e
Montmorency 48.59 02.19e
Montmorillon 46.26 00.52e
Montpellier 43.36 03.53e
Montredon-Labessonnie 43.45 02.18e
Montreuil 48.52 02.28e
Montreuil-aux-Lions 49.01 03.11e
Montreuil-Bellay 47.08 00.10w
Montreuil-le-Chetif 48.14 00.03w
Montreuil-sur-Ille 48.18 01.40w
Montrichard 47.21 01.11e
Morcenx 44.02 00.55w
Morez 46.31 06.02e
Morlaix 48.35 03.50w
Morosaglia (Corsica) 42.26 09.18e
Mortagne-au-Perche 48.32 00.33e
Mortagne-sur-Gironde 45.27 00.48w
Mortagne-sur-Sevre 47.00 00.57w
Morteau 47.03 06.53e
Mosset 42.41 02.21e
Moulins (Allier) 46.34 03.20e
Moulins (Sarthe) 48.22 00.01w
Moutiers 45.29 06.32e
Mouy 49.19 02.20e
Mouzens 44.51 01.00e
Mouzon 49.36 05.05e
Mulhouse 47.45 07.21e
Murat 45.06 02.51e
Murat-sur-Vebre 43.41 02.50e
Muret 43.28 01.19e
Muret, le 44.24 00.50w
Myennes 47.27 02.55e
Nancy 48.42 06.12e
Nans-les-Pins 43.22 05.47e
Nantes 47.14 01.35w
Nantua 46.09 05.36e
Narbonne 43.11 03.00e
Nasbinals 44.40 03.03e
Nemours 48.16 02.41e
Nerac 44.08 00.21e
Neufchateau 48.21 05.42e
Neuilly (Nievre) 47.14 03.29e
Neuilly (Orne) 48.33 00.55e
Neung-sur-Beuvron 47.33 01.48e
Neussargues-Moissac 45.08 02.59e
Neuville (Correze) 45.06 01.49e
Nevache 45.01 06.36e
Nevers 47.00 03.09e
Nice 43.42 07.16e
Niederbronn-les-Bains 48.58 07.39e
Nimes 43.50 04.12e
Niort 46.21 00.27w
Nogent-le-Rotrou 48.19 00.50e
Noiretable 45.49 03.45e
Nozay 47.34 01.37w
Nuits 47.43 04.12e
Nuits-Saint-Georges 47.08 04.57e
Obernai 48.28 07.30e
Olargues 43.33 02.55e
Oletta (Corsica) 42.37 09.20e
Orange 44.08 04.48e
Orchies 50.28 03.15e
Orleans 47.54 01.54e
Orthez 43.29 00.46w
Oyonnax 46.15 05.40e
Pacy-sur-Eure 49.01 01.24e
Paimpol 48.47 03.03w
Palais, le 47.21 03.09w
Palais-sur-Vienne, le 45.52 01.20e
Pamiers 43.07 01.36e
Paris 48.52 02.20e
Partinello (Corsica) 42.18 08.40e
Pau 43.18 00.22w
Paulhan 43.30 03.27e
Pelussin 45.25 04.40e
Penne 44.04 01.43e
Perignac 45.38 00.28w
Perigne 46.11 00.16w
Perigueux 45.12 00.44e
Pernes (Calais) 50.29 02.25e
Pernes-les-Fontaines 44.00 05.03e
Peronne 49.56 02.57e
Perpignan 42.42 02.54e
Perros-Guirec 48.49 03.27w
Petreto-Bicchisano (Corsica) 41.47 08.58e
Peyrehorade 43.33 01.05w
Piana (Corsica) 42.14 08.39e
Piedicroce (Corsica) 42.22 09.22e
Pierrefitte-Nestalas 42.57 00.04w
Pissos 44.19 00.46w
Pithiviers 48.10 02.15e
Pleneuf 48.35 02.32w
Pleumartin 46.45 00.45e
Ploermel 47.56 02.23w
Plombieres-les-Bains 47.58 06.28e
Plombieres-les-Dijon 47.20 04.58e
Poitiers 46.35 00.20e
Pons 45.35 00.32w
Pontarion 46.00 01.50e
Pontarlier 46.54 06.20e
Pontaumur 45.52 02.40e
Pont-Chateau 47.27 02.04w
Pont-de-Vaux 46.26 04.56e
Pont-de-Veyle 46.15 04.53e
Pontivy 48.04 02.58w
Pont-Sainte-Marie 48.20 04.06e
Porte-Puymorens 42.33 01.49e
Porto Pollo (Corsica) 41.42 08.47e
Porto Vecchio (Corsica) 41.35 09.16e
Port-Saint-Louis-du-Rhone 43.23 04.48e
Prades (Ardeche) 44.38 04.19e
Prades (Ariege) 42.47 01.51e
Prades (Pyren.-Orient.) 42.38 02.25e
Prats-de-Mollo-la-Preste 42.25 02.28e
Preignac 44.35 00.18w
Premery 47.10 03.19e
Privas 44.44 04.36e
Propriano (Corsica) 41.40 08.54e
Provins 48.34 03.18e
Puget-Thcniers 43.57 06.54e
Puybrun 44.55 01.47e
Quiberon 47.29 03.07w
Quiberville 49.54 00.54e
Quillan 42.52 02.11e
Quimper 48.00 04.06w
Quissac 43.54 04.00e
Rambouillet 48.39 01.50e
Redon 47.39 02.05w
Reims 49.15 04.02e
Remuzat 44.25 05.22e
Rennes 48.06 01.40w
Reole, la 44.35 00.02w
Requista 44.02 02.31e
Rethel 49.31 04.22e
Retiers 47.55 01.22w
Rians 43.36 05.45e
Ribeauville 48.12 07.20e
Riberac 45.14 00.22e
Riceys, les 48.00 04.22e
Rieupeyroux 44.18 02.14e
Riez 43.49 06.06e
Riols 43.31 02.47e
Riom 45.54 03.07e
Riom-les-Montagnes 45.17 02.39e
Rioz 47.25 06.05e
Riscle 43.40 00.04w
Roanne 46.02 04.05e
Rochechouart 45.49 00.50e
Rochefort 45.57 00.58w
Rochefort-Montagne 45.42 02.48e
Rochefoucauld 45.44 00.24e
Roche-les-Beaupre 47.16 06.07e
Rocroi 49.56 04.31e
Rogliano (Corsica) 42.57 09.25e
Roquefort (Landes) 44.02 00.18w
Roscoff 48.43 03.59w
Rosporden 47.57 03.50w
Rouen 49.26 01.05e
Rouffach 47.57 07.18e
Rouffiac 45.01 02.08e
Roumazieres-Loubert 45.52 00.35e
Ruffec (Charente) 46.02 00.12e
Ruffec (Indre) 46.38 01.11e
Rumigny 49.49 04.16e
Sables d'Olonne, les 46.30 01.47w
Sables d'Or 48.39 02.24w
Sable-sur-Sarthe 47.50 00.20w
Saccarello, Mont* 44.03 07.43e
Saint Affrique 43.58 02.53e
Saint Brieuc 48.31 02.45w
Saint Brisson 47.16 04.04e
Saint Cernin 45.03 02.24e
Saint Chinian 43.26 02.57e
Saint Claude 46.25 05.52e
Saint Die 48.17 06.57e
Saint Dizier (Haute-Marne) 48.38 04.58e
Saint Dizier (Lot-et-Garonne) 44.40 00.38e
Saint Eloy-les-Mines 46.10 02.49e
Saint Etienne (Alp.-H.-Prov.) 44.02 05.47e
Saint Etienne (Loire) 45.26 04.23e
Saint Florent (Corsica) 42.41 09.18e
Saint Flour 45.02 03.05e
Saint Germain (Aube) 48.16 04.02e
Saint Girons 42.59 01.08e
Saint Girons-en-Marensin 43.57 01.18w
Saint Hilaire-du-Harcouet 48.35 01.05w
Saint Jean-du-Gard 44.07 03.53e
Saint Laurent-et-Benon 45.10 00.50w
Saint Lo 49.07 01.05w
Saint Marcellin 45.10 05.20e
Saint Martin (Var) 43.35 05.55e
Saint Martin-Vesubie 44.04 07.15e
Saint Maurice (Paris) 48.49 02.26e
Saint Maximin (Oise) 49.13 02.27e
Saint Michel (Aisne) 49.55 04.11e
Saint Michel (Gers) 43.27 00.25e
Saint Michel (Maine-et-Loire) 47.41 01.08w
Saint Mihiel 48.54 05.33e
Saint Nazaire (Loire-Atl.) 47.17 02.12w
Saint Omer 50.45 02.15e
Saint Pardoux-la-Riviere 45.30 00.44e
Saint Paul en Foret 43.34 06.43e
Saint Paul-de-Fenouillet 42.49 02.29e
Saint Pol (Nord France) 51.01 02.22e
Saint Quentin (Aisne) 49.51 03.17e
Saint Quentin (Maine-et-Loire) 47.16 00.54w
Saint Raphael 43.26 06.46e
Saint Savin (Gironde) 45.09 00.26w
Saint Savin (Vienne) 46.34 00.52e
Saint Servan 48.38 02.00w
Saint Sulpice (Orne) 48.47 00.40e
Saint Sulpice (Tarn) 43.46 01.40e
Saint Symphorien (Gironde) 44.26 00.29w
Saint Symphorien (Lozere) 44.50 03.37e
Saint Vallier (Ardeche) 45.11 04.49e
Saint Vallier (Saone-et-Loire) 46.39 04.23e

Sainte Enimie 44.22 03.25e
Sainte Maure-de-Peyriac 44.01 00.09e
Sainte Maure-de-Touraine 47.07 00.38e
Sainte Suzanne 48.06 00.21w
Saintes 45.44 00.38w
Salbris 47.26 02.03e
Salice (Corsica) 42.07 08.54e
Sallanches 45.56 06.38e
Salles-Curan 44.11 02.46e
Salon-de-Provence 43.38 05.06e
Salvagnac 43.54 01.40e
Samer 50.38 01.45e
Sancerre 47.20 02.50e
San-Martino-di-Lota (Corsica) 42.44 09.26e
Sari-d'Orcino (Corsica) 42.03 08.49e
Sarralbe 49.00 07.01e
Sarraltroff 48.46 07.04e
Sartene (Corsica) 41.37 08.58e
Saugues 44.56 03.34e
Saulieu 47.17 04.14e
Saumos 44.56 01.00w
Saumur 47.16 00.05w
Sauveterre-de-Bearn 43.24 00.56w
Sauveterre-de-Guyenne 44.42 00.04w
Sauveterre-de-Rouergue 44.13 02.18e
Sauveterre-la-Lemance 44.35 01.01e
Sauviat-sur-Vige 45.54 01.35e
Savigny-sur-Braye 47.53 00.49e
Sedan 49.42 04.57e
Sees 48.36 00.10e
Segre 47.41 00.51w
Seix 42.51 01.10e
Selestat 48.16 07.27e
Sens 48.12 03.18e
Seranon 43.46 06.42e
Serra-di-Scopamene (Corsica) 41.46 09.06e
Sete 43.25 03.43e
Sezanne 48.44 03.44e
Signes 43.17 05.50e
Sisteron 44.16 05.56e
Soissons 49.23 03.20e
Solenzara (Corsica) 41.51 09.24e
Sommesous 48.45 04.12e
Sospel 43.52 07.27e
Soustons 43.45 01.19w
Stello* (Corsica) 42.47 09.25e
Ste-Maria-Siche (Corsica) 41.53 08.59e
Stenay 49.29 05.12e
Strasbourg 48.35 07.45e
Suippes 49.09 04.32e
Surgeres 46.07 00.44w
Tallone (Corsica) 42.09 09.29e
Tarare 45.54 04.26e
Tarbes 43.14 00.05e
Tardets Sorholus 43.07 00.51w
Tenda, Colle di* 44.09 07.34e
Tende 44.05 07.35e
Teste, la 44.39 01.09w
Thann 47.49 07.05e
Thiers 45.51 03.33e
Thionville 49.22 06.11e
Thiviers 45.24 00.56e
Thones 45.53 06.20e
Thonon-les-Bains 46.22 06.30e
Thorenc 43.49 06.48e
Thouarce 47.16 00.30w
Tonnerre 47.51 03.59e
Totes 49.40 01.03e
Toul 48.41 05.54e
Toulon (Var) 43.07 05.55e
Toulon-sur-Allier 46.32 03.22e
Toulon-sur-Arroux 46.41 04.08e
Toulouse 43.37 01.27e
Tour-du-Pin, la 45.34 05.26e
Tourmalet, Col du* 42.54 00.09e
Tourouvre 48.36 00.40e
Tours 47.23 00.42e
Tremblade, la 45.46 01.08w
Troyes 48.18 04.05e
Tuchan 42.53 02.43e
Urdos 42.53 00.33w
Vaison-la-Romaine 44.14 05.04e
Valbonnais 44.53 05.53e
Valence (Charente) 45.53 00.18e
Valence (Drome) 44.56 04.54e
Vallon Pont d'Arc 44.24 04.24e
Vallon-en-Sully 46.32 02.36e
Vallon-sur-Gee 47.58 00.04w
Vallorcine 46.01 06.56e
Valognes 49.31 01.28w
Valreas 44.22 04.59e
Vannes 47.40 02.44w
Varennes-en-Argonne 49.13 05.03e
Varennes-en-Gatinais 47.53 02.39e
Vauvert 43.41 04.16e
Velines 44.51 00.06e
Venaco (Corsica) 42.13 09.08e
Vendargues 43.39 03.58e
Vendome 47.48 01.04e
Ventoux, Mont* 44.09 05.16e
Vercel-Villedieu-le-Camp 47.11 06.23e
Verdon-sur-Mer, la 45.33 01.04w
Verdun-sur-Garonne 43.49 01.13e
Verdun-sur-le-Doubs 46.53 05.01e
Verdun-sur-Meuse 49.10 05.24e
Vermenton 47.40 03.43e
Vernet-la-Varenne 45.28 03.27e
Vernet-les-Bains 42.32 02.23e
Verneuil (Eure) 48.44 00.55e
Verneuil (Marne) 49.06 03.40e
Verteillac 45.20 00.22e
Vertus 48.54 04.00e
Verzy 49.09 04.10e
Vescovato (Corsica) 42.30 09.26e
Vesoul 47.38 06.09e
Veynes 44.31 05.49e
Vibraye 48.03 00.44e
Vicdessos 42.46 01.28e
Vichy 46.08 03.25e
Vico (Corsica) 42.10 08.48e
Vidauban 43.26 06.26e
Vienne 45.32 04.54e
Vierzon 47.14 02.03e
Vif 45.03 05.40e
Vigeois 45.22 01.30e
Ville 48.21 07.18e
Villedieu (Cote d'Or) 47.55 04.22e
Villefort 44.27 03.56e
Villefranche-de-Rouergue 44.21 02.02e
Villefranche-sur-Saone 46.00 04.43e
Villeneuve (Ain) 46.01 04.50e
Villeneuve (Aveyron) 44.26 02.01e
Villeneuve-l'Archeveque 48.14 03.35e
Villeneuve-Loubet 43.40 07.07e
Vimoutiers 48.55 00.12e
Vire 48.50 00.53w
Vitre 48.07 01.12w
Vitry-le-Francois 48.44 04.36e
Vivonne 46.26 00.16e
Vizzavona (Corsica) 42.08 09.08e
Voiron 45.22 05.35e
Vouziers 49.25 04.41e
Vouzon 47.39 02.02e
Voves 48.16 01.37e
Yssingeaux 45.09 04.07e

FIN Finland

Alajärvi 63.00 23.05e
Alastaro 60.57 22.50e
Alavuokki 64.44 29.26e
Alavus 62.35 23.35e
Asikkala 61.14 25.30e
Borga (= Porvoo) 60.24 25.40e
Bromary 60.00 23.03e
Dragsfjärd 60.04 22.30e
Eno 62.45 30.15e
Eura 61.08 22.12e
Föglö (Aland) 60.02 20.25e
Geta (Aland) 60.23 19.50e
Haapajärvi 63.45 25.20e
Haapavesi 64.09 25.25e
Halsua 63.28 24.10e
Hämeenkyrö 61.39 23.10e
Hämeenlinna 61.00 24.25e
Hangö 59.50 23.00e
Hankasalmi 62.21 26.30e
Haukipudas 65.12 25.20e
Heinola 61.13 26.05e
Helsinki 60.08 25.00e
Hinnerjoki 61.00 22.00e
Hirvensalmi 61.40 26.51e
Hirvineva 64.44 25.10e
Hossa 65.29 29.36e
Huittinen 61.11 22.40e
Hyvinkää 60.37 24.00e
Iisvesi 62.42 27.03e
Ikaalinen 61.46 23.05e
Ilomantsi 62.40 30.55e
Imatra 61.14 28.50e
Iniö (Iniö) 60.24 21.25e
Isojoki 62.07 22.00e
Iso-Syöte* 65.38 27.40e
Ivalo 68.40 27.40e
Jaala 61.04 26.30e
Jaatila 66.17 25.20e
Jakobstad 63.41 22.40e
Jalasjärvi 62.30 22.50e
Joukokylä 65.02 28.00e
Juntusranta 65.12 29.30e
Jurva 62.40 22.00e
Juuka 63.13 29.20e
Juva 61.54 27.49e
Jyväskylä 62.16 25.50e
Kaamanen 69.05 27.16e
Kaaresuvanto 68.27 22.28e
Kalajoki 64.15 24.00e
Kalvitsa 61.56 27.20e
Kangasniemi 62.01 26.35e
Kannonkoski 62.58 25.15e
Kantala 62.09 27.15e
Kärsämäki 63.58 25.50e
Karstula 62.53 24.50e
Kätkätunturi* 68.20 25.10e
Kauhajoki 62.26 22.10e
Kaustinen 63.33 23.40e
Kemijärvi 66.42 27.30e
Kerava 60.25 25.10e
Kestilä 64.23 26.12e
Kihniö 62.11 23.10e
Kiikoinen 61.27 22.35e
Kilminki 65.08 25.45e
Kinnula 63.24 25.00e
Kittilä 67.40 24.50e
Kivijärvi 63.09 25.05e
Koarvikodds* 69.05 26.20e
Kokkola 63.50 23.10e
Konnevesi 62.35 26.20e
Korpilahti 62.02 25.34e
Korsnäs 62.47 21.10e
Korvatunturi* 68.03 29.25e
Korvua (= Metsäkylä) 65.22 28.25e
Kotka 60.26 26.55e
Kouvola 60.54 26.45e
Kovero 62.33 30.35e
Kristiinankaupunki 62.12 21.18e
Kuhmalahti 61.31 24.35e
Kuhmo 64.04 29.30e
Kuivamemi 65.35 25.10e

Kumlinge (Kumlinge) 60.15 20.45e
Kuopio 62.54 27.40e
Kuorboaivi* 69.40 27.40e
Kuorevesi 61.56 24.40e
Kuru 61.54 23.45e
Kustavi (Kustavi) 60.34 21.20e
Kuusamo 65.57 29.15e
Lahti 61.00 25.40e
Lämpsä 65.50 30.00e
Längelmäki 61.42 24.40e
Lapinlahti 63.21 27.50e
Lappajärvi 63.08 23.41e
Lappeenranta 61.04 28.15e
Lapua 62.57 23.00e
Lehtimäki 62.47 23.55e
Lieksa 63.20 30.00e
Liperi 62.33 29.29e
Lohja 60.12 24.10e
Lohtaja 64.01 23.30e
Lokka 67.55 27.30e
Lovisa 60.27 26.15e
Luhanka 61.46 25.40e
Maaninka 63.10 27.20e
Mainua 64.05 27.27e
Mariehamn (Aland) 60.10 19.45e
Marraskoski 66.48 25.25e
Martti 67.28 28.20e
Maxmo 63.14 22.05e
Mikkeli 61.44 27.15e
Morgam Viibus* 68.38 25.55e
Multia 62.27 24.50e
Mustola 68.48 28.10e
Mynämäki 60.41 22.00e
Naantali (= Nadendal) 60.28 22.05e
Nagu 60.12 21.55e
Näkkäla 68.37 23.35e
Nakkila 61.21 22.00e
Nilsiä 63.13 28.00e
Nurmes 63.31 29.10e
Nykarleby 63.22 22.30e
Oijärvi 65.37 25.56e
Orajärvi 66.54 24.05e
Orajärvi* 67.20 26.50e
Oravais 63.18 22.25e
Oulainen 64.17 24.50e
Oulu 65.00 25.26e
Ounastunturi* 68.16 23.50e
Övermark 62.37 21.26e
Padasjoki 61.24 25.20e
Paistunturit* 69.38 26.25e
Paltamo 64.25 27.50e
Pargas (Pargas) 60.18 22.20e
Parikkala 61.35 29.30e
Parkano 62.03 23.00e
Pekkala 61.21 26.50e
Pelkosenniemi 67.06 27.30e
Peltovuoma 68.24 24.10e
Perho 63.15 24.25e
Perniö 60.13 23.10e
Pertunmaa 61.34 26.32e
Petsikko* 69.27 27.20e
Pihlajavesi 62.21 24.20e
Pihtipudas 63.24 25.30e
Pohja 60.07 23.30e
Pokka 68.11 25.45e
Polvijärvi 62.53 29.20e
Pomarkku 61.40 22.00e
Pori 61.28 21.45e
Porkkala 60.00 24.27e
Portimo 66.08 26.25e
Pudasjärvi 65.23 27.00e
Pukkila 60.38 25.35e
Puolanka 64.50 27.44e
Puumala 61.34 28.15e
Pyhäjärvi 61.00 22.20e
Pyhäjoki 64.28 24.15e
Pyhäntä 64.07 26.20e
Pyhäsalmi 63.43 25.58e
Pylkonmäki 62.40 24.50e
Raahe 64.42 24.30e
Rääkkylä 62.19 29.40e
Raanujärvi 66.39 24.40e
Raistakka 66.03 28.05e
Rantasalmi 62.06 28.20e
Rantsila 64.31 25.40e
Ranua 65.55 26.34e
Rauma 61.09 21.30e
Rautavaara 63.30 28.20e
Renko 60.54 24.10e
Reposaari 61.38 21.25e
Riipi 67.22 26.10e
Ristijärvi 64.30 28.15e
Ropi* 68.50 21.40e
Rovaniemi 66.29 25.40e
Rukatunturi* 66.12 29.10e
Ruokolahti 61.19 28.55e
Saija 67.07 28.46e
Salmivaara 66.48 28.30e
Salo 60.23 23.10e
Saltvik (Aland) 60.16 20.05e
Sammati 60.20 23.50e
Savonranta 62.10 29.11e
Seinäjoki 62.45 22.55e
Sevettijärvi 69.32 28.40e
Sideby 62.03 21.20e
Siikainen 61.52 21.50e
Somero 60.37 23.30e
Sonkajärvi 63.40 27.30e
Sotkamo 64.11 28.28e
Storby (Aland) 60.13 19.31e
Suomenniemi 61.21 27.36e
Suomussalmi 64.52 29.10e
Sysmä 61.33 25.40e
Taipale 62.37 29.20e
Tampere 61.32 23.45e
Tanhua 67.32 27.30e
Teisko 61.43 23.50e
Tepasto 68.01 24.40e
Tervo 62.57 26.48e
Tervola 66.05 24.50e
Tohmajärvi 62.15 30.21e
Toholampi 63.46 24.15e
Tornio 65.52 24.10e
Turku 60.27 22.15e
Ullava 63.43 23.56e
Unari 67.07 25.38e
Urjala 61.06 23.35e
Utajärvi 64.45 26.26e
Utsjoki 69.54 27.01e
Uukuniem 61.46 29.59e
Vaaraslahti 63.22 26.45e
Vaasa 63.06 21.36e
Vaattojärvi 67.15 24.10e
Valkeakoski 61.17 24.05e
Valkeavaara* 66.15 24.10e
Vammala 61.20 22.55e
Varkaus 62.20 27.50e
Viermä 63.48 27.00e
Vihanti 64.29 25.00e
Vihti 60.25 24.16e
Virdni* 68.58 21.25e
Virolahti 60.30 27.40e
Vuotso 68.05 27.10e
Ylämaa 60.47 28.00e
Ylihärmä 63.10 22.45e
Ylikiiminki 65.02 26.10e
Yli-li 65.24 25.50e
Ylitornio 66.19 23.40e
Ylivieska 64.05 24.30e

FL Liechtenstein

Vaduz 47.08 09.32e

GB Great Britain

Aberdare 51.43 03.27w
Aberdeen 57.10 02.04w
Aberfeldy 56.37 03.54w
Abergavenny 51.50 03.00w
Aberystwyth 52.25 04.05w
Achnasheen 57.34 05.05w
Alford 57.14 02.42w
Amlwch 53.25 04.20w
Andover 51.13 01.28w
Appleby 54.36 02.29w
Applecross 57.26 02.49w
Ardrishaig 56.00 05.27w
Arinagour (Coll) 56.38 06.31w
Arrochar 56.12 04.45w
Aviemore 57.12 03.50w
Axminster 50.47 03.00w
Ayr 55.26 04.43w
Bala 52.53 03.38w
Ballachulish 56.40 05.09w
Ballantrae 55.06 05.00w
Ballater 57.03 03.03w
Ballycastle (Ulster) 55.12 06.15w
Ballymena 54.52 06.17w
Bampton 54.34 02.45w
Banbridge 54.21 06.16w
Banbury 52.04 01.20w
Banchory 57.03 02.30w
Banff 57.40 02.31w
Bangor (Ulster) 54.40 05.40w
Bangor (Wales: Clwyd) 53.00 02.55w
Bangor (Wales: Gwynedd) 53.13 04.08w
Barmouth 52.43 04.03w
Barnsley 53.34 01.28w
Barnstaple 51.05 04.04w
Barrow 53.41 00.23w
Beauly 57.29 04.29w
Belfast 54.35 05.55w
Belford 55.36 01.49w
Bellingham 55.09 02.16w
Ben Attow* 57.13 05.18w
Ben Hope* 58.24 04.36w
Ben More Assynt* 58.07 04.52w
Ben Nevis* 56.48 05.00w
Ben Wyvis* 57.40 04.35w
Berwick 55.46 02.00w
Birmingham 52.30 01.50w
Birsay (Orkney) 59.08 03.18w
Bishops Stortford 51.53 00.09w
Blair Atholl 56.46 03.51w
Blairgowrie 56.36 03.21w
Bodmin 50.29 04.43w
Boston 52.59 00.01w
Bournemouth 50.43 01.54w
Bowmore (Islay) 55.45 06.17w
Bradford 51.22 02.15w
Braemar 57.01 03.24w
Braintree 51.53 00.32e
Brechin 56.44 02.40w
Brecon 51.57 03.24w
Bridge of Orchy 56.31 04.44w
Bridlington 54.05 00.12w
Bridport 50.44 02.46w
Brighton 50.50 00.10w

Bristol 51.27 02.35w
Broadford 57.14 05.54w
Brodick (Arran) 55.35 05.09w
Brora 58.01 03.51w
Buckingham 52.00 02.00w
Bude 50.50 04.33w
Builth Wells 52.09 03.24w
Burton-on-Trent 52.49 01.36w
Bury St. Edmunds 52.15 00.43e
Callander 56.15 04.13w
Cambridge 52.12 00.07e
Campbeltown 55.26 05.36w
Canterbury 51.17 01.05e
Cardiff 51.30 03.13w
Cardigan 52.06 04.40w
Carlisle 54.54 02.55w
Carmarthen 51.52 04.19w
Carstairs 55.42 03.42w
Chatham 51.23 00.32e
Chester 53.12 02.54w
Chippning Norton 51.56 01.32w
Coleraine 55.08 06.40w
Comber 54.33 05.45w
Coniston 54.22 03.05w
Coventry 52.25 01.30w
Cromarty 57.40 04.02w
Cromer 52.56 01.18e
Cumnock 55.27 04.16w
Dalhalvaig 58.27 03.54w
Doncaster 53.32 01.07w
Dorchester (Dorset) 50.43 02.26w
Dorchester (Oxford) 51.39 01.10w
Dornoch 57.52 04.02w
Douglas (Isle of Man) 54.09 04.29w
Dover 51.08 01.19e
Downpatrick 54.20 05.40w
Dufftown 57.27 03.09w
Dumfries 55.04 03.37w
Dunbar 56.00 02.31w
Dundee 56.28 03.00w
Dungannon 54.31 06.36w
Durham 54.47 01.34w
Durness 58.33 04.45w
Eastbourne 50.46 00.17e
Edinburgh 55.57 03.13w
Ellon 57.22 02.05w
Ely 52.24 00.16e
Enniskillen 54.21 07.38w
Exeter 50.43 03.31w
Eyemouth 55.52 02.06w
Falmouth 50.08 05.04w
Fintona 54.30 07.18w
Fishguard 51.59 04.59w
Folkestone 51.05 01.11e
Ford 56.10 05.26w
Fort Augustus 57.09 04.41w
Fraserburgh 57.42 02.00w
Gairloch 57.43 05.40w
Galashiels 55.37 02.49w
Girvan 55.15 04.51w
Glasgow 55.53 04.15w
Glastonbury 51.09 02.43w
Gloucester 51.53 02.14w
Goole 53.42 00.52w
Grantham 52.55 00.39w
Great Yarmouth 52.37 01.44e
Greenock 55.57 04.45w
Grimsby 53.35 00.05w
Grutness (Shetland) 59.52 01.17w
Guildford 51.24 00.35w
Guisborough 54.32 01.04w
Haddington 55.58 02.47w
Harwich 51.57 01.17e
Haslemere 51.06 00.43w
Hawick 55.25 02.47w
Hereford 52.04 02.43w
Herm (Herm) 49.28 02.27w
Hillswick (Shetland) 60.28 01.30w
Hitchin 51.57 00.17w
Holyhead 53.19 04.38w
Horsham 52.41 01.16e
Hugh Town (Scilly Is.) 49.55 06.19w
Hull 53.45 00.20w
Huntly 57.27 02.47w
Inverness 57.27 04.15w
Ipswich 52.04 01.10e
Isbister (Shetland) 60.36 01.19w
Kendal 54.20 02.45w
Keswick 54.37 03.08w
Kettering 52.24 00.44w
Killin 56.28 04.20w
Kilmarnock 55.37 04.30w
Kinbrace 58.15 03.56w
Kingussie 57.05 04.04w
Kinloch Castle (Rum) 57.01 06.17w
Kinross 56.13 03.27w
Kirkby Lonsdale 54.13 02.36w
Kirkby Stephen 54.28 02.20w
Kirkcaldy 56.07 03.10w
Kirkcudbright 54.50 04.03w
Kirkwall (Orkney) 58.59 02.58w
Knighton 52.21 03.03w
Knutsford 53.18 02.23w
Lairg 58.01 04.25w
Lampeter 52.07 04.05w
Lancaster 54.03 02.48w
Langholm 55.09 03.00w
Largo 56.13 02.56w
Larne 54.51 05.49w
Leeds 53.50 01.35w
Leominster 52.14 02.45w
Lerwick (Shetland) 60.09 01.09w
Limavady 55.03 06.57w
Lincoln 53.14 00.33w
Liverpool 53.25 02.55w
Llandovery 51.59 03.48w
Llandudno 53.19 03.49w
London 51.30 00.10w
Londonderry 55.00 07.19w
Lossiemouth 57.43 03.18w
Louth 53.22 00.01w
Ludlow 52.22 02.43w
Lybster 58.18 03.18w
Lynton 51.15 03.50w
Maghera 54.45 06.36w
Mallaig 57.00 05.50w
Malton 54.08 00.48w
Manchester 53.30 02.15w
Mansfield 53.09 01.11w
Matlock 53.08 01.32w
Middleton 53.33 02.12w
Milford Haven 51.44 05.02w
Moffat 55.20 03.27w
Montrose 56.43 02.29w
Motherwell 55.48 04.00w
New Galloway 55.05 04.10w
Newcastle Emlyn (Wales) 52.02 04.28w
Newcastle-under-Lyme 53.00 02.14w
Newcastle-upon-Tyne 54.59 01.35w
Newport (Isle of Wight) 50.42 01.18w
Newquay 50.25 05.05w
Newry 54.11 06.20w
Newtonstewart 54.43 07.22w
Northallerton 54.20 01.26w
Northampton 52.14 00.54w
Norwich 52.38 01.18e
Nottingham 52.58 01.10w
Oakham 52.40 00.43w
Oban 56.25 05.29w
Okehampton 50.44 04.00w
Omagh 54.36 07.18w
Oxford 51.46 01.15w
Paps of Jura* (Jura) 55.55 06.00w
Pateley Bridge 54.05 01.45w
Peel (Isle of Man) 54.14 04.42w
Pembroke 52.14 02.53w
Penzance 50.07 05.33w
Perth (Orkney) 50.15 02.52w
Peterhead 57.30 01.46w
Plymouth 50.23 04.10w
Plynlimon* 52.28 03.47w
Port Askaig (Islay) 55.51 06.07w
Port Ellen (Islay) 55.39 06.12w
Port Patrick 54.51 05.07w
Portadown 54.26 06.27w
Portbrush 55.12 06.40w
Portland 50.33 02.27w
Portmadoc 52.55 04.08w
Portree 57.24 06.12w
Portsmouth 50.48 01.05w
Preston (Lancashire) 53.46 02.42w
Preston 50.39 02.25w
Pwllheli 52.53 04.25w
Ramsey (Isle of Man) 54.19 04.23w
Reading 51.28 00.59w
Rhyl 53.19 03.29w
Rothbury 55.19 01.55w
Rothesay 55.51 05.03w
Royal Tunbridge Wells 51.08 00.16e
Royston 52.03 00.01w
Ruthin 53.07 03.18w
Rye 50.57 00.44w
Saint Andrews 56.20 02.48w
Saint Annes (Alderney) 49.43 02.12w
Saint Aubin (Jersey) 49.12 02.10w
Saint Helier (Jersey) 49.12 02.07w
Saint Ive (Cornwall) 50.29 04.23w
Saint Ives (Cambridge) 52.20 00.05w
Saint Ives (Cornwall) 50.12 05.29w
Saint Peter Port (Guernsey) 49.27 02.32w
Salen 56.31 05.56w
Salisbury 51.05 01.48w
Sark (Sark) 49.26 02.22w
Sawel, Mount* 54.49 07.03w
Scalasaig (Colonsay) 56.04 06.12w
Scalloway (Shetland) 60.08 01.17w
Scarinish (Tiree) 56.30 06.49w
Shaftesbury 51.01 02.12w
Sheffield 53.23 01.30w
Sherborne 50.57 02.31w
Shrewsbury 52.43 02.49w
Silloth 54.52 03.23w
Skegness 53.10 00.21e
Sollas (Hebrides) 57.39 07.22w
Southampton 50.55 01.25w
Southend 51.33 00.43e
Southwold 52.20 01.40e
Spalding 52.47 00.10w
Stafford 52.48 02.07w
Stonehaven 56.58 02.13w
Stoneybridge (Hebrides) 57.17 07.24w
Stornoway (Hebrides) 58.12 06.23w
Strabane 54.49 07.27w
Stromness (Orkney) 58.57 03.18w
Swanage 50.37 01.58w
Swansea 51.38 03.57w
Swindon 51.34 01.47w
Tamworth 52.39 01.40w
Tarbert (Hebrides) 57.54 06.49w
Tarbert (Strathclyde) 55.52 05.26w
Taunton 51.01 03.06w
Tavistock 50.33 04.08w
Tees-side 54.35 01.14w
Tenby 51.41 04.43w
Thetford 52.25 00.45e
Thornhill 55.15 03.46w
Thurso 58.35 03.32w
Tobermory (Mull) 56.37 06.05w
Trowbridge 51.20 02.13w
Truro 50.16 05.03w
Ullapool 57.54 05.10w
Ulverston 54.12 03.06w
Ventnor (Isle of Wight) 50.36 01.11w
Warminster 51.13 02.12w
Wells 52.58 00.51e
Welshpool 52.40 03.09w
Weston-on-the-Green 51.52 01.14w
Weston-super-Mare 51.21 02.59w
Weymouth 50.36 02.28w
Whitehaven 54.33 03.35w
Wick 58.26 03.06w
Wigtown 54.52 04.26w
Winchester 51.04 01.19w

Worcester 52.11 02.13w

Yeovil 50.57 02.39w

York 53.58 01.05w

GR Greece

Agios Oros 40.10 24.19e
Agrinion 38.38 21.25e
Ahaia 38.02 22.06e
Aitolikon 38.26 21.21e
Aiyinion 40.31 22.32e
Aiyion 38.15 22.05e
Aiyos Evstratios 39.32 25.00e
Alexandroupolis 40.51 25.53e
Alistati 41.03 23.58e
Aliverion 38.24 24.02e
Amalias 37.48 21.21e
Amfiklia 38.38 22.35e
Amfilokhia 38.22 21.45e
Amfissa 38.32 22.22e
Amorgos 36.49 25.54e
Anafi (Anafi) 36.23 25.44e
Andritsaina 37.29 21.54e
Andros (Andros) 37.49 24.54e
Andros 37.49 24.54e
Ano Viannos (Crete) 35.03 25.25e
Anoyia (Crete) 35.17 24.53e
Arakhova 38.11 21.58e
Areopolis 36.40 22.22e
Arfara 37.10 22.03e
Argolida 37.38 22.43e
Argos 37.38 22.43e
Argos Orestikon 40.27 21.26e
Argostolion 38.13 20.29e
Arkadia 37.31 22.22e
Arkhangelos (Rodhos) 36.13 28.07e
Aroania 37.52 22.01e
Arta 39.10 20.59e
Artotina 38.42 22.02e
Assiros 40.49 23.02e
Astakos 38.32 21.04e
Astipalaia (Astipalaia) 36.33 26.20e
Astipalea 36.33 26.20e
Astros 37.24 22.43e
Athinai 38.00 23.44e
Athos* 40.10 24.19e
Attaviros* (Rodhos) 36.12 27.52e
AttikiPireas 38.00 23.44e
Avas 40.57 25.56e
Avgo (Crete) 35.37 25.36e
Avgo (Kithira) 36.05 23.00e
Avgo (Messinia) 36.41 21.53e
Avgo* 39.29 21.23e
Ayia Varvara (Crete) 35.08 25.00e
Ayia Varvara (Dhyt. Ellas) 38.00 22.16e
Ayios Kirikos (Ikaria) 38.23 25.08e
Ayios Petros (Levkas) 38.40 20.37e
Ayios Petros (Pelopon.) 37.20 22.33e
Delphi 38.29 22.30e
Delvinakion 39.57 20.28e
Dhafni (Dhytiki Ellas) 37.48 22.01e
Dhafni (Lakonia) 36.56 22.32e
Dheskati 39.55 21.49e
Dhidhimotikhon 41.22 26.29e
Dhimaina 37.47 23.04e
Dhimitra 37.42 21.55e
Dhimitsana 37.36 22.03e
Dhomokos 39.07 22.18e
Drama 41.10 24.11e
Edhessa 40.48 22.03e
Ekhinos 41.16 25.01e
Elati 38.45 20.30e
Eressos (Lesbos) 39.11 25.57e
Erithrai 38.13 23.20e
EtoliaAkam 38.22 21.45e
Evia 38.28 23.36e
Evritania 38.57 21.50e
Evropos 41.03 22.10e
Evros 40.51 25.53e
Exo Nimfi 36.34 22.28e
Farsala 39.17 22.23e
Ferrai 40.53 26.10e
Filiates 39.38 20.16e
Filiatra 37.09 21.35e
Fiskardho (Kefallinia) 38.29 20.31e
Florina 40.48 21.26e
Fokida 38.32 22.22e
Fournas 39.04 21.53e
Fthiotida 38.56 22.26e
Galaxidhion 38.22 22.23e
Gavrion (Andros) 37.54 24.44e
Gonnos 39.52 22.29e
Goumenissa 40.56 22.27e
Goura 37.56 22.20e
Grevena 40.05 21.26e
Halkidiki 40.23 23.25e
Hios 38.23 26.07e
Ierapetra (Crete) 35.00 25.45e
Ierissos 40.20 22.55e
Igoumenitsa 39.32 20.13e
Ikaria 37.32 25.58e
Ilia 37.29 21.54e
Imathia 40.38 22.04e
Ioannina 39.40 20.51e
Ios 36.44 25.16e
Iraklion (Crete) 35.20 25.08e
Isari 37.22 22.00e
Ithaki (Ithaca) 38.15 20.39e
Kalabaka 39.42 21.38e
Kalamai 37.02 22.07e
Kalavrita 38.02 22.06e
Kaliakoudha* 38.49 21.45e
Kalimnos 36.57 26.59e
Kallonis (Lesbos) 39.16 25.16e
Kalon Kastron 41.00 23.20e
Kambos (Crete) 35.22 23.34e
Kambos (Peloponnisos) 36.56 22.12e
Karava 39.18 21.34e
Kardhamila* (Chios) 38.34 26.05e
Kardhitsa 39.22 21.55e
Karditsa 39.22 21.55e
Karistos 38.01 24.25e
Karousadhes (Corfu) 39.47 19.45e
Karpathos (Karpathos) 35.30 27.12e
Karpathos 35.30 27.12e
Kasos (Kasos) 35.20 26.55e
Kasos 35.20 27.00e
Kastaneai 41.39 26.30e
Kastelli (Crete) 35.29 23.38e
Kastellion (Crete) 35.12 25.20e
Kastellorizo 36.08 29.35e
Kastoria 40.33 21.15e
Kastron 39.53 25.04e
Kastroni (Limnos) 39.53 25.04e
Kastrosikia 39.06 20.36e
Katerini 40.15 22.30e
Kato Akhaia 38.08 21.33e
Kato Nevrokopion 41.21 23.51e
Kato Stavros 40.39 23.43e
Kattavia (Rodhos) 35.57 27.46e
Kavalla 40.56 24.25e
Kavallari 39.44 20.55e
Kea 37.38 24.20e
Kefalonia 38.13 20.29e
Keratea 37.48 23.58e
Kerkira (Corfu) 39.38 19.55e
Khaliki 39.41 21.12e
Khalkis 38.28 23.36e
Khania (Crete) 35.31 24.01e
Khiliomodhion 37.48 22.51e
Khios (Khios) 38.23 26.07e
Khora Sfakion (Crete) 35.12 24.08e
Khorafakia (Crete) 35.34 24.05e
Khrisoupolis 40.59 24.24e
Kilkis 41.00 22.53e
Killini Oros* 37.55 22.25e
Kimi 38.38 24.06e
Kithira (Kithira) 36.10 22.49e
Kithnos 37.25 24.25e
Kitros 40.22 22.34e
Kivotos 40.31 21.26e
Kollinai 37.17 22.21e
Komboti 39.06 21.05e
Komotini 41.06 25.25e
Konitsa 40.03 20.25e
Korinthos 37.56 22.55e
Korintia 37.56 22.55e
Korisia 37.40 24.19e
Koroni 36.48 21.57e
Kos (Kos) 36.53 27.19e
Kozani 40.18 21.48e
Krania 39.53 21.18e
KritiHania 35.20 23.55e
KritiIraklio 35.08 25.00e
KritiLassithi 35.11 25.29e
KritiRethimno 35.17 24.53e
Laina 41.03 26.19e
Lakki (Leros) 37.08 26.51e
Lakonia 37.05 22.25e
Lambia 30.50 21.47e
Lamia 38.56 22.26e
Larisa 39.38 22.25e
Lavrion 37.43 24.03e
Lefkada 38.50 20.42e
Lekani 41.10 24.35e
Lekhaina 37.56 21.16e
Lekhovon 40.35 21.30e
Leonidhion 37.10 22.51e
Leros 37.08 26.51e
Lesvos 39.06 26.34e
Levadhia 38.26 22.53e
Levkas (Levkas) 38.50 20.42e
Levkimmi (Corfu) 29.26 20.05e
Limenaria (Thasos) 40.39 24.34e
Limnos 39.53 25.19e
Lindos (Rodhos) 36.05 28.05e
Lixourion (Kefallinia) 38.14 20.24e
Loutra Aidhipsou 38.51 23.03e
Magnissia 39.22 22.57e
Mahalas 38.41 21.11e
Makri (Peloponnisos) 37.28 22.19e
Makri (Thraki) 40.52 25.44e
Males (Crete) 35.05 25.35e
Margarition 39.23 20.26e
Maronia 40.52 25.32e
Megalo Khorio (Thessalia) 39.33 21.50e
Megalo Khorio (Tilos) 36.26 27.24e
Megalopolis 37.24 22.08e
Megara 38.00 23.20e
Meligala 37.13 21.58e
Messinia 37.02 22.07e
Metsovo 39.46 21.11e
Mikron Pondias 38.04 21.56e
Milos (Milos) 36.44 24.25e
Milos 36.44 24.25e
Mithimna (Lesbos) 39.20 26.12e
Mitilini (Lesbos) 39.06 26.34e
Monemvasia 36.41 23.03e
Monolithos (Rhodos) 36.08 27.45e
Moudhros (Limnos) 39.53 25.19e
Moundros (Crete) 35.17 24.22e
Naousa 40.38 22.04e
Navplion 37.34 22.48e
Naxos (Naxos) 37.06 25.24e
Nea Filippias 39.12 20.53e
Nea Koroni 36.51 21.55e
Nea Palatia 38.19 23.48e
Nea Vissi 41.34 26.33e
Neapolis (Crete) 35.15 25.36e
Neapolis (Makedhonia) 40.20 21.24e
Neapolis (Peloponnisos) 36.31 23.03e

Neon Karlovasi (Samos) 37.47 26.40e
Nestorion 40.24 21.02e
Niata 36.54 22.50e
Nisiros (Nisiros) 36.35 27.13e
Nisiros 36.35 27.13e
Notia 41.06 22.23e
Olimbos (Karpathos) 35.44 27.11e
Olimbos* (Ellas) 38.28 23.52e
Olimbos* (Makedhonia) 40.05 22.21e
Omalos 35.20 23.55e
Pagondhas (Samos) 37.14 26.50e
Palaia Epidhavros 37.38 23.09e
Palaiokastron (Crete) 35.12 26.15e
Palaiokhora (Crete) 35.13 23.40e
Palamas (Sterea Ellas) 39.02 22.25e
Palamas (Thessalia) 39.28 22.05e
Panaitolion 38.35 21.27e
Paramithia 39.38 20.30e
Parga 39.18 20.23e
Paros (Paros) 37.04 25.06e
Patmos (Patmos) 37.20 26.33e
Patrai 38.14 21.44e
Pella 40.48 22.03e
Pendalofon 40.14 21.09e
Perama (Crete) 35.22 24.42e
Peristeri* 39.40 21.08e
Peta 39.10 21.02e
Petromagoula 38.30 22.59e
Pieria 40.05 22.21e
Pilos 36.55 21.42e
Pirgos (Crete) 35.00 25.10e
Piryi (Khios) 38.12 25.59e
Plomarion (Lesbos) 38.58 26.24e
Polikastron 41.01 22.33e
Polikhniros (Lesbos) 39.04 26.10e
Poliyiros 40.23 23.25e
Pombia (Crete) 35.00 24.51e
Potamoi 41.24 24.09e
Potamos (Corfu) 39.38 19.53e
Potamos (Kithira) 36.18 22.56e
Preveza 38.58 20.54e
Psara (Psara) 38.34 25.35e
Ptolemais 40.32 21.42e
Rapsani 39.54 22.33e
Rethimnon (Crete) 35.23 24.28e
Rizoma 39.40 21.44e
Rodholivos 40.55 24.00e
Rodhos (Rodhos) 36.26 28.14e
Rodopi 41.06 25.25e
Samos 37.44 26.59e
Samothraki (Samothraki) 40.30 25.30e
Santorini 36.24 25.27e
Sapai 41.02 25.44e
Serifos (Serifos) 37.09 24.30e
Serrai 41.03 23.33e
Servia 40.11 22.01e
Siatista 40.16 21.34e
Sifnos (Sifnos) 36.59 24.43e
Silo* 41.08 25.52e
Simi (Simi) 36.35 27.50e
Sinias (Corfu) 35.45 19.53e
Siniatsikon* 40.25 21.35e
Siros (Siros) 37.26 24.55e
Sitia (Crete) 35.13 25.06e
Skiros (Skiros) 38.55 24.34e
Skopelos (Skopelos) 39.08 23.43e
Smolikas* 40.05 20.56e
Souflion 41.12 26.18e
Sparti 37.05 22.25e
Spili (Crete) 35.12 24.32e
Spilia (Crete) 35.31 23.46e
Stira 38.09 24.14e
Thasos (Thasos) 40.42 24.42e
Thermon 38.35 21.40e
Thesprotia 39.32 20.13e
Thessaloniki 40.38 22.58e
Thira (Thira) 36.24 25.27e
Thivai 38.19 23.19e
Tilos 36.26 27.24e
Timbakion (Crete) 35.04 24.45e
Timfistros 38.55 21.51e
Timfristos* 38.57 21.50e
Tinos (Tinos) 37.33 25.08e
Tomaros* 39.29 20.48e
Trikala 39.33 21.46e
Tringia 39.38 21.24e
Tripolis 37.31 22.22e
Tsinga* 41.23 24.44e
Tsiotion 39.36 22.04e
Tzermiadhes (Crete) 35.11 25.29e
Vafes (Crete) 35.21 24.10e
Varvara* 37.11 21.41e
Vathi (Samos) 37.44 26.59e
Velaora 39.02 21.27e
Velestinon 39.23 22.45e
Vernon* 40.40 21.25e
Veroia 40.32 22.11e
Vevi 40.47 21.38e
Viotia 38.26 22.53e
Vitina 37.40 22.10e
Volos 39.22 22.57e
Voulgarelion 39.22 21.11e
Vrakhionas* (Zakinthos) 37.49 20.42e
Vrondamas 36.58 22.29e
Xanthi 41.07 24.56e
Yeraki 37.00 22.42e
Yiali (Yiali) 36.40 27.08e
Yithion (= Githion) 36.46 22.34e
Zakinthos (Zakinthos) 37.47 20.54e

H Hungary

Abony 47.10 20.00e
Babocsa 46.02 17.20e
Baja 46.11 18.58e
Balassagyarmat 48.06 19.17e
Balatonfüred 46.59 17.53e
Balkany 47.44 21.52e
Balmazujvaros 47.36 21.18e
Barcs 45.58 17.30e
Battonya 46.16 21.08e
Bekes 46.45 21.09e
Bekescsaba 46.40 21.05e
Berettyoujfalu 47.13 21.31e
Budapest 47.30 19.03e
Bük 47.24 16.48e
Cegled 47.10 19.47e
Celldömölk 47.16 17.10e
Csongrad 46.42 20.09e
Csorna 47.38 17.18e
Debrecen 47.30 21.37e
Devecser 47.07 17.26e
Dregelypalank 48.02 19.01e
Dunaföldvar 46.48 18.55e
Dunaujvaros 47.00 18.55e
Eger 47.53 20.38e
Emöd 47.57 20.47e
Encs 48.21 21.06e
Enying 46.55 18.15e
Ercsi 47.15 18.55e
Esztergom 47.46 18.42e
Fonyod 46.45 17.33e
Fülöpszallas 46.50 19.15e
Gönc 48.29 21.14e
Gyöngyös 47.46 20.00e
Gyönk 46.34 18.26e
Györ 47.41 17.40e
Gyula 46.39 21.17e
Hahot 46.40 16.57e
Hajdudorog 47.48 21.29e
Hajdunanas 47.50 21.26e
Hajduszoboszlo 47.27 21.21e
Heves 47.36 20.17e
Hodmezovasarhely 46.26 20.21e
Janoshalma 46.20 19.20e
Janoshaza 47.06 17.11e
Jaszbereny 47.30 19.56e
Jaszladany 47.21 20.10e
Josvafo 48.30 20.33e
Kadarkut 46.13 17.39e
Kalocsa 46.31 19.00e
Kaposvar 46.21 17.49e
Kapuvar 47.36 17.00e
Karcag 47.19 20.53e
Kecskemet 46.56 19.43e
Kisber 47.30 18.00e
Kiskomarom 46.33 17.10e
Kiskunfelegyhaza 46.42 19.52e
Kiskunhalas 46.26 19.29e
Kiskunmajsa 46.30 19.46e
Kistelek 46.27 19.58e
Kisvarda 48.13 22.03e
Kocsola 46.30 18.10e
Komarom 47.43 18.06e
Komlo 46.11 18.15e
Köszeg 47.22 16.32e
Kunmadaras 47.29 20.44e
Kunszentmiklos 47.00 19.07e
Lebenymiklos 47.44 17.26e
Lenti 46.37 16.33e
Mako 46.11 20.30e
Marcali 46.33 17.29e
Mateszalka 47.58 22.20e
Melykut 46.11 19.23e
Mezocsat 47.50 20.55e
Mezotur 47.00 20.32e
Miskolc 48.07 20.47e
Mohacs 46.00 18.40e
Mor 47.21 18.12e
Mosonmagyarovar 47.51 17.18e
Murakeresztur 46.21 16.52e
Nagyatad 46.15 17.25e
Nagycenk 47.37 16.41e
Nagykallo 47.51 21.51e
Nagykata 47.25 19.45e
Nagykorös 47.01 19.47e
Ocsa 47.18 19.13e
Ozd 48.13 20.51e
Ozora 46.45 18.21e
Paks 46.38 18.51e
Papa 47.20 17.29e
Pecs 46.04 18.15e
Putnok 48.18 20.25e
Romhany 47.55 19.16e
Salgotarjan 48.05 19.47e
Sarospatak 48.19 21.30e
Sellye 45.52 17.51e
Somogyvar 46.34 17.40e
Sopron 47.40 16.35e
Sümeg 47.00 17.20e
Sumony 45.59 17.55e
Szarvas 46.51 20.35e
Szecseny 48.07 19.30e
Szeged 46.15 20.09e
Szekesfehervar 47.11 18.22e
Szekszard 46.21 18.41e
Szendrö 48.24 20.40e
Szentes 46.40 20.17e
Szentgotthard 46.57 16.18e
Szerencs 48.10 21.11e
Szikszo 48.12 20.58e
Szob 47.49 18.52e
Szolnok 47.10 20.10e
Szombathely 47.14 16.38e
Tab 46.45 18.01e
Tapolca 46.54 17.29e

Tatabanya 47.31 18.25e
Tet 47.30 17.31e
Tokaj 48.08 21.23e
Törökszentmiklos 47.11 20.26e
Vac 47.46 18.08e
Varoslöd 47.10 17.40e
Vasarosnameny 48.10 22.18e
Veszprem 47.06 17.54e
Villany 45.51 18.26e
Zalaegerszeg 46.53 16.51e
Zalalövö 46.53 16.36e

HR Croatia

Backa Palanka 45.14 19.24e
Batina 45.50 18.50e
Batrina 45.11 17.40e
Beli Manastir 45.45 18.40e
Benkovac 44.02 15.39e
Biograd 43.56 15.29e
Bisevo (Bisevo) 42.59 16.00e
Bjelo-Lasica* 45.15 14.59e
Bjelovar 45.54 16.51e
Bosanska Gradiska 45.09 17.15e
Brac* (Brac) 43.20 16.35e
Brijuni (Brijuni) 44.55 13.45e
Brinje 45.01 15.09e
Buje 45.25 13.40e
Cakovec 46.24 16.26e
Canak 44.47 15.31e
Casma 45.46 16.38e
Cavlat 42.35 18.13e
Cernik 45.17 17.22e
Ciovo* (Ciovo) 43.30 16.17e
Cres (Cres) 44.55 16.25e
Crikvenica 45.11 14.40e
Dakovo 45.19 18.24e
Daruvar 45.36 17.14e
Delnice 45.23 14.50e
Dolici (Mali Drvenik) 43.27 15.58e
Donji Miholjac 45.45 18.10e
Drvenik (Veliki Drvenik) 43.41 15.56e
Dubrovnik 42.40 18.07e
Dugo Selo 45.49 16.15e
Durdevac 46.02 17.03e
Garesnica 45.33 16.56e
Glina 45.20 16.06e
Golubovec 46.11 16.03e
Gornje Selo 43.22 16.21e
Gospic 44.30 15.22e
Gracac 44.20 15.52e
Grubisno Polje 45.41 17.11e
Gruda 42.31 18.22e
Hvar (Hvar) 43.11 16.28e
Imotski 43.27 17.12e
Ivanic Grad 45.41 16.25e
Jastrebarsko 45.11 15.39e
Kanfanar 45.06 13.50e
Kaprije (Kaprije) 43.42 15.43e
Karlobag 44.32 15.05e
Karlovac 45.30 15.34e
Kladnjice 43.42 16.18e
Knin 44.02 16.11e
Komiza (Vis) 43.03 16.11e
Koprivnica 46.09 16.50e
Korcula (Korcula) 45.56 17.05e
Kornat (Kornat) 43.50 15.20e
Koska 45.33 18.16e
Kostajnica 45.13 16.34e
Kotoriba 46.20 16.50e
Krapina 46.10 15.52e
Krizevci 46.02 16.33e
Krk (Krk) 45.05 16.34e
Krusevo 43.35 16.13e
Kutina 45.29 16.48e
Legrad 46.17 16.51e
Losinj (Losinj) 44.35 14.37e
Ludbreg 46.15 16.33e
Lupoglav 45.21 14.07e
Makarska 43.19 17.01e
Medak 44.26 15.01e
Metkovic 43.02 17.39e
Milna (Solta) 43.20 16.28e
Mljet* (Mljet) 42.45 17.30e
Motovun 45.20 13.50e
Murter (Murter) 43.49 15.37e
Nasice 45.29 18.04e
Nin (Nin) 44.14 15.10e
Novi 44.10 15.32e
Novigrad 44.10 15.32e
Novska 45.20 17.00e
Obrovac 44.11 15.41e
Ogulin 45.16 15.41e
Olib (Olib) 44.22 14.48e
Omis 43.28 16.40e
Opatija 45.20 14.18e
Osijek 45.33 18.41e
Otocac 44.52 15.12e
Pag (Pag) 44.27 15.05e
Pakrac 45.27 17.11e
Palagruza (Palagruza) 42.24 16.15e
Pasman (Pasman) 43.58 15.20e
Pazin 45.14 13.56e
Perusic 44.40 15.22e
Pisarovina 45.35 15.50e
Plaski 45.04 15.22e
Pljesac* (Pljesac) 42.55 16.55e
Ploca* 43.05 16.46e
Ploce 43.01 17.29e
Porec 45.14 13.36e
Priseka* 45.12 16.19e
Pula 44.52 13.52e
Rab* (Rab) 44.45 14.50e
Rasa 45.05 14.05e
Rijeka 45.20 14.27e
Rovinj 45.05 13.40e
Rovinjskoselo 45.07 13.43e
Senj 45.00 14.55e
Sibenik 43.45 15.55e
Sinac 44.49 15.22e
Sinj 43.43 16.39e
Sisak 45.30 16.22e
Slano 42.48 17.53e
Slavonski Brod 45.09 18.00e
Slunj 45.06 15.33e
Split 43.31 16.28e
Sredisce 46.23 16.17e
Strizivojna 45.14 18.22e
Sunja 45.21 16.35e
Susak 45.19 14.28e
Sutivan (Solta) 43.23 16.30e
Svetac (Svetac) 43.02 15.45e
Svilaja* 43.49 16.31e
Topusko 45.18 15.59e
Trogir 43.32 16.51e
Troglav* 43.57 16.36e
Udbina 44.31 15.47e
Ugljan (Ugljan) 44.04 15.10e
Ugljane 43.35 16.46e
Valpovo 45.39 18.25e
Varazdin 46.18 16.21e
Velika 45.27 17.40e
Velika Gorica 45.44 16.05e
Vinkovci 45.16 18.49e
Vis (Vis) 43.03 16.11e
Vodice 43.47 15.47e
Vojnic 45.19 15.41e
Vrbovsko 45.24 15.05e
Vrgorac 43.12 17.20e
Vrlika 43.55 16.26e
Vukovar 45.19 19.01e
Zabok 46.01 15.55e
Zadar (= Zara) 44.07 15.14e
Zagreb 45.18 15.58e
Zedno (Ciovo) 43.30 16.17e
Zelina 45.57 16.16e
Zirje (Zirje) 43.40 15.40e
Zlarin (Zlarin) 43.42 15.51e
Zupanja 45.05 18.42e

I Italy

Abbadia San Savatore 42.53 11.40e
Acqui 44.41 08.28e
Acri 39.29 16.23e
Adrano (Sicily) 37.40 14.50e
Adria 45.03 12.04e
Agira (Sicily) 37.39 14.32e
Agnone 41.48 14.23e
Agordo 46.17 12.02e
Agrigento (Sicily) 37.19 13.35e
Alatri 41.44 13.21e
Alba 44.42 08.02e
Albenga 44.03 08.13e
Alburno, Monte* 40.32 15.20e
Alcamo (Sicily) 37.58 12.58e
Alessandria 44.55 08.37e
Alghero (Sardinia) 40.34 08.19e
Altamura 40.49 16.34e
Amatrice 42.38 13.17e
Amelia 42.33 12.25e
Amendolara 39.57 16.35e
Amiata, Monte* 42.53 11.57e
Ancona 43.37 13.31e
Andria 41.14 16.18e
Anzeddu, Monte* (Sardinia) 39.24 08.38e
Aosta 45.43 07.19e
Aquila, L' 42.22 13.24e
Aquino 41.27 13.42e
Arbatax (Sardinia) 39.56 09.44e
Archi 42.05 14.24e
Arci, Monte* 39.47 08.44e
Arezzo 43.28 11.53e
Argentario, Monte* 42.23 11.11e
Ariano Irpino 41.09 15.05e
Aritzo (Sardinia) 39.58 09.13e
Ascoli Piceno 42.53 13.35e
Ascoli Satriano 41.13 15.34e
Asiago 45.53 11.31e
Asti 44.54 08.13e
Atessa 42.04 14.26e
Augusta (Sicily) 37.14 15.14e
Avellino 40.49 14.47e
Aversa 40.58 14.13e
Aviano 46.04 12.35e
Avigliana 45.04 07.23e
Avigliano 40.44 15.44e
Avola (Sicily) 36.54 15.08e
Bagni di Lucca 44.01 10.35e
Bagni di Masion 46.15 09.37e
Bagni di Rabbi 46.24 10.48e
Bagni di Vinadio 44.17 07.44e
Balestrieri* (Sardinia) 40.52 09.11e
Ballao (Sardinia) 39.33 09.22e
Barcellona (Sicily) 38.10 15.15e
Barcis 44.11 12.34e

Bari 41.07 16.52e
Bassano del Grappa 45.46 11.44e
Bellano 46.03 09.18e
Bellante 42.45 13.49e
Belluno 46.08 12.13e
Belvedere Maritimo 39.37 15.52e
Belvedere Ostrense 43.35 13.10e
Benevento 41.08 14.46e
Berceto 44.30 09.59e
Bergamo 45.42 09.40e
Bettola 44.47 09.36e
Bettona 43.01 12.29e
Bianco 38.05 16.10e
Biella 45.34 08.04e
Bisacquino (Sicily) 37.43 13.15e
Bitti (Sardinia) 40.29 09.23e
Bobbio 44.46 09.23e
Bobbio Pellice 44.48 07.07e
Bologna 44.30 11.20e
Bolzano 46.30 11.12e
Bonorva (Sardinia) 40.25 08.47e
Borgo San Dalmazo 44.20 07.29e
Borgo San Lorenzo 43.57 11.24e
Borgo Val di Taro 44.29 09.46e
Borgo Valsugana 46.03 11.28e
Borgo Vercelli 45.22 08.28e
Bormio 46.28 10.22e
Bosa (Sardinia) 40.18 08.30e
Bracciano 42.06 12.11e
Brennero 47.01 11.31e
Breno 45.57 10.18e
Brenta, Gruppo di* 46.12 10.52e
Brescia 45.33 10.13e
Bressanone 46.43 11.40e
Brindisi 40.37 17.57e
Brozzi 43.48 11.10e
Brozzo 45.44 10.13e
Bruncu Spina* (Sardinia) 40.02 09.19e
Brunico 46.43 11.40e
Bulgheria, Monte* 40.04 15.26e
Busto Arsizio 45.37 08.51e
Caccia, Monte* 41.02 16.14e
Cagliari (Sardinia) 39.13 09.08e
Calitri 40.54 15.26e
Caltagirone (Sicily) 37.14 14.31e
Caltanissetta (Sicily) 37.29 14.04e
Cameri 45.30 08.39e
Camerino 43.08 13.04e
Camerota 40.02 15.23e
Camigliatello Silano 39.20 16.27e
Campagna 40.40 15.06e
Campagna Lupia 45.21 12.06e
Campo Turres 46.55 11.57e
Campobasso 41.33 14.39e
Candela 41.08 15.31e
Cannero Riviera 46.02 08.40e
Canosa di Puglia 41.13 16.04e
Capitignano 42.32 13.18e
Cappane, Monte* (Elba) 42.47 10.10e
Capraia (Capraia) 43.03 09.54e
Capri (Capri) 40.33 14.15e
Caprino Bergamasco 45.44 09.29e
Caprino Veronese 45.37 10.47e
Caravius, Monte* (Sardinia) 39.08 08.49e
Carbonia (Sardinia) 39.11 08.31e
Carloforte (Sardinia) 39.08 08.17e
Carona 46.02 09.47e
Carpineti 44.27 10.31e
Carpinetto Romano 41.36 13.06e
Carsoli 42.07 13.06e
Casale 43.03 11.18e
Casale Monferrato 45.08 08.27e
Casamicciola (Ischia) 40.44 13.54e
Casarano 40.01 18.10e
Caserta 41.04 14.20e
Casina 44.31 10.30e
Cassino 41.29 13.50e
Castallabate 40.16 14.57e
Castel del Monte 41.05 16.15e
Castel del Rio 44.12 11.30e
Castelfranci 40.55 15.03e
Castellammare (Sicily) 38.02 12.53e
Castellammare di Stabia 40.47 14.29e
Castelmauro 41.19 14.43e
Castelnuovo di Garfagna 44.06 10.24e
Casteltermini (Sicily) 37.33 13.38e
Castiglione del Lago 43.07 12.03e
Castiglione die Pepoli 44.08 11.10e
Castropignano 41.37 14.34e
Castrovillari 39.48 16.12e
Catania (Sicily) 37.31 15.06e
Catanzaro 38.54 16.36e
Cauloni 38.23 16.24e
Ceccano 41.34 13.20e
Cefalu (Sicily) 38.03 14.03e
Ceres 45.19 07.22e
Cervialto, Monte* 40.47 15.08e
Cesena 44.09 12.15e
Chatillon 45.47 07.37e
Chiavari 44.19 09.19e
Chiavenna 46.19 09.24e
Chioggia 45.13 12.17e
Chiusa 46.38 11.34e
Chiusa die Pesio 44.19 07.40e
Cinquefrondi 38.25 16.06e
Cirie 45.14 07.36e
Ciro Marina 39.22 17.08e
Citta delle Pieve 42.57 12.00e
Citta di Castello 43.27 12.14e
Civita 39.50 16.09e
Civita Castellana 42.17 12.25e
Civitavecchia 49.05 11.47e
Coda Cavallo (Sardinia) 40.51 09.44e
Codogno 45.10 09.42e
Coghinas* (Sardinia) 40.42 09.18e
Cogne 45.37 07.21e
Colle di Val di Elsa 43.25 11.08e
Comabbio 45.47 08.41e
Comeglians 46.31 12.52e
Como 45.47 09.05e
Conegliano 45.53 12.18e
Contarina 45.02 12.13e
Corigliano Calabro 39.36 16.32e
Corleone (Sicily) 37.49 13.18e
Corno, Monte* 46.17 12.59e
Cortina d'Ampezzo 46.33 12.08e
Cortona 43.17 11.59e
Corvo, Monte* 42.29 13.30e
Cosenza 39.17 16.15e
Courmayeur 45.48 06.58e
Crema 45.22 09.41e
Cremona 45.08 10.01e
Crocco, Monte* 38.29 16.15e
Croce di Sierra, Monte* 42.39 12.20e
Crodo 46.14 08.19e
Crotone 39.05 17.08e
Cuglieri (Sardinia) 40.12 08.34e
Cuneo 44.24 07.33e
Curon Venosta 46.48 10.23e
Cusna, Monte* 44.17 10.23e
Delianuova 38.14 15.55e
Desenzano del Garda 45.28 10.32e
Dobbiaco 46.44 12.14e
Dolianova (Sardinia) 39.23 09.11e
Domodossola 46.06 08.17e
Empoli 43.43 10.57e
Enna (Sicily) 37.34 14.17e
Epomeo, Monte* (Ischia) 40.44 13.57e
Fabriano 43.20 12.54e
Favara (Sicily) 37.24 13.40e
Favignana (Egadi) 37.56 12.22e
Feltre 46.01 11.55e
Feminamorta, Monte* 39.07 16.40e
Fermo 43.09 13.44e
Ferrara 44.50 11.38e
Ferrara di Monte Baldo 45.40 10.52e
Ferru* (Sardinia) 40.07 08.35e
Figline Valdarmo 43.37 11.28e
Finale Emilia 44.50 11.18e
Finale Ligure 44.10 08.21e
Fiorenzuolla d'Arda 44.56 09.54e
Firenze 43.47 11.15e
Firenzuola 44.03 11.23e
Fluminimaggiore (Sardinia) 39.27 08.29e
Foggia 41.28 15.33e
Foligno 42.57 12.43e
Follina 45.57 12.03e
Follonica 42.46 10.45e
Fondo 44.27 11.08e
Fonni (Sardinia) 40.08 09.16e
Forli 44.13 12.02e
Formazza 46.23 08.26e
Formia 41.16 13.37e
Forni Avoltri 46.35 12.47e
Forno 46.21 11.38e
Fortezza 46.48 11.37e
Fossacesia 42.15 14.30e
Fossano 44.33 07.43e
Fossombrone 43.42 12.48e
Francavilla al Mare 42.25 14.16e
Francavilla di Sicilia 37.54 15.08e
Francavilla Fontana 40.32 17.35e
Francavilla in Sinni 40.04 16.21e
Gaeta 41.13 13.36e
Gallipoli 40.03 17.59e
Gargazzone 46.36 11.12e
Gavirate 45.51 08.42e
Gela (Sicily) 37.04 14.15e
Gemona del Friuli 46.17 13.08e
Generoso, Monte* 45.55 09.02e
Genova 44.24 08.56e
Giarre (Sicily) 37.44 15.12e
Giglio Porto (Giglio) 42.22 10.55e
Ginostra (Stromboli) 38.47 15.12e
Gonosfanadiga (Sardinia) 39.30 08.39e
Gorizia 45.57 13.37e
Gragnano 40.42 14.31e
Gran Paradiso, Monte* 45.33 07.17e
Grosseto 42.46 11.07e
Grottaglie 40.32 17.26e
Grumo Appula 41.02 16.43e
Gualdo Taldino 43.13 12.47e
Guardia Piemontese 39.28 16.00e
Guardia Saframondi 41.15 14.36e
Guastalla 44.56 10.39e
Gubbio 43.21 12.35e
Guspini (Sardinia) 39.33 08.38e
Ierzu (Sardinia) 39.48 09.32e
Imola 44.22 11.43e
Ischia (Ischia) 40.44 13.57e
Iseo 45.39 10.03e
Isernia 41.35 14.14e
Ispra 45.49 08.36e
Ivrea 45.28 07.52e
Jesolo 45.32 12.43e
La Maddalena (Sardinia) 41.13 09.25e
La Spezia 44.07 09.48e
Lago 39.10 16.09e
Lampedusa (Lampedusa) 35.31 12.37e
Lanusei (Sardinia) 39.53 09.33e
Lanzo 45.59 09.02e
Lanzo Torinese 45.16 07.28e
Latina 41.28 12.53e
Laurenzana 40.28 15.48e
Lauria 40.03 15.50e
Laurino 40.20 15.20e
Lauro* (Sicily) 37.06 14.50e
Lecce 40.21 18.11e
Lecco 45.51 09.23e
Lenna 45.57 09.41e
Lercara Friddi (Sicily) 37.45 13.37e
Licata (Sicily) 37.07 13.57e
Linas, Monte* (Sardinia) 39.27 08.37e
Linosa (Linosa) 35.53 12.52e
Lipari (Lipari) 38.27 14.58e
Livigno 46.33 10.08e
Livorno 43.33 10.18e
Locri 38.14 16.15e
Longobucco 39.27 16.37e
Lucca 43.50 10.30e
Macerata 43.18 13.27e
Macerata Feltria 43.48 12.26e
Macomer (Sardinia) 40.16 08.47e

Madonna (Val Senales) 46.43 10.51e
Madonna di Campiglio 46.13 10.49e
Male 46.21 10.55e
Manduria 40.24 17.38e
Manfredonia 41.37 15.55e
Maniago 46.10 12.42e
Mantova 45.10 10.47e
Marettimo (Egadi) 37.58 12.05e
Marettimo Egadi) 37.58 12.05e
Marmirolo 45.13 10.45e
Marsala (Sicily) 37.48 12.27e
Marsico Nuovo 40.25 15.44e
Marsico Vetere 40.22 15.50e
Martina Franca 40.42 17.20e
Massa 44.02 10.09e
Massa Marittima 43.03 10.53e
Matera 40.40 16.37e
Mazara del Vallo (Sicily) 37.39 12.36e
Meduno 46.13 12.47e
Melito di Porto Salvo 35.56 15.47e
Mendola 46.25 11.13e
Merano 46.41 11.10e
Messina (Sicily) 38.13 15.33e
Mestre 45.30 12.14e
Meta, La* 41.41 13.57e
Metaponto 40.22 16.49e
Milano 45.28 09.12e
Miletto, Monte* 41.27 14.23e
Minervino Murge 41.06 16.05e
Mistretta (Sicily) 37.56 14.22e
Modena 44.39 10.55e
Molveno 46.08 10.58e
Mondovi 44.23 07.49e
Monopoli 40.57 17.18e
Montalto (Aspromonte) 38.10 15.55e
Montalto Uffigo 39.24 16.10e
Monte Etna* (Sicily) 37.45 15.00e
Monte Genis* (Sardinia) 39.25 09.20e
Monte Limbara* (Sardinia) 40.52 09.11e
Monte Linas* (Sardinia) 39.27 08.37e
Monte S. Salvatore* (Sicily) 37.50 14.04e
Monte San Angelo 41.43 15.58e
Monte Senes* (Sardinia) 40.29 09.40e
Monte Soro* (Sicilia) 37.56 14.42e
Monte Spada* (Sardinia) 40.04 09.23e
Monte Sparagio* (Sicily) 38.04 12.47e
Monte Urtigu* (Sardinia) 40.08 08.37e
Montechristo, Isola di 42.20 10.18e
Montecorvino Rovella 40.43 14.57e
Montefiorino 44.22 10.37e
Montepulciano 43.05 11.46e
Monterotondo (Grosseto) 43.08 10.51e
Monterotondo (Roma) 42.03 12.38e
Montevarchi 43.32 11.34e
Monti (Sardinia) 40.49 09.20e
Mormanno 39.53 15.59e
Mortara 45.15 08.44e
Motta Baluffi 45.03 10.15e
Motta di Livenza 45.46 12.37e
Motta San Giovanni 38.00 15.41e
Motta Visconti 45.18 08.59e
Murazzano 44.28 08.01e
Muro Lucano 40.45 15.29e
Muro Luccese 40.06 18.21e
Napoli 40.50 14.15e
Naturno 46.39 11.00e
Nicastro 38.59 16.20e
Nicosia (Sicily) 37.40 14.24e
Nola 40.55 14.32e
Novara 45.27 08.37e
Novoli 40.22 18.03e
Nulvi (Sardinia) 40.47 08.45e
Nuoro (Sardinia) 40.20 09.21e
Olbia (Sardinia) 40.56 09.30e
Oliena (Sardinia) 40.16 09.25e
Omegna 45.52 08.25e
Orbetello 42.27 11.03e
Oristano (Sardinia) 39.54 08.36e
Ormea 44.08 07.54e
Orosei (Sardinia) 40.23 09.42e
Orsara di Puglia 41.17 15.16e
Orsaro, Monte* 44.24 09.59e
Orsia 45.51 07.49e
Orsiera, Monte* 45.03 07.07e
Orte 42.27 12.23e
Orvieto 42.43 12.06e
Orvinio 42.09 12.56e
Orzinuovi 45.24 09.55e
Ostia (Parma) 44.31 09.50e
Ostia (Roma) 41.46 12.18e
Ostiano 45.13 10.15e
Ostiglia 45.04 11.09e
Otranto 40.08 18.30e
Oulx 45.02 06.50e
Ovada 44.38 08.38e
Ovindoli 42.08 13.31e
Pachino (Sicily) 36.43 15.06e
Padova 45.24 11.53e
Palermo (Sicily) 38.08 13.23e
Palmanova 45.54 14.19e
Palmi 38.21 15.51e
Panarea (Panarea) 33.38 15.05e
Panteleria (Pantelleria) 36.50 11.57e
Paola 39.22 16.02e
Papa, Monte del* 40.08 15.50e
Papozze 44.59 12.02e
Parma 44.48 10.19e
Partanna (Sicily) 37.43 12.54e
Paterno (Sicily) 37.34 14.55e
Patti (Sicily) 38.08 14.58e
Pavia 45.12 09.09e
Pavullo nel Frignano 44.20 10.49e
Pecoraro, Monte* 38.32 16.21e
Peglia, Monte* 42.48 12.12e
Pennapiedomonte 42.09 14.11e
Penne 42.27 13.56e
Perciato (Alicudi) 38.33 14.22e
Perdifumo 40.15 15.01e
Perugia 43.07 12.23e
Pesaro 43.54 12.54e
Pescara 42.27 14.13e
Peschici 41.57 16.02e
Pescia 43.54 10.41e
Pesco Sannita 41.14 14.49e
Petralia (Sicily) 37.48 14.07e
Petrella, Monte* 41.19 13.40e
Piacenza 45.03 09.41e
Piacenza di Adige 45.08 11.33e
Piana degli Albanesi (Sicily) 37.59 13.17e
Piazza Armerina (Sicily) 37.23 14.22e
Pieve di Cadore 46.27 12.23e
Pinerolo 44.53 07.19e
Piombino 42.56 10.32e
Piscina 44.55 07.25e
Pisciotta 40.06 15.15e
Pisticci 40.23 16.33e
Pistoia 43.56 10.55e
Pitigliano 42.38 11.40e
Pizzo Carbonara* (Sicily) 37.53 14.03e
Pizzo Cupetti* (Sardinia) 40.34 09.39e
Pizzo Mutucrone* (Sardinia) 40.32 09.37e
Pizzo Palai* (Sardinia) 40.20 08.55e
Poggibonsi 43.28 11.09e
Polizzi (Sicily) 37.48 14.01e
Ponte di Legno 46.15 10.30e
Ponte di Piave 45.43 12.28e
Pontecagnano 40.38 14.53e
Pontecorvo 41.27 13.40e
Pontedera 43.40 10.38e
Pontremoli 44.23 09.53e
Ponza (Ponza) 40.53 12.58e
Pordenone 45.58 12.39e
Portella Contrasto* (Sicily) 37.52 14.24e
Porto Cervo (Sardinia) 41.09 09.32e
Porto San Stefano 42.26 11.06e
Porto Torres (Sardinia) 40.51 08.24e
Portoferraio (Elba) 42.49 10.20e
Portogruaro 45.46 12.50e
Potenza 40.38 15.46e
Pramaggiore, Monte* 46.22 12.33e
Prato, Monte* 44.15 10.24e
Predappio 44.06 11.58e
Predazzo 46.19 11.37e
Procida (Procida) 40.47 14.02e
Pta Catirina* (Sardinia) 40.28 09.33e
Putignano 40.51 17.08e
Quartu Sant Elena (Sardinia) 39.15 09.12e
Ragusa (Sicily) 36.56 14.44e
Randazzo (Sicily) 37.52 14.57e
Rapallo 44.21 09.13e
Rasu* (Sardinia) 40.29 09.02e
Ravenna 44.25 12.12e
Reggello 43.41 11.32e
Reggio di Calabria 38.06 15.39e
Reggio nell'Emilia 44.42 10.37e
Reggiolo 44.55 10.48e
Riccia 41.24 14.50e
Riccio 43.13 12.01e
Riccione 44.00 12.39e
Riesi (Sicily) 37.17 14.05e
Rieti 42.24 12.51e
Rimini 44.03 12.34e
Riva del Garda 45.33 10.50e
Rocca Busambra* (Sicily) 37.52 13.24e
Rocca di Mezzo 42.13 13.32e
Rocca di Papa 41.46 12.42e
Rocca Imperiale 40.07 16.35e
Rocca San Casciano 44.03 11.50e
Roccadaspide 40.25 15.11e
Roccastrada 43.01 11.10e
Roma 41.53 12.30e
Romagnano Sesia 45.38 08.23e
Rosa, Monte* 45.57 07.53e
Rossano 39.35 16.38e
Rotondo, Monte* 42.12 13.30e
Rovereto 45.53 11.03e
Rovigo 45.04 11.47e
Sacro, Monte* (Foggia) 41.45 16.03e
Sacro, Monte* (Salerno) 40.13 15.25e
Sala Consilina 40.23 15.35e
Salemi (Sicily) 37.48 12.48e
Salerno 40.40 14.46e
Salina (Salina) 38.33 14.50e
Saluzzo 44.39 07.29e
San Angelo Fasanella 40.25 15.19e
San Bartolomeo in Galdo 41.24 15.01e
San Bartolomeo Valmara 46.06 08.41e
San Benedetto del Tronto 42.57 13.53e
San Bonifacio 45.24 11.16e
San Fratello (Sicily) 38.02 14.36e
San Giovanni in Fiore 39.15 16.42e
San Remo 43.48 07.46e
San Stefano di Cadore 46.34 12.33e
San Vito al Tagliamento 45.55 12.51e
San Vito lo Capo (Sicily) 38.11 12.43e
Sassari (Sardinia) 40.43 08.34e
Savona 44.18 08.28e
Scalea 39.49 15.47e
Schio 45.43 11.21e
Sciacca (Sicily) 37.31 13.05e
Scicli (Sicily) 36.48 14.43e
Scigliano 39.07 16.18e
Scopello 45.46 08.06e
Senise 40.08 16.18e
Serano, Monte* 42.52 12.48e
Serra San Bruno 38.35 16.20e
Sessa Aurunca 41.14 13.56e
Sestri Levante 44.16 09.23e
Sestri Ponente 44.25 08.51e
Sestriere 44.58 06.54e
Seui (Sardinia) 39.50 09.19e
Seulo (Sardinia) 39.52 09.15e
Siderno Marina 38.16 16.17e
Siena 43.19 11.19e
Silandro 46.38 10.47e
Siniscola (Sardinia) 40.34 09.42e
Siracusa (Sicily) 37.04 15.18e
Sirente, Monte* 42.09 13.37e
Sluderno 46.40 10.53e
Sondrio 46.11 09.25e
Sorgono (Sardinia) 40.02 09.07e
Spina, Monte la* 40.02 15.55e
Spinazzola 40.58 16.06e

Spoleto 42.44 12.44e
Spoltore 42.27 14.08e
Stella, Monte della* 40.13 15.04e
Stelvio 46.37 10.32e
Stia 43.48 11.43e
Stigliano 40.24 16.14e
Stignano 38.25 16.28e
Stilves 46.53 11.29e
Subiaco 41.56 13.06e
Sulmona 42.03 13.56e
Susa 45.08 07.02e
Talana (Sardinia) 40.03 09.30e
Taormina (Sicily) 37.51 15.17e
Taranto 40.28 17.51e
Tarquinia 42.23 11.45e
Tarvisio 46.30 13.35e
Tempio (Sardinia) 40.54 09.07e
Teramo 42.20 13.43e
Termini Imerese (Sicily) 37.59 13.42e
Terminillo, Monte* 42.29 13.00e
Terminio, Monte* 40.50 14.56e
Termoli 42.00 15.00e
Terni 42.34 12.39e
Terracina 41.17 13.51e
Terralba (Sardinia) 39.43 08.38e
Teulada (Sardinia) 38.58 08.46e
Thiesi (Sardinia) 40.32 08.43e
Tirano 46.13 10.11e
Tirolo 46.42 11.09e
Tolmezzo 46.24 13.01e
Torino 45.04 07.40e
Torre Maggiore, Monte* 42.38 12.37e
Torremaggiore 41.41 15.17e
Trapani (Sicily) 38.02 12.32e
Tremiti (Isole di Tr.) 42.07 15.30e
Trento 46.04 11.08e
Treviglio 45.32 09.35e
Treviso 45.40 12.51e
Tricarico 40.37 16.09e
Tricase 39.55 18.22e
Trieste 45.39 13.47e
Tropea 38.40 15.54e
Tuscania 42.25 11.53e
Udine 46.03 13.41e
Ugento 39.55 18.10e
Urbino 43.43 12.38e
Urtigu, Monte* (Sardinia) 40.08 08.37e
Ustica (Ustica) 38.43 13.12e
Valdagno 45.39 11.18e
Valdieri 44.16 07.23e
Valdritta, Cima* 45.43 10.50e
Vanzone 45.59 08.07e
Varese 45.49 08.49e
Varsi 44.39 09.50e
Varzi 44.49 09.12e
Vasto 42.07 14.43e
Velletri 41.41 12.47e
Venezia 42.46 12.20e
Ventimiglia 43.47 07.37e
Ventotene (Ventotene) 40.48 13.25e
Verbania 45.56 08.34e
Verbicaro 40.46 15.55e
Vercelli 45.19 08.26e
Verolanuova 45.19 10.05e
Verona 45.26 11.00e
Vesuvio* 40.49 14.26e
Vibo Valentia 38.40 16.06e
Vicenza 45.33 11.32e
Vico del Gargano 41.53 15.58e
Viggiano 40.20 15.54e
Villamar (Sardinia) 39.37 08.58e
Villaputzu (Sardinia) 39.27 09.35e
Vipiteno 46.54 11.27e
Vittoria (Sicily) 36.58 14.32e
Vittorio Veneto 45.59 12.18e
Voghera 44.59 09.01e
Voghiera 44.46 11.45e
Volterra 43.24 10.52e
Voltri 44.26 08.54e
Vulcano (Vulcano) 38.25 14.58e
Vulture, Monte* 40.56 15.38e

IRL Ireland

An Uaimh 53.39 06.41w
Arklow 52.48 06.09w
Athboy 53.37 06.55w
Athy 52.59 06.59w
Ballaghaderreen 53.55 08.35w
Ballina 54.07 09.09w
Ballinrobe 53.35 09.12w
Ballybunion 52.36 09.40w
Ballycastle (Mayo) 54.17 09.22w
Ballyheige 52.24 09.50w
Ballyshannon 54.30 08.11w
Baltimore 51.29 09.22w
Bandon 51.44 08.44w
Bangor (Mayo) 54.09 09.44w
Bantry 51.41 09.27w
Burtonport 54.59 08.26w
Cahersiveen 51.57 10.13w
Carlow 52.50 06.55w
Carndonagh 55.15 07.15w
Carrickmacros 53.58 06.42w
Carrick-on-Shannon 53.57 08.05w
Cashel (Galwan) 53.25 09.48w
Cashel (Tipperary) 52.31 07.53w
Castlebar 53.52 09.17w
Castlegregory 52.15 10.01w
Castlerea 53.46 08.29w
Castletown Bere 51.39 09.55w
Cavan 54.00 07.21w
Clara 53.20 07.36w
Claremorris 53.44 09.00w
Clifden 53.29 10.01w
Clonakilty 51.37 08.54w
Clones 54.11 07.14w
Cootehill 54.04 07.05w
Cork 51.45 08.28w
Dingle 52.08 10.15w
Donegal 54.31 08.30w
Downpatric Head 54.20 09.20w
Drogheda 53.43 06.21w
Dublin 53.20 06.15w
Dungarvan (Kilkenny) 52.35 07.06w
Dungarvan (Waterford) 52.05 07.37w
Dunmanway 51.43 09.07w
Enfield 53.25 06.50w
Ennis 53.12 06.10w
Enniscorthy 52.30 06.34w
Errigal* 55.02 08.07w
Fermoy 52.08 08.16w
Galway 53.16 09.03w
Garrick-on-Suir 52.21 07.25w
Glengariff 51.45 09.33w
Glenties 54.47 08.17w
Gorey 52.40 06.18w
Greenore 54.02 06.08w
Greenore Point 52.15 06.08w
Kanturk 52.10 08.55w
Kenmare 51.53 09.35w
Kilbaha 52.35 09.52w
Kilgarvan 51.45 09.26w
Kilkenny 52.39 07.15w
Killaloe 52.48 08.27w
Killarney 52.03 09.30w
Killorglin 52.06 09.47w
Killybegs 54.38 08.27w
Kilmalock 52.25 08.35w
Kilrush 52.39 09.29w
Kingscourt 53.55 06.48w
Kinsale 51.42 08.32w
Kippure* 53.11 06.20w
Leane* 52.03 09.33w
Letterkenny 54.57 07.44w
Limerick 52.40 08.38w
Lisdoonvarna 53.02 09.17w
Lismore 52.08 07.55w
Listowel 52.27 09.29w
Longford (Longford) 53.44 07.47w
Longford (Offaly) 53.04 07.44w
Loughrea 53.12 08.34w
Macroom 51.44 08.57w
Mallow 52.08 08.39w
Midleton 51.55 08.10w
Millstreet 52.03 09.04w
Mitchelstown 52.16 08.16w
Mount Bellew 53.28 08.30w
Muine Bheag (Bagenalstown) 52.42 06.57w
Mweelrea* 53.38 09.50w
Nenagh 52.52 08.12w
New Ross 52.24 06.56w
Newcastle (Dublin) 53.18 06.30w
Newcastle West 52.25 09.04w
Newmarket 52.13 09.00w
Oldcastle 53.46 07.10w
Portarlington 53.10 07.11w
Roscommon 53.38 08.11w
Roscrea 52.57 07.47w
Schull 51.32 09.33w
Skerries 53.35 06.07w
Skibbereen 51.33 09.15w
Sneem 51.50 09.45w
Templemore 52.48 07.50w
Thomastown 52.31 07.08w
Thurles 52.41 07.49w
Tipperary 52.29 08.10w
Tralee 52.16 09.42w
Tramore 52.08 07.08w
Waterford 52.15 07.06w
Waterville 51.50 10.10w
Wexford 52.15 07.06w
Wicklow 52.59 06.30w
Youghal 51.57 07.50w

KAZ Kazakhstan

Chapayevo 50.12 51.09e
Chapchachi 47.50 47.52e
Chizha Vtoraya 50.50 49.40e
Dzhanybek 49.25 46.50e
Furmanovo 49.43 49.28e
Guryev 47.08 51.59e
Kalenyy 49.31 51.40e
Kamenka 51.09 50.17e
Karmanovka 49.21 50.19e
Kaztalovka 49.95 48.42e
Kolovernyy 50.31 51.08e
Kulagino 48.22 51.35e
Masteksay 48.57 49.55e
Mergenovo 49.59 51.19e
Novobogatinskoe 47.20 51.11e
Saykhin 48.49 46.46e
Sazdy 46.58 49.15e
Uralsk 51.19 51.20e
Urda 48.44 47.30e
Verbovskyy 49.30 49.00e
Vladimirovka 50.50 51.10e
Zaburnye 46.45 50.02e
Zhangaly 47.00 50.39e

L Luxembourg

Clervaux 50.03 06.02e
Echternach 49.49 06.25e
Esch-sur-Alzette 49.30 05.59e
Esch-sur-Sure 49.54 05.56e
Ettelbrück 49.51 06.06e
Grevenmacher 49.51 06.27e
Luxembourg 49.37 06.08e
Remich 49.33 06.23e
Wiltz 49.58 05.56e

LT Lithuania

Akmene 56.14 22.44e
Baisogala 55.38 23.43e
Darbenai 56.02 21.18e
Druskininka 53.48 23.58e
Eisisks 54.09 24.55e
Erzvilkas 55.12 22.16e
Gruzdziai 56.02 23.11e
Ignalina 55.21 26.10e
Jieznas 54.34 24.12e
Joniskis 56.16 23.32e
Kaisiadorys 54.51 24.29e
Kapsukas 54.31 23.20e
Kaunas 54.52 23.55e
Kedainiai 55.17 23.58e
Kelme 55.38 22.50e
Klaipeda 55.43 21.07e
Kupiskis 55.50 24.58e
Lazdijai 54.12 23.30e
Neringa 55.30 21.00e
Pagegiai 55.08 21.54e
Panevezys 55.44 24.24e
Pasvalys 56.02 24.30e
Ramygala 55.30 24.19e
Rietavas 55.40 22.00e
Sakiai 55.00 23.10e
Saukenai 55.49 22.50e
Siauliai 55.51 23.20e
Silute 55.18 21.30e
Skaudvile 55.28 22.38e
Skuodas 56.12 22.32e
Svencioneliai 55.10 26.00e
Ukmerge 55.14 24.49e
Utena 55.30 25.35e
Varena 54.10 24.40e
Vilnius 54.40 25.19e
Zarasai 55.40 26.20e

LV Latvia

Aluksne 57.22 27.00e
Balvi 57.10 27.10e
Bauska 56.22 24.10e
Cesis 57.18 25.18e
Daugavpils 55.52 26.31e
Dobele 56.39 23.12e
Dundaga 57.30 22.30e
Dzukste 56.50 23.15e
Eleja 56.21 23.40e
Engure 57.09 23.11e
Ergli 56.50 25.33e
Gulbene 57.10 26.42e
Jaunpiebalga 57.25 26.00e
Jekabpils 56.28 25.58e
Kandava 57.00 22.42e
Karsava 56.45 27.40e
Kegums 56.42 24.50e
Kraslava 55.50 27.12e
Kuldiga 56.58 21.58e
Liepaja 56.30 21.00e
Limbazi 57.30 24.40e
Lubana 56.54 26.42e
Ludza 56.30 27.41e
Madona 56.54 26.10e
Mersrags 57.20 23.10e
Nereta 56.10 25.12e
Pavilosta 56.51 21.12e
Piltene 57.09 21.40e
Preili 56.15 26.50e
Priekule 56.24 21.39e
Pusa 56.15 27.12e
Rauna 57.22 25.40e
Rezekne 56.30 27.22e
Riga 56.53 24.08e
Roja 57.30 22.46e
Saldus 56.38 22.30e
Staicele 57.45 24.48e
Subate 55.59 26.00e
Valmiera 57.32 25.29e
Ventspils 57.22 21.31e
Zilupe 56.26 28.04e

M Malta

Bugibba (Malta) 35.57 14.25e
Nadur (Gozzo) 36.02 14.18e
Rabat (Malta) 35.53 14.25e
Valletta (Malta) 35.54 14.32e
Vctoria (Gozzo) 36.03 14.14e
Zurrieq (Malta) 35.50 14.29e

MC Monaco

Monte Carlo 43.44 07.56e

MD Moldova

Ataki 48.25 27.48e
Baymakliya 46.10 28.24e
Beltsy 47.44 27.41e
Bendery 46.50 29.29e
Bessarabka 46.20 28.59e
Brichany 48.20 27.01e
Bykovets 47.12 28.29e
Chimishliya 46.30 28.50e
Drokiya 48.07 27.49e
Dubossary 47.18 29.08e
Faleshty 47.30 27.45e
Floreshty 47.52 28.12e
Kagul 45.58 28.10e
Kagul, Ozero* 45.22 28.25e
Kalarash 47.18 28.16e
Kangaz 46.06 28.06e
Kishinev 47.00 28.50e
Kolibash 45.43 28.11e
Komrat 46.18 28.40e
Korneshty 47.21 28.00e
Kotorsk 46.50 28.31e
Kotyuzhany 47.50 28.38e
Leovo 46.29 28.12e
Lipkany 48.18 26.48e
Miryeny 47.00 28.06e
Oknitsa 48.22 27.30e
Olomeshty 46.29 29.25e
Orgeyev 47.24 28.50e
Rybnitsa 47.42 29.00e
Slobodzeya 46.42 29.40e
Soroki 48.08 28.12e
Strasheny 47.09 28.39e
Synzhera 47.37 28.10e
Teleneshty 47.35 28.17e
Tiraspol 46.50 29.38e
Tyrnovo 48.20 27.45e
Ungeny 47.10 27.43e
Vulkaneshty 45.39 28.28e
Yedintsy 48.09 27.18e

MK Macedonia

Berovo 41.42 22.51e
Bitola 41.01 21.21e
Brod 41.30 21.15e
Debar 41.31 20.31e
Dedino 41.33 22.25e
Delcevo 41.58 22.45e
Dolneni 41.25 21.29e
Dracevo 41.55 21.32e
Dragoevo 41.40 22.09e
Gevgelija 41.02 22.30e
Gostivar 41.47 20.55e
Gradsko 41.33 21.59e
Kadrifakovo 41.51 22.02e
Kavadarci 41.26 22.01e
Kicevo 41.30 20.59e
Kocani 41.55 22.25e
Kratovo 42.03 22.10e
Kriya Palanka 42.11 22.19e

Krusevo 41.20 21.15e
Kumanovo 42.07 21.40e
Lukovo 41.20 20.38e
Ohrid 41.06 20.49e
Pehcevo 41.45 22.52e
Prilep 41.20 21.32e
Radovis 41.38 22.28e
Rostusa 41.35 20.37e
Rozden 41.10 21.56e
Skopje 42.00 21.28e
Solunska Glava* 41.44 21.31e
Srbica 41.35 21.02e
Stip 41.44 22.12e
Strumica 41.26 22.39e
Sveti Nikola 41.51 21.56e
Tetovo 42.00 20.59e
Titov Veles 41.43 21.49e
Topolcani 41.13 21.28e
Valandovo 41.19 22.34e
Veles 41.43 21.49e
Vinica 41.53 22.30e
Visoko* 41.11 21.37e
Zirovnica 41.40 20.37e
Zletovo 41.59 22.15e

N Norway

Aiddejavrre 68.45 23.15e
Alesund 62.28 06.11e
Alhus 61.32 06.13e
Alta 70.00 23.15e
Alvdal 62.06 10.42e
Amdalsverk 59.23 08.02e
Amotsdal 59.38 08.23e
Andalsnes 62.33 07.43e
Andenes 69.18 16.10e
Ardal 59.09 06.13e
Aremark 59.15 11.41e
Arendal 58.27 08.56e
Arnes 60.07 11.28e
Askvoll 61.21 05.04e
Asnes 60.37 11.56e
Austrheim 60.46 04.55e
Baevasgiedde 69.12 24.40e
Ballangen 68.21 13.20e
Beiarn 67.02 14.40e
Berg 69.27 17.15e
Bergen 60.23 05.20e
Berkak 62.48 10.03e
Berlevag 70.50 29.09e
Bilto 69.26 21.35e
Bindal 65.05 12.22e
Bjelland 58.27 07.47e
Bjordal 61.04 05.50e
Bjornesfjord* 60.10 07.38e
Björnskinn 69.00 15.40e
Bö (Sogn og Fjordane) 61.08 05.19e
Bö (Telemark) 59.24 09.04e
Bö Nordland) 68.38 14.35e
Bodö 67.18 14.26e
Bomlo 59.37 05.13e
Bonnes 68.39 18.15e
Borge 68.15 13.50e
Borgund (Möre og Romsdal) 62.28 06.15e
Borgund (Sogn og Fjordane) 61.02 07.49e
Breim 61.44 06.25e
Brekstad 63.42 09.40e
Brönnöysund 65.38 12.15e
Brumunddal 60.54 11.00e
Bud 62.64 06.56e
Bygland 58.50 07.49e
Bykleheiene* 59.21 07.10e
Dagali 60.25 08.27e
Dirdal 58.47 06.14e
Dombas 62.05 09.07e
Dönnes 66.12 12.35e
Drammen 59.45 10.15e
Drevsjö 61.54 12.03e
Dröbak 59.40 10.40e
Edöy 63.19 08.08e
Egersund 58.27 06.01e
Eggedal 60.15 09.22e
Eidsvoll 60.19 11.14e
Eikefjord 61.36 05.28e
Eikesdalsvatn 62.33 08.10e
Elvdal 61.38 11.56e
Etne 59.40 09.39e
Fagernes 60.59 09.17e
Faksefjel* 61.20 12.50e
Farsund 58.05 06.49e
Fillefjord* 61.10 08.05e
Fjaere 58.23 08.36e
Fla 63.13 10.18e
Flakstad 68.06 13.20e
Flekkefjord 58.17 06.40e
Fredrikstad 59.15 10.55e
Fresvik 61.03 06.55e
Froan 60.00 09.10e
Fusa 60.12 05.39e
Galdhöpiggen* 61.38 08.19e
Gamvik 71.03 28.10e
Gandvik 70.02 28.42e
Gargia 69.47 23.30e
Geilo 60.32 08.13e
Geiranger 62.06 07.13e
Geirangerfjorden 62.05 07.00e
Gjendesheim 61.30 08.51e
Gjövik 60.47 10.41e
Gol 60.48 08.55e
Grane 65.35 13.25e
Granvin 60.33 06.49e
Grong 64.27 12.19e
Grönöy 66.48 13.30e
Halsa 63.05 08.20e
Haltdalen 62.56 11.10e
Hammerfest 70.40 23.44e
Harstad 68.48 16.30e
Hattfjelldal 65.35 14.00e
Havoysund 70.59 24.35e
Hedal 60.37 09.41e
Heddal 60.37 09.41e
Hellemobotn 67.50 16.34e
Hemnesberget 66.14 13.40e
Heradsbygd 60.58 11.38e
Heskestad 58.28 06.22e
Hjerkinn 62.14 09.29e
Holm (= Solstad) 65.12 12.10e
Holöydal 62.13 11.25e
Hönefos 60.08 10.16e
Hornesund 58.37 07.55e
Hornindal 61.59 06.32e
Horten 59.25 10.30e
Hovden 61.41 04.51e
Hvaler 59.07 10.55e
Hylestad 59.06 07.33e
Idd 59.05 11.25e
Jelsa 59.20 06.02e
Joma* 64.48 13.50e
Jordet 61.26 12.08e
Jostedal 61.35 07.18e
Karasjok 69.27 25.30e
Karlsöy 70.02 19.50e
Kautokeino 69.00 23.06e
Kilboghamn 66.28 13.30e
Killingdal 62.47 11.26e
Kirkenes 69.41 30.02e
Kistefjeld 68.37 19.35e
Kistrand 70.27 25.11e
Kjelvik 70.59 26.08e
Klöfta 60.04 11.06e
Knaben 58.40 07.05e
Kolbotn 62.15 10.24e
Kongsmoen 64.53 12.26e
Kongsvinger 60.13 11.59e
Koppang 61.34 11.04e
Korgen 66.04 13.50e
Kornsjö 58.50 11.40e
Kragero 58.59 09.38e
Krampenes 70.07 30.14e
Kristiansand 58.08 08.01e
Kristiansund 63.06 07.58e
Kroken 65.23 14.15e
Kvaloy, N. 70.10 19.10e
Kvaloy, S. 69.40 18.30e
Kvigtid* 65.13 13.50e
Kvikne 62.36 10.19e
Kviteseid 59.25 08.28e
Kvitnes 70.48 28.45e
Kvitsöy 59.04 05.26e
Lakselv 70.06 25.04e
Laksfors 65.38 13.16e
Larvik 59.04 10.02e
Lebesby 70.34 27.00e
Leirvik (Hordaland) 59.47 05.31e
Leirvik (Sogn og Fjordane) 61.08 05.20e
Leksvik 63.40 10.40e
Lenvik 69.22 18.10e
Lesjaskog 62.15 08.20e
Levanger 63.44 11.20e
Lillehammer 61.06 10.27e
Lillesand 58.15 08.23e
Lödingen 68.25 16.00e
Lönsdal 66.46 15.26e
Loppa 70.21 21.25e
Lyngen 69.36 20.10e
Lysebotn 59.04 06.39e
Mandal 58.02 07.30e
Masi 69.26 23.40e
Matre 60.52 05.35e
Mo-i-Rana 66.19 14.10e
Mollijus* 69.24 22.15e
Mosjöen 65.50 13.10e
Moskenes 67.55 13.00e
Myrdal 60.44 07.08e
Namdalseid 64.13 11.13e
Namsos 64.28 11.30e
Narvik 68.26 17.25e
Neiden 69.42 29.25e
Nelaug 58.39 08.46e
Nesna 66.13 13.04e
Nevernes 65.25 12.36e
Nissedal 59.15 08.30e
Noarvas* 68.48 24.44e
Norddal (Möre og Romsdal) 62.15 07.15e
Norddal (Sogn og Fjordane) 61.39 05.25e
Nordfold 67.48 15.20e
Nordkjosbotn 69.14 19.34e
Nordli 64.37 13.36e
Nordreisa 69.46 21.00e
Norskholmen 70.22 28.11e
Notodden 59.35 09.18e
Nyrud 69.09 29.14e
Odda 60.03 06.34e
Öksfjord 70.14 22.20e
Oppdal 62.36 09.41e
Ore 62.54 07.58e
Orkanger 63.17 09.52e
Örsta 62.12 06.09e
Osen (Nord-Tröndelag) 64.18 10.32e
Osen (Sogn og Fjordane) 61.22 05.12e
Oslo 59.56 10.45e
Otta 61.46 09.33e
Öv-Sirdal 58.58 06.45e
Porsa 70.23 23.37e
Rastigaise* 70.00 26.16e
Reineskarvet* 60.46 08.12e
Rendal 61.54 11.05e
Rennebu 62.53 09.52e
Rjukan 59.54 08.33e
Röldal 59.50 06.50e
Rollag 60.01 09.18e

Romsdalshorn* 62.31 07.37e
Röros 62.35 11.23e
Rörvik 61.27 05.27e
Röykenvik 60.25 10.29e
Rundoy 62.24 05.37e
Sand 59.28 06.15e
Sande (Möre og Romsdal) 62.15 05.27e
Sande (Rogaland) 59.02 05.36e
Sande (Sogn og Fjordane) 61.20 05.48e
Selbu 63.14 11.03e
Sjövegan 68.54 17.50e
Skaget* 61.17 09.13e
Skibotn 69.25 20.15e
Skien 59.14 09.37e
Skjak 61.53 08.21e
Skjold 59.30 05.36e
Skorovatn 64.39 13.05e
Skreia 60.38 10.57e
Skudeneshavn 59.15 05.15e
Snasa 64.15 12.23e
Snöhetta* 62.19 09.16e
Solbergfoss 59.37 11.10e
Sollia 61.47 10.24e
Solund 61.05 04.50e
Sör Flatanger 64.27 10.46e
Sörfold 67.30 15.30e
Sörli 64.15 13.50e
Sörreisa 69.08 18.08e
Sortland 68.44 15.25e
Sotra 60.20 05.03e
Stamnes 60.40 05.45e
Stange 60.40 11.05e
Stavanger 58.58 05.45e
Steigen 67.57 15.00e
Steinkjer 64.00 11.30e
Stemshang 63.19 08.44e
Stjördal 63.27 10.57e
Stokksund 64.03 10.05e
Stordal (Möre og Romsdal) 62.23 07.00e
Stordal (Nord-Tröndelag) 63.18 11.48e
Stranda 62.18 16.05e
Sulitjelma 67.10 16.05e
Sundsli 59.01 08.17e
Sunndalsöra 62.39 08.37e
Surnadalsora 62.58 08.48e
Svanvik 69.25 30.00e
Svartisen* 66.40 13.51e
Svolvaer 68.15 14.40e
Tana bru 70.13 28.07e
Tinn 60.01 08.45e
Titran 63.42 08.22e
Tolga 62.26 11.01e
Törberget 61.08 12.06e
Tranoy 69.08 17.25e
Tretten 61.16 10.21e
Tromsö 69.42 19.00e
Trondheim 63.36 10.23e
Tydal 63.04 11.33e
Tysfjord 68.07 16.25e
Umbukta 66.10 14.35e
Urnes 61.17 07.20e
Vadsö 70.05 29.47e
Vagsoy 61.57 05.05e
Vaksdal 60.29 05.45e
Valjok 69.41 25.50e
Vang 61.09 08.20e
Vanylven 62.05 05.33e
Vardo 70.24 31.00e
Veines 70.38 26.33e
Venabygd 61.35 10.05e
Vestnes 62.38 07.04e
Vik (Nordland) 65.19 12.10e
Vik (Rogaland) 59.21 06.13e
Vinje 59.12 09.00e
Vinstra 61.36 09.45e

NL Netherlands

Aalten 51.56 06.35e
Alkmaar 52.38 04.44e
Almelo 52.21 06.40e
Amersfoort 52.09 05.23e
Amsterdam 52.21 04.54e
Apeldoorn 52.13 05.57e
Arnhem 52.00 05.53e
Assen 53.00 06.34e
Bergen-op-Zoom 51.30 04.17e
Breda 51.35 04.46e
Cadzand 51.22 03.25e
Coevorden 52.39 06.45e
Delfzijl 53.19 06.56e
Den Haag (= s'Gravenhage) 52.05 04.16e
Den Helder 52.58 04.46e
Denekamp 52.23 07.00e
Deventer 52.15 06.10e
Dokkum 53.20 06.00e
Drachten 53.07 06.06e
Eindhoven 51.26 05.30e
Emmen 52.47 06.55e
Enschede 52.13 06.55e
Genk-B 50.58 05.30e
Gennep 51.43 05.58e
Glanerbrug 52.13 06.59e
Goedereede 51.50 03.59e
Gorinchem 51.50 04.59e
Gouda 52.01 04.43e
Groningen 53.13 06.35e
Haarlem 52.23 04.38e
Harderwijk 52.12 05.37e
Harlingen 53.10 05.25e
Heerde 52.23 06.02e
Heerenveen 52.27 05.55e
Heerlen 50.53 05.59e
Helmond 51.28 05.40e
Hilversum 52.14 05.10e
Hoorn 52.38 05.03e
Hulst 51.17 04.03e
Kampen 52.33 05.55e
Leeuwarden 53.12 05.48e
Leiden 52.10 04.30e
Lelystad 52.30 05.26e
Mastricht 50.51 05.42e
Medemblik 52.47 05.06e
Meppel 52.42 06.12e
Middelburg 51.30 03.36e
Nieuweschanz 53.11 07.11e
Nieuwschoonebeer 52.38 06.59e
Nijmegen 51.50 05.52e
Oosterhout 51.52 05.20e
Roermond 51.12 06.00e
Rotterdam 51.55 04.29e
Schiermonnikoog 53.28 06.10e
s'Gravenhage (= Den Haag) 52.05 04.16e
s'Gravenhage 52.05 04.16e
s'Hertogenbosch 51.41 05.19e
Sittard 51.00 05.25e
Sluis 51.18 03.25e
Sneek 53.02 05.40e
StaverenBant 52.47 05.45e
Steenwijk 52.47 06.07e
Ter-Apel 52.52 07.05e
Terneuzen 51.20 03.50e
Tiel 51.53 05.26e
Tilburg 51.34 05.55e
Turnhout-B 51.19 04.57e
Uithuisen 53.24 06.41e
Utrecht 52.06 05.07e
Valkenswaard 51.21 05.27e
Veendam 53.07 06.53e
Venlo 51.22 06.10e
Vlissingen 51.27 03.35e
Wageningen 51.58 05.40e
Willemstad 51.41 04.27e
Winschoten 53.07 07.02e
Zandvort 52.22 04.31e
Zierikzee 51.39 03.55e
Zoutkamp 53.20 06.18e
Zwolle 52.31 06.06e

P-1 Portugal: Mainland

Abrantes 39.28 08.12w
Agueda 40.34 08.27w
Albufeira 37.05 08.15w
Alcacer do Sal 38.22 08.30w
Alcoutim 37.28 07.29w
Alenquer 39.03 09.00w
Aljezur 37.18 08.49w
Aljustrel 37.52 08.10w
Almodovar 37.31 08.03w
Alpiarca 39.13 08.35w
Alter do Chao 39.12 07.40w
Arcos de Valdevez 41.51 08.25w
Arganil 40.13 08.03w
Arraiolos 38.44 08.59w
Arronches 39.08 07.16w
Barrancos 38.08 06.59w
Benavente 38.59 08.49w
Bensafrim 37.09 08.44w
Boticas 41.41 07.40w
Braga 41.32 08.26w
Braganca 41.47 06.46w
Caldas da Rainha 39.24 09.08w
Caldas das Taipas 41.29 08.22w
Caldas de Monchique 37.15 08.33w
Caminha 41.52 08.50w
Castelo de Vide 39.25 07.27w
Castro Marim 37.13 07.26w
Coimbra 40.12 08.25w
Covilha 40.17 07.30w
Cuba 38.10 07.54w
Elvas 38.53 07.10w
Estremoz 37.50 07.35w
Evora (Evora) 38.34 07.54w
Faro 37.01 07.56w
Fatima 39.37 08.39w
Ferreira do Alentejo 38.04 08.06w
Figueira da Foz 40.09 08.51w
Figueiro dos Vinhos 39.55 08.16w
Grandola 38.10 08.34w
Guarda 40.32 07.17w
Guimaraes 41.26 08.19w
Ilhavo 40.36 08.40w
Lagos 37.05 08.40w
Leiria 39.45 08.49w
Lisboa 38.44 09.08w
Loule 37.08 08.02w
Macao 39.33 08.00w
Macedo de Cavaleiros 41.31 06.57w
Mangualde 40.36 07.46w
Marateca 38.34 08.40w
Meda 40.48 07.15w
Mertola 37.38 07.40w
Miranda do Corvo 40.05 08.20w
Miranda do Duero 41.30 06.16w
Mogadouro 41.20 06.43w
Moncao 42.08 08.29w
Montalegre 41.49 07.48w
Montargil 39.05 08.10w
Montargil* 39.04 08.11w
Mortagua 40.24 08.14w

Moura 38.08 07.27w
Mourao 38.22 07.20w
Nisa 39.31 07.39w
Oleiros 38.55 07.55w
Oliveira de Azemeis 40.49 08.29w
Oliveira do Hospital 40.21 07.52w
Ourique 37.38 08.13w
Ovar 40.52 08.38w
Ponte de Lima 41.46 08.35w
Ponte de Sor 39.15 08.01w
Portimao 37.08 08.32w
Porto 41.09 08.37w
Porto de Lagos 37.12 08.32w
Redondo 38.38 07.32w
Reguengos de Monsaraz 38.25 07.32w
Rio Maior 39.20 08.55w
Sabugal 40.20 07.05w
Sagres 37.01 08.56w
Santarem 39.14 08.40w
Santiago do Cacem 38.01 08.42w
Sao Bartolomeu 38.01 08.37w
Sao Bartolomeu do Messines 37.15 08.17w
Sao Bartolomeu do Outeiro 38.21 07.54w
Sao Pedro do Sul 40.46 08.04w
Sao Teotonio 37.30 08.42w
Setubal 38.31 08.54w
Souzelas 40.17 08.25w
Souzelo 41.04 08.14w
Tavira 37.07 07.39w
Tomar 39.36 08.25w
Torre de Moncorvo 41.10 07.03w
Torres Vedras 39.05 09.15w
Trancoso 40.46 07.21w
Vendas Novas 38.41 08.27w
Vila Nova 38.15 07.54w
Vila Nova de Famalicao 41.24 08.31w
Vila Nova de Milfontes 37.43 08.47w
Vila Nova de Paiva 40.51 07.44w
Vila Pouca de Aguiar 41.30 07.38w
Vila Real 41.17 07.45w
Vila Velha de Rodao 39.39 07.40w
Vilar 39.11 09.07w
Vilar Formoso 40.37 06.50w
Vimioso 41.35 06.31w
Vinhais 41.50 07.00w

P-2 Portugal: Atlantic Islands

Angra do Heroismo (Terceira) 38.40 27.14w
Caldeira* (Corvo) 39.34 31.08w
Caldeira* (Terceira) 38.44 27.19w
Calheta (Sao Jorge) 38.37 28.02w
Candelaria (Pico) 38.28 28.31w
Cedros (Faial) 38.38 28.42w
Delgada (Flores) 39.21 31.09w
Faial (Madeira) 32.47 16.53w
Faja Grande (Flores) 39.17 31.16w
Fenaes d'Ajuda (Sao Miguel) 37.36 25.20w
Feteiras (Sao Miguel) 37.33 25.47w
Fogo (Graciosa) 39.02 27.59w
Funchal (Madeira) 32.40 16.55w
Furnas (Sao Miguel) 37.32 25.19w
Guadalupe (Graciosa) 39.04 28.04w
Horta (Faial) 38.32 28.38w
Lagoa (Sao Miguel) 37.30 25.30w
Lajes das Flores (Flores) 39.13 31.12w
Lajes do Pico (Pico) 38.25 28.15w
Magdalena (Pico) 38.32 28.32w
Mosteiros (Sao Jorge) 37.37 25.49w
Nordeste (Sao Jorge) 37.35 25.10w
Pica da Pedra (Sao Jorge) 37.33 25.36w
Pico Ruivo* (Madeira) 32.46 16.57w
Pico* (Pico) 38.28 28.24w
Piedade (Pico) 38.27 28.04w
Ponta Delgada (Sao Jorge) 37.29 25.40w
Porto Moniz (Madeira) 32.52 17.12w
Povoacao (Sao Jorge) 37.30 25.15w
Praia (Faial) 38.33 28.37w
Praia de Vitoria (Terceira) 38.44 27.04w
Praia do Norte (Faial) 38.37 28.46w
Prainha (Pico) 38.28 28.13w
Raminho (Terceira) 38.48 27.21w
Ribeira (Sao Jorge) 37.34 25.32w
Ribiera Brava (Madeira) 32.39 17.04w
Rosario (Corvo) 39.41 31.08w
Santa Barbara (Santa Maria) 36.59 25.06w
Santa Barbara (Terceira) 38.42 27.21w
Santa Cruz (Madeira) 32.41 16.48w
Santa Cruz da Graciosa (Gr.) 39.05 28.00w
Santa Cruz das Flores (Fl.) 39.28 31.08w
Santo Antonio (Sao Miguel) 37.37 25.43w
Sao Bartolomeu (Terceira) 38.41 27.18w
Sao Sebastiao (Terceira) 38.41 27.06w
Sao Vicente (Madeira) 32.48 17.03w
Vila Baleira (Madeira) 33.04 16.20w
Vila das Velas (Sao Jorge) 38.42 28.13w
Vila do Porto (Santa Maria) 36.57 25.10w
Vila do Topo (Sao Jorge) 38.33 27.48w
Vila Franca do Campo (S. Mig.) 37.28 25.27w

PL Poland

Augustow 53.51 23.00e
Banie 53.04 14.40e
Bartoszyce 54.16 20.49e
Belzec 50.21 23.28e
Biala Piska 53.38 22.08e
Biala Podlaska 52.03 23.05e
Bialogard 54.00 16.00e
Bialowieza 52.41 23.50e
Bialystok 53.09 23.10e
Bielsk Podlaski 52.47 23.11e
Bielsko-Biala 49.50 19.00e
Biezun 52.50 19.42e
Bilgoraj 50.31 22.41e
Bledzew 52.31 15.23e
Blonie 52.12 20.24e
Bochnia 49.59 20.25e
Boleslawiec 51.16 15.34e
Boze Pole 54.33 17.56e
Braniewo 54.24 19.50e
Busko 50.28 20.42e
Bychawa 51.01 22.32e
Bydgoszcz 53.16 18.00e
Bytow 54.10 17.29e
Chelm 51.08 23.29e
Chelmno 53.20 18.25e
Chmielnik 50.37 20.43e
Chodziez 53.00 16.55e
Chojna 52.57 14.26e
Chojnice 53.24 17.32e
Chrzanow 50.10 19.21e
Ciechanow 52.52 20.38e
Ciechanowiec 52.41 22.30e
Ciechocinek 52.53 18.49e
Cisna 49.12 22.20e
Cybinka 52.11 14.48e
Czaplinek 53.35 16.16e
Czeremcha 52.32 23.15e
Czersk 53.49 17.59e
Czestochowa 50.49 19.07e
Czlopa 53.04 16.05e
Dabrowa 53.40 23.20e
Darlowo 54.26 16.25e
Deblin 51.34 21.50e
Debno 52.43 14.42e
Dobiegniew 52.58 15.45e
Dobra 51.57 18.35e
Dobre Miasto 53.59 20.23e
Dobrodzien 50.45 18.25e
Drawsko 53.32 15.49e
Drobin 52.42 19.58e
Drohiczyn 52.23 22.34e
Dubiecko 49.50 22.24e
Dukla 49.32 21.40e
Dygowo 54.08 15.43e
Dzialoszyce 50.22 20.20e
Dzialoszyn 51.06 18.50e
Dziwnow 54.02 14.50e
Elblag 54.10 19.25e
Elk 53.51 22.20e
Filipow 54.19 22.38e
Gdansk 54.22 18.41e
Gdynia 54.31 18.30e
Gizycko 54.03 21.48e
Gliwice 50.20 18.40e
Glogow 51.40 16.06e
Glowno 51.59 19.41e
Glubczyce 50.13 17.50e
Gniezno 52.32 17.32e
Golancz 52.57 17.18e
Goldap 54.19 22.19e
Goniadz 53.30 22.44e
Gorlice 49.40 21.09e
Gorzow 51.01 18.21e
Gorzow Wielkopolski 52.42 15.12e
Gostynin 52.25 19.27e
Grodkow 50.41 17.21e
Grojec 51.54 20.51e
Grudziadz 53.29 18.45e
Gryfino 53.15 14.30e
Hajnowka 52.45 23.32e
Hrubieszow 50.49 23.53e
Ilawa 53.35 19.33e
Inowroclaw 52.49 18.12e
Janowiec 52.45 17.29e
Jarocin 51.59 17.30e
Jaroslaw 50.00 22.40e
Jastrowie 53.25 16.50e
Jawor 51.01 16.11e
Jedrzejow 50.39 20.18e
Jelenia Gora 50.55 15.45e
Jeziorany 53.59 20.43e
Jozefow 51.03 21.50e
Kalisz (Kalisz) 51.46 18.02e
Kalisz (Koszalin) 53.18 15.55e
Kamien (Chojnice) 53.32 17.30e
Kamienna Gora 50.48 16.00e
Kamiensk 51.12 19.29e
Kargowa 52.04 15.53e
Kartuzy 54.21 18.11e
Katowice 50.15 18.59e
Kazimierz 51.20 21.56e
Kepno 51.18 17.59e
Ketrzyn 54.05 21.24e
Kielce 50.51 20.39e
Klobuck 50.54 18.54e
Klodzko 50.28 16.40e
Kobylin 51.42 17.14e
Kolno 53.26 21.58e
Kolo 52.12 18.37e
Kolobrzeg 54.10 15.35e
Koluszki 51.44 19.50e
Kossow 52.35 22.08e
Kostrzyn 52.24 17.11e
Koszalin 54.10 16.10e
Kozienice 51.35 21.31e
Kozuchow 51.45 15.36e
Krakow 50.03 19.55e
Krapkowice 50.29 17.56e
Krasnystaw 51.00 23.10e
Krokowa 54.47 18.09e

Krosno 49.40 21.46e
Krynica 49.25 20.56e
Kutno 52.13 19.20e
Kwidzyn 53.44 18.53e
Laskowice 53.30 18.25e
Leba 54.45 17.32e
Lebork 54.32 17.43e
Leczna 51.20 22.52e
Leczyca 52.04 19.10e
Ledyczek 53.31 17.01e
Lesko 49.29 22.20e
Lipiany 53.00 14.56e
Lipusz 54.07 17.45e
Lodz 51.49 19.28e
Lomza 53.11 22.04e
Losice 52.14 22.41e
Lubaczow 50.11 23.08e
Luban 51.07 15.17e
Lubartow 51.29 22.38e
Lublin 51.18 22.31e
Lubsko 51.49 14.59e
Lukow 51.57 22.21e
Lwowek 52.28 16.10e
Majdan 50.25 21.45e
Makow 49.43 19.40e
Malbork 54.02 19.01e
Miastko 54.00 16.58e
Miechow 50.20 20.00e
Miedzychod 52.36 15.53e
Miedzyrzec 52.00 22.48e
Miejska Gorka 51.40 16.59e
Mielec 50.18 21.35e
Mikolajki 53.50 21.33e
Milicz 51.23 17.15e
Milowka 49.31 19.05e
Minsk Mazowiecki 52.10 21.31e
Mlawa 53.08 20.20e
Myszyniec 53.23 21.20e
Namyslaki 51.34 18.02e
Namyslow 51.03 17.41e
Narew 52.55 23.29e
Nidzica 53.22 20.57e
Nisko 50.31 22.09e
Nowogard 53.40 15.08e
Nowogrod 53.12 21.53e
Nowy Sacz 49.39 20.40e
Nowy Targ 49.28 20.00e
Nowy Tomysl 52.20 16.09e
Nysa 50.30 17.20e
Olesno 50.51 18.26e
Olkusz 50.18 19.33e
Olsztyn 53.48 20.29e
Opatow 50.49 21.25e
Opole (Lublin) 51.08 22.00e
Opole (Opole) 50.40 17.56e
Orchovo 52.30 18.00e
Orneta 54.08 20.09e
Ostroda 53.42 19.59e
Ostroleka 53.05 21.32e
Ostrzeszow 51.25 17.55e
Oswiecim 50.02 19.11e
Paczkow 50.30 17.00e
Pelczyce 53.03 15.18e
Piotrkow (Bydgoszcz) 52.32 18.28e
Piotrkow (Lodz) 51.27 19.40e
Piwniczna 49.27 20.40e
Plock 52.32 19.40e
Plonsk 52.37 20.21e
Ploty 53.48 15.14e
Polanow 54.07 16.40e
Police 53.34 14.34e
Poznan 52.25 16.53e
Praszka 51.02 18.28e
Prochowice 51.18 16.21e
Proszowice 50.11 20.19e
Prudnik 50.20 17.34e
Przasnysz 53.01 20.51e
Przechlewo 53.49 17.15e
Przedborz 51.05 19.50e
Przemysl 49.48 22.48e
Przewoz 51.30 14.59e
Przysucha 51.22 20.38e
Pszczolki 49.59 18.54e
Pszczyna 49.59 18.54e
Puck 54.43 18.21e
Pultusk 52.42 21.02e
Rabka 49.36 19.55e
Raciborz 50.05 18.10e
Radom 51.26 21.10e
Radomsko 51.04 19.25e
Radoszyce 51.03 20.15e
Radzyn Podlaski 51.49 22.38e
Rajgrod 53.46 22.41e
Rogozno 52.47 17.00e
Rozan 52.54 21.21e
Rychwal 52.03 18.09e
Rypin 53.03 19.23e
Rzepin 52.20 14.50e
Rzeszow 50.04 22.00e
Sandomeirz 50.40 21.45e
Sandomierz 50.40 21.45e
Sanok 49.32 22.12e
Sejny 54.07 23.22e
Serock 52.31 21.01e
Siedlce 52.10 22.18e
Sieniawa 50.11 22.38e
Sierpc 52.52 19.40e
Skarszewy 54.04 18.25e
Skaryszew 51.20 21.16e
Skierniewice 51.58 20.10e
Slupsk 54.28 17.00e
Sochaczev 52.15 20.13e
Sokolka 53.26 23.30e
Sokolow Malopolski 52.12 22.07e
Sokolow Podlaski 52.25 22.15e
Sokoly 53.00 22.41e
Sompolno 52.22 18.30e
Srem 52.07 17.00e
Sroda 52.15 17.15e
Stargard 53.21 15.01e
Starogard 53.58 18.30e
Staszow 50.33 21.07e
Stawiski 53.23 22.10e
Stebark 53.30 20.09e
Strzegom 50.59 16.20e
Strzelce (Gorzow Wlkp.) 52.53 15.31e
Strzelce (Opole) 50.32 18.15e
Strzyzow 49.52 21.47e
Suchedniow 51.03 20.50e
Suchowola 53.34 23.05e
Sulechow 52.05 15.37e
Suwalki 54.06 22.56e
Szamotuly 52.36 16.34e
Szczecin 53.25 14.32e
Szczercow 51.18 19.09e
Szezecinek 53.42 16.41e
Szezytno 53.33 20.59e
Szklarska Poreba 50.50 15.33e
Szprotava 51.35 15.32e
Szubin 53.00 17.43e
Szydlowiec 51.14 20.50e
Tarnobrzeg 50.35 21.40e
Tarnow 50.01 20.59e
Tarnowskie Gory 50.28 18.40e
Terespol 52.04 23.35e
Tluszcz 52.25 21.25e
Tomaszow Lubelski 50.29 23.23e
Tomaszow Mazowiecki 51.33 20.00e
Torun 53.01 18.35e
Torzym 52.18 15.05e
Trzebnica 51.20 17.01e
Turobin 50.50 22.45e
Twardogora 51.22 17.28e
Tykocin 53.13 22.46e
Tymbark 49.44 20.20e
Tyszowce 50.36 23.41e
Uhrusk 51.20 23.38e
Ujscie 53.03 16.44e
Ustka 54.35 16.50e
Ustrzyki Dolne 49.24 22.38e
Wabrzezno 53.18 18.55e
Warka 51.46 21.10e
Warszawa 52.15 21.00e
Wasozs 51.31 16.40e
Wegliniec 51.19 15.12e
Wegorzewo 54.13 21.45e
Wiazow 50.50 17.10e
Widawa 51.27 18.51e
Wielen 52.53 16.12e
Wieruszow 51.19 18.09e
Wizajny 54.21 22.51e
Wloclawek 52.39 19.01e
Wlodawa 51.33 23.31e
Wloszczowa 50.51 19.58e
Wodzislaw (Katovice) 50.01 18.26e
Wodzislaw (Kielce) 50.31 20.08e
Wolin 53.51 14.38e
Wozniky 50.36 19.04e
Wroclaw 51.05 17.00e
Wrzesnia 52.20 17.32e
Wyrzysk 53.09 17.14e
Zabkowice Slaskie 50.36 16.49e
Zabludow 53.00 23.19e
Zagan 51.37 15.20e
Zaklikow 50.45 22.08e
Zakopane 49.17 19.54e
Zakroczym 52.27 20.35e
Zalewo 53.51 19.37e
Zambrow 52.59 22.11e
Zamosc 50.43 23.15e
Zarnow 51.15 20.10e
Zary 51.40 15.10e
Zawiercie 50.30 19.24e
Zbaszyn 52.16 15.55e
Zdunska Wola 51.36 18.55e
Zelechow 51.49 21.55e
Zerkow 52.05 17.32e
Zielona Gora 51.57 15.30e
Zlotoryja 51.08 15.57e
Zlotow 53.22 17.01e

RO Rumania

Abrud 46.16 23.05e
Agnita 45.59 24.40e
Alba Iulia 46.04 23.33e
Alexandria 43.59 25.19e
Arad 46.10 21.19e
Arefu 45.24 24.33e
Bahnea 46.22 24.28e
Baia de Arama 45.00 22.48e
Baia Mare 47.39 23.36e
Baile Herculane 44.51 22.24e
Bailesti 44.01 23.20e
Balacita 44.23 23.05e
Balcesti 44.37 23.55e
Bals 44.20 24.06e
Band 46.34 24.20e
Beresti 46.05 27.53e
Bicaz 46.53 26.05e
Bihor* 46.26 22.43e
Bira 47.02 27.03e
Birca 43.59 23.34e
Birchis 45.48 22.10e
Birlad 46.14 27.40e
Bistrita 47.08 24.30e
Bivolu* 47.16 25.52e
Bocsa 45.23 21.47e
Borca 47.09 25.49e
Botosani 47.44 26.41e

Bozovici 44.56 22.00e
Brad 46.07 22.47e
Braila 45.17 27.58e
Brasov 45.39 25.35e
Bretcu 46.02 26.19e
Brosteni (Craiova) 44.46 22.58e
Brosteni (M. Bistritei) 47.14 25.43e
Bucuresti 44.25 26.07e
Buftea 44.34 25.58e
Buzau 45.09 26.49e
Calarasi 44.12 27.22e
Calatele 46.47 23.01e
Calimanesti 45.14 24.20e
Caracal 44.07 24.18e
Caransebes 45.23 22.13e
Carasova 45.11 21.51e
Carei 47.40 22.28e
Cazanesti 44.36 27.03e
Ceahlau* 44.57 25.57e
Cerna 45.06 28.18e
Cernavoda 44.20 28.03e
Chisineu-Cris 46.33 21.30e
Cimpina 45.08 25.44e
Cimpulung 45.16 25.03e
Cimpulung Moldovenesc 47.32 25.34e
Cimpuri 46.01 26.49e
Cindrelu* 45.35 23.48e
Ciucasu* 45.31 25.56e
Ciucea 46.58 22.50e
Cluj-Napoca 46.47 23.37e
Cogealac 44.36 28.36e
Comana 44.10 26.10e
Constanta 44.12 28.40e
Costesti 44.40 24.53e
Craiova 44.18 23.47e
Cuca 44.58 24.31e
Cujmir 44.14 22.54e
Daeni 44.51 28.10e
Dej 47.08 23.55e
Denta 45.20 21.15e
Deva 45.53 22.55e
Dobresti 46.51 22.19e
Dorohoi 47.57 26.31e
Draganesti-Olz 44.09 24.32e
Draganesti-Vlasca 44.05 25.39e
Dragasani 44.40 24.16e
Drocea* 46.10 22.12e
Dumitresti 45.33 26.56e
Falciu 46.17 28.10e
Falticeni 47.27 26.20e
Fetesti 44.22 22.51e
Filiasi 44.32 23.31e
Focsani 45.41 27.12e
Foltesti 45.45 28.00e
Gaesti 44.42 25.19e
Galati 45.27 28.02e
Geoagiu 45.56 23.11e
Ghimes-Faget 46.34 26.03e
Giurgiu 43.53 25.58e
Gradistea Muncelului 45.37 23.11e
Gugu* 45.17 22.40e
Halmagiu 46.16 22.37e
Hateg 45.35 22.57e
Hida 47.01 23.19e
Hirlau 47.26 26.54e
Hirsova 44.41 27.56e
Homorod 46.03 25.15e
Horezu 45.06 24.00e
Ianca 45.06 27.29e
Iasi 47.09 27.38e
Iezeru* 45.28 24.57e
Insuratei 44.55 27.40e
Intorsura Buzaului 45.40 26.02e
Ionesti 44.52 24.12e
Jurilovca 44.46 28.52e
Lechinta 47.01 24.20e
Lehliu 44.27 26.55e
Lipnita 44.06 27.38e
Lovrin 45.58 20.49e
Lugoj 45.41 21.57e
Lupeni 45.20 23.10e
Mangalia 43.48 28.36e
Marghita 47.20 22.20e
Medias 46.10 24.21e
Mercurea 45.51 23.43e
Miercurea-Ciuc 46.21 25.48e
Mindra* 45.19 23.33e
Mizil 45.00 26.29e
Moinesti 46.27 26.31e
Moldova Nona 44.45 21.39e
Muntele Mare* 46.30 23.12e
Nadlac 46.10 20.44e
Negoiu* 45.35 24.31e
Negresti 46.50 27.28e
Negresti-Oas 47.56 23.22e
Negru Voda 43.45 28.21e
Nehoiasu 45.47 25.50e
Nehoissu 45.24 26.20e
Nemira* 46.12 26.21e
Oltenita 44.05 26.40e
Oradea 47.03 21.55e
Orasu Nou 47.50 23.19e
Oravita 45.02 21.43e
Orsova 44.42 22.22e
Otelec 45.36 20.50e
Papusa* 45.30 25.01e
Parincea 46.27 27.09e
Pascani 47.14 26.46e
Peleaga* 45.22 22.51e
Pesteana Jiu 44.50 23.15e
Petroseni 45.25 23.22e
Piatra Neamt 46.53 26.23e
Pietro-su 47.35 24.39e
Pietrosu* 47.07 25.10e
Plenitea 44.14 23.10e
Ploiesti 44.57 26.01e
Podul Iloaiei 47.12 27.20e
Pogoanele 44.55 27.00e
Predeal 45.30 25.31e
Racaciuni 46.20 27.00e
Radauti 47.49 25.58e
Rastolita 46.50 24.59e
Recas 45.46 21.30e
Reghin 46.46 24.41e
Rodna 47.25 24.50e
Roman 46.56 26.56e
Rosiori de Vede 44.06 25.00e
Rucar 45.21 25.10e
Sacel 47.39 24.23e
Sacele 45.36 25.40e
Salonta 46.49 21.40e
Satu Mare 47.48 22.52e
Saveni 47.58 26.57e
Sebis 46.22 22.06e
Segarcea 44.06 23.43e
Sercaia 45.49 25.09e
Sfintu Gheorghe (Brasov) 45.51 25.48e
Sfintu Gheorghe (Constanta) 44.52 29.37e
Sibiu 45.46 24.09e
Sighetul Marmatici 47.56 23.53e
Sighisoara 46.12 24.48e
Simleul Silvaniei 47.12 22.49e
Sinaia 45.20 25.33e
Sinnicolau Mare 46.05 20.38e
Siria 46.16 21.38e
Slatina 44.26 24.22e
Slobozia (Constanta) 44.34 27.23e
Slobozia (Pitesti) 44.30 25.14e
Somcuta Mare 47.29 23.30e
Sovata 46.35 25.03e
Stefanesti 47.44 27.15e
Strehaia 44.37 23.10e
Suceava 47.37 26.18e
Sulina 45.07 29.40e
Supuru 47.29 22.49e
Surduc 47.13 23.20e
Sureanu* 45.32 23.34e
Tandarei 45.39 27.43e
Teaca 46.55 24.30e
Tecuci 45.50 27.27e
Telciu 47.25 24.24e
Teregova 45.10 22.16e
Tirgoviste 44.56 25.27e
Tirgu Jiu 45.03 23.18e
Tirgu Mures 46.33 24.34e
Tirgu Ocna 46.17 26.37e
Titu 44.40 25.25e
Topraisar 44.01 28.29e
Toroiaga* 47.44 24.43e
Tulcea 45.10 28.50e
Turda 46.35 23.50e
Turnu Magurele 43.44 24.53e
Turnul Rosu 45.33 24.17e
Urziceni 44.43 26.39e
Vadu 44.27 28.45e
Valea-lui-Mihai 47.30 22.08e
Vaslui 46.37 27.46e
Vatra Dornei 47.20 25.21e
Victoria 45.44 24.41e
Vinga 46.00 21.14e
Vinju Mare 44.25 22.52e
Virtoapele 44.10 25.14e
Vladeni 47.24 27.52e
Voinesti 47.05 27.27e
Zimnica 43.39 25.21e

RSM San Marino

San Marino 43.56 12.26e

RUS Russia

Abez 66.33 61.51e
Abganerovo 48.05 44.12e
Achikulak 44.34 44.51e
Achit° 56.48 57.53e
Agryz 56.30 53.00e
Akbulak 51.00 55.40e
Akhunovo 54.13 59.41e
Aksakovo 54.00 54.14e
Aksay 47.18 39.53e
Aksubayevo 54.45 50.40e
Akyar° 51.58 58.11e
Alatyr 54.51 46.35e
Aleksandro-Nevskiy 53.30 40.13e
Aleksandrov 56.23 38.45e
Aleksandrov-Gay 50.08 48.34e
Aleksandrovka (Bashkiria) 53.04 56.14e
Aleksandrovka (Krasnodar) 46.46 38.59e
Aleksandrovka (Orenburg) 52.44 54.24e
Aleksandrovka (Saratov) 51.16 46.52e
Aleksandrovka° 53.51 40.38e
Aleksandrovskoye (Stavropol) 44.45 42.59e
Alekseyevka (Belgorod) 50.46 37.02e
Aleksikovo 50.56 42.20e
Algasovo 53.41 41.41e
Alikovo 55.44 46.45e
Almetyevsk 54.50 52.22e
Alozero 65.02 31.10e

Amderma 69.44 61.35e
Anapa 44.54 37.20e
Andomskiy Pogost 61.14 36.41e
Andreapol 56.38 32.21e
Andreyevka (Orenburg) 52.21 51.58e
Anna (Voronezh) 51.30 40.28e
Annenskiy Most 60.49 37.00e
Antrea 60.51 29.12e
Antsiferovo (N. Novgorod) 58.59 34.00e
Anyudin 62.31 58.12e
Ardatov (N. Novgorod) 55.14 43.05e
Ardatov (Saransk) 54.51 46.15e
Arkadak 51.58 43.30e
Arkaim Res.° 52.36 59.37e
Arkhangelsk 64.32 40.40e
Arkhangelskoye (Bashkiria) 54.26 56.45e
Arkhangelskoye (Stavropol) 44.37 44.06e
Arkhangelskoye (Tula) 53.15 37.44e
Arkhangelskoye (Voronezh) 51.29 40.56e
Armavir 44.59 41.10e
Arti 56.26 58.31e
Arzamas 55.24 43.48e
Arzgir 45.24 44.04e
Asekeyevo 53.32 53.00e
Asha° 55.00 57.11e
Askarovo° 53.20 58.30e
Askino° 56.02 56.31e
Astrakhan 46.22 48.00e
Atkarsk 51.55 45.00e
Atyashevo 54.35 46.05e
Azeyevo 54.39 42.00e
Azov 47.07 39.26e
Baganyuvam 66.05 58.01e
Bakal 54.58 58.45e
Bakaly 55.11 53.48e
Balakovo 52.04 47.46e
Balashi 51.22 49.50e
Balashov 51.31 43.10e
Baltasi 56.21 50.21e
Baltiysk 54.42 19.59e
Balykla 54.00 52.10e
Baranovka (Ulyanovsk) 53.02 47.10e
Baranovka (Volgograd) 50.00 46.10e
Baryatino 54.20 34.30e
Barysh 53.40 47.09e
Basegi Reserve° 58.52 58.29e
Bashkirskiy Res.° 53.20 57.45e
Bataysk 47.06 39.43e
Batyrevo 55.04 47.37e
Baymak° 52.33 58.13e
Bazarnyy Karabulak 52.17 46.24e
Bazarnyy Syzgan 53.45 46.45e
Bednodemyanovsk 53.56 43.12e
Bekovo 52.29 43.43e
Belaya Glina 46.04 40.54e
Belaya Kalitva 48.10 40.47e
Belebelka 57.39 30.49e
Belebey° 54.06 54.09e
Belgorod 50.38 36.36e
Belomorsk 64.34 34.45e
Beloretsk 53.39 58.20e
Beloye (Arkhangelsk) 64.19 39.50e
Beloye (Kursk) 51.04 35.45e
Belyaevka° 51.04 55.50e
Belyy 55.49 32.58e
Berezovskiy (Orenburg) 52.25 58.59e
Berezovskiy (Sverdlovsk) 56.56 60.50e
Besskorbnaya 44.39 41.20e
Bestuzhevo 61.40 43.57e
Birsk° 55.24 55.30e
Bizhbulyak 53.40 54.17e
Blagodarnyy (Stavropol) 45.06 43.26e
Blagoveshchensk° 55.02 56.00e
Bobrov (Voronezh) 51.06 40.01e
Bogoroditsk 53.45 38.08e
Bogorodsk (Komi) 62.19 52.30e
Bogorodsk (N. Novgorod) 56.06 43.30e
Bogorodskoye 57.50 50.50e
Bokovskaya 49.15 41.52e
Boksitogorsk 59.28 33.49e
Bolatnya 56.12 49.29e
Bologovo 56.51 31.39e
Bologoye 57.58 34.00e
Bolshaya Chernigovka 52.11 50.51e
Bolshaya Glushitsa 52.28 50.30e
Bolshaya Pyssa 64.11 48.44e
Bolshiye Kozly 65.11 44.00e
Bolshoye Korovino 54.30 39.08e
Bondari 52.58 42.02e
Bor 56.22 44.05e
Borilovo 53.19 35.58e
Boriskovo° 54.46 40.14e
Borisoglebsk 51.23 42.02e
Borisovo Sudskoye 59.56 36.00e
Borki (Lipetsk) 52.09 38.07e
Borki (Ryazan) 53.56 41.50e
Borkovskaya 65.14 49.31e
Borok° 54.21 40.58e
Borovichi 58.22 34.00e
Borovoye 62.40 52.40e
Bozhatkovo° 54.35 39.40e
Bredy 52.23 60.16e
Britvino 61.23 44.22e
Brusenets 60.61 44.05e
Bryansk 53.15 34.09e
Bryanskoye 44.22 47.00e
Brykin Bor° 53.43 40.52e
Brynkovskaya 46.02 38.39e
Bugulma 54.32 52.46e
Buguruslan 53.36 52.30e
Bulanovo 52.30 55.08e
Burayevo° 55.49 55.24e
Burunduki 54.49 47.35e
Butka 56.45 63.45e
Butkan 63.17 49.02e
Butyrskaya 62.20 44.40e
Buzovyazy 54.20 55.49e
Buzuluk 52.49 52.19e
Bykovo (Arkhangelsk) 61.02 48.09e
Bykovo (Kursk) 51.36 37.54e
Bykovo (Volgograd) 49.40 45.19e
Bytosh 53.49 34.06e
Chagoda 59.11 35.15e
Chalmny Varre 67.13 37.40e
Chamzinka 54.23 45.45e
Chapayevsk 52.28 49.44e
Charkayuvom 65.43 54.33e
Charozero 60.30 38.36e
Chasovenskaya 62.55 39.42e
Chastyye 57.20 54.52e
Chavanga 66.06 37.51e
Chaykovskiy° 56.45 54.10e
Chazhegovo 60.04 54.16e
Chebarkul° 54.59 60.25e
Cheboksary 56.08 47.12e
Chebsara 59.14 38.59e
Chekmagush° 55.08 54.40e
Chelyabinsk 55.12 61.25e
Cherdakly 54.23 48.51e
Cherdyn 60.25 56.22e
Cherepovets 59.09 35.50e
Chereptsovo 59.36 33.15e
Cherkasskove 52.26 47.11e
Chermoz 58.46 56.01e
Chernikovsk 54.51 56.06e
Chernushka 56.30 56.00e
Chernyakhovsk 54.36 21.48e
Chernyy Yar 48.05 46.07e
Cherva 62.15 48.45e
Chikhachevo 57.19 29.49e
Chishmy° 54.34 55.24e
Chistopol 55.22 50.33e
Chitayevo 60.20 49.29e
Chizha 67.04 44.20e
Chuchkovo 54.16 41.29e
Chudovo 59.10 31.41e
Chum 67.05 63.15e
Chuny 59.20 36.30e
Chupa 66.18 33.04e
Churaki 59.38 55.15e
Churikovo 52.07 43.15e
Chushevitsy 60.30 41.40e
Chusovoy 58.18 57.50e
Chusovskoy 61.10 56.31e
Danilovka (Komi) 64.44 57.50e
Danilovka (Penza) 52.34 45.22e
Danilovka (Volgograd) 50.24 44.09e
Danilovo 62.56 35.43e
Darovskoye 58.50 47.59e
Davlekanovo 54.12 55.00e
Demidov 55.16 31.31e
Demyansk 57.40 32.29e
Denezhkin Kamen Res.° 60.21 59.29e
Dergachi 51.14 48.46e
Devlino° 54.49 40.21e
Dimitrovgrad 54.14 49.37e
Divnoye 45.55 43.21e
Dmitriev-Lgovskiy 52.07 35.05e
Dmitriyevka (Samara) 52.47 50.42e
Dmitriyevka (Tambov) 52.54 40.50e
Dobryanka (Perm) 58.30 56.29e
Dolginino° 54.39 40.08e
Dolgorukovo (Penza) 53.34 44.18e
Dolgorukovo (Yelets) 52.20 38.18e
Donets 55.09 32.05e
Donetsk 48.22 40.02e
Dorovitsa 59.07 46.30e
Dubovka (Tula) 53.58 38.03e
Dubovka (Volgograd) 49.04 44.48e
Dubovka (Voronezh) 51.28 40.29e
Dubovskoye 47.26 42.26e
Dubrovichi° 54.40 39.59e
Dubrovka 53.40 33.30e
Dubyazy 56.06 49.13e
Dudorovskiy 53.39 35.22e
Dutovo 63.49 56.38e
Dvurechensk° 56.48 61.14e
Dzerzhinsk 56.15 43.30e
Ekaterinburg° 56.50 60.32e
Eletskaya° 67.05 64.06e
Elista 46.18 44.14e
Elton 49.08 46.50e
Emanzhelinsk° 54.45 61.21e
Engels 51.30 46.07e
Essoyla 61.47 33.11e
Fedorovka (Bashkiria) 53.13 55.10e
Fedorovka (Penza) 53.10 44.15e
Fedorovka (Rostov) 47.21 38.25e
Fedorovka (Samara) 53.30 49.30e
Fedorovka (Saratov) 51.26 47.29e
Fedovo (Arkhangelsk) 62.22 39.21e
Fedovo (Tver) 57.28 34.31e
Firovo 57.30 33.48e
Fominskaya 65.00 48.45e
Fominskoye 59.45 42.03e
Frolovo 49.45 43.40e
Galich 58.20 42.12e
Gatchina 59.32 30.09e
Gavrino 58.38 44.01e
Gayutino 58.41 38.30e
Georgiyevsk 44.10 43.30e
Glazok 53.06 40.42e
Glazov 58.09 52.42e
Glinka (Smolensk) 54.38 32.54e
Glotovka 53.58 46.43e
Glotovo 63.25 49.28e
Glukhovo 55.05 43.30e
Gmelinka 50.24 46.54e
Golovanovo 54.56 40.29e
Gorbachevo 53.35 37.10e
Gorki (Tyumen) 65.05 65.20e
Gorlichevskaya 62.33 42.59e
Gornyy Balykley 49.34 45.04e
Gorodnya 57.20 31.35e
Gorshechnoye 51.31 38.02e
Grachevka (Lipetsk) 52.05 40.00e
Grachevka (Orenburg) 52.54 52.26e
Grayvoron 50.29 35.40e
Gremikha 68.03 39.38e
Gridino 66.00 34.39e
Griva 60.35 50.58e
Gryazi 52.30 39.56e
Gryazovets 58.52 40.12e

Gus-Zhelezny° 55.06 41.10e
Ibresi 55.19 47.00e
Idritsa 56.20 28.50e
Iki Burul 45.49 44.41e
Ilebniki° 54.32 41.19e
Ilek 51.32 53.20e
Ilovatka 50.30 45.54e
Ilovlya 49.18 43.59e
Ilyinskiy° 58.33 55.42e
Imandra 67.53 33.30e
Indiga 67.40 49.00e
Inta° 66.03 60.12e
Intsy 65.56 40.45e
Inzer 54.12 57.31e
Ipatovo 45.44 42.56e
Iremel, Mt.°* 54.33 58.50e
Irta 62.05 48.52e
Isakovo 60.05 33.25e
Isherim, Gora* 61.07 59.08e
Ishimbay 53.30 55.59e
Issa 53.52 44.50e
Istra 55.55 36.52e
Isyangulovo 52.14 56.34e
Ivankovo (Kostroma) 57.59 43.01e
Ivankovo (Tula) 54.44 37.58e
Ivanovka (Orenbugr) 55.52 53.47e
Ivanovo 57.00 41.00e
Ivanovskoye (Kursk) 51.37 34.58e
Ivanovskoye (Orel) 53.05 36.16e
Ivanteyevka (Moskva) 55.58 37.55e
Ivanteyevka (Saratov) 52.16 49.05e
Ivdel° 60.41 60.28e
Izdeshkovo 55.09 33.37e
Izhevsk 56.49 53.11e
Izhma 65.03 53.48e
Izobilnyy 45.25 41.44e
Kabanovka 53.39 51.10e
Kachalinskaya 49.07 44.02e
Kadnoye 53.15 37.50e
Kadom 54.32 42.30e
Kaduy 59.12 37.02e
Kadyy 57.48 43.10e
Kadzherom 64.42 55.59e
Kagalnitskaya 46.53 46.10e
Kalach na Donu 48.43 43.32e
Kalach-Kurtlak 49.00 42.28e
Kalgachikha 63.16 36.40e
Kalikino (Lipetsk) 52.55 39.30e
Kalinina 57.59 45.07e
Kaliningrad (Königsberg) 54.40 20.30e
Kaltasy° 55.58 54.50e
Kaluga 54.31 36.16e
Kalyazin 57.15 37.59e
Kamchuga 60.01 43.09e
Kamenets 55.59 33.40e
Kamenka (Arkhangelsk) 65.55 44.02e
Kamenka (Kaluga) 54.09 35.54e
Kamenka (Lipetsk) 52.01 38.46e
Kamenka (Penza) 53.10 44.05e
Kamenka (Saratov) 50.42 45.25e
Kamenka (Voronezh) 50.43 39.25e
Kamenskiy (Rostov) 49.20 41.51e
Kamenskiy (Saratov) 50.55 45.30e
Kamensk-Shakhtinskiy 48.20 40.16e
Kamskiy 60.05 53.22e
Kamskoye Ustye 55.12 49.15e
Kamyshevatskaya 46.25 37.57e
Kamyzyak 46.05 48.06e
Kananikolskoe° 52.43 57.31e
Kanash 55.30 47.27e
Kanava 61.08 55.00e
Kandalaksha 67.09 32.31e
Kanevka 67.08 39.50e
Kanin Nos 68.35 43.21e
Kapustin Yar 48.33 45.42e
Kara*° 68.10 65.20e
Karachev 53.06 35.00e
Karagay 58.22 55.02e
Karakulino 56.05 53.41e
Karepino 61.05 57.08e
Kargopol 61.32 38.59e
Karmanovo 55.49 34.51e
Karmaskaly° 54.22 56.12e
Kartaly° 53.06 60.53e
Kartayel 64.30 53.19e
Kashary 49.03 41.00e
Kashin 57.22 37.39e
Kashira 54.52 38.13e
Kashkarantsy 66.25 35.45e
Kasimov 54.55 41.25e
Kasli° 55.52 60.46e
Kaspiysk 42.54 47.36e
Kaspiyskiy 45.24 47.21e
Katav-Ivanovsk 54.45 58.11e
Kavkaz 45.20 36.39e
Kaysatskoe 49.44 46.50e
Kazan 55.45 49.10e
Kazanskaya 49.48 41.10e
Kazhim 60.18 51.34e
Kem 64.58 34.39e
Kemlya 54.43 45.15e
Kepina 65.21 41.50e
Kerga 62.41 45.59e
Keros 60.45 55.52e
Keskozero 61.15 33.06e
Kesova Gora 57.34 37.15e
Khadyta*° 67.00 69.40e
Khalmer-Yu 67.58 64.48e
Kharabali 47.26 47.15e
Kharlu 61.45 30.55e
Kharutayuvam 66.51 59.31e
Khitrovo 52.28 41.49e
Kholm-Zhirkovskiy 55.30 33.30e
Khomutovka 51.56 34.31e
Khoreyver 67.26 58.00e
Khosheutovo 47.04 47.50e
Khutorskoy 46.52 43.01e
Khvalynsk 52.30 48.00e
Khvorostyanka (Lipetsk) 52.20 40.15e
Khvorostyanka (Samara) 52.32 48.58e
Khvoynaya 58.58 34.30e
Kiknur 57.12 47.01e
Kineshma 57.28 42.08e
Kipchakovo° 53.53 40.09e
Kirgiz-Miyaki 53.39 54.49e
Kiritsy° 54.17 40.20e
Kirov (Kaluga) 54.05 34.20e
Kirov (Kirov) 58.38 49.38e
Kirovsk (Murmansk) 67.37 33.39e
Kirovsk (St. Petersburg) 59.49 31.00e
Kirovskiy (Astrakhan) 45.51 48.02e
Kislovo 49.55 45.24e
Kislovodsk 43.56 42.44e
Kistendey 55.02 43.40e
Kizel 59.01 57.42e
Kizema 61.12 44.52e
Kizilskoye 52.44 58.49e
Kizlyar 43.51 46.43e
Klepovo 50.44 40.27e
Kletnya 53.23 33.14e
Klimovka 58.52 51.09e
Klimovo 52.24 32.14e
Klintsovka 51.42 49.12e
Klintsy 52.45 32.15e
Klyavlino 54.18 52.00e
Klyuchevaya 65.14 41.18e
Knyazhevo 59.40 43.51e
Kochemary° 54.48 41.00e
Kochkoma 64.03 34.14e
Kochmes 66.12 60.48e
Kologriv 58.49 44.19e
Kolomna 55.05 38.45e
Koltubanovskiy 53.00 52.00e
Kolva*° 65.58 57.20e
Komarichi 52.24 34.50e
Kondopoga 62.12 34.17e
Konevo (Arkhangelsk) 62.09 39.22e
Konevo (Sverdlovsk) 57.29 60.41e
Konosha 60.58 40.08e
Korelaksha 65.31 32.30e
Korenovsk 45.29 39.28e
Korocha 50.50 37.13e
Korotoyak 50.58 39.12e
Kortsovo 58.21 42.10e
Kosterevo 55.54 39.39e
Kostino° 54.48 39.40e
Kostomuksha (Karelia) 64.37 30.42e
Kostomushksa 64.39 30.45e
Kostroma 57.46 40.59e
Kosyuvom 66.19 59.45e
Kotelnich 58.10 48.20e
Kotelnikovo 47.39 43.08e
Kotlas 61.15 46.35e
Kovdor 67.33 30.30e
Kovernino 57.08 43.41e
Kovrov 56.23 41.21e
Koyda 66.20 42.30e
Koyp, Gora* 62.05 59.09e
Kozelsk 54.02 35.48e
Kozhim 65.45 59.30e
Kozhim-Iz, Gora* 63.10 58.52e
Kozhposelok 63.10 38.10e
Krasivka 52.15 42.30e
Krasnoarmeyskiy (Rostov) 47.01 42.12e
Krasnoborsk 61.34 46.05e
Krasnodar 45.02 39.00e
Krasnogorskoye (Izhevsk) 57.42 52.31e
Krasnoufimsk 56.40 57.49e
Krasnousolskiy° 53.53 56.29e
Krasnoye (Belgorod) 50.55 38.42e
Krasnoye (Bryansk) 53.03 33.54e
Krasnyy Kamen*° 66.51 65.08e
Krasnyy Kholm (Orenburg) 51.38 54.11e
Krasnyy Kholm (Tver) 58.05 37.00e
Krasnyy Kut 50.58 47.00e
Krasnyy Sulin 47.13 40.10e
Krasnyy Yar (Astrakhan) 46.30 48.20e
Krasnyy Yar (Samara) 53.28 50.20e
Krasnyy Yar (Saratov) 51.39 46.26e
Krasnyy Yar (Sverdlovsk) 59.22 60.09e
Krasnyy Yar (Volgograd) 50.44 44.45e
Krasnyye Baki 57.02 45.15e
Kraynovka 43.58 47.22e
Kresti 55.48 31.22e
Kresttsy 58.09 32.48e
Kriusha 54.58 39.58e
Krivyachka 58.38 45.19e
Kromy 52.40 35.46e
Kronshstadt 60.00 29.40e
Kropotkin (Krasnodar) 45.25 40.35e
Krugloye 47.01 39.15e
Krutaya 62.59 54.45e
Krymsk 44.56 38.00e
Kudymkar 59.01 54.40e
Kugulta 45.23 42.24e
Kukmor 56.09 50.50e
Kuligy 58.15 53.42e
Kuloy 64.57 43.32e
Kumeny 58.02 49.50e
Kumertau° 52.46 55.46e
Kungur 57.25 57.10e
Kunya (Perm) 58.47 56.48e
Kunya (Pskov) 56.18 30.59e
Kurgiyevo 65.13 32.50e
Kurikha 55.01 42.51e
Kurlak 51.22 40.30e
Kurovskoye 55.33 38.52e
Kursavka 44.29 42.32e
Kursk 51.45 36.14e
Kurskava 44.01 44.30e
Kurya (Izhevsk) 57.42 52.00e
Kurya (Komi) 61.42 57.11e
Kushkushara 64.56 40.32e
Kushnarenkovo 55.08 55.20e
Kushva° 58.17 59.43e
Kuvandyk 51.29 57.25e
Kuvshinovo 57.03 34.12e
Kuybyshev (Kazan) 54.57 49.03e
Kuznetsk 53.08 46.35e
Kvarkeno 52.07 59.45e
Kyanda 64.15 38.02e
Kychema 65.32 42.42e
Kyn° 57.52 58.39e

Kyshtym 55.43 60.32e
Kyssa 64.00 47.59e
Kytlym° 59.30 59.12e
Labytnangi° 66.38 66.26e
Ladozhskoye Ozero 60.13 31.01e
Ladva Vetka 61.16 34.23e
Laishevo 55.25 49.31e
Lalsk 60.45 47.34e
Lamskoye 52.56 38.04e
Laplandiya 68.16 33.20e
Laptevo° 55.07 40.17e
Laskovo° 54.50 39.55e
Lebyazhye (Kirov) 57.28 49.28e
Lekshmozero 61.47 37.45e
Leningradskaya 46.19 39.24e
Leninsk (Astrakhan) 46.10 43.46e
Leninsk (Chelyabinsk) 54.52 59.51e
Leninsk (Volgograd) 48.42 45.14e
Leninskiy (Tula) 54.19 37.25e
Leninskiy (Yoshkar Ola) 56.32 46.02e
Leninskoye (Kirov) 58.20 47.08e
Leshukonskoye 64.55 45.50e
Lesnaya Sloboda° 54.05 42.06e
Lesnoy (Kirov) 59.47 52.08e
Lesnoy (Murmansk) 66.40 34.20e
Letnyaya Zolotitsa 64.55 36.58e
Letyazhevka 51.51 43.20e
Lev Tolstoy 53.11 39.28e
Levinskoye 58.32 41.20e
Lgov 51.41 35.16e
Likhoslavl 57.10 35.30e
Lipetsk 52.37 39.36e
Lipin Bor 60.15 37.59e
Liski (Voronezh) 51.00 39.30e
Liski 51.00 39.30e
Livny 52.25 37.35e
Lodeynoye Pole 60.43 33.30e
Log 49.28 43.51e
Lokot (Bryansk) 52.34 34.35e
Lopatino (Penza) 52.38 45.46e
Lopukhi° 54.45 40.01e
Lopydino 61.10 52.02e
Lovozero (Karelia) 64.25 30.46e
Loyma 60.39 48.49e
Lubyaniki° 54.47 40.50e
Ludoni 58.15 29.29e
Luga 58.42 29.49e
Lugansk 51.10 45.39e
Lumbovka 67.42 40.35e
Lunino 53.37 45.15e
Lyamtsa 64.25 37.10e
Lyskovo 56.02 45.01e
Lysye Gory (Saratov) 51.32 44.48e
Lysye Gory (Tambov) 52.52 41.14e
Lyubim 58.21 40.39e
Lyuk 56.56 52.49e
Madzhalis 42.08 47.50e
Magnitogorsk 53.28 59.06e
Makar-Ib 63.39 49.30e
Makarovo 52.17 43.19e
Makarye 58.38 48.01e
Makaryev 57.52 43.30e
Maksatikha 57.48 35.51e
Malmyzh 56.34 50.41e
Maloarkhangelsk 52.23 36.30e
Maloshuyka 63.42 37.29e
Mamadysh 55.43 51.20e
Mamonovo° 54.30 19.59e
Marchuki 53.34 40.10e
Mari Turek 56.50 49.38e
Marino 43.57 39.33e
Marks 51.43 46.45e
Maryevka 52.30 49.26e
Matveev Kurgan 47.35 38.54e
Matveyevka 53.32 53.30e
Mayak 51.23 55.14e
Mayna (Ulyanovsk) 54.07 47.37e
Medvedzhyegorsk 62.56 34.28e
Megra (Arkhangelsk) 66.11 41.38e
Melekhina 59.18 55.01e
Meleuz° 52.58 55.57e
Melogorskoye 65.25 45.10e
Menzelinsk 55.45 53.00e
Meshchovsk 54.20 35.16e
Mezen 65.50 44.20e
Miass 55.00 60.08e
Michaichmon 64.12 50.02e
Michurinsk 52.54 40.30e
Migulinskaya 49.43 41.14e
Mikhaylovka 50.05 43.15e
Mikhnevo 55.07 37.59e
Mikun 62.20 50.01e
Millerovo 48.55 40.25e
Miloslavskoye° 53.34 39.28e
Mineralnyye Vody 44.14 43.10e
Mitrofanovka 49.58 39.41e
Mitrofanovskaya 63.12 56.00e
Mityakinskaya 48.37 39.42e
Molodoy-Tud 56.25 33.39e
Molokovo 58.10 36.41e
Mordovo 52.06 40.45e
Mordovskya Bokla 53.49 53.00e
Morozovsk 48.20 41.50e
Morshansk 53.26 41.48e
Morskaya Maselga 63,03 34.45e
Moseyevo 65.45 46.22e
Moshok 55.45 41.10e
Moskva 55.45 37.42e
Mostovaya 57.01 57.24e
Mozhary° 53.53 41.03e
Mozhaysk 55.29 36.02e
Mrakovo (Bashkiria) 52.45 56.38e
Mtsensk 53.18 36.35e
Mukhtolovo 55.28 43.11e
Mullovka 54.12 49.26e
Muravlyanka° 53.38 41.12e
Murmansk 68.59 33.08e
Murom 55.34 42.04e
Muslyumovo (Chelyabinsk) 55.36 61.39e
Muslyumovo (Kazan) 55.20 53.10e
Myaksa 58.52 38.12e
Myatlevo 54.51 35.41e
Myla 65.25 50.45e
Myshkino 57.45 38.25e
Mysy 60.35 54.00e
Myt 56.49 42.20e
Myyeldino 61.45 54.51e
Naberezhnyye Chelny 55.42 52.19e
Nagornoye° 53.43 39.57e
Narodnaya, Gora* 65.02 60.01e
Narovchat 53.54 43.40e
Naryan Mar 67.37 53.02e
Navlya 52.51 34.30e
Navoloki 57.28 41.58e
Nebolchi 59.10 33.25e
Nedvigovka 47.15 39.21e
Neftekamsk° 56.05 54.16e
Nelidovo 56.13 32.46e
Nema 57.30 50.30e
Nerekhta 57.30 47.40e
Neroyka, Gora* 64.35 59.44e
Neryuvom 67.06 60.12e
Nestiary 56.32 45.20e
Nevel 56.00 29.59e
Nevinnomysk 44.38 41.59e
Nevyansk° 57.30 60.14e
Nikel 69.20 30.00e
Nikolayevskiy (Chelyabinsk) 53.04 61.59e
Nikolayevskiy (Volgograd) 50.05 45.32e
Nikolsk (Penza) 53.41 46.01e
Nikolsk (Vologda) 59.33 45.30e
Nikolskoye° 54.34 39.37e
Nivnoye 53.10 32.25e
Nizhnaya Omra 62.43 55.40e
Nizhnaya Voch 61.14 54.06e
Nizhnegnutov 48.00 42.25e
Nizhneye Bugayevo 66.00 56.01e
Nizhni Chir 48.22 43.05e
Nizhnie Sergi 56.40 59.19e
Nizhniy Baskunchak 48.13 46.50e
Nizhniy Novgorod 56.20 44.00e
Nizhniy Tagil 58.00 59.58e
Nizhniy Yenangsk 59.59 46.21e
Nizhniye Sergi° 56.40 59.18e
Nizhnyaya Mgla 66.29 44.28e
Nizhnyaya Zolotitsa 65.42 40.10e
Noginsk 55.52 38.29e
Nolinsk 57.38 49.52e
Norka 51.12 45.18e
Noshul 60.04 49.30e
Nosovshchina 62.57 37.00e
Novgorod 58.30 31.20e
Novoaleksandrovsk 45.31 41.14e
Novoanninskiy 50.32 42.42e
Novobelokatay 55.42 58.58e
Novocherkassk 47.25 40.05e
Novomelovoye 51.22 37.15e
Novomoskovsk 54.06 38.15e
Novorossiysk 44.44 37.46e
Novorzhev 57.00 29.21e
Novoshakhtinsk 47.46 39.55e
Novosil 52.56 37.03e
Novosokolniki 56.19 30.09e
Novospasskoye 53.09 47.45e
Novouzensk 50.29 48.08e
Novoveselyy 46.40 42.59e
Novozavidovskiy 56.30 36.45e
Novozhilovskaya 64.48 51.17e
Novyy Oskol 50.46 37.52e
Novyy Zay 55.11 51.20e
Nyandoma 61.34 40.11e
Nyazepetrovsk 56.06 59.30e
Nyrob 60.45 56.38e
Nyukhcha (Arkhangelsk) 63.24 46.31e
Nyukhcha (Karelia) 63.57 36.13e
Nyuksenitsa 60.24 44.08e
Obilnoye 47.32 44.28e
Oblivskaya 48.32 42.31e
Oboyan 51.13 36.17e
Ocher 57.56 54.43e
Odoyev 53.58 36.48e
Okhansk 57.42 55.20e
Oktjabrskiy (N. Novg.) 56.16 44.14e
Oktyabrskoe (Ornb.)° 52.21 55.30e
Olkhovka 49.51 44.33e
Olonets 61.00 32.59e
Omutninsk 58.35 52.28e
Onega 63.57 37.11e
Opochka 56.11 28.42e
Oranzherei 45.51 47.35e
Orda 57.11 56.58e
Orel (Orel) 52.58 36.04e
Orel (Perm) 59.25 56.31e
Orenburg 51.50 55.00e
Orlov-Gay 50.56 48.14e
Orsk 51.13 58.35e
Osa° 57.17 55.27e
Oshkurya 66.04 56.40e
Oshminskoe 58.00 47.00e
Osovo° 54.30 38.51e
Ostashkov 57.09 33.10e
Ostashovo 55.52 35.52e
Ostrov 57.22 28.22e
Ozernoye (Orenburg) 51.45 51.29e
Ozinki 51.11 49.43e
Padany 63.12 33.20e
Padun 68.37 32.00e
Palkino 58.11 42.59e
Pallasovka 50.02 46.54e
Panfilovo 50.25 42.53e
Pashskiy Perevoz 60.20 33.00e
Pavelets 53.51 39.16e
Pavlovka (Bashkiria) 55.26 56.36e
Pavlovka (Orenburg) 51.22 54.42e
Pavlovka (Ulyanovsk) 52.42 47.06e
Pavlovsk (Voronezh) 50.28 40.07e
Pechero-Ilychskiy Res.° 61.56 59.03e
Pechora 65.14 57.18e
Pechory 57.42 27.41e
Pedy, Gora* 64.06 59.48e
Pegysh 63.27 50.30e
Pelkula 63.39 32.41e
Penza 53.11 45.00e

Perelazovskiy 49.08 42.35e
Perelyub 51.50 50.19e
Pereslavl Zalesskiy 56.40 38.50e
Perevolotskiy 51.50 54.15e
Perkino 53.08 41.30e
Perm 58.01 56.10e
Permas 59.21 45.33e
Pervomaysk 54.53 43.48e
Pervouralsk 56.59 59.58e
Pestovo 58.32 35.42e
Petrakovo 61.39 46.41e
Petrokrepost 59.59 31.08e
Petropavlovskiy 55.25 55.22e
Petrovichi 53.58 32.10e
Petrovo° 53.45 40.08e
Petrovsk 55.2o 45.24e
Petrovskoye (Bashkiria) 53.38 56.29e
Petrovskoye (Tambov) 52.43 40.15e
Petrovskoye (Yaroslavl) 57.00 39.19e
Petrozavodsk 61.46 34.19e
Petrun 66.31 60.50e
Pichkasy 55.06 49.39e
Pilevo° 55.03 40.03e
Piterka 50.41 47.29e
Pizhanka 57.30 48.30e
Plesetsk 62.42 40.21e
Ploskosh 56.41 31.11e
Pochep 52.55 33.29e
Pochinki 54.43 44.53e
Pochinok (Smolensk) 54.24 32.28e
Pochinok (Sverdlovsk) 57.04 59.58e
Podcherye 63.55 57.35e
Poddorye 57.29 31.11e
Podlesnoye 51.50 47.00e
Podolsk 55.23 37.32e
Podosinovets 60.16 47.02e
Podporozhye 60.55 34.02e
Podyuga 61.08 40.43e
Pogar 52.35 33.15e
Poim 53.02 43.10e
Pokrov (Kaluga) 54.15 35.15e
Pokrov (Vladimir) 55.54 39.14e
Pole 63.36 39.15e
Polevaya 51.37 36.30e
Polevskoy 56.28 60.15e
Polna 58.31 28.03e
Polotnyanyy 54.44 35.59e
Polovniky 62.30 50.45e
Polyarnyy Ural° 67.02 65.08e
Pomozdino 62.12 54.10e
Ponomarevka 53.20 54.01e
Ponoy 67.02 41.03e
Poplevino 53.50 40.07e
Poretskoye 55.12 46.19e
Porosozero 62.45 32.48e
Povorino 51.12 42.15e
Poztykeros 61.36 51.33e
Pravda (Ulyanovsk) 53.57 49.29e
Priluki (Arkhangelsk) 62.59 42.30e
Priluki (Pskov) 56.07 31.20e
Primorsk (Primorsk) 60.18 28.35e
Primorsk (Volgograd) 49.15 45.02e
Priozersk 61.01 30.08e
Privolzhsk 57.21 41.20e
Priyutnoye 46.05 43.30e
Proletarskaya 46.43 41.45e
Proletarskiy (Belgorod) 50.47 35.49e
Proletarskiy (Moskva) 55.01 37.22e
Pronsk 54.07 39.36e
Prosnitsa 58.59 50.18e
Prosunduy 67.16 53.11e
Pskov 57.48 28.26e
Puchezh 57.00 43.00e
Pudozh 61.50 36.32e
Pugachev 52.02 48.49e
Pushkino (Moskva) 56.01 37.52e
Pushkino (Saratov) 51.15 47.00e
Putilovo 59.25 44.00e
Puzla 62.28 54.40e
Pyanteg 60.11 56.12e
Pyatigorsk 44.04 43.06e
Pyatigory 60.11 54.44e
Pychas 56.29 52.28e
Pyshchug 58.51 45.40e
Raevskiy° 54.04 54.57e
Rakityanka 51.30 57.39e
Rakula 63.48 41.29e
Rakulka 61.55 46.28e
Ramenskoye 55.35 38.15e
Rameshki 57.22 36.00e
Ramza 52.30 42.39e
Rasskazovo 52.39 41.54e
Reboly 63.50 30.49e
Remontnoye 46.33 43.42e
Rogovskaya 45.43 38.45e
Romanovka 51.45 42.45e
Romanovskaya 47.33 42.03e
Romodanovo 54.26 45.19e
Roshchino 60.20 29.28e
Roslavl 53.55 32.53e
Rossosh (Belgorod) 51.05 38.28e
Rossosh (Voronezh) 50.12 39.35e
Rostov (Yaroslavl) 57.11 39.23e
Rostov-na-Donu 47.15 39.45e
Rosvinskoye 66.31 52.30e
Rovdino 61.37 42.30e
Rovenki 49.54 38.55e
Rovnoye 50.42 46.04e
Rozhdesvenskoye 58.10 45.29e
Rudnya (Pskov) 56.02 28.31e
Rudnya (Saratov) 50.49 44.35e
Rudnya (Smolensk) 54.55 31.07e
Rudnya (Tver) 56.04 32.06e
Russkiy-Kamenshkirp 52.51 46.05e
Rustay 58.12 47.14e
Ruzayevka 54.04 44.55e
Ryazan 54.37 39.43e
Ryazhsk 53.40 40.07e
Rybinsk 58.03 38.50e
Rybnoe° 54.44 39.29e
Rynda 68.53 36.54e
Rzhaksa-Vyselki 52.08 42.01e
Rzhev 56.15 34.18e
Sablya, Mt.*° 64.47 54.57e
Sadovoye (Stavropol) 45.17 44.42e
Safonovo (Arkhangelsk) 65.43 47.44e
Safonovo (Smolensk) 55.08 33.16e
Salaushi 56.02 52.58e
Salobelyak 57.09 48.00e
Salsk 46.30 41.35e
Samara 53.10 50.10e
Samoded 63.36 40.32e
Sandovo 58.28 36.30e
Sankt-Petersburg 59.55 30.25e
Saraktash 51.48 56.24e
Saranpaul° 64.20 61.00e
Saransk 54.12 45.10e
Sarapul 56.30 53.49e
Saratov 51.30 45.55e
Sars 56.30 57.08e
Satka° 55.03 59.00e
Savino (Ivanovo) 56.30 41.20e
Savino (Komi) 65.08 50.31e
Sebryakovo 50.02 43.18e
Seida° 67.07 63.07e
Selib 63.42 48.30e
Selishchi 54.29 43.30e
Selizharovo 56.50 33.31e
Selty 57.19 52.12e
Semenov 56.42 44.30e
Semenovo 57.19 45.41e
Sementsovo 58.38 40.20e
Semigorodnyaya 59.46 40.10e
Semilovo 55.04 42.12e
Semzha 66.09 44.15e
Sengiley 53.57 48.46e
Senkina 65.52 51.00e
Serafimovich 49.33 42.42e
Serdohsk 52.29 44.13e
Sereda (Moskva) 55.43 35.30e
Sereda (Yaroslavl) 58.01 40.30e
Seredka 58.11 28.10e
Sergach 55.32 45.27e
Sergiyev Posad 56.20 38.10e
Sergiyevka 44.56 42.45e
Sergiyevsk 53.56 51.00e
Sergiyevskaya 50.15 43.48e
Sernur 56.52 49.02e
Seroglazovka 47.00 47.28e
Serov° 59.38 60.38e
Serpukhov 54.53 37.25e
Severouralsk° 61.10 59.58e
Sevsk 52.08 34.31e
Shaitan-Tau Res.° 51.50 57.20e
Shakhty 47.43 40.16e
Shakhunya 57.41 46.46e
Shalya° 57.13 58.43e
Shamary 57.24 58.19e
Shangaly 61.09 43.22e
Sharan 54.50 54.00e
Sharkan 57.19 53.51e
Sharlyk 52.58 54.46e
Sharya 58.22 45.20e
Shaverki 63.11 31.27e
Shaytanovka 62.03 58.01e
Shchekino 57.00 37.34e
Shchigry (Kaluga) 53.40 35.00e
Shchigry (Kursk) 51.52 36.54e
Shchuchya*° 67.20 68.40e
Shegmas 64.40 49.18e
Sheltozero 61.22 35.21e
Shenkursk 62.05 42.58e
Shentala 54.28 51.30e
Shigony 53.25 48.40e
Shikhany 52.06 47.12e
Shilovo (Ryazan) 54.20 40.56e
Shilovo (Tula) 53.10 38.34e
Shipitsino 61.20 46.26e
Shomvukva 63.40 51.49e
Shugozero 59.54 34.10e
Shulgantash Res.° 52.57 57.01e
Shunga 62.34 34.56e
Shuyskoye 59.19 41.02e
Sig 65.31 34.16e
Sim 55.00 57.40e
Sivaya Maska 66.38 62.30e
Siverskiy 59.20 30.00e
Skopin° 53.48 39.37e
Slavkovichi 57.31 29.01e
Slavyansk-na-Kubani 45.14 38.08e
Sloboda (Smolensk) 55.31 31.51e
Sloboda (Sverdlovsk) 57.01 59.35e
Sloboda (Voronezh) 51.09 40.17e
Slobodchikovo 61.46 48.16e
Smolensk 54.49 32.04e
Sobolev 51.59 51.49e
Sofporog 65.47 31.30e
Sokol (Vologda) 59.28 40.04e
Sokolozero 66.21 30.57e
Solikamsk 59.40 56.45e
Sol-Iletsk 51.09 55.00e
Solodniky 48.24 45.17e
Solotcha° 54.47 39.50e
Soltsy 58.12 30.30e
Sorochinsk 52.29 53.15e
Sorvizhi 57.58 48.28e
Sosnovka 54.48 41.33e
Sosnovo 60.33 30.11e
Sosnovoborsk 53.17 46.15e
Sosyka 46.11 38.49e
Sotnikovskoye 45.01 43.47e
Sovetsk (Kaliningrad) 55.02 21.50e
Sovetsk (Kirov) 57.39 48.59e
Sovetskoye (Belgorod) 50.22 39.03e
Spas-Demensk 54.24 34.01e
Spasskaya Guba 62.11 33.45e
Spasskoe° 52.20 56.11e
Spassk-Ryazanskiy 54.24 40.25e
Spirovo 57.28 35.00e
Srednikovo° 53.00 47.53e
Sredniy Yegorlik 46.22 40.47e
Star 53.37 34.09e
Staraya Kulatka 52.44 47.38e

Staraya Poltavka 50.29 46.29e
Staraya Pustyn' 55.15 43.30e
Staraya Russa 58.00 31.22e
Staritsa (Tver) 56.29 34.59e
Starobaltachevo° 56.00 55.56e
Starocherneevo 53.50 41.52e
Starodub 52.35 32.46e
Staroletovo° 54.49 39.27e
Starominskaya 46.33 39.04e
Starosubkhangulovo° 53.07 57.27e
Staroverchcheskaya 59.35 48.33e
Stavropol 45.03 41.59e
Stepana Razina 54.53 44.15e
Sterlitamak 53.40 55.59e
Storozhevsk 62.00 52.20e
Strugi Krasnye 58.18 29.01e
Suday 58.59 43.00e
Sudilova 57.20 38.48e
Sudogda 55.58 45.50e
Sudzha 51.11 35.17e
Suksun° 57.09 57.22e
Sura (Arkhangelsk) 63.38 45.28e
Sura (Penza) 53.52 45.45e
Surovikino 48.36 42.50e
Surskoye 54.30 46.44e
Susanino (Kostroma) 58.08 41.30e
Suvorov 54.08 36.30e
Sverdlovo 51.15 44.35e
Svetogorsk 61.07 28.50e
Svyatozero 61.32 33.39e
Syamzha 60.01 41.04e
Syktyvkar 61.42 51.45e
Synya*° 65.20 58.20e
Sysert 56.30 60.50e
Syumsi 57.08 51.12e
Syviyu*° 65.40 59.40e
Syzran 53.10 48.29e
Taganrog 47.14 38.55e
Tagay 54.20 47.35e
Takhta (Stavropol) 45.54 42.08e
Taldom 56.49 37.30e
Talovka (Volgograd) 49.59 45.02e
Taman 45.12 36.43e
Tambov 52.44 41.28e
Tarasovo 66.14 46.43e
Tarasovskiy 48.45 40.20e
Tarnogskiy Gorodok 60.32 43.33e
Tarusa 54.44 37.14e
Tashelka 53.46 49.28e
Tashla 51.43 52.41e
Taybola 68.32 33.10e
Telegino 52.55 44.31e
Telpos-Iz, Mt.*° 63.50 59.20e
Temkino 55.05 35.00e
Temnikov 54.39 43.14e
Temryuk 45.16 37.24e
Teploye 53.36 37.43e
Terbuny 52.08 38.16e
Terenga 53.20 48.25e
Teriberka 69.10 35.11e
Ternovka (Saratov) 51.19 42.58e
Ternovka (Voronezh) 51.41 41.38e
Tetyushi 54.55 48.49e
Teykovo 56.50 40.35e
Timashevo 53.26 51.10e
Timashevsk 45.38 38.56e
Timoshino (Kostroma) 57.50 44.31e
Timoshino (Vologda) 60.08 36.14e
Timsher 60.43 54.45e
Tobseda 68.34 52.16e
Toksha Kuznetsova 62.37 38.03e
Tolbazy 54.00 55.50e
Tolmachevo 58.57 29.51e
Tolvayarvi (Karelia) 62.10 31.45e
Tolvuya 62.29 35.17e
Tolyatti 53.32 49.24e
Tonkino 57.24 46.48e
Topornya 59.51 38.20e
Topsa 62.38 43.40e
Toropets 56.30 31.40e
Torzhok 57.02 34.51e
Tosno 59.25 30.40e
Totskoe° 52.31 52.44e
Troitsa 54.24 40.14e
Troitsk (Chelyabinsk) 54.08 61.33e
Troitsk (Moskva) 55.27 37.19e
Troitsk (Saransk) 54.06 43.50e
Troitsko-Pechorsk 62.40 56.08e
Trosh 66.24 56.08e
Troyekurovo (Lipetsk) 53.25 39.45e
Troyekurovo (Tula) 53.28 37.28e
Tselina 46.33 41.02e
Tsenogora 64.54 46.44e
Tsimlyansk 47.36 42.06e
Tugolukovo 51.57 41.40e
Tukan 53.51 57.28e
Tula 54.11 37.38e
Tulumbasy 57.27 57.40e
Tuma 55.08 35.40e
Tumanovo 55.24 34.30e
Tumutuk 55.00 53.20e
Tundra 64.14 40.44e
Tupik 55.40 33.32e
Turchasovo 63.05 39.12e
Tutayev 57.52 39.31e
Tver 56.49 35.57e
Tyukovo° 55.06 39.55e
Uchaly 54.22 59.30e
Ufa 55.46 60.08e
Uglich 57.30 38.20e
Uglovka 58.13 33.30e
Ugra 54.46 34.20e
Ukholovo 53.48 40.30e
Ukhta 63.33 53.44e
Uktym 62.43 49.00e
Ulyankovo 52.24 47.50e
Ulyanovsk 54.19 48.22e
Una 64.31 38.15e
Undory 54.36 38.24e
Unezhma 63.54 36.50e
Uralsk 51.19 51.20e
Urazovka 55.25 45.37e
Uren 57.30 45.50e
Urman 54.55 56.44e
Urtazym 52.13 58.45e
Urussu 54.38 53.29e
Uryupinsk 50.49 42.01e
Urzhum 57.00 50.00e
Ushma*° 61.41 59.29e
Usman 52.02 39.43e
Ust'Chernaya (Perm) 60.27 52.36e
Ust-Ilych 62.31 56.49e
Ust-Katav 54.51 58.10e
Ust'Kulom 61.43 53.40e
Ust'Labinsk 45.14 39.41e
Ust'Padenga 61.55 42.31e
Ust'Pinega 64.10 41.59e
Ust'Reka 62.19 46.52e
Ust'Sara 60.14 34.06e
Ust-Shchugor 64.16 57.30e
Ust-Tsilma 65.28 52.09e
Ust'Tzilma 65.30 52.10e
Ust-Uls 60.35 58.29e
Ust'Ura 63.06 44.41e
Ust'Usa 66.00 56.52e
Ust-Usa° 66.00 56.52e
Ust'Uza 59.29 45.20e
Ust'Vyyskaya 63.02 46.44e
Ustyuzhna 58.49 36.28e
Usvyaty 55.45 30.45e
Vacha (Karelia) 63.59 33.30e
Vacha (N. Novgorod) 56.46 42.45e
Vadinsk 53.42 43.02e
Vakhtan 57.53 46.47e
Valday (Karelia) 63.28 35.36e
Valday (N. Novgorod) 57.59 33.10e
Valuyki 50.13 38.06e
Vanchur° 54.21 41.02e
Varandey 68.49 58.00e
Varnavino 57.28 45.02e
Varnek 69.45 60.01e
Varzino 68.20 38.30e
Vasilyevka 50.56 41.00e
Vazhgort 63.55 47.15e
Velikiaya Guba 62.13 35.11e
Velikiy Ustyug 60.48 46.15e
Velikiye Luki 56.19 30.31e
Velikovo 59.15 42.05e
Velsk 61.05 42.06e
Vendenga 63.32 47.52e
Veretye 54.38 40.34e
Verhkniy Ufaley° 55.53 65.28e
Verkhneuralsk 53.52 59.14e
Verkhneyarkeyeovo° 55.26 54.19e
Verkhniy Shar 68.21 50.45e
Verkhniy Tagil 57.22 59.58e
Verkhniy Ufaley° 56.06 60.29e
Verkhoshizhemye 58.00 49.09e
Verkola 63.51 45.12e
Vernadovka 53.19 42.25e
Veselyy (Rostov) 47.06 40.45e
Veselyy (Volgograd) 47.50 43.01e
Veshenskaya 43.39 41.45e
Veslyana 62.58 51.00e
Vezhyudor 63.04 51.01e
Vichuga 57.12 41.50e
Vidziuyar 60.53 51.20e
Vieshenskaya 49.37 41.42e
Visim (Perm) 58.40 56.10e
Visim (Sverdlovsk) 57.42 59.59e
Visimskiy Res.° 57.22 58.45e
Vizhas 66.35 46.01e
Vizhay° 61.15 60.10e
Vizinga 61.06 50.05e
Vladimir 56.08 40.25e
Vladychnoye 58.25 39.35e
Volga 57.58 38.22e
Volgodonsk 47.35 42.08e
Volgograd 48.45 44.30e
Volodarsk 56.14 43.10e
Volodskaya 62.21 42.00e
Vologda 59.10 39.55e
Volokonovka 50.28 37.52e
Volokovaya 66.29 48.13e
Volonga 67.05 47.44e
Volosovo 59.30 29.32e
Volovo (Lipetsk) 52.02 37.54e
Volovo (Tula) 53.32 38.02e
Volsk 52.02 47.22e
Volteva 64.31 44.14e
Vorkuta 67.27 64.00e
Voronezh 51.40 39.13e
Voronovo° 54.18 39.54e
Vorontsovka (Sverdlovsk) 59.39 60.10e
Vorontsovka (Voronezh) 50.38 40.22e
Vorontsovo 57.18 27.43e
Voronye 58.00 42.01e
Voskhod° 54.35 42.07e
Voskresenskoye (Bashkiria) 52.07 56.09e
Voskresenskoye (Chelyabinsk) 56.04 60.51e
Voskresenskoye (Lipetsk) 53.11 38.45e
Voskresenskoye (N. Novgorod) 56.49 45.28e
Voskresenskoye (Saratov) 51.49 46.55e
Voskresenskoye (Vologda) 59.27 37.58e
Vostochnaya Litsa 68.40 37.45e
Votkinsk 57.00 54.00e
Voykar*° 65.58 63.44e
Voyvozh 64.19 55.12e
Vozhega 60.25 40.11e
Voznesenskoye 54.53 42.45e
Vyaltsevo 59.05 43.51e
Vyatskiye Polyany 56.14 51.08e
Vyazma 55.12 34.17e
Vyazniki 56.14 42.08e
Vyazovka (Astrakhan) 48.18 45.39e
Vyazovka (Saratov) 51.49 45.46e
Vyazovka (Saratov: Tereshka) 52.10 46.44e
Vybor 57.10 29.15e
Vyborg 60.45 28.41e
Vygliadovka 53.18 43.30e
Vymsk 60.21 48.10e
Vyshniy-Volochek 57.34 34.23e
Vysokovsk 56.20 36.33e

Vysokoye (Saratov) 51.01 45.29e
Vysokoye (Tver) 56.41 45.00e
Vytegra 61.04 36.27e
Yagodnoye (Samara) 53.37 49.00e
Yagrysh 62.03 45.01e
Yaksha° 61.48 56.50e
Yamantau, Mt.*° 54.15 58.07e
Yami 56.51 30.11e
Yanaul 56.17 54.55e
Yangarey 68.46 61.29e
Yar 58.13 52.08e
Yaroslavl 57.34 39.52e
Yary 68.54 66.30e
Yashalta 46.20 42.18e
Yashkul 46.10 45.20e
Yedoma (Arkhangelsk) 63.50 44.44e
Yedoma (Komi) 65.27 51.23e
Yegoryevsk 55.21 39.01e
Yekaterinburg 56.52 60.35e
Yelabuga 55.48 52.00e
Yelets 52.35 38.30e
Yeletskiy 67.04 64.00e
Yelganskaya 57.55 51.30e
Yelniki 54.38 43.54e
Yelnya 54.36 33.18e
Yeltsy 56.37 33.52e
Yemetsk 63.28 41.49e
Yeraktur 54.43 41.10e
Yermitsa 66.56 52.20e
Yesenovichi 57.16 34.19e
Yeysk 46.43 38.17e
Yezhikha 58.08 47.42e
Yndin 61.25 55.10e
Yoskhar Ola 56.38 47.52e
Yukhmachi 54.38 49.59e
Yurino 56.18 46.19e
Yurma, Gora* 55.30 60.00e
Yuroma 65.10 45.45e
Yury 54.21 32.07e
Yushino 68.08 54.15e
Yushkozero 64.45 32.03e
Yusta 47.07 46.17e
Yuzha 56.34 42.01e
Yuzhnyy (Rostov) 47.21 41.51e
Zaborovye 58.50 33.00e
Zadonsk 52.23 38.55e
Zainsk 55.18 52.00e
Zaluchye 57.43 31.49e
Zapadnaya Dviha 56.19 32.00e
Zarechka 60.06 57.28e
Zarubino 58.42 33.30e
Zaterchnyy 44.48 45.08e
Zavetnoye 47.07 43.54e
Zelenga 46.11 48.37e
Zernograd 46.53 40.19e
Zhari 56.37 30.20e
Zharkovskiy 55.51 32.16e
Zheshart 62.06 49.31e
Zhigulevsk 53.26 49.30e
Zhitkur 48.56 46.16e
Zhizdra 53.45 34.45e
Zilair° 52.15 57.28e
Zimovniki 47.09 42.29e
Zirgan 53.10 55.50e
Zlatoust 55.10 59.38e
Znamenka (Smolensk) 54.53 34.34e
Znamenka (Tambov) 52.25 41.30e
Zolotukino 52.04 36.28e
Zubova Polyana 54.04 42.55e
Zubovka 54.18 51.01e
Zuyevka 58.22 51.01e
Zvenigovo 55.49 48.01e
Zverevo 48.01 40.09e

S Sweden

Abisko 68.21 18.50e
Abyn 65.03 21.20e
Adakgruvan 65.23 18.35e
Akerskön 63.45 14.10e
Akkajaure 67.40 17.30e
Alanas 64.09 15.40e
Alingsas 57.55 12.30e
Älmhult 56.32 14.10e
Älvsbyn 65.41 21.00e
Ammarnäs 65.58 16.10e
Aneby 57.50 14.45e
Ange 62.31 15.40e
Ängelholm 56.15 12.50e
Ankarede 64.49 14.15e
Ankarsund 65.22 16.30e
Anundsjö 63.28 18.05e
Äppelbo 60.30 14.00e
Arjäng 59.24 12.09e
Arjeplog 66.04 18.00e
Arvestuottär* 66.37 18.05e
Arvika 59.41 12.38e
Askersund 58.55 14.55e
Asträsk 64.38 20.00e
Atran 57.07 12.55e
Auktsjaur 65.46 19.20e
Avesta 60.09 16.10e
Bäckefors 58.49 12.08e
Bäckstrand 65.07 16.25e
Baktsjaure 65.22 19.20e
Balforsen 64.40 18.25e
Bastuträsk 64.47 20.00e
Bengtsfors 59.03 12.14e
Berg 62.49 14.30e
Bergfors 68.10 19.46e
Bjärka-Säby 58.15 15.54e
Bjärnum 56.15 13.45e
Björkliden 68.25 18.40e
Björklinge 60.03 17.33e
Blackstad 57.47 16.10e
Blattnicksele 65.22 17.40e
Blidö 59.37 18.56e
Böda (Öland) 57.16 17.05e
Boden 65.50 21.44e
Bollnäs 61.20 16.25e
Boras 57.44 12.55e
Borgholm (Öland) 56.50 16.40e
Borlänge 60.29 15.25e
Borrby 55.27 14.10e
Boxholm 58.12 15.05e
Bräcke 62.44 15.30e
Brönnestad 56.05 13.42e
Brunflo 63.04 14.50e
Burea 64.36 21.15e
Burgsvik (Gotland) 57.03 18.19e
Burträsk 64.31 20.40e
Buttle (Gotland) 57.25 18.31e
Bygdea 64.03 20.50e
Charlottenberg 59.53 12.17e
Dannemora 60.13 17.50e
Dikanäs 65.15 16.00e
Djursholm 59.25 18.05e
Dorotea 64.17 16.30e
Duved 63.24 12.55e
Egby (Öland) 56.52 16.50e
Eksjö 57.40 15.00e
Enköping 59.38 17.07e
Ervalla 59.25 15.15e
Eskilstuna 59.22 16.31e
Eslöv 55.50 13.20e
Everöd 55.53 14.05e
Fällfors 65.08 20.46e
Falun 60.37 15.40e
Farö (Gotland) 57.55 19.10e
Figeholm 57.12 16.35e
Filipstad 59.44 14.10e
Finspang 58.42 15.45e
Fjälläsen 67.33 20.05e
Fjällfjällen* 65.10 14.45e
Fredrika 64.03 18.25e
Gävle 60.41 17.10e
Genarp 55.36 13.25e
Gidea 63.29 19.00e
Gillhov 62.40 14.50e
Gislaved 57.19 13.30e
Glissjöberg 62.07 14.05e
Gnarp 62.03 17.20e
Göteborg 57.45 12.00e
Grangärde 60.15 15.00e
Graninge 63.03 17.00e
Gränna 58.02 14.30e
Grebbestad 58.42 11.15e
Guldsmedshyttan 59.40 15.10e
Gullabo 56.26 15.50e
Gullspang 58.58 14.05e
Gunnarn 65.01 17.40e
Gust Adolf 60.05 13.55e
Hablingbo (Gotland) 57.12 18.16e
Hägerstad 58.05 15.55e
Hälla 63.56 17.20e
Hälleberga 56.51 15.40e
Hällnäs 64.18 19.40e
Hallsberg 59.05 15.07e
Halmstad 56.41 12.55e
Hammerdal 63.35 15.20e
Hamra 61.40 15.00e
Han 62.19 14.05e
Hanger 57.06 13.58e
Haparanda 65.50 24.10e
Harbo 60.06 17.15e
Härnösand 62.37 17.55e
Hasjö 63.02 16.20e
Haverö (Holmsjön*) 62.25 15.05e
Haverö (Stockholm) 60.03 18.42e
Hedesunda 60.25 17.00e
Helsingborg 56.05 12.45e
Hemse (Gotland) 57.14 18.25e
Hillared 57.37 13.10e
Högsby 57.10 16.03e
Höljes 60.54 12.35e
Holmön 63.47 20.55e
Holmsund 63.41 20.20e
Holmudden (Gotland) 57.57 19.20e
Hölö 59.02 17.36e
Hörvik 56.02 14.45e
Hotagen 63.59 14.15e
Hoting 64.08 16.15e
Hovdsjö 62.53 15.35e
Hudigsvall 61.45 17.10e
Hultsfred 57.30 15.50e
Idre 61.52 12.45e
Indal 62.34 17.10e
Järpen 63.20 13.30e
Jönköping 57.45 14.10e
Junsele 63.40 16.55e
Jutis 66.16 17.15e
Kalix 65.51 23.14e
Kallsjön* 63.35 13.00e
Kalmar 56.39 16.20e
Kappelshamn (Gotland) 57.52 18.50e
Karlskrona 56.10 15.35e
Karlstad 59.24 13.32e
Karsvall 61.50 15.10e
Katrineholm 58.59 16.15e
Kebnekaise* 67.53 18.40e
Kiruna 67.53 20.15e
Kivik 55.40 14.15e
Klimpfjäll 65.05 14.50e
Klintehamn (Gotland) 57.24 18.14e
Klövsjö 62.31 14.09e
Kolasen 63.45 13.00e
Kopparberg 59.55 14.59e
Koppom 59.42 12.08e
Köttsjön 63.20 16.00e

Kristianopel 56.15 16.05e
Kristianstad 56.02 14.10e
Kristinehamn 59.17 14.09e
Kroksjö 64.30 17.55e
Kultsjöluspen* 64.57 15.30e
Kummavuopio 68.55 20.50e
Kungälv 57.44 12.00e
Kungsbacka 57.30 12.05e
Kusfors 64.58 20.00e
Kustarakaise* 66.45 16.50e
Laholm 56.30 13.05e
Lammhult 57.09 14.35e
Landskrona 55.49 12.50e
Langträsk 65.23 20.20e
Lannavaara 68.04 22.00e
Lärbro (Gotland) 57.47 18.48e
Laxsjö 63.49 14.50e
Leipojärvi 67.03 21.15e
Lessebo 56.45 15.20e
Lidköping 58.30 13.10e
Liedakka 68.23 21.35e
Lillhardal 61.51 14.05e
Lillholmträsk 65.01 19.10e
Limedsforsen 60.52 13.25e
Lingbo 61.04 16.45e
Linköping 58.25 15.35e
Linsell 62.10 13.50e
Lit 63.20 14.50e
Ljugarn (Gotland) 57.20 18.45e
Ljunga 62.46 16.20e
Ljungby 56.49 13.55e
Ljusda 61.50 16.10e
Loftahammar 57.55 16.45e
Lomsjö 64.11 17.00e
Lovikka 67.20 22.35e
Lövsjön 64.46 15.20e
Ludvika 60.08 15.14e
Lulea 65.35 22.10e
Lund 55.42 13.10e
Luongastunturi* 67.38 21.10e
Luspebryggan 67.02 19.50e
Lysvik 60.01 13.09e
Mala 65.12 18.45e
Malgovik 64.37 16.25e
Malmköping 59.08 16.49e
Malmö 55.35 13.00e
Malung 60.40 13.45e
Marby 63.08 14.20e
Mardsele 64.39 19.15e
Mariannelund 57.37 15.33e
Mariestad 58.44 13.50e
Markaryd 56.26 13.35e
Markotjakko* 67.57 17.15e
Marmatjakko* 68.06 18.40e
Märsta 59.37 17.52e
Mattmar 63.19 13.45e
Mellansjö 62.19 15.40e
Mellerud 58.42 12.27e
Meselefors 64.27 16.50e
Misterhult 57.28 16.35e
Mo 63.24 18.30e
Möja 59.25 18.55e
Mönsteras 57.04 16.25e
Mörbylanga (Öland) 56.31 16.25e
Mörlunda 57.19 15.53e
Moskojärvi 67.24 21.05e
Munkflohögen 63.32 15.00e
Muskö 59.00 18.10e
Nässjö 57.39 14.40e
Nordanas 64.16 18.10e
Nordmaling 63.35 19.30e
Norrfors 63.48 19.00e
Norrköping 58.35 16.10e
Norrtälje 59.46 18.43e
Nottebäck 57.06 15.10e
Nydala 57.19 14.20e
Nyköping 58.45 17.03e
Nynäshamn 58.54 17.55e
Ockelbo 60.52 16.45e
Ödeshög 58.13 14.40e
Offerdal 63.29 14.00e
Ontorp 61.23 14.30e
Örebro 59.18 15.05e
Orno 59.03 18.29e
Örnsköldsvik 63.19 18.45e
Orsa 61.07 14.40e
Orsundsbro 59.45 17.20e
Österlövsta 60.27 17.45e
Östersund 63.10 14.40e
Othem (Gotland) 57.45 18.45e
Överkalix 66.19 22.50e
Övre Grundsel 65.42 20.15e
Paljaape* 66.12 19.15e
Palsboda 59.04 15.21e
Parkajoki 67.45 23.25e
Partefjällen* 67.11 17.40e
Persnäs (Öland) 57.04 16.55e
Pitea 65.19 21.30e
Puottaure 66.11 20.20e
Rakisvaara* 68.16 20.20e
Rämmen 60.02 14.11e
Ramsele (Norrland) 63.32 16.30e
Ramsele (Västerbotten) 64.03 19.30e
Ramsjö 62.10 15.40e
Rättvik 60.56 15.10e
Regna 58.54 15.42e
Resele 63.20 17.10e
Rimbo 59.44 18.21e
Risträsk 66.32 21.55e
Roma (Gotland) 57.32 18.28e
Ruda 57.06 16.10e
Säffle 59.08 12.55e
Saivomuotka 68.10 23.10e
Saltoluokta 67.24 18.30e
Sappisaasi 67.52 21.35e
Särna 61.40 13.10e
Särvsjö 62.38 13.10e
Säter 60.21 15.45e
Sävatnäs 64.46 21.50e
Sikselet 66.15 17.55e
Simonstorp 58.45 16.10e
Sjulsasen 64.21 14.45e
Skansnäs 65.45 17.04e
Skarvsjö 64.58 17.10e
Skelleftea 64.47 20.59e
Skröven 66.46 21.55e
Slagnäs 65.36 18.10e
Slite (Gotland) 57.43 18.50e
Snyten 59.59 16.01e
Söderhamn 61.19 17.10e
Södertälje 59.11 17.39e
Sörfors 64.37 15.30e
Sorsjön 61.24 13.10e
Spangenäs 57.36 16.07e
Stensele 65.05 17.10e
Stenstorp 58.15 13.45e
Stenungsund 58.05 11.55e
Stockholm 59.20 18.05e
Storfors 59.33 14.16e
Storlien 63.20 12.05e
Storsavarträsk 64.25 19.55e
Storsjön (Gävleborg) 60.35 16.45e
Storsjön (Jemtland) 62.50 13.10e
Storvarden* 61.36 13.55e
Strimasund 66.04 14.55e
Strömstad 58.56 11.11e
Studsvik 58.45 17.17e
Stugun 63.10 15.40e
Styggberget 62.14 16.20e
Sundsvall 62.22 17.20e
Sunne (Jemtland) 63.07 14.30e
Sunne (Värmland) 59.52 13.05e
Svabensverk 61.04 15.45e
Svaipa* 66.19 16.15e
Svanskog 59.11 12.35e
Svanstein 66.39 23.50e
Tännäs 62.27 12.40e
Tärnady 65.44 15.20e
Tevansjo 62.05 15.30e
Tingsryd 56.31 15.00e
Tjällmo 58.44 15.20e
Tjamotis 66.56 18.30e
Tjärrokieble* 67.23 20.20e
Toresund 59.20 17.15e
Torsby 60.07 13.00e
Torup 56.57 13.05e
Torved 58.50 14.05e
Torvsjö 64.22 17.20e
Trädet 57.59 13.33e
Transtrand (Kopparberg) 61.06 13.20e
Transtrand (Värmland) 60.34 13.05e
Traryd 56.35 13.45e
Trehönningsjö 63.42 18.50e
Trelleborg 55.22 13.10e
Trollhättan 58.17 12.20e
Tun 58.26 12.45e
Tving 56.18 15.30e
Tyngsjö 60.22 13.50e
Uddevalla 58.20 11.56e
Uddjaur* 66.55 17.50e
Umea 63.50 20.15e
Umnäs 65.27 16.05e
Undenäs 58.38 14.25e
Undersvik 61.36 16.20e
Uppsala 59.55 17.38e
Utö 58.56 18.20e
Vaggeryd 57.30 14.10e
Vajkijaur 66.42 19.50e
Valdemarsvik 58.13 16.35e
Valvträsk 66.08 21.50e
Vänjaurbäck 64.22 18.35e
Vännäs 63.56 19.50e
Varberg 57.06 12.15e
Vargarda 58.05 12.47e
Vassijaure 68.25 18.16e
Västeras 59.36 16.32e
Vaxjö 56.52 14.50e
Veddige 57.17 12.20e
Vetlanda 57.26 15.05e
Vilhelmina 64.38 16.40e
Vilshult 56.21 14.30e
Virserum 57.20 15.30e
Visby (Gotland) 57.37 18.20e
Vislanda 56.46 14.30e
Vissefjarda 56.31 15.35e
Vitsand 60.20 12.57e
Vittangi 67.41 21.40e
Volgsele 64.41 16.45e
Volgsjöfors 64.34 16.40e
Ystad 55.25 13.50e

SK Slovakia

Banovce 48.43 18.51e
Banska Bystrica 48.44 19.10e
Banska Stiavnica 48.29 18.50e
Bardejov 49.18 21.15e
Bratislava 48.10 17.10e
Brezno 48.49 19.40e
Detva 48.35 19.25e
Dobsina 48.50 20.20e
Dunajska Streda 48.10 17.30e
Fialkovo 48.17 19.50e
Gerlachovsky Stit* 49.09 20.05e
Giraltovce 49.07 21.30e
Hurbanovo 47.53 18.10e
Jesenske 48.20 20.00e
Komarno 47.46 18.05e
Kosice 48.44 21.15e
Kozarovce 48.20 18.30e
Kralovany 49.10 19.05e

Krupina 48.22 19.00e
Kuty 48.39 17.01e
Levice 48.14 18.35e
Levoca 49.01 20.35e
Liptovsky Mikulas 49.06 19.35e
Lucenec 48.20 19.40e
Malacky 48.26 17.01e
Martin 49.05 18.55e
Medzilaborce 49.17 21.50e
Michalany 48.33 21.40e
Michalovce 48.45 21.55e
Mincol* 49.14 21.00e
Mnisek 48.49 20.50e
Modry Kamen 48.16 19.17e
Myjava 48.45 17.35e
Namestovo 49.24 19.25e
Nitra 48.19 18.04e
Nizni Medzev 48.43 20.55e
Nova Bana 48.28 18.40e
Nove Mesto nad Vahom 48.45 17.50e
Nove Zamky 48.00 18.05e
Pezinok 48.17 17.15e
Piestany 48.35 17.50e
Plavecky Svaty Mikulas 48.30 17.20e
Plesivec 48.33 20.25e
Podolinec 49.16 20.30e
Pohorela 48.52 20.02e
Poltar 48.27 19.45e
Poprad 49.03 20.12e
Povazska Bystrica 49.08 18.25e
Presov 49.00 21.10e
Puchov 49.08 18.15e
Radosina 48.32 18.00e
Roznava 48.40 20.30e
Ruzomberok 49.04 19.15e
Rysy* 49.19 20.01e
Safarikovo 48.25 20.20e
Sahy 48.04 18.55e
Sala 48.10 17.50e
Senica 48.40 17.20e
Sered 48.19 17.45e
Simonka* 48.57 21.30e
Slovenske Pravno 48.52 18.39e
Spisska Nova Ves 48.58 20.35e
Spisske Podhradie 49.00 20.47e
Stakcin 49.00 22.13e
Starina 49.04 22.15e
Stropkov 49.12 21.40e
Sturovo 47.50 18.40e
Surany 48.04 18.10e
Tisovec 48.42 19.55e
Trebisov 48.39 21.40e
Trencin 48.53 18.00e
Trnava 48.23 17.35e
Turzovka 49.24 18.35e
Velke Kapusany 48.34 22.05e
Vlcany 48.03 17.55e
Vranov 48.54 21.40e
Vrutky 49.07 18.50e
Zeliezovce 48.02 18.40e
Zilina 49.14 18.40e
Zvolen 48.35 19.10e

SLO Slovenia

Ajdovscina 45.54 13.54e
Bled 46.22 14.07e
Bohinska Bistrica 46.46 13.59e
Bovec 46.20 13.33e
Brezice 45.55 15.37e
Brezno 46.36 15.18e
Celje 46.15 15.16e
Crni Vrh 46.29 15.21e
Crnomelj 45.53 15.10e
Dravograd 46.36 15.02e
Grintavec* 46.20 14.32e
Grosuplje 45.57 14.40e
Hodos 46.49 16.20e
Idrija 46.00 14.00e
Ilriska Bistrica 45.34 14.14e
Jesenice 46.26 14.02e
Kamnik 46.16 14.35e
Kanal 46.08 13.43e
Kobarid 46.16 13.35e
Kocevje 45.39 14.51e
Koper 45.31 13.44e
Kozina 45.35 13.58e
Kranj 46.15 14.20e
Kranjska Gora 46.29 13.48e
Lendava 46.34 16.28e
Ljubljana 46.04 14.30e
Ljutomer 46.31 16.11e
Maribor 46.34 15.38e
Metlika 45.39 15.19e
Murska Sobota 46.40 16.11e
Nova Gorica 45.57 13.39e
Novigrad 45.19 13.33e
Ormoz 46.25 16.10e
Pivka 45.39 14.21e
Postojna 45.46 14.12e
Ptuj 46.27 15.51e
Ribnica 45.44 14.44e
Rogaska Slatina 46.15 15.42e
Sezana 45.42 13.51e
Slovenska Bistrica 46.24 15.35e
Sneznik* 45.36 14.35e
Sostanj 46.23 15.04e
Tolmin 46.11 13.45e
Trbovlje 46.10 15.02e
Triglav* 46.21 13.59e
Velenje 46.23 15.08e
Vrhnika 45.58 14.15e
Zidani Most 46.05 15.11e

TR Turkey

Alcitepe 40.07 26.14e
Babaeski 41.26 27.06e
Bakirköy 40.59 28.52e
Boyalik 44.10 28.37e
Catalca 41.09 28.28e
Corlu 41.11 27.48e
Dambaslar 41.14 27.16e
Eceabat 40.12 26.22e
Edirne 41.40 26.34e
Enez 40.44 26.05e
Gelibolu 40.25 26.41e
Gökce (Gökceada) 40.12 25.54e
Havsa 41.32 26.49e
Igneada 41.50 28.01e
Istanbul 41.02 28.57e
Kesan 40.52 26.37e
Kirklareli 41.45 27.12e
Lalapasa 41.52 26.44e
Lüleburgaz 41.25 27.22e
Malkara 40.54 26.54e
Pinarhisar 41.37 27.32e
Saray (Istanbul) 41.27 27.56e
Sarieyr 41.11 29.03e
Sarköy 40.37 27.07e
Tekirdag 40.59 27.31e
Üsküp 41.44 27.23e
Uzunköprü 41.18 26.40e
Vize 41.34 27.45e

UKR Ukraine

Akhtyrka 50.19 34.54e
Alupka 44.26 34.02e
Alushta 44.41 34.24e
Amvrosiyevka 47.46 38.30e
Andreyovo-Ivanovka 47.28 30.29e
Apostolovo 47.40 33.45e
Askaniya Nova 46.27 33.53e
Astrakhanka 46.57 36.40e
Ay-Petri* 44.29 34.02e
Ayukaya* 44.54 34.44e
Bakhchisaray 44.44 33.53e
Balaklava 44.31 33.35e
Balakleya (Cherkassy) 49.14 31.43e
Balakleya (Kharkov) 49.27 36.53e
Barvenkovo 48.55 37.02e
Belgorod Dnestrovskiy 46.10 30.19e
Belogorsk 45.04 34.35e
Belokorovichi 51.04 28.00e
Belokurakino 49.33 38.46e
Belozerka 46.35 32.08e
Berdichev 49.54 28.39e
Berdyansk 46.45 36.47e
Berezany 50.23 31.32e
Berezdov 50.30 27.05e
Berezna 51.34 31.46e
Berezno 51.00 26.41e
Berezovka 47.12 30.56e
Bolshaya Lepetikha 47.09 33.59e
Bolshaya Novoselka 47.51 36.51e
Borki (Kharkov) 49.40 36.04e
Borki (Poltava) 50.06 34.14e
Borodyanka 50.38 29.58e
Borzna 51.15 32.25e
Bratslav 48.49 28.51e
Brody 50.05 25.08e
Brusilov 50.19 29.35e
Buki 49.02 30.25e
Chatyr-Dag 44.44 34.17e
Chemer 51.05 31.13e
Cherkassy 49.27 32.04e
Chernigov 51.30 31.18e
Chernigovka 47.11 36.12e
Chernobyl 51.17 30.15e
Chernomorskoye 45.30 32.40e
Chernovtsy 48.19 25.52e
Chigrin 49.04 32.38e
Chop 48.26 22.13e
Chortkov 49.01 25.42e
Chudnov 50.05 28.01e
Chulakovka 46.21 32.22e
Derazhyna 49.18 27.28e
Dikanka 49.50 34.32e
Dneprodzerzhinsk 48.30 34.37e
Dneprograd 47.26 34.59e
Dnepropetrovsk 48.29 35.00e
Donetsk 48.00 37.50e
Donuzlav, O.* 45.31 33.03e
Dozornoye 45.31 33.03e
Drogobych 49.30 48.45e
Dubrovitsa 51.38 36.40e

Dzhankoy 45.40 34.20e
Dzhurin 48.40 28.12e
Fastov 50.08 29.59e
Feodosiya 45.03 35.23e
Gaysin 48.50 29.29e
Gertsa 48.05 26.31e
Glinsk (Kirovgrad) 48.57 32.54e
Glinsk (Sumy) 50.39 33.20e
Gorlovka 48.17 38.05e
Gorodenka 48.40 25.30e
Gorodnitsa 50.50 27.19e
Gorokhov 50.30 24.46e
Granitnoye 47.28 37.15e
Grebenka 50.07 32.25e
Ivankov 50.59 29.50e
Ivano-Frankovsk (= Stanislavl) 48.40 24.40e
Ivanovka (Kherson) 46.43 34.35e
Ivanovka (Lugansk) 48.15 38.58e
Izmail 45.20 28.48e
Izyaslav 50.10 24.46e
Izyum 49.12 37.19e
Kalanchak 46.14 33.18e
Kalinovka 49.29 28.30e
Karlovka 49.28 35.09e
Kazantip, Mys* 45.29 35.53e
Kerch 45.22 36.27e
Kharkov 50.00 36.15e
Kherson 46.39 32.38e
Khmelev 50.58 33.22e
Khmelevoye 48.33 31.25e
Khmelnik 49.36 27.59e
Khmelnitskiy 49.25 26.59e
Khoten 51.05 34.47e
Khust 48.11 23.19e
Kirillovka 46.23 35.23e
Kirovo 47.38 35.43e
Kirovograd 48.31 32.15e
Kishenki 48.52 34.08e
Kiyev 50.25 30.30e
Kolki 51.09 25.40e
Kolomyya 48.31 25.00e
Konotop 51.15 33.14e
Koreiz 44.27 34.08e
Korets 50.39 27.10e
Korosten 51.00 28.30e
Kotovka 49.07 34.57e
Kotovsk 47.42 29.30e
Kovel 51.12 24.48e
Kovpyta 51.22 30.51e
Kozelets 50.54 31.09e
Kozelshchina 49.12 33.52e
Kramatorsk 48.43 37.33e
Krasnogvardeyskoye 45.31 34.16e
Krasnokutsk 50.03 35.13e
Krasnopavlovka 49.08 36.20e
Krasnoperekopsk 45.56 33.47e
Krasnopolye (Dnepropetrovks) 48.25 34.56e
Krasnopolye (Sumy) 50.46 35.16e
Krasnorechenskoye 49.13 38.15e
Krasnoselka 46.37 30.45e
Krasnyy Liman 49.00 37.50e
Krasnyy Luch 48.10 39.00e
Kremenchug 49.03 33.25e
Kremenets 50.05 25.48e
Kremenevka 47.20 37.30e
Krivoy Rog 47.50 33.24e
Krivoye Ozero 47.58 30.12e
Krolevets 51.34 33.24e
Kupyansk 49.41 37.37e
Kupyansk-Uzlovoy 49.37 37.40e
Lenino 45.17 35.46e
Letichev 49.21 27.32e
Liman 49.32 36.25e
Lipovets 49.11 29.01e
Lokhvitsa 50.25 33.16e
Lozovaya (Donetsk) 49.12 37.35e
Lozovaya (Kharkov) 48.54 36.20e
Lubny 50.01 33.00e
Lugansk (= Voroshilovgrad) 48.35 39.20e
Lutsk 50.49 25.15e
Lvov 49.50 24.00e
Lysyanka 49.16 30.49e
Lyubar 49.58 27.41e
Lyubeshov 51.42 25.32e
Malaya Viska 48.39 31.36e
Maleyevka 47.29 32.42e
Malin 50.48 29.08e
Marfovka 45.12 36.04e
Mariupol 47.05 37.34e
Melitopol 46.51 35.22e
Mirgorod 49.58 33.37e
Mironovka (Kharkov) 49.14 36.05e
Mironovka (Kiyev) 49.40 30.59e
Mizoch 50.30 25.50e
Mogilev 48.51 34.32e
Mogilev Podolskiy 48.29 27.49e
Molochansk 47.11 35.35e
Mukachevo 48.26 22.45e
Nadvornaya 48.37 24.30e
Narodichi 51.11 29.01e
Nesterov 50.04 24.00e
Nezhin 51.03 31.54e
Nikolayev (Lvov) 49.32 23.59e
Nikolayev (Nikolayev) 46.57 32.00e
Nikopol 47.34 34.25e
Novaya Kakhovka 46.45 33.20e
Novaya Ushitsa 48.00 27.12e
Novo Arkhangelsk 48.34 30.50e
Novo Troitskoye 46.21 34.21e
Novograd Volynskiy 50.34 27.32e
Novopskov 49.32 39.07e
Novyy Bug 47.40 32.30e
Novyy Bykov 50.33 31.38e
Obukhov 50.05 30.36e
Ochakov 46.37 31.33e
Odessa 46.30 30.46e
Olenevka 45.23 32.34e
Ordzhonikidze (Dnepropetrovsk) 47.39 34.08e
Ordzhonikidze (Krym) 44.58 35.22e
Orlinoye 44.27 33.45e
Ostrog 50.20 26.29e
Pavlograd 48.34 35.50e
Perekop 46.10 33.42e
Pervomaysk (Lugansk) 48.38 38.36e
Pervomaysk (Nikolayev) 48.03 30.50e
Petrovka (Kherson) 46.30 34.40e
Petrovka (Lugansk) 48.49 39.16e
Petrovo 48.19 33.15e
Petrovskoye 49.10 36.55e
Planerskoye 45.58 35.15e
Podgaytsy 49.19 25.10e
Poltava 49.35 34.35e
Priluki 50.35 32.24e
Primorskiy 45.09 35.30e
Pyatikhatki 48.32 33.43e
Radekhov 50.18 24.35e
Rakhov 48.03 24.10e
Rakitnoye 51.18 27.10e
Ratno 51.40 24.32e
Rava-Russkaya 50.15 23.36e
Razdolnoye 45.46 33.29e
Repki 51.47 31.06e
Rovenki 48.05 39.20e
Rovno 50.39 26.10e
Rozhishche 50.58 25.15e
Rozovka 47.23 37.04e
Sarny 51.21 26.31e
Semenovka (Chernigov) 52.08 32.36e
Semenovka (Poltava) 49.36 33.10e
Semenovka (Zaporozhye) 47.20 36.19e
Senkovo 49.31 37.40e
Sevastopol 44.36 33.31e
Severodonetsk 48.58 38.29e
Shepetovka 50.12 27.01e
Shostka 51.53 33.30e
Simferopol 44.57 34.05e
Skala-Podolskaya 48.51 26.11e
Skole 49.00 23.30e
Skvortsovo 45.05 33.50e
Slavgorod (Dnepropetrovsk) 48.05 35.30e
Slavgorod (Sumy) 50.36 35.22e
Slavyansk 48.51 37.36e
Sokal 50.30 24.10e
Solenoye 48.12 34.53e
Sosnitsa 51.31 32.31e
Sovetskiy 45.30 34.55e
Staraya Sinyava 49.35 27.39e
Staryy Krym (Crimea) 45.03 35.06e
Staryy Krym (Donetsk) 47.10 37.30e
Stepan 51.02 26.18e
Stryy 49.16 23.51e
Sudak 44.52 34.57e
Sumy 50.55 34.49e
Svatovo 49.24 38.11e
Tarashcha 49.35 30.20e
Tarkhankut, Mys* 45.28 32.30e
Ternopol 49.35 25.39e
Troitskoye (Lugansk) 49.54 38.16e
Tulchin° 48.40 28.51e
Uman 48.45 30.10e
Usovo 51.20 28.01e
Ustinovka 47.58 32.32e
Uzhgorod 48.38 22.15e
Valki 49.51 35.38e
Vasilkov 50.12 30.15e
Vasilkovka 48.13 36.02e
Vasilyevka 47.26 35.16e
Veselyye Terny 48.04 33.35e
Vinnitsa 49.11 28.30e
Vladimir Volynskiy 50.51 24.19e
Vladimirets 51.28 26.03e
Volchansk 50.19 36.55e
Volkovintsky 49.12 27.40e
Volnoyakha 47.36 37.32e
Voykovo 45.31 33.54e
Voznesensk 47.34 31.21e
Yagotin 50.51 31.45e
Yalta (Crimea) 44.30 34.09e
Yalta (Donetsk) 46.56 37.18e
Yampol (Donetsk) 48.55 37.59e
Yampol (Lvov - Zhitomir) 49.59 26.29e
Yampol (Sumy) 51.55 33.50e
Yasinya 48.12 24.20e
Yenakiyevo 48.14 38.15e
Yevpatoriya 45.12 33.20e
Zaporozhye 47.50 35.10e
Zbarazh 49.40 25.49e
Zborov 49.40 25.09e
Zhdany 50.12 33.14e
Zhitomir 50.18 28.40e
Zhmerinka 49.00 28.02e
Zlynka 48.27 31.23e
Zolochev (Kharkov) 50.18 36.00e
Zolochev (Lvov) 49.48 24.51e
Zuya 45.03 34.18e

V Vaticano

Citta del Vaticano 41.53 12.30e

YU Yugoslavia

Aleksandrovac 43.28 21.03e
Aleksinac 43.31 21.42e
Alibunar 45.05 20.57e
Andrijevica 42.45 19.48e
Apatin 45.40 19.00e
Arandelovac 44.19 20.35e
Arilje 43.44 20.07e
Backa Petrovo Selo 45.41 20.04e
Backa Topola 45.49 19.39e
Bajina Basta 43.58 19.35e
Bajmok 45.57 19.24e
Banatsko Novo Selo 44.59 20.49e
Bar 42.05 19.06e
Becej 45.36 20.04e
Bela Crkva 44.54 21.25e
Bela Palanka 43.13 22.17e
Beljanica* 44.08 21.43e
Beograd 44.50 20.30e
Besna Kobila* 42.31 22.11e
Bezdan 45.50 18.57e
Bijelo Polje 43.03 19.42e
Boka 45.21 20.50e
Bor 44.05 22.06e
Bosilegrad 42.30 22.37e
Brodarevo 43.14 19.44e
Brza Palanka 44.30 22.25e
Budva 42.17 18.50e
Bujanovac 42.27 21.46e
Cacak 43.54 20.22e
Cajetina 43.47 19.42e
Cetinje 42.25 18.56e
Crepaja 45.01 20.38e
Crna Trava 42.49 22.19e
Cuprija 43.56 21.21e
Dakovica 42.22 20.26e
Danilovgrad 42.34 19.06e
Dardevica Tara 43.12 19.20e
Debrc 44.38 19.53e
Deceni 42.30 20.19e
Deli Jovan* 44.13 22.09e
Devica* 43.36 21.55e
Dimitrovgrad 43.00 22.47e
Donji Milanoca 44.28 22.06e
Goransko 43.07 18.51e
Gornji Milanovac 44.01 20.29e
Gusinje 42.35 19.50e
Herceg Novi 42.26 18.35e
Indija 45.03 20.06e
Ivangrad 42.51 19.50e
Ivanjica 43.35 20.12e
Janjevo 42.33 21.15e
Jasa Tomic 45.26 20.50e
Kacanik 42.14 21.15e
Kanjiza 46.03 20.04e
Kikinda 45.50 20.30e
Kitka* 42.40 21.41e
Kladovo 44.36 22.33e
Knjazevac 43.35 22.12e
Koceljevo 44.28 19.50e
Kolasin 42.50 19.31e
Komovi* 42.51 19.38e
Kotor 42.27 18.46e
Kovren 43.12 19.34e
Kragujevac 44.01 20.55e
Kraljevo 43.44 20.41e
Krupanj 44.21 19.21e
Krusevac 43.34 21.20e
Kucevo 44.30 21.40e
Kula 45.37 19.32e
Kumanica 43.28 20.16e
Kursumlija 43.09 20.17e
Lajkovac 44.22 20.13e
Lapovo 44.10 21.02e
Lebane 42.56 21.45e
Leskovac 43.00 21.57e
Lesnica 44.40 19.20e
Lipljan 42.30 21.06e
Ljuboten* 42.11 21.09e
Lovcen* 42.23 18.49e
Majdanpek 44.24 21.54e
Maljen* 44.09 20.01e
Margita 45.12 21.05e
Medveda 42.50 21.32e
Metohija* 42.37 20.34e
Midzor* 43.24 22.40e
Minicevo 43.42 22.18e
Mladenovac 44.29 20.41e
Mokrin 45.56 20.26e
Morovic 45.00 19.13e
Negotin 44.14 22.32e
Niksic 42.48 18.56e
Nis 43.20 21.54e
Njegos* 42.55 18.42e
Novi Pazar 43.09 20.29e
Novi Sad 45.15 19.51e
Novo Milosevo 45.42 20.20e
Obrenovac 44.40 20.11e
Odzaci 45.30 19.17e
Orahovac 42.24 20.40e
Padej 45.50 20.11e
Pancevo 44.52 20.40e
Paracin 43.51 21.25e
Pec 42.40 20.19e
Perlez 45.11 20.22e
Petrovac (Montenegro) 42.11 18.56e
Petrovac (Serbia) 44.24 21.25e
Pirot 43.10 22.32e
Plavnica 42.17 19.13e
Pljevlja 43.21 19.21e
Podgorica (= Titograd) 42.28 19.17e
Podujevo 42.54 21.10e
Povlen* 44.07 19.44e
Pozarevac 44.37 21.12e
Presevo 42.16 21.37e
Priboj 43.35 19.32e
Prijepolje 43.23 19.39e
Pristina 42.39 21.10e
Prizren 42.12 20.43e
Prokuplje 43.14 21.35e
Radan* 43.00 21.29e
Radojevo 45.42 30.46e
Raska 43.17 20.37e
Ravna Reka 44.00 21.35e
Risan 42.32 18.42e
Rudnik* 44.07 20.35e
Ruma 45.01 19.50e
Sabac 44.45 19.41e
Savnik 42.58 19.06e
Senta 45.50 20.06e
Sid* 45.06 19.16e
Sjenica 43.16 20.00e
Smederevo 44.40 20.56e
Sombor 45.46 19.09e
Srbobran 45.32 19.48e
Sremska Mitrovica 44.59 19.39e
Sremska Raca 44.55 19.19e
Stozac* 42.49 19.14e
Streser* 42.38 22.11e
Subotica 46.04 19.11e
Surdulica 42.41 22.11e
Suva Reka 42.21 20.50e
Svilajnac 44.15 21.11e
Svrljig 43.25 22.06e
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Temerin 45.53 19.54e
Titova Mitrovica 42.54 20.52e
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Vrdnik 45.06 19.49e
Vrsac 45.07 21.19e
Zajecar 43.55 22.16e
Zeljin* 43.29 20.46e
Zlot 44.01 21.59e
Zrenjanin 45.22 20.23e

5 Distribution maps

Generally speaking, three recording periods are recognised in this atlas:

1. Before 01 January 1951 symbol ○
2. From 01 January 1951 until 31 December 1980 symbol ◒
3. After 31 December 1980 symbol ●

On the distribution maps recording periods are not combined: the latest record has always priority. This means that observation from the third period overrides the one from the second period and observation from the second period overrides the one from the first period. This principle keeps the distribution maps up-to-date, which is important for the conservation of species.

Butterflies are being recorded in several European countries since the seventies, commencing soon after the first computer aided butterfly distribution atlas was published in Great Britain (HEATH 1970). Regretably the European national mapping schemes follow the individual time patterns. Distribution data extracted or converted from the national data banks form from a practical point of view a substantial proportion of the MEB data bank. The interpretation of data bank periods utilised by certain national data banks made necessary to undertake the following compensations:

Austria (REICHL 1992): First period contains data until 31 December 1959. Second period contains only original data provided directly by recorders (i.e. no data bank data). The third period contains data banks records made since 01 January 1960. All doubtful records ignored.

Finland (HULDEN 2000): Data bank records are interpreted as the third period, except for a few known extinctions. There are no substantial extinctions.

France (DELMAS, MAECHLER & SIBERT 1999): All records made before 01 January 1970 are interpreted as the second period. All records made after 31 December 1969 are interpreted as the third period. There are no first period data bank records.

Poland (BUSZKO 1997): The national recording scheme contains no data older than 01 January 1980. There are no substantial older data provided directly by MEB recorders from Poland.

There were no significant problems with the interpretation of records from any of the remainig data banks. Without the utilisation of data bank records, the range of many a common or widespread species would appear relatively restricted and thus misleading; this is because such species are very often neglected by many lepidopterists.

The distribution maps do not contain three groups islands situated in the Atlantic Ocean: The Azores, Canary Islands and Madeira Islands. Butterfly species inhabiting these islands are shown in a separate distribution table. The reason for this arrangement is the small size of these islands: the dot indicating the occurrence of a species is larger than many an island owing to the same map scale as the standard map of Europe used in this Atlas. Figure 1, 2 or 3 indicates the period of the latest observation of the species.

The Azores

1 = Corvo, 2 = Faial, 3 = Flores, 4 = Graciosa, 5 = Pico, 6 = Santa Maria, 7 = Sao Jorge, 8 = Sao Miguel, 9 = Terceira.

↓ Species	Island →	1	2	3	4	5	6	7	8	9
Colias crocea		3	3	3	3	3	3	3	3	3
Danaus plexippus						1			1	
Hipparchia azorina		3	3	3		3		3		3
Lampides boeticus			3		3	3	3	3	3	3
Pieris brassicae		3	3	3	3	3	3	3	3	3
Vanessa atalanta		3	3	3	3	3	3	3	3	3
Vanessa cardui			3	3			3		3	3

Canary and Madeira Islands

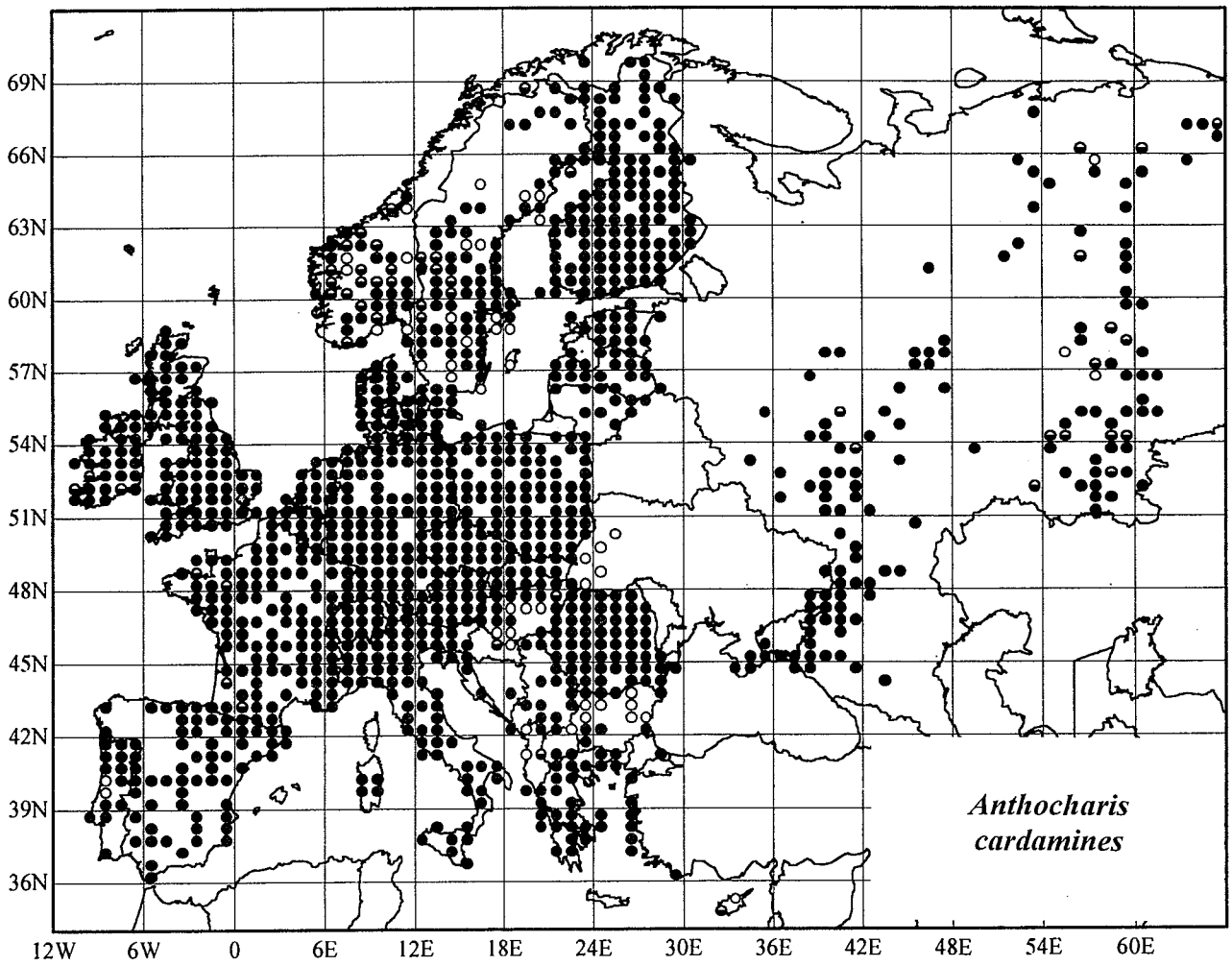
1 = Fuerteventura, 2 = Gomera, 3 = Gran Canaria, 4 = Hiero, 5 = Lanzarote, 6 = La Palma, 7 = Tenerife, 8 = Madeira and/or Porto Santo

↓ Species Island →	1	2	3	4	5	6	7	8
Argynnis pandora		3		3		3	3	
Aricia cramera		3	3	3		3	3	
Azanus ubaldus			3					
Catopsilia florella	3	3	3		3	3	3	
Colias crocea	3	3	3	3	3	3	3	3
Cyclirius webbianus		3	3	3		3	3	
Danaus chrysippus		3				3	3	
Danaus plexippus	3	1	3	3		3	3	
Euchloe belemia	3		3				3	
Euchloe charlonia	3				3			
Gonepteryx cleobule		3				3	3	
Gonepteryx maderensis								3
Hipparchia bacchus				3				
Hipparchia gomera		3						
Hipparchia maderensis								3
Hipparchia tilosi						3		
Hipparchia wyssii			3				3	
Hypolimnas misippus		3					1	
Issoria lathonia								3
Lampides boeticus								3
Lycaena phlaeas								3
Maniola jurtina		3	3	3			3	
Pararge aegeria								3
Pararge xiphia								3
Pararge xiphioides		2	3			3	3	
Pieris brassicae					3			3
Pieris cheiranthi		2				3	7	
Pieris daplidice	3	3	3	3	2	3	3	
Pieris rapae	3	3	3	3	3	3	3	3
Polyommatus icarus	3				3		3	
Thymelicus acteon		2	3	3		3	3	
Vanessa atalanta	3	3	3	3	3	3	3	3
Vanessa cardui	3	3	3	3	3	3	3	3
Vanessa virginensis		2	2				3	
Vanessa vulcania		3	3	3		3	3	3
Zizeeria knysna	2	3	3	2		3	3	

The distribution maps are arranged alphabetically according to their genus and species names. Some species had to be lumped as 'complex':

Euchloe ausonia complex contains *E. ausonia, E. crameri* and *E. simplonia.*
Leptidea sinapis complex contains two sibling species *L. reali* and *L. sinapis.*
Pieris daplidice complex contains *P. daplidice* and *P. edusa.*
Polyommatus dolus complex contains two species (?) *P. dolus* and *P. virgilius.*
Pyrgus alveus complex contains *P. accretus, P. alveus* and *P. trebevicensis.*
Pyrgus malvae complex contains *P. malvae* and *P. malvoides.*

The reasons for the adoption of this treatment are explained and discussed elsewhere..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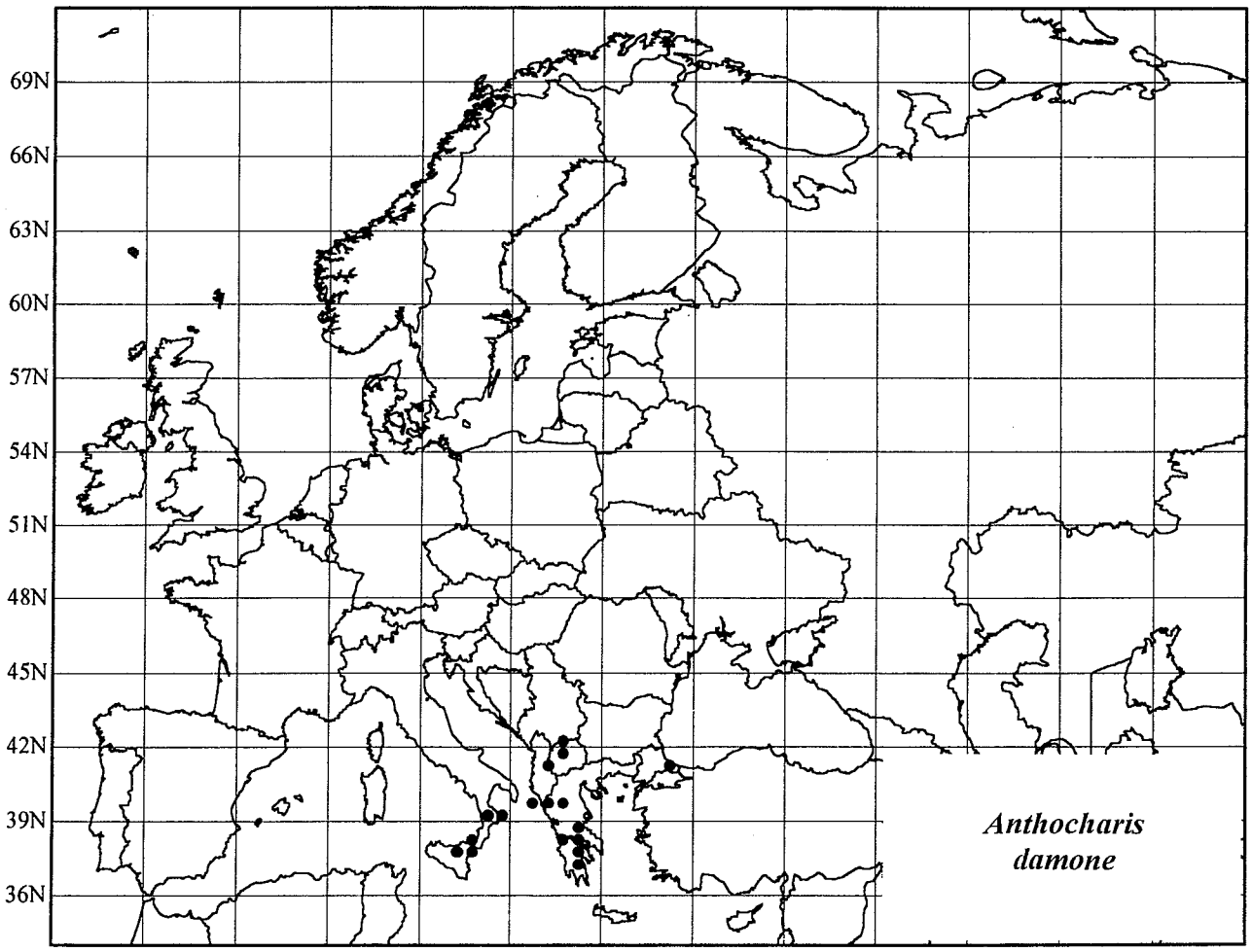
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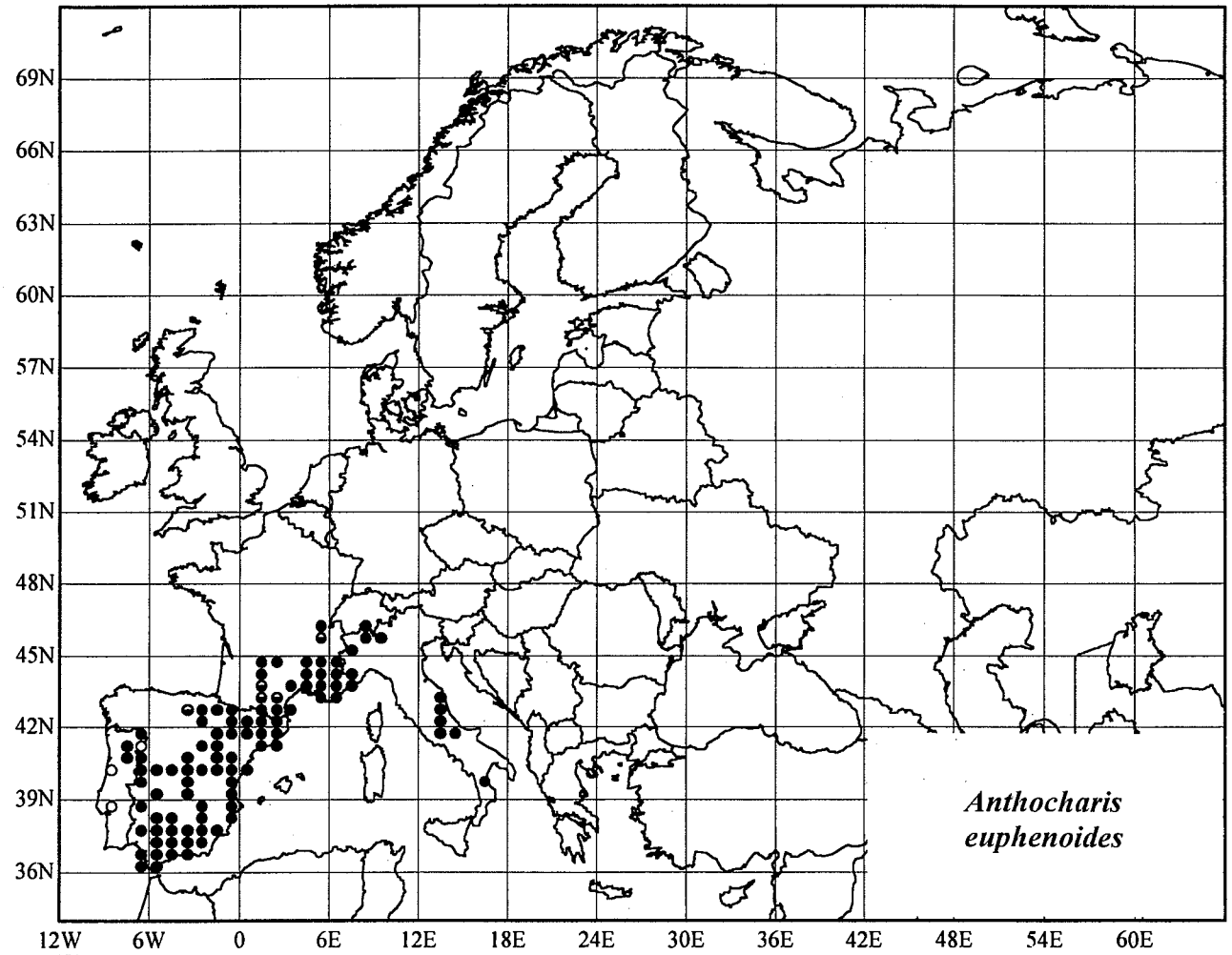
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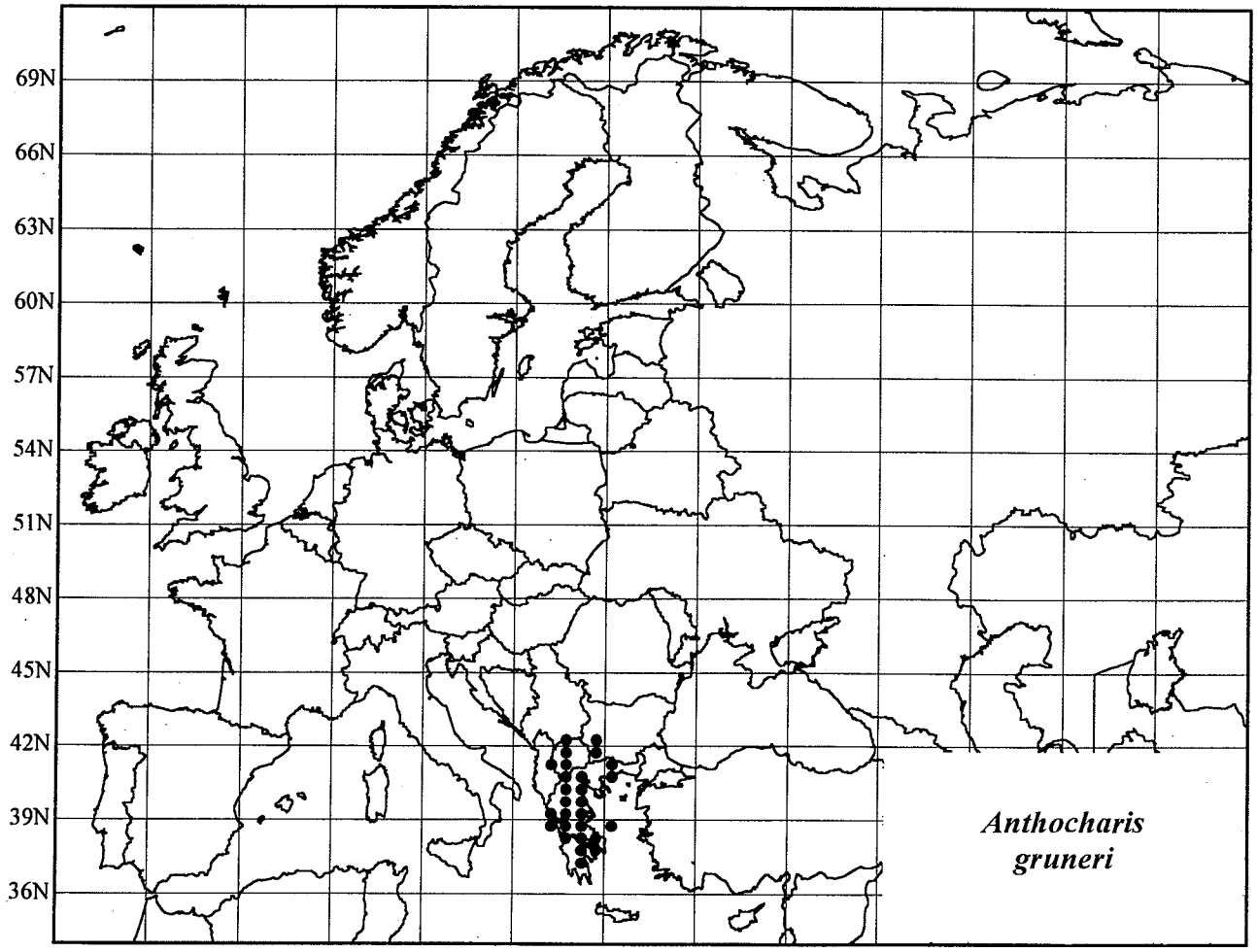
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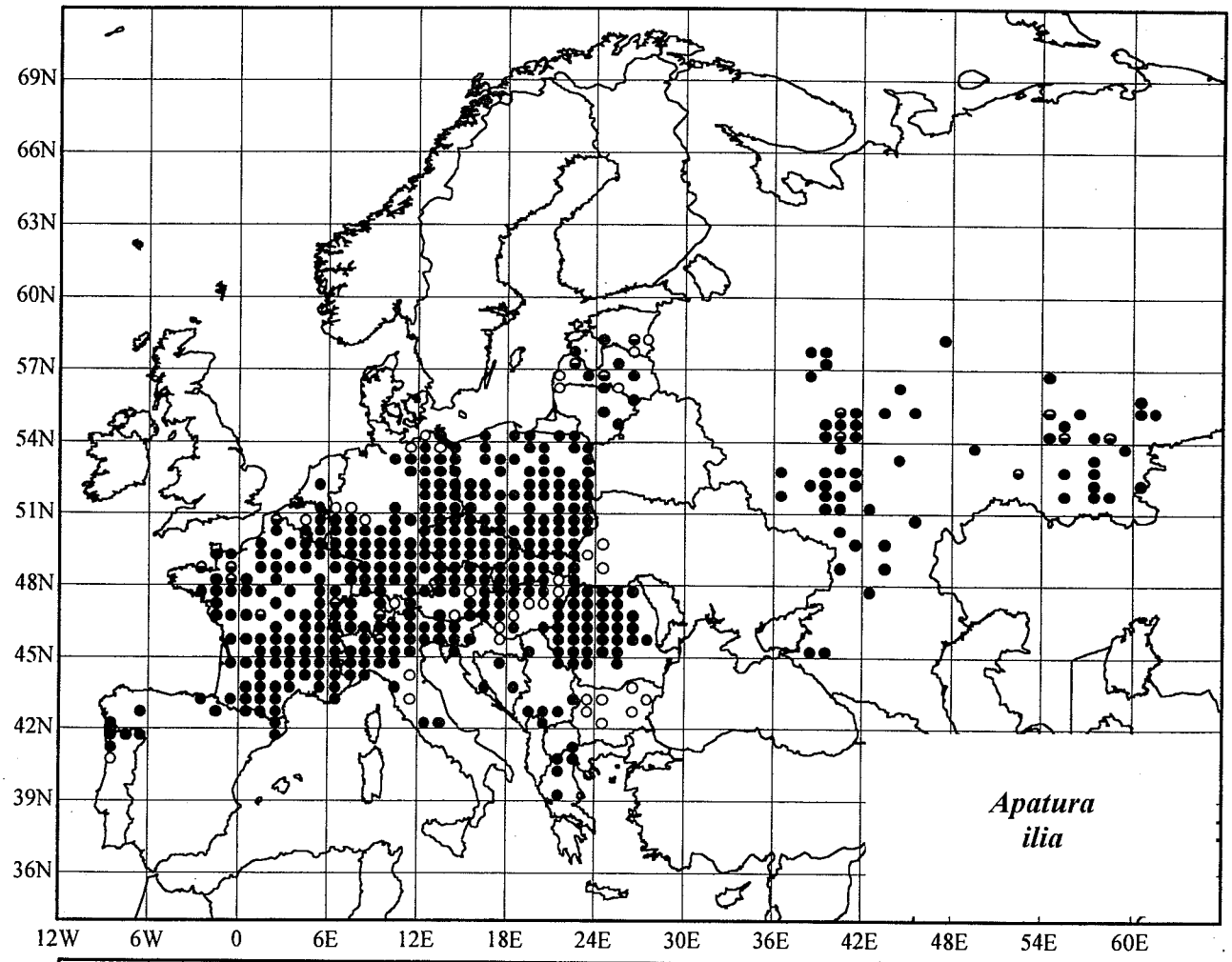
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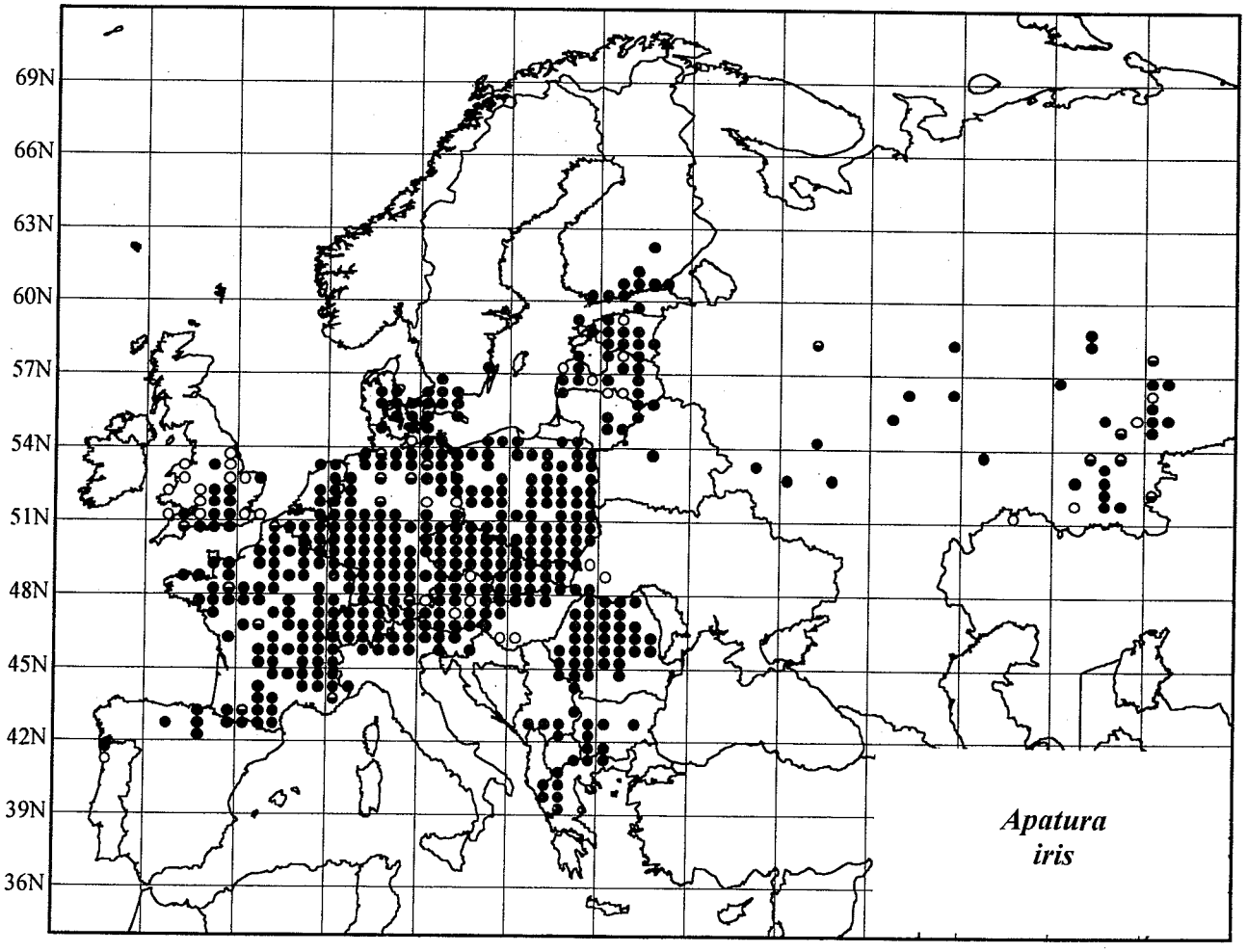
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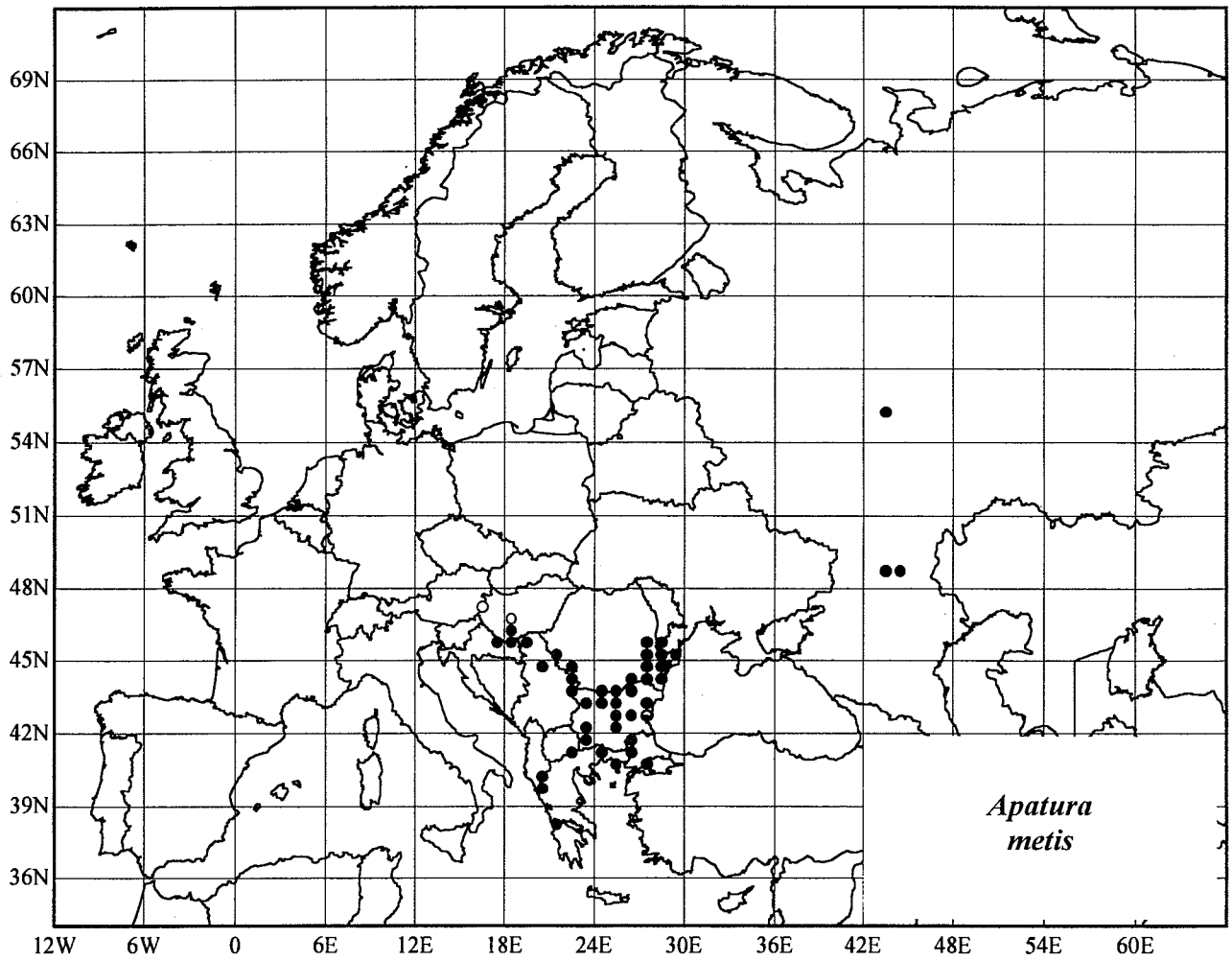
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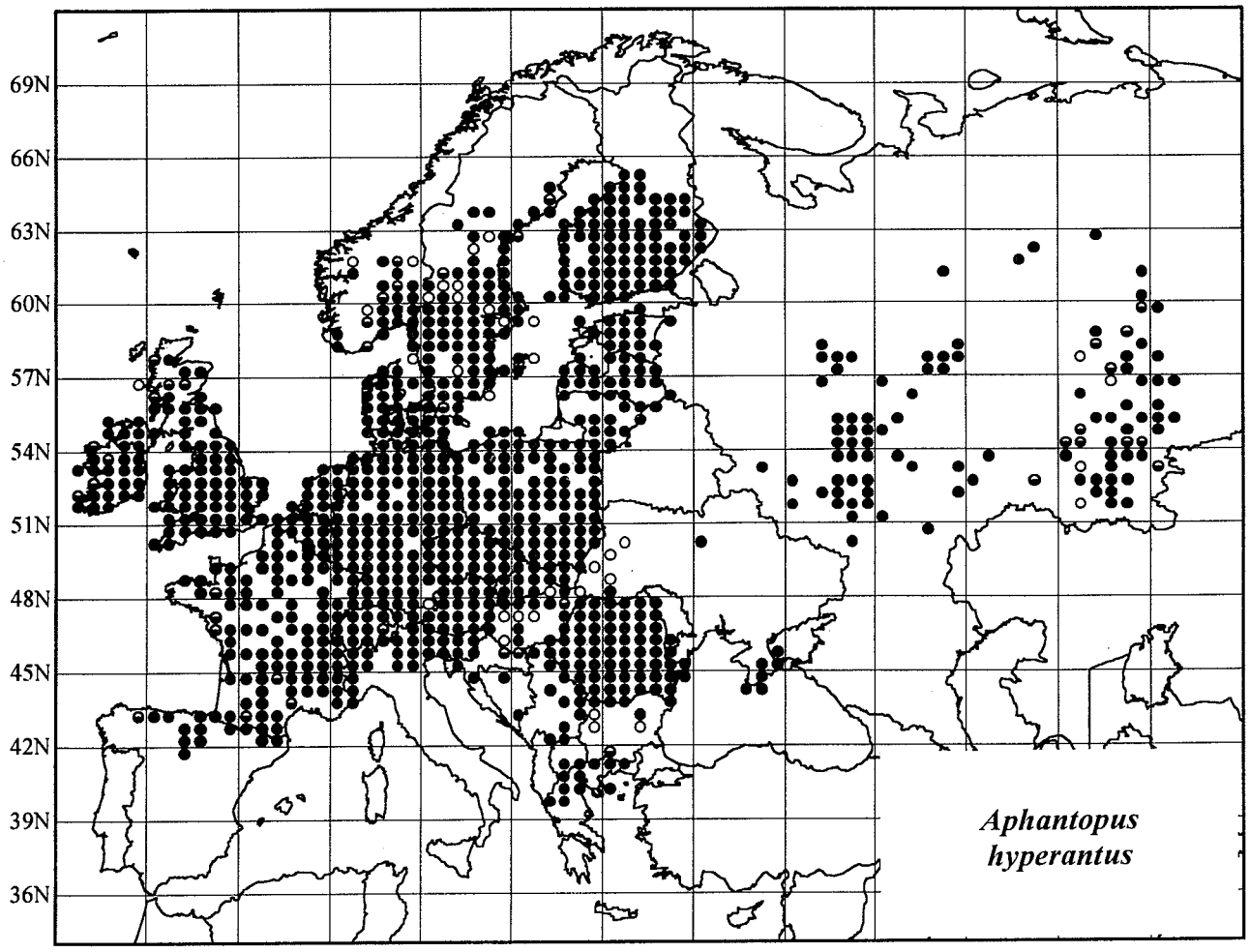
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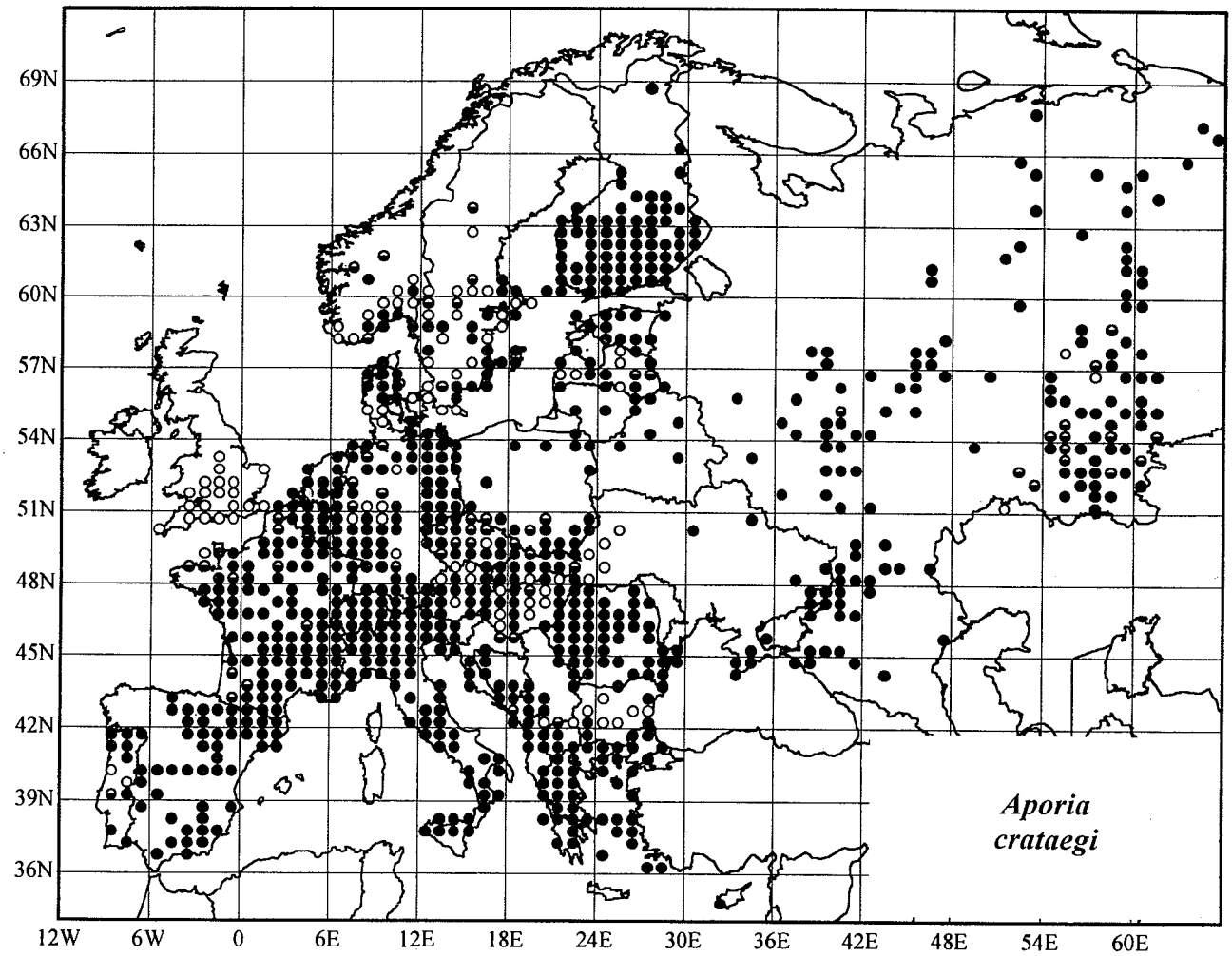
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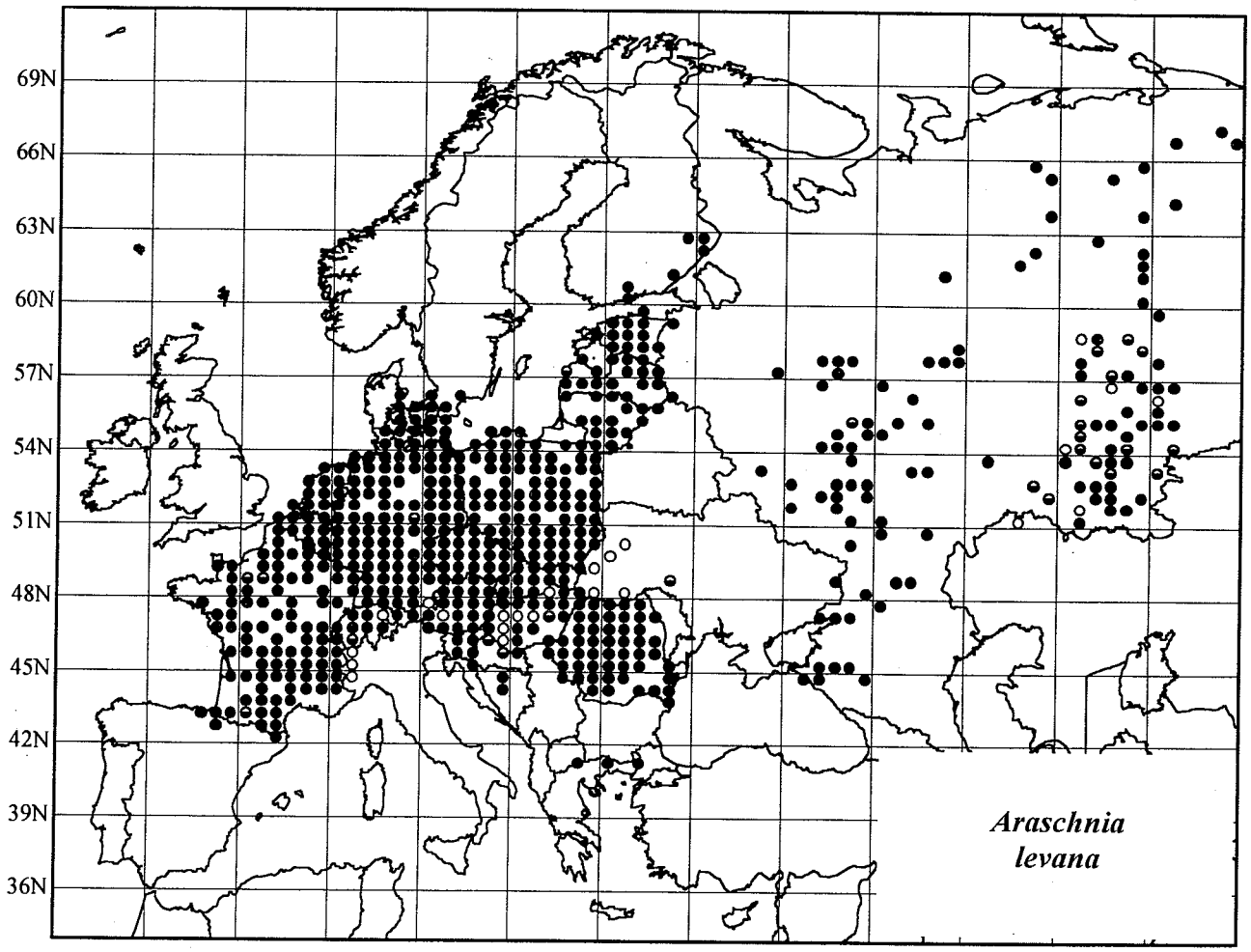
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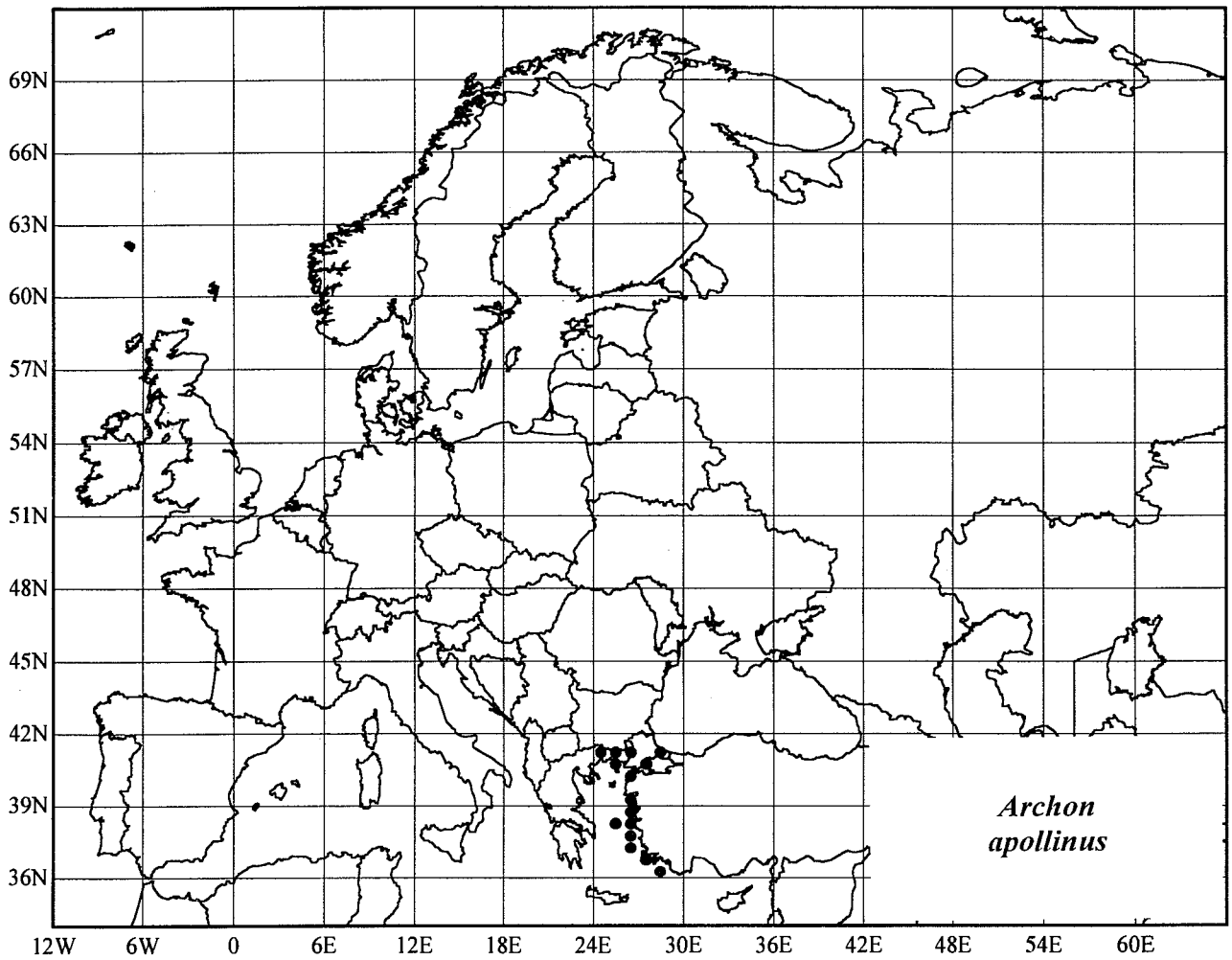
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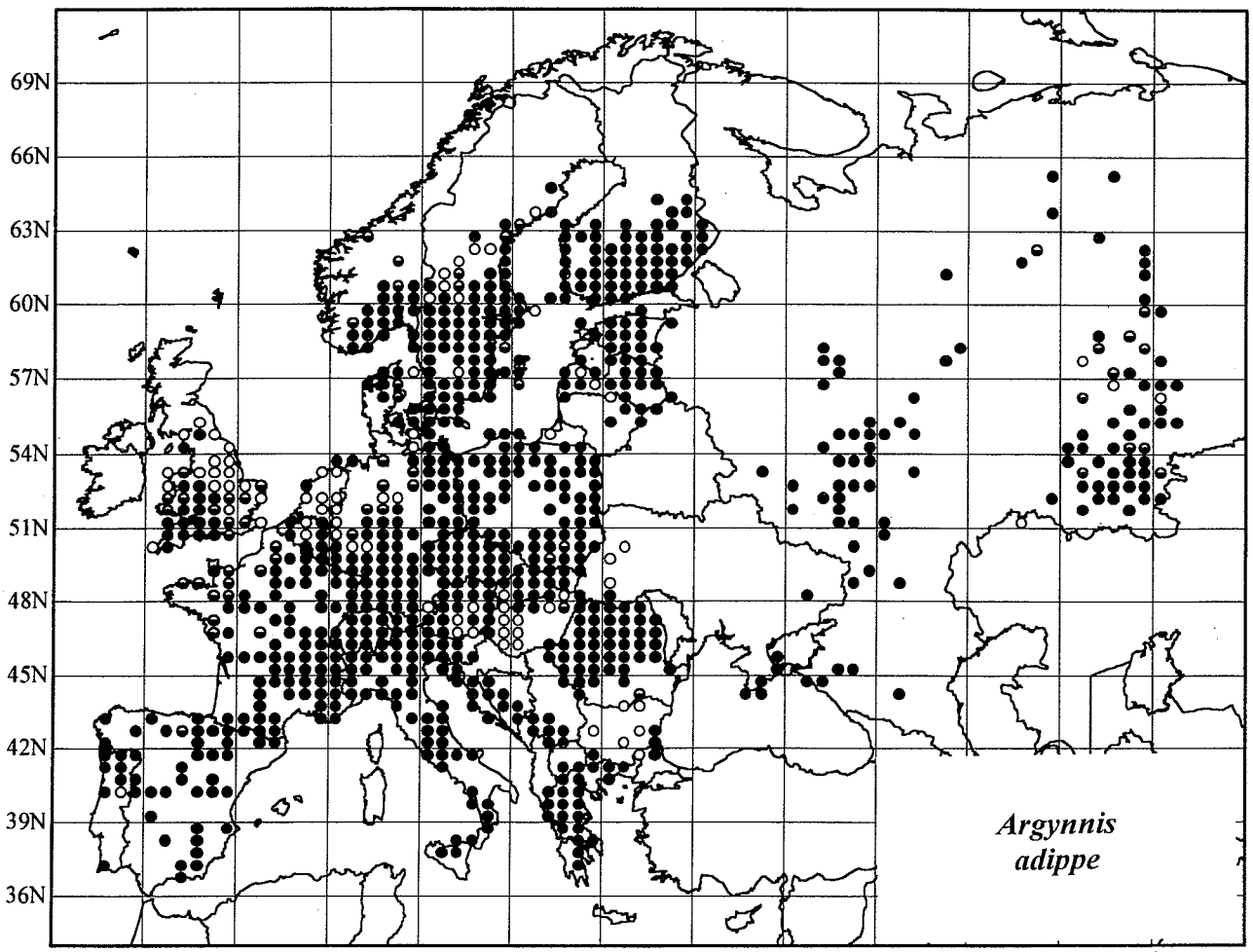
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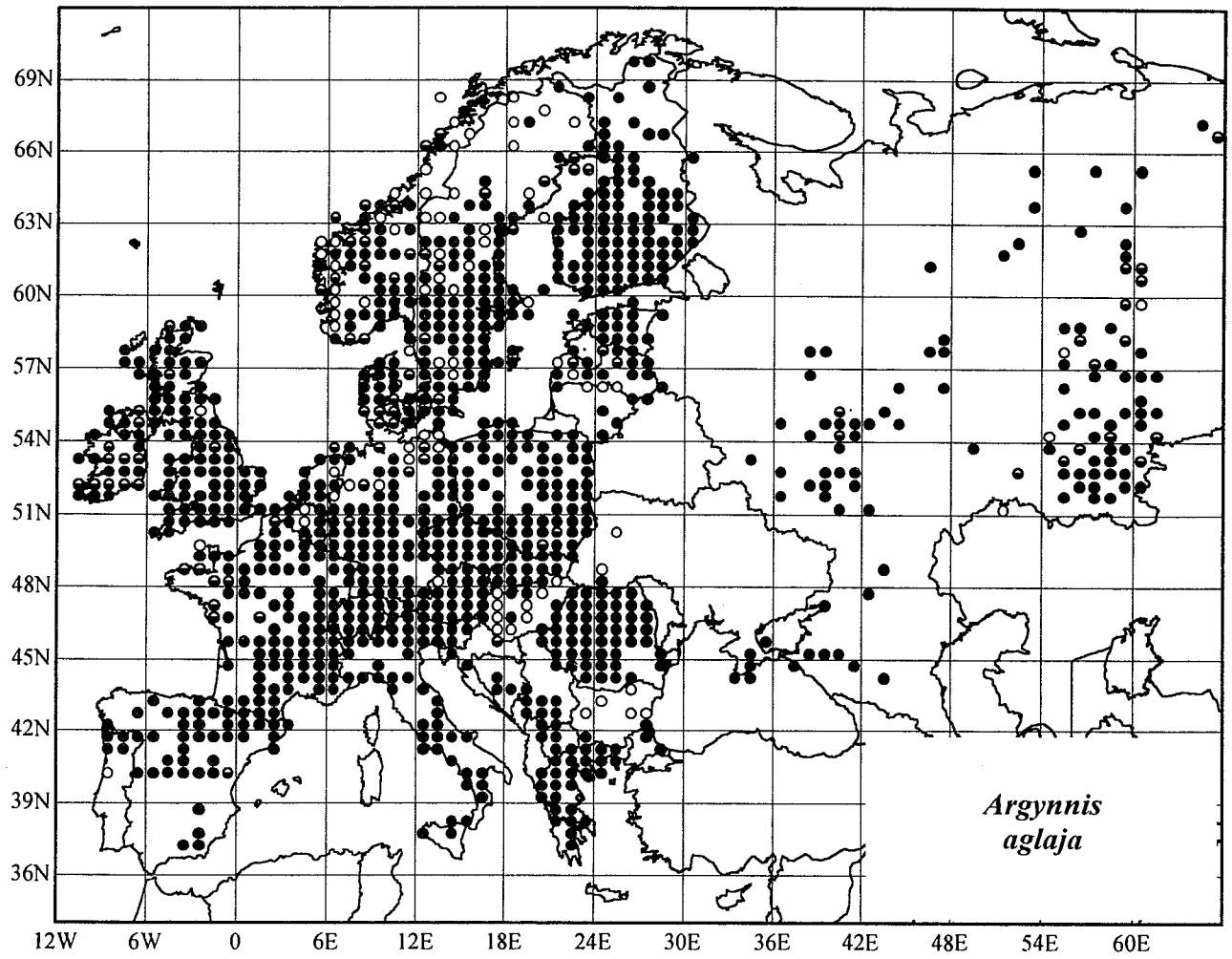
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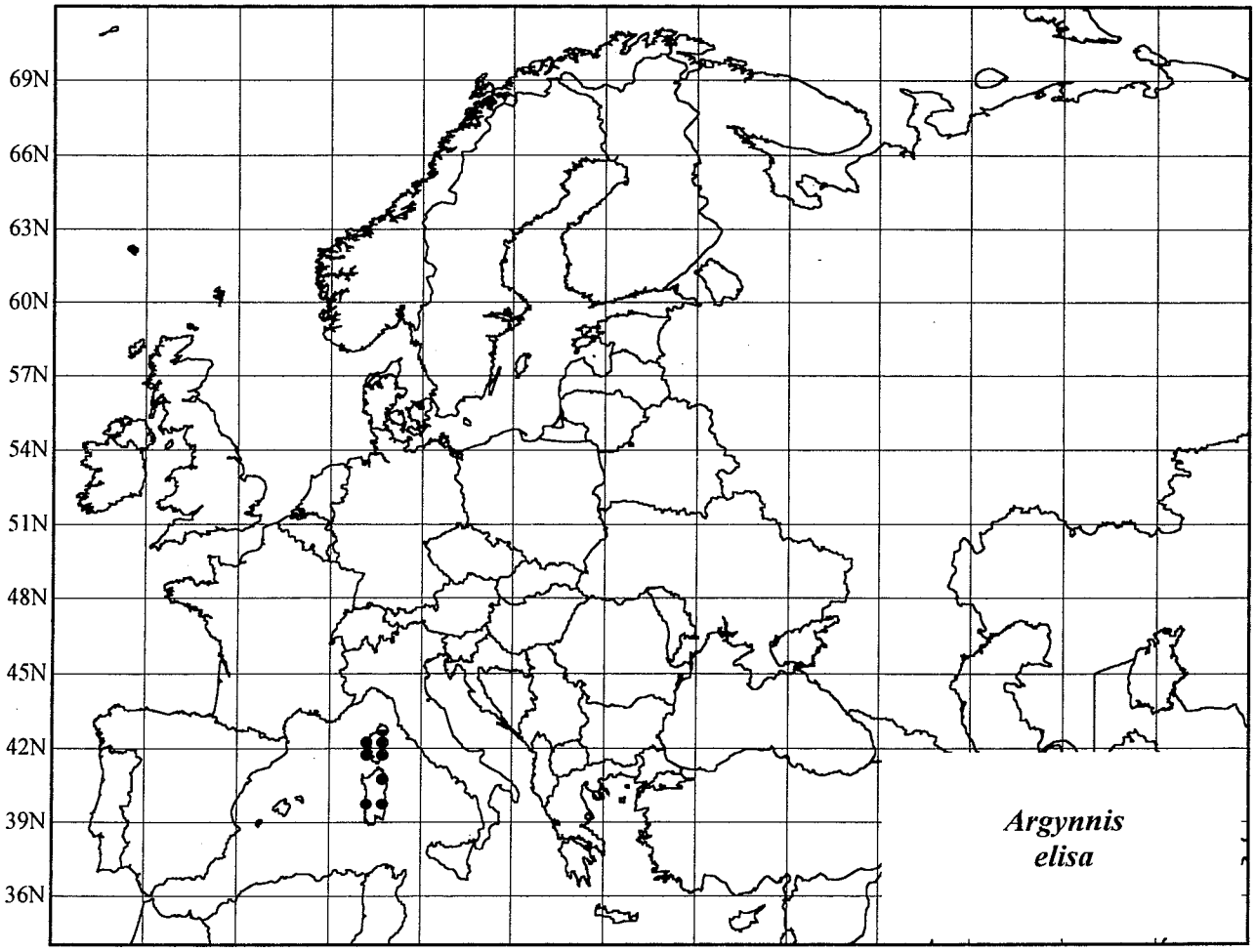
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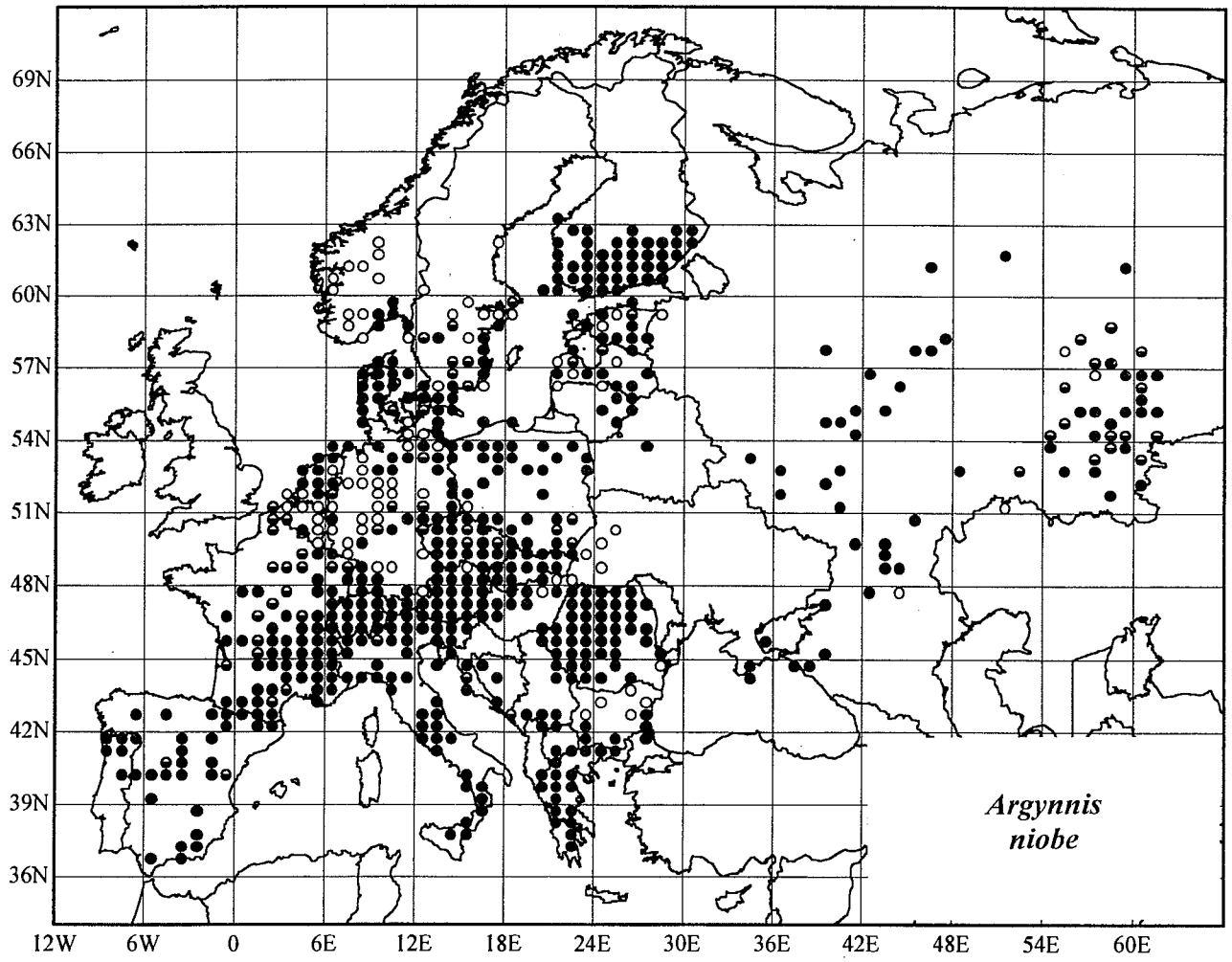
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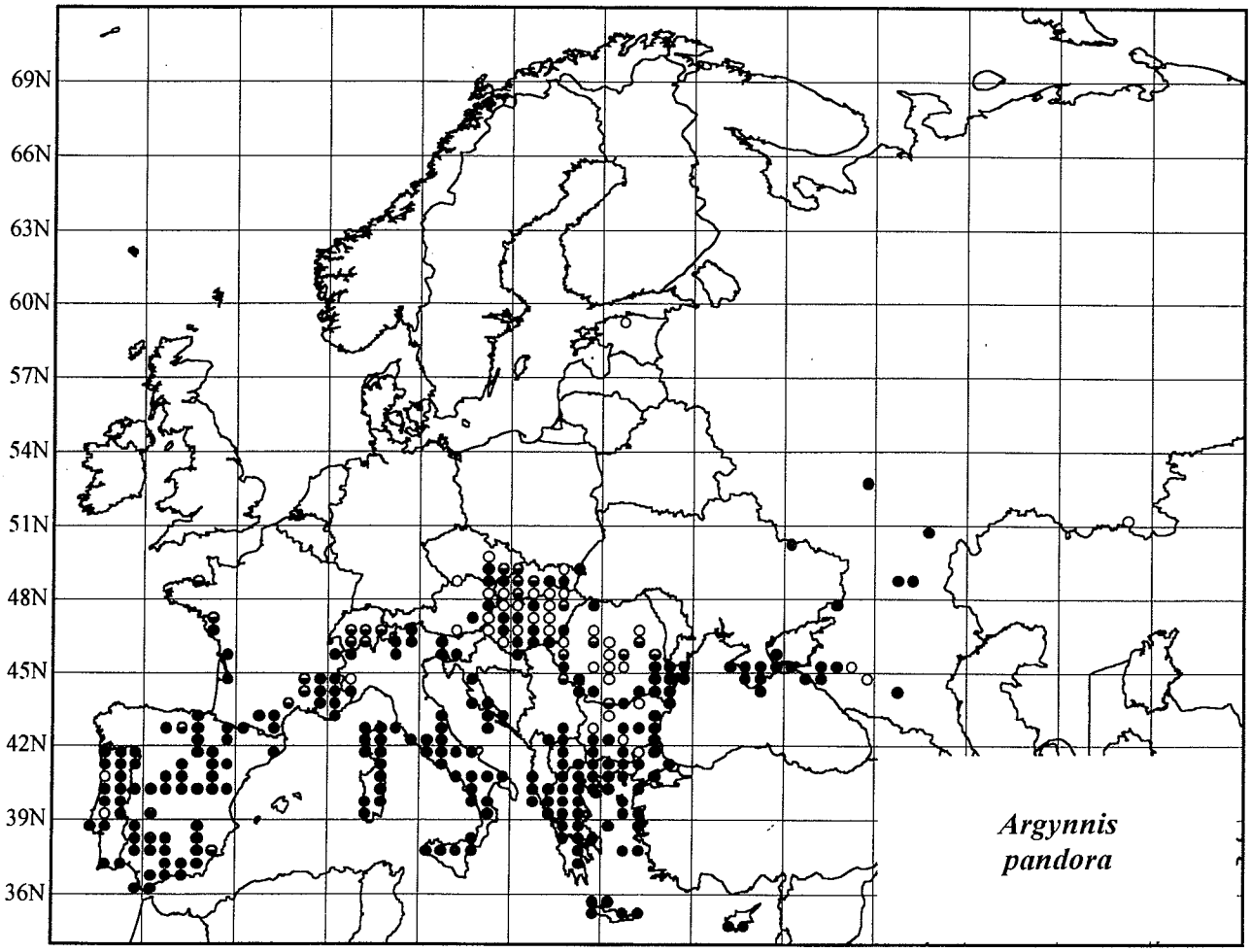
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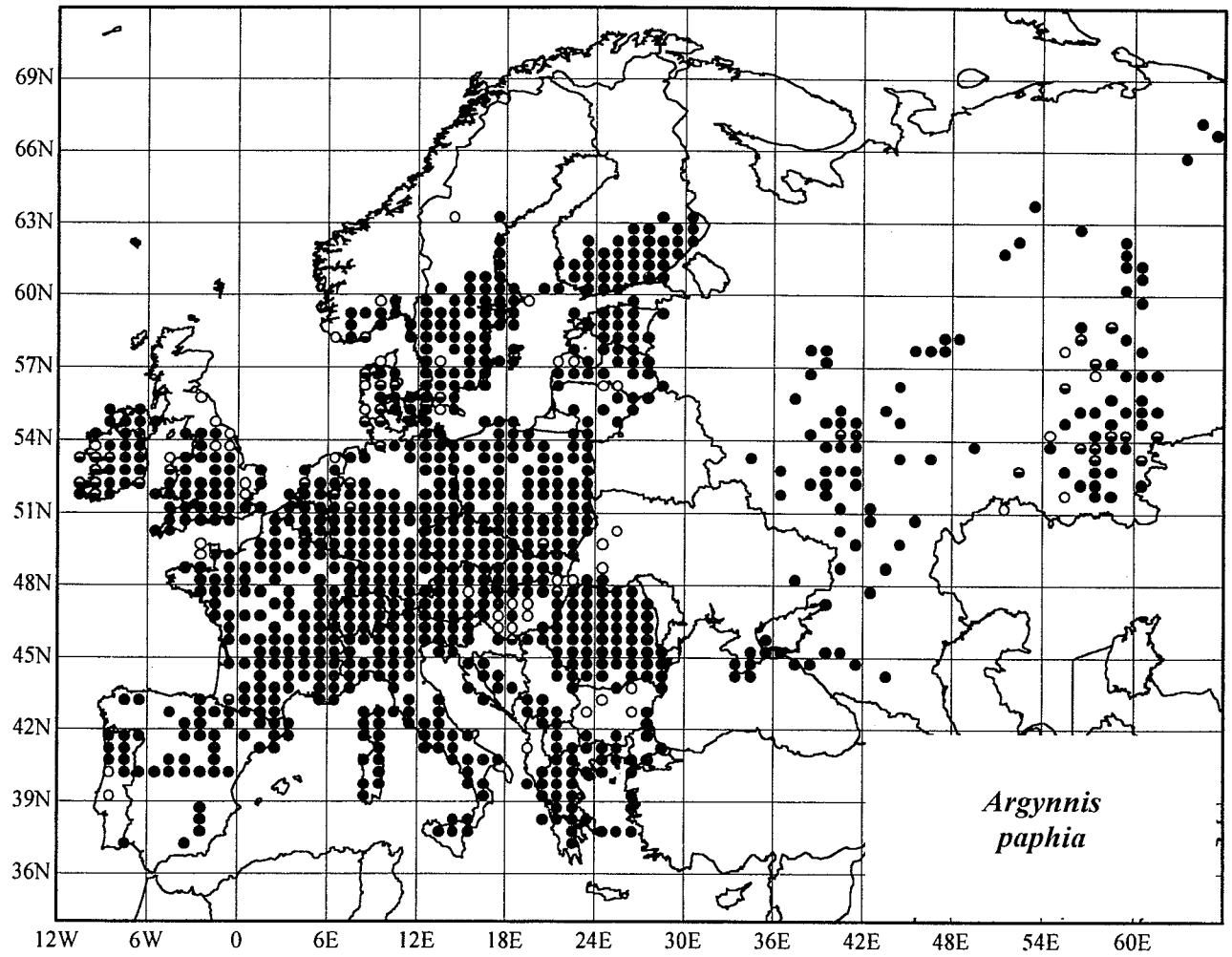
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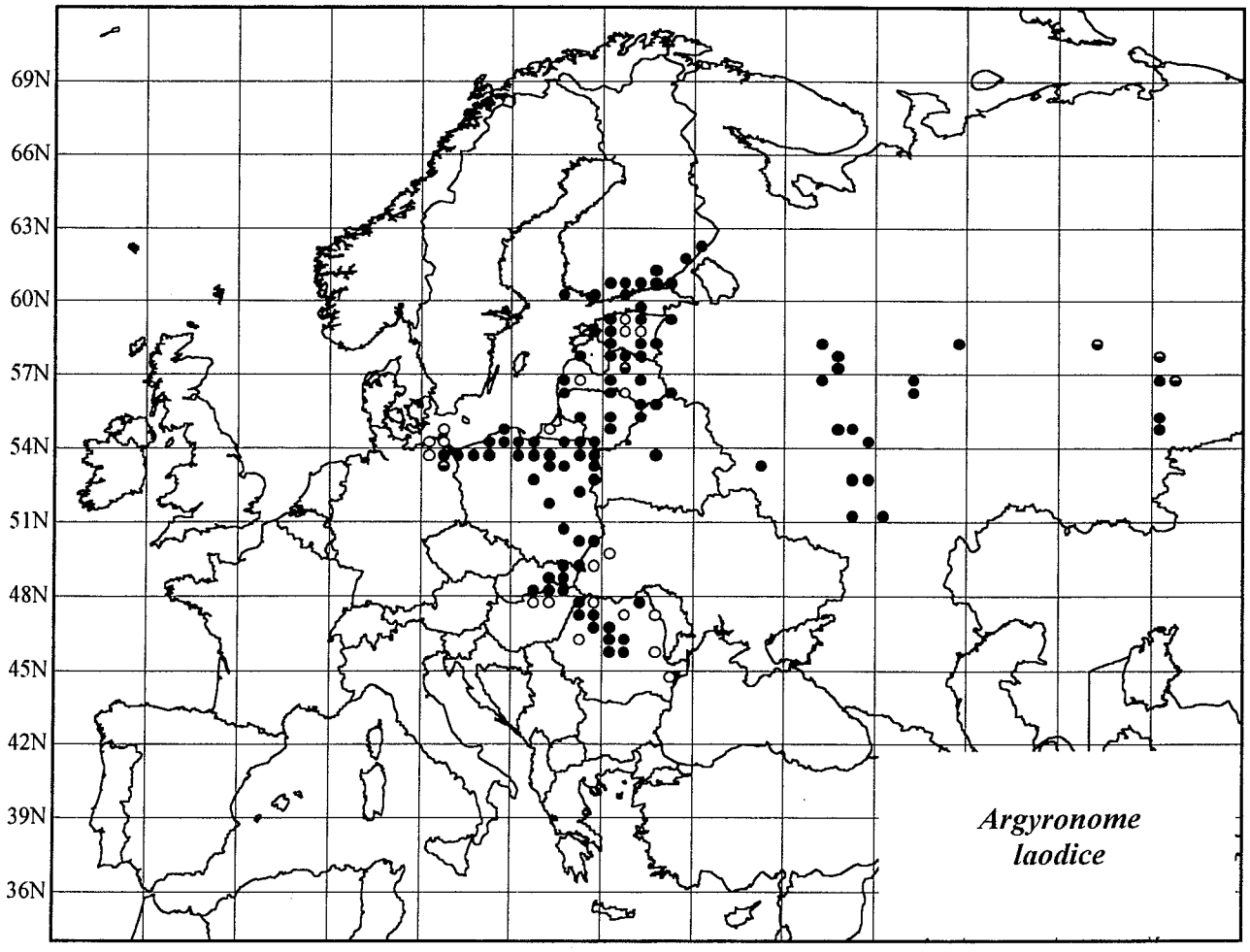
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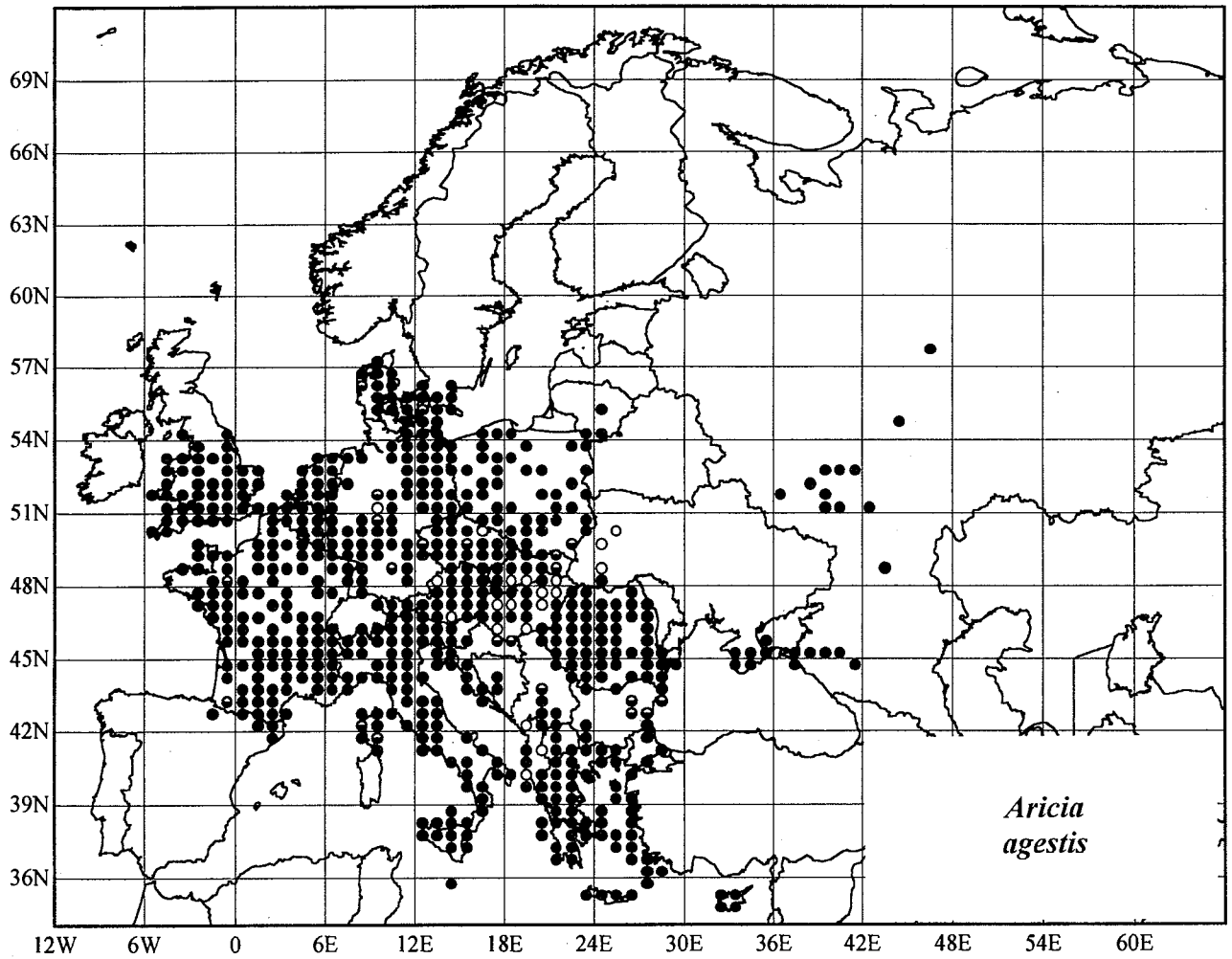
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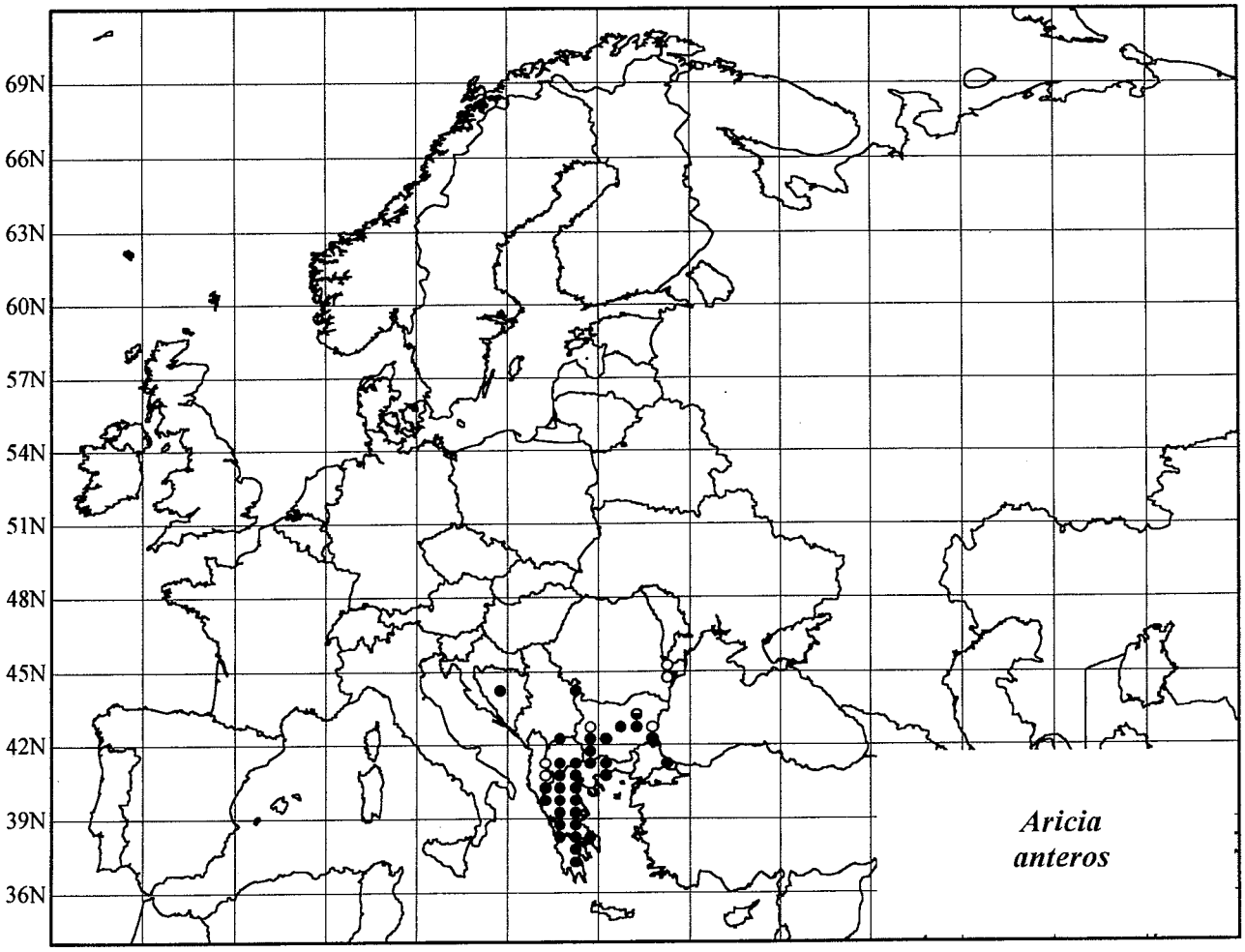
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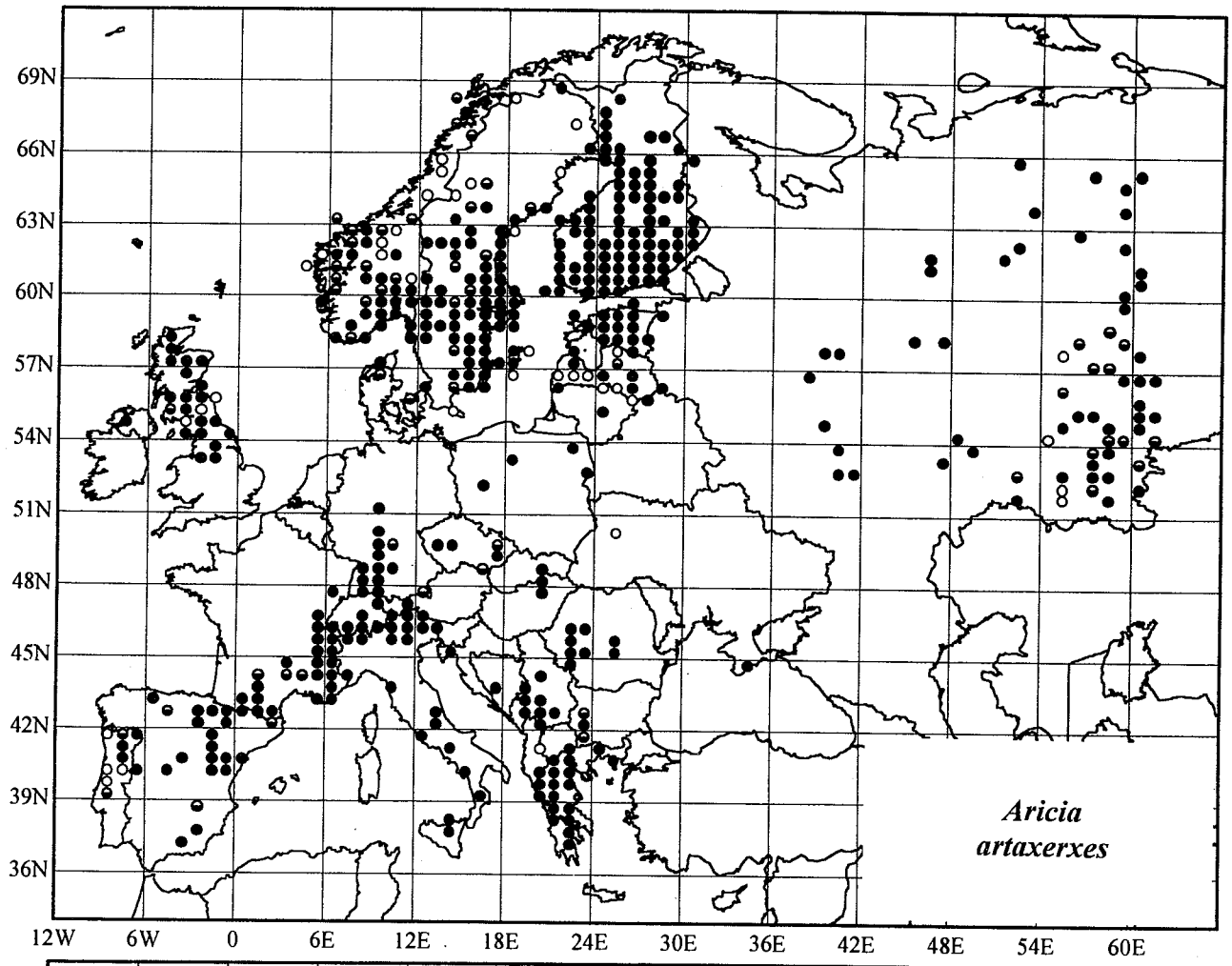
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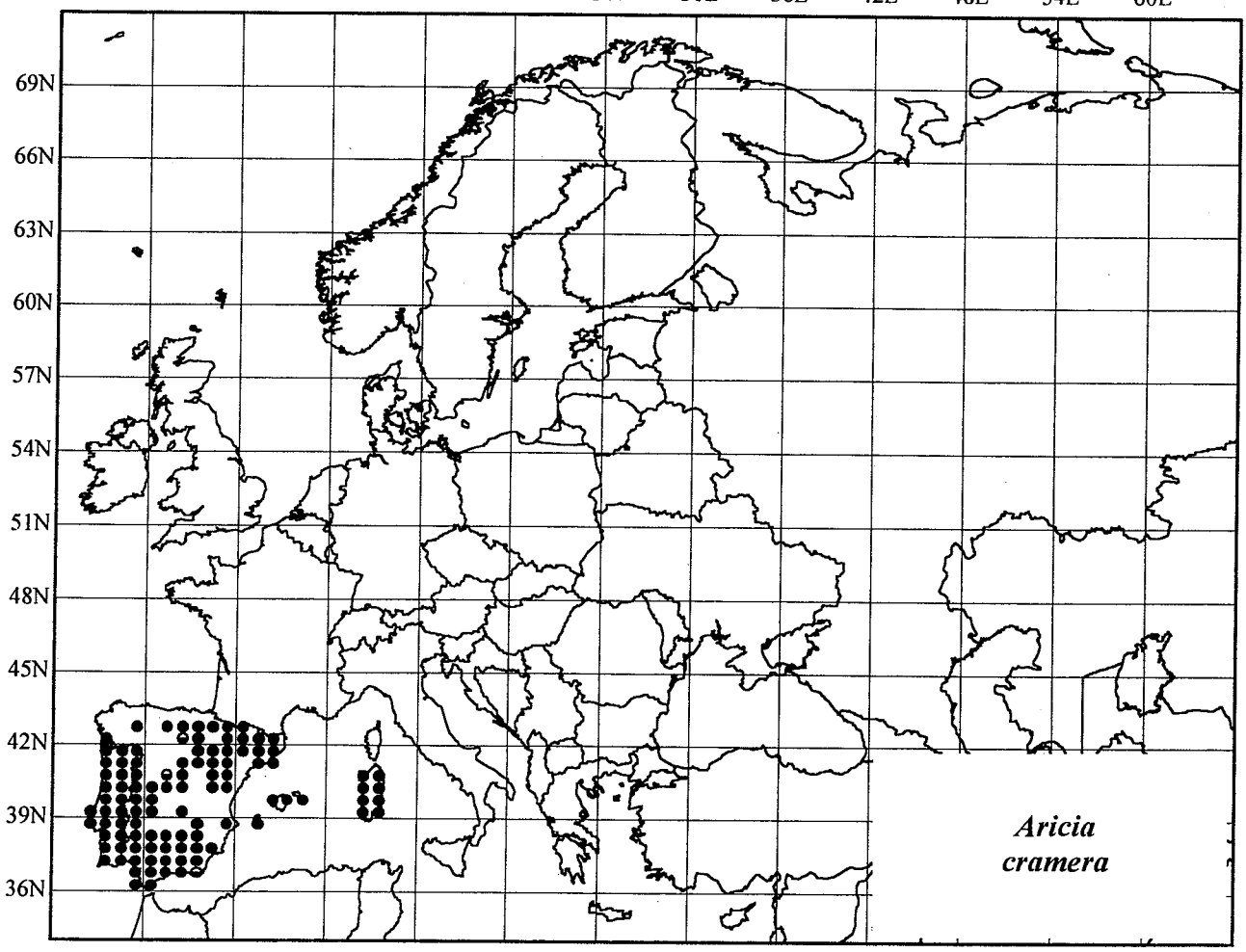
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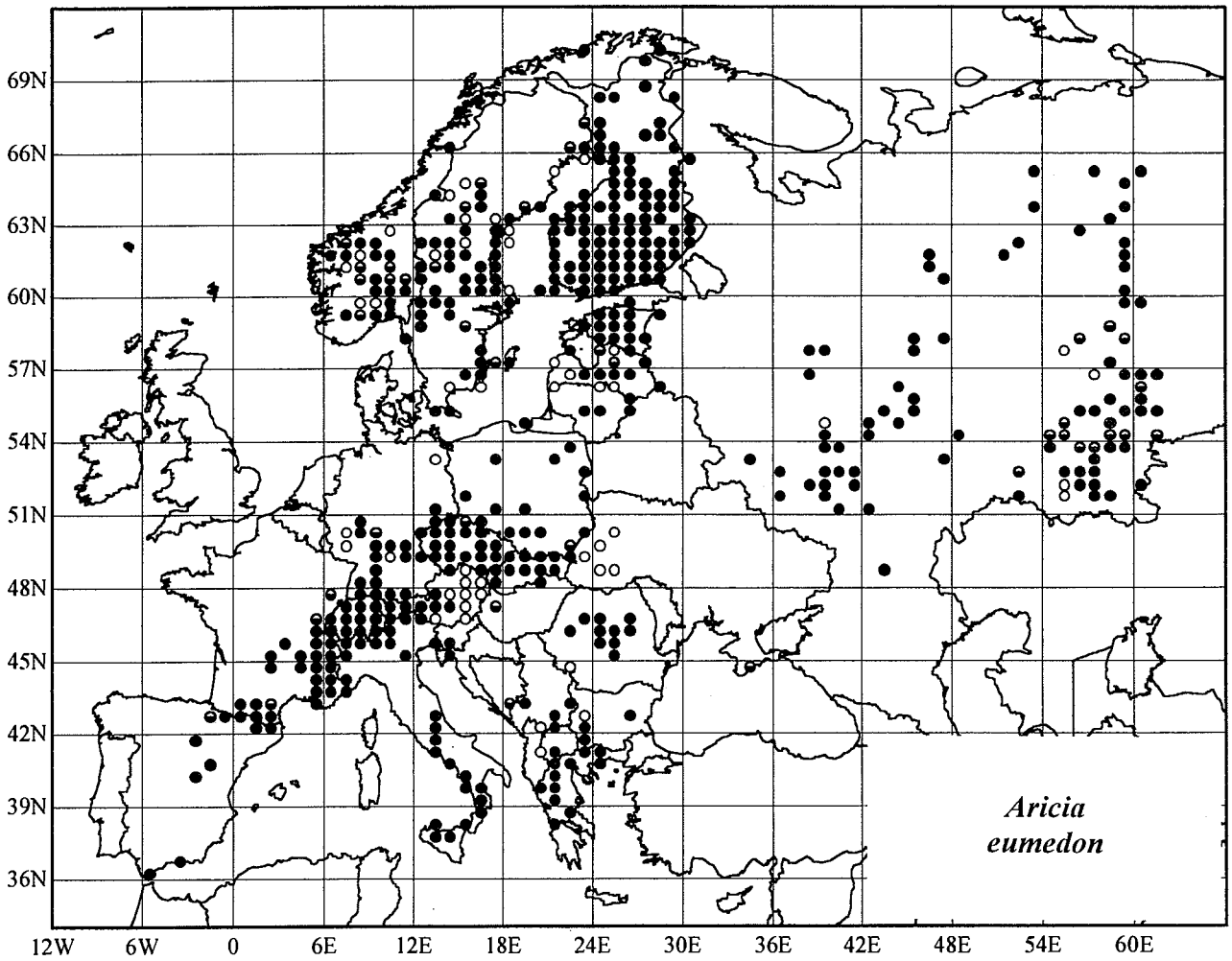
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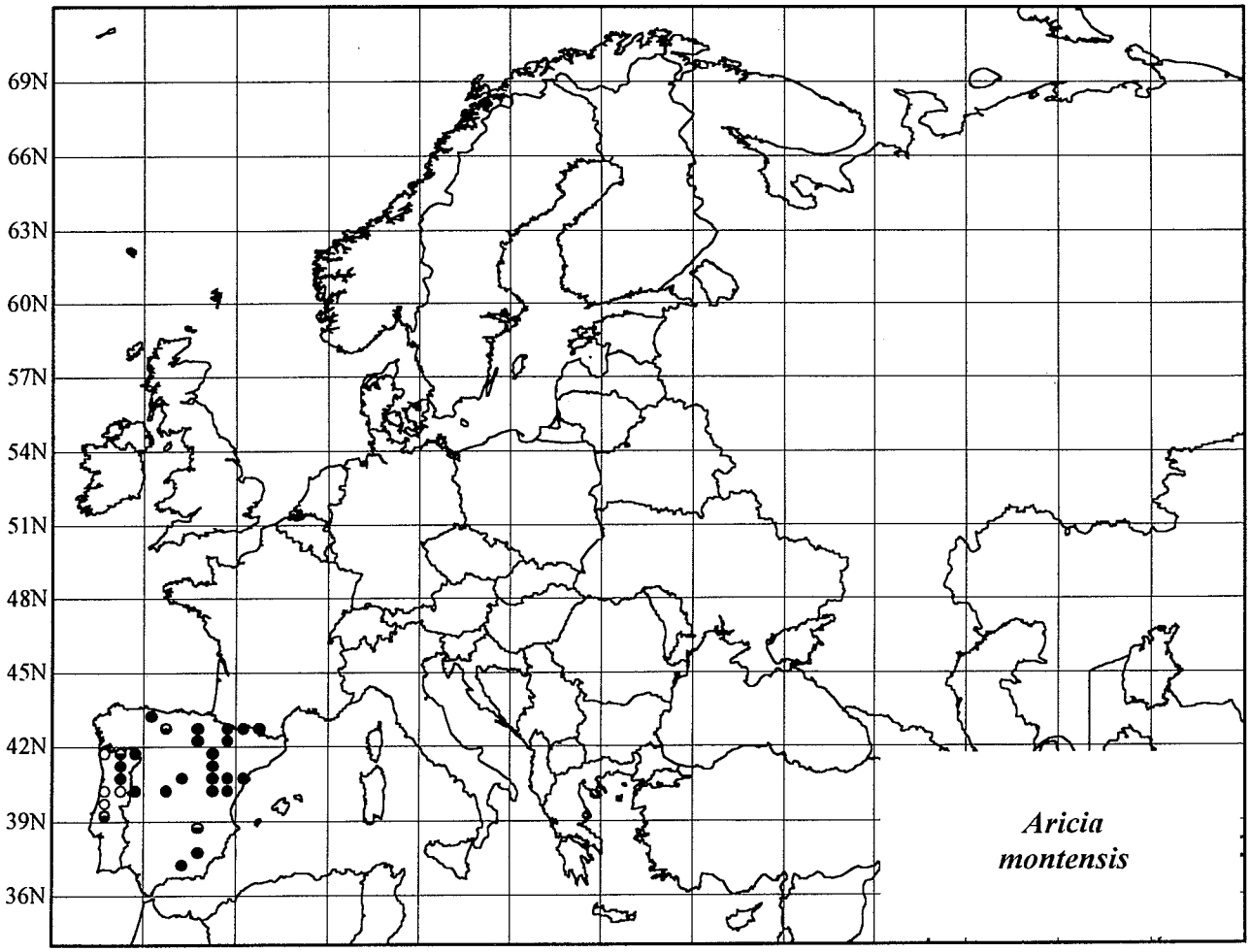
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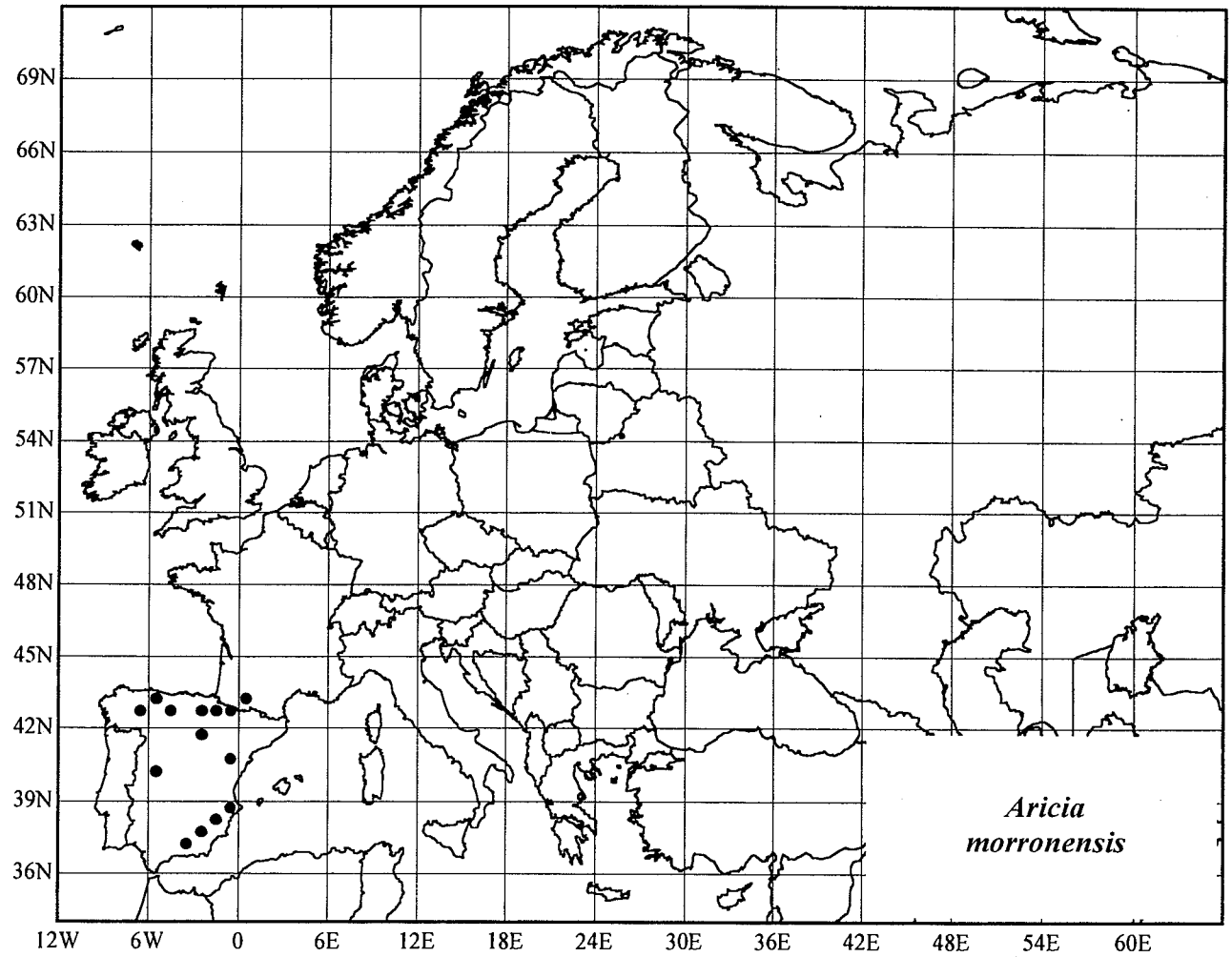
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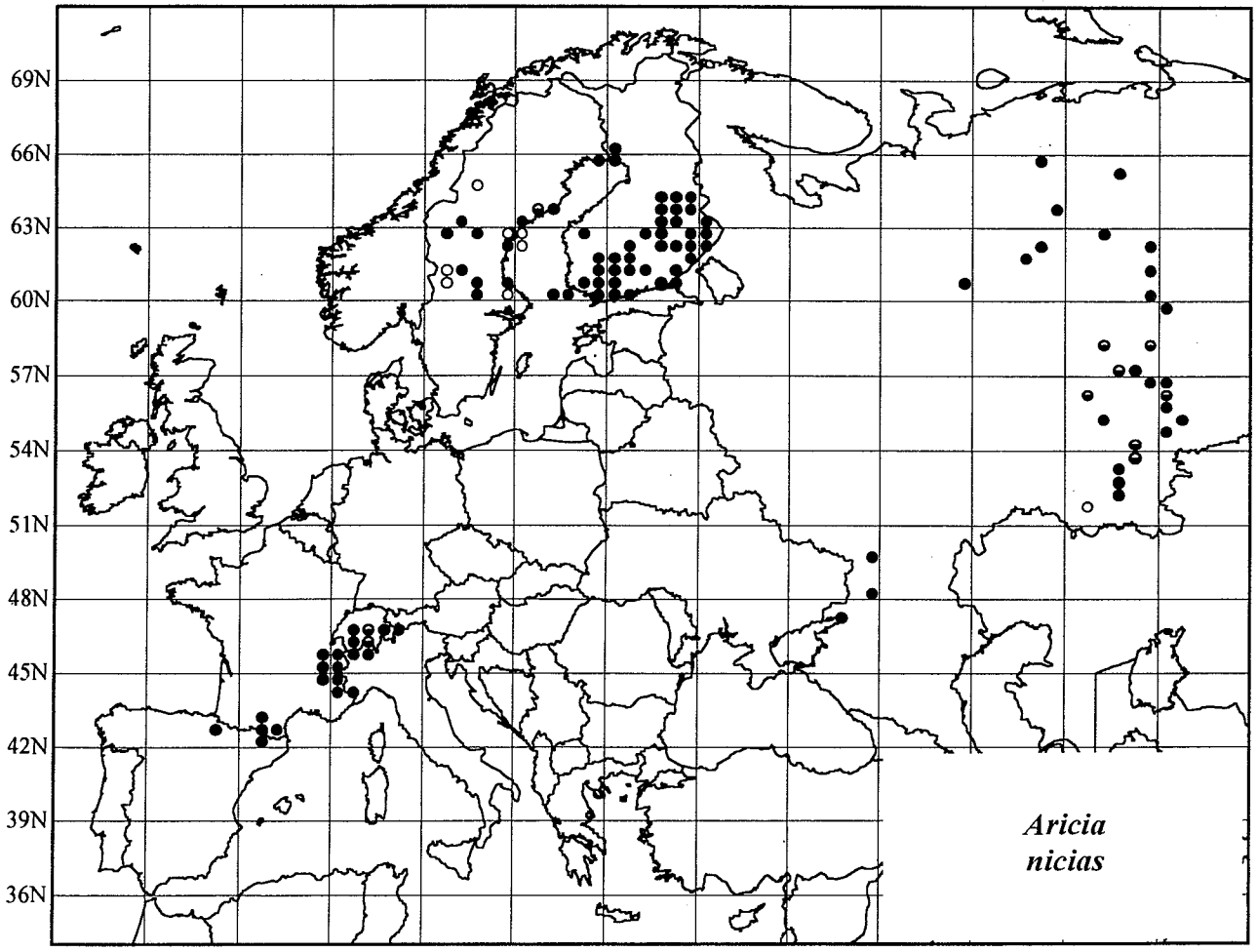
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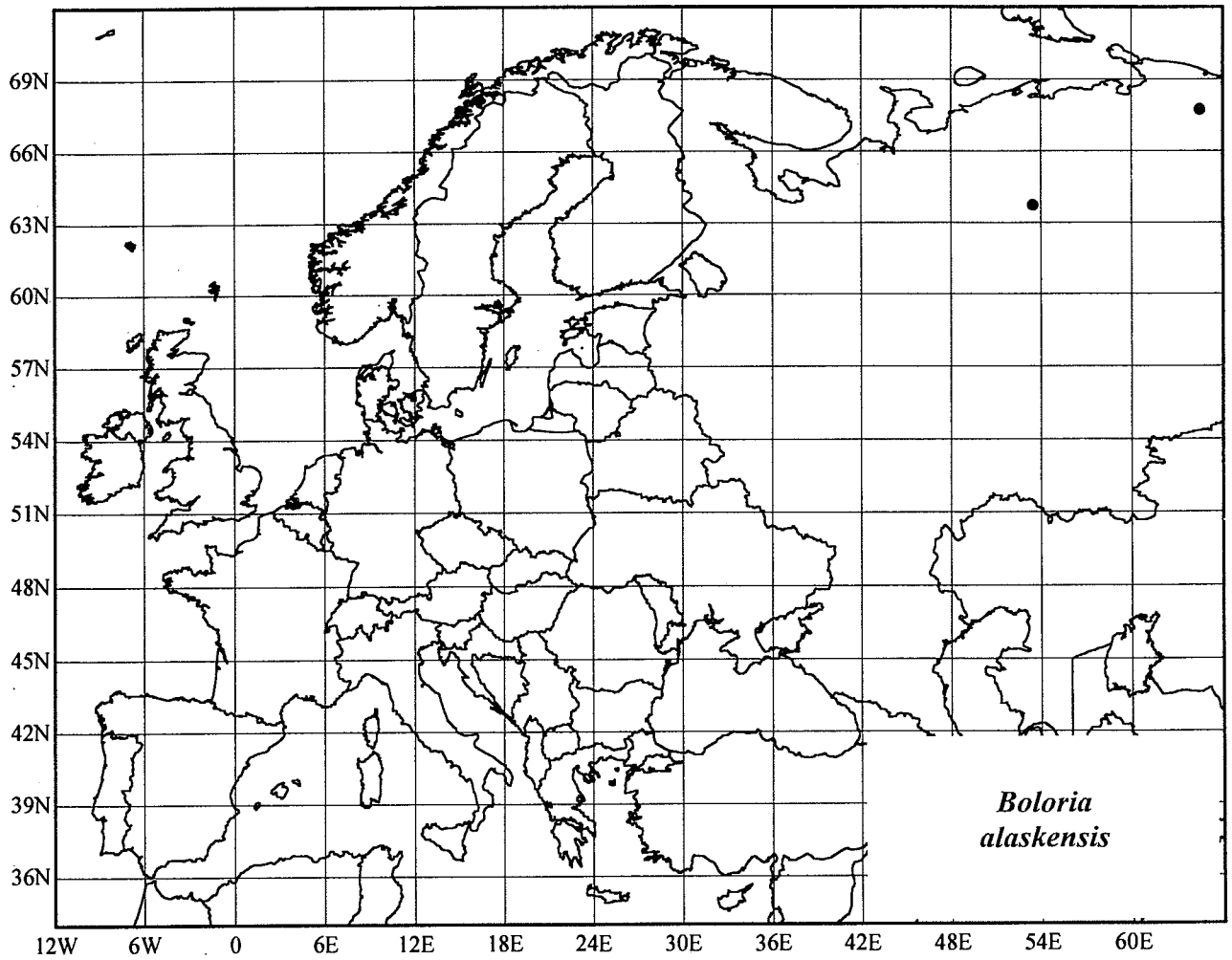
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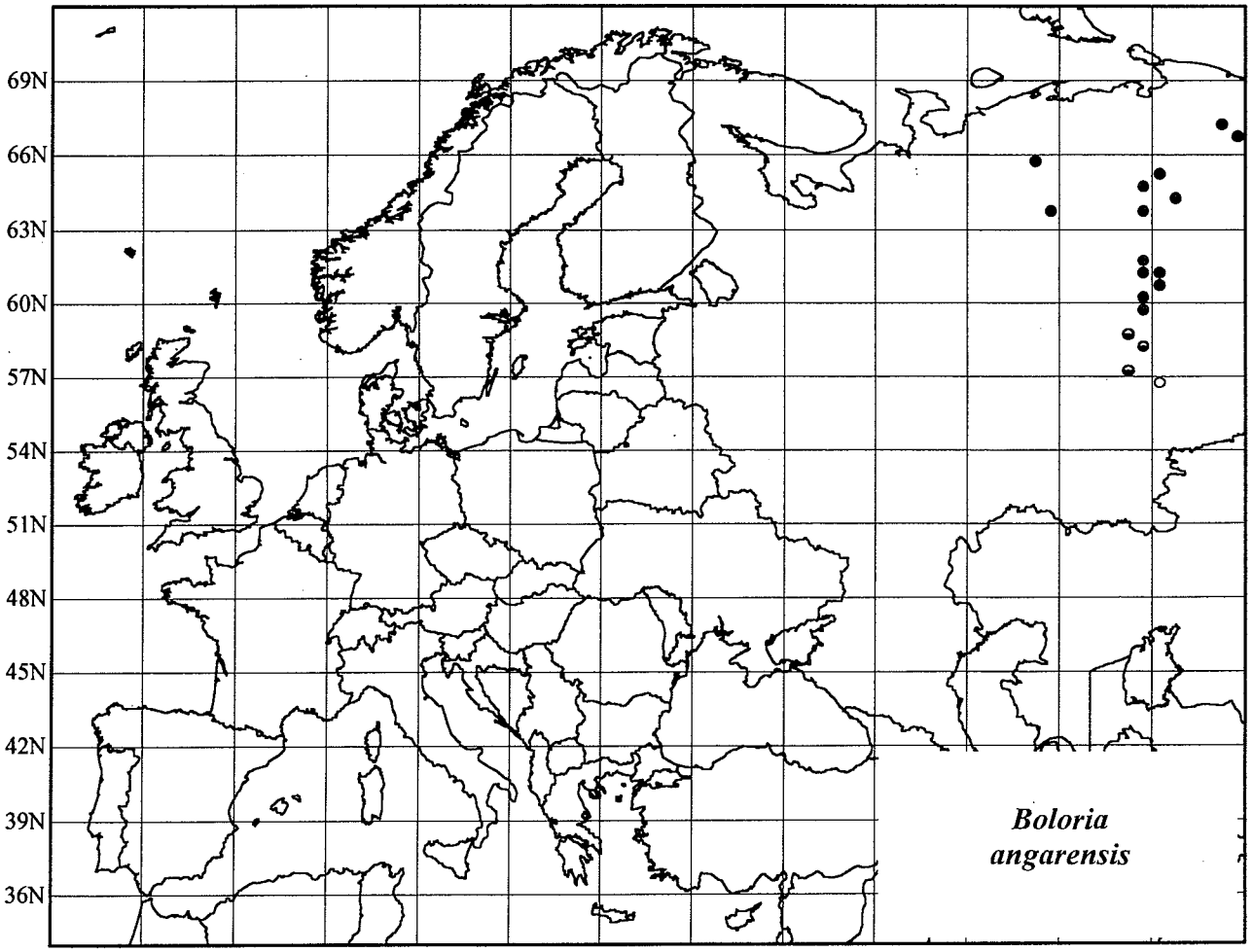
Boloria alaskensis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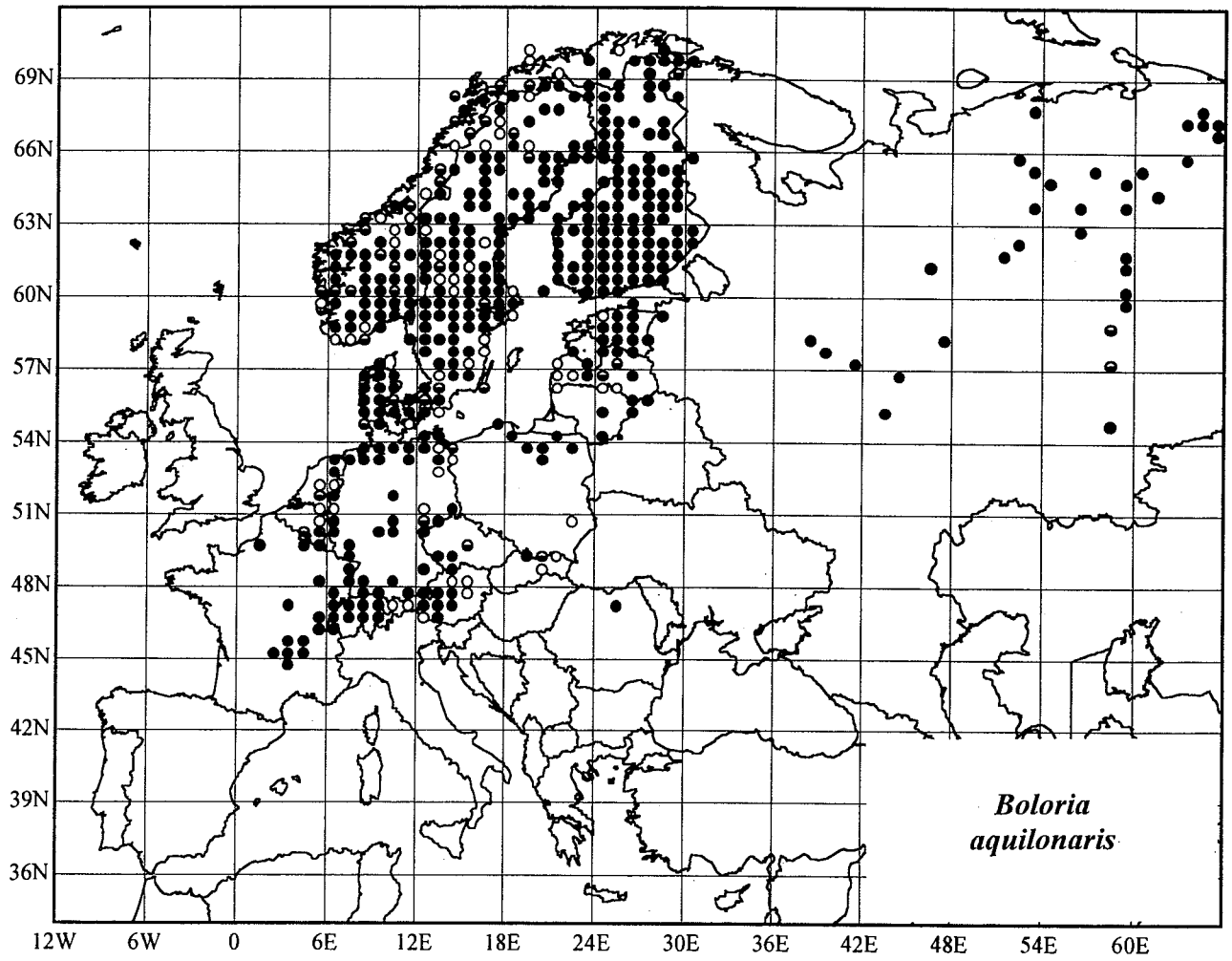
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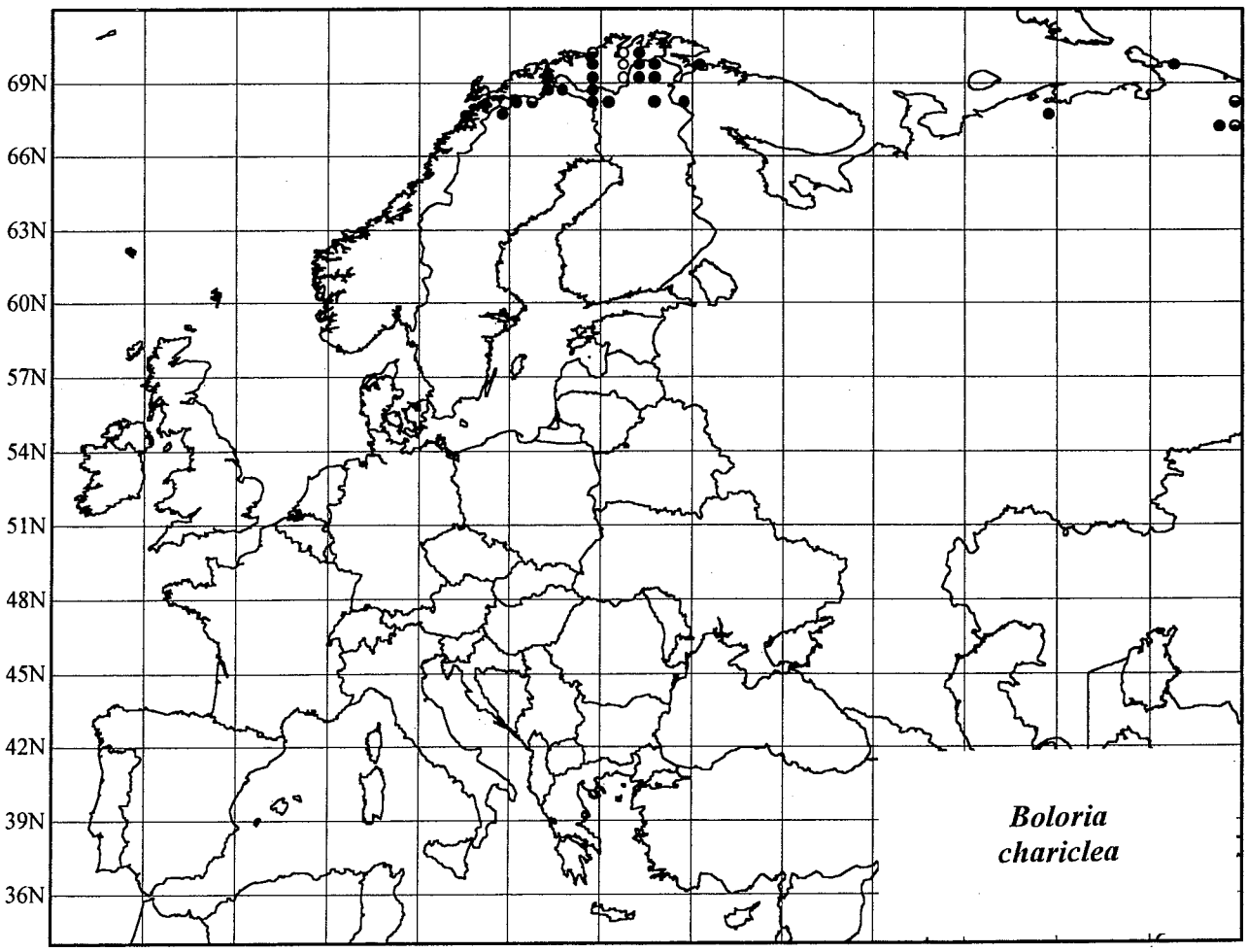
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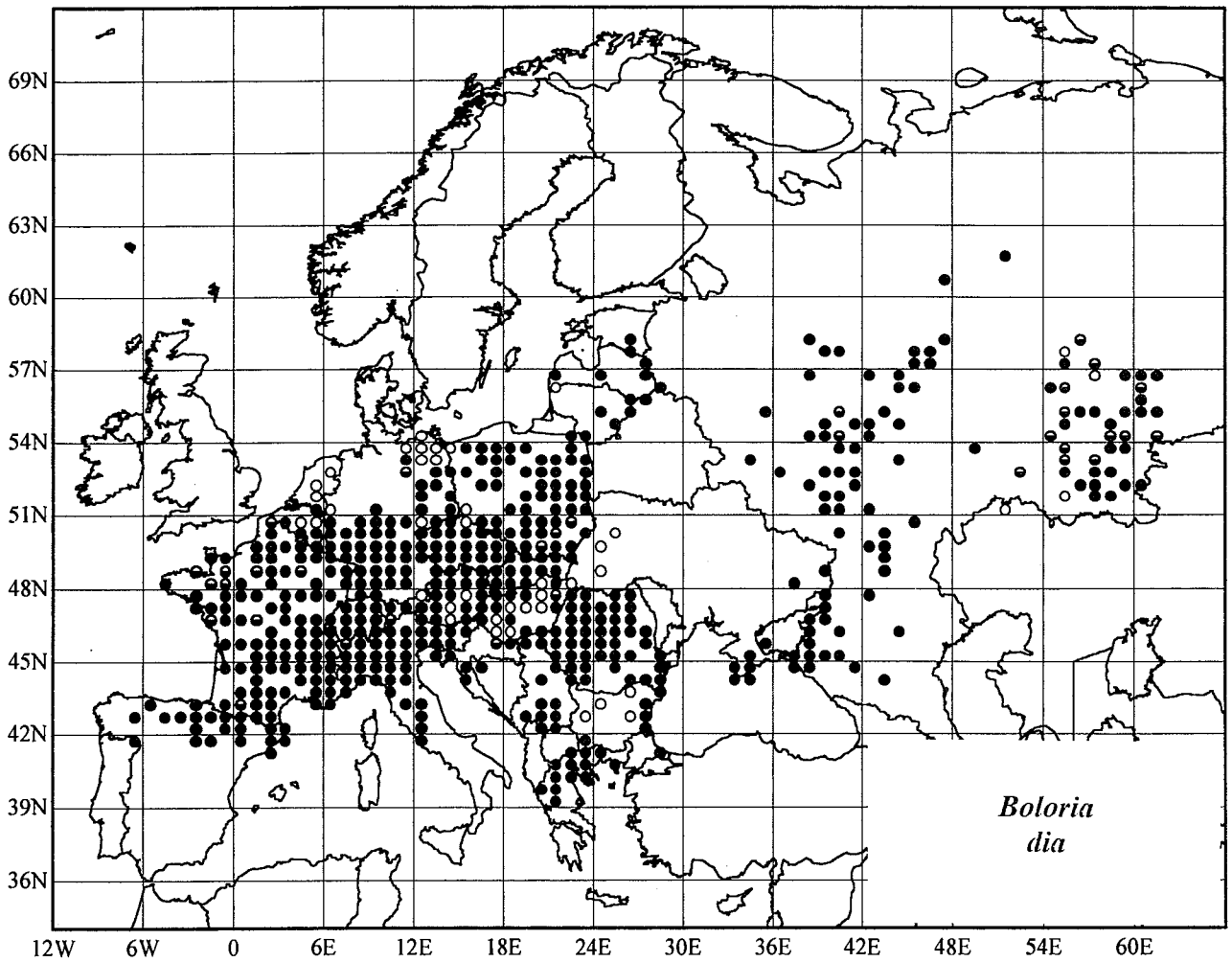
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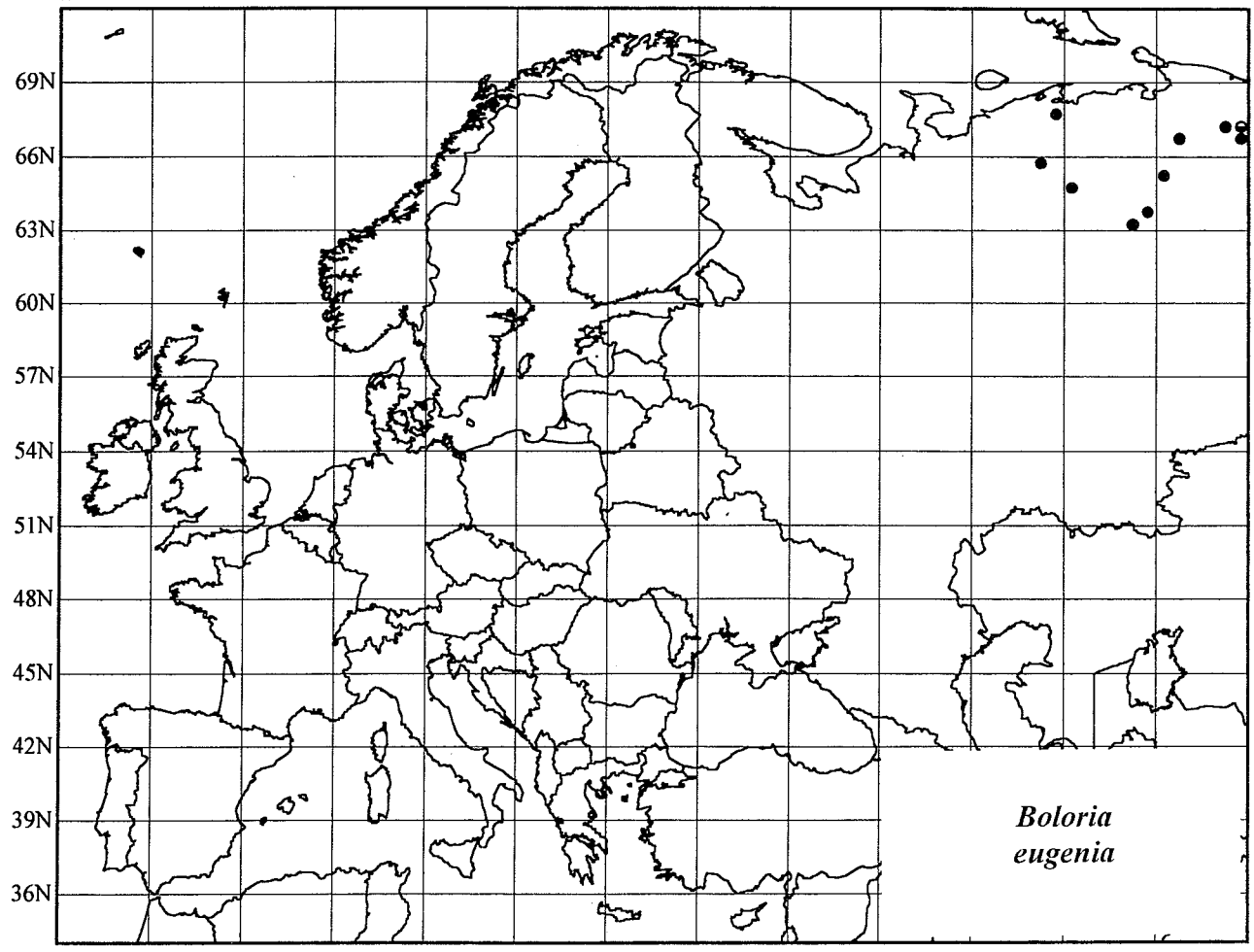
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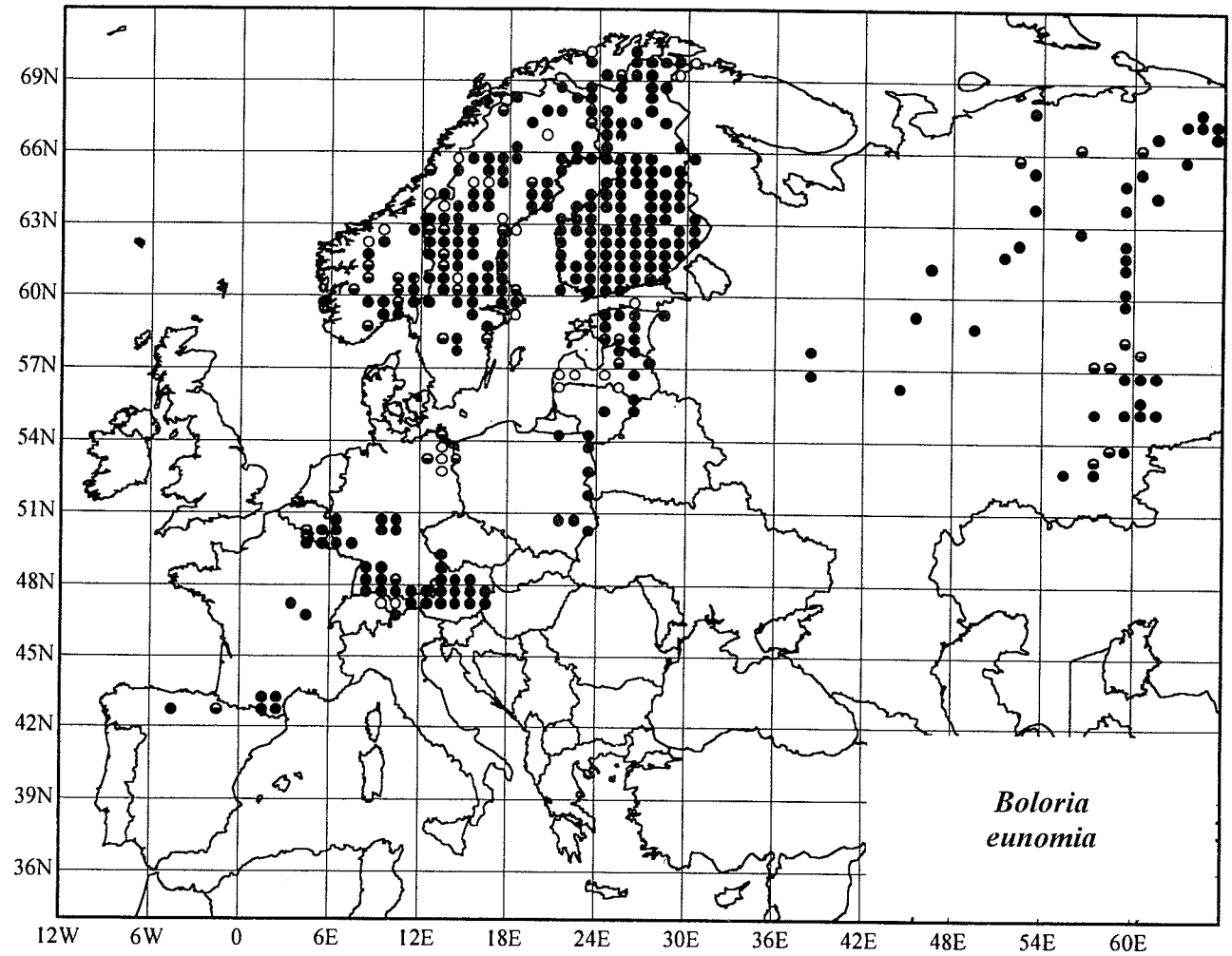
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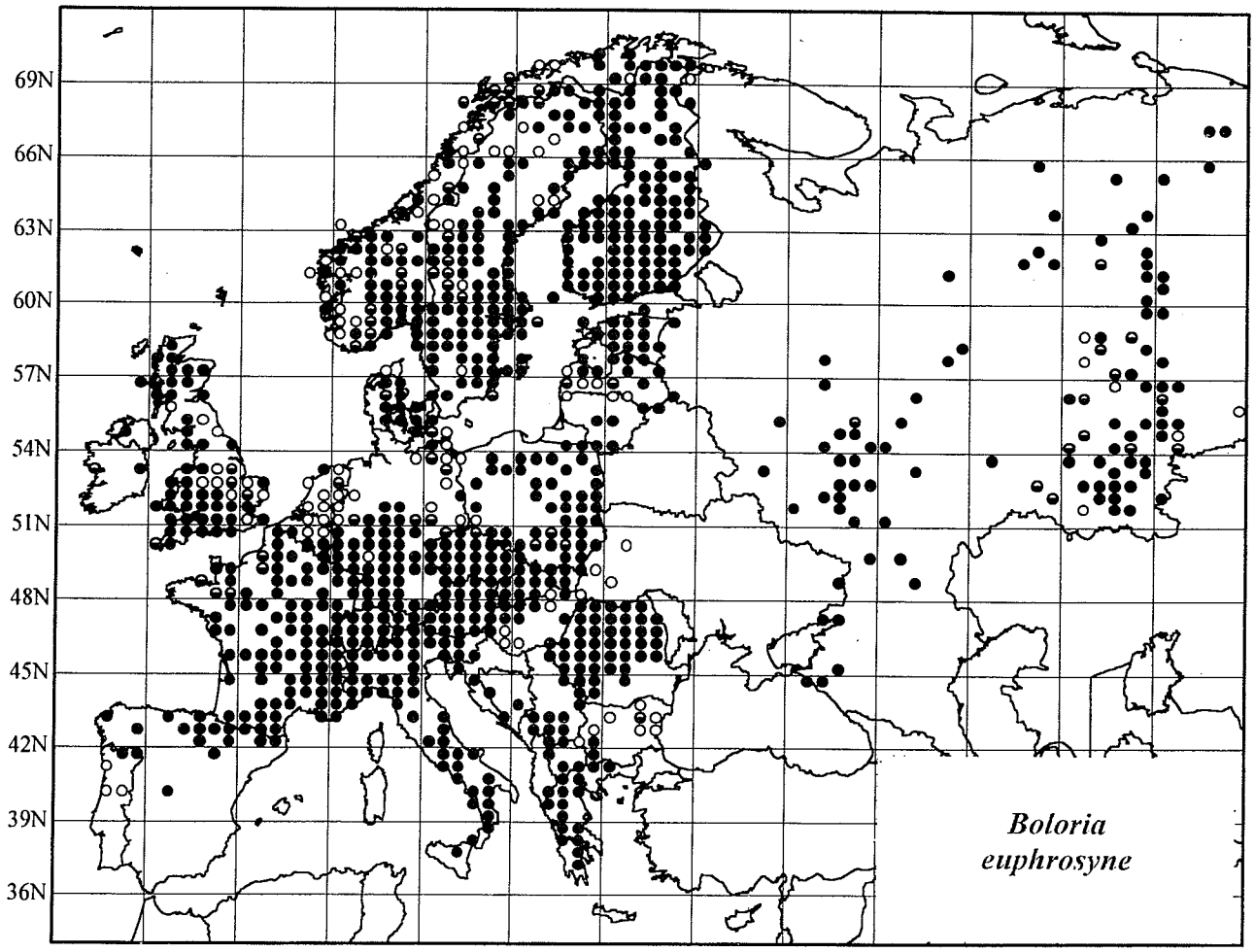
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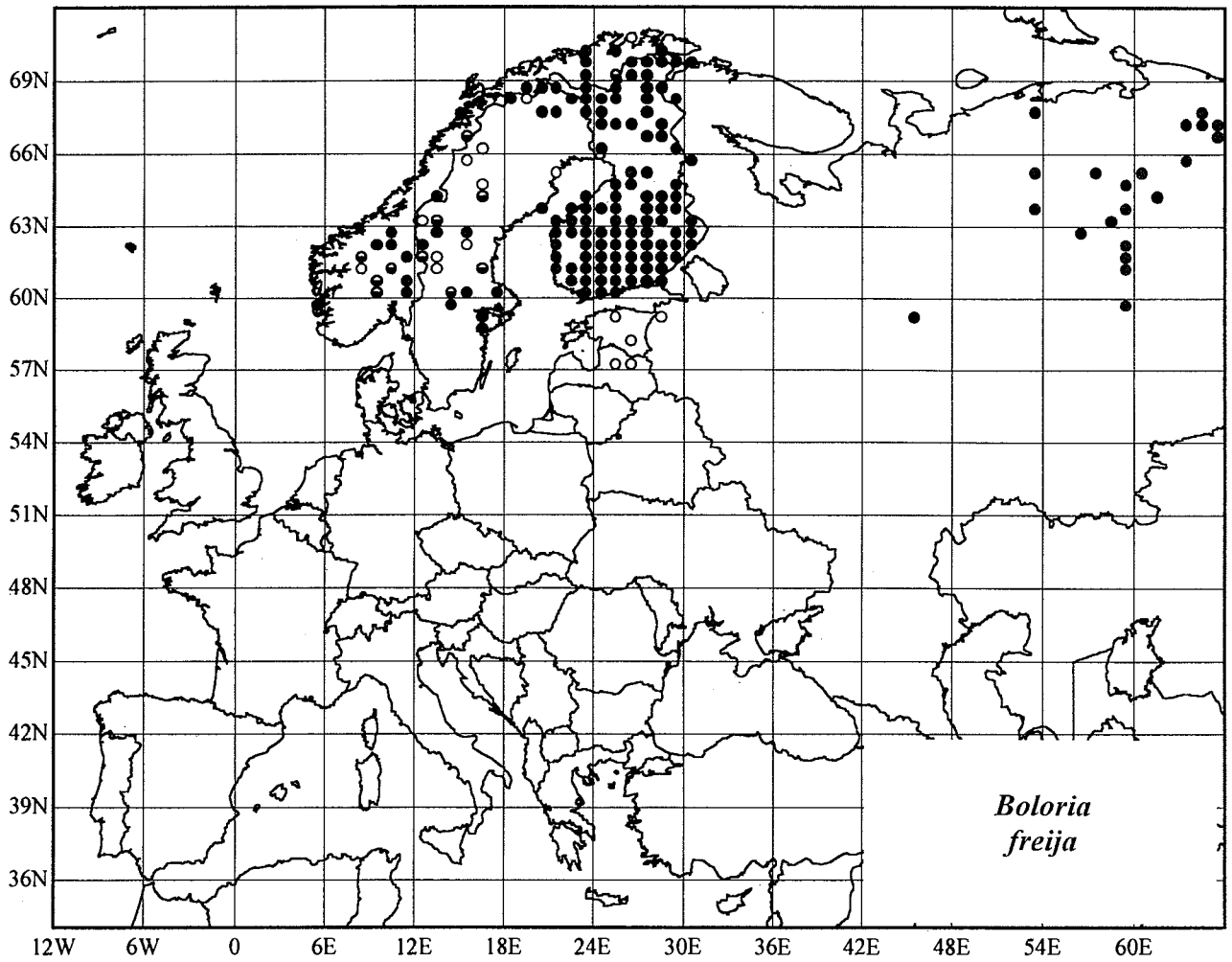
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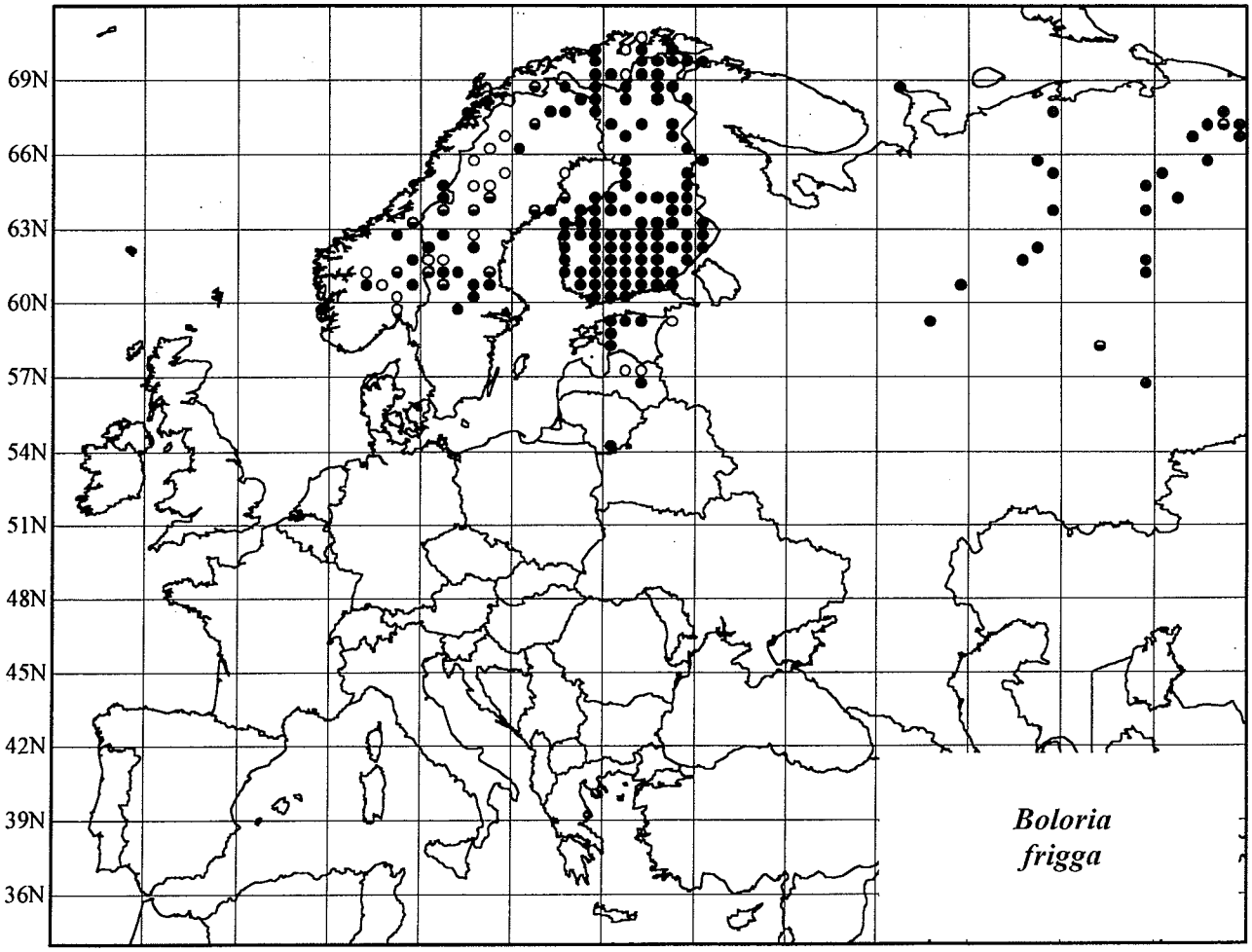
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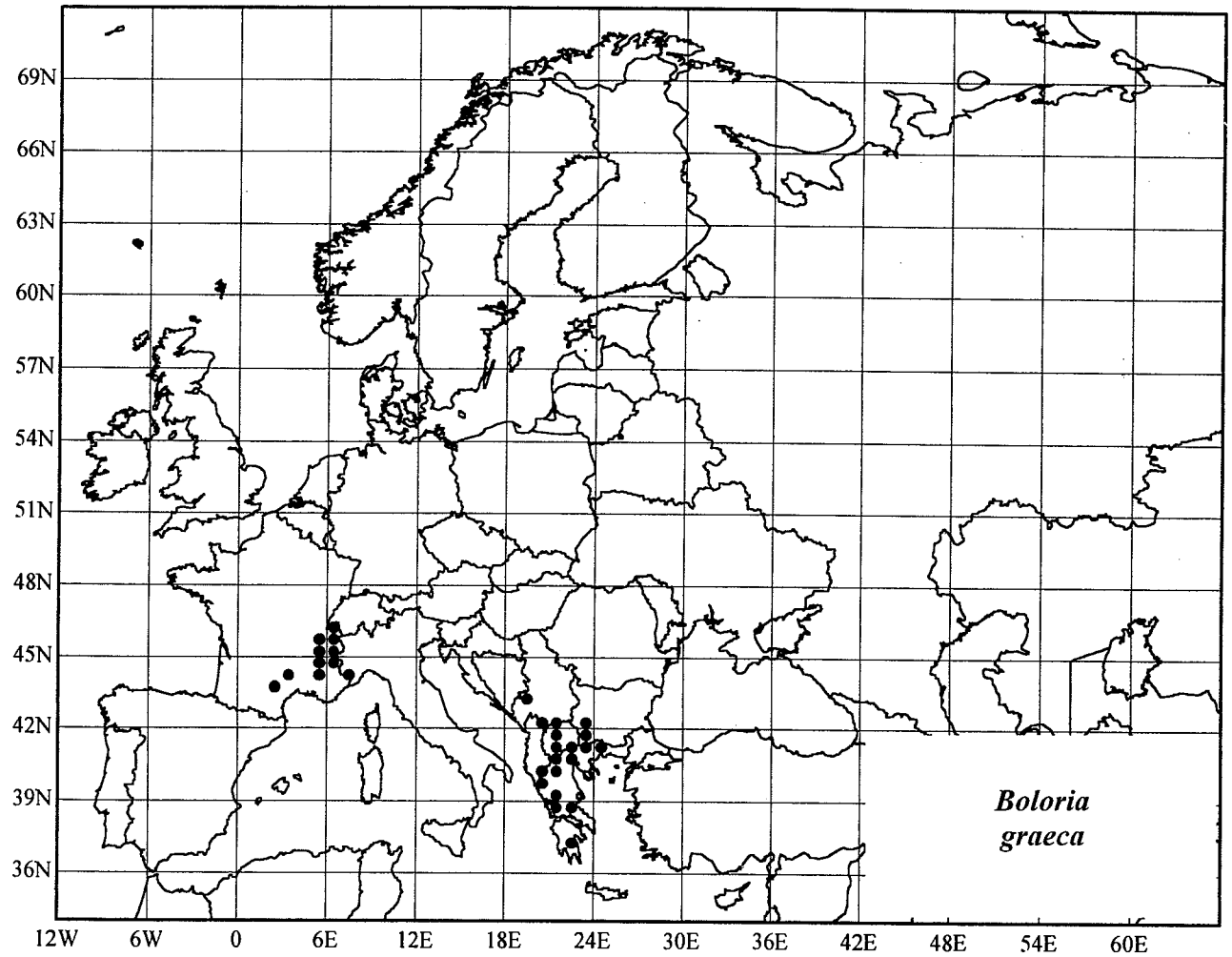
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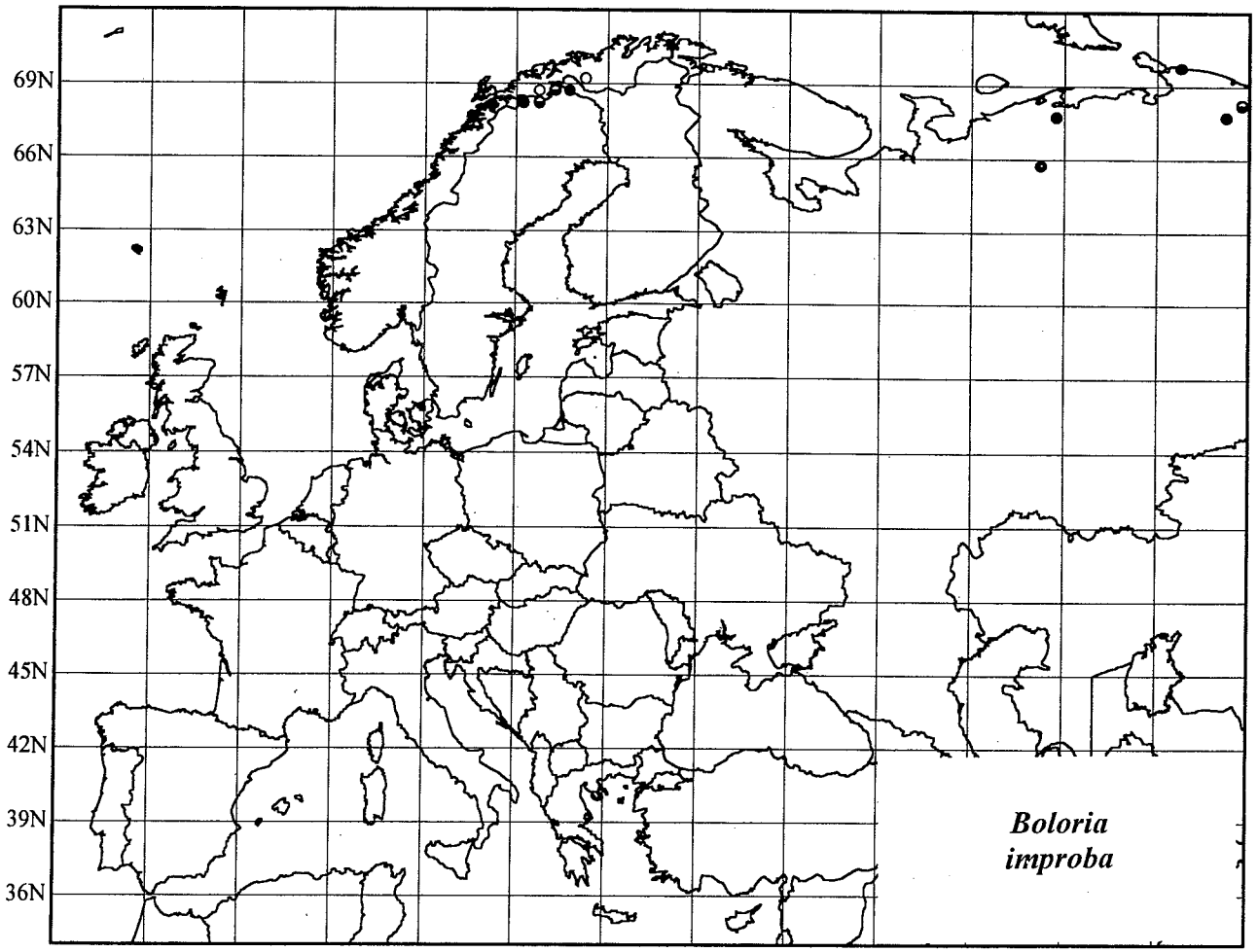
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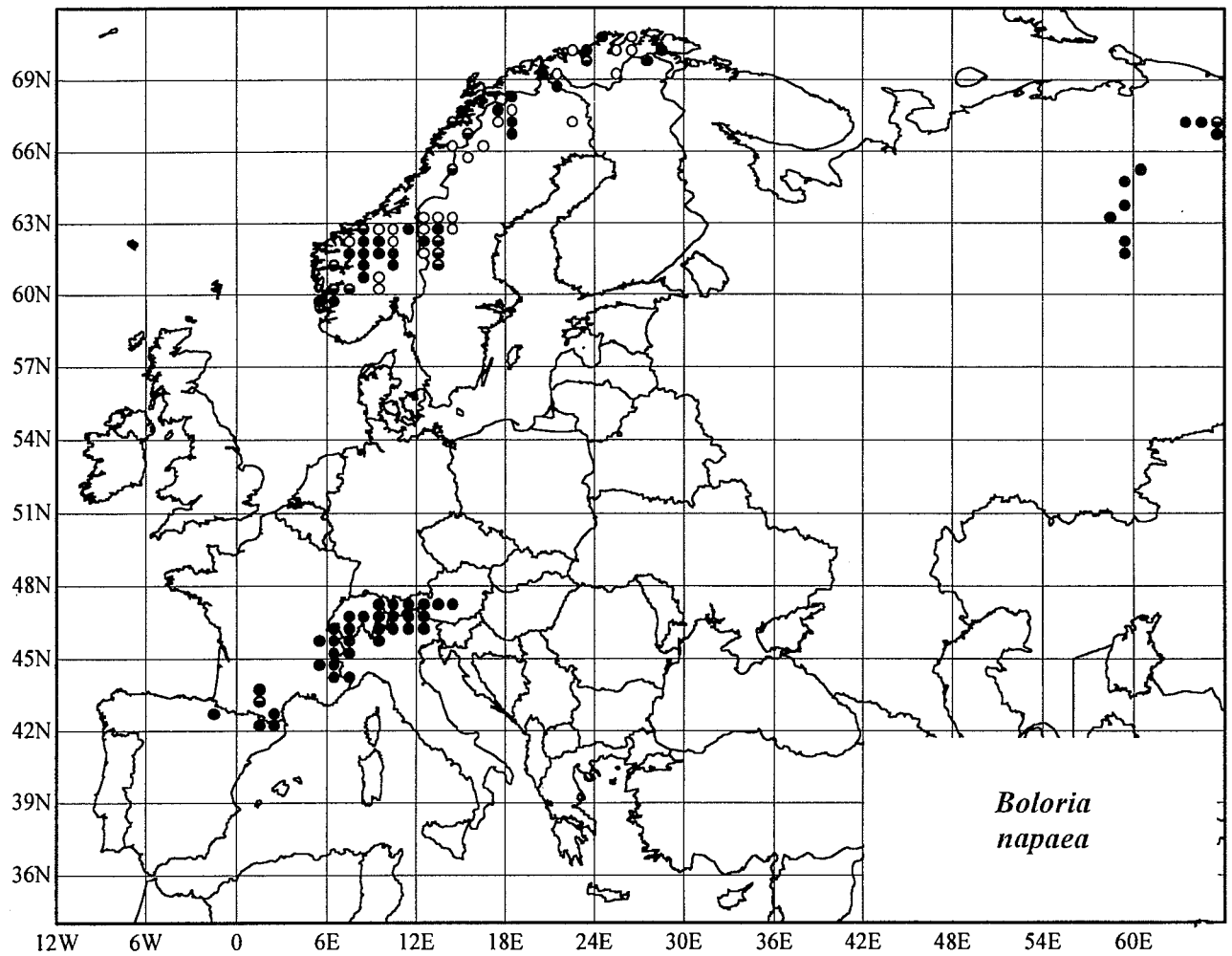
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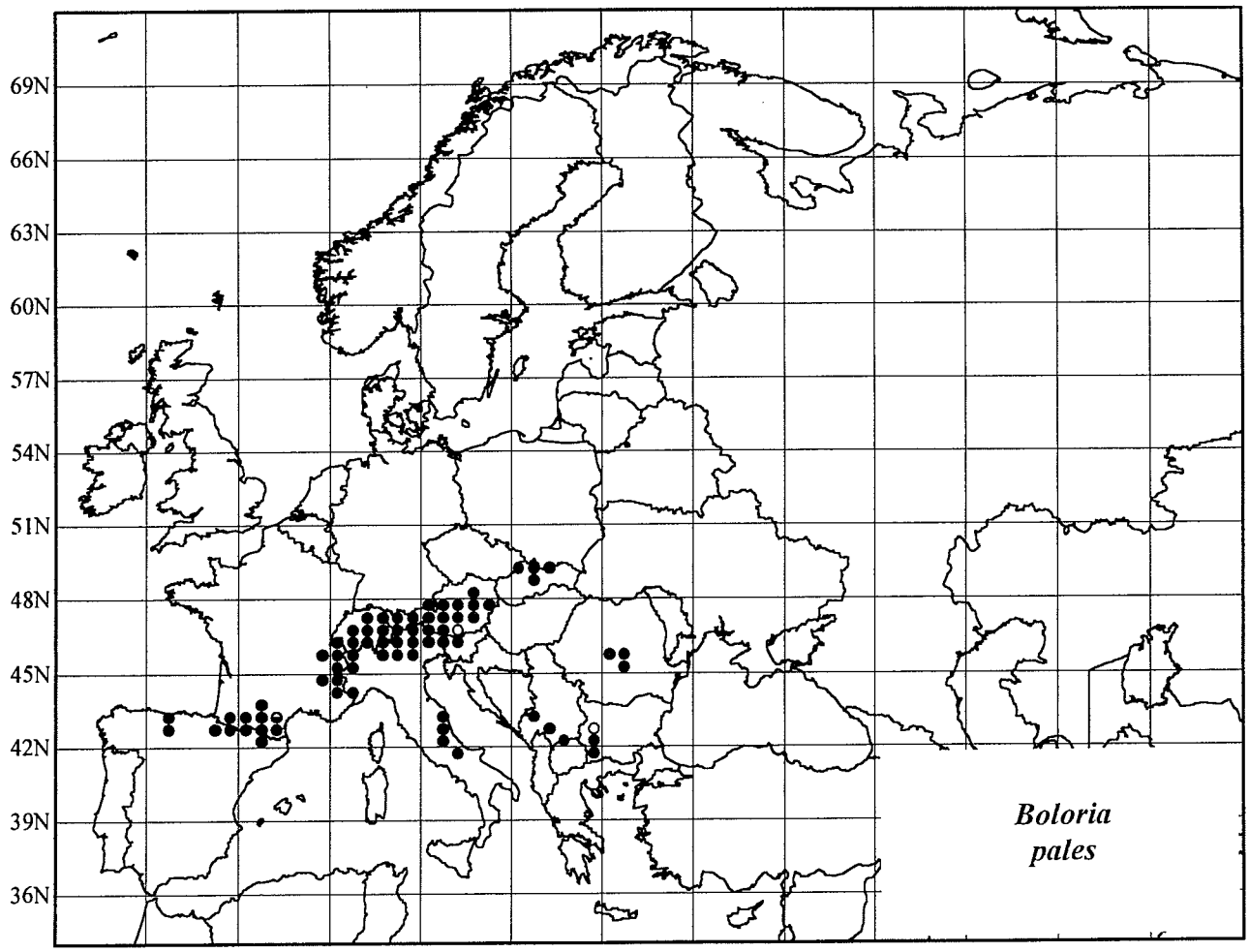
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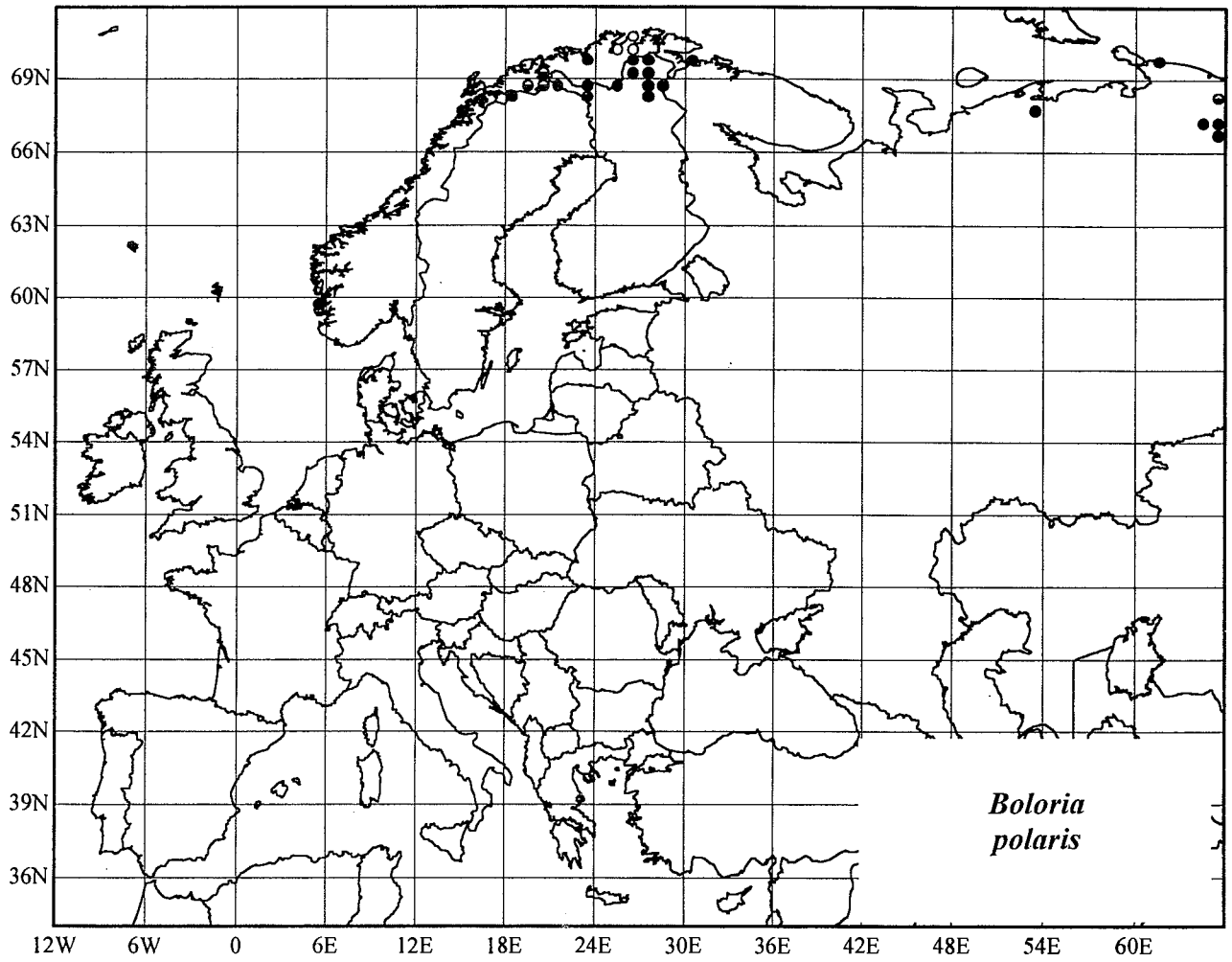
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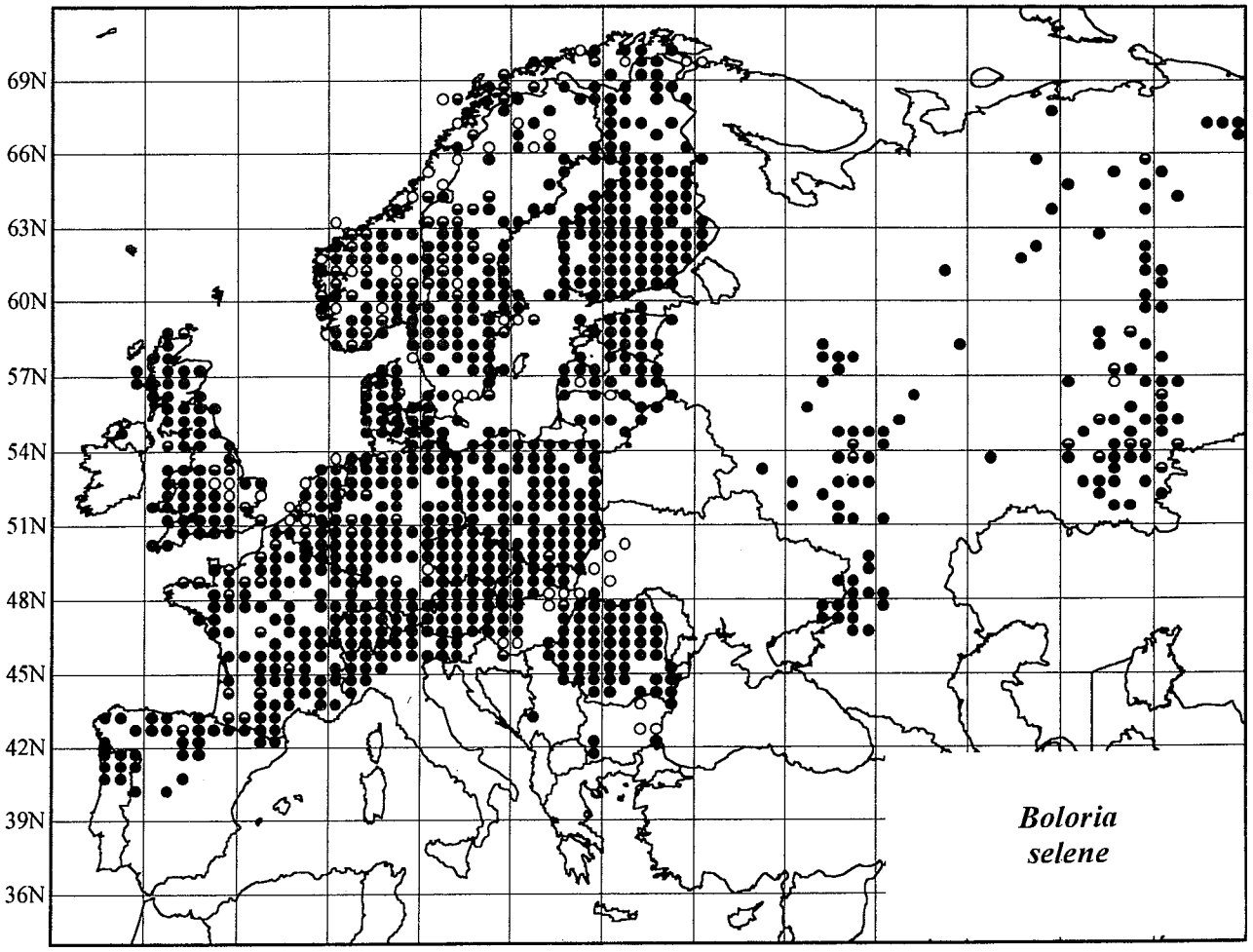
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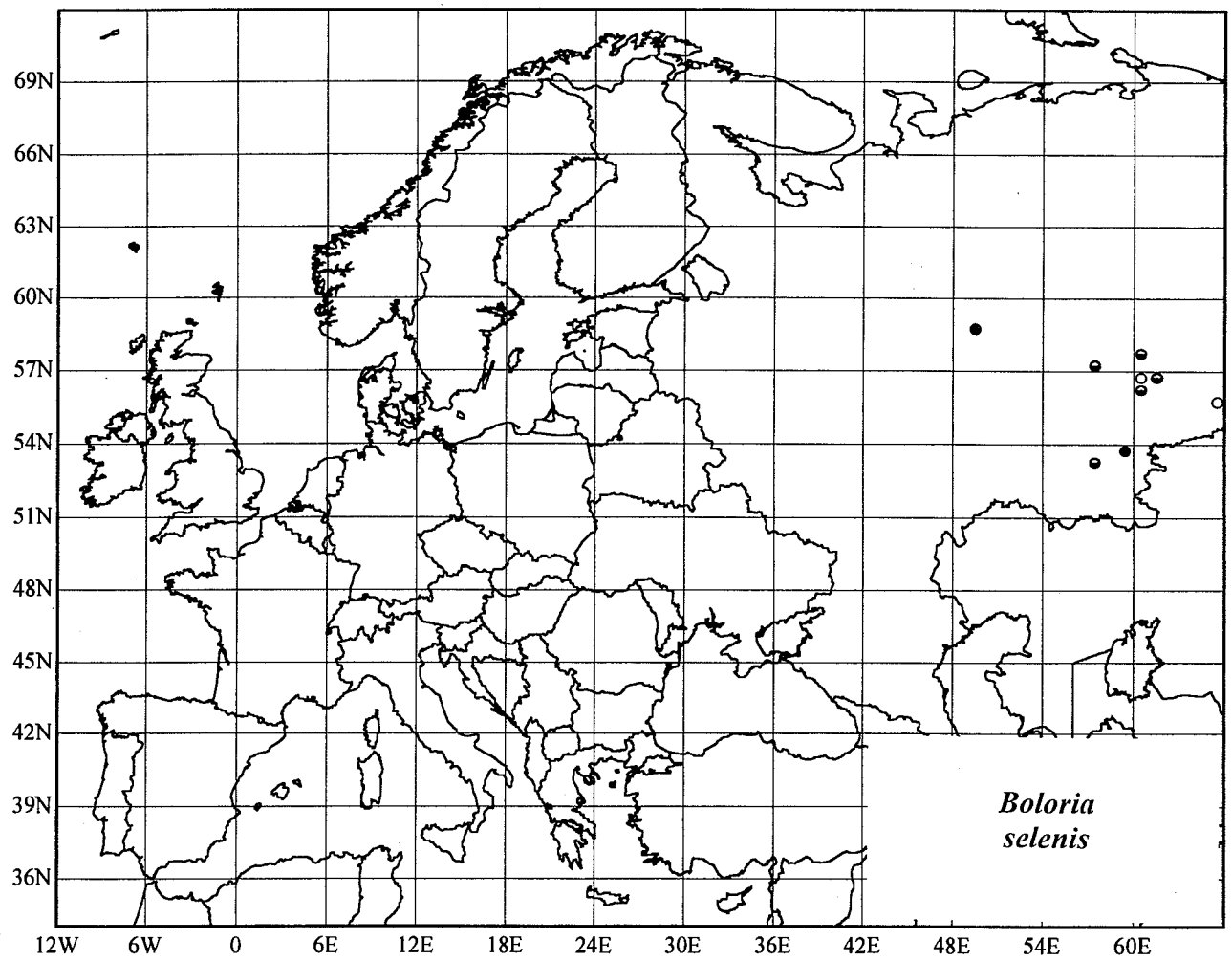
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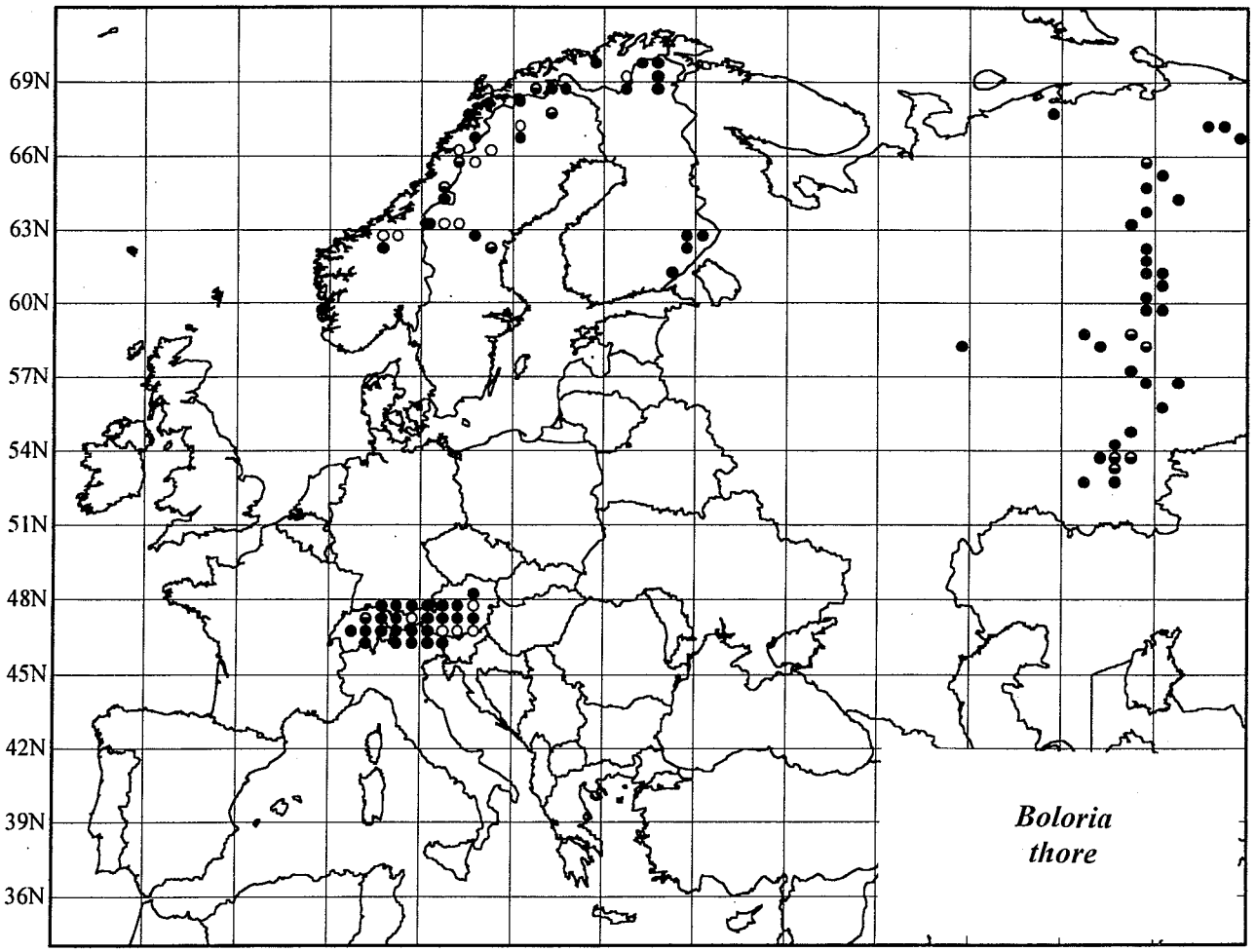
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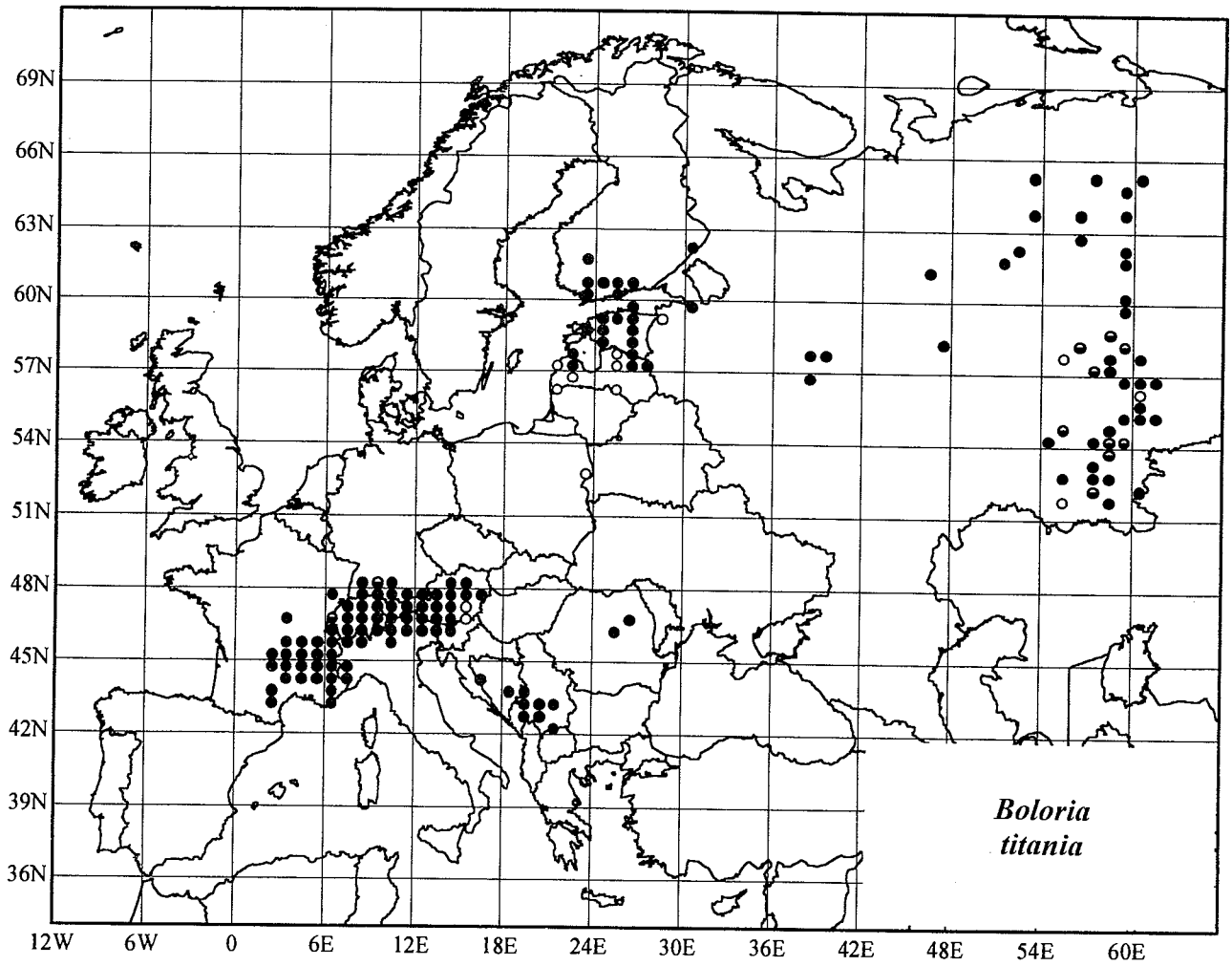
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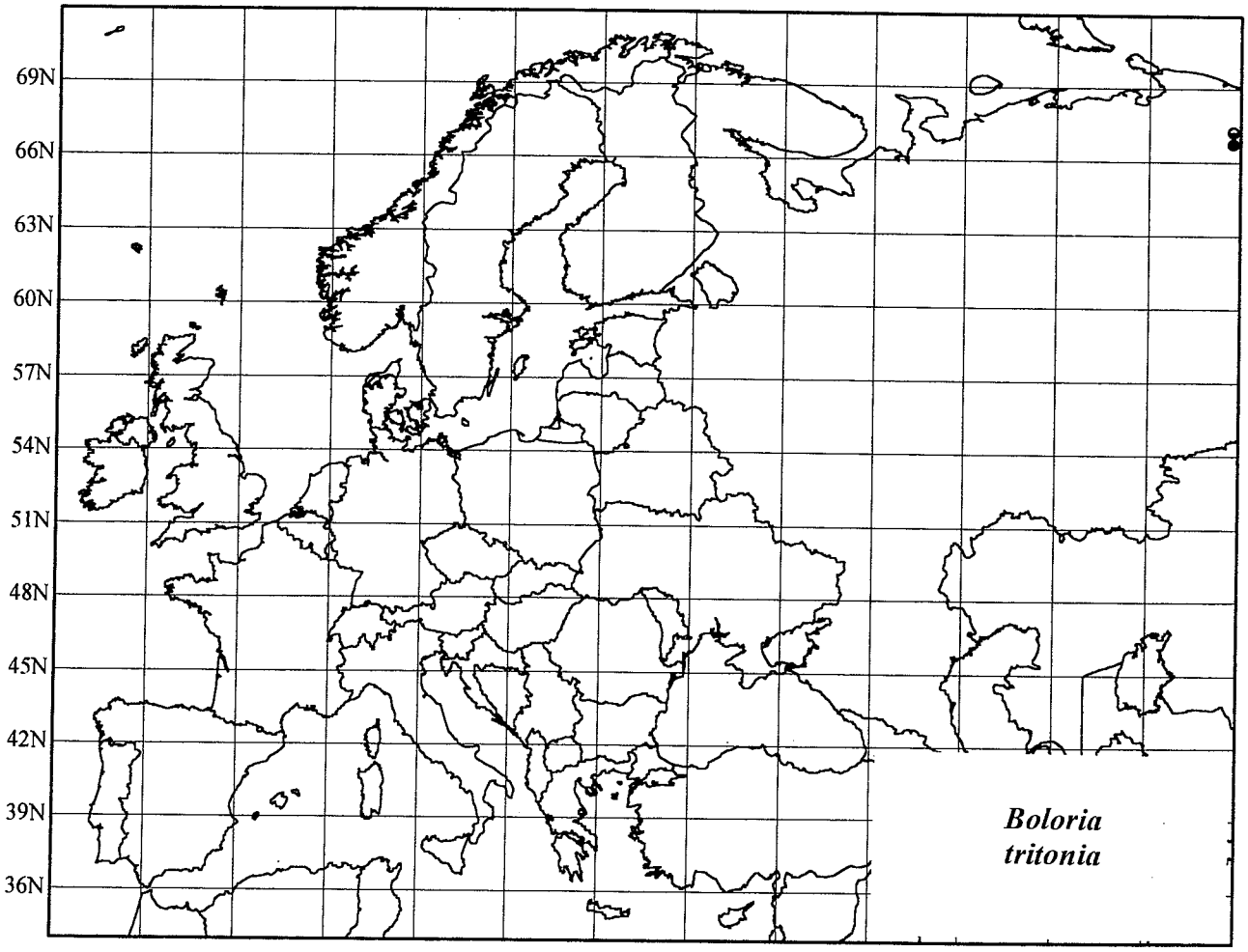
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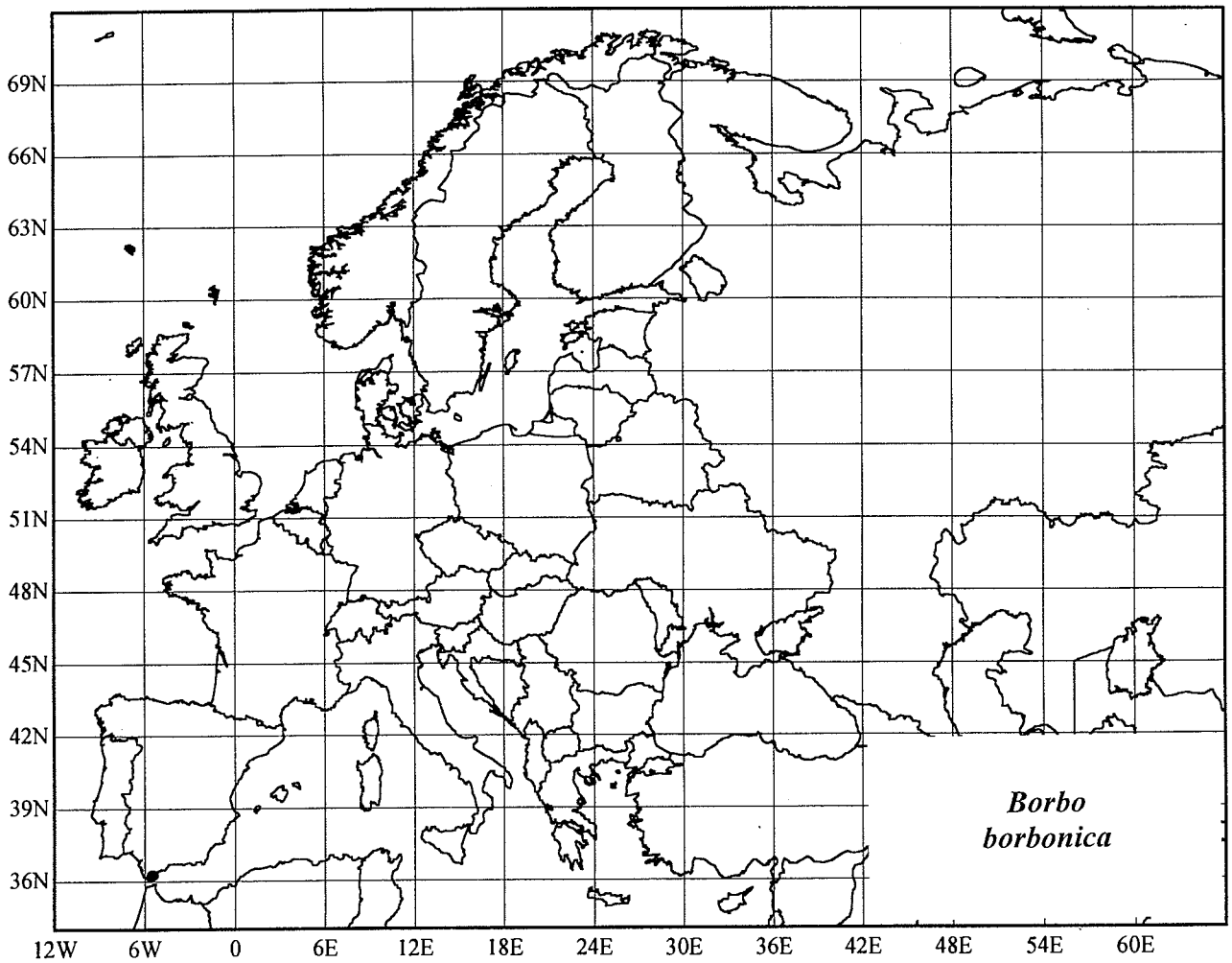
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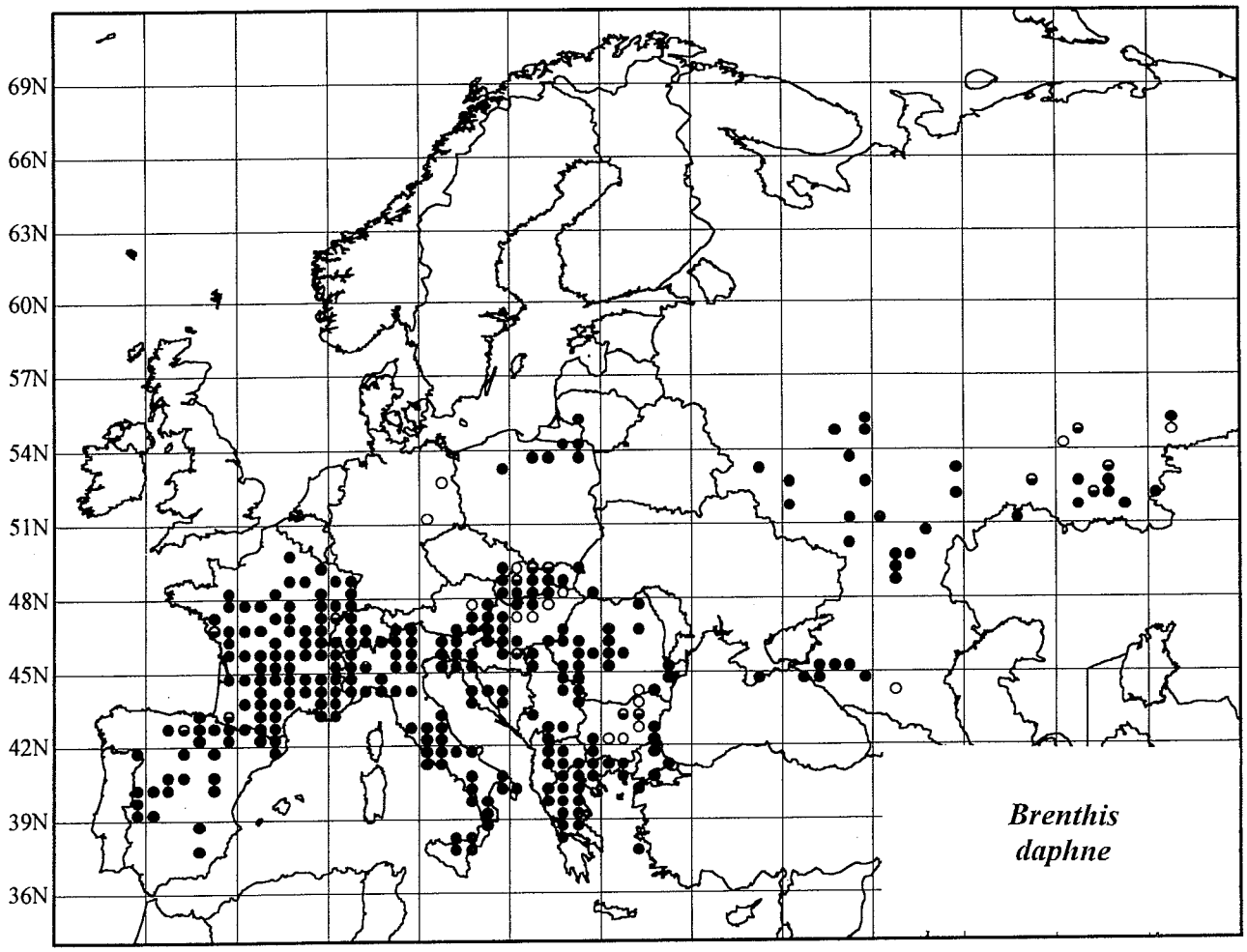
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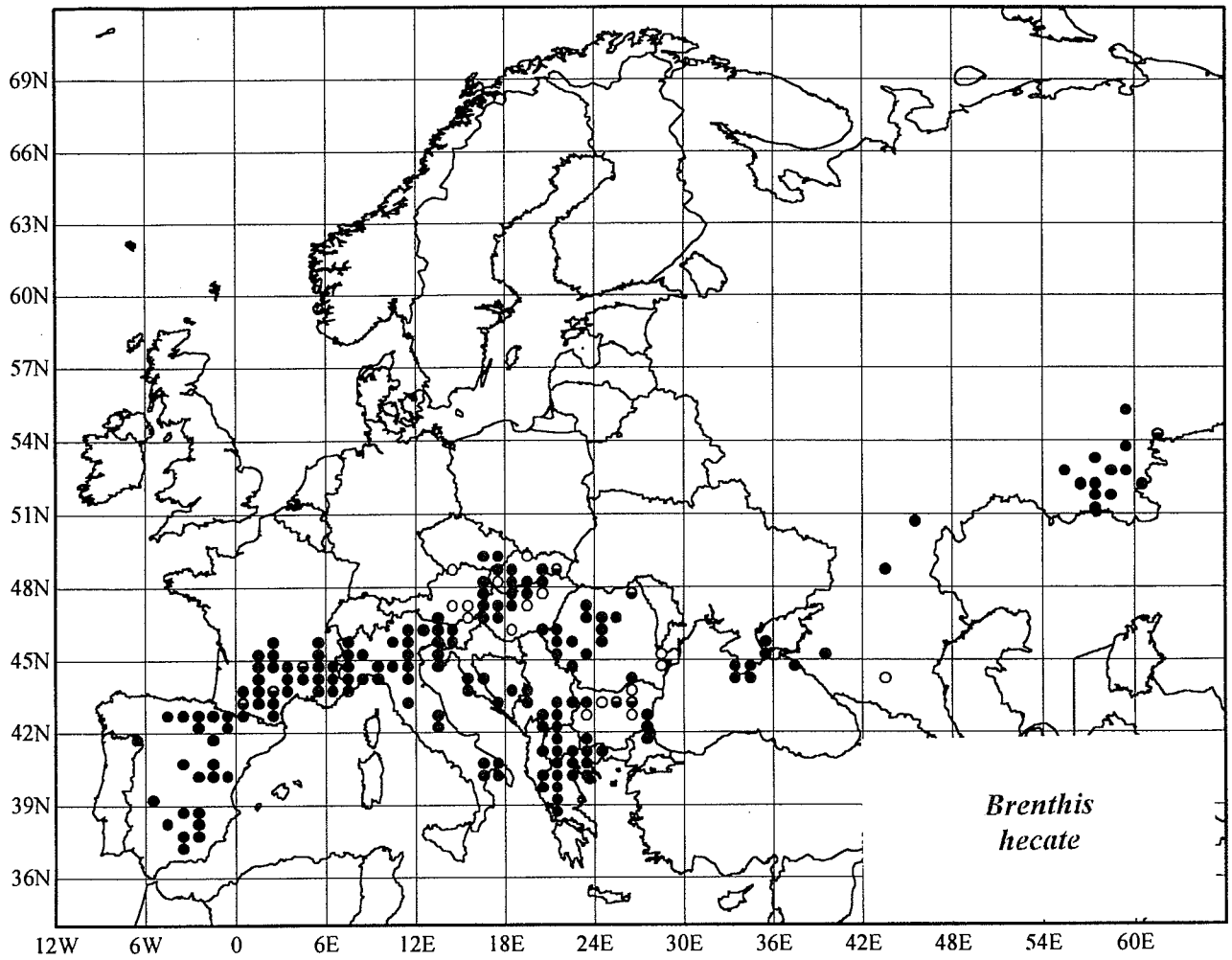
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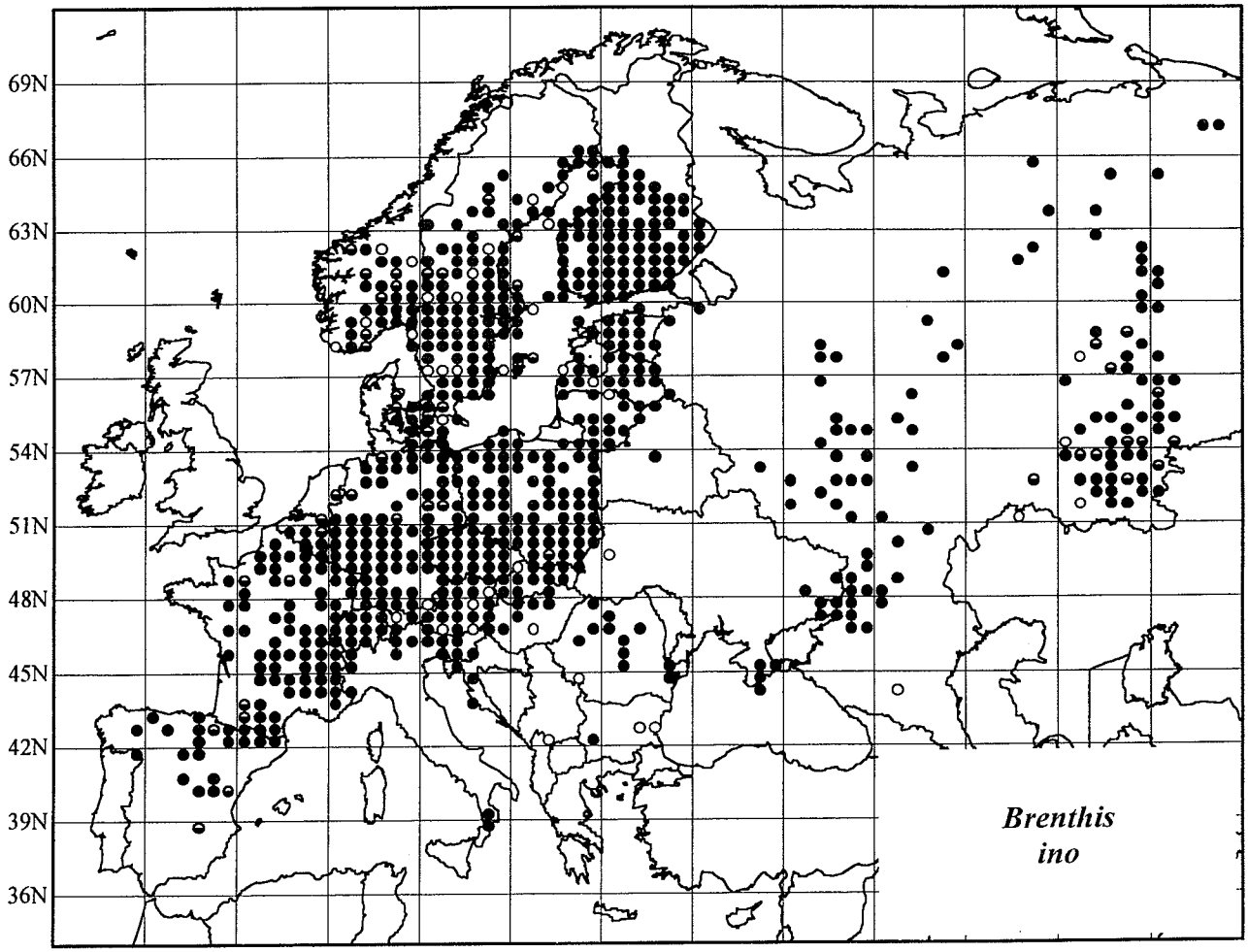
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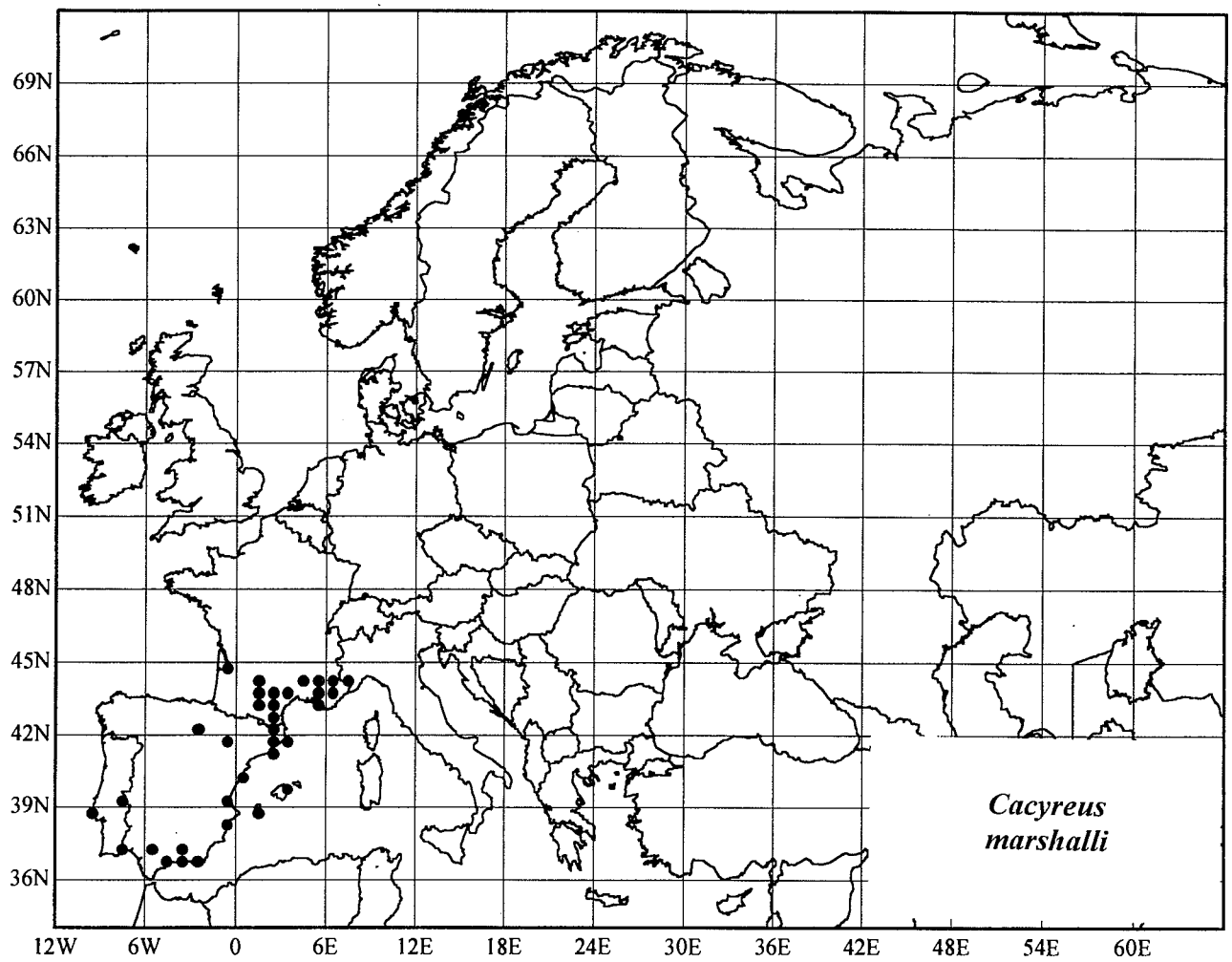
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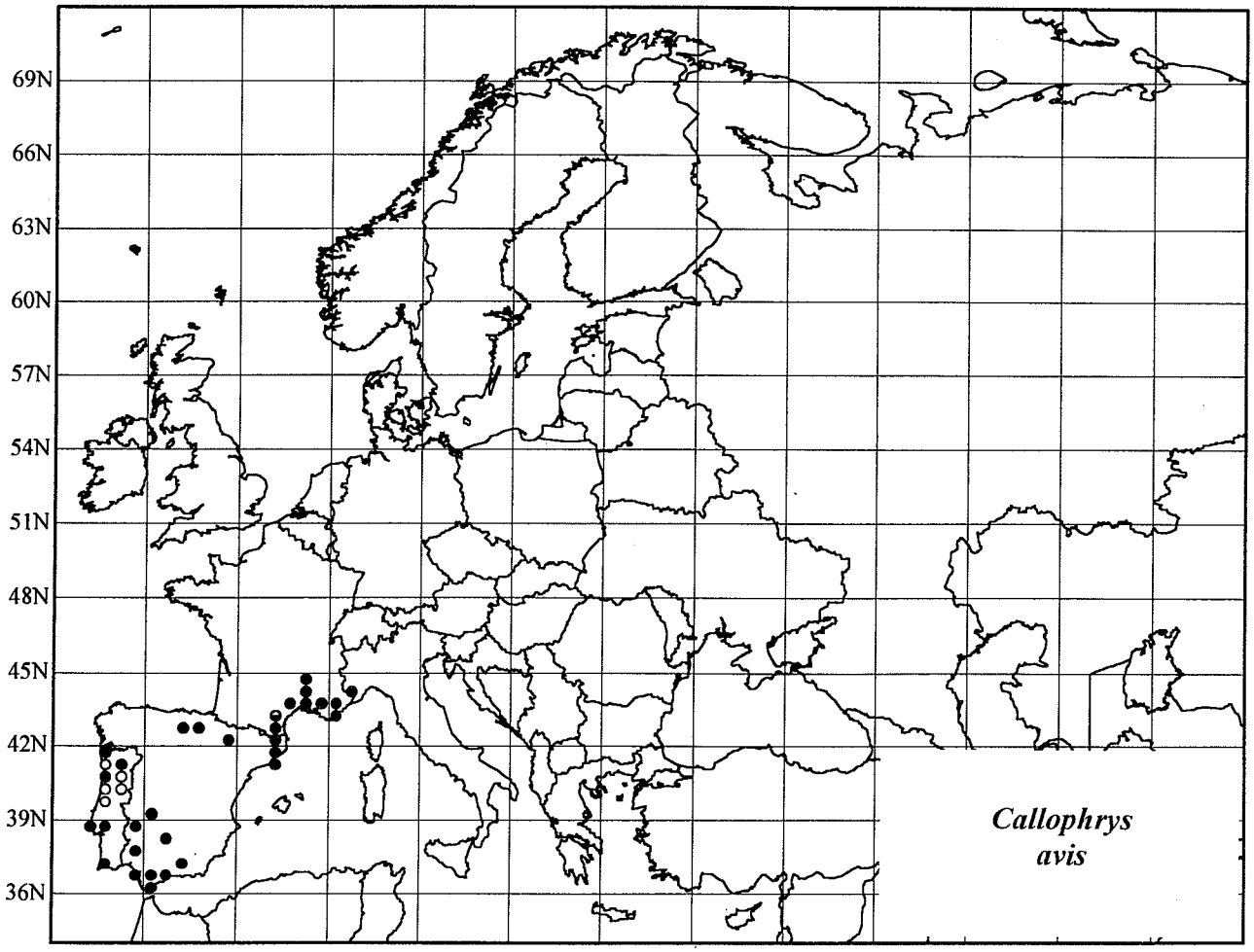
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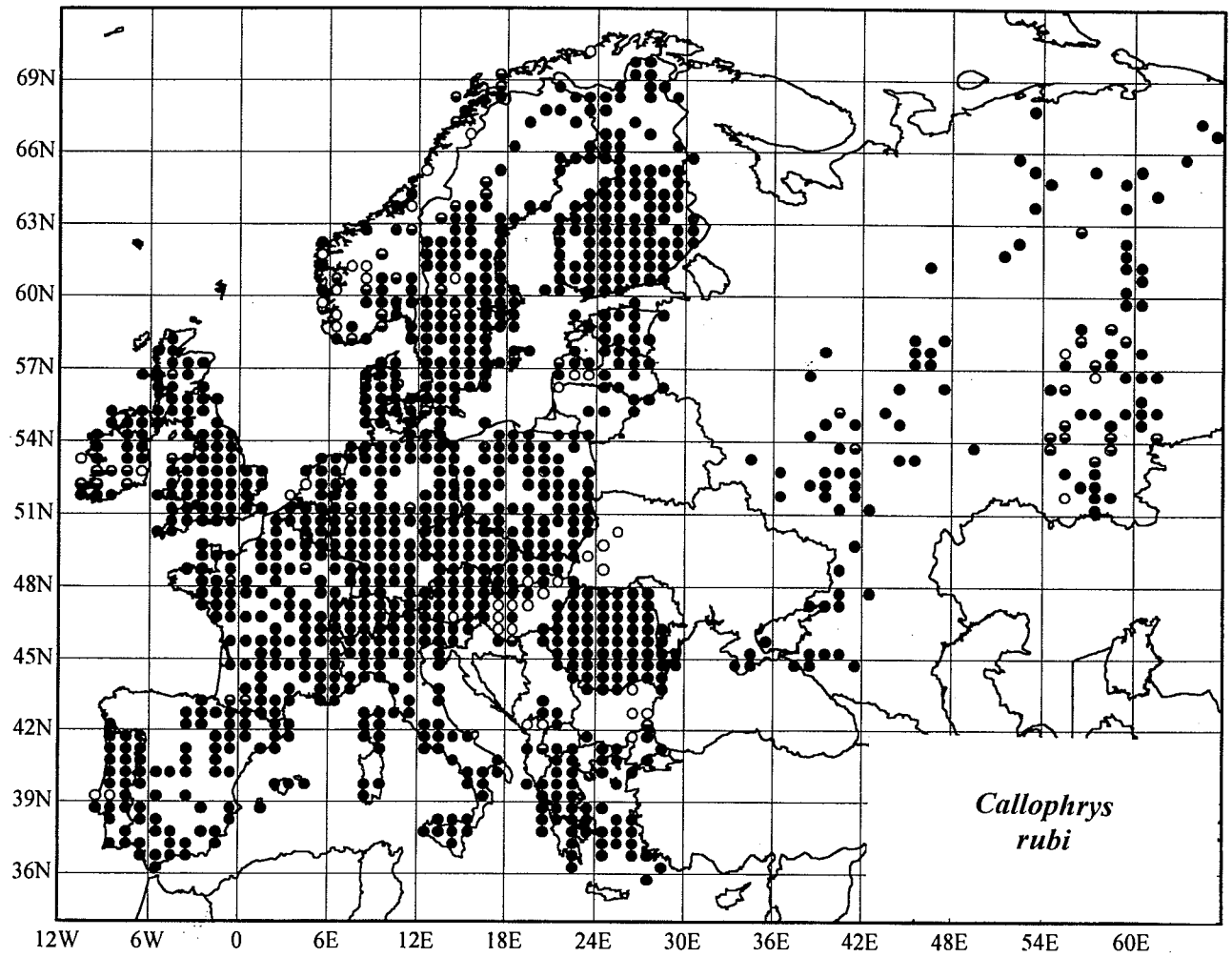
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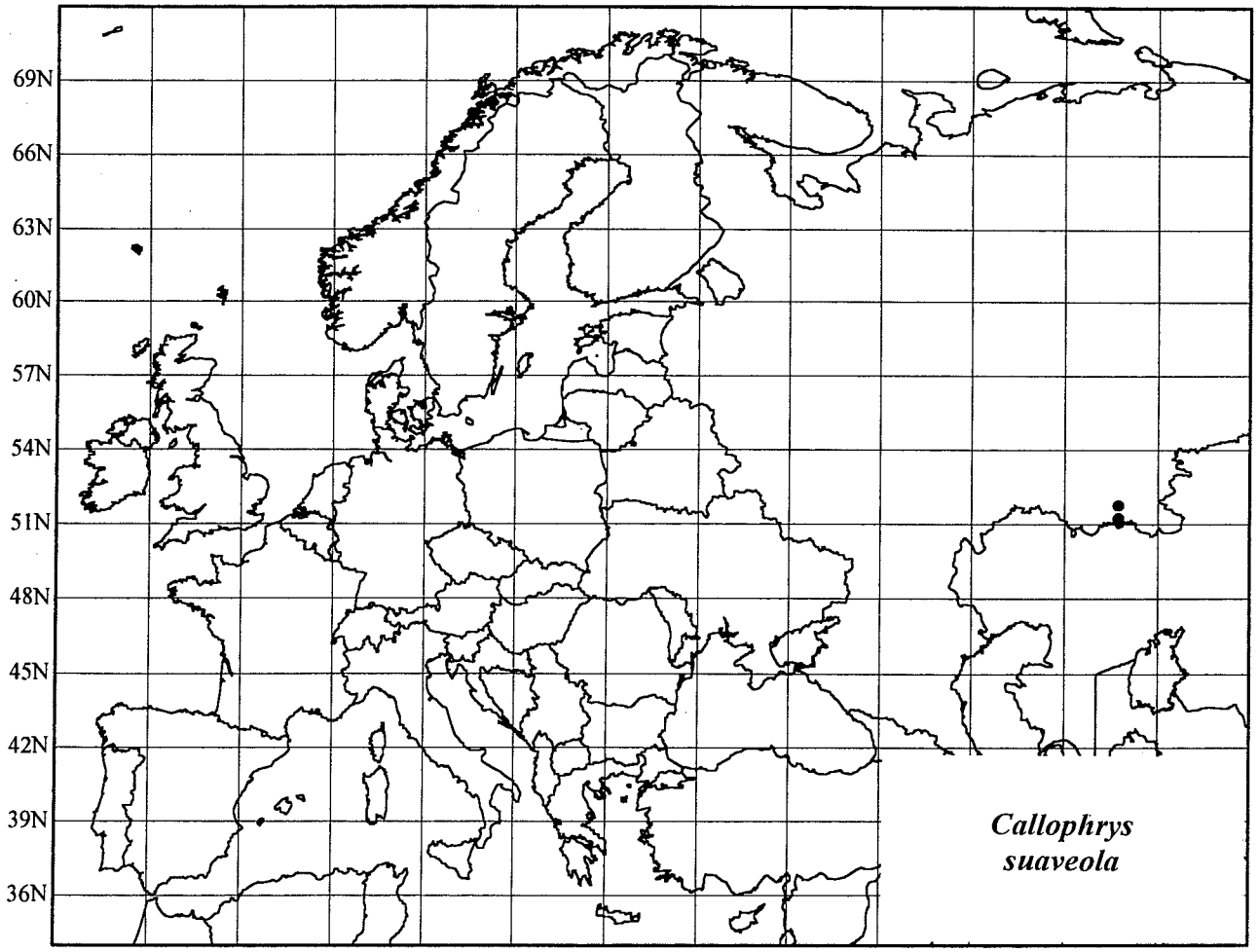
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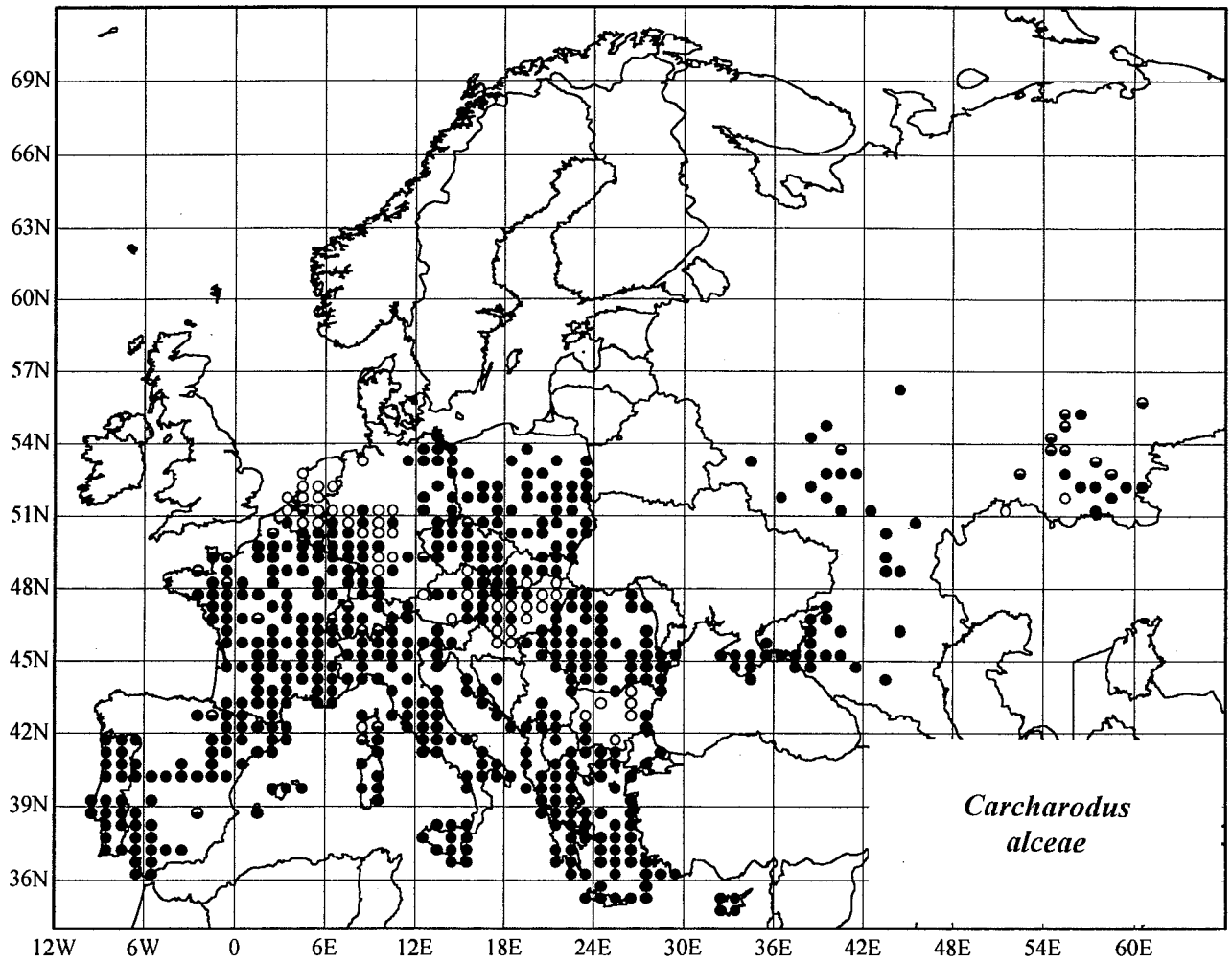
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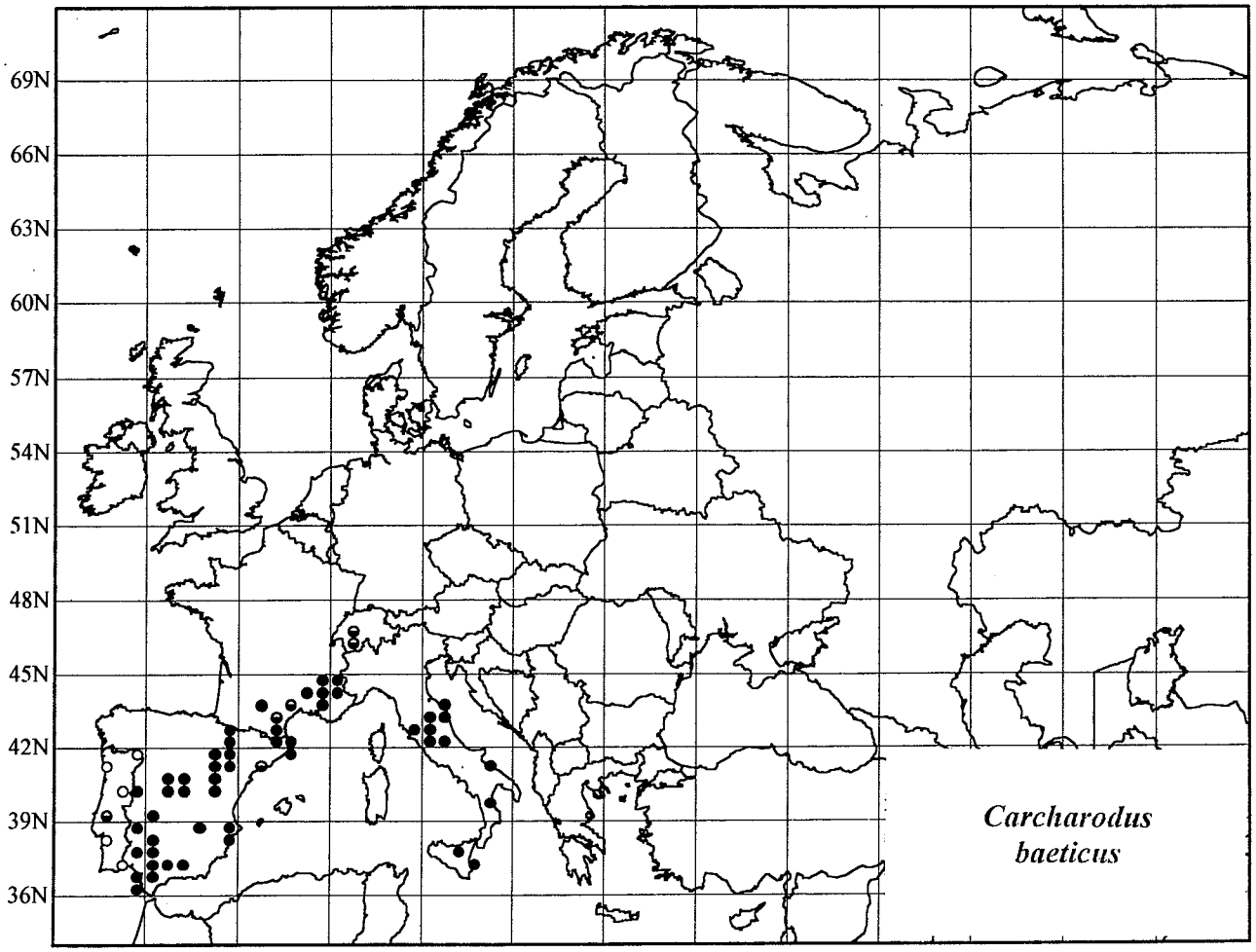
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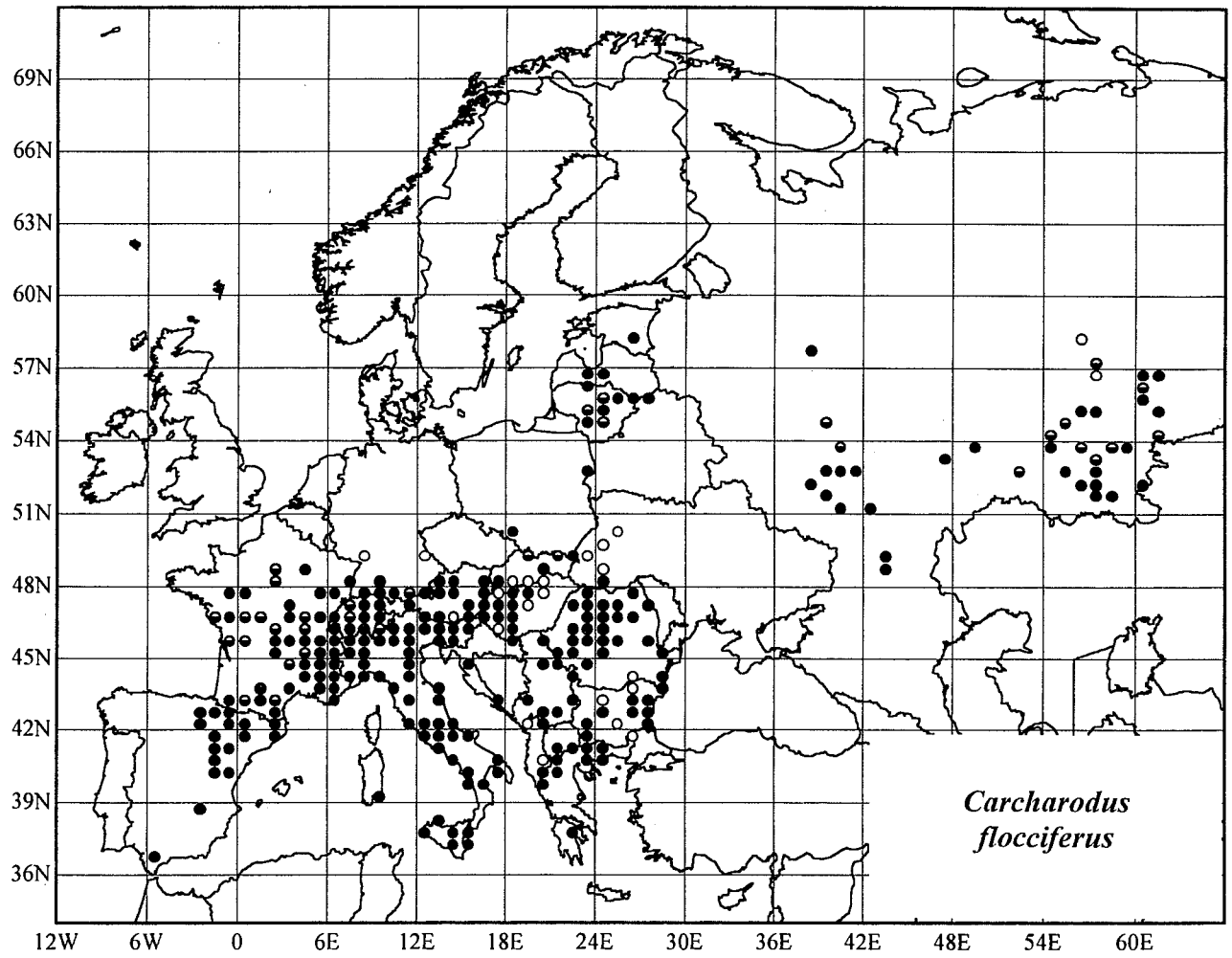
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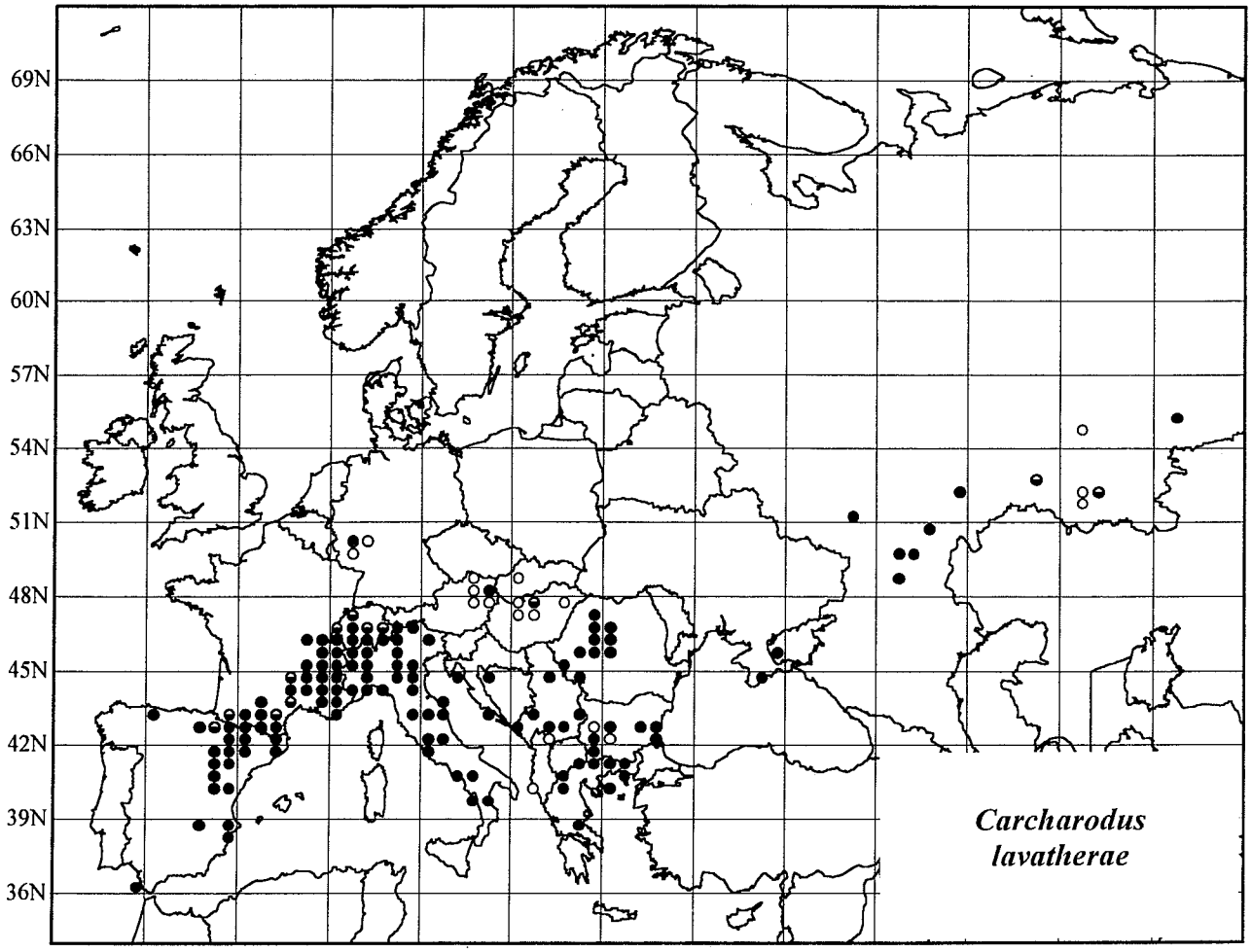
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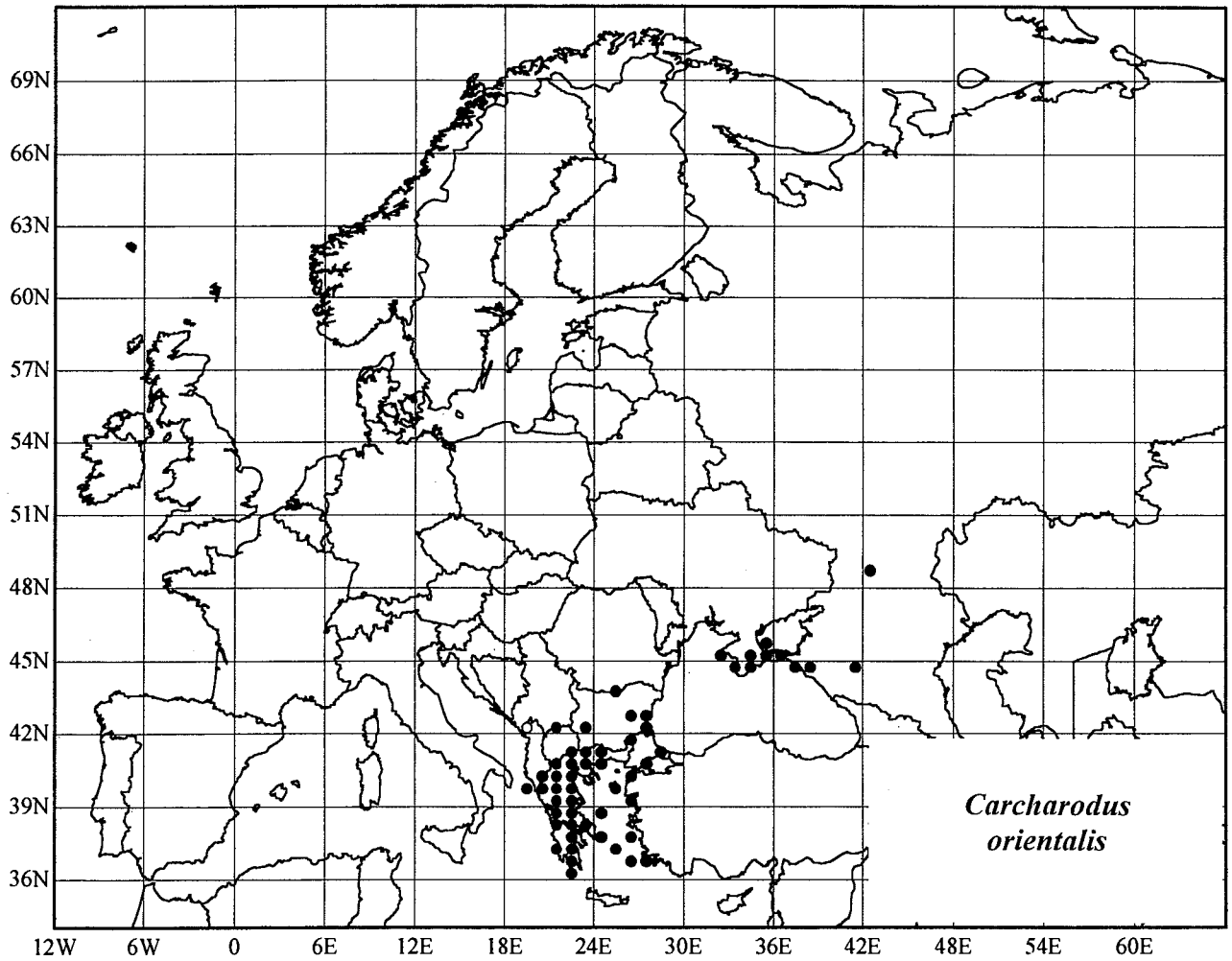
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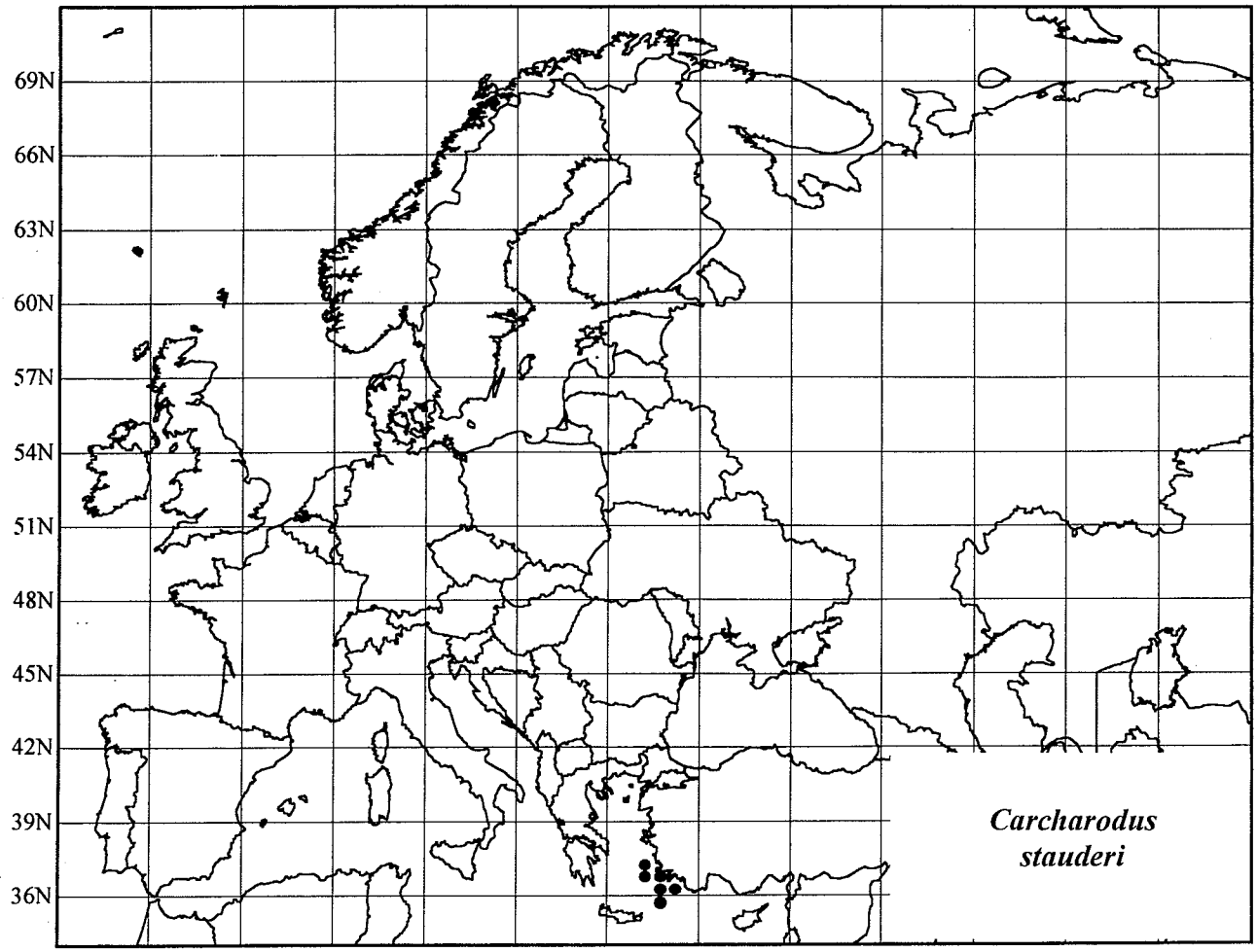
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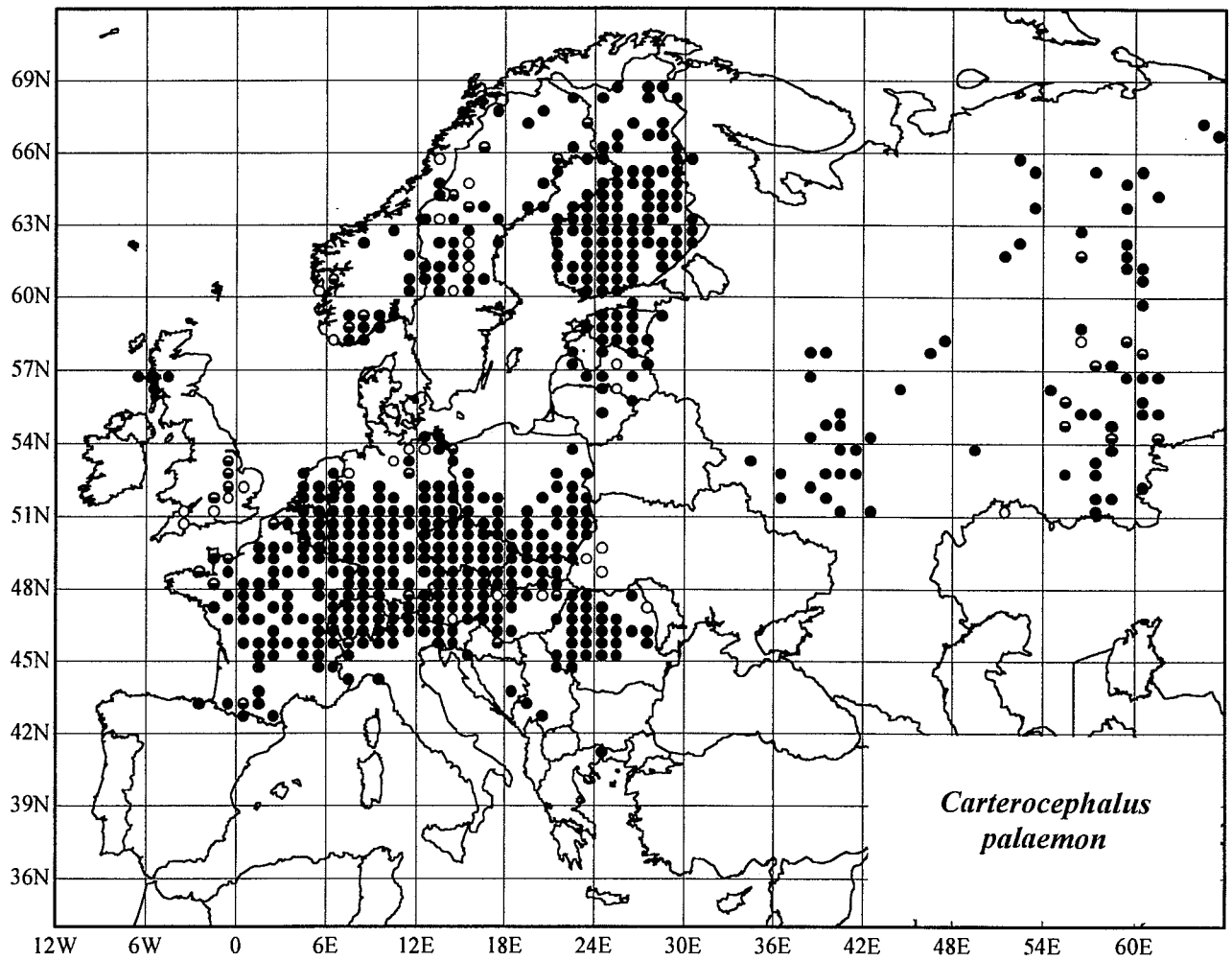
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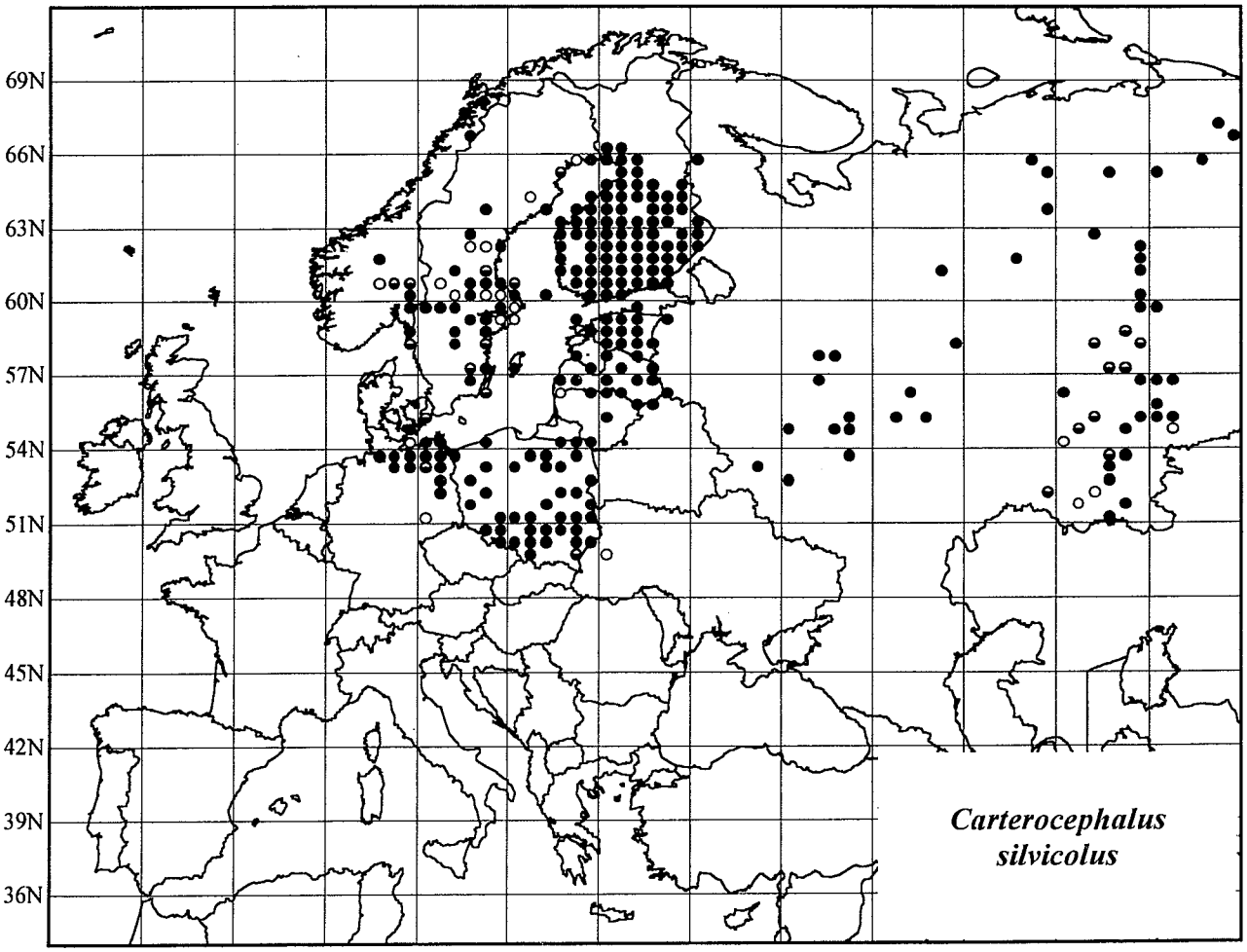
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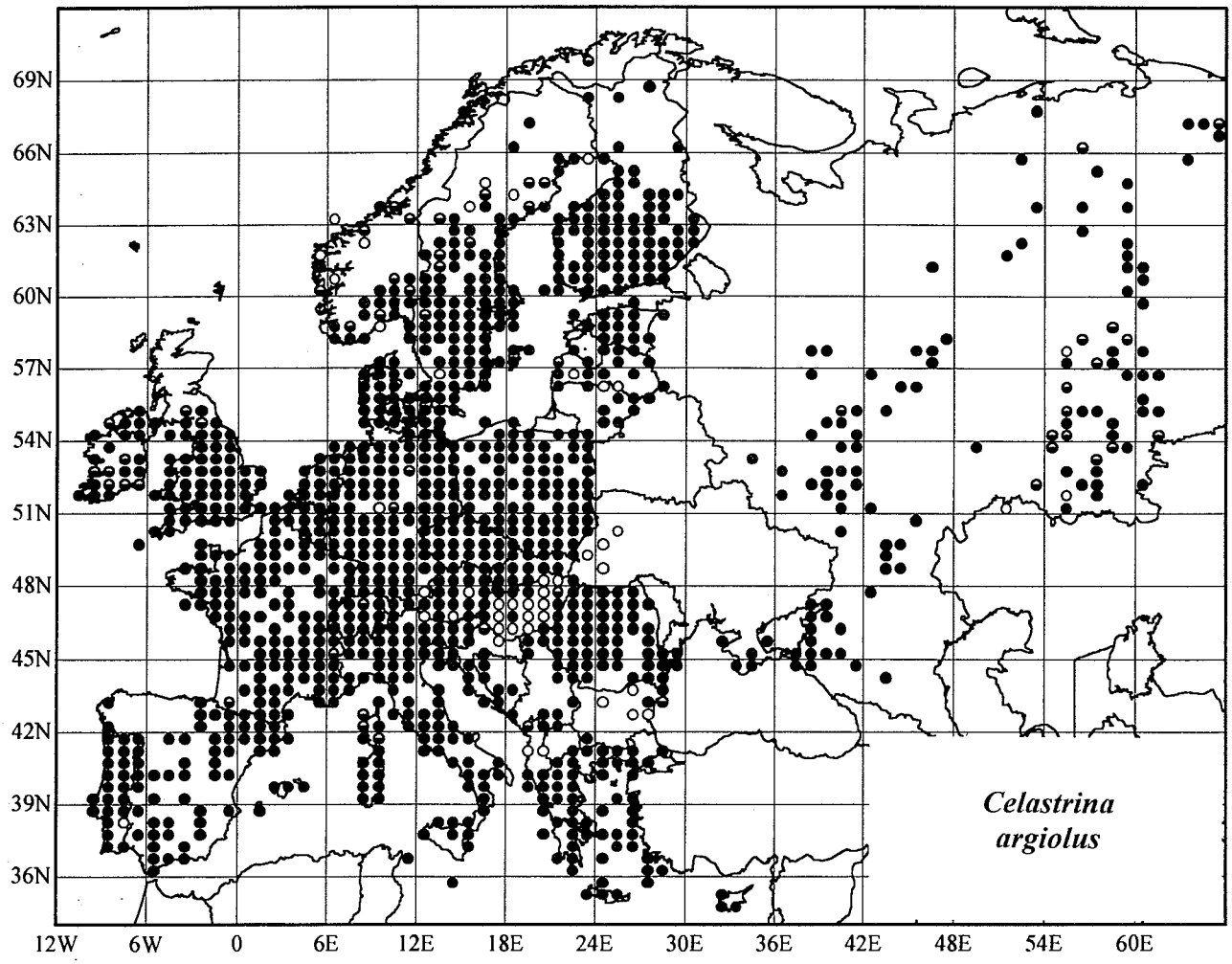
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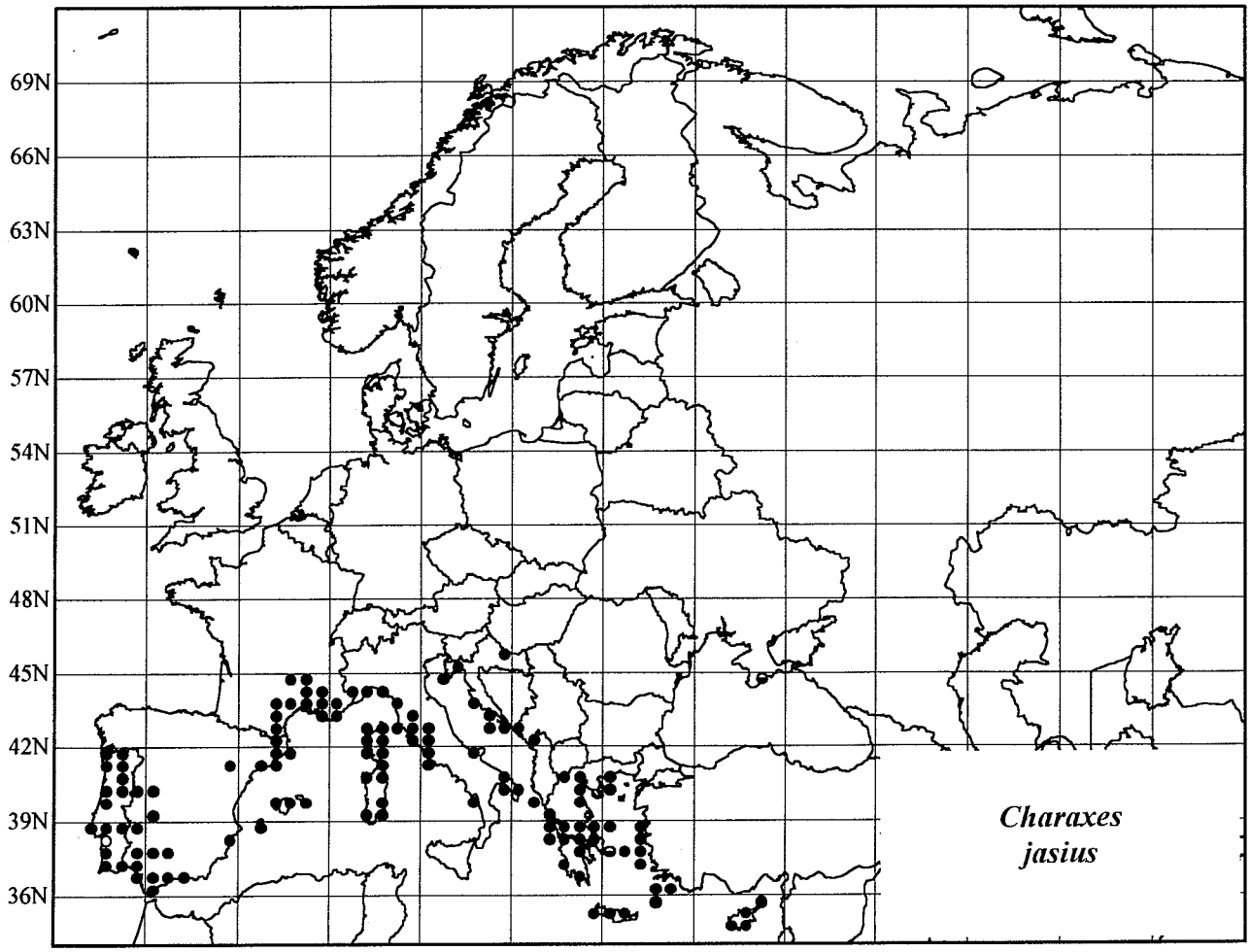
Celastrina argiolus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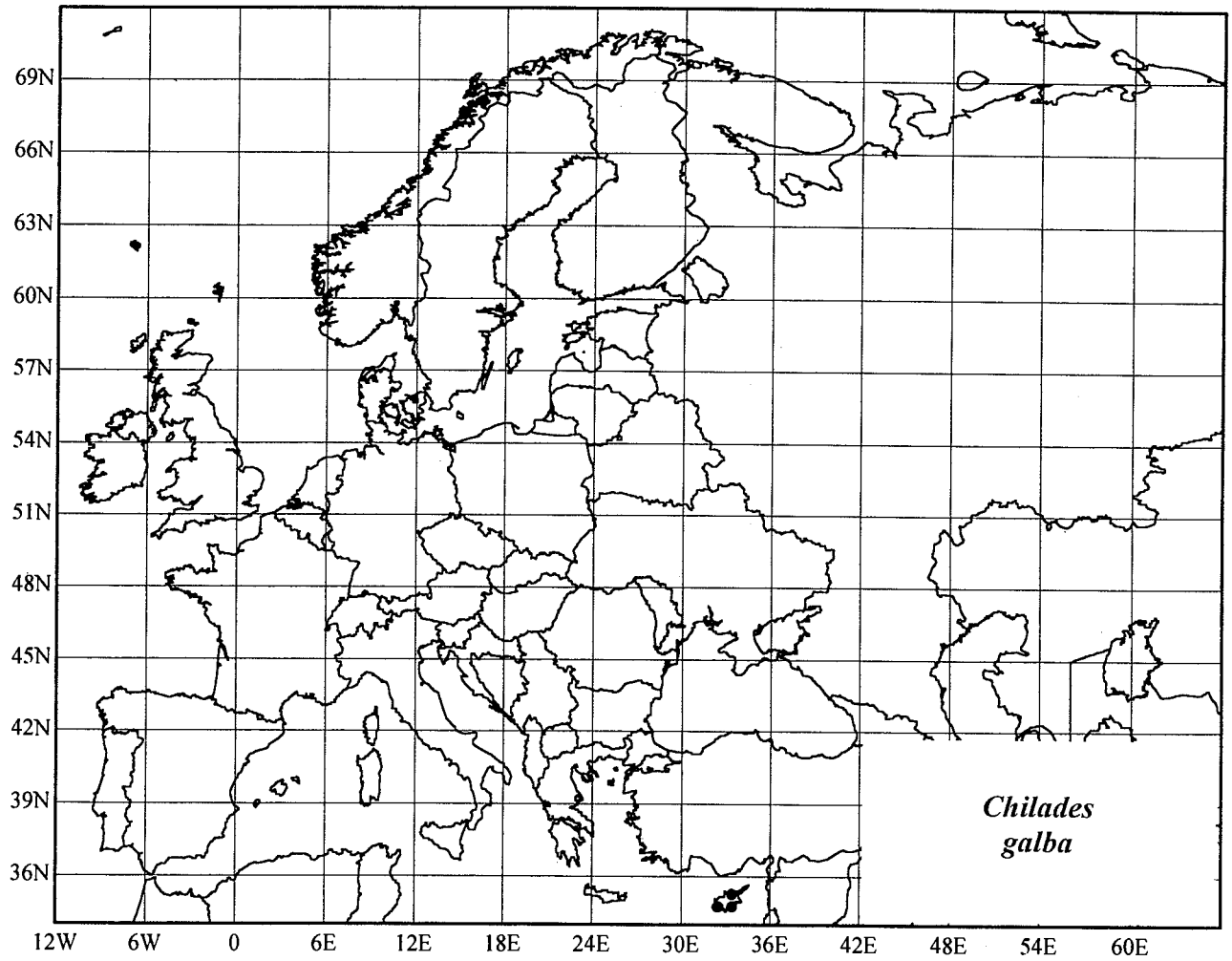
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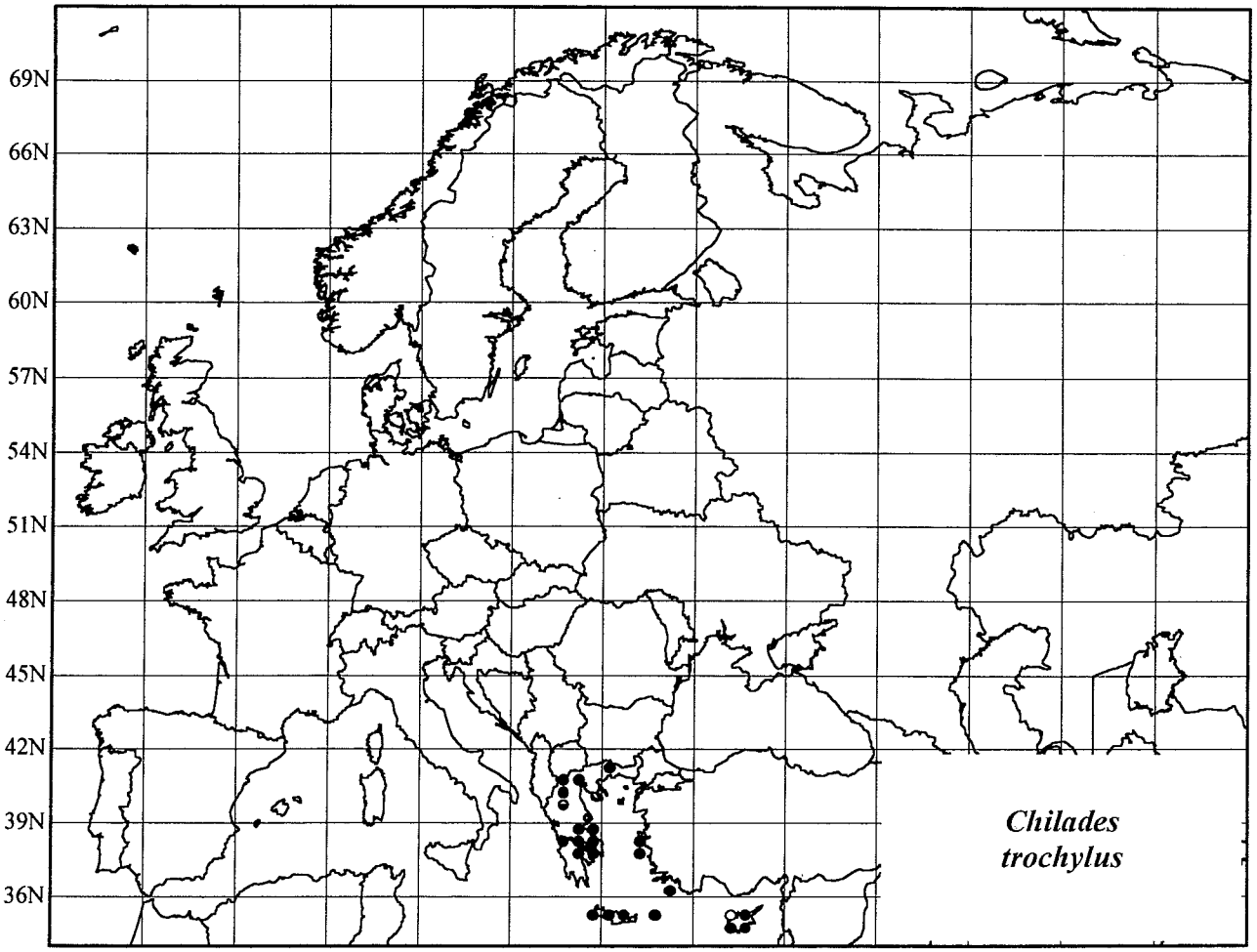
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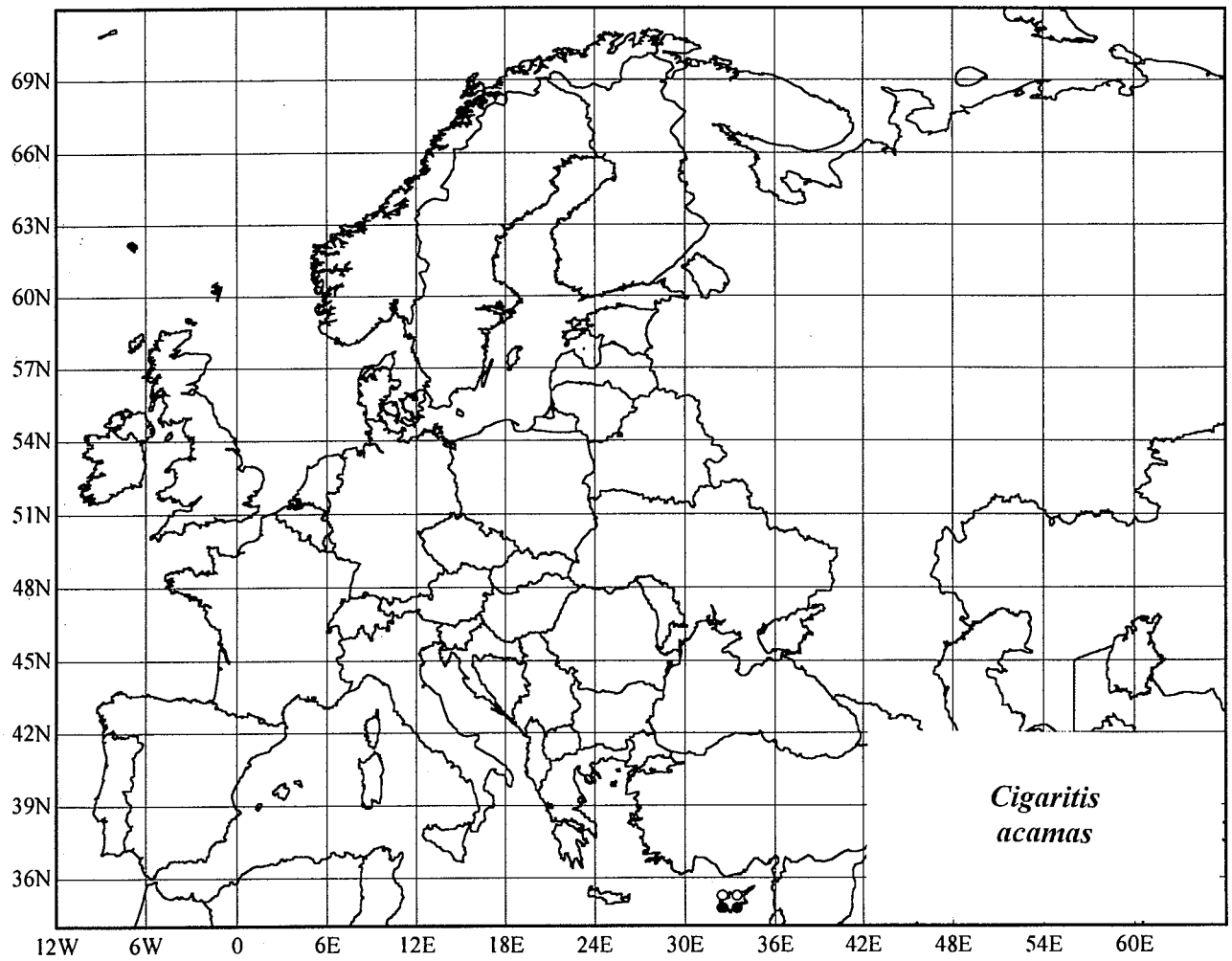
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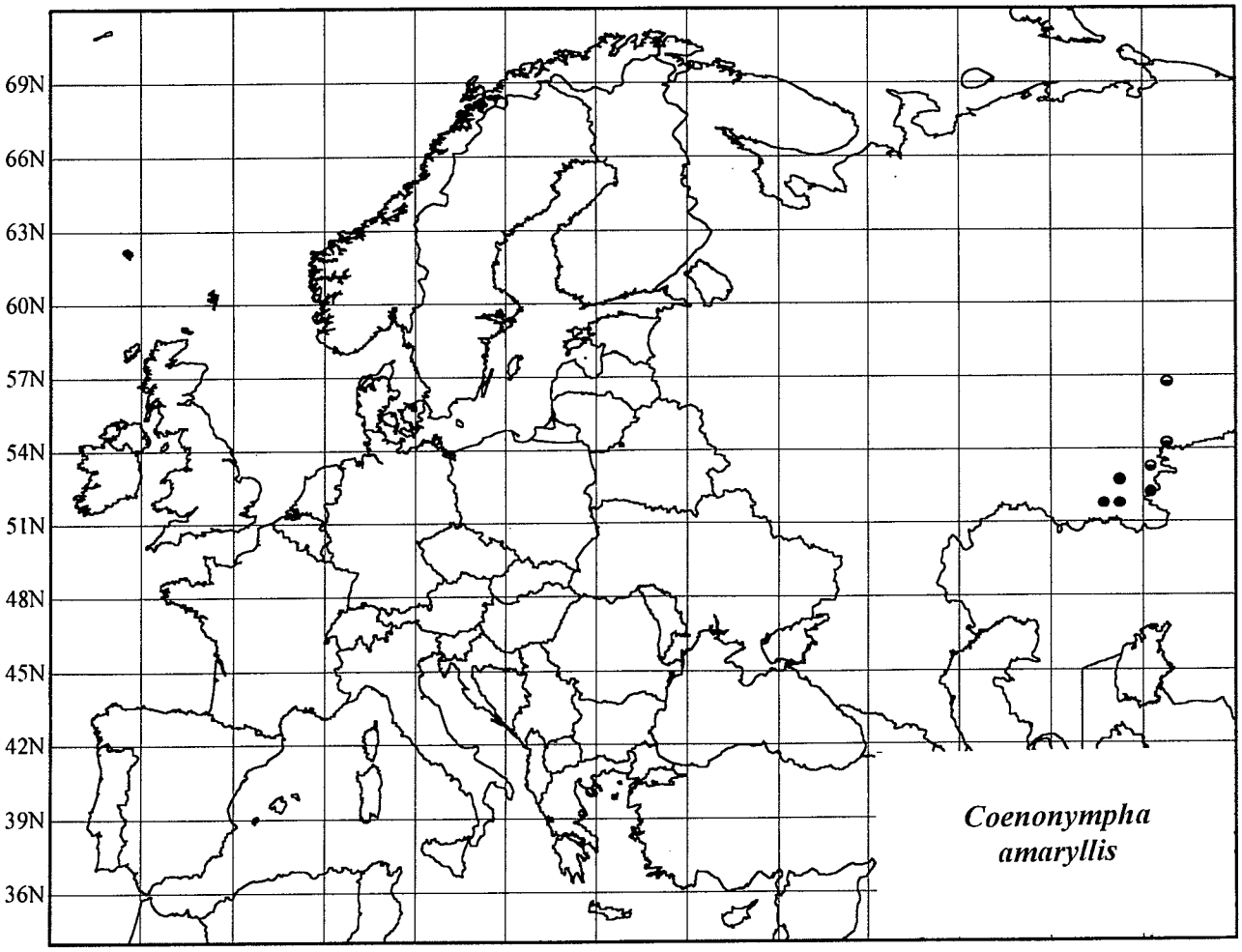
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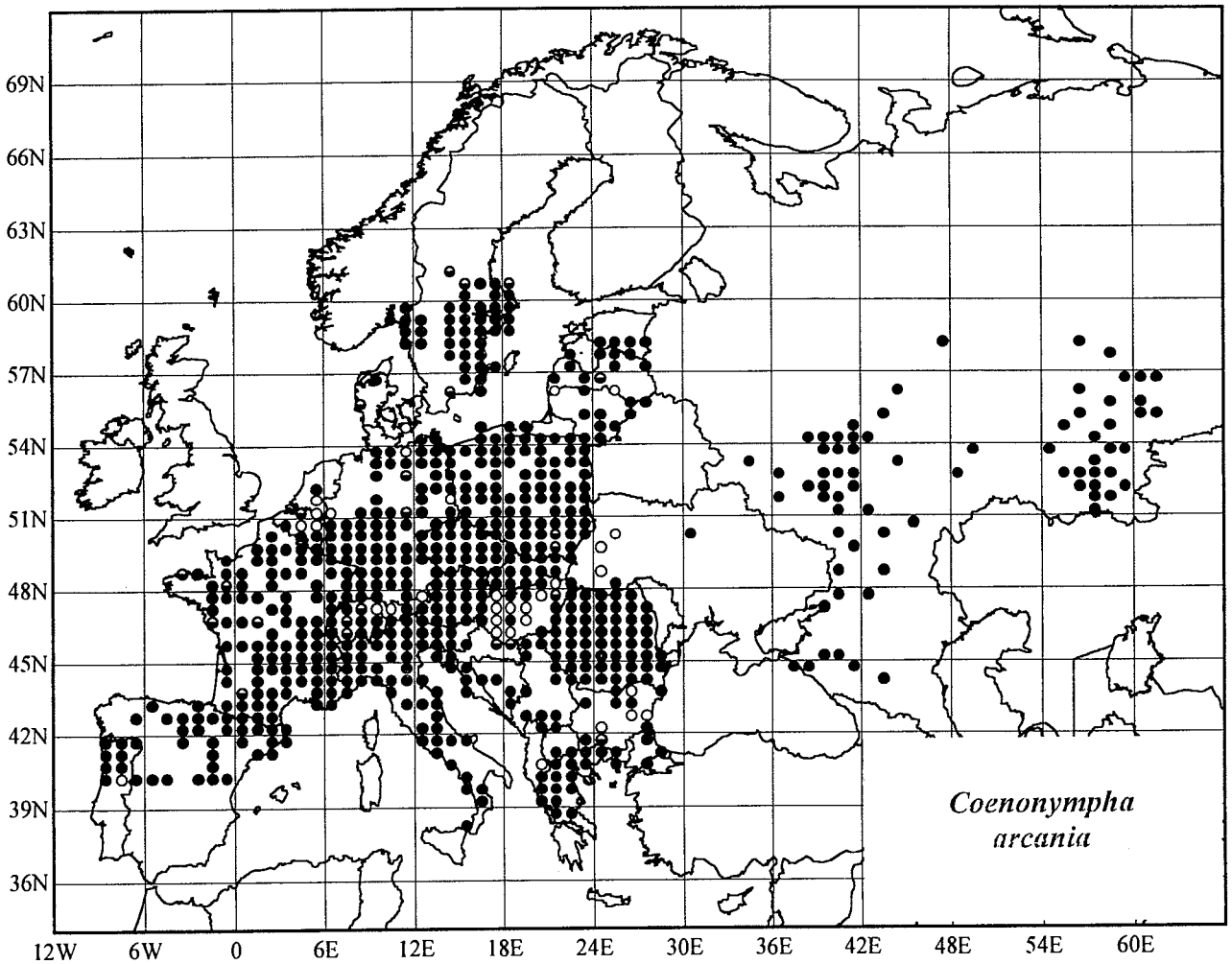
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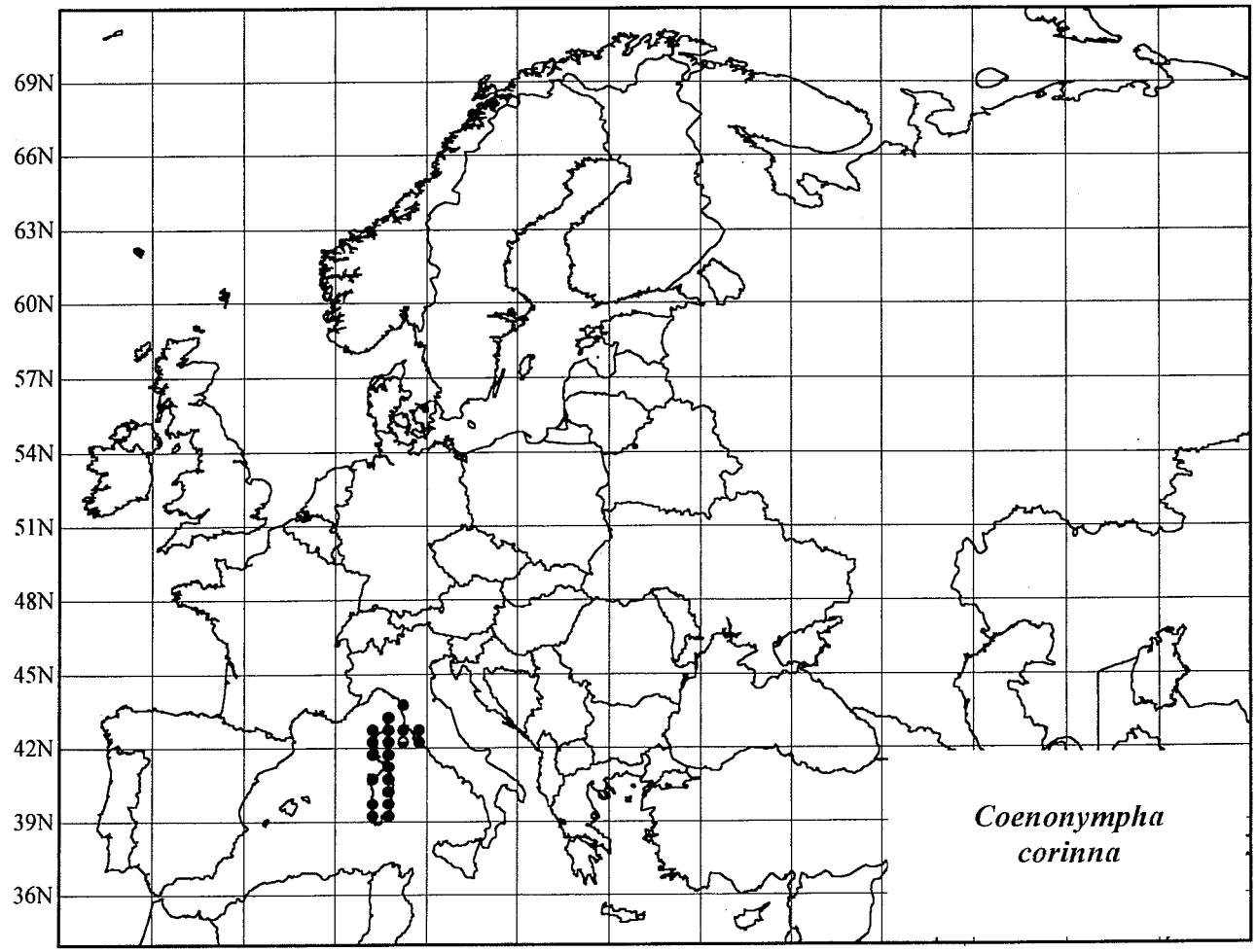
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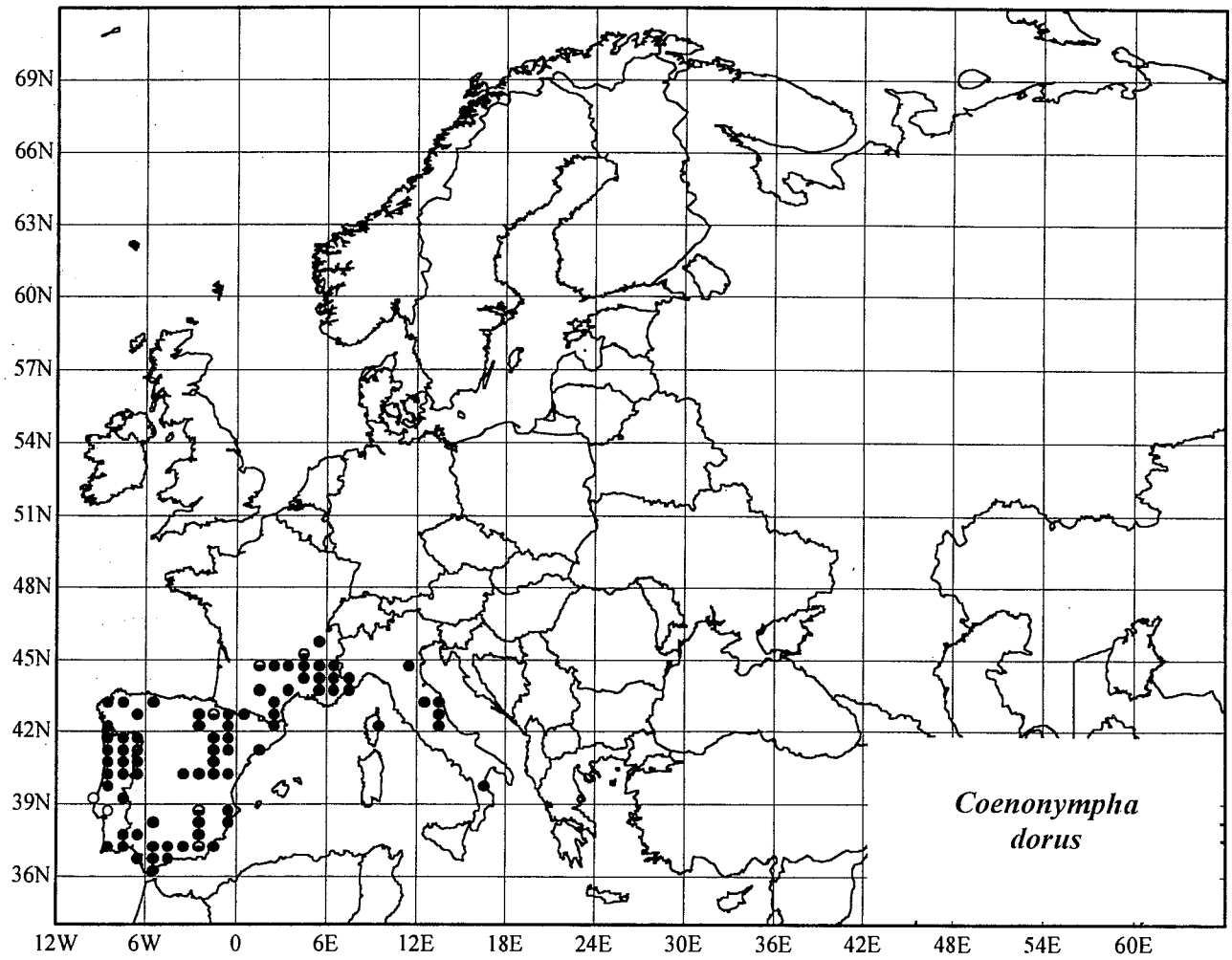
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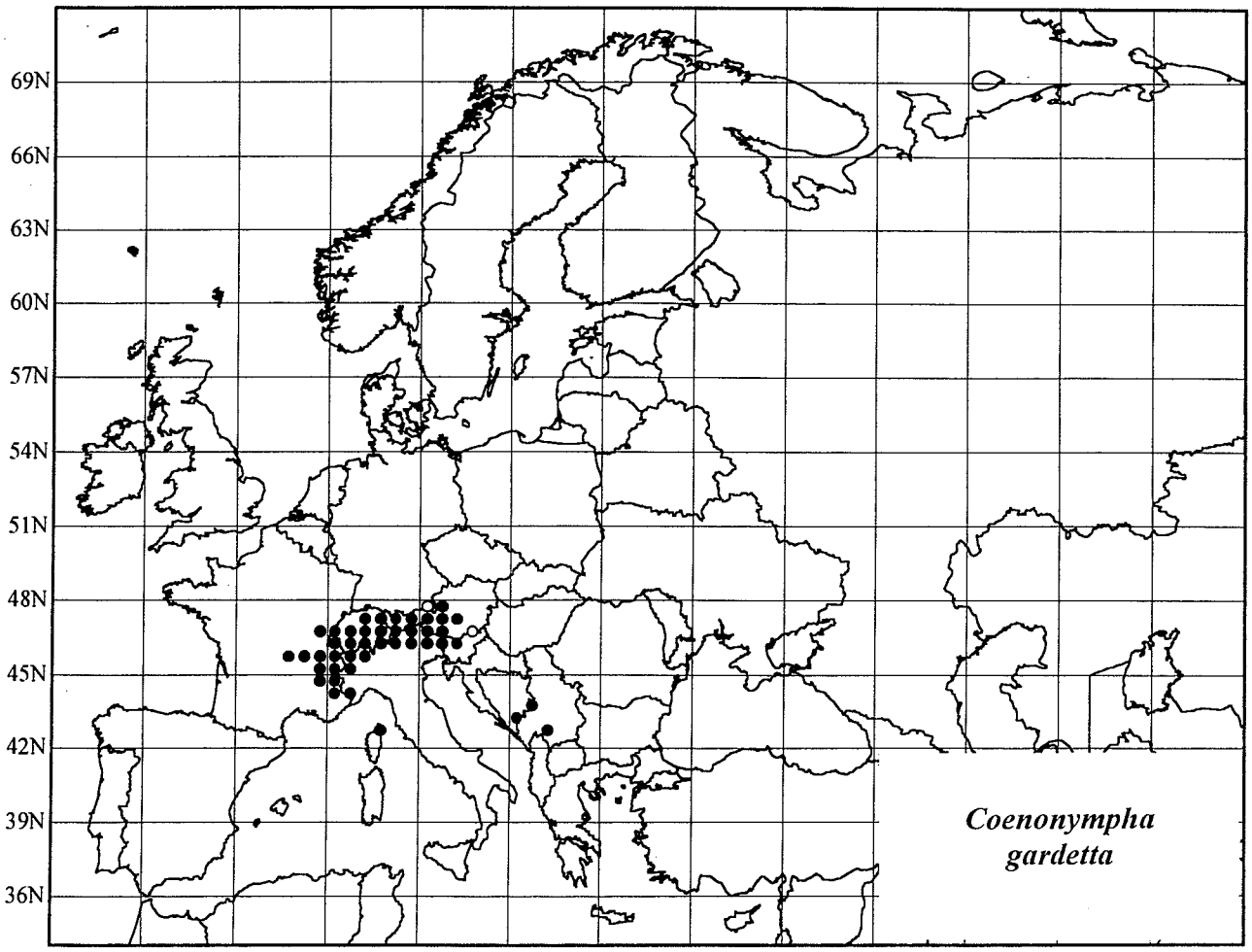
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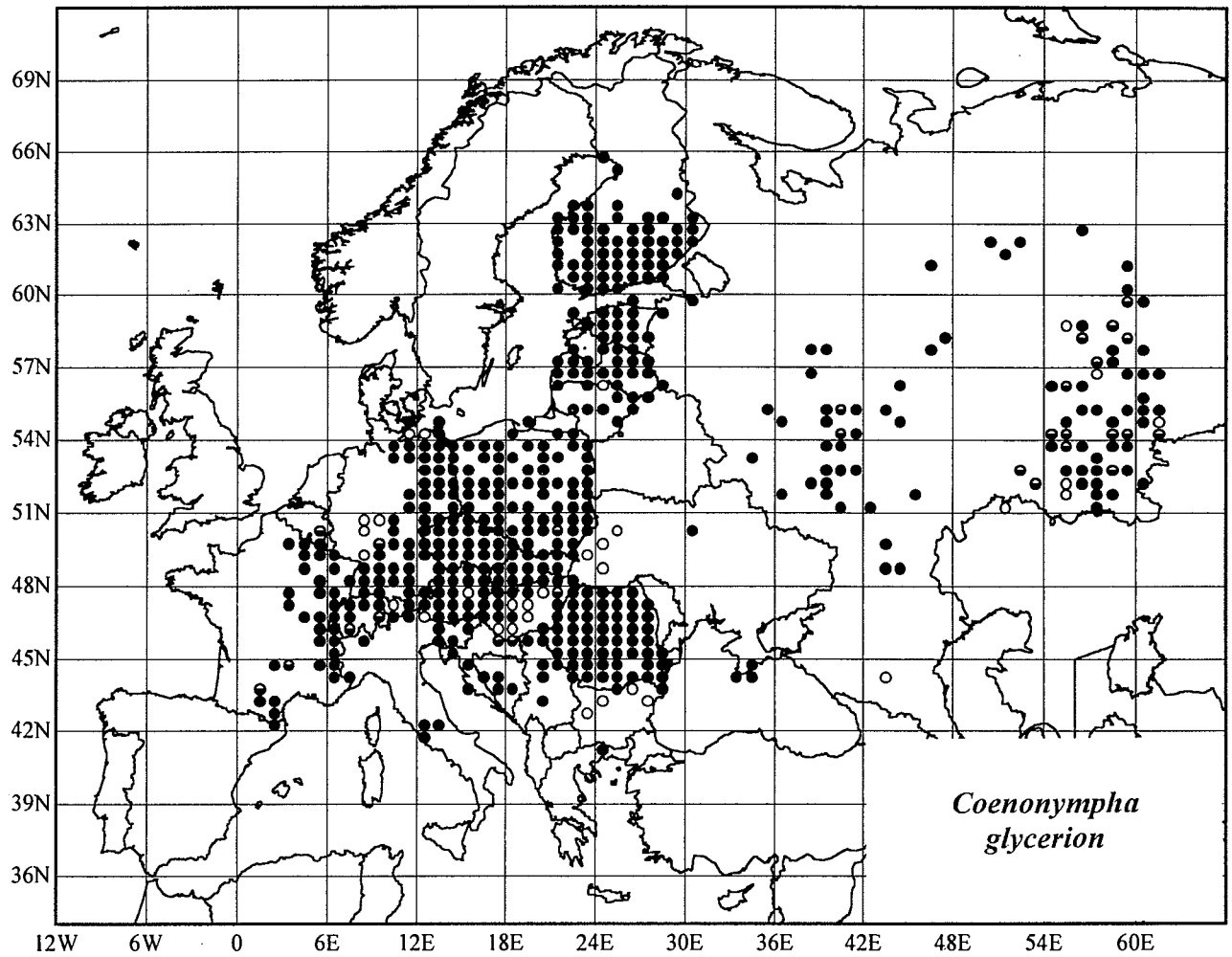
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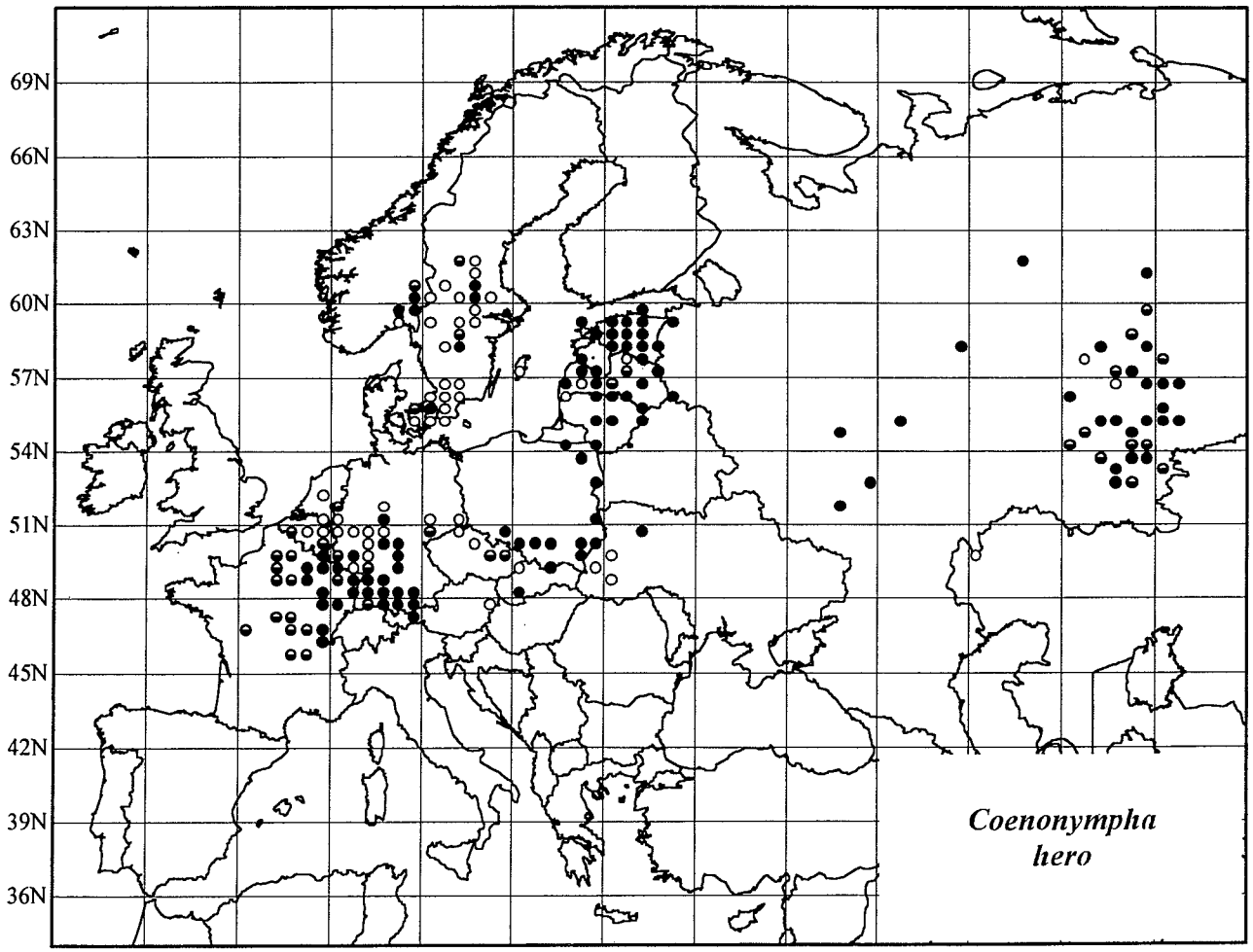
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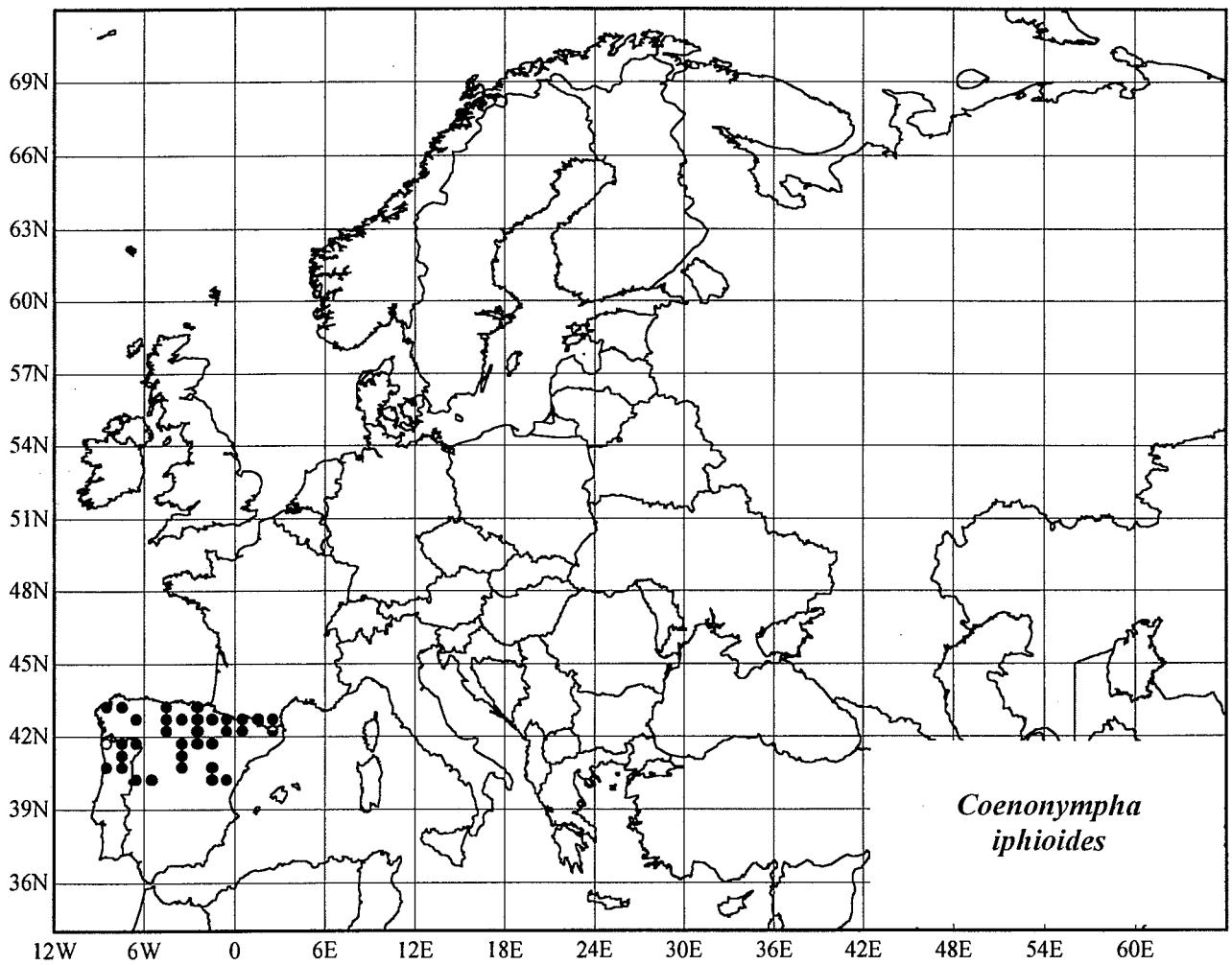
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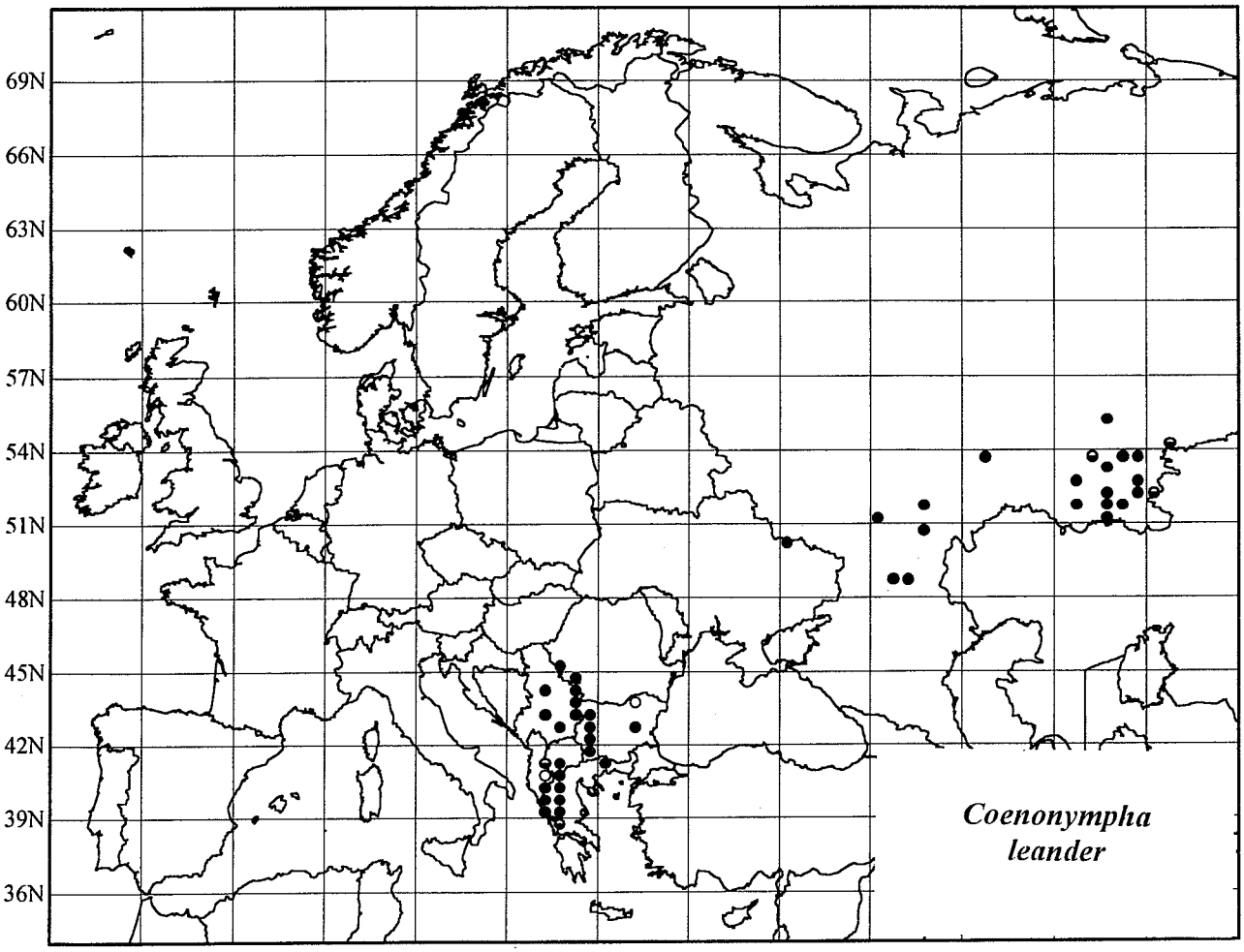
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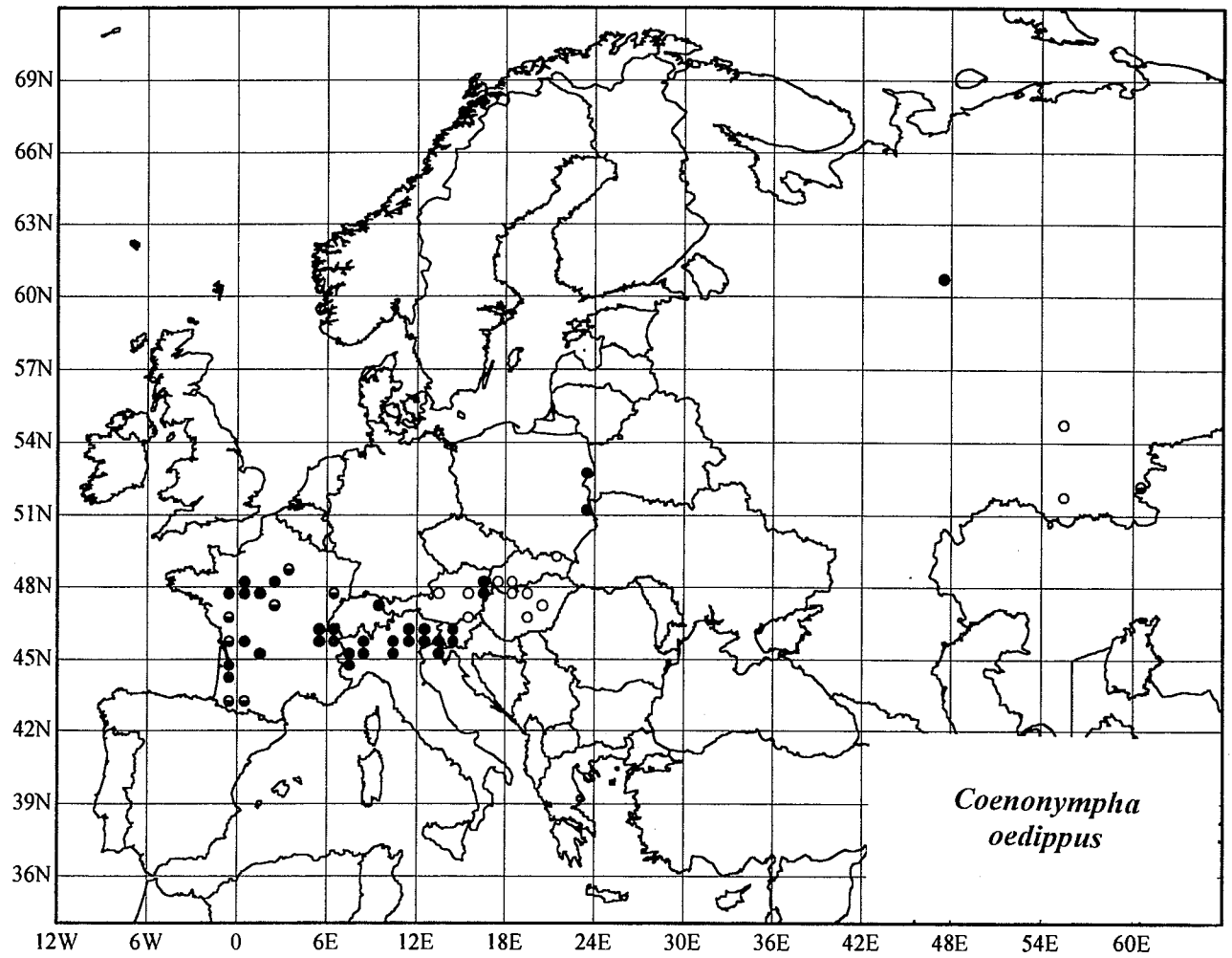
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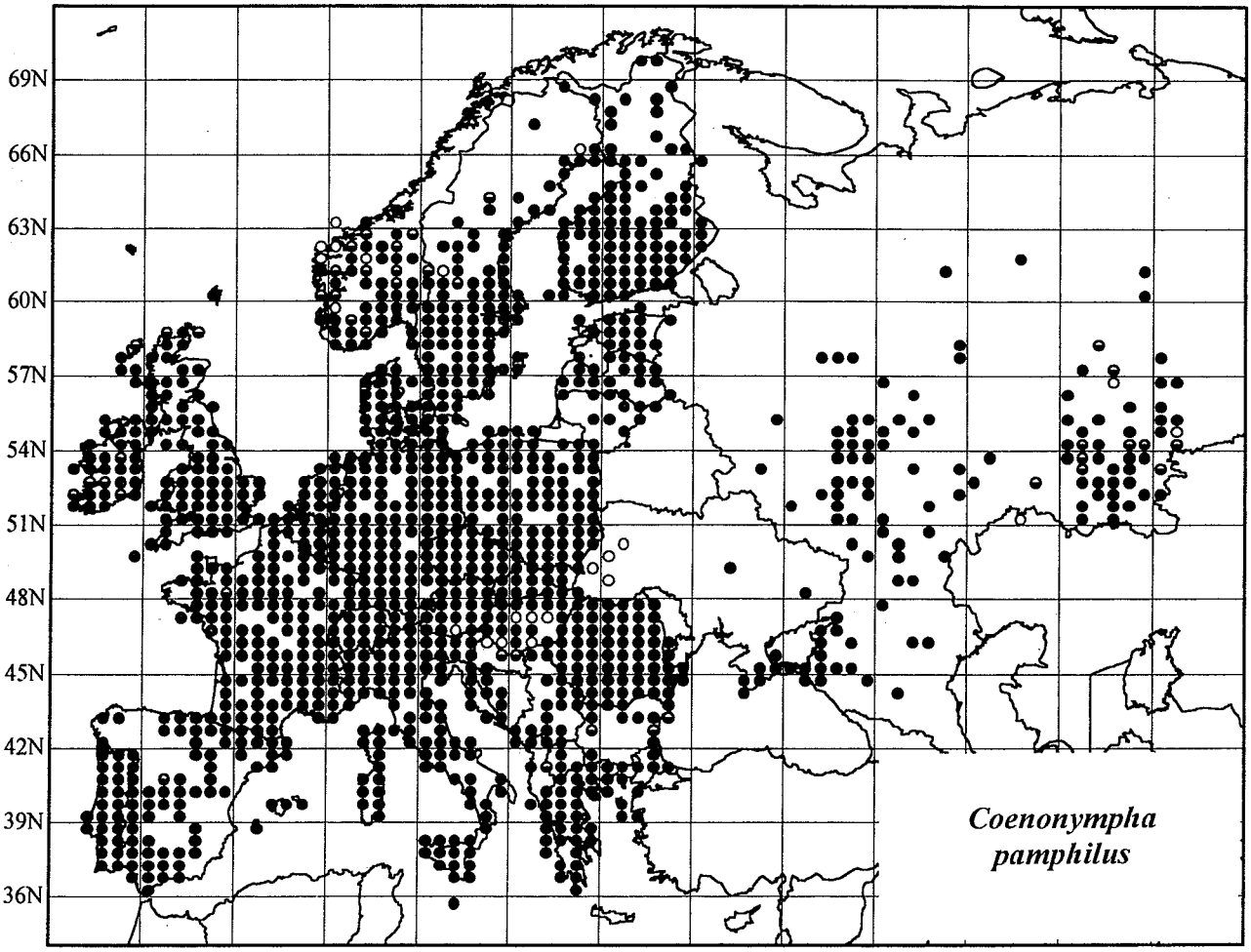
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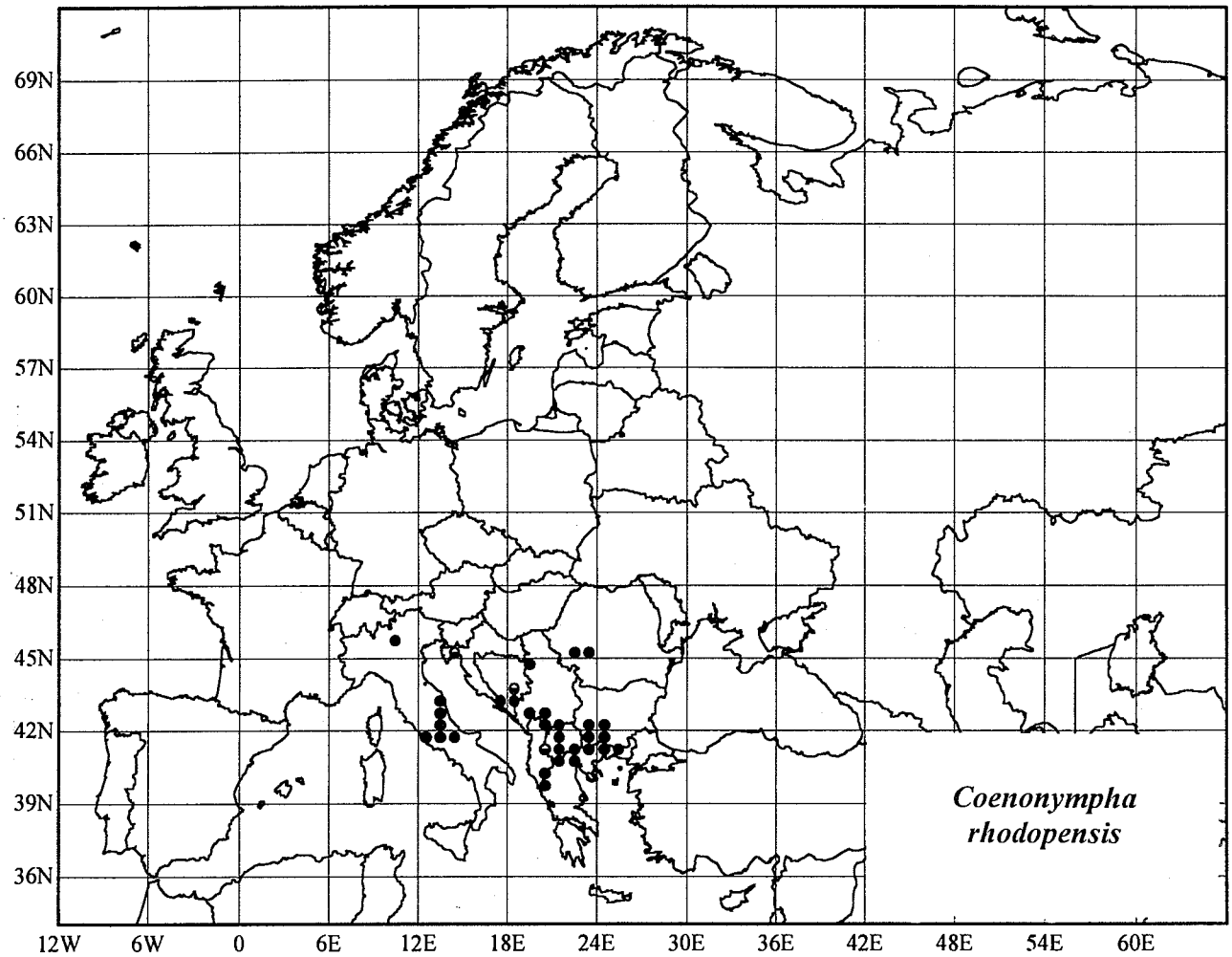
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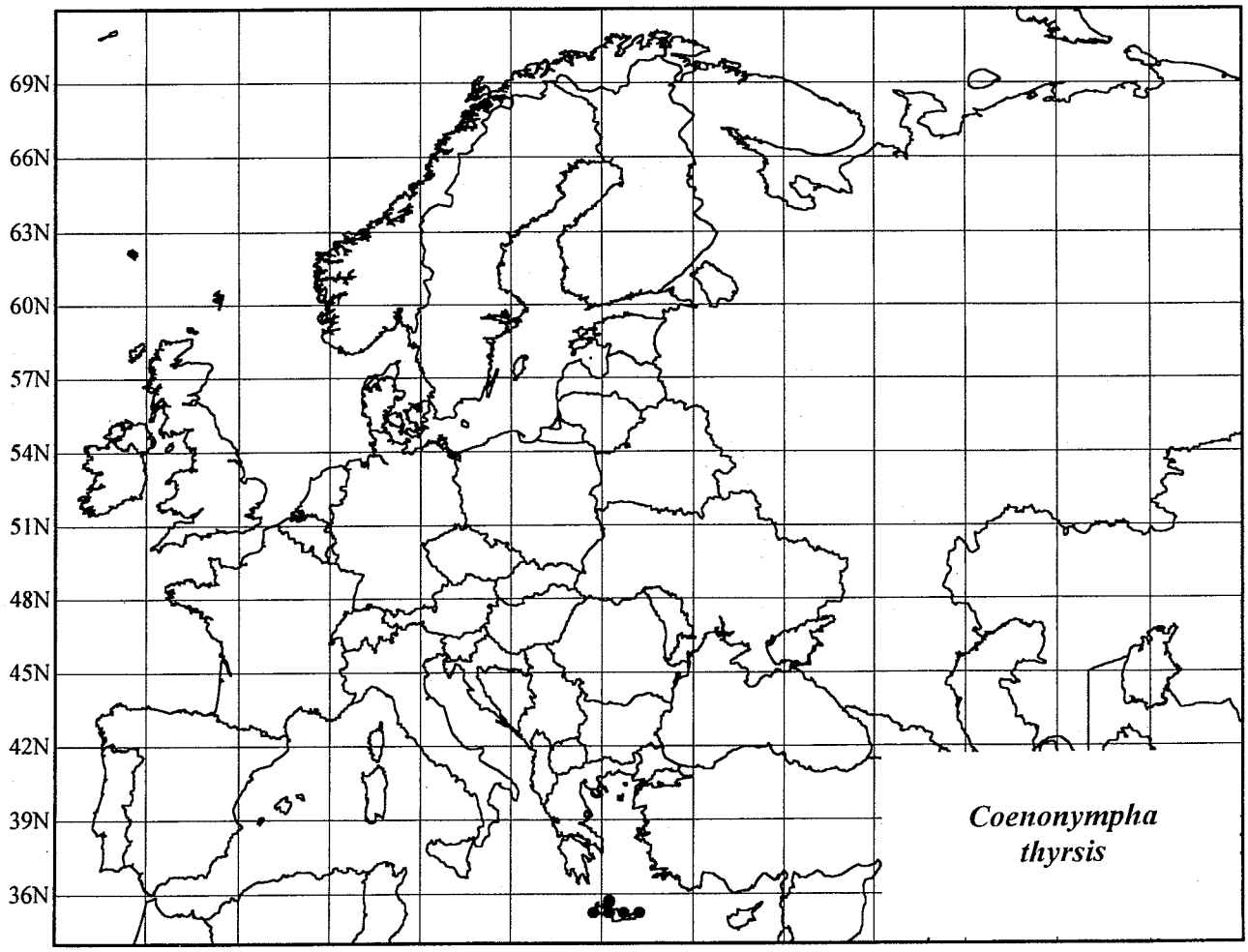
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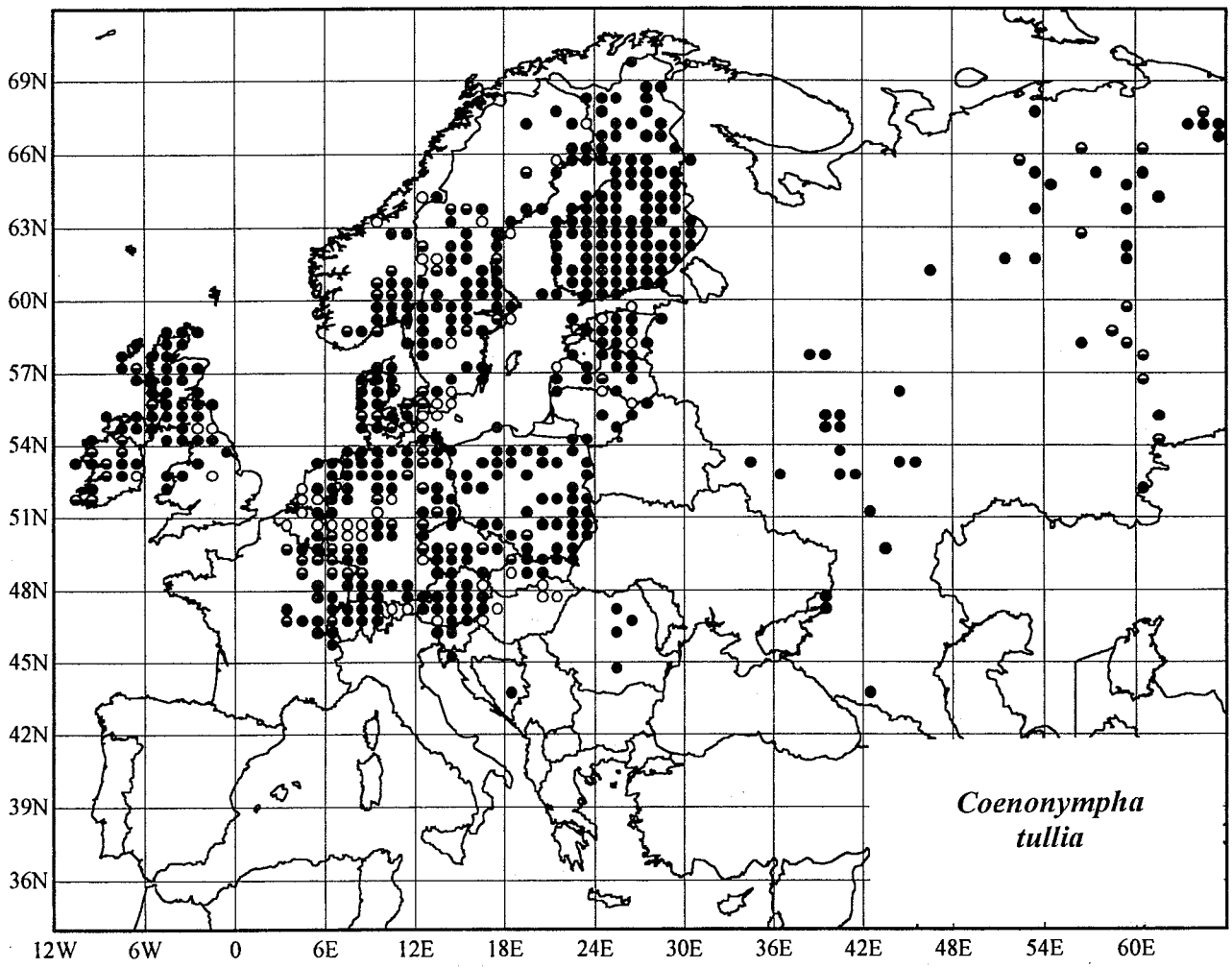
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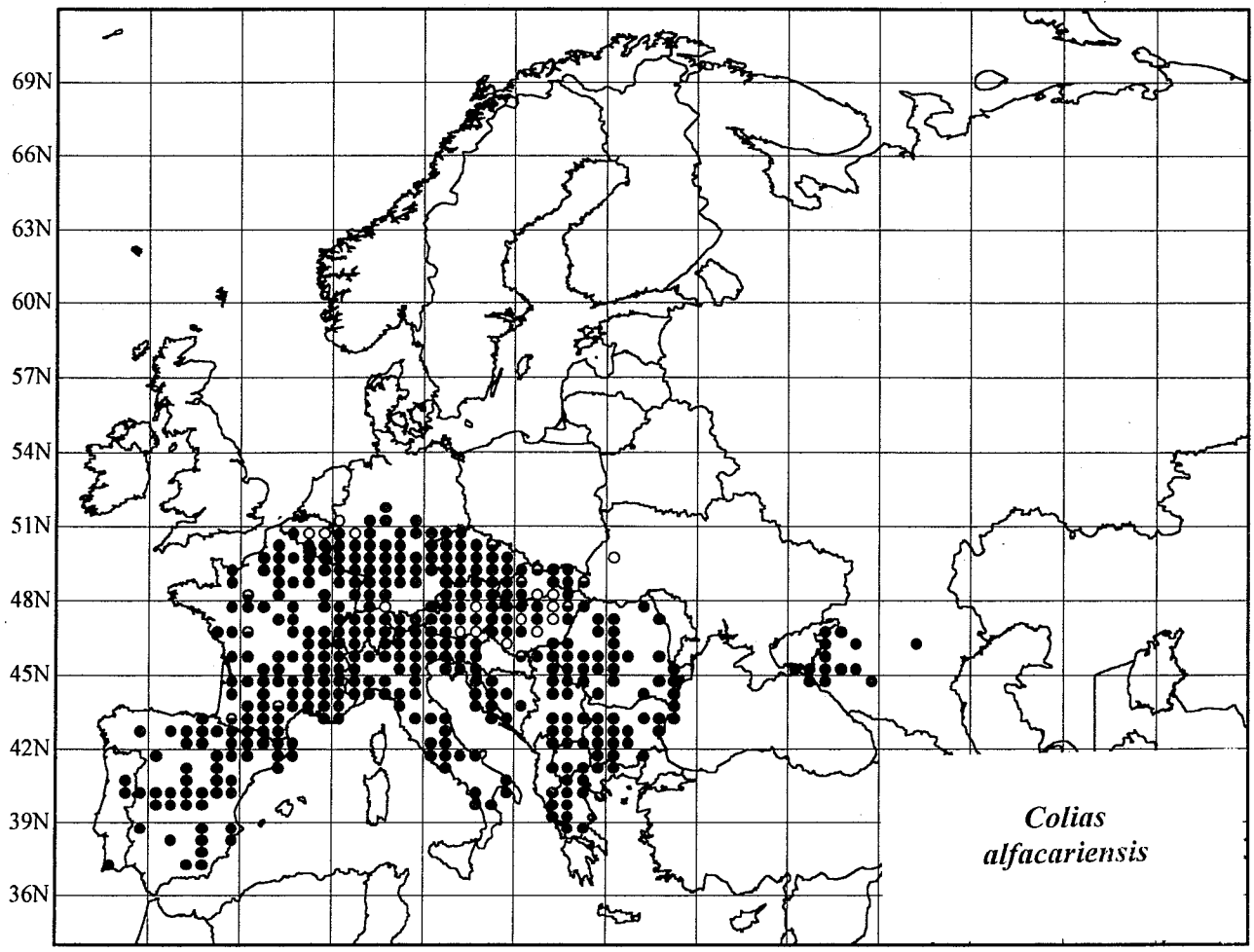
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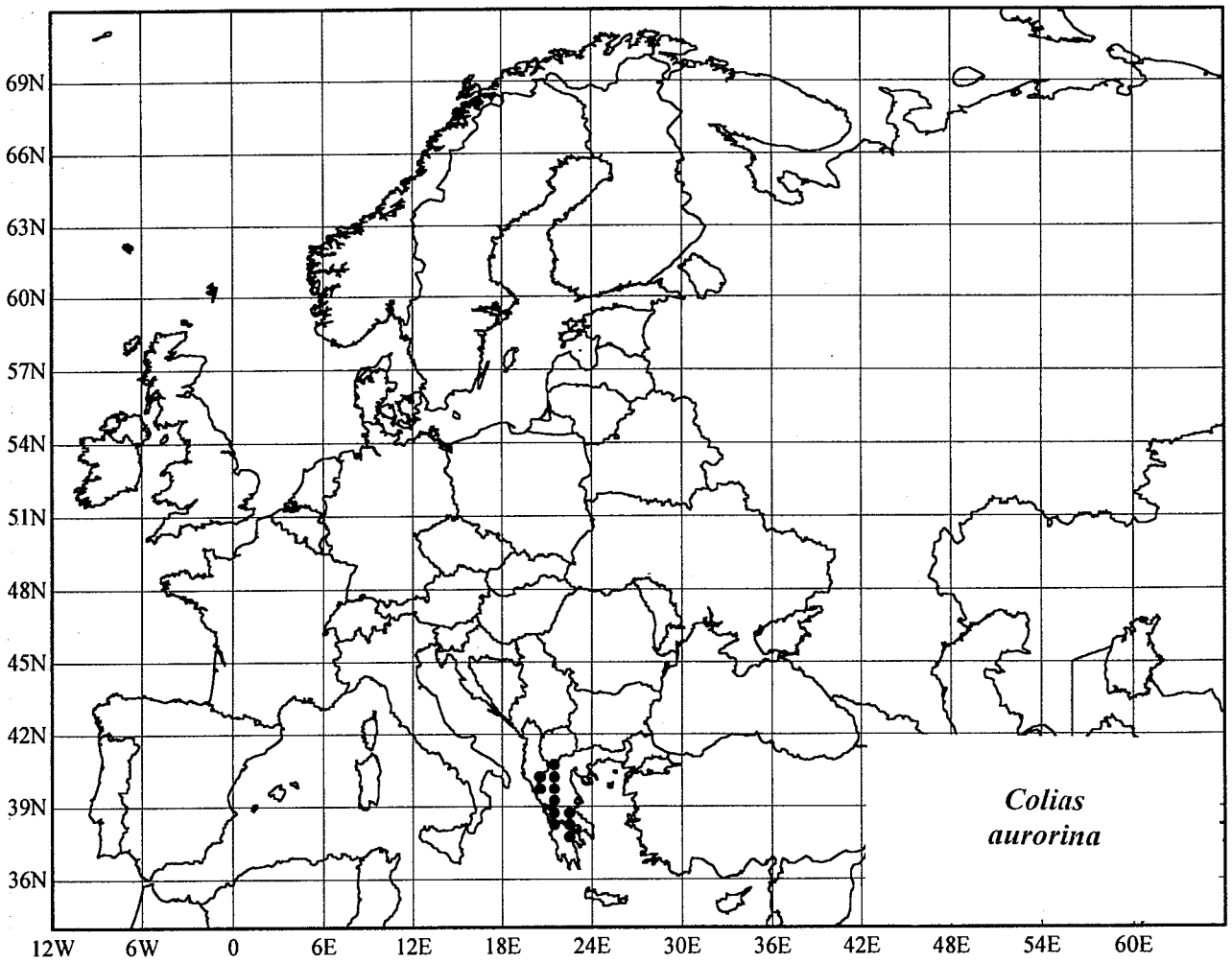
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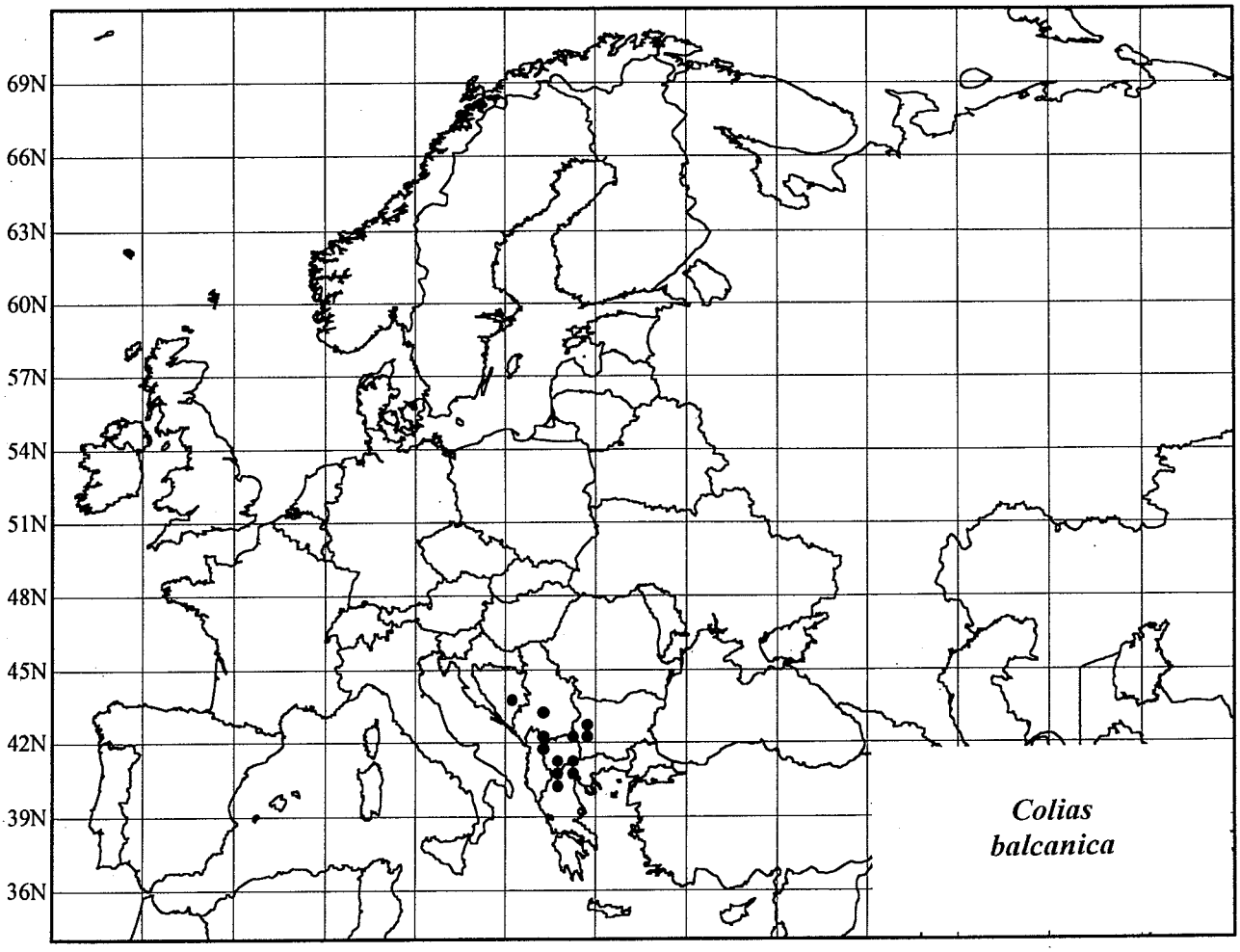
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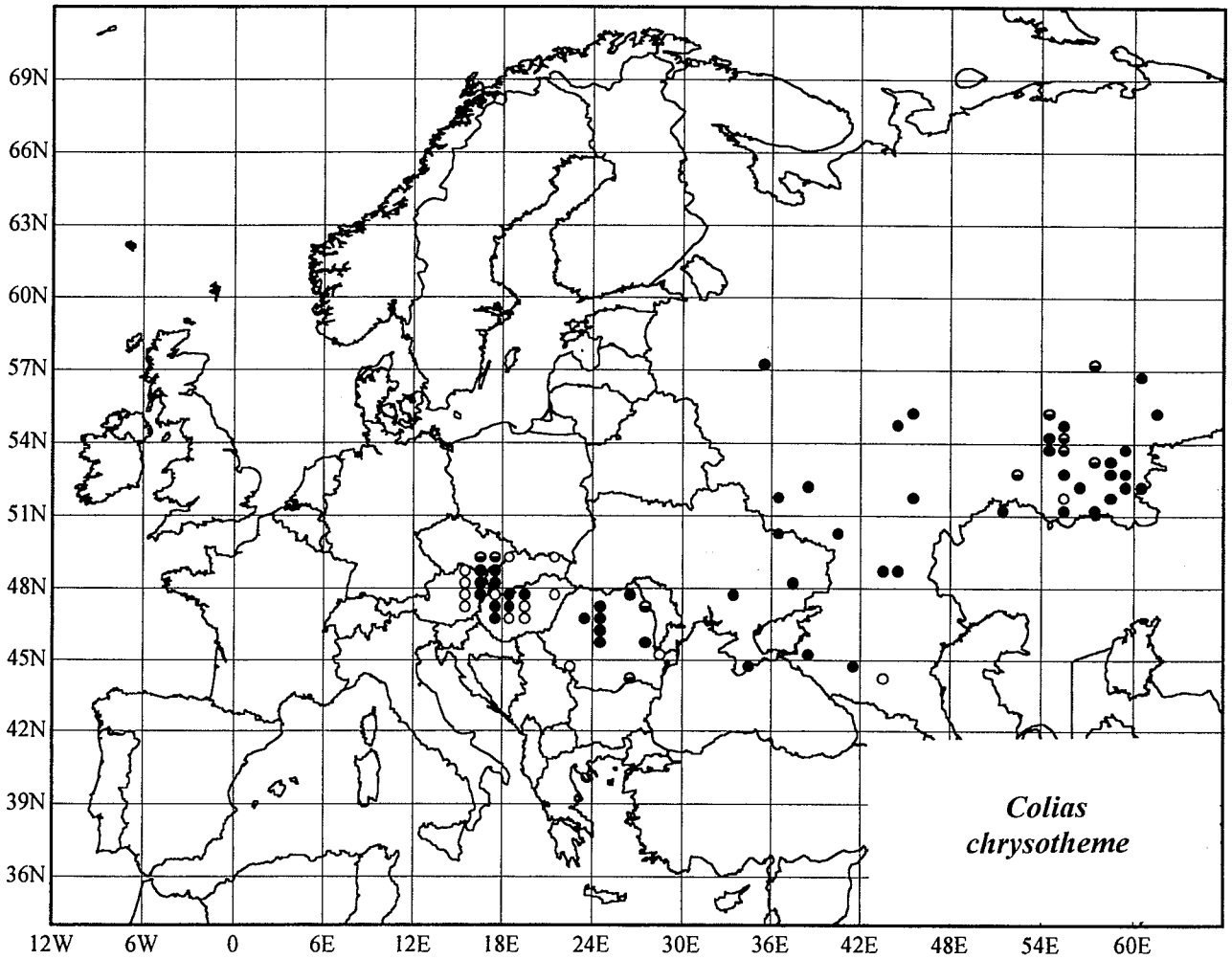
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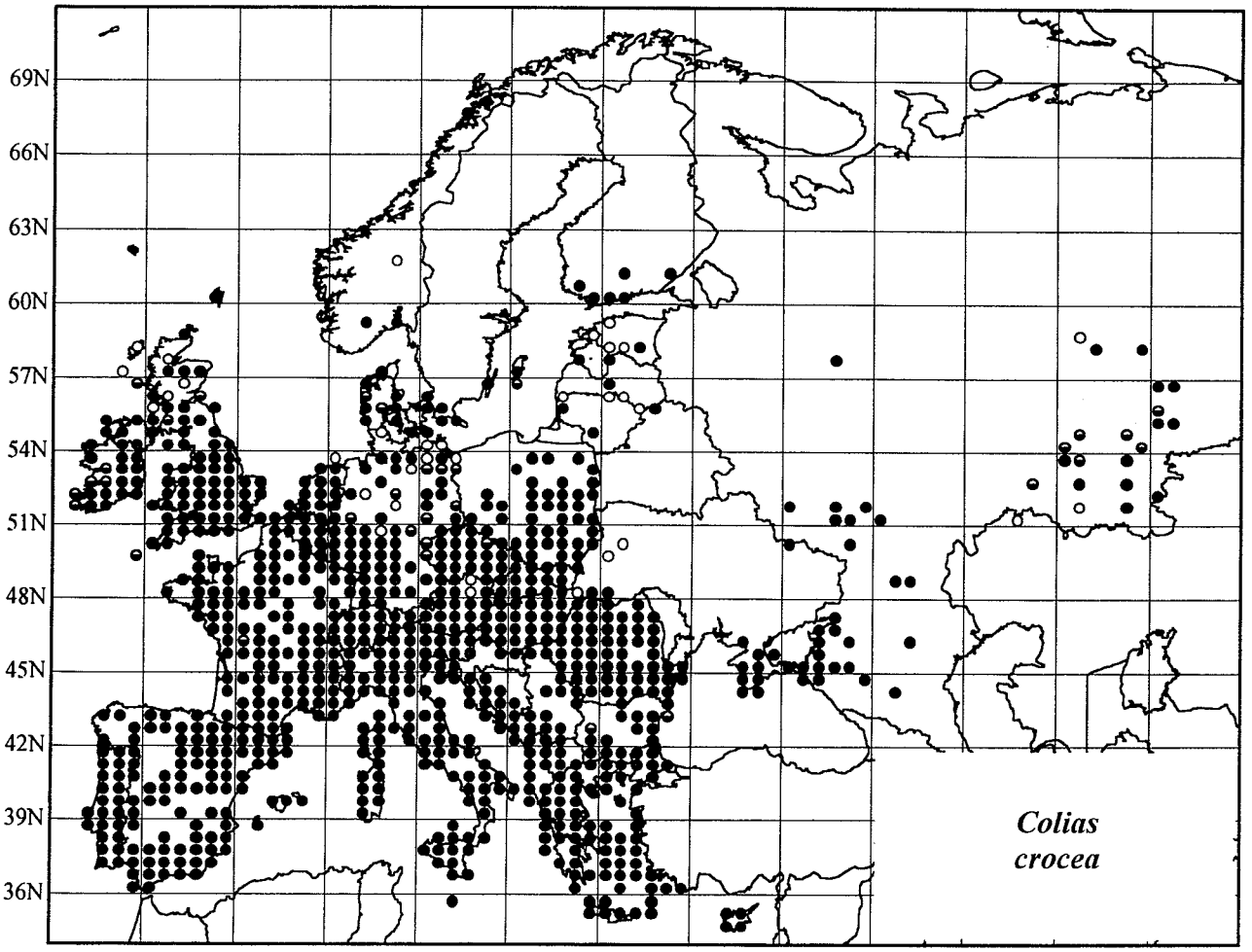
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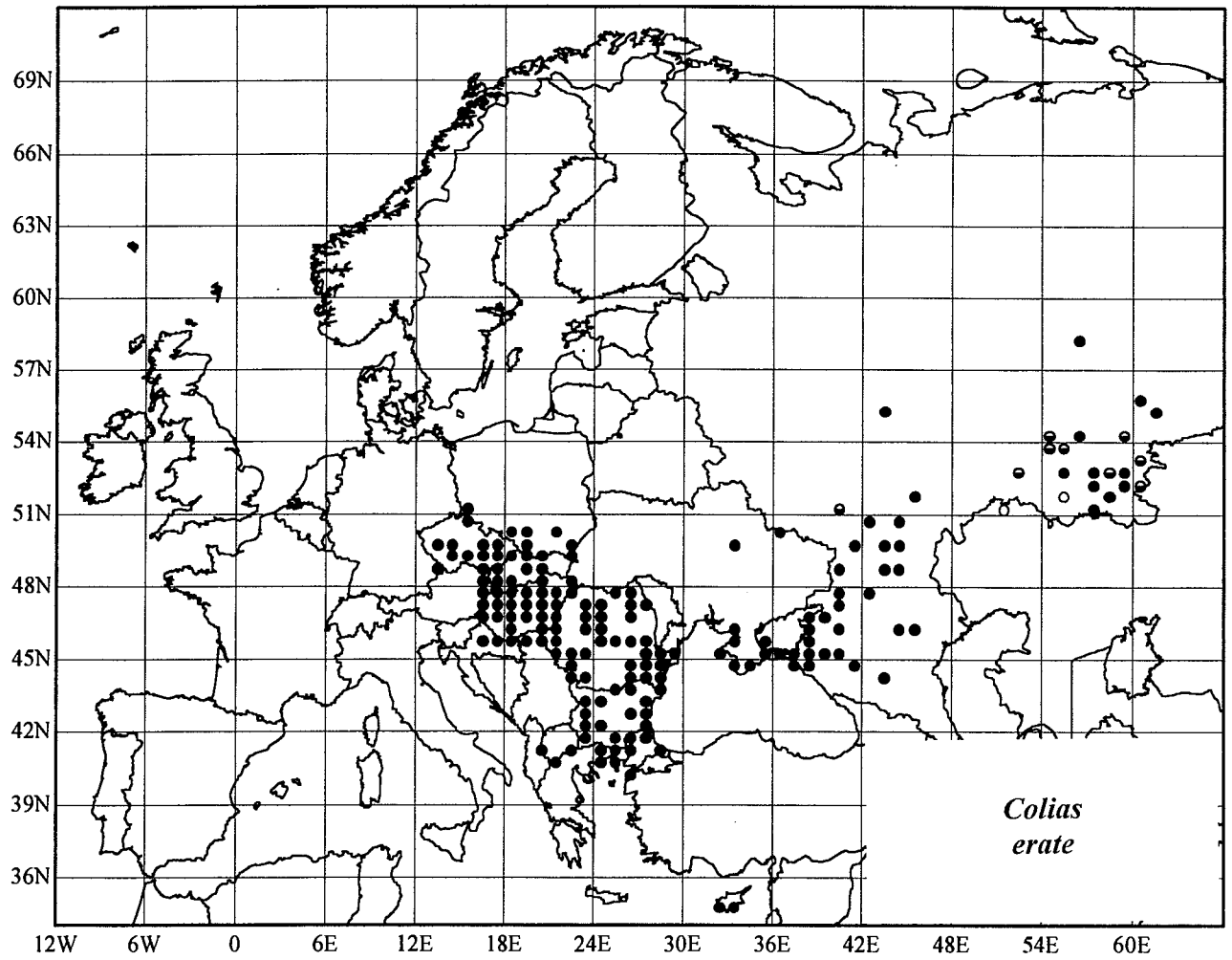
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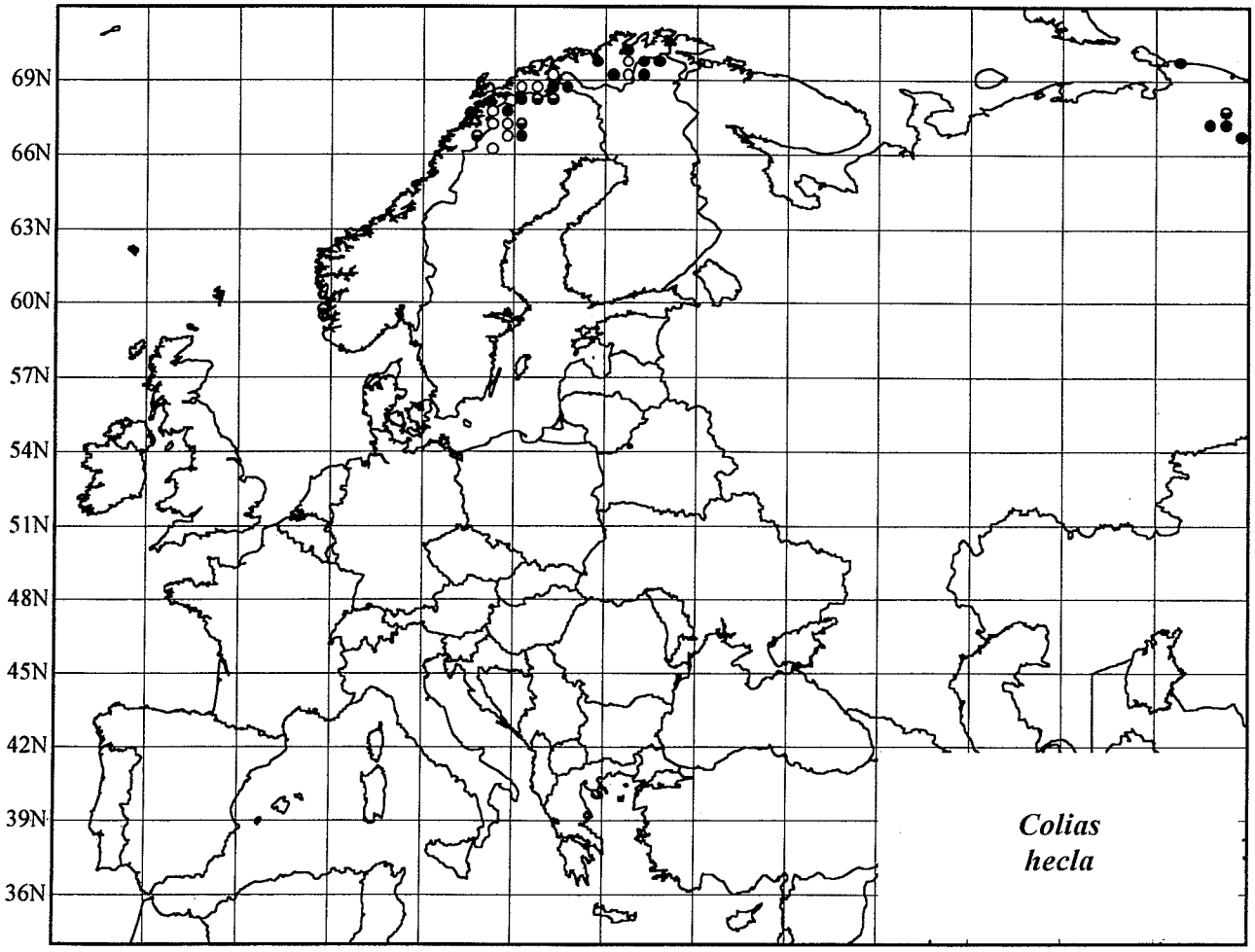
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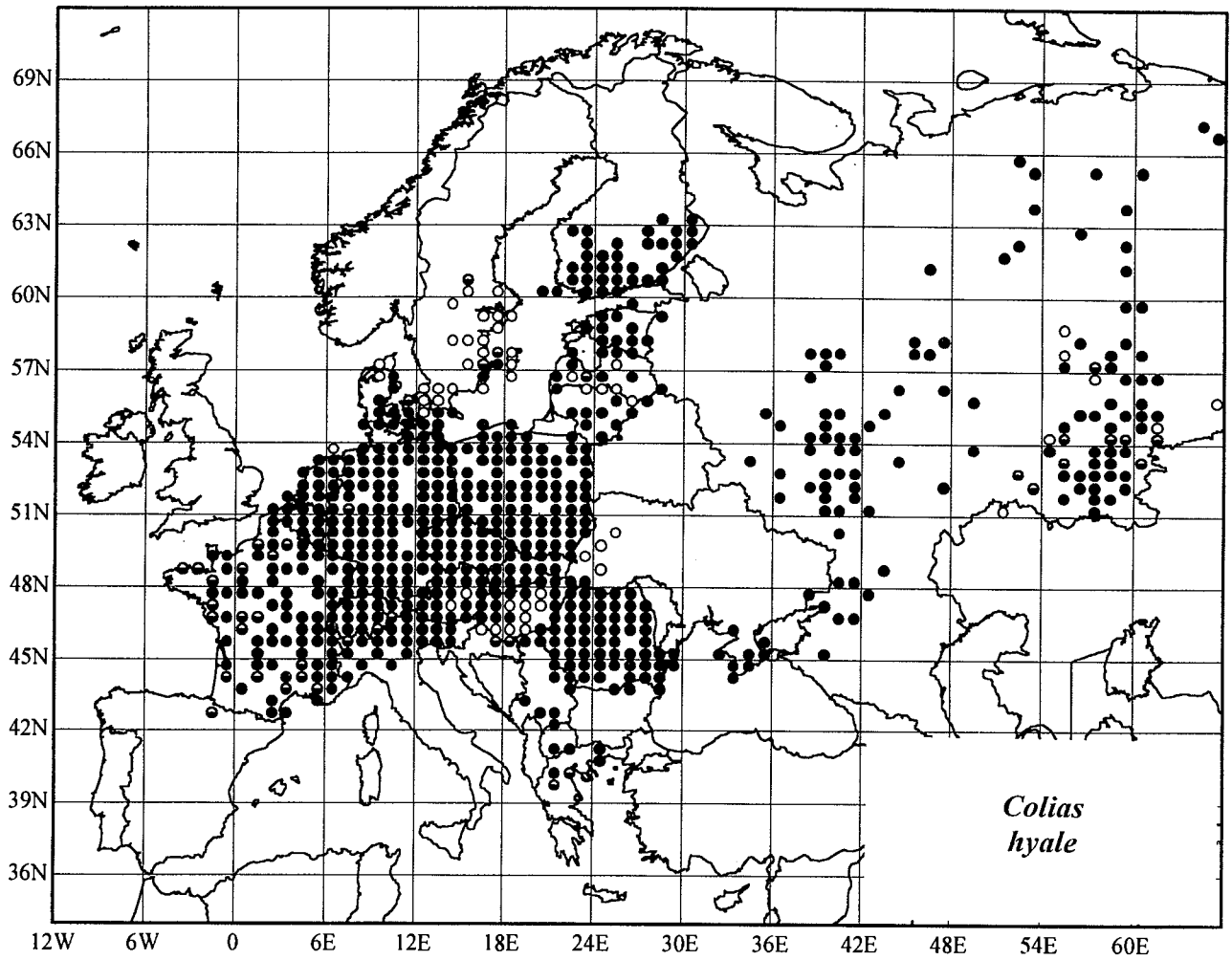
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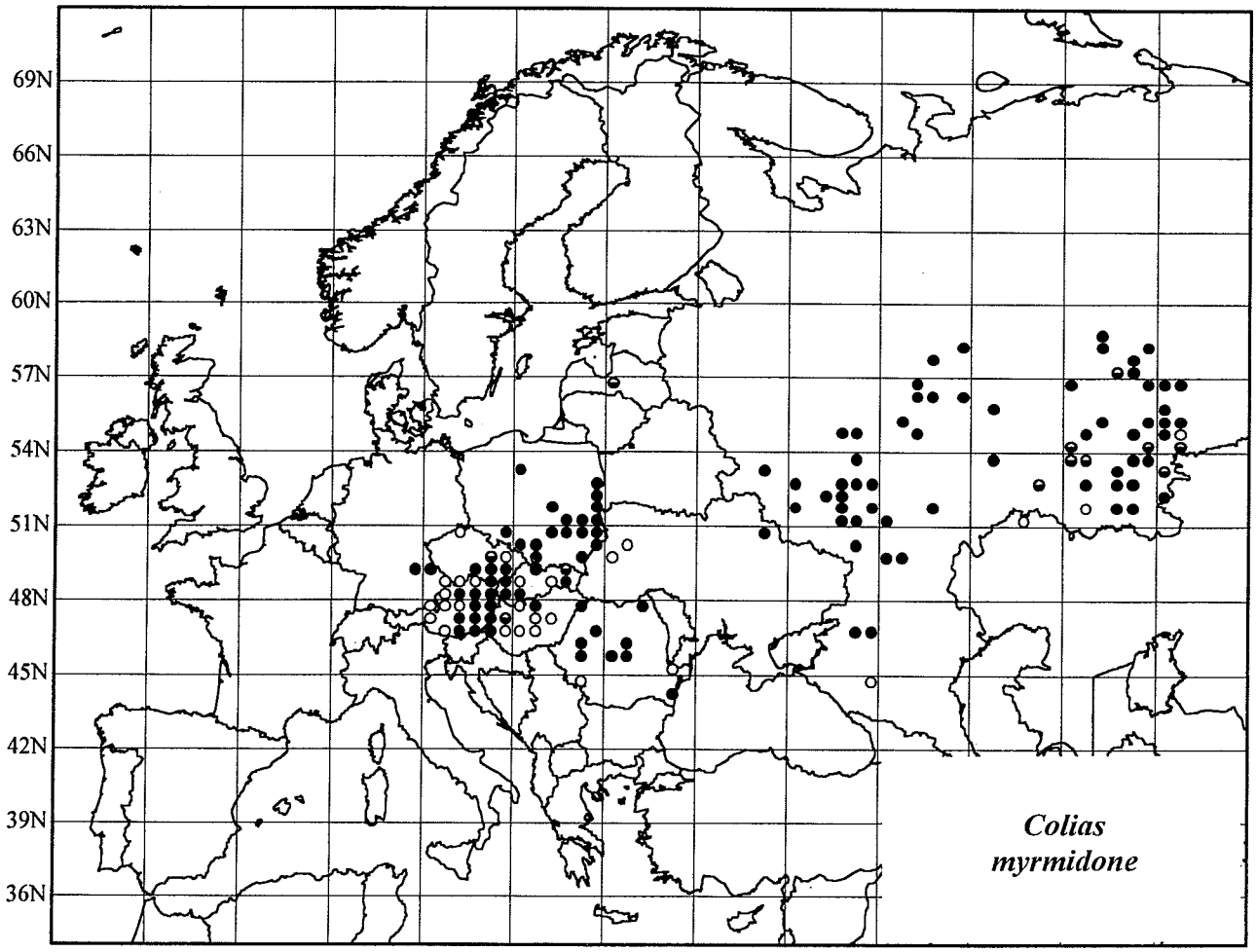
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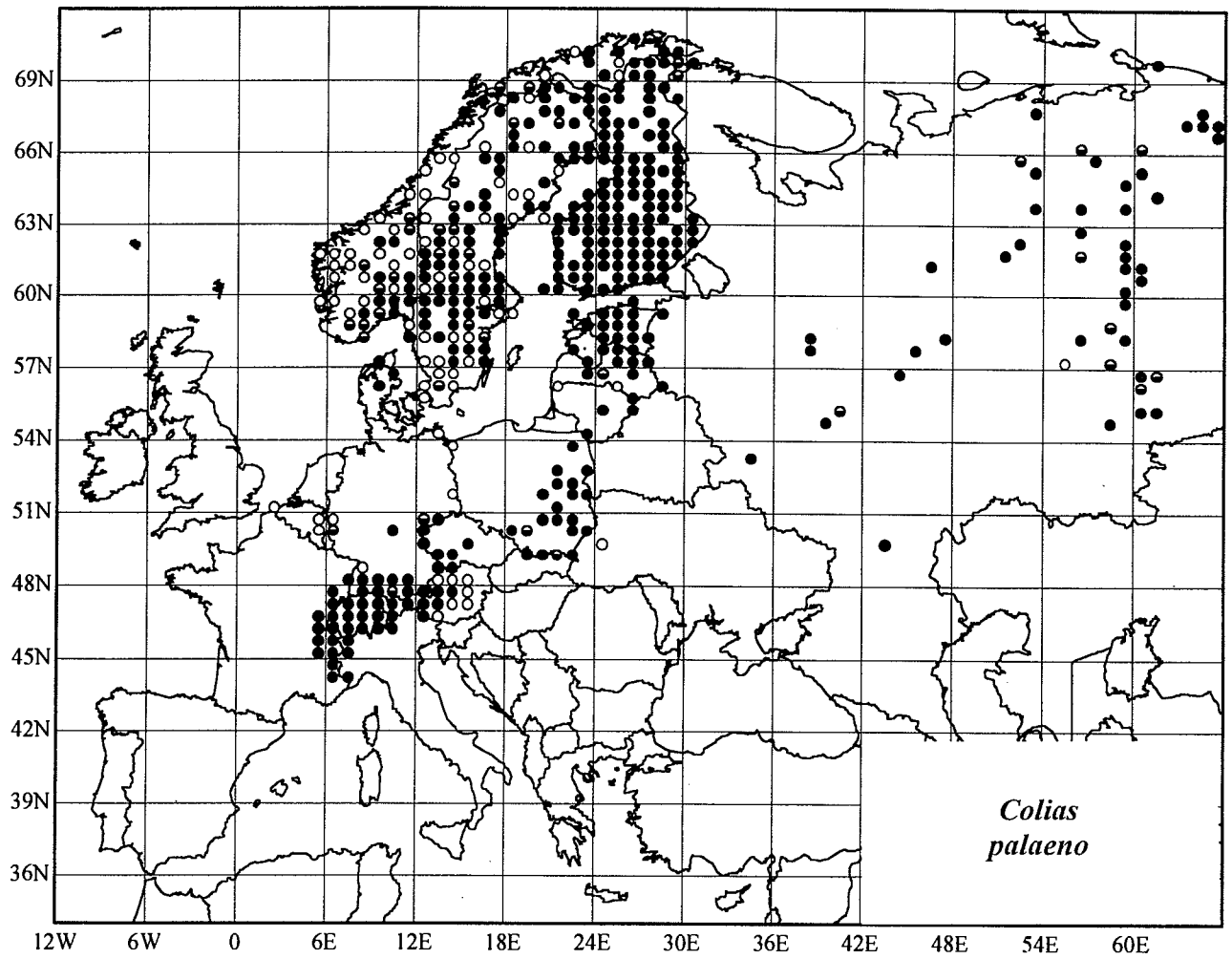
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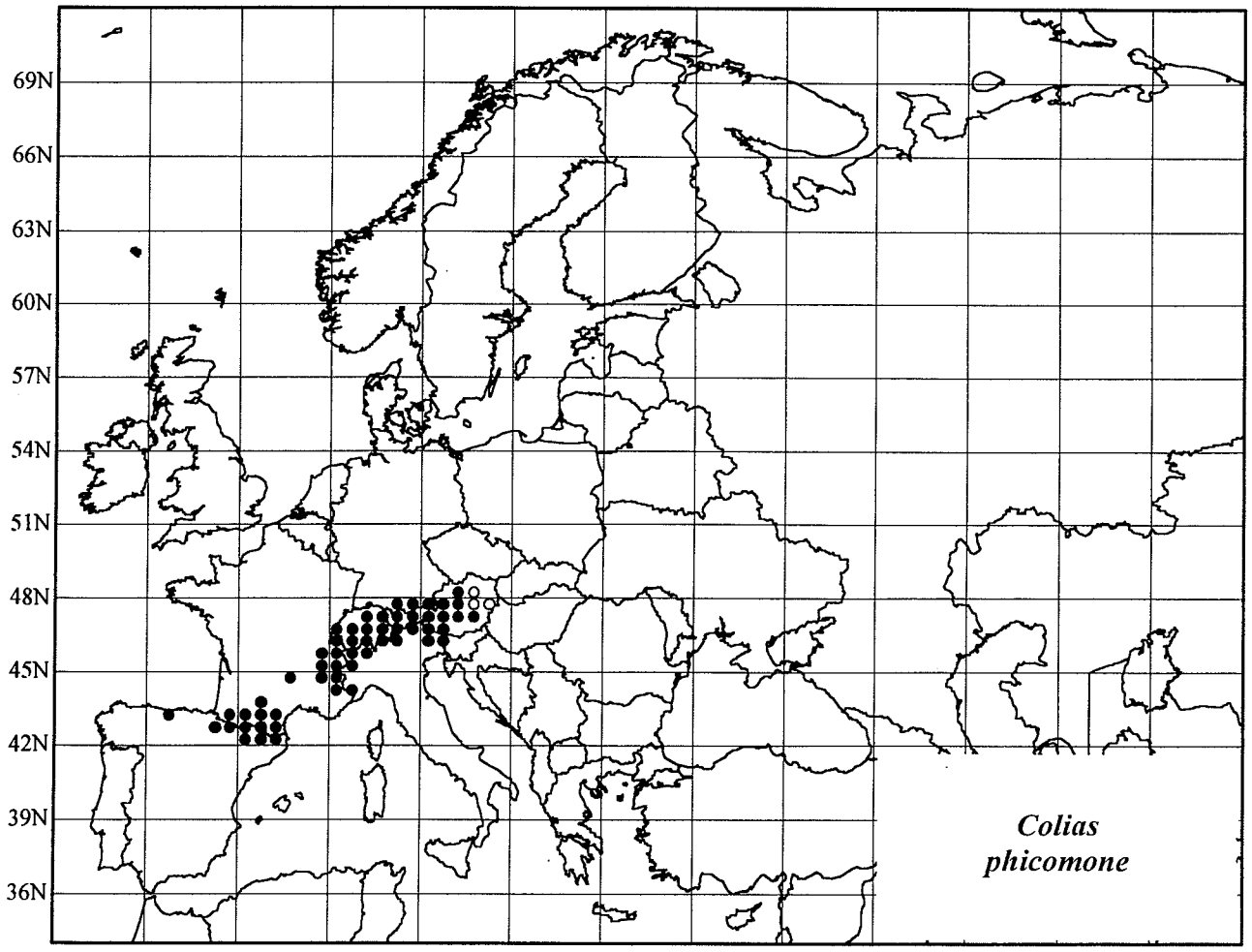
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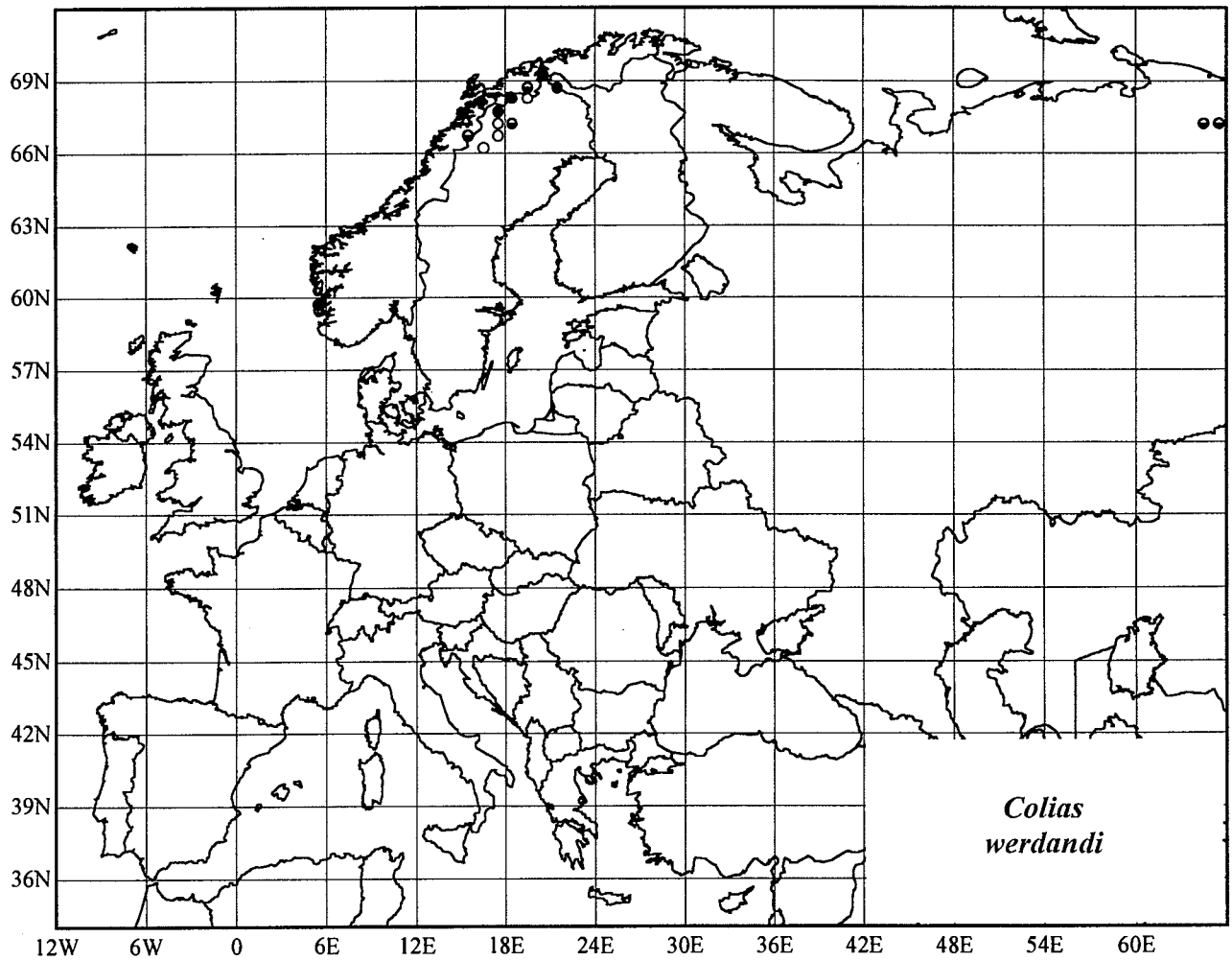
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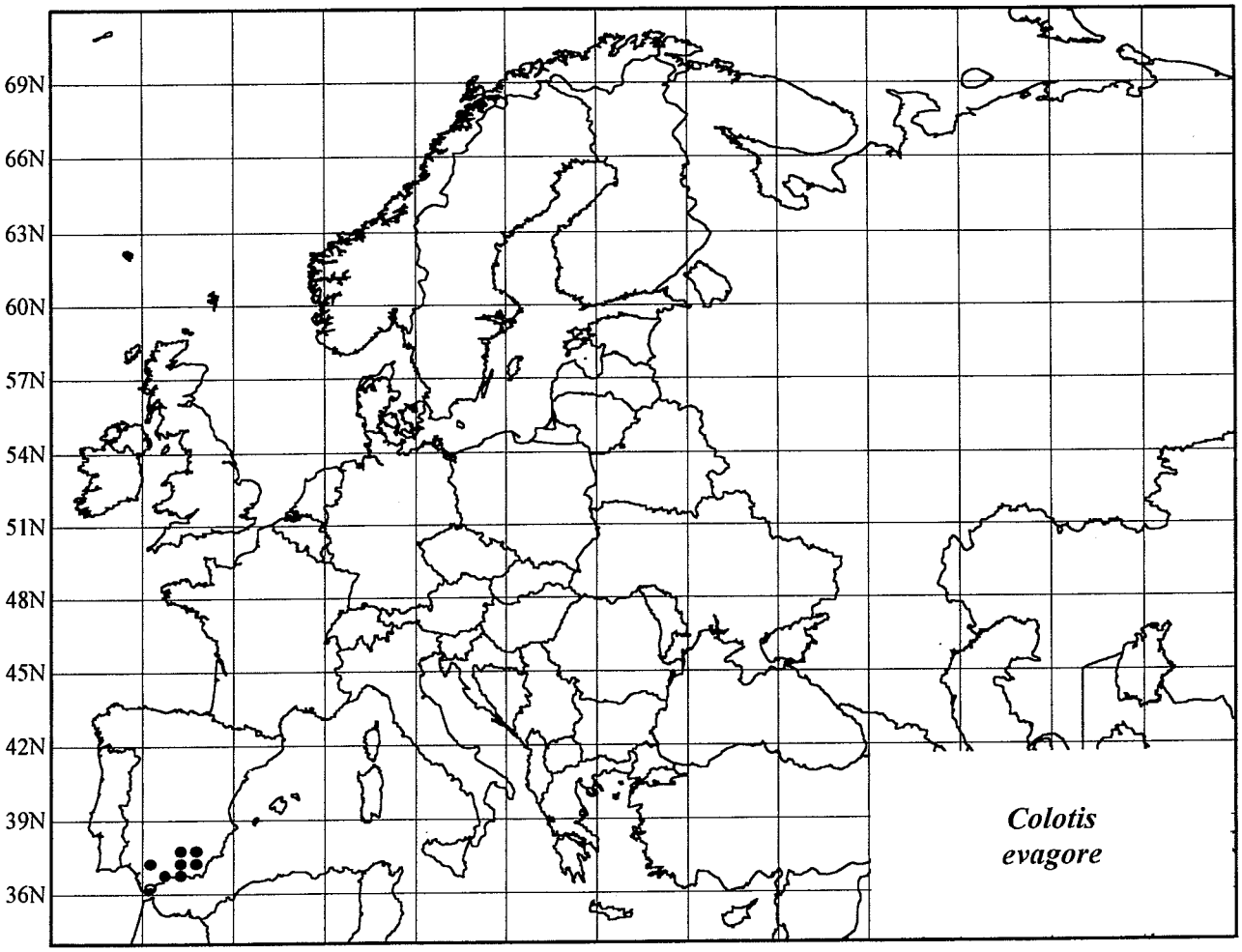
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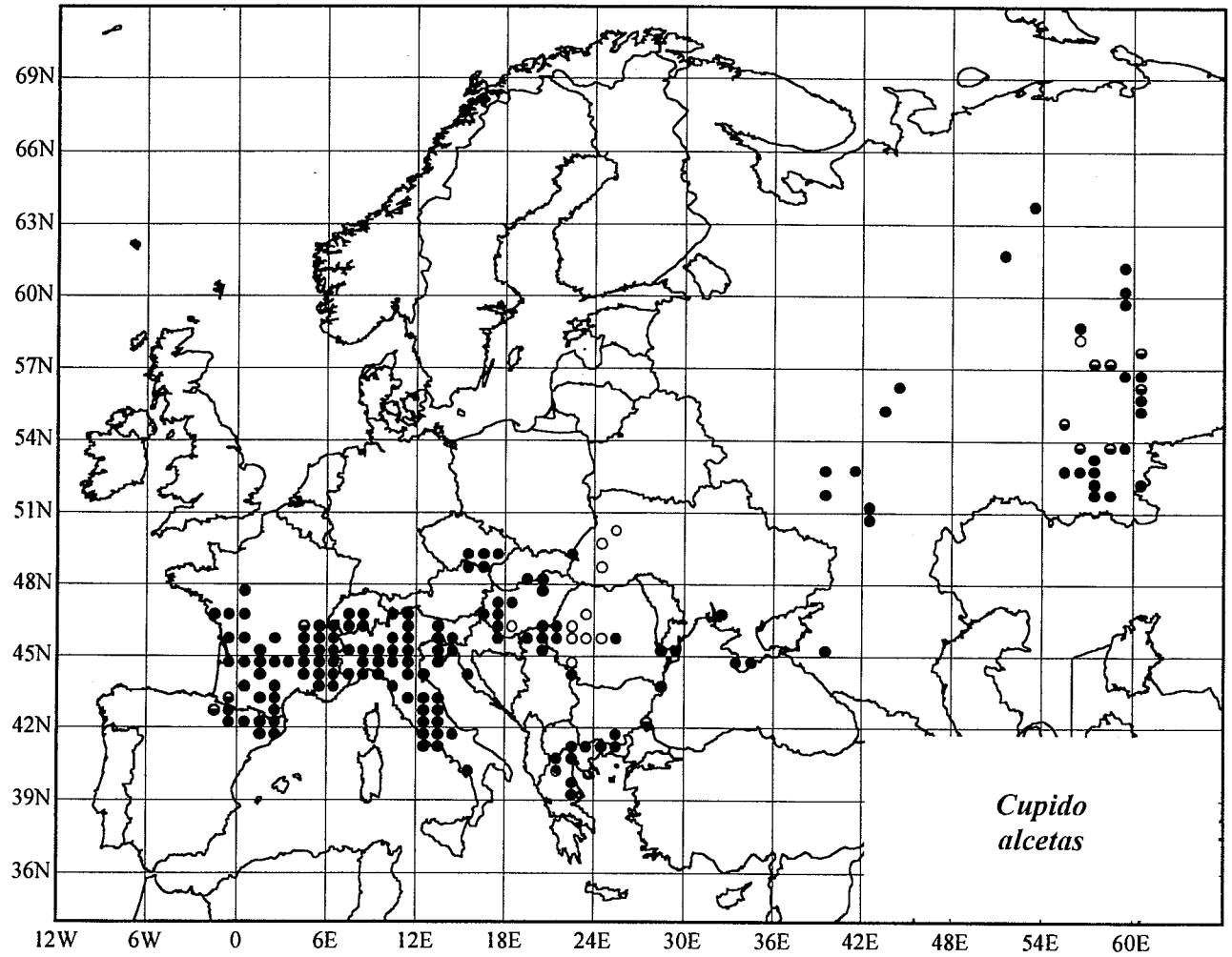
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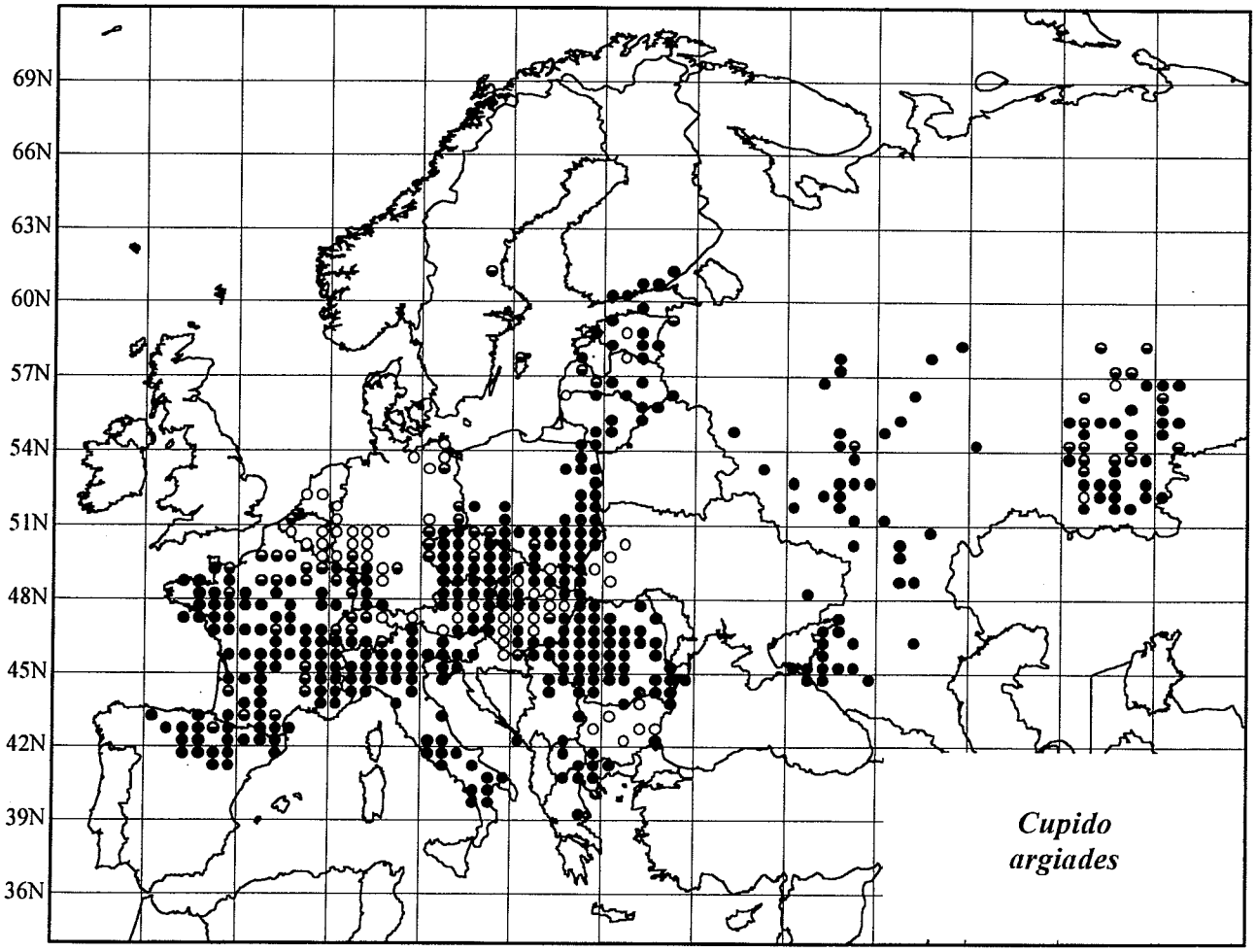
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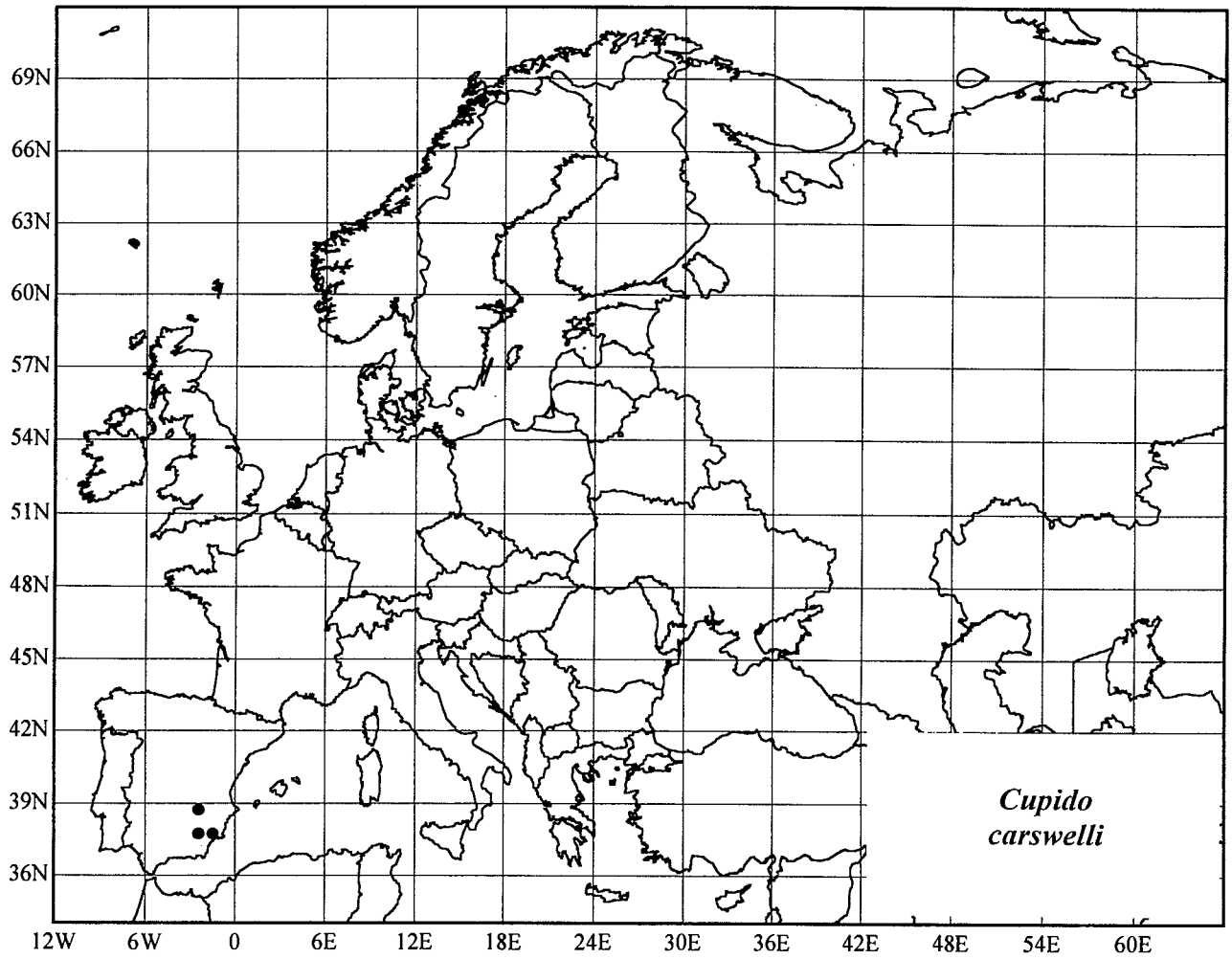
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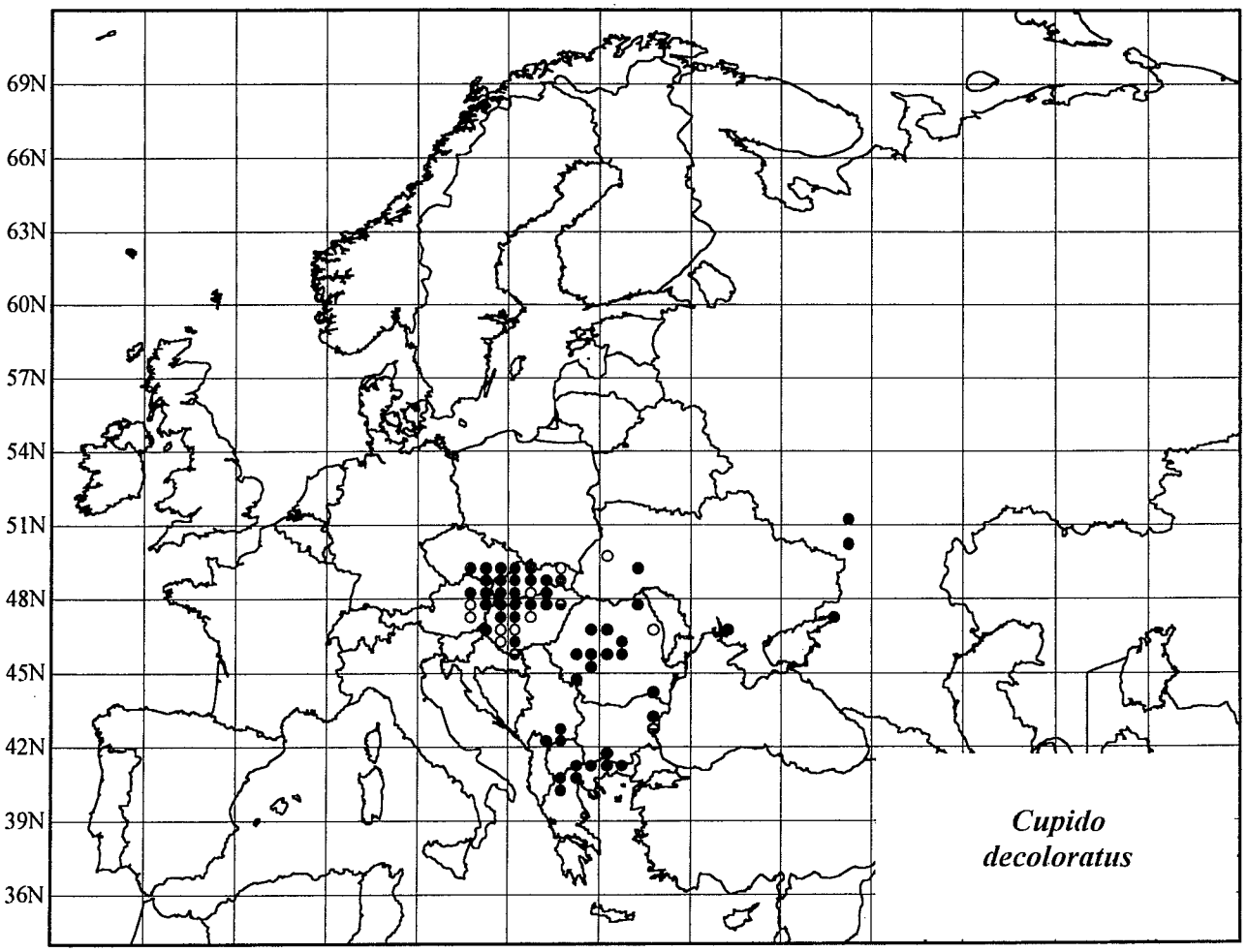
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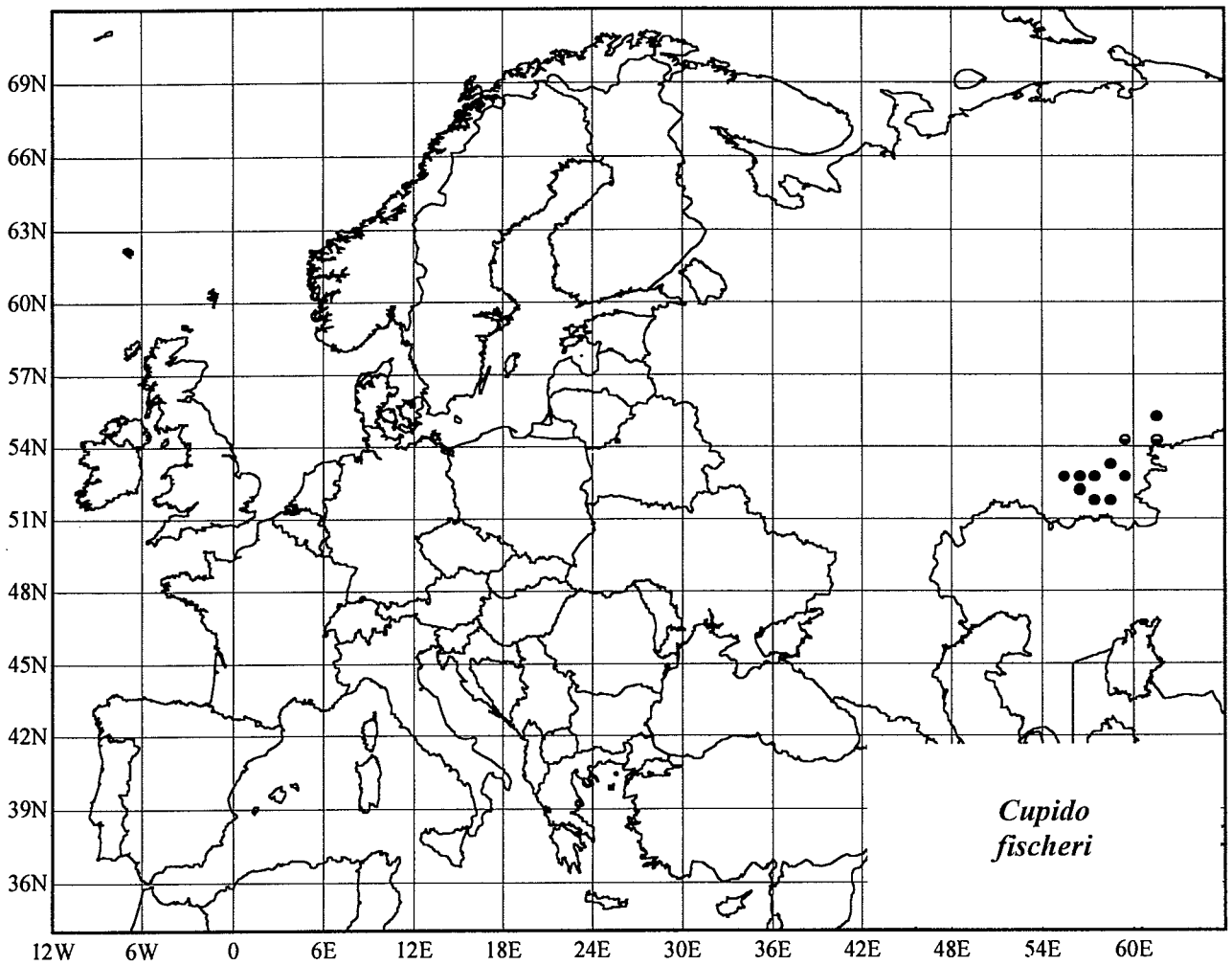
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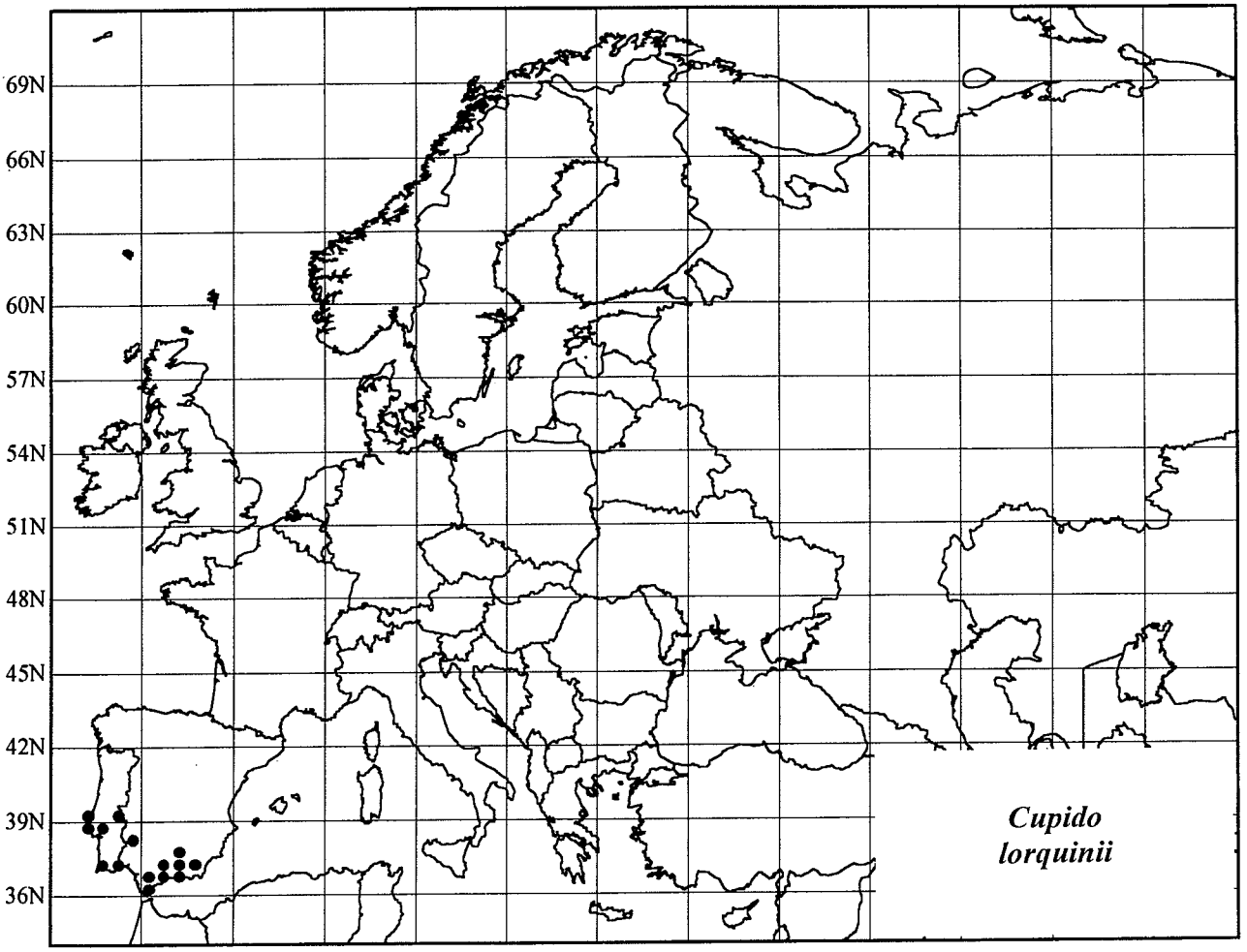
Cupido fischeri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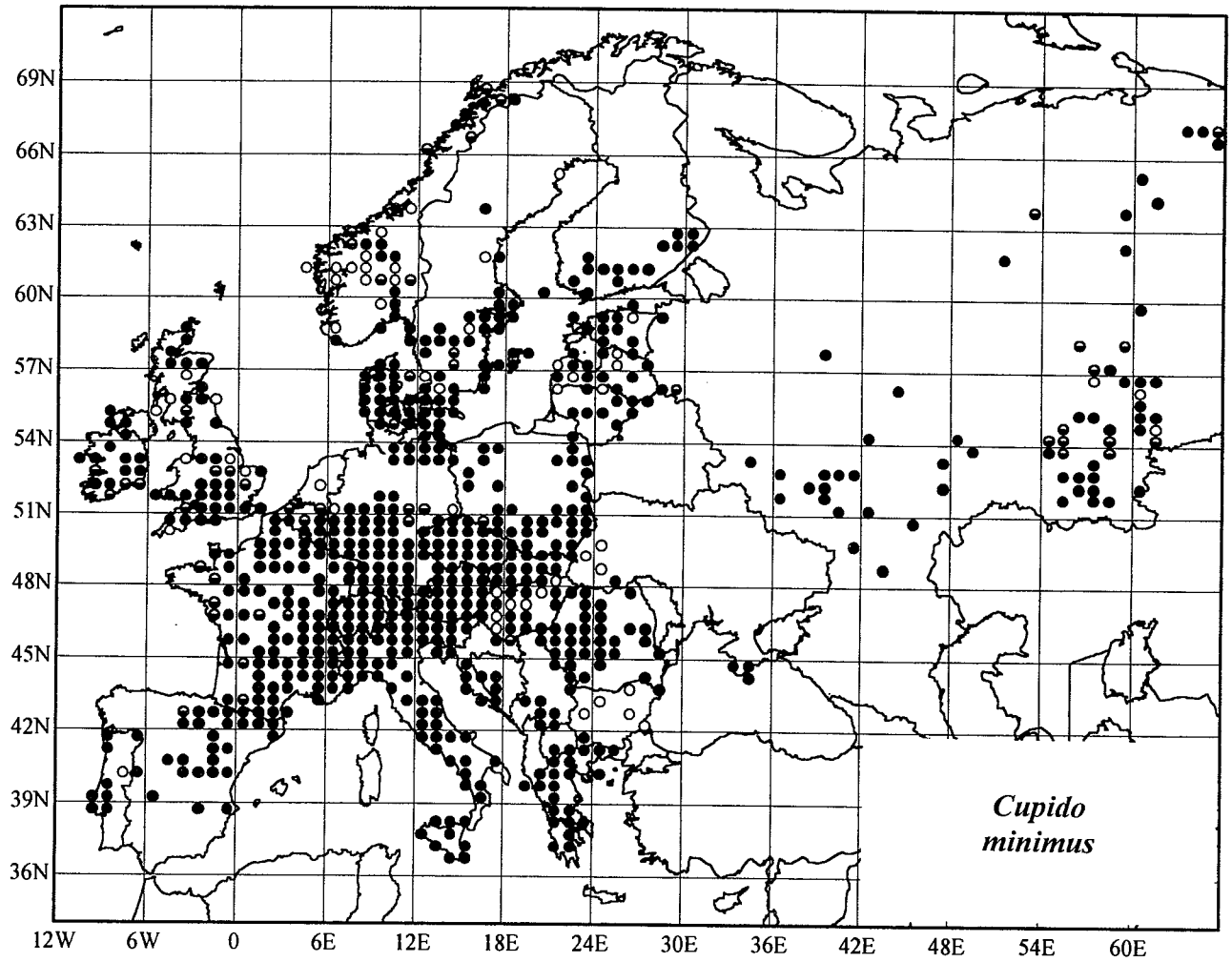
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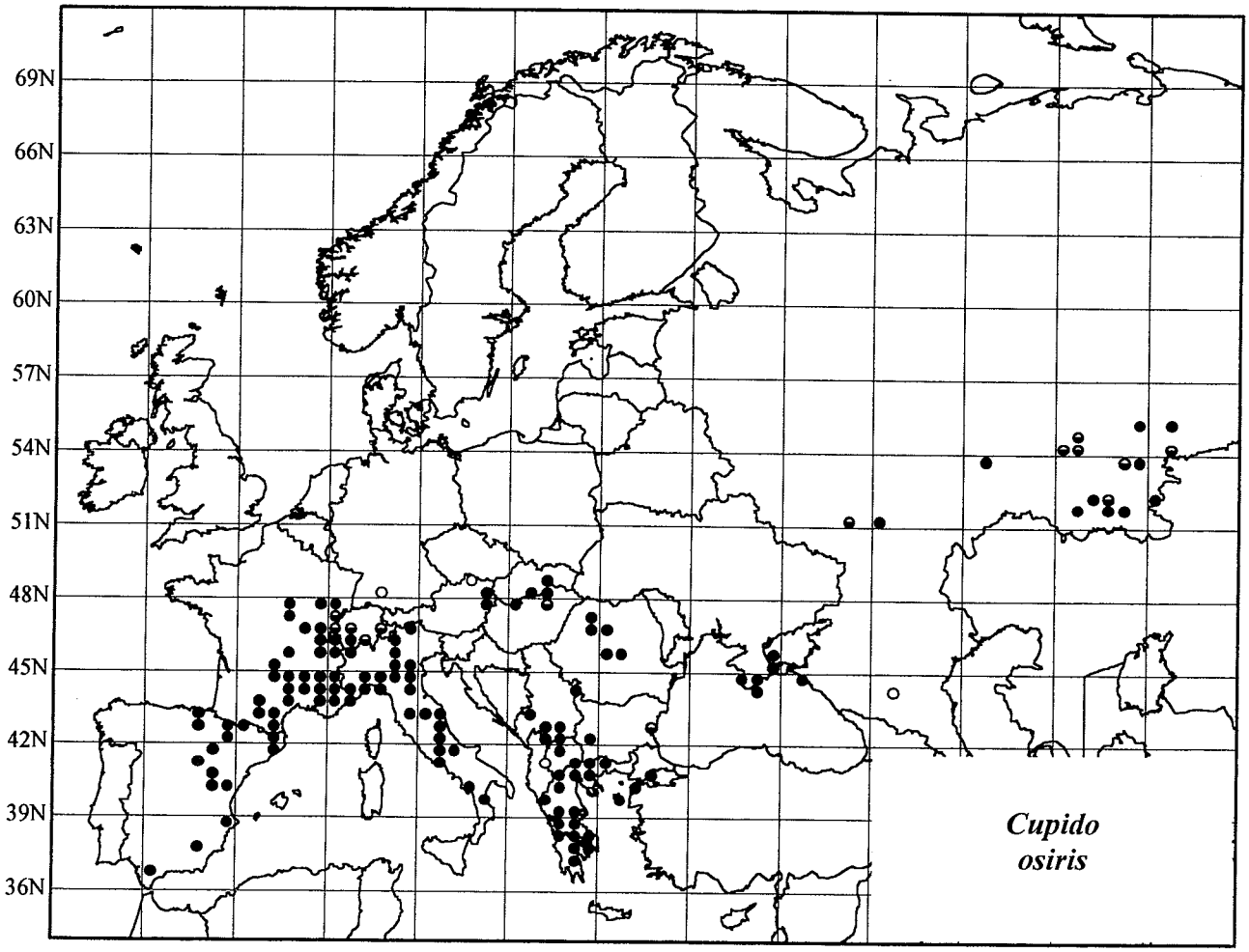
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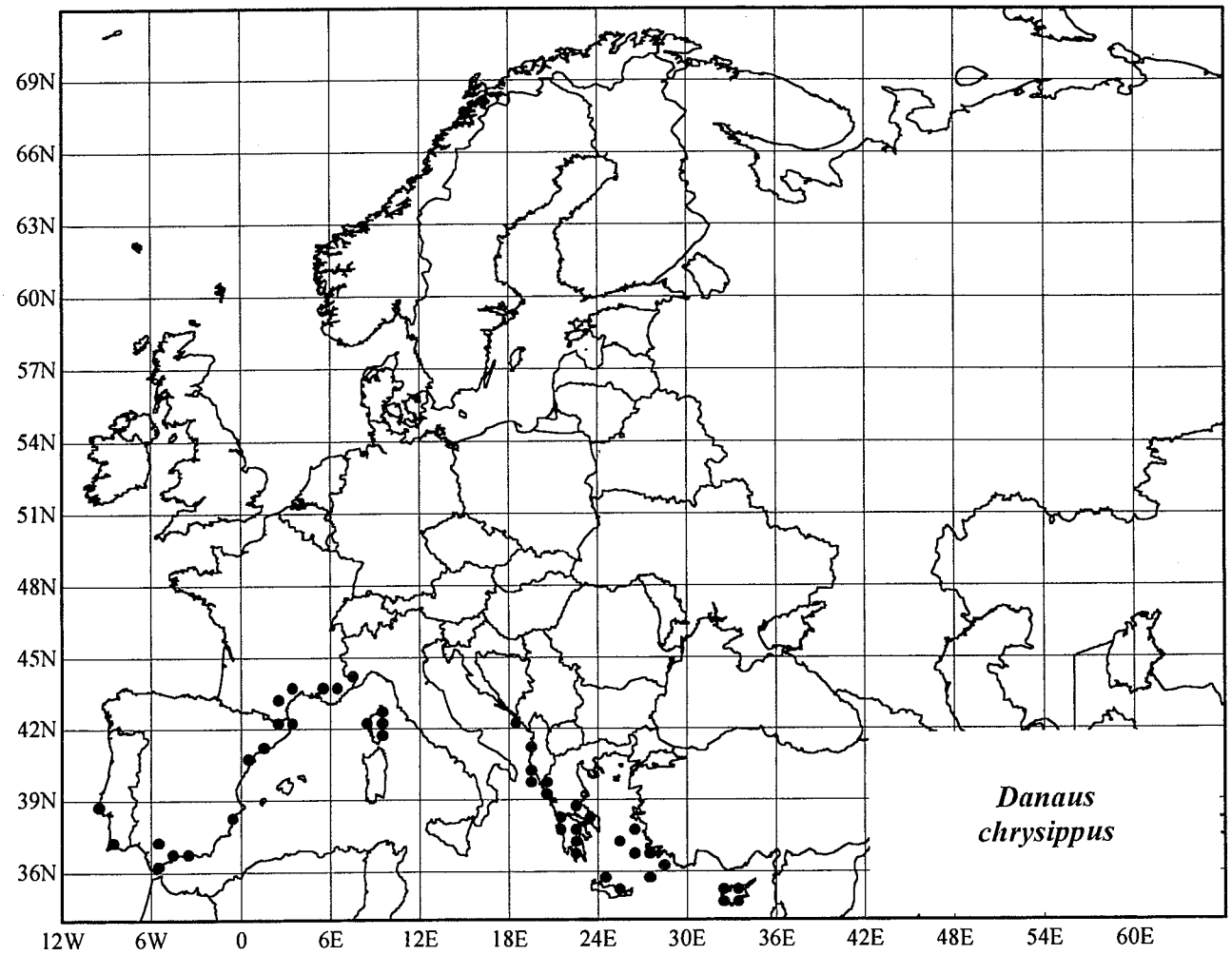
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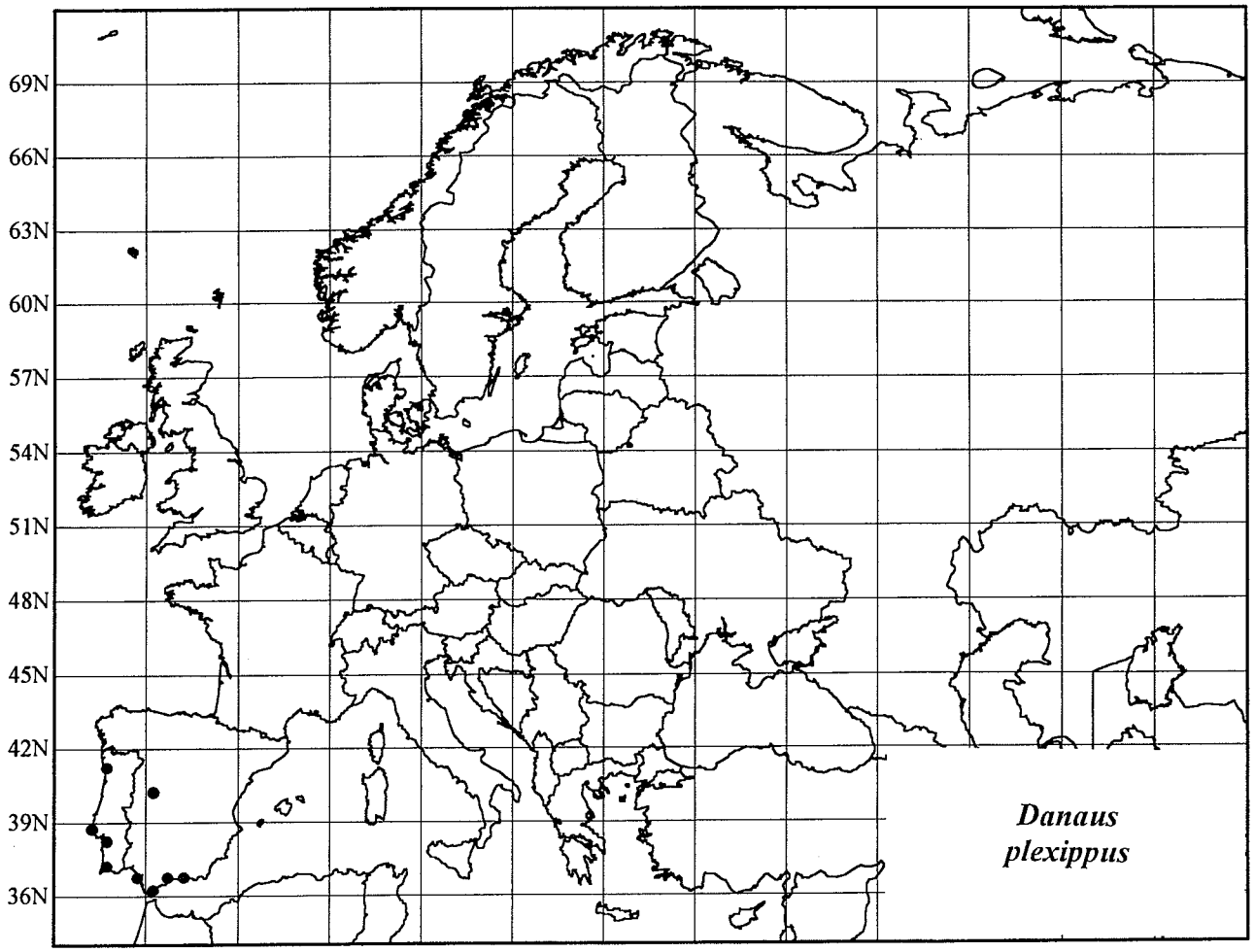
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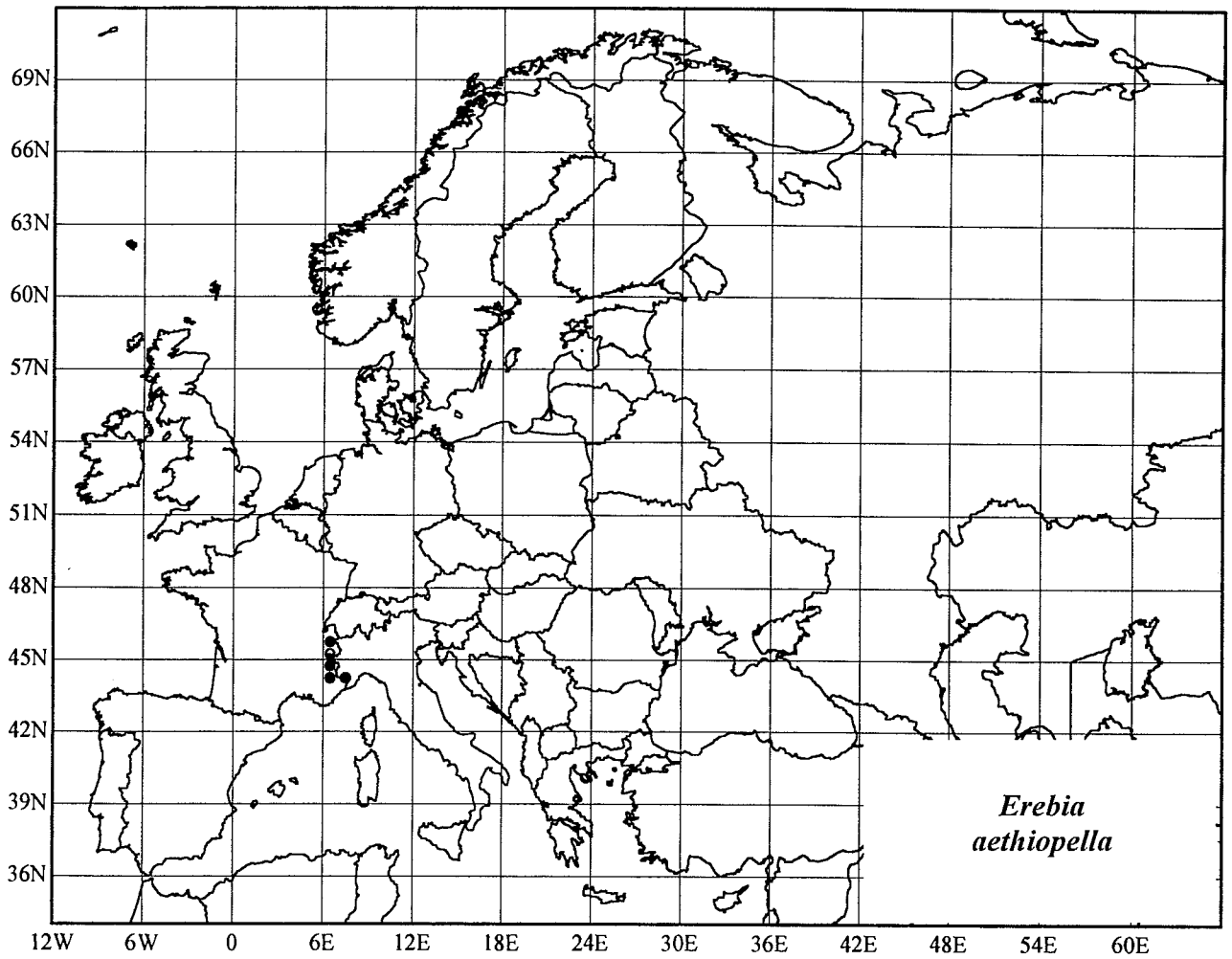
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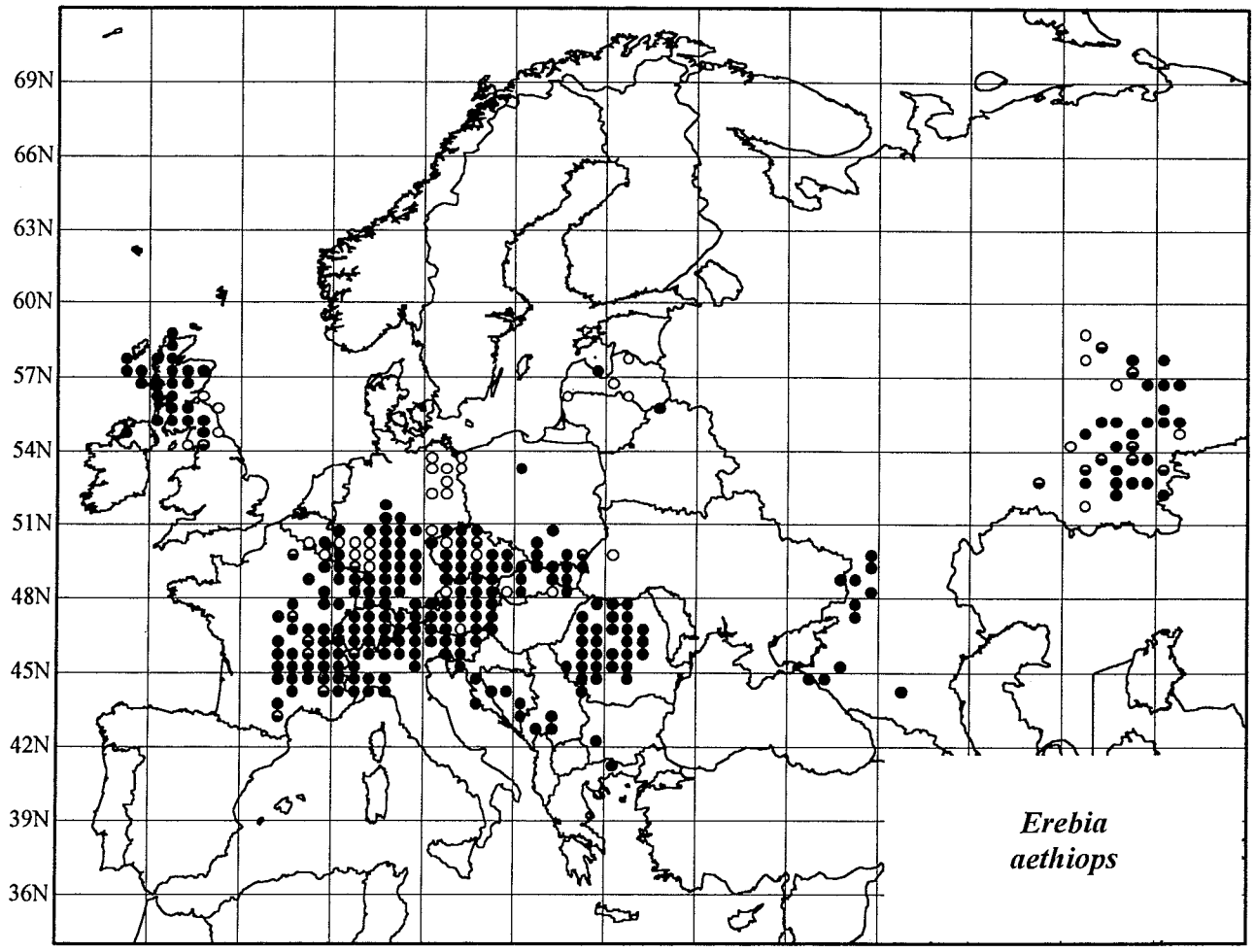
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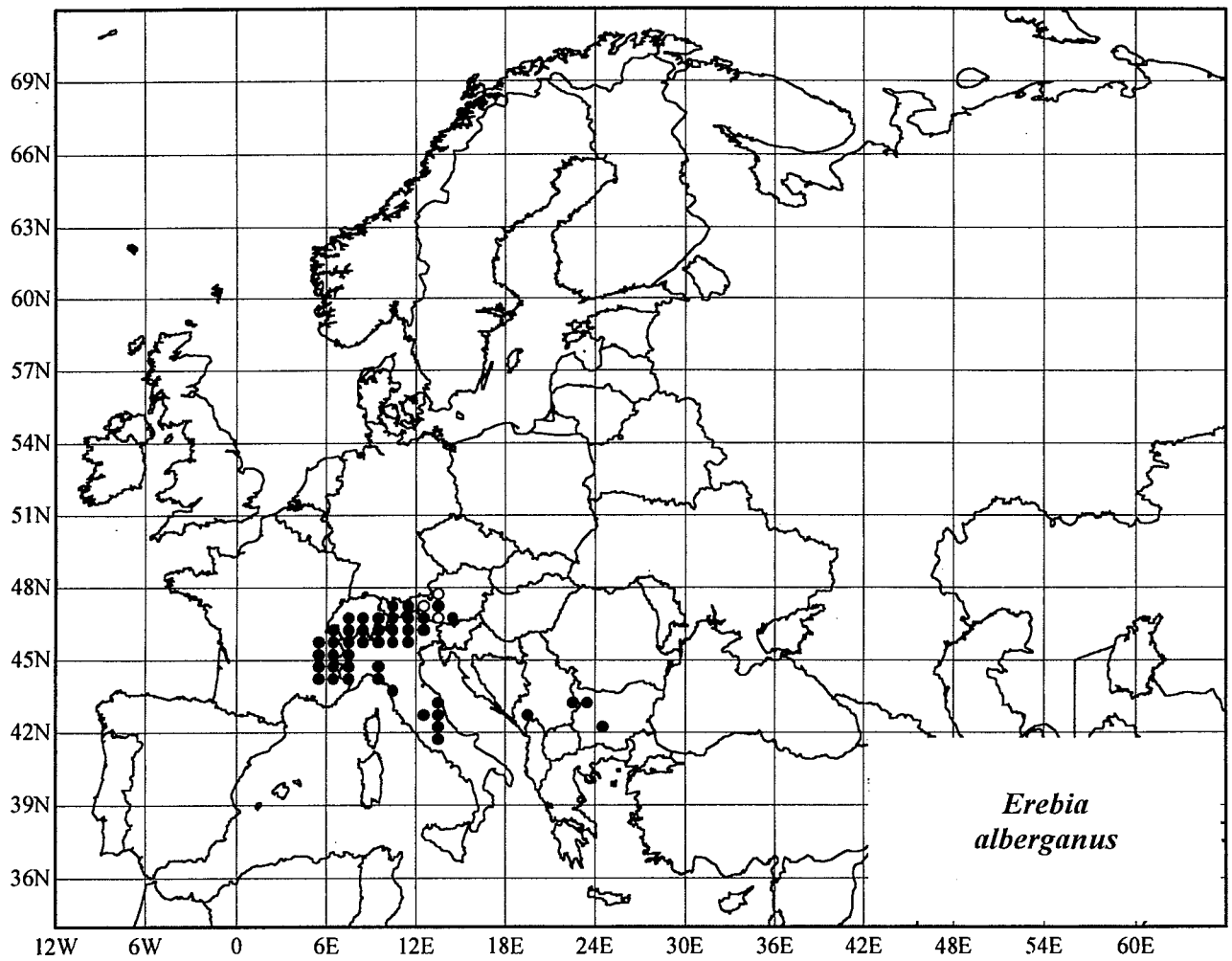
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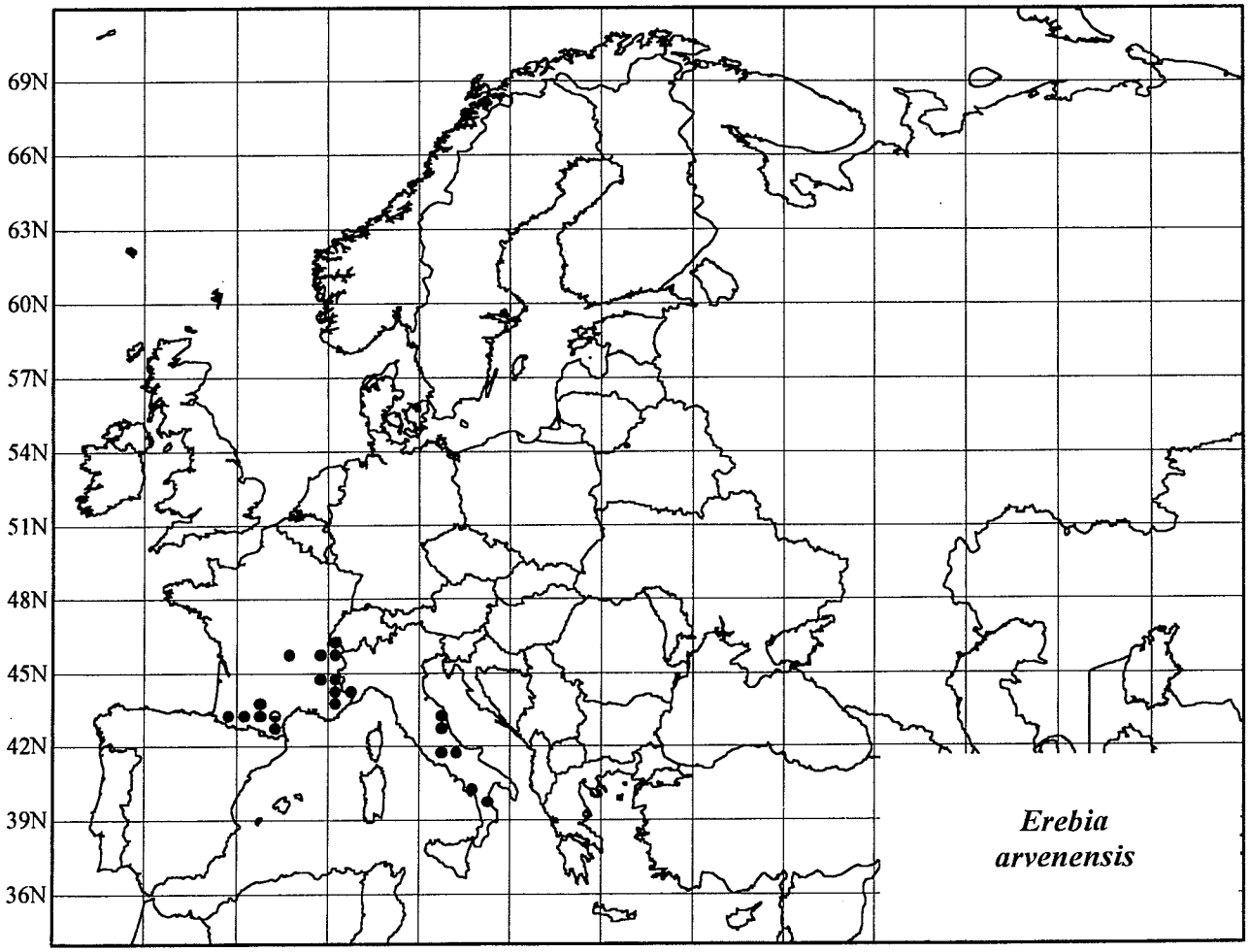
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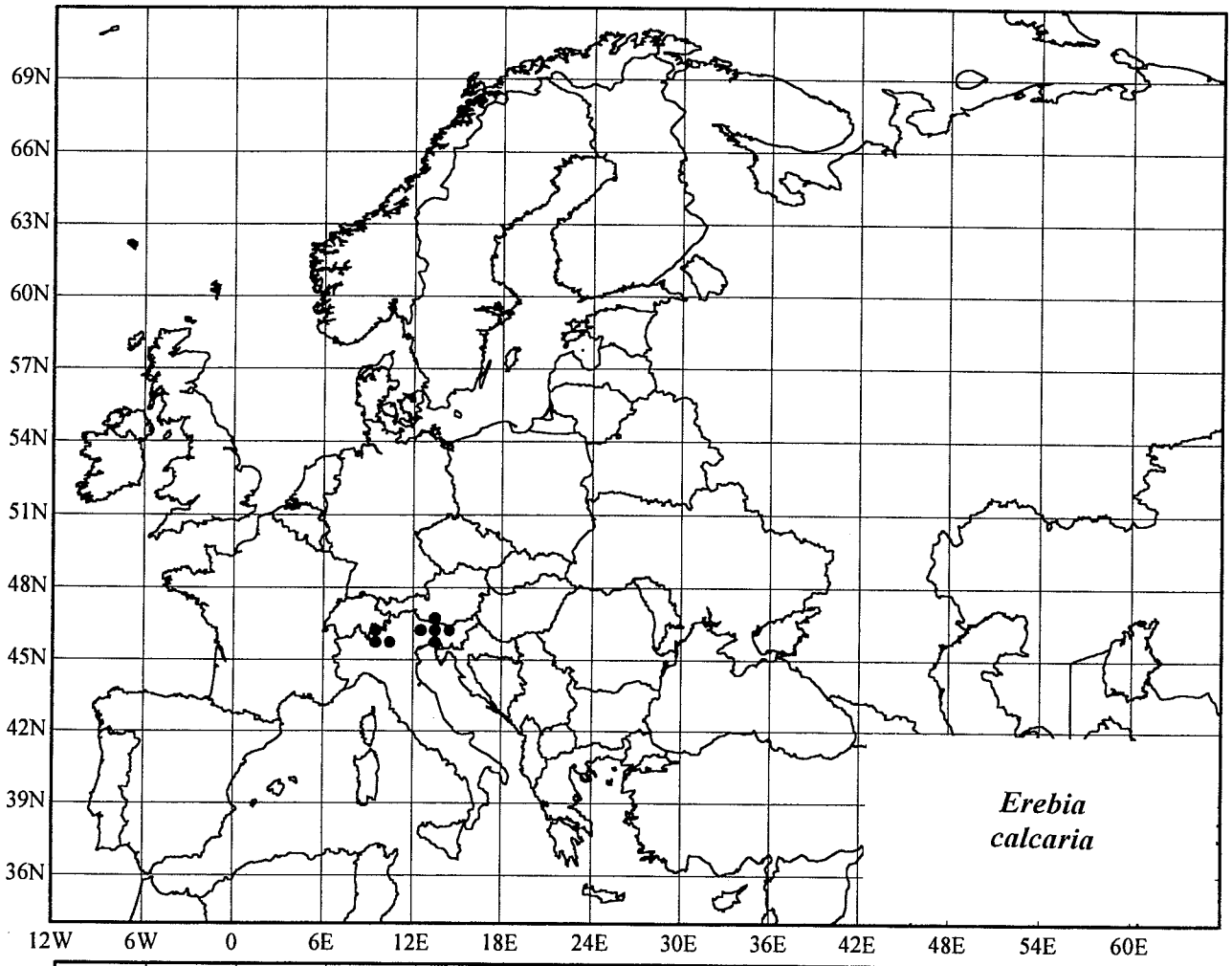
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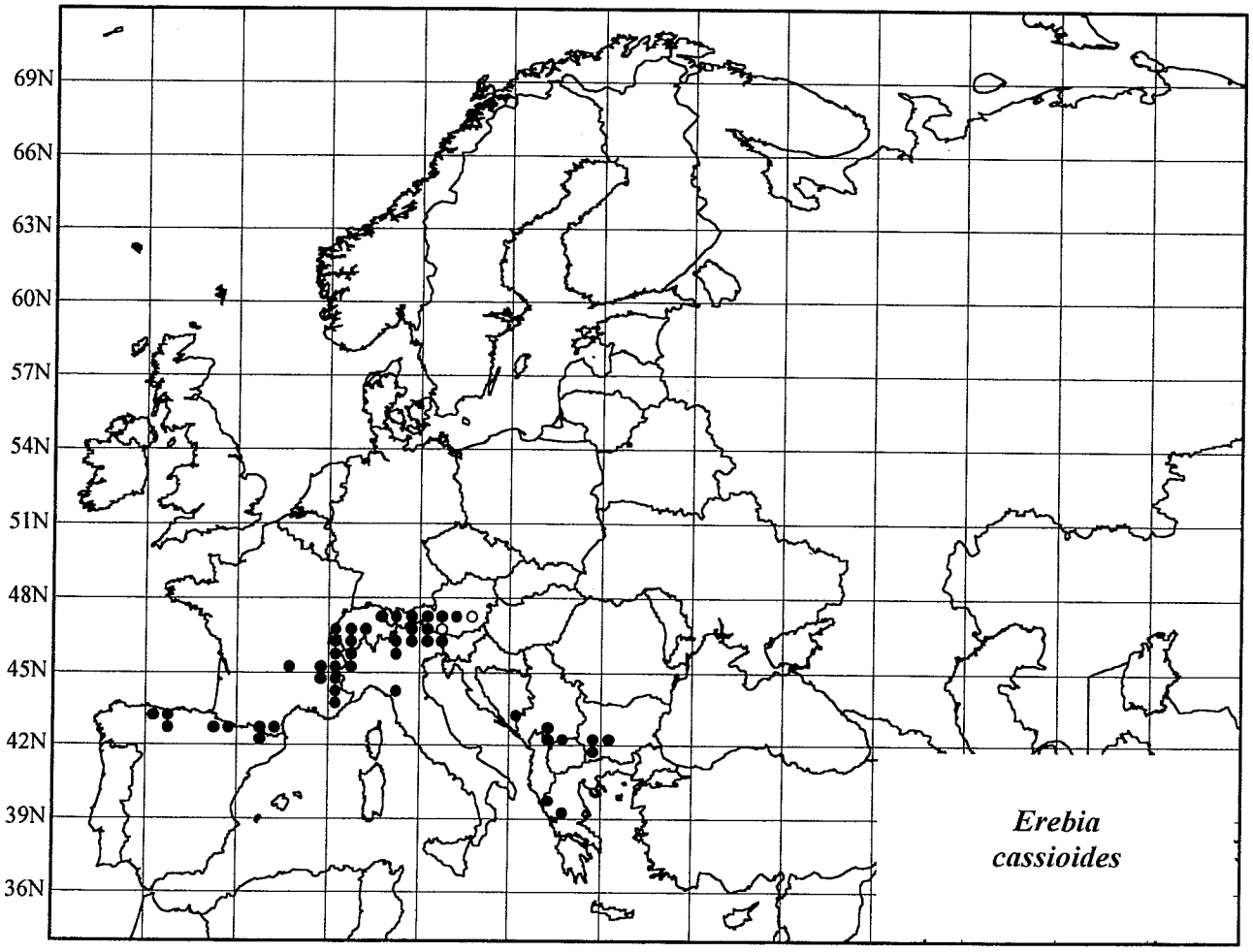
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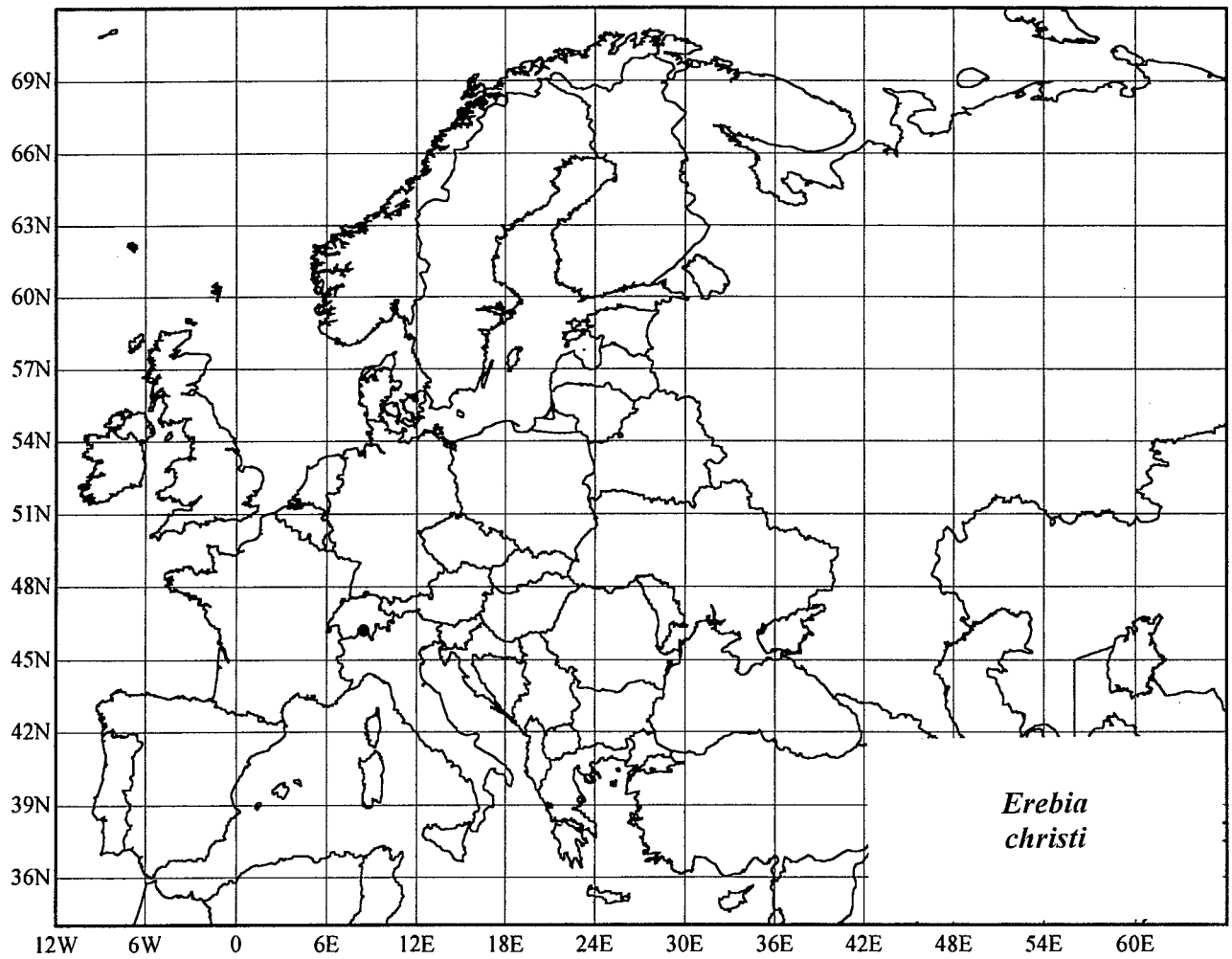
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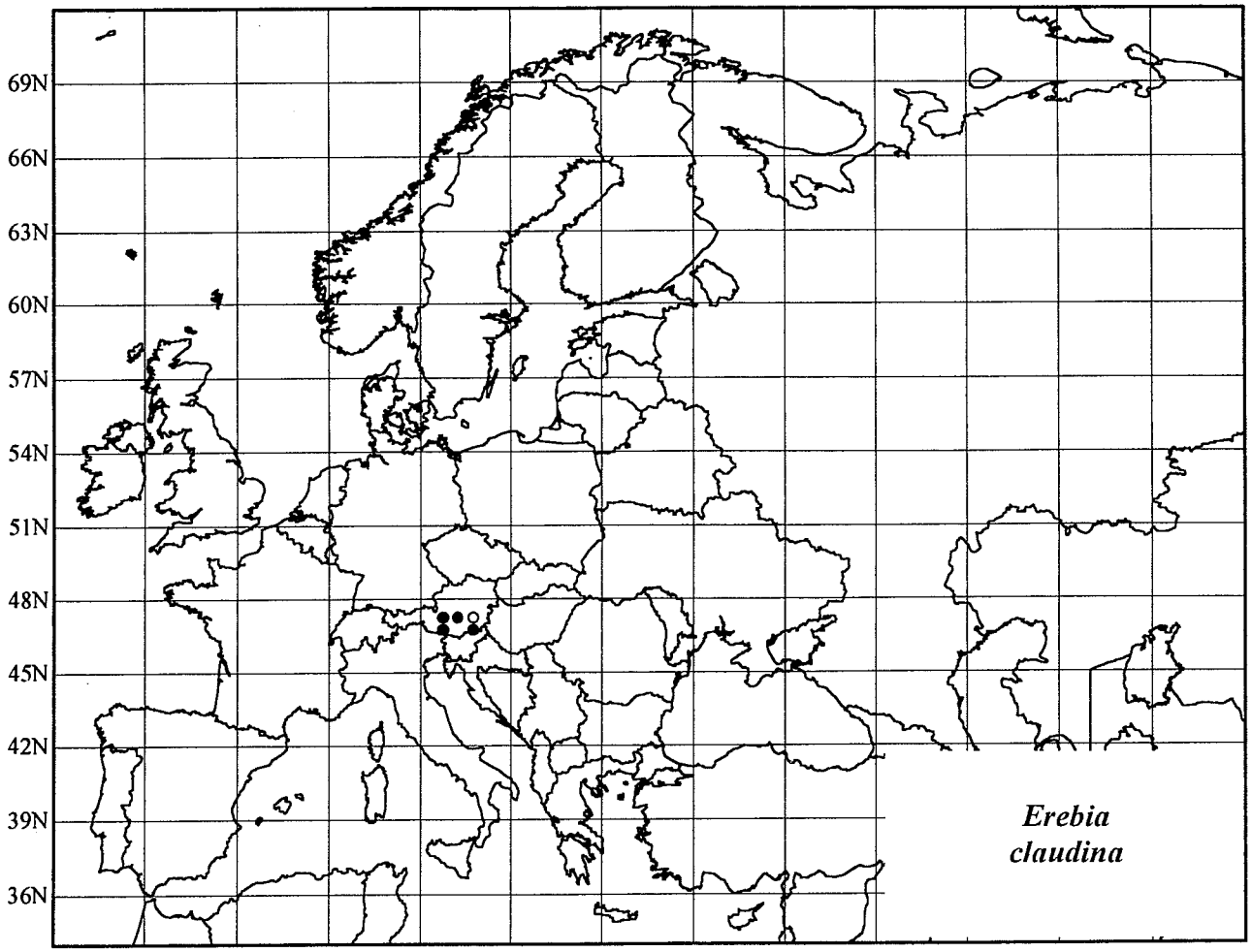
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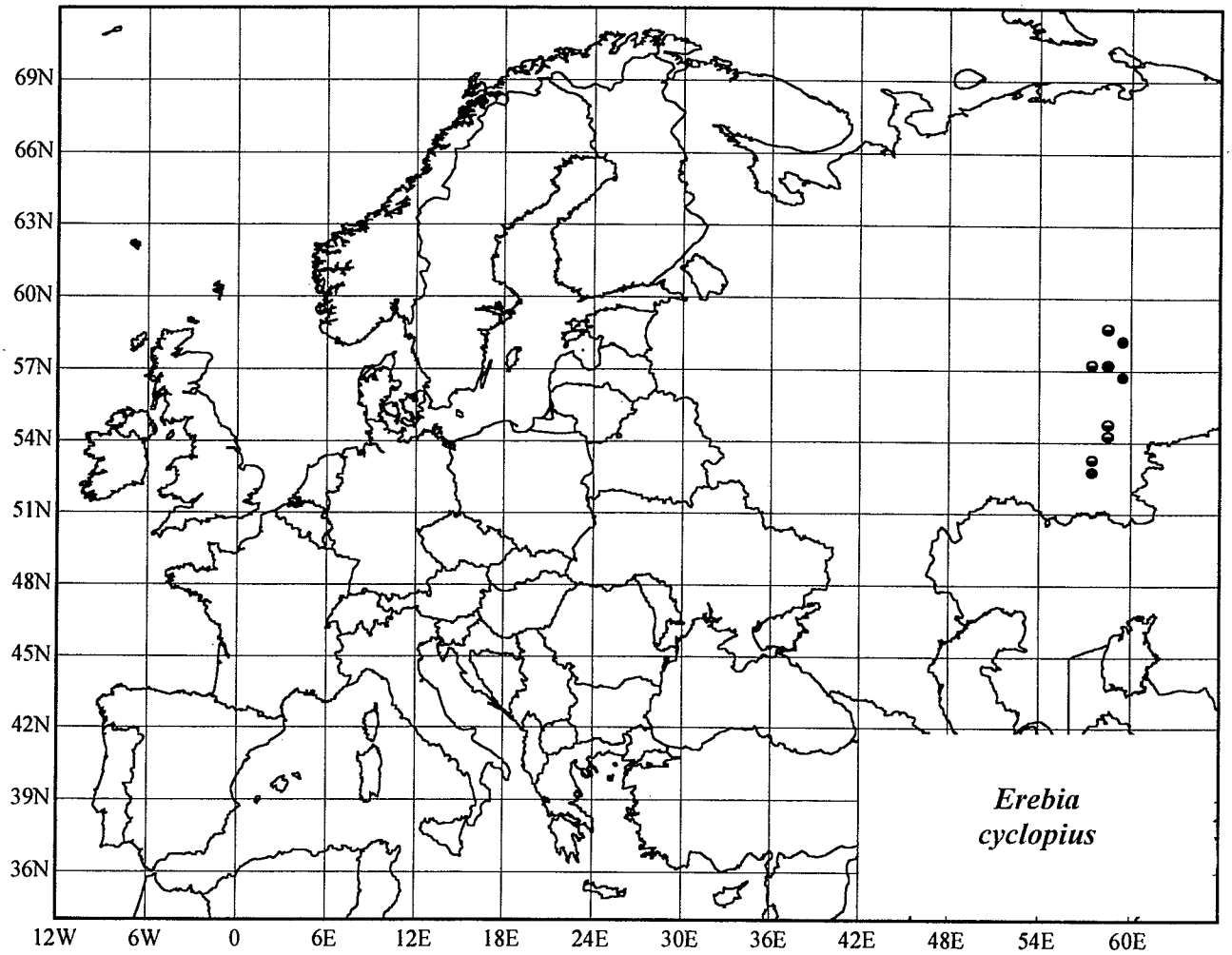
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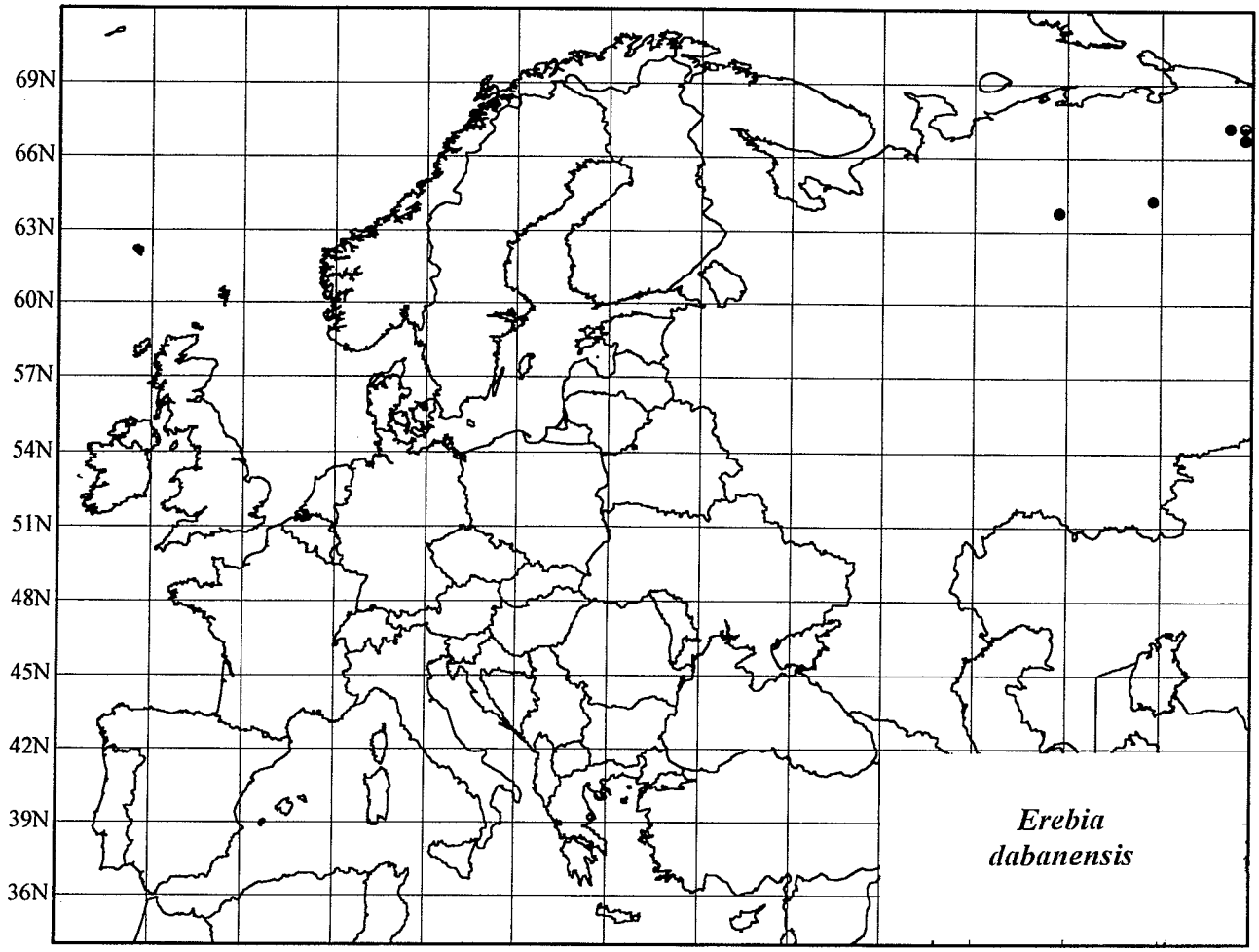
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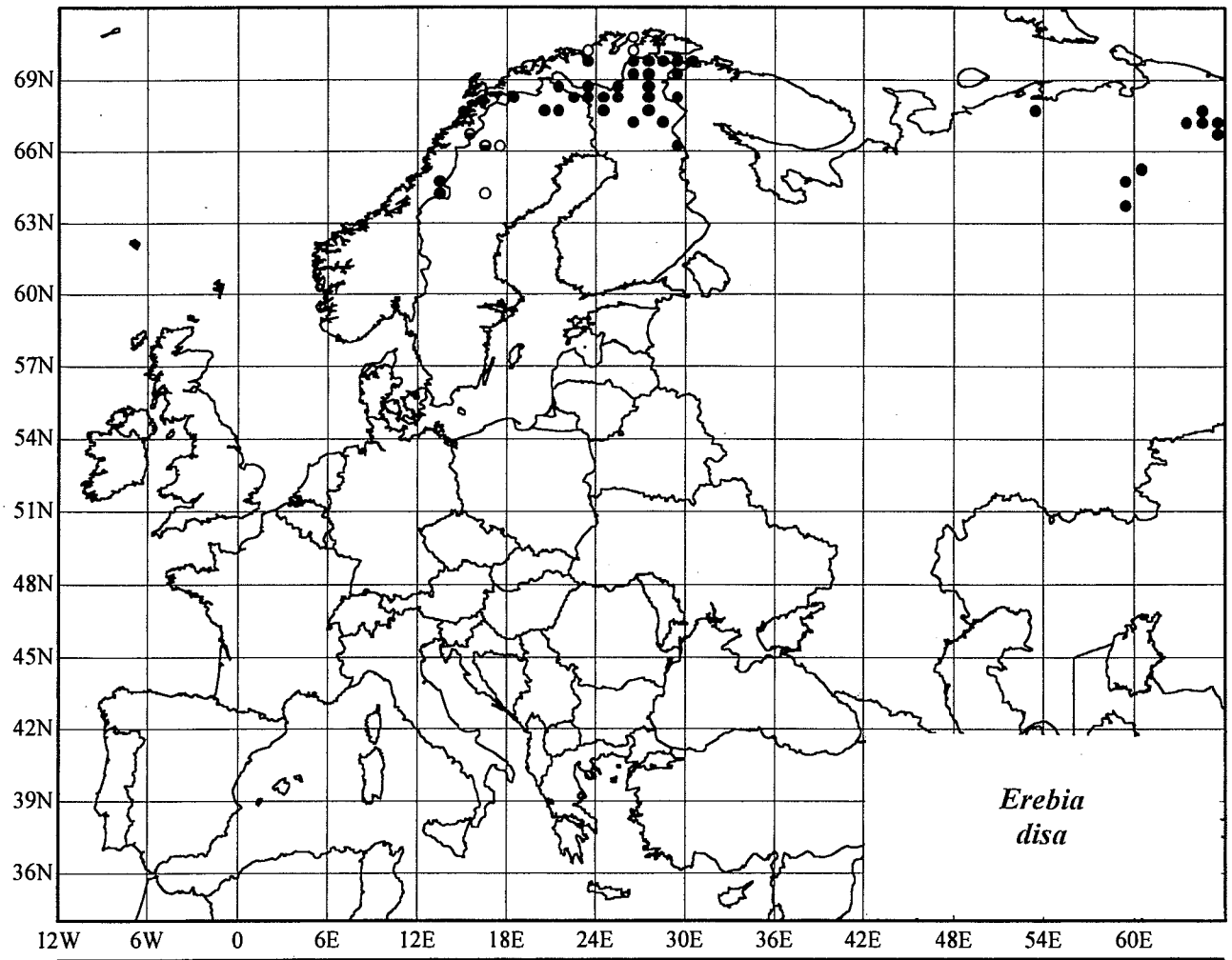
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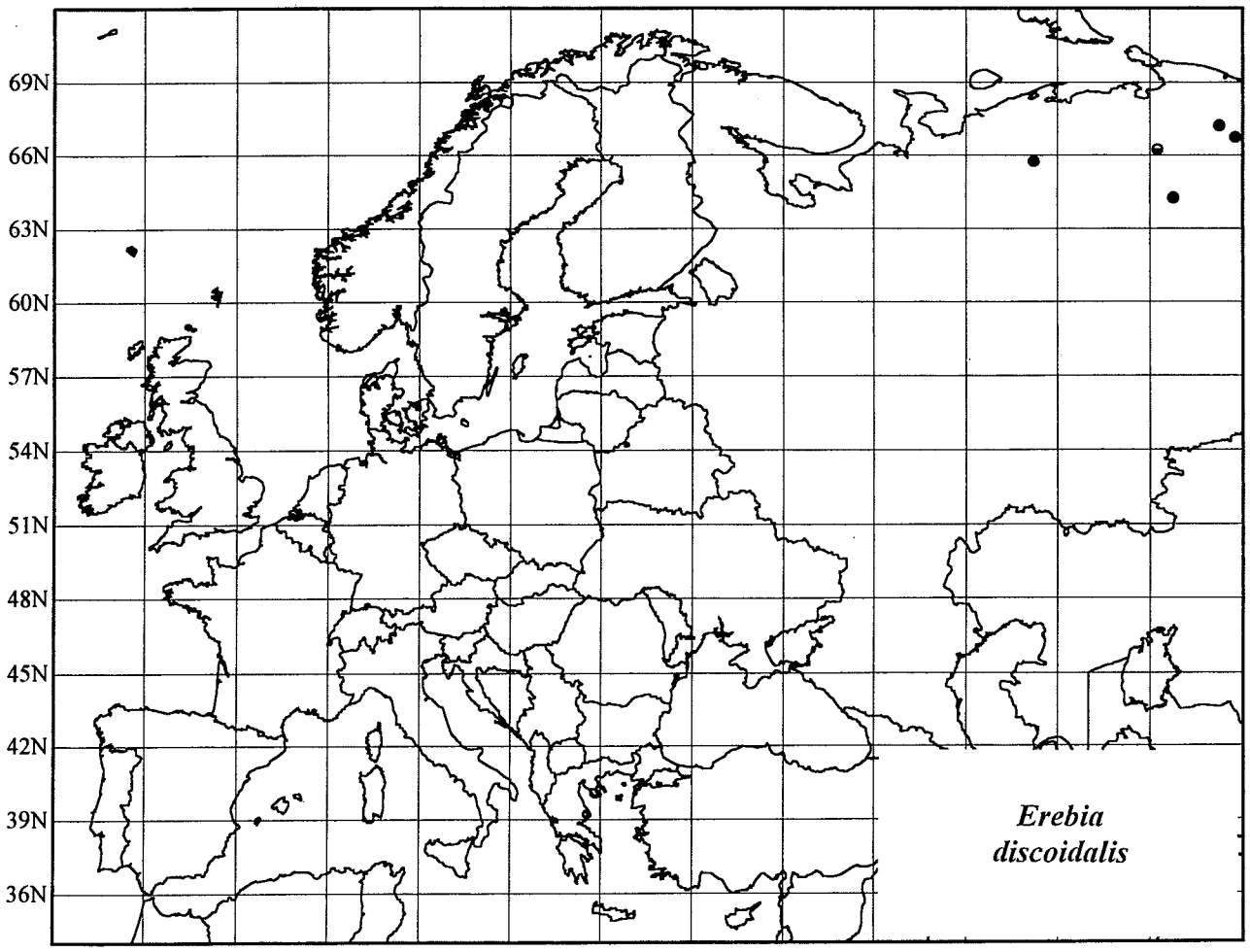
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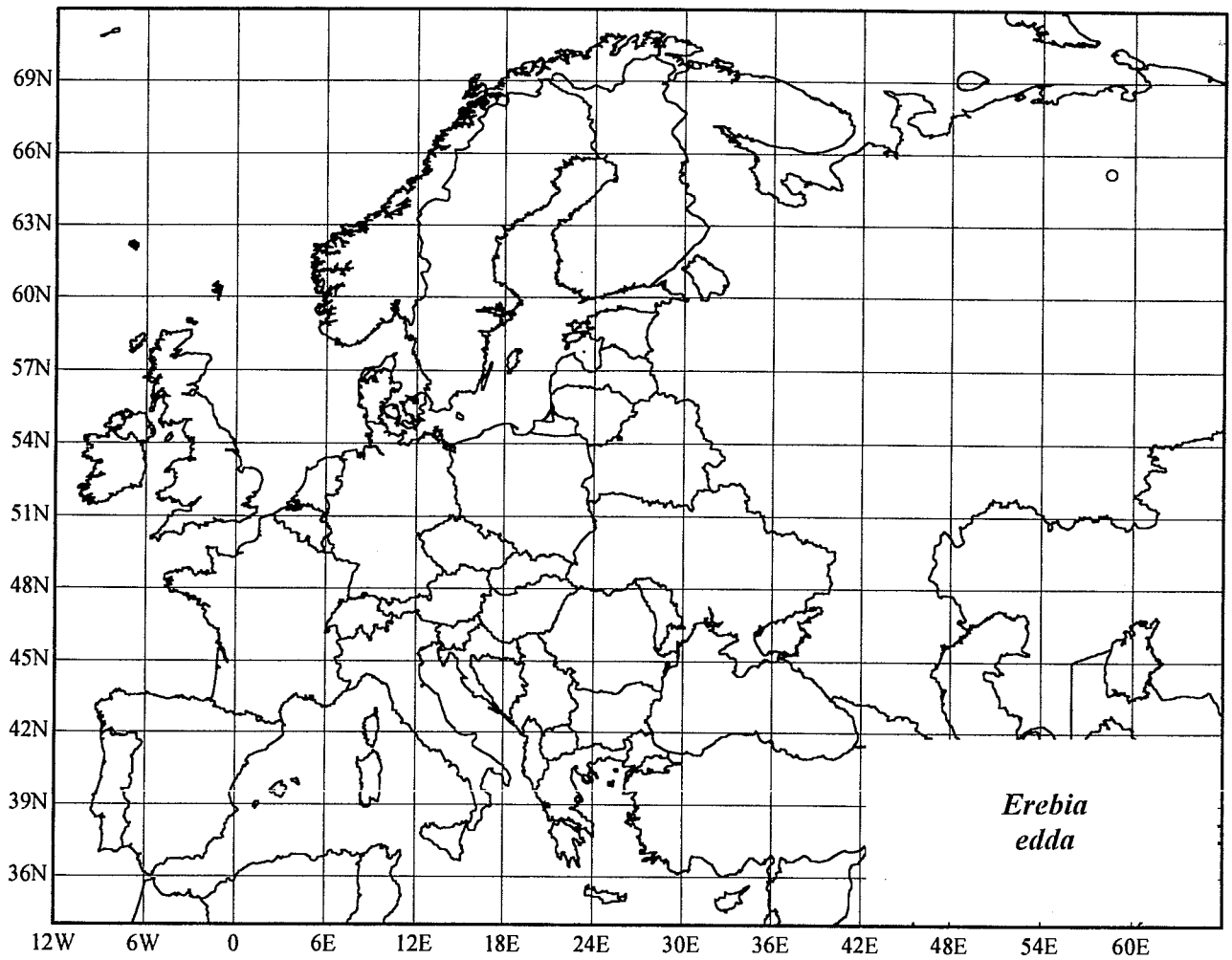
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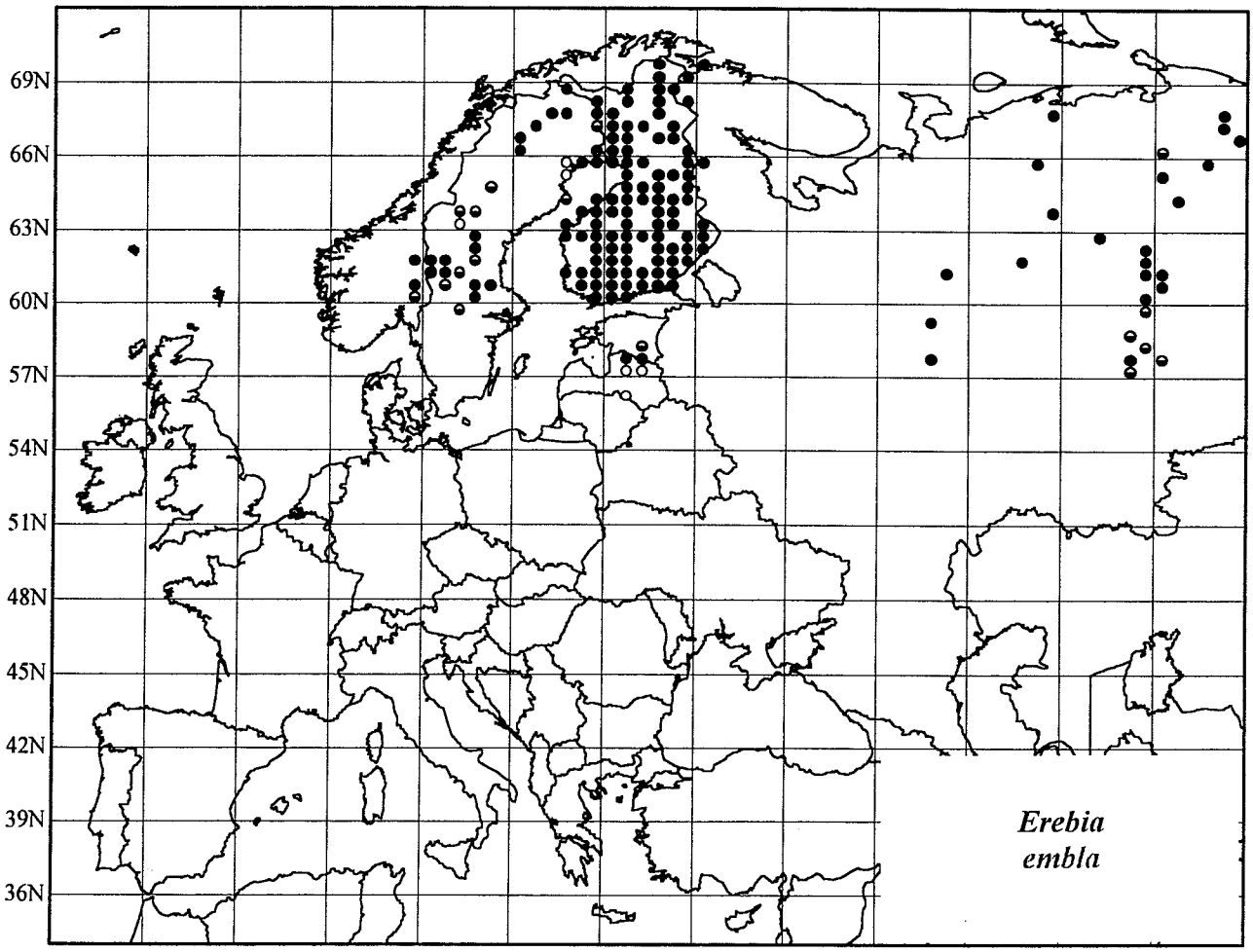
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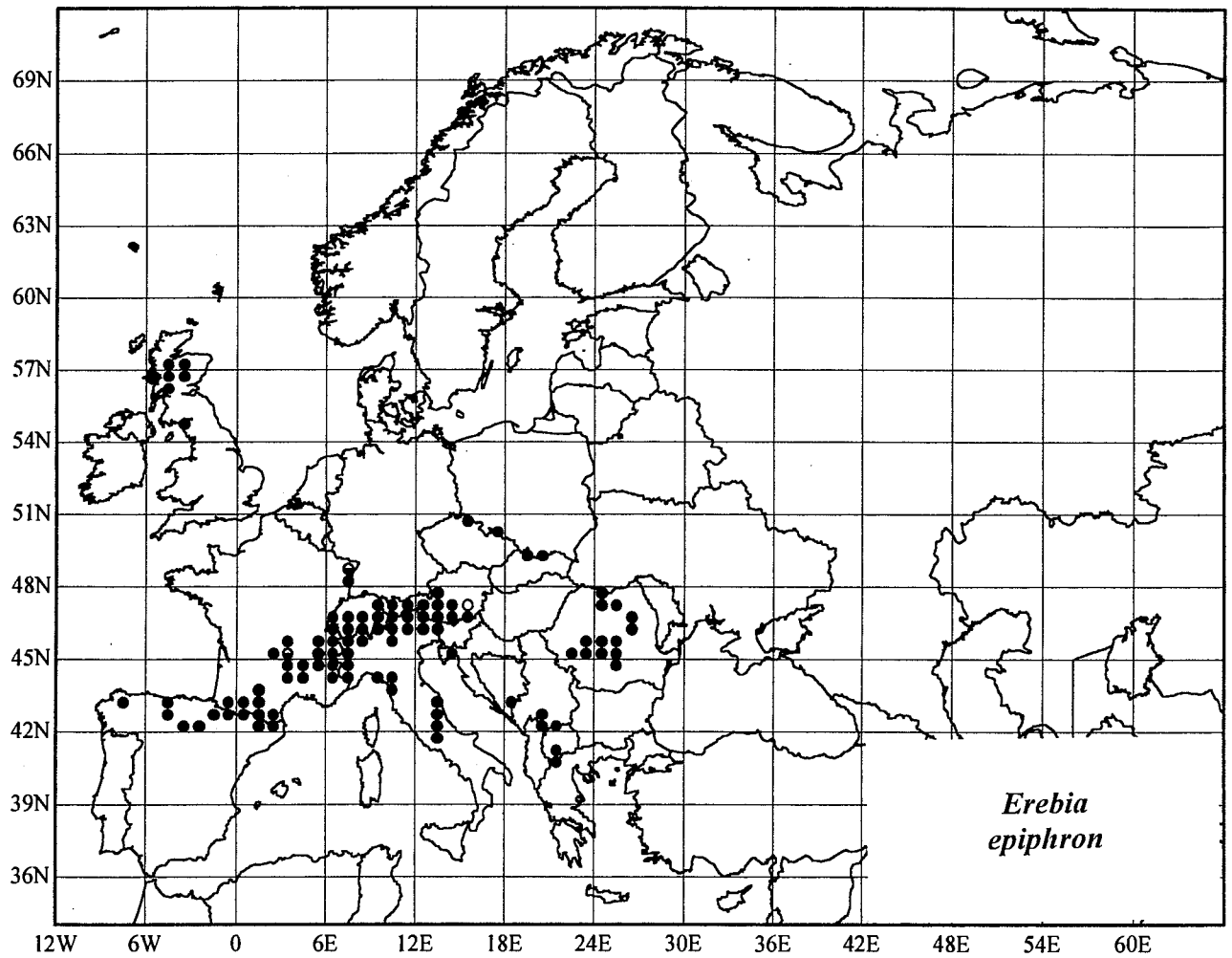
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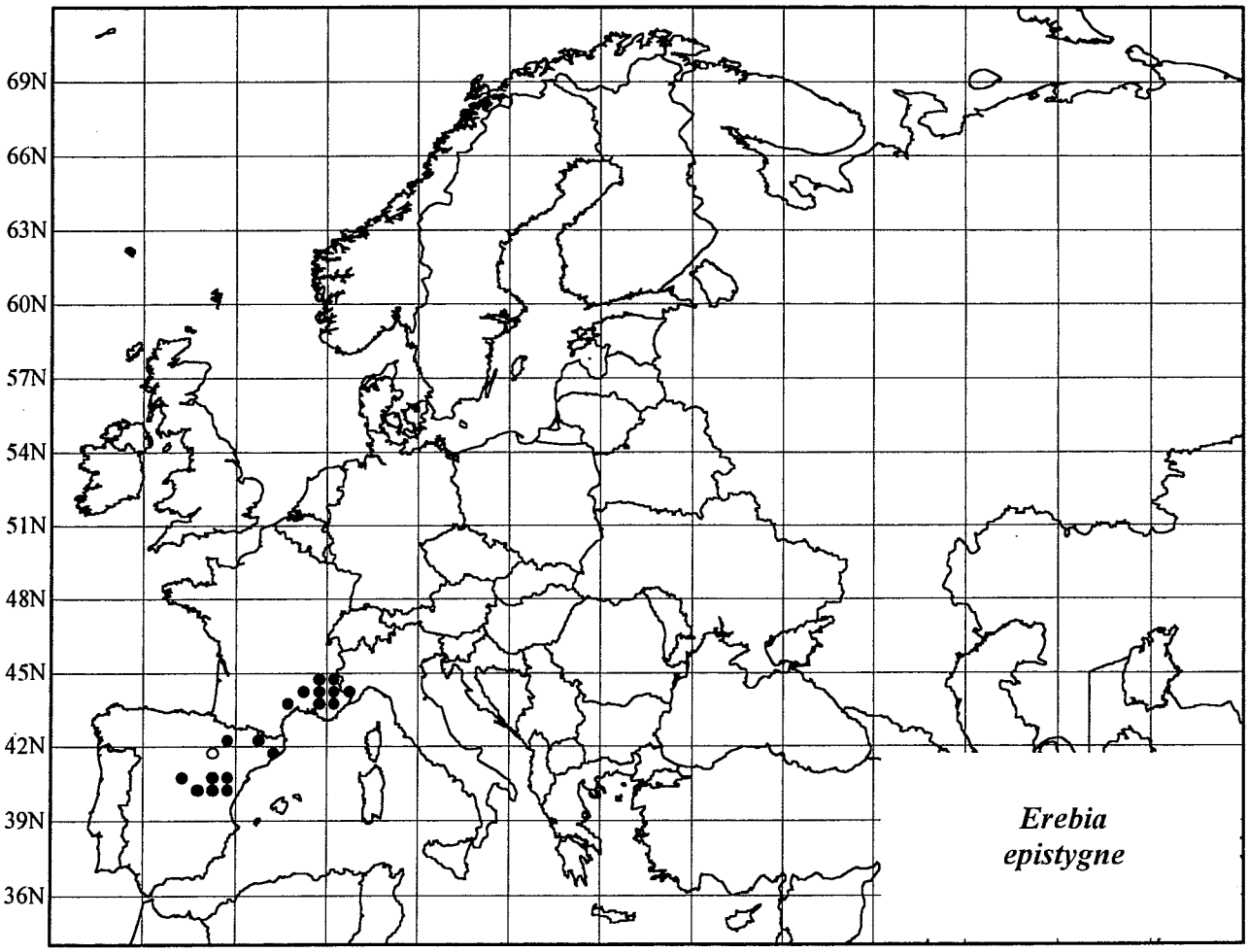
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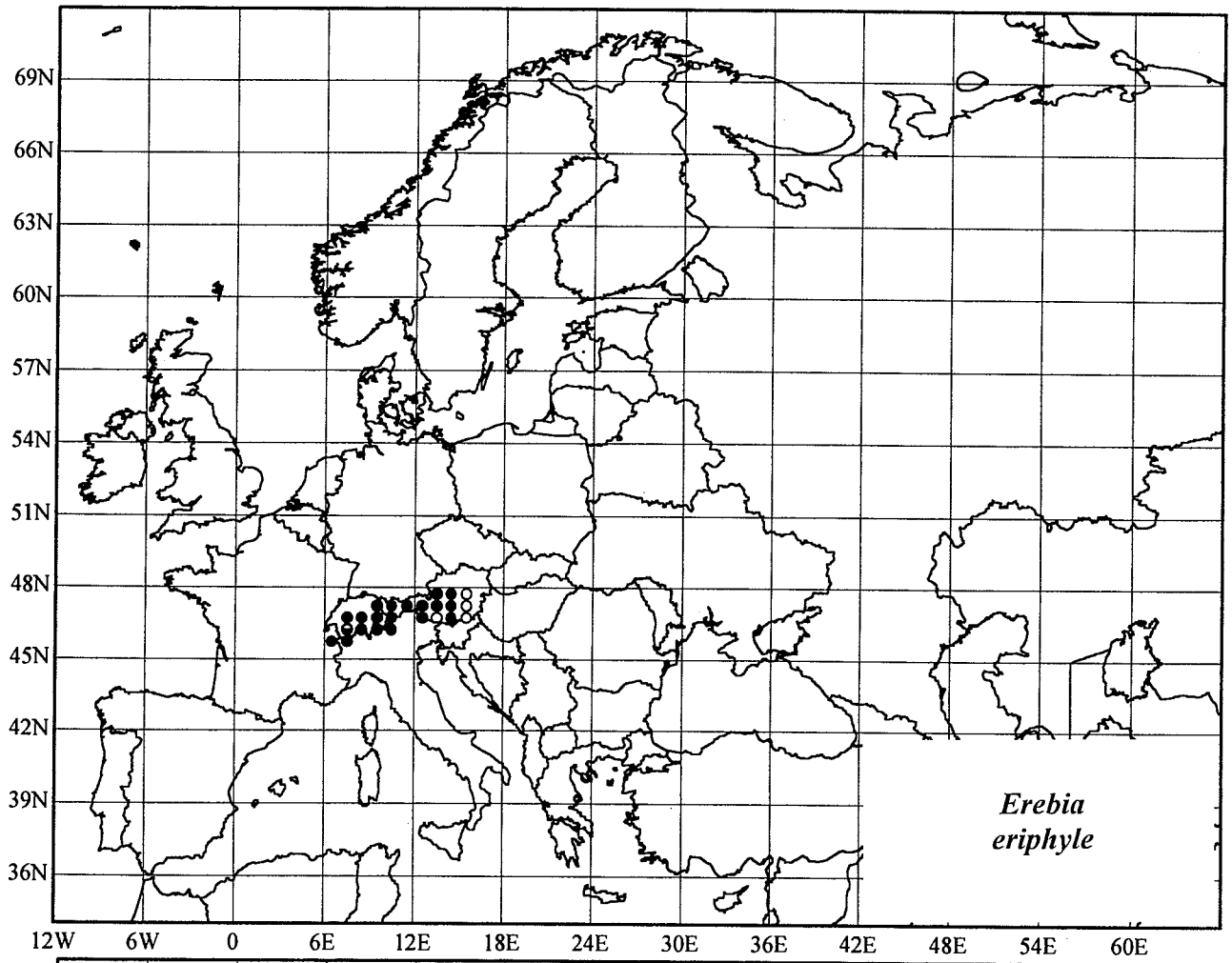
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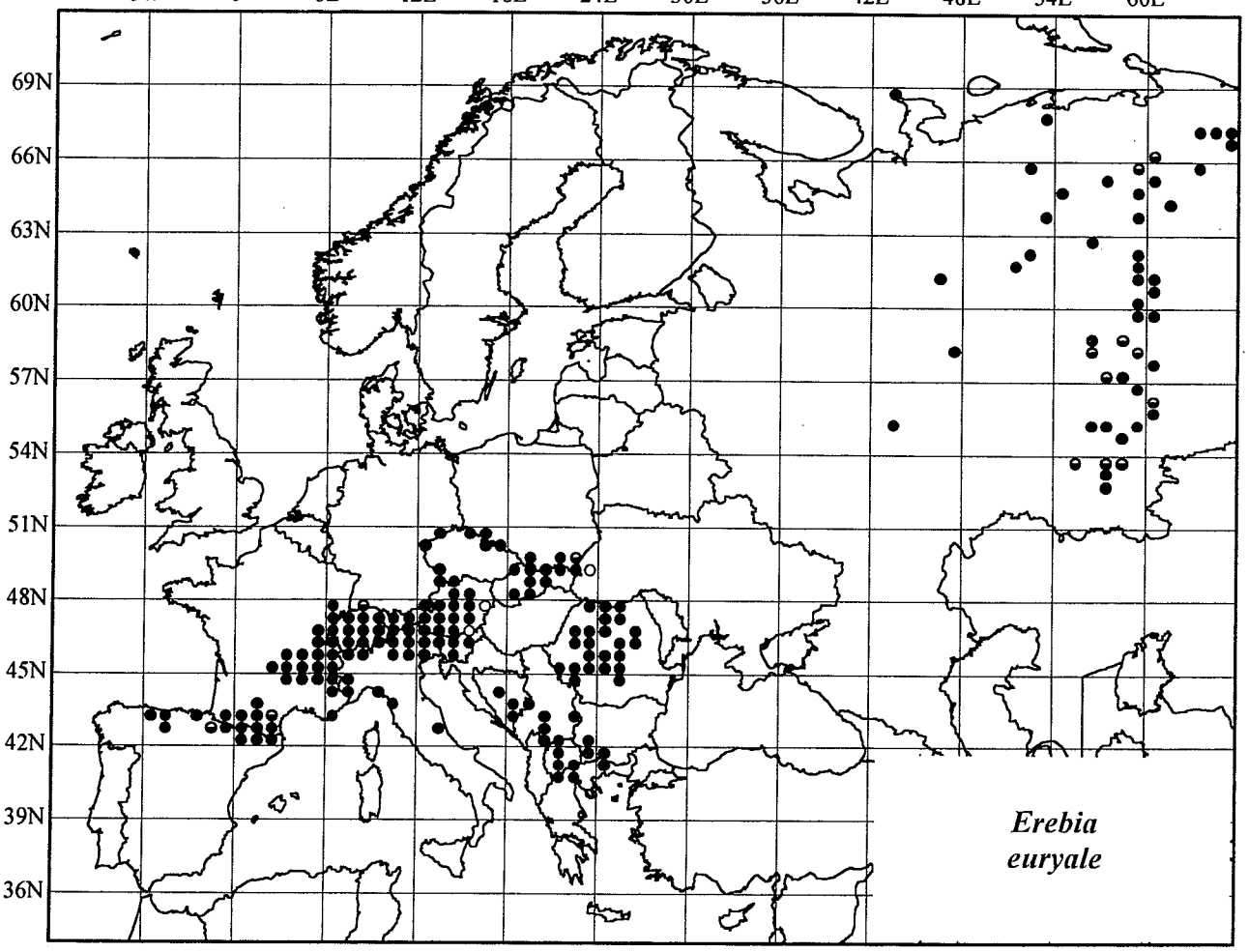
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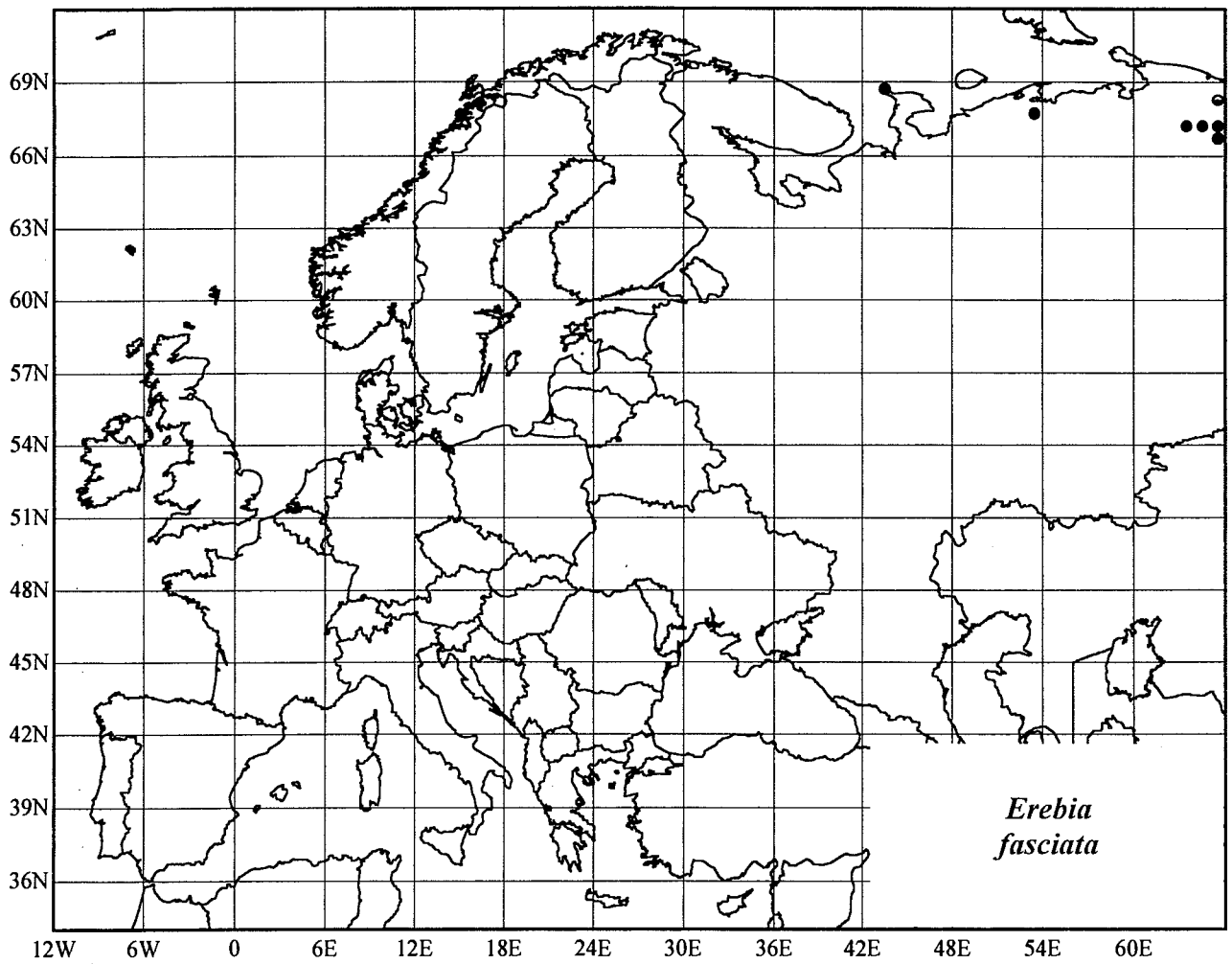
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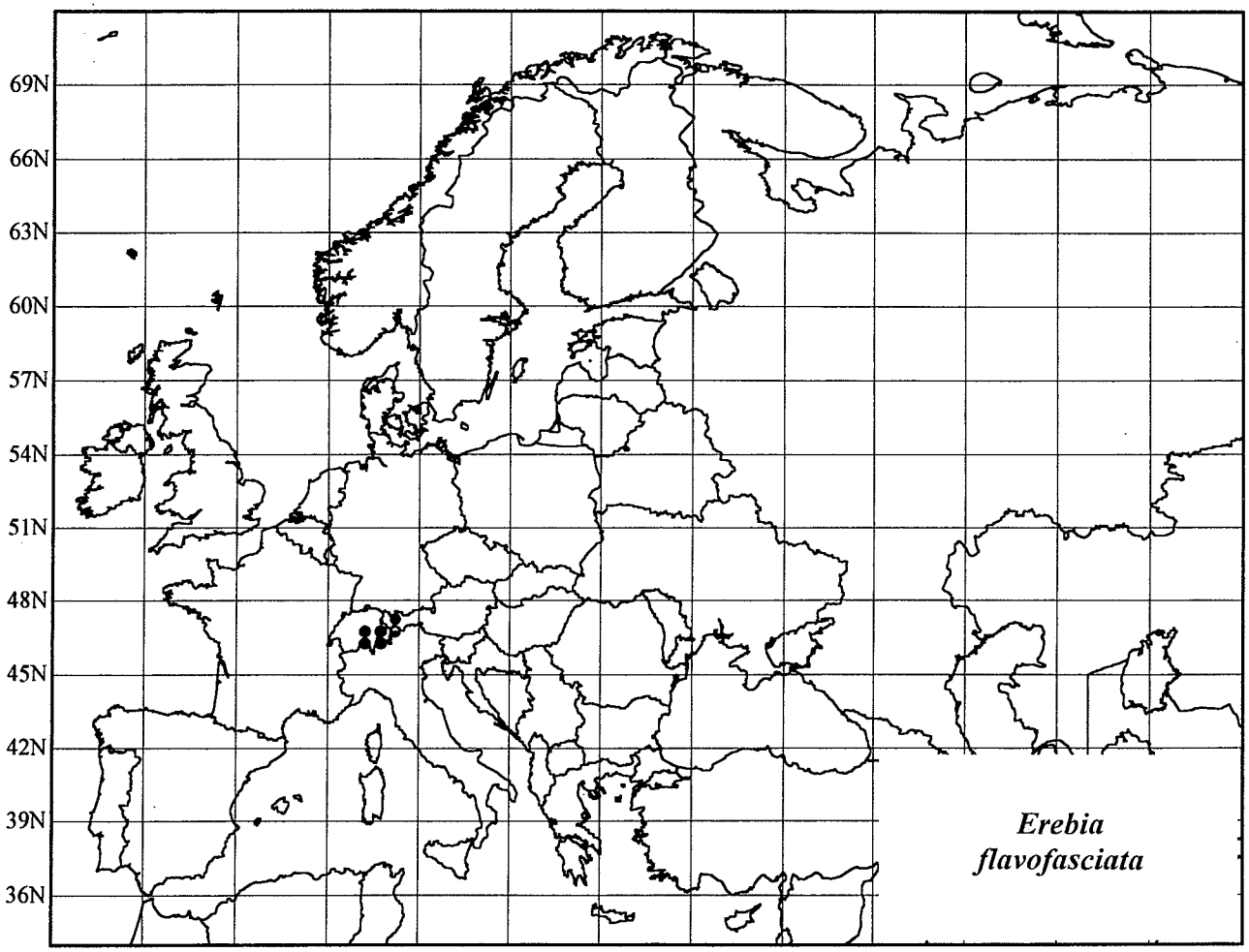
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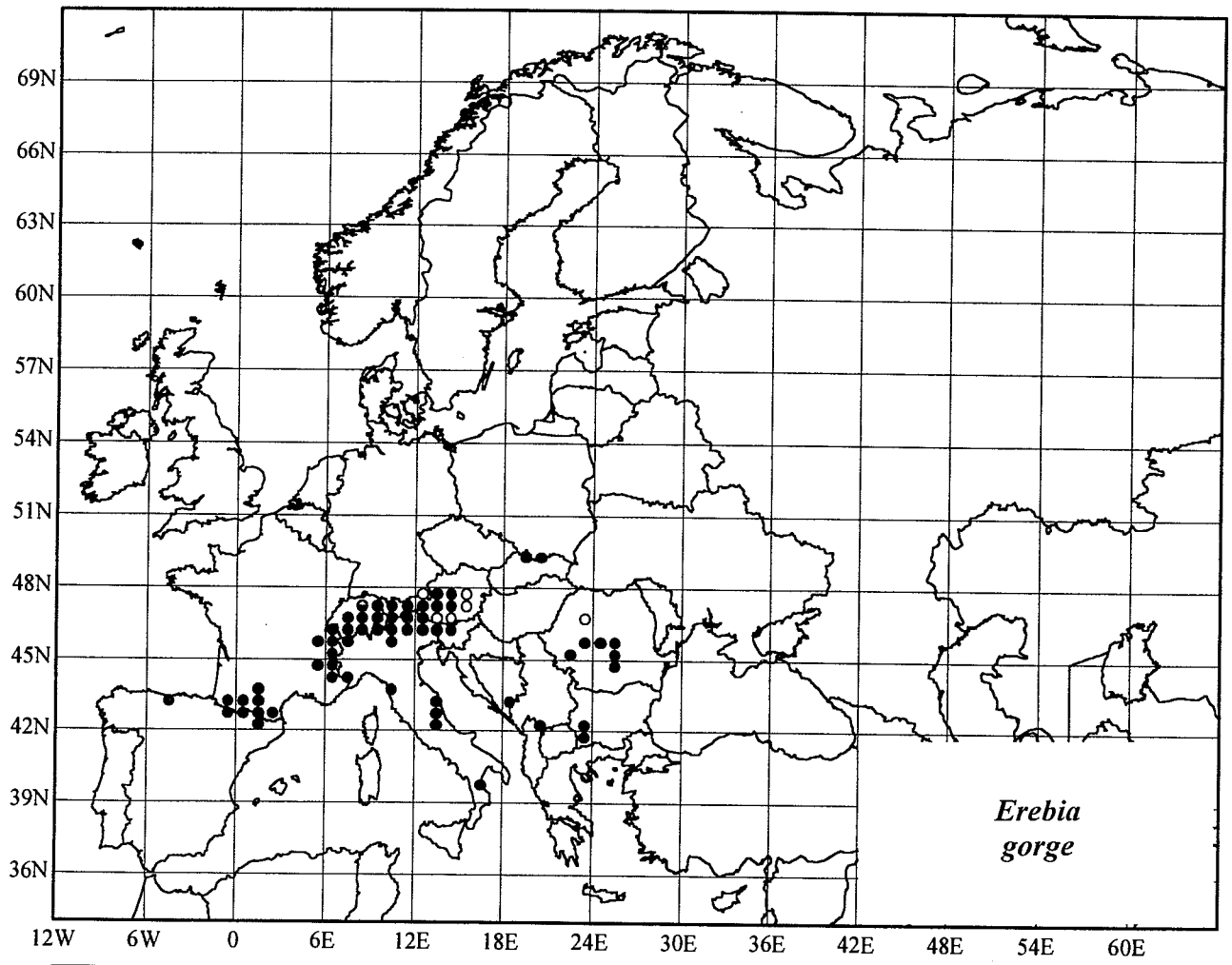
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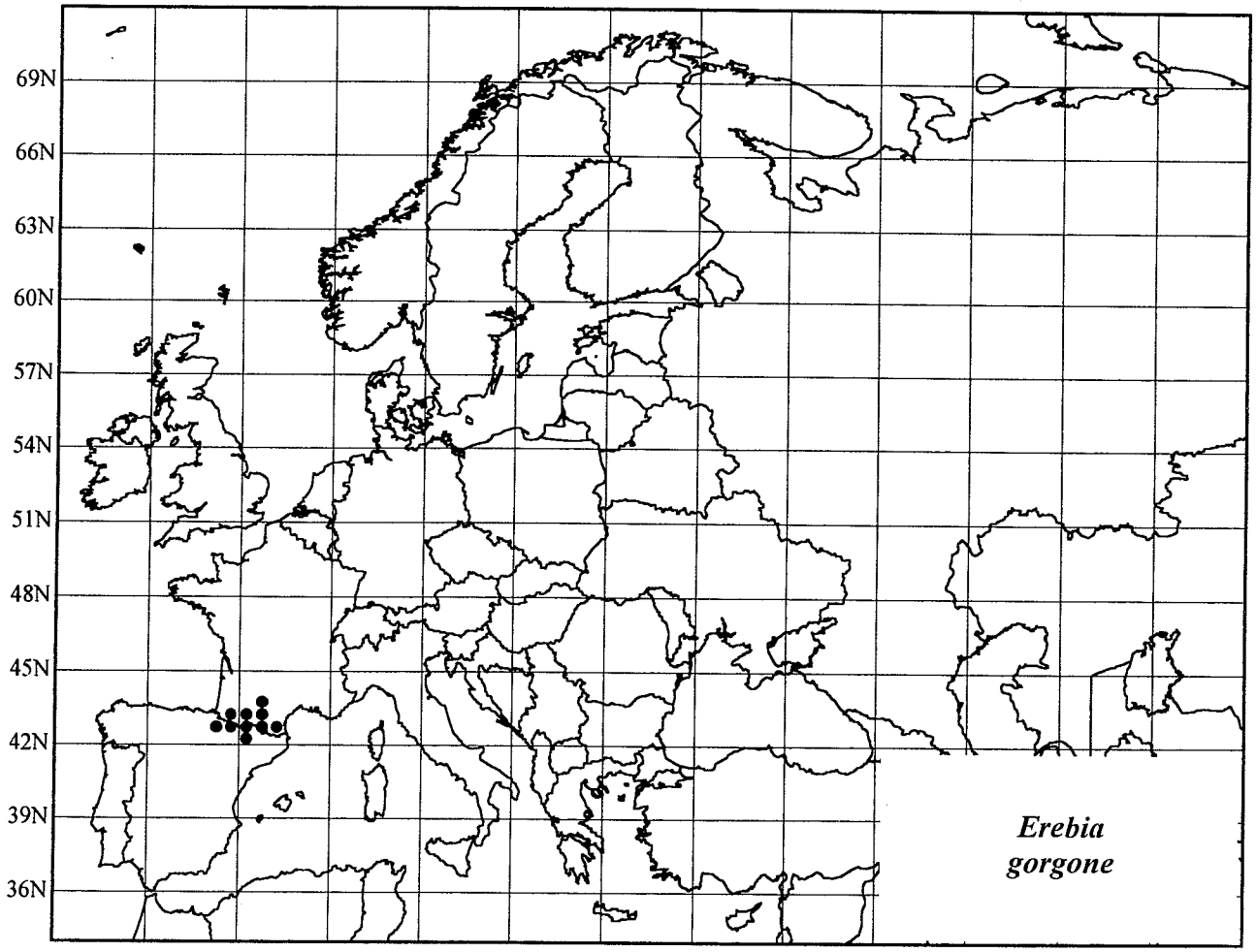
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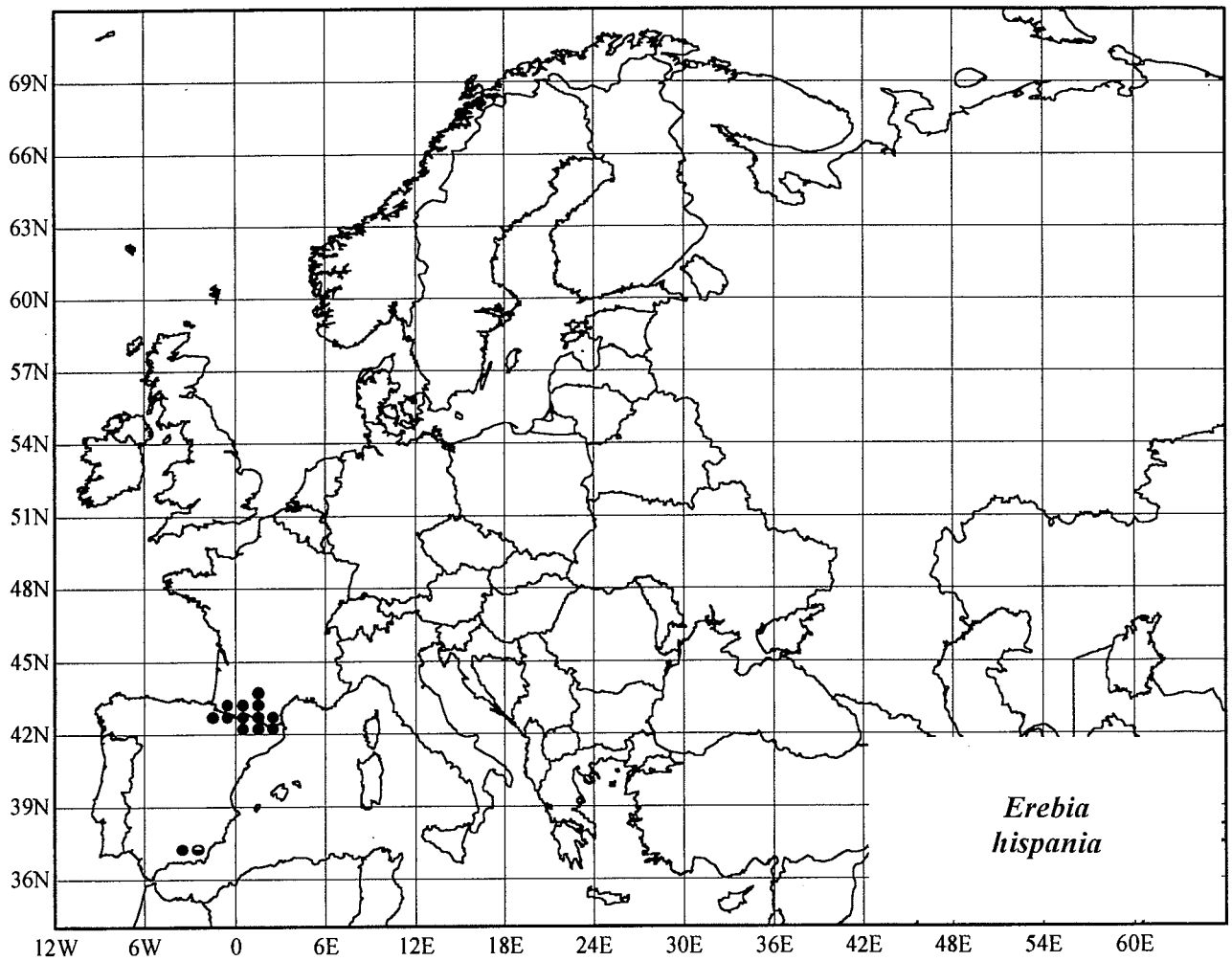
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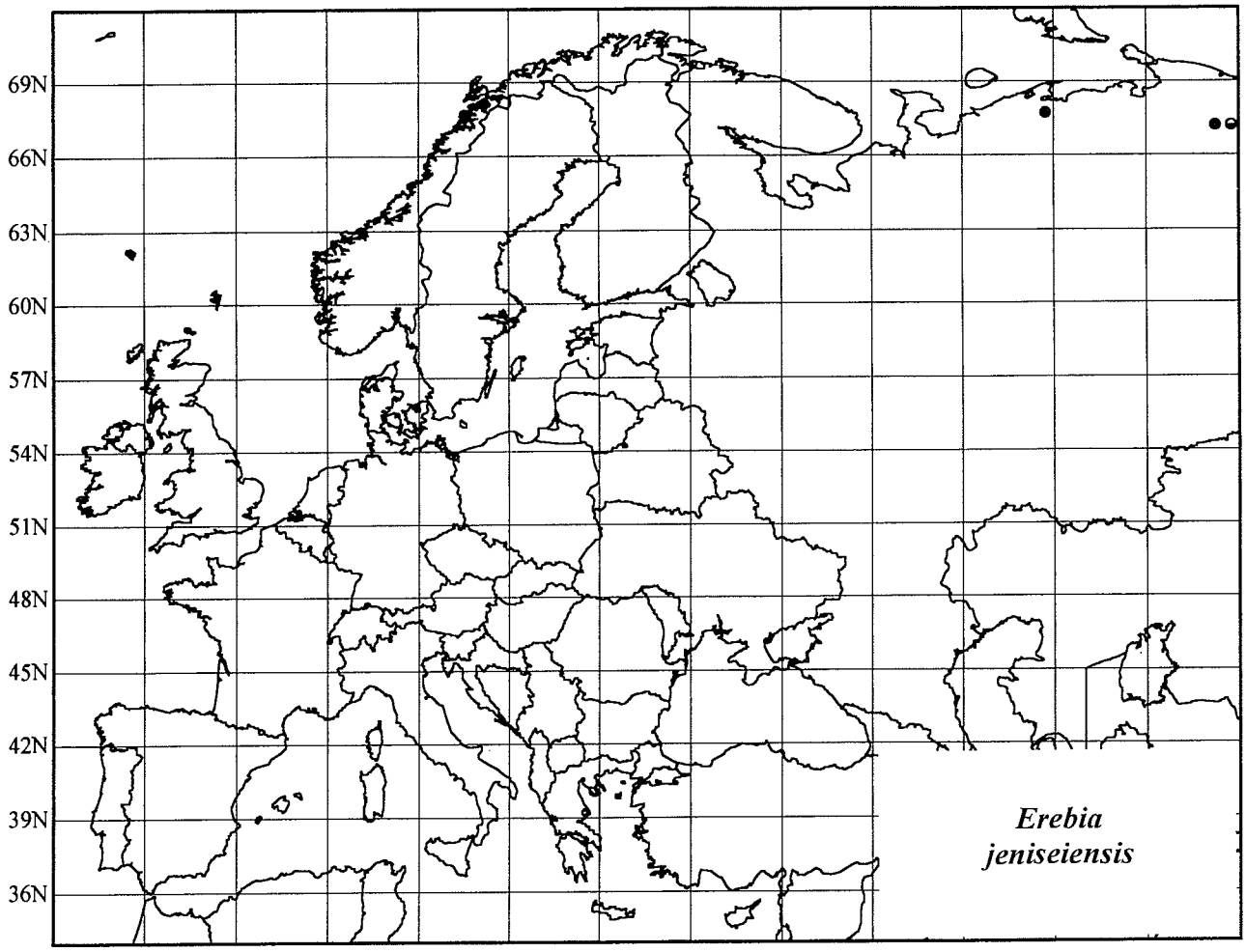
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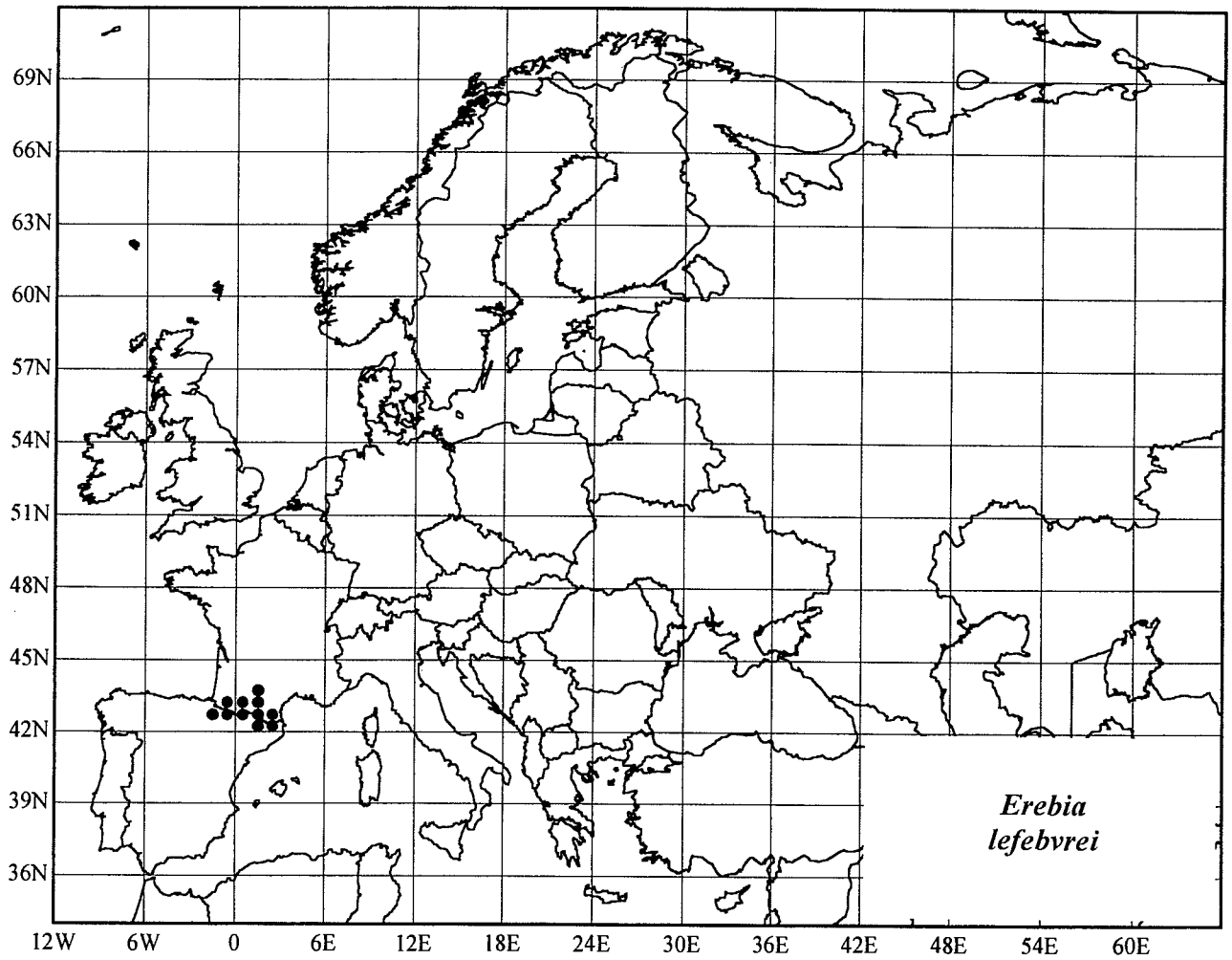
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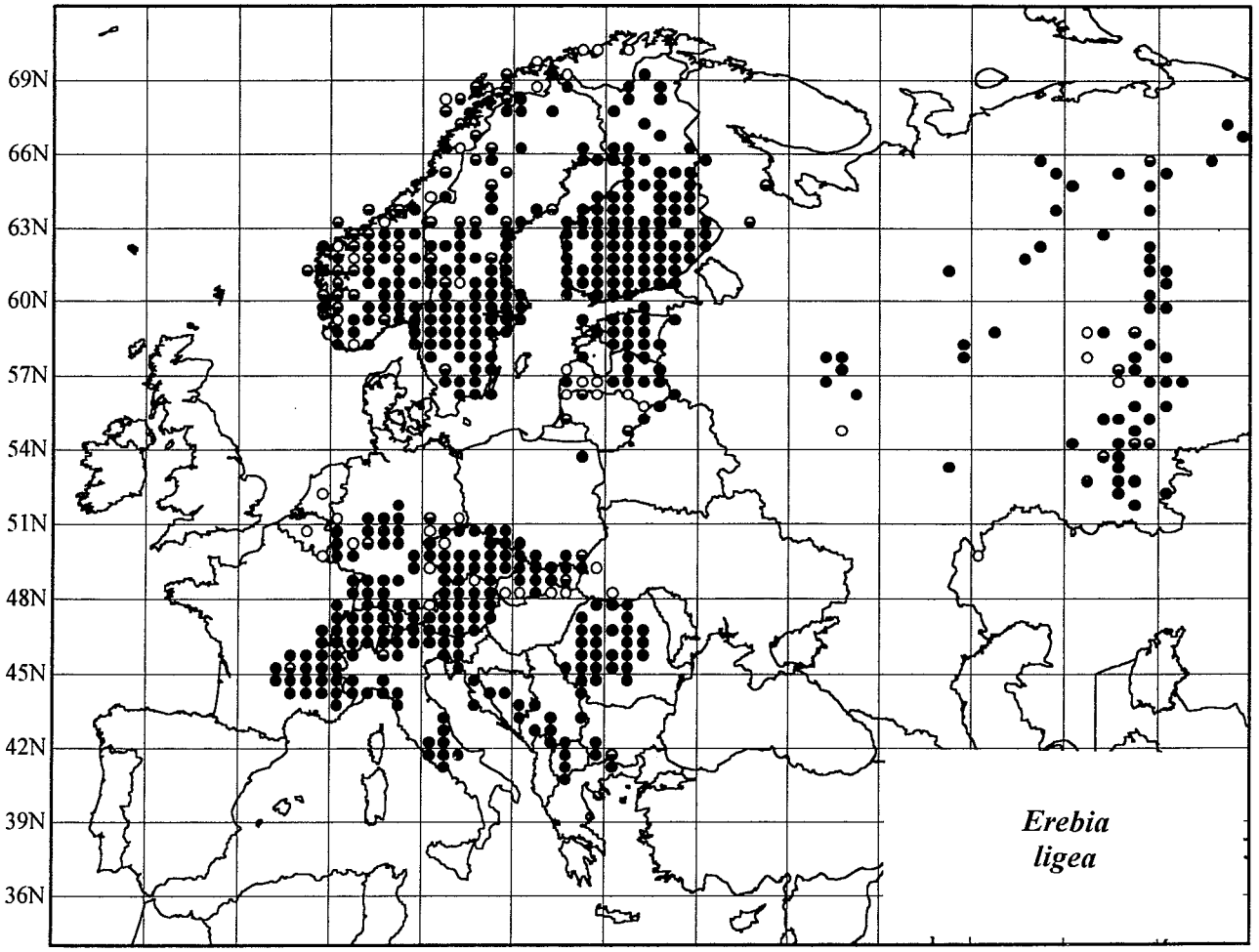
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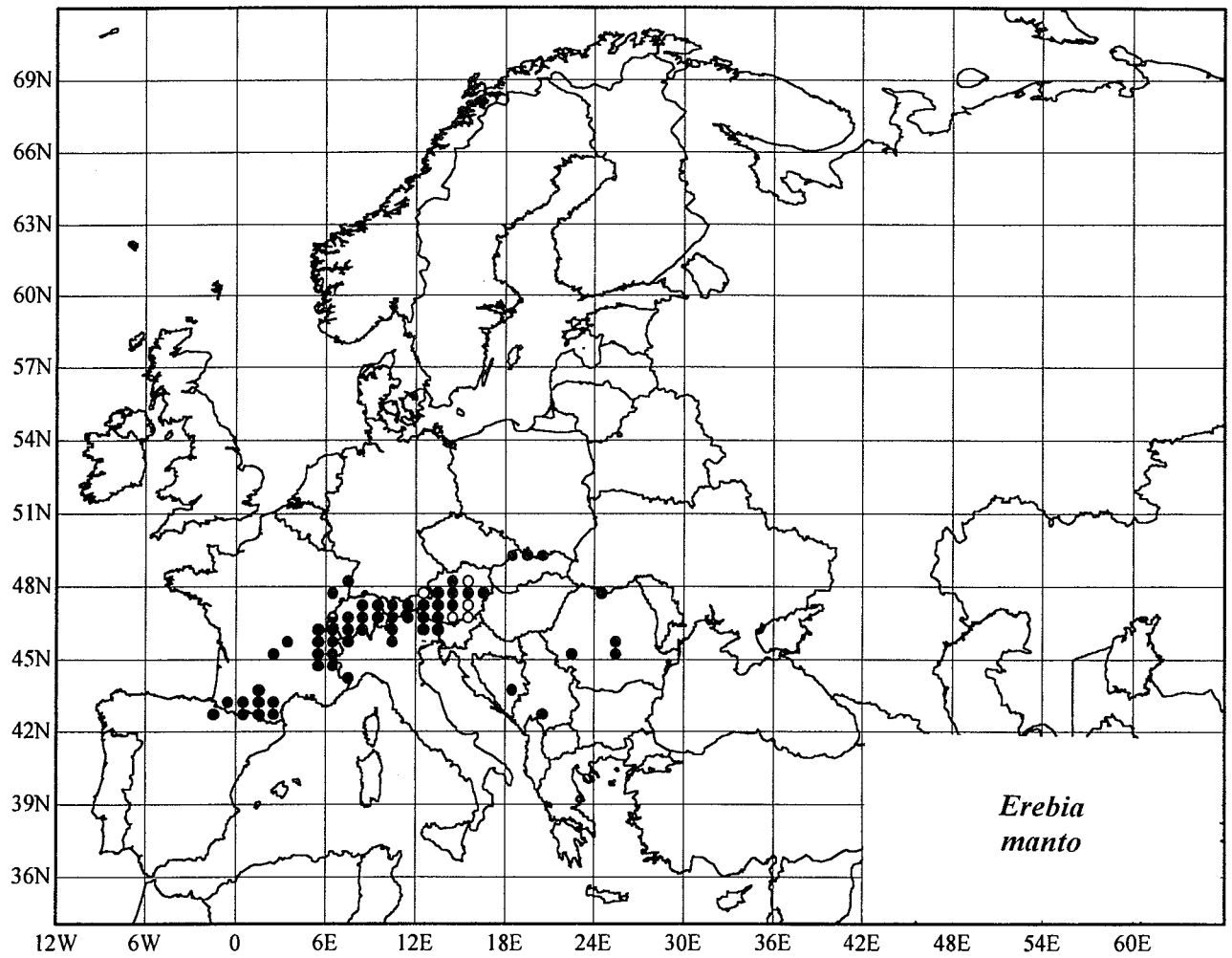
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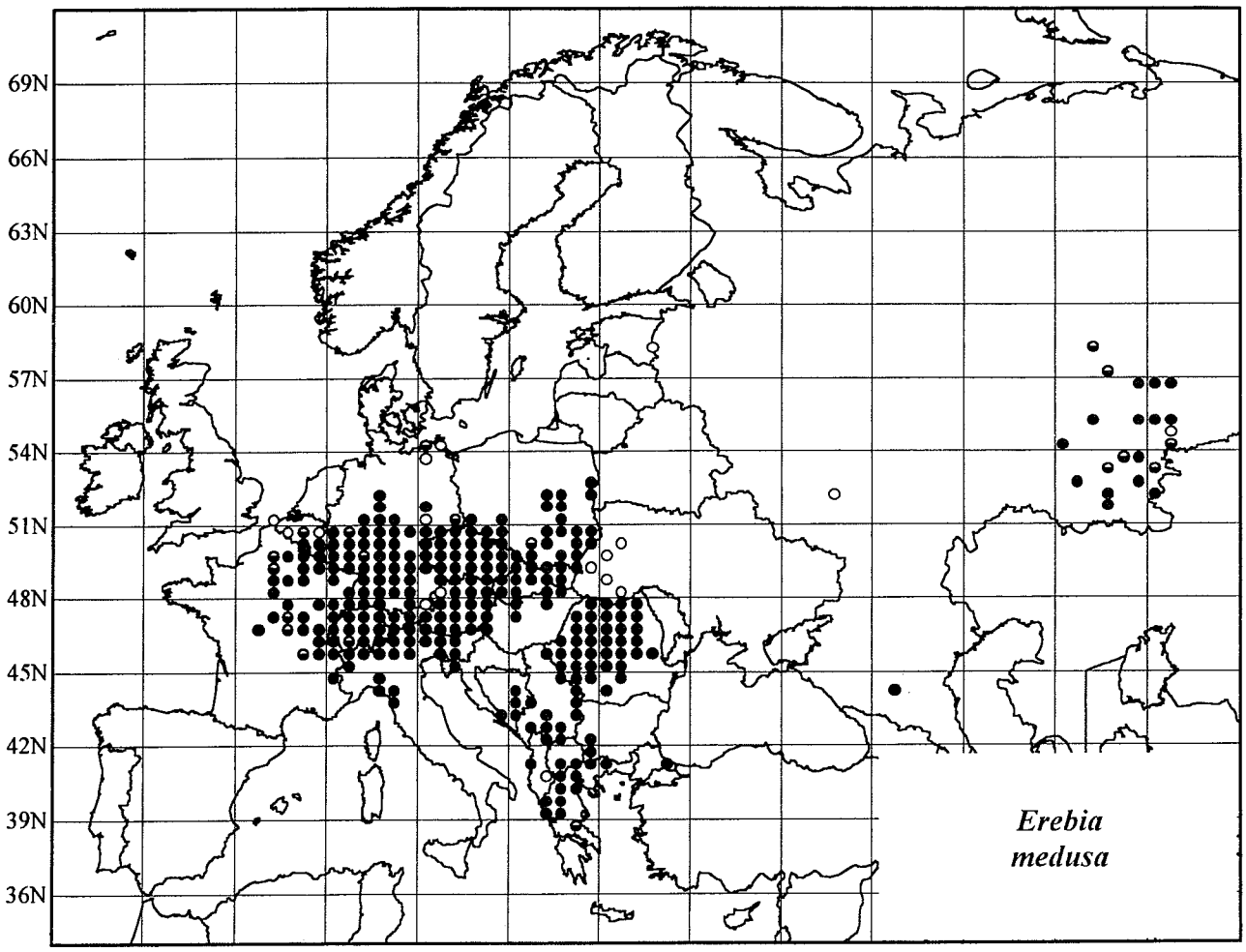
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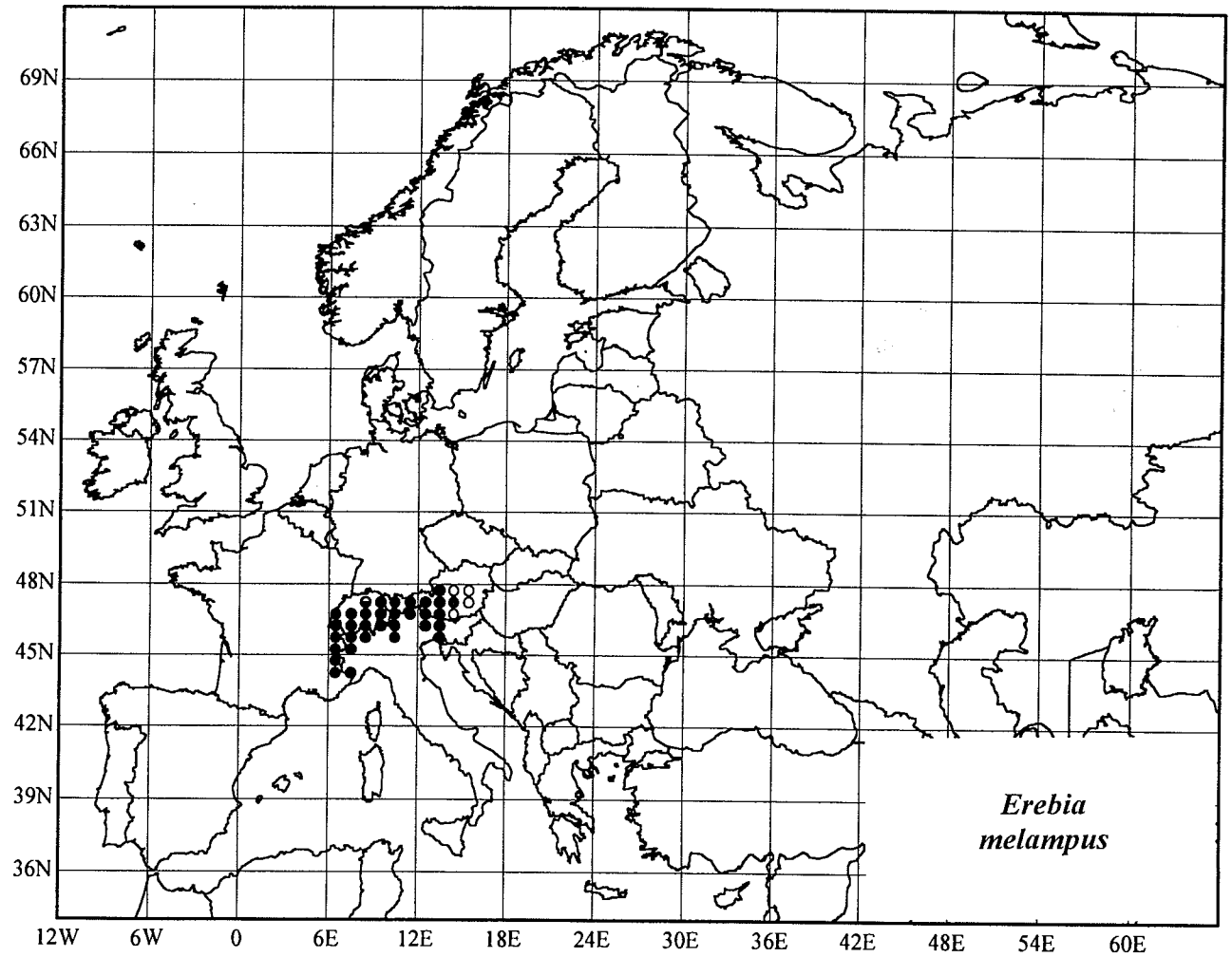
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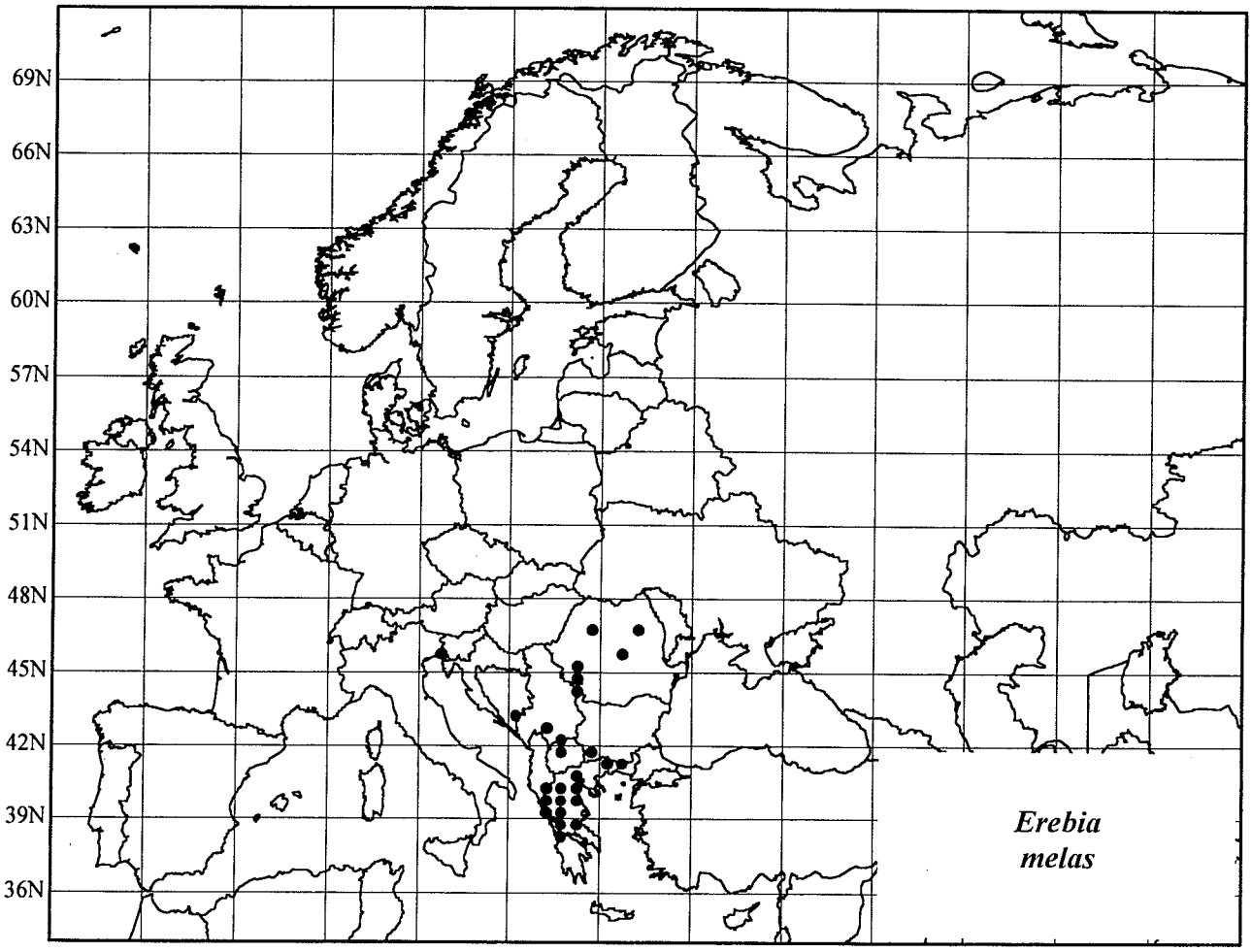
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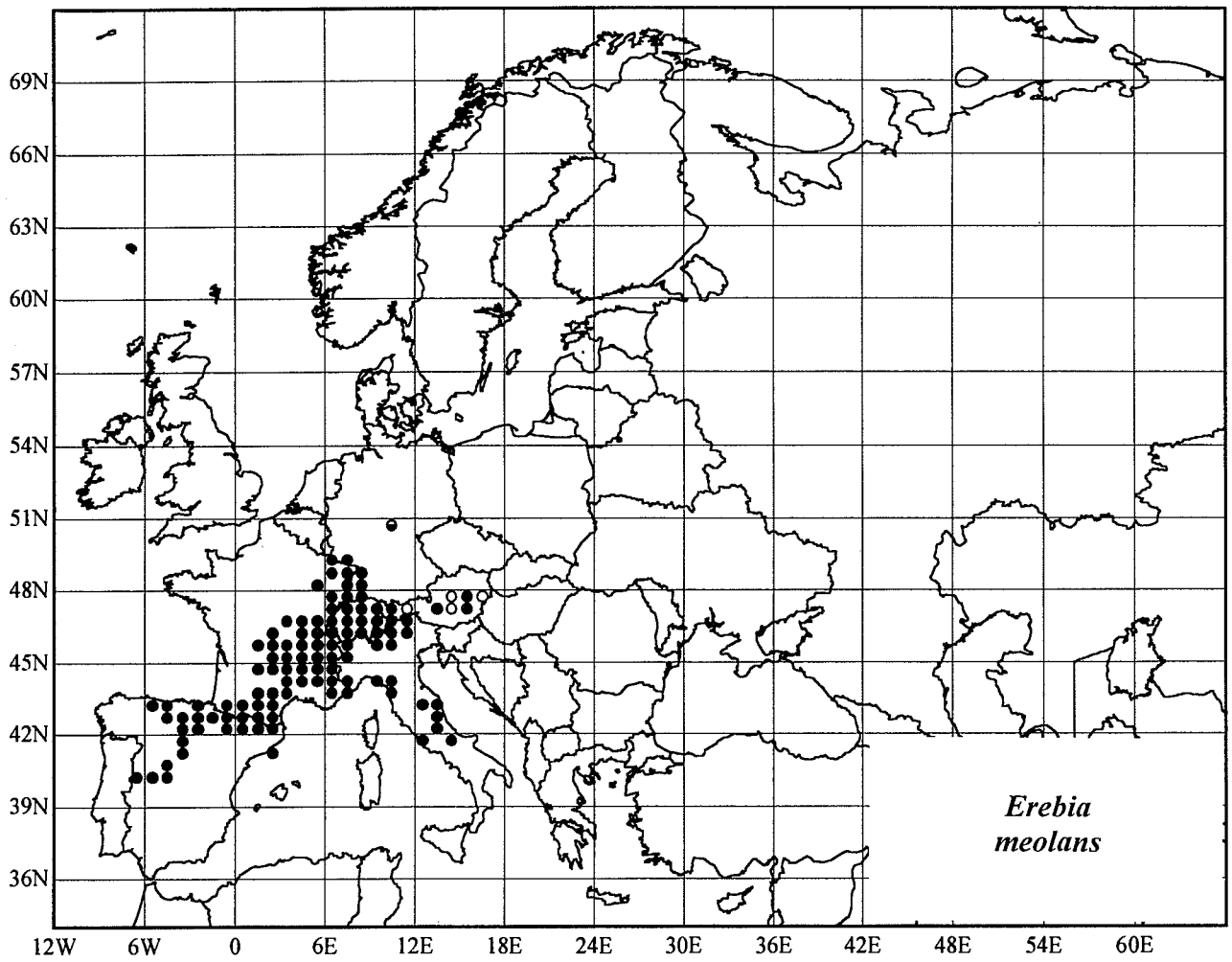
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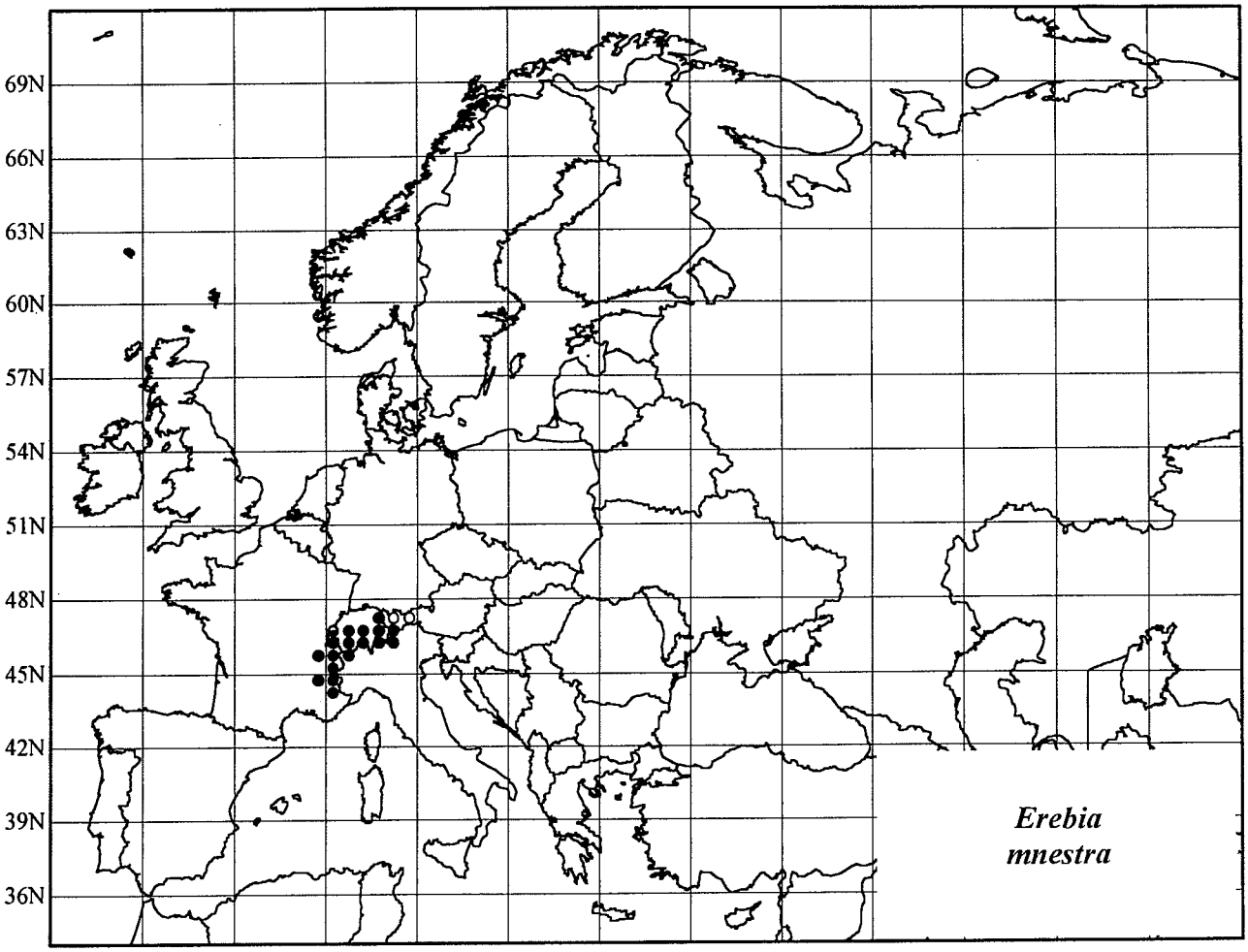
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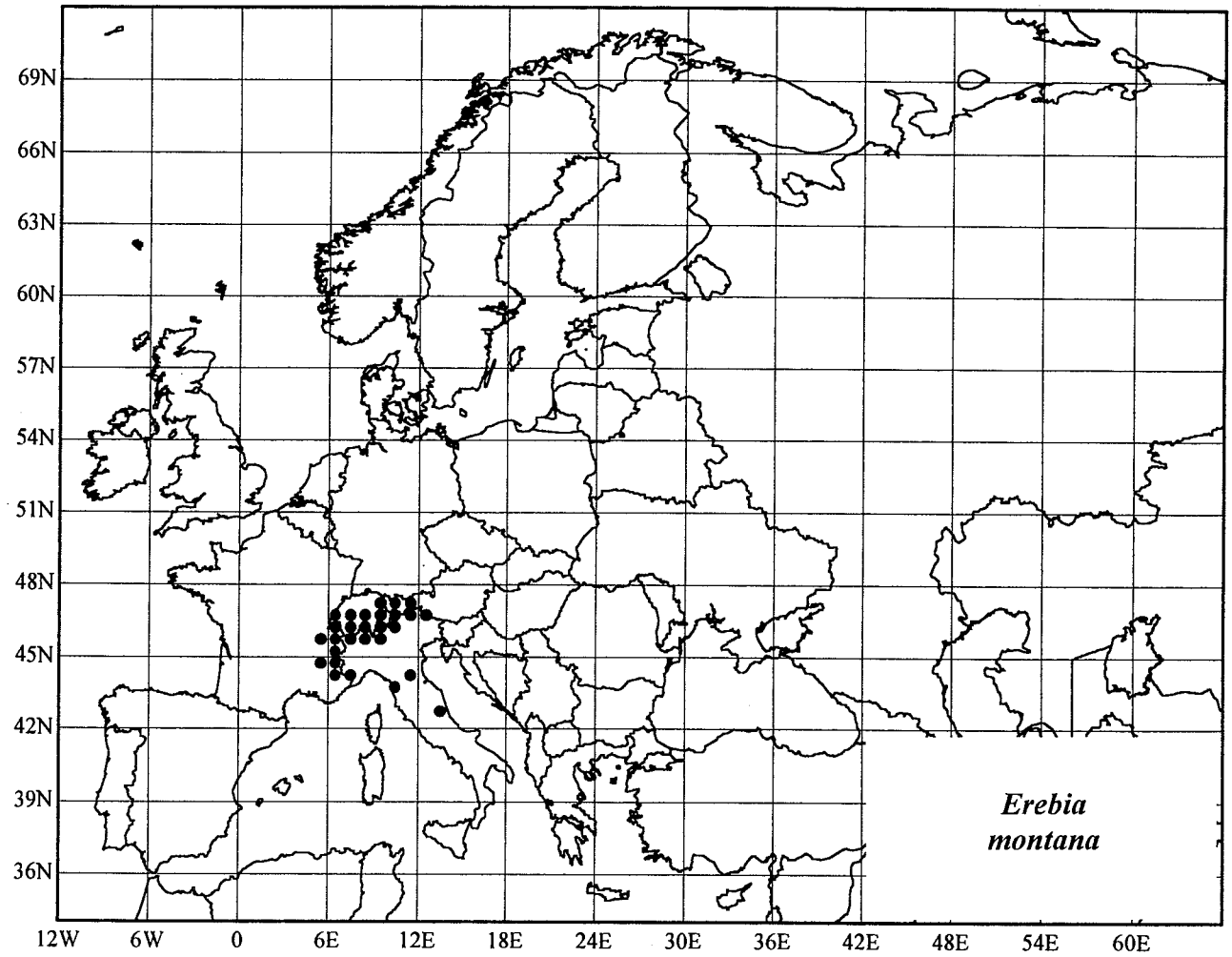
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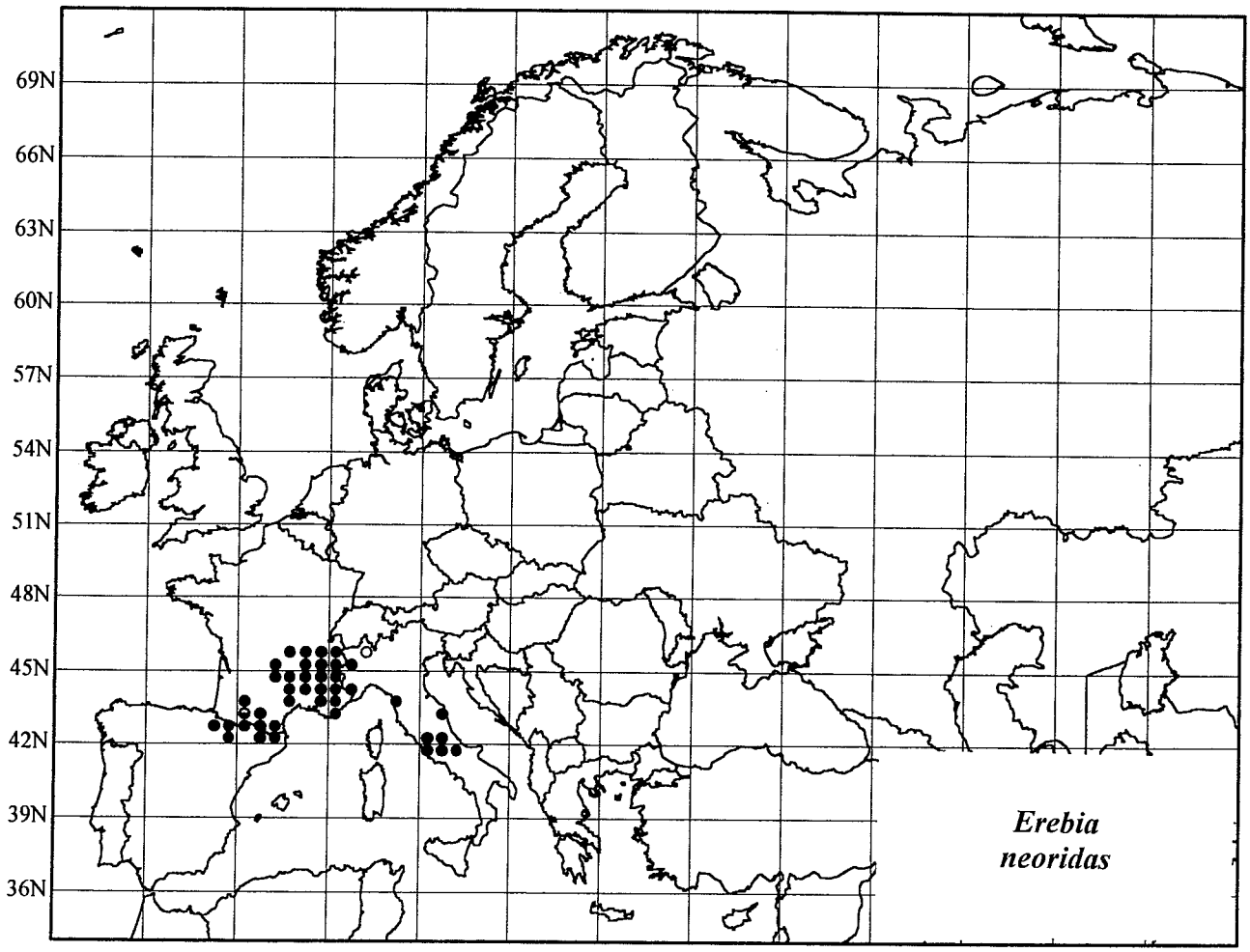
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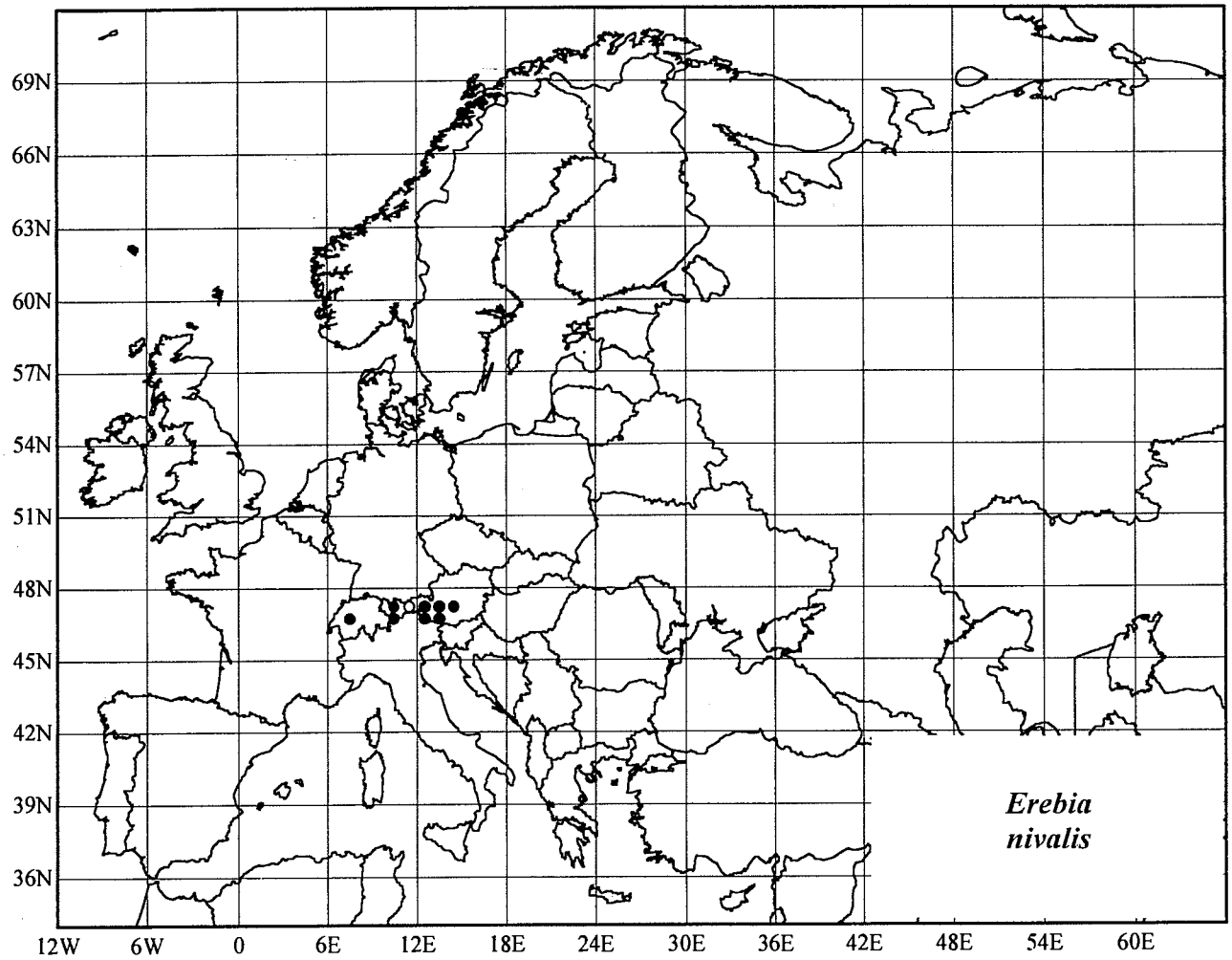
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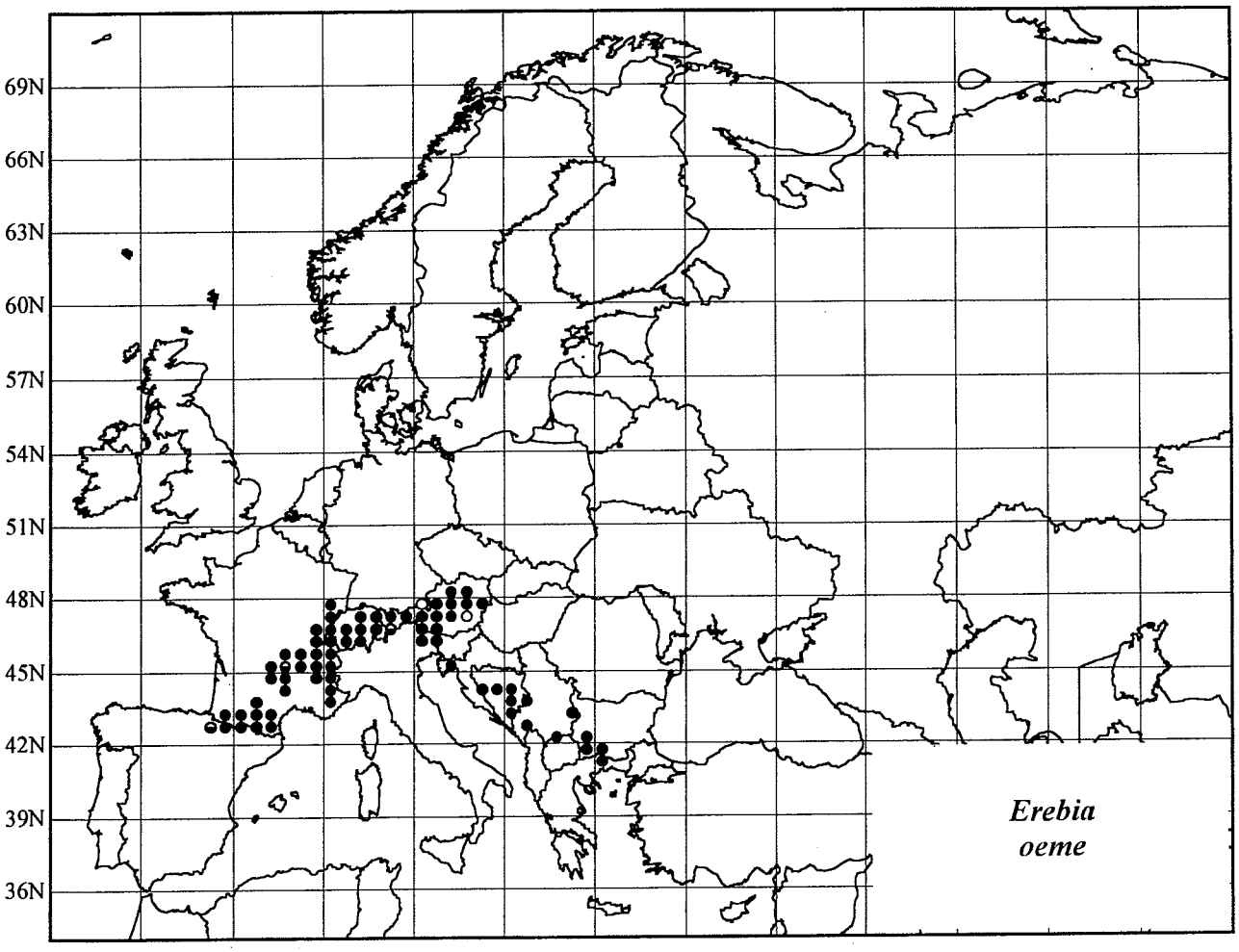
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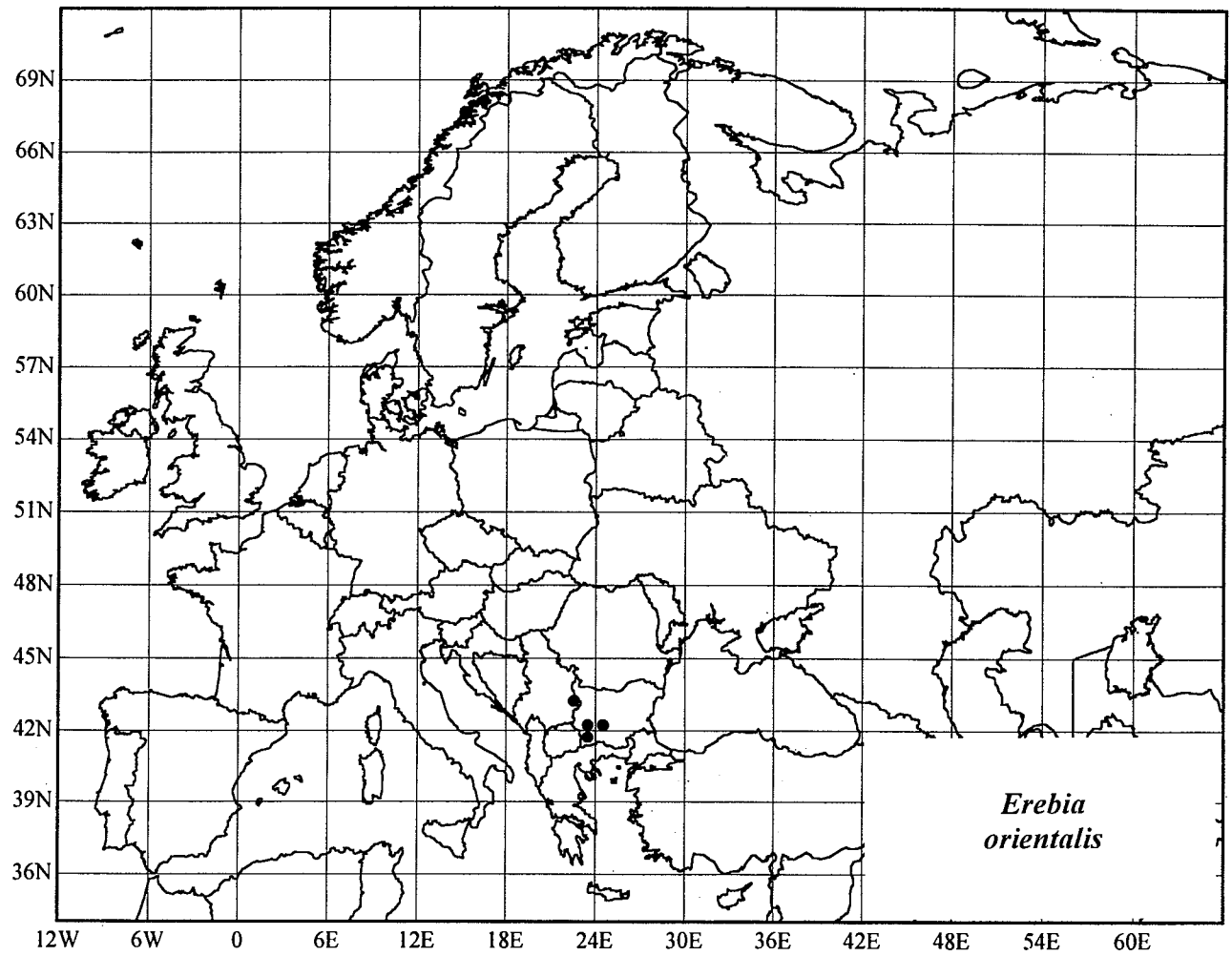
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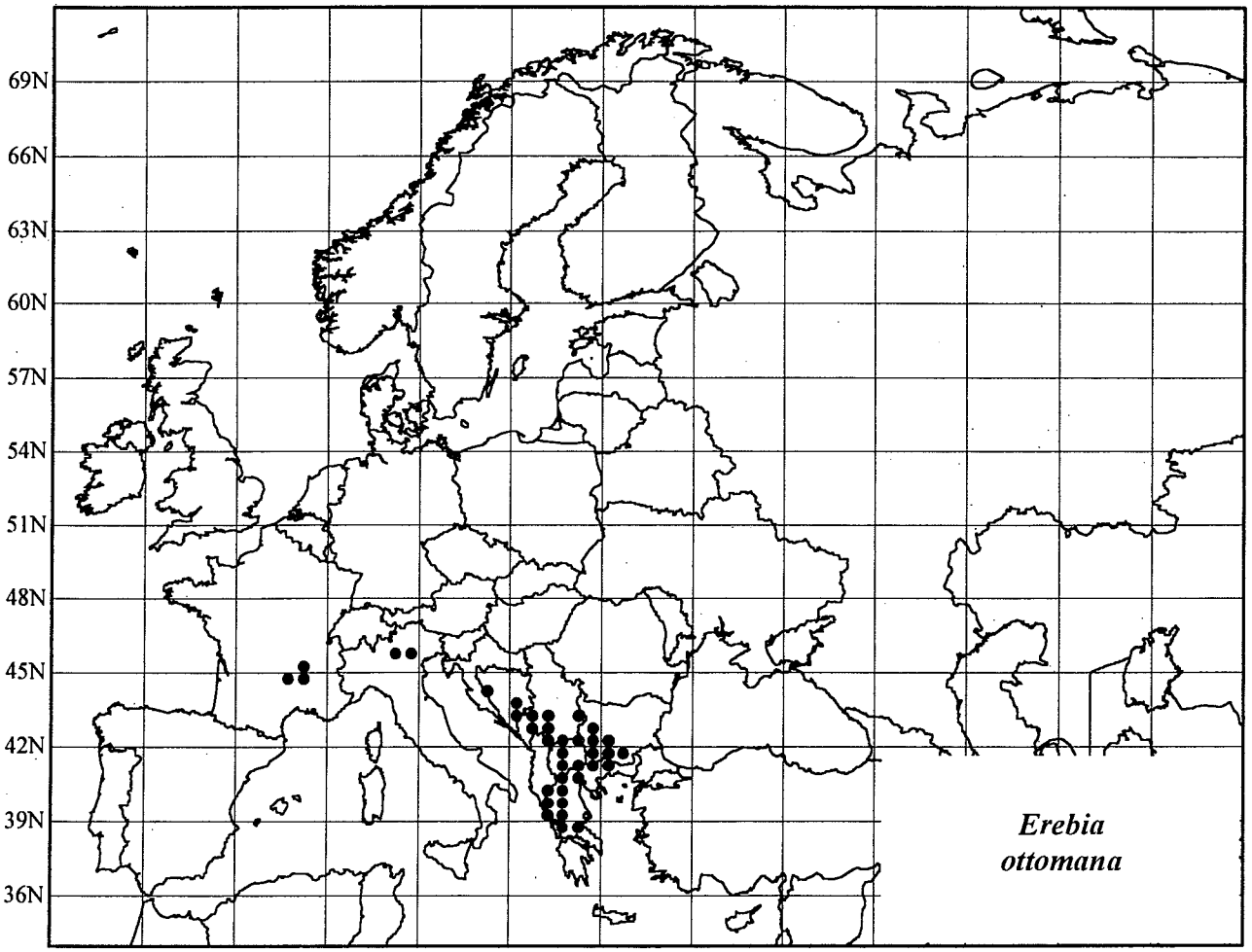
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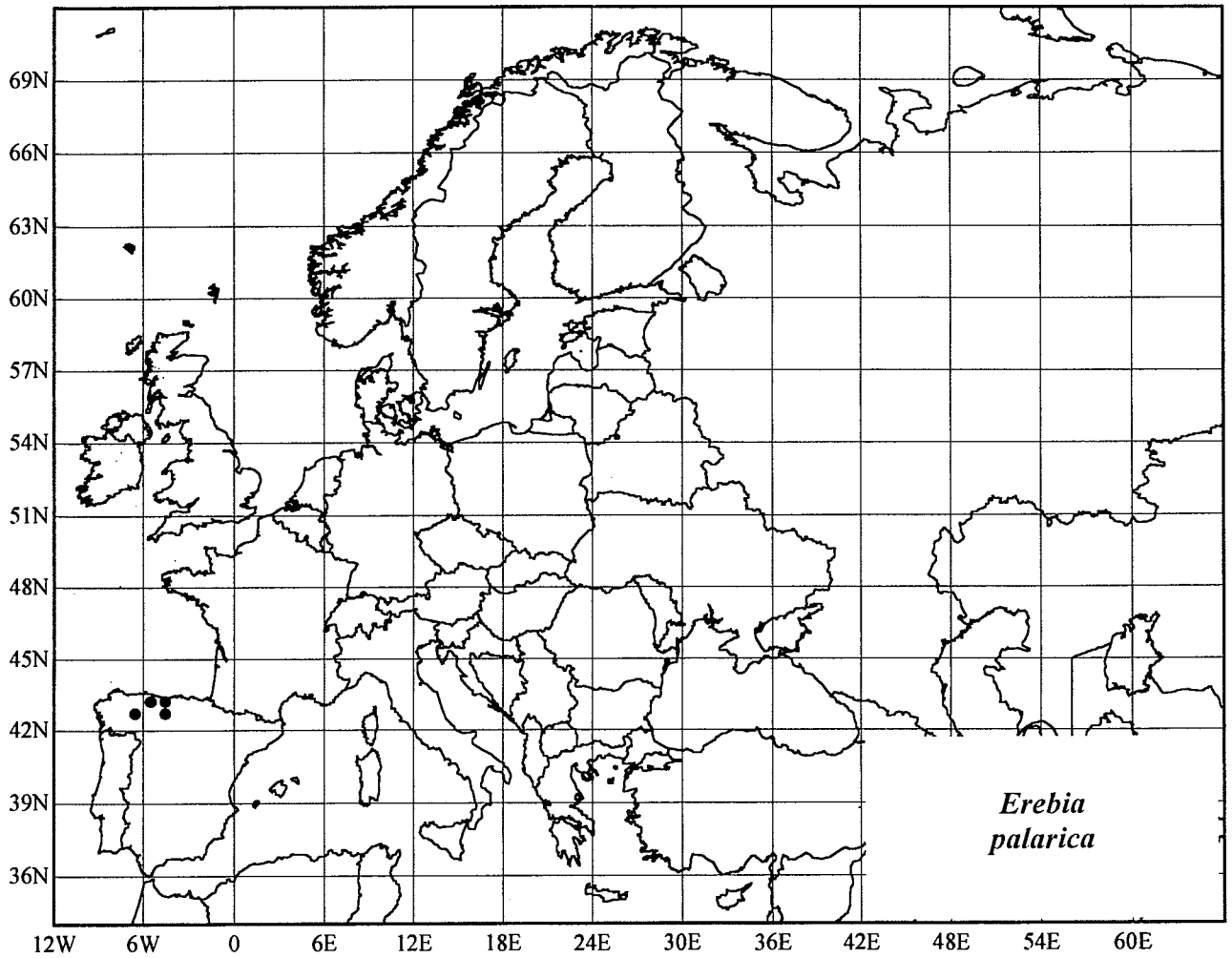
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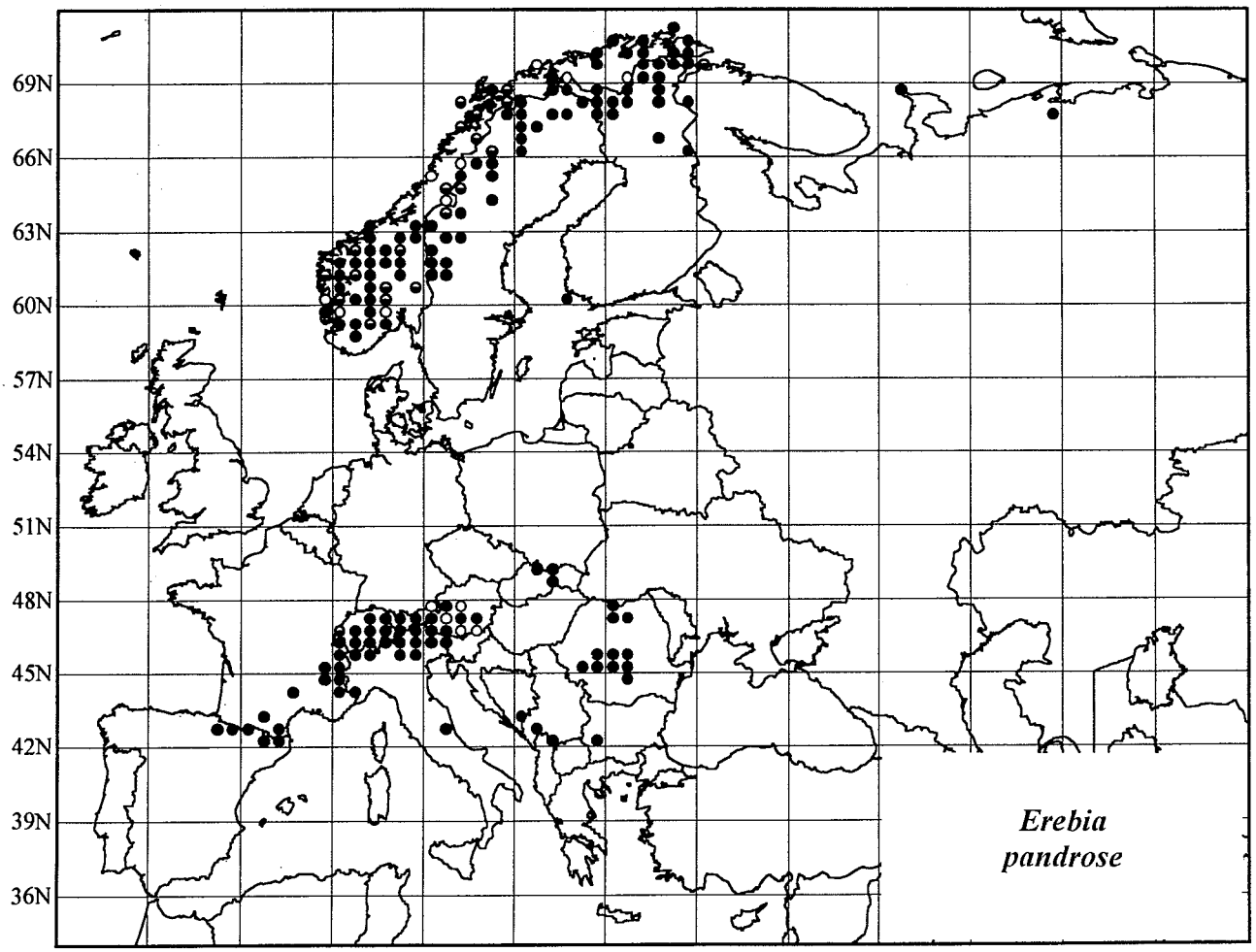
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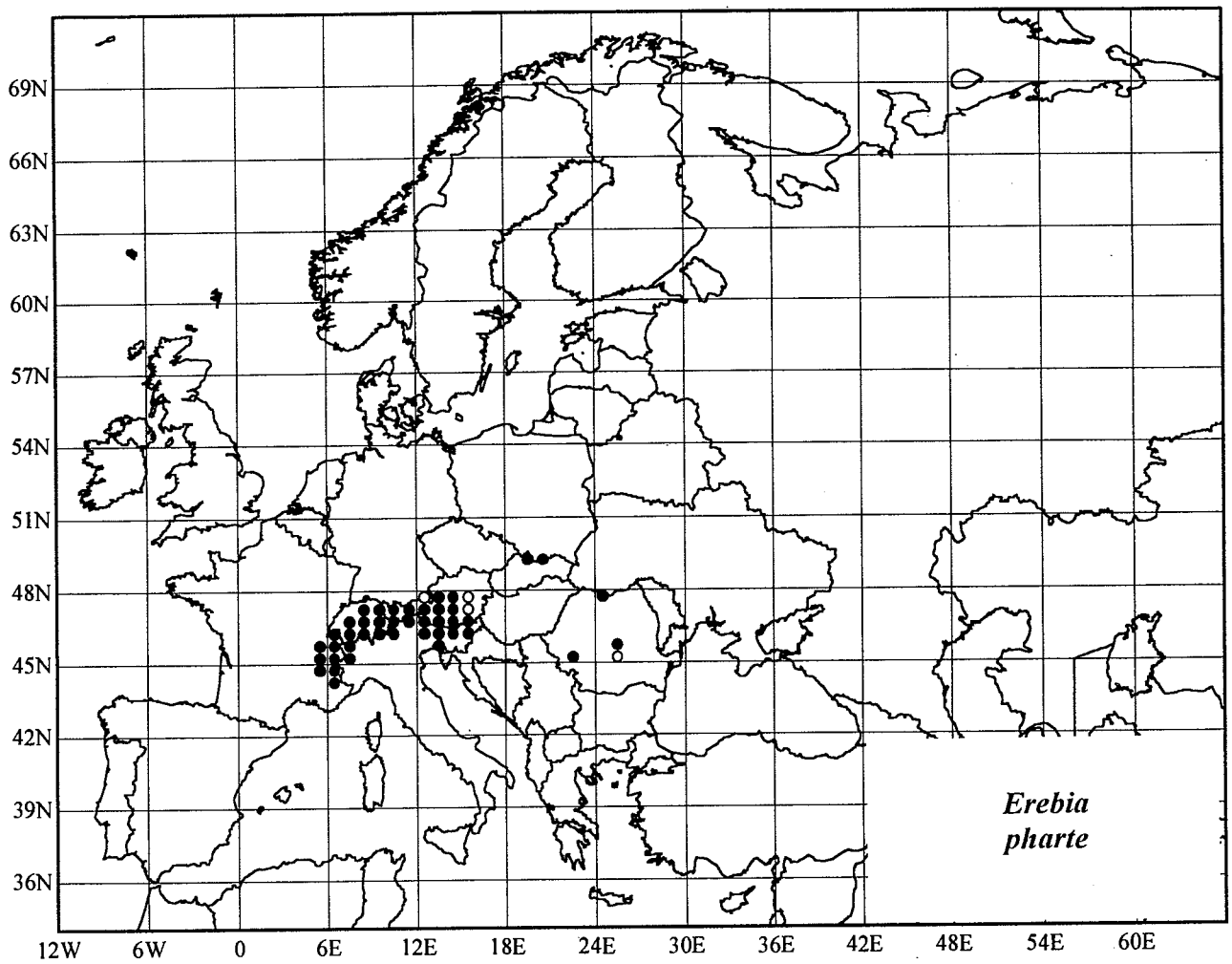
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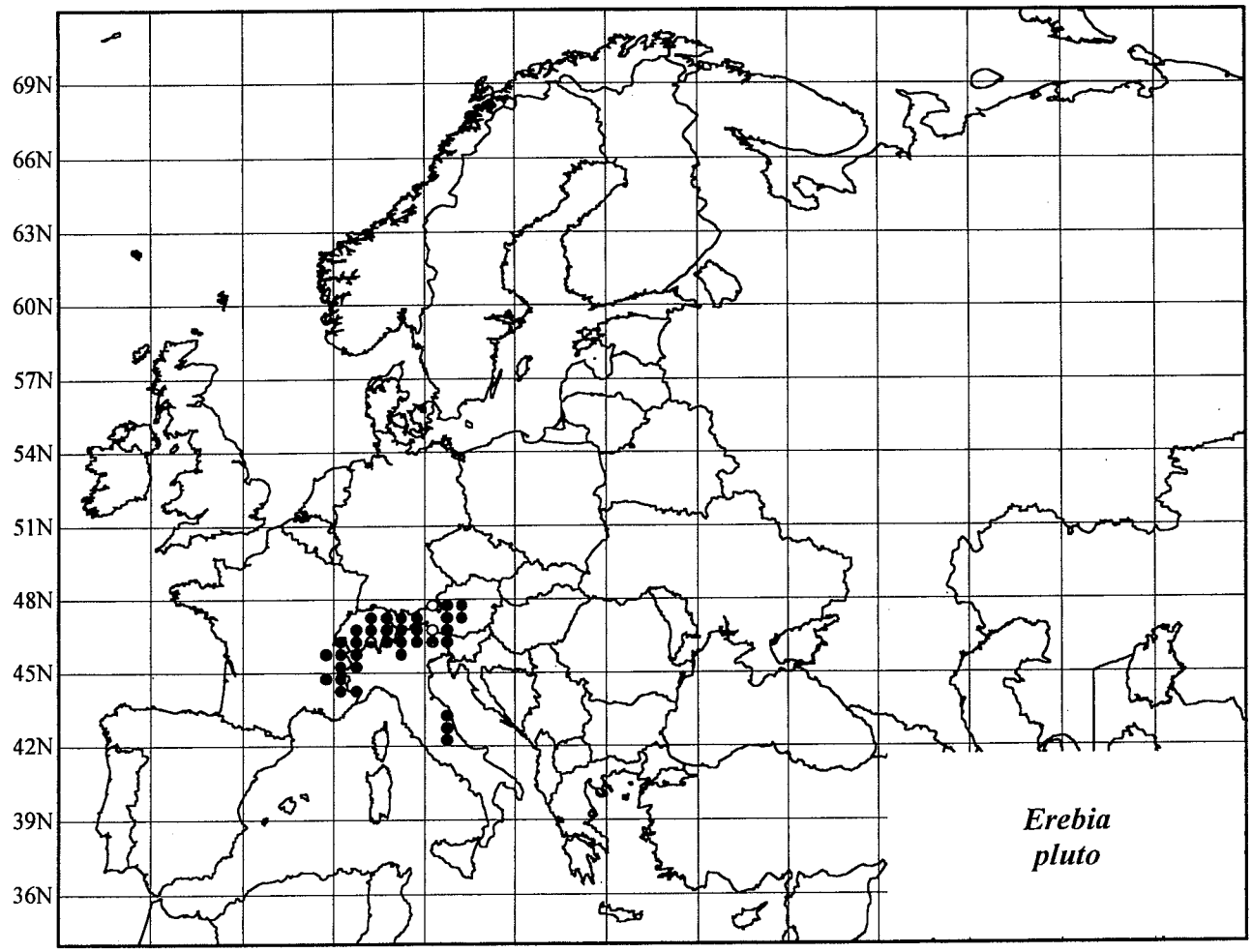
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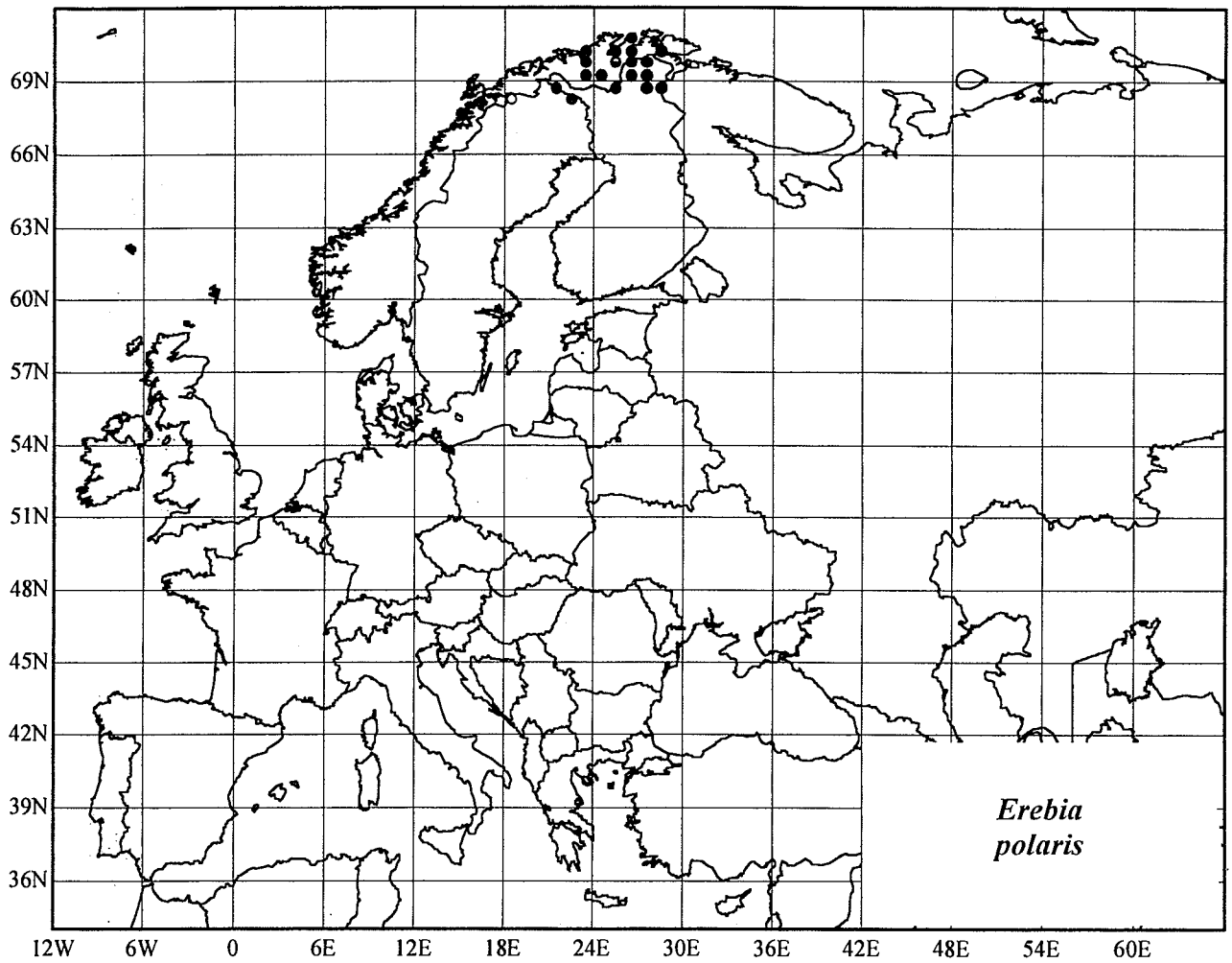
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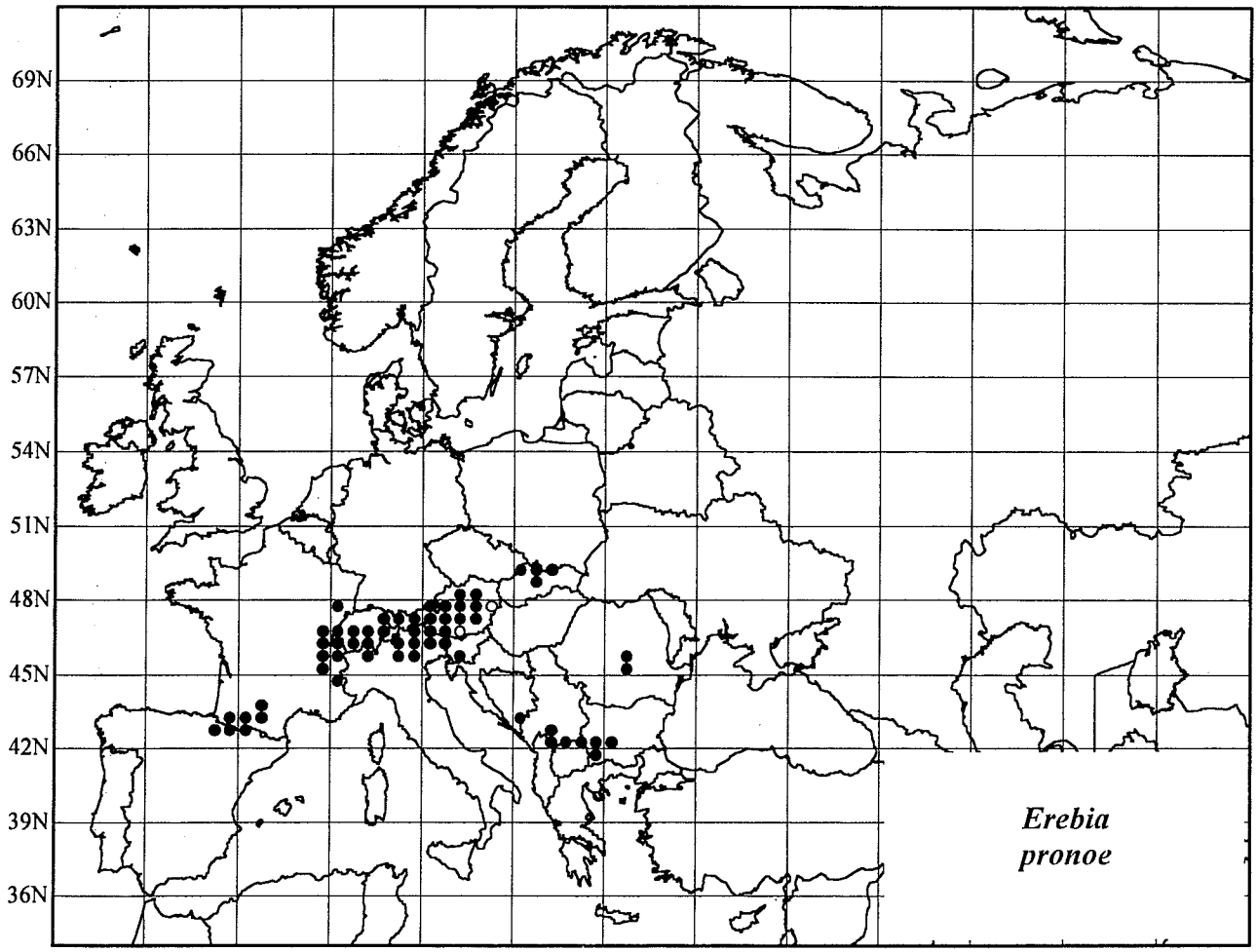
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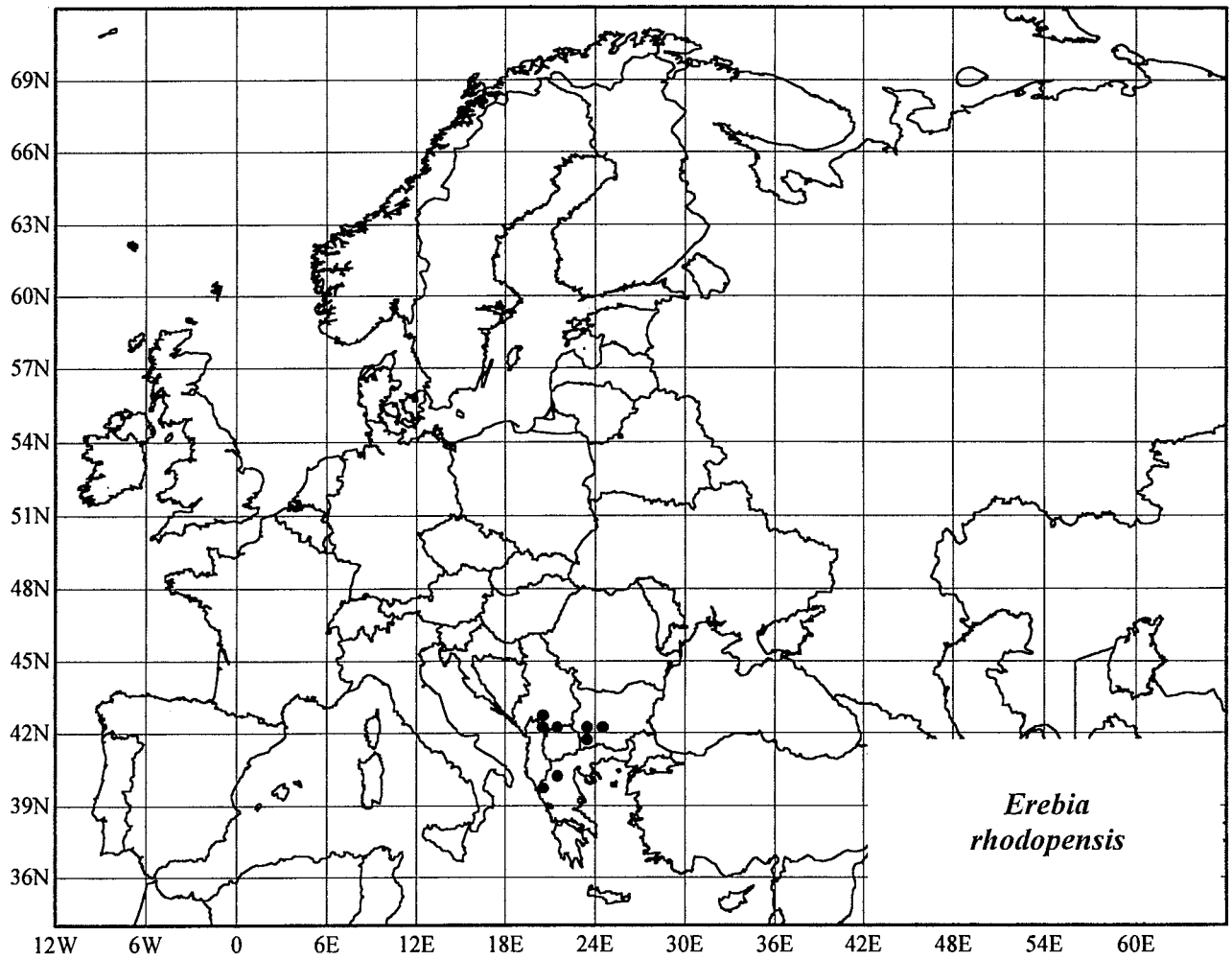
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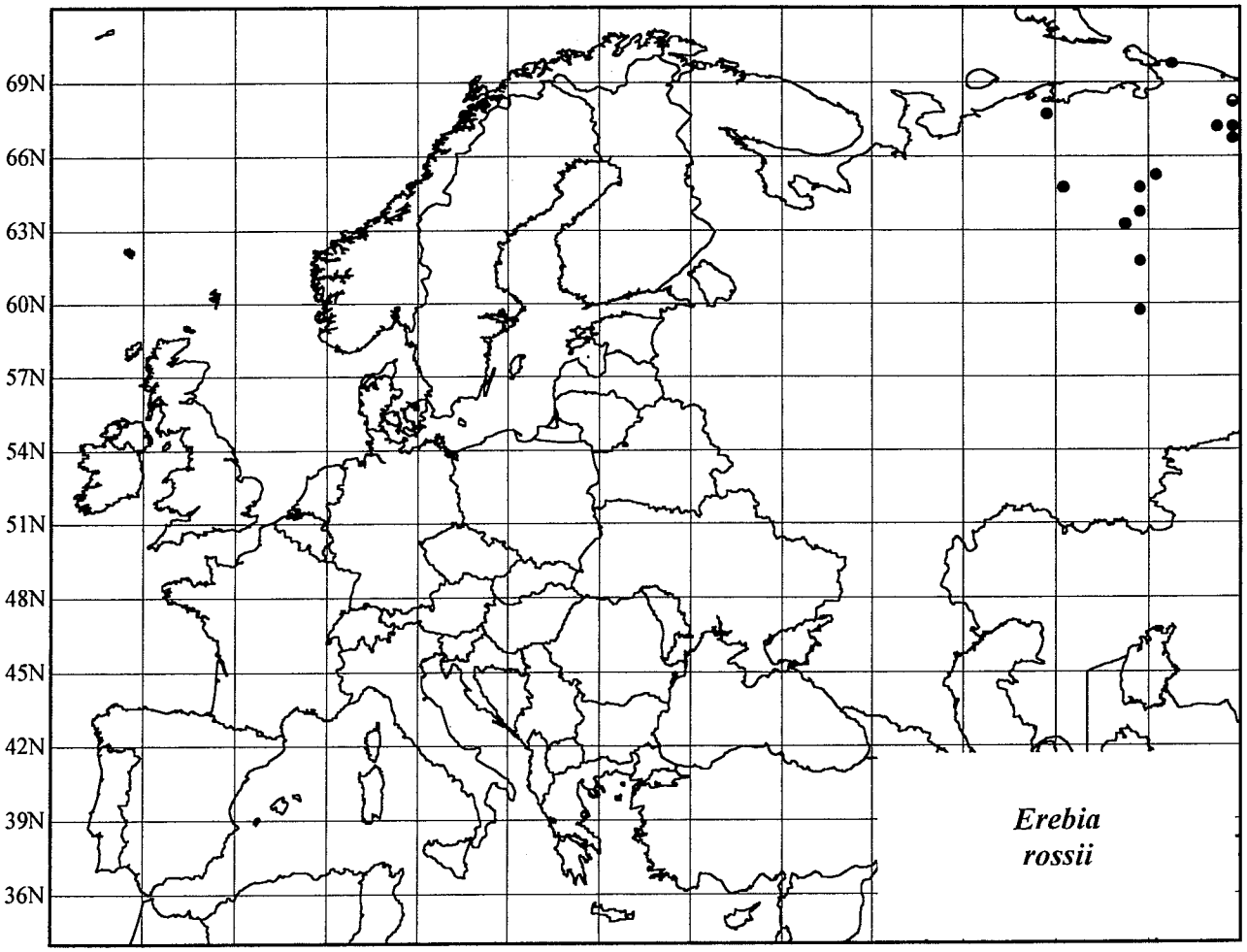
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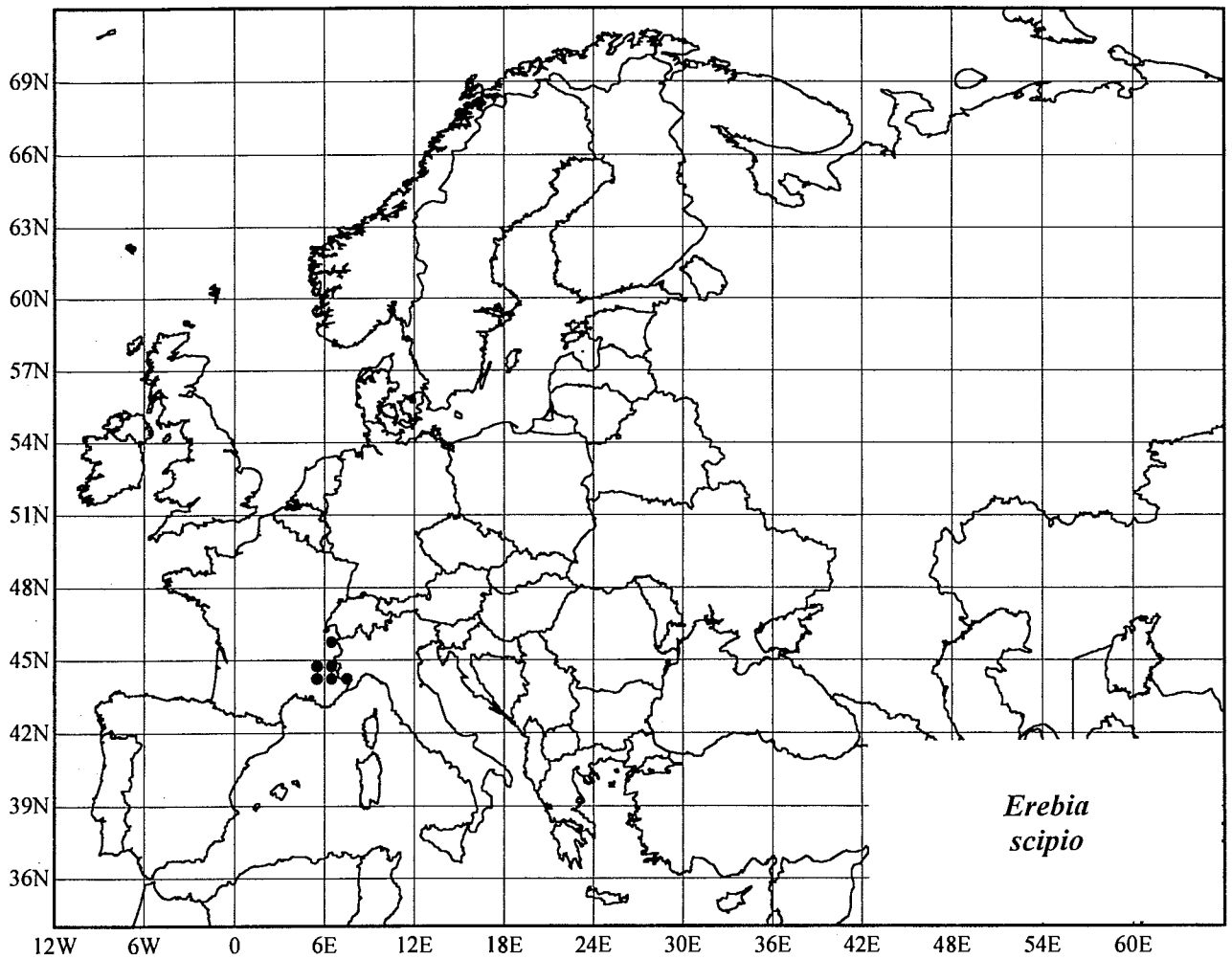
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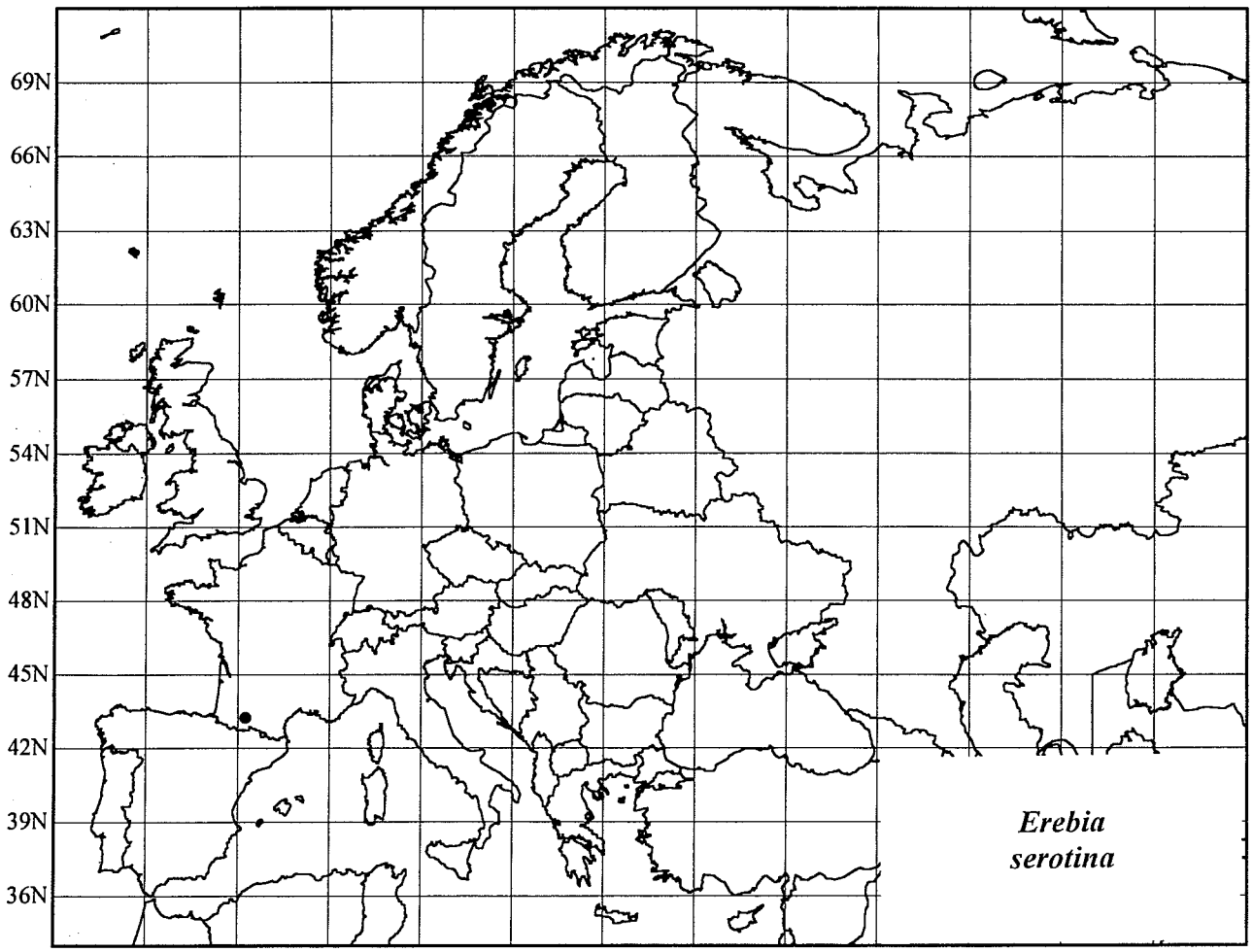
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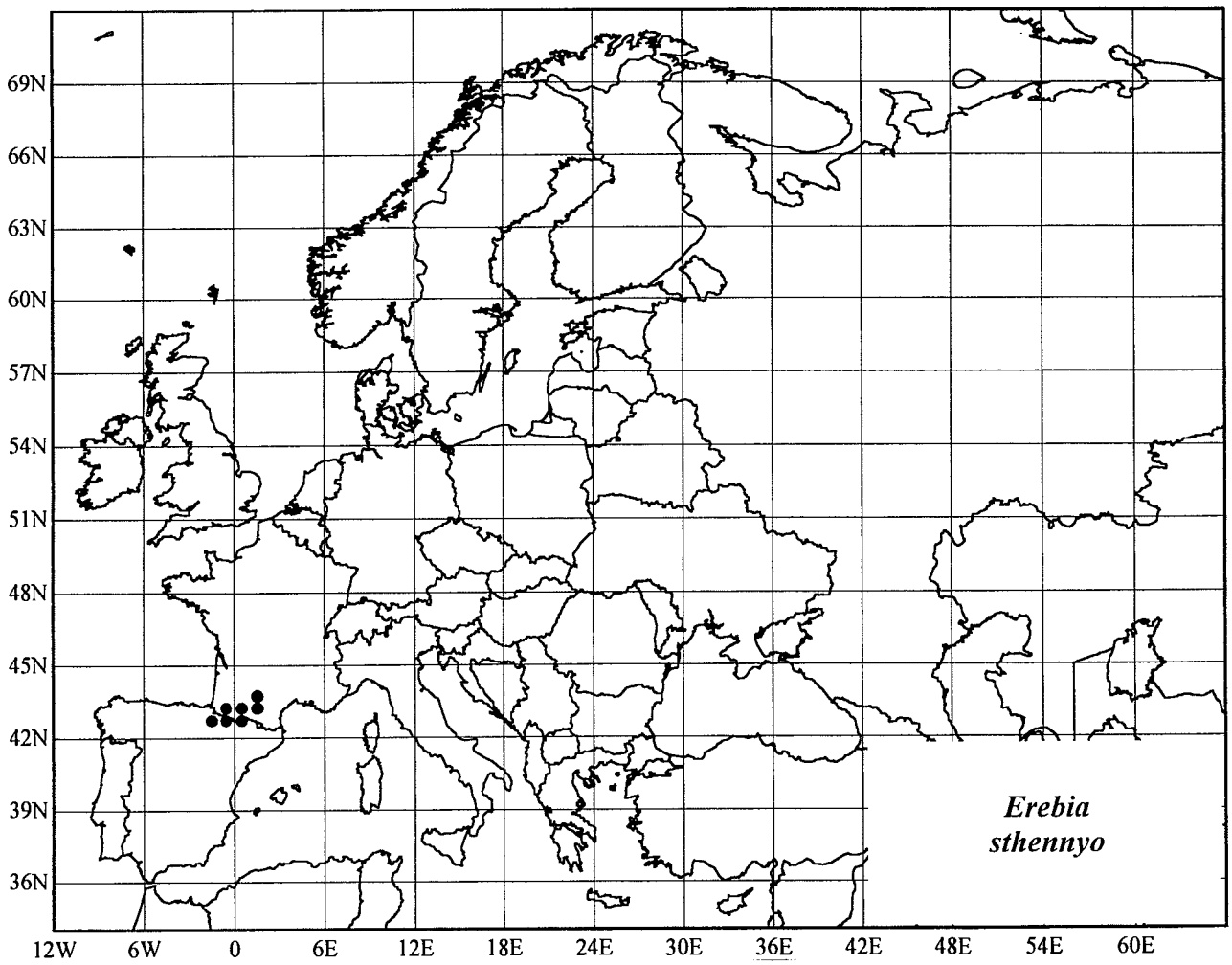
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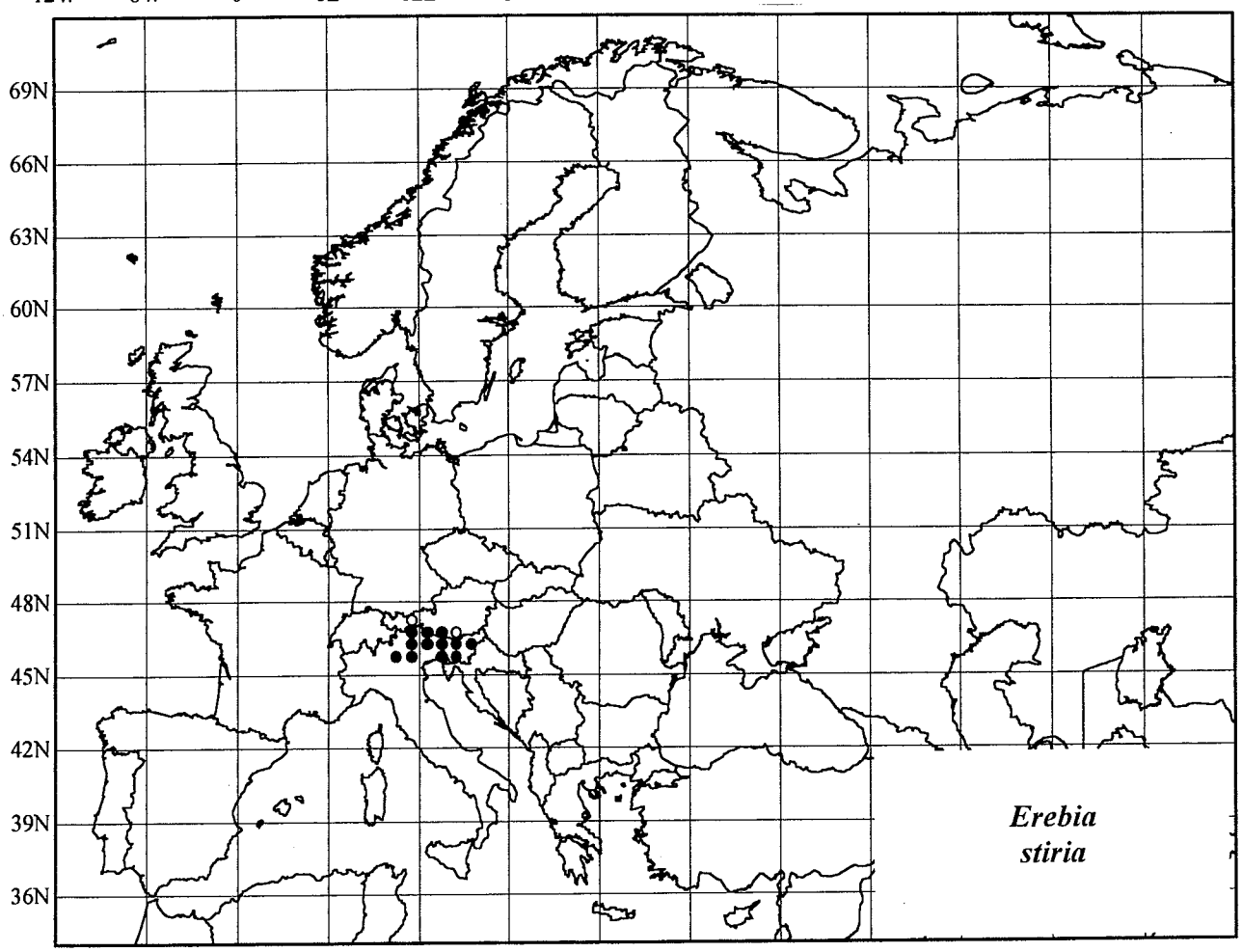
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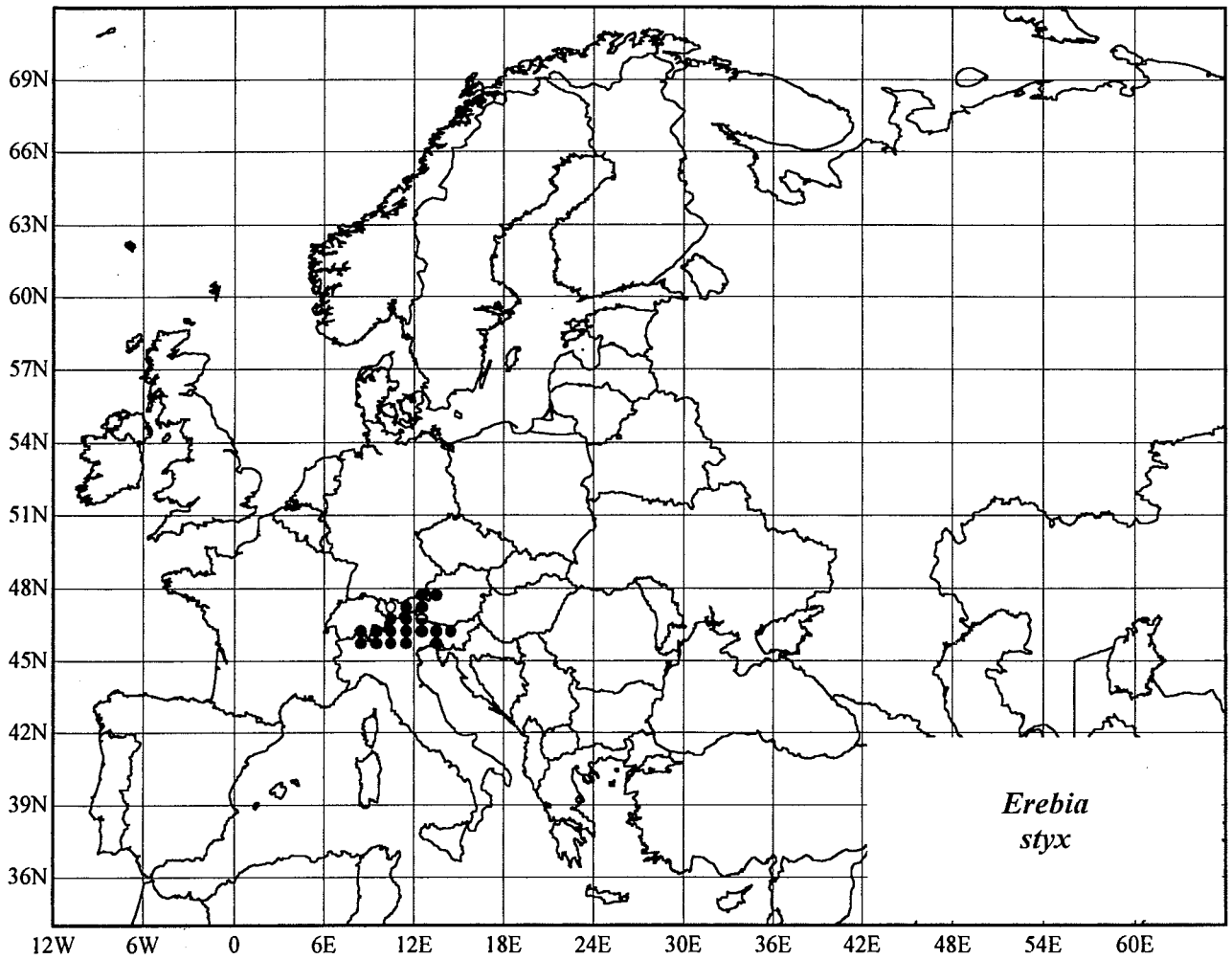
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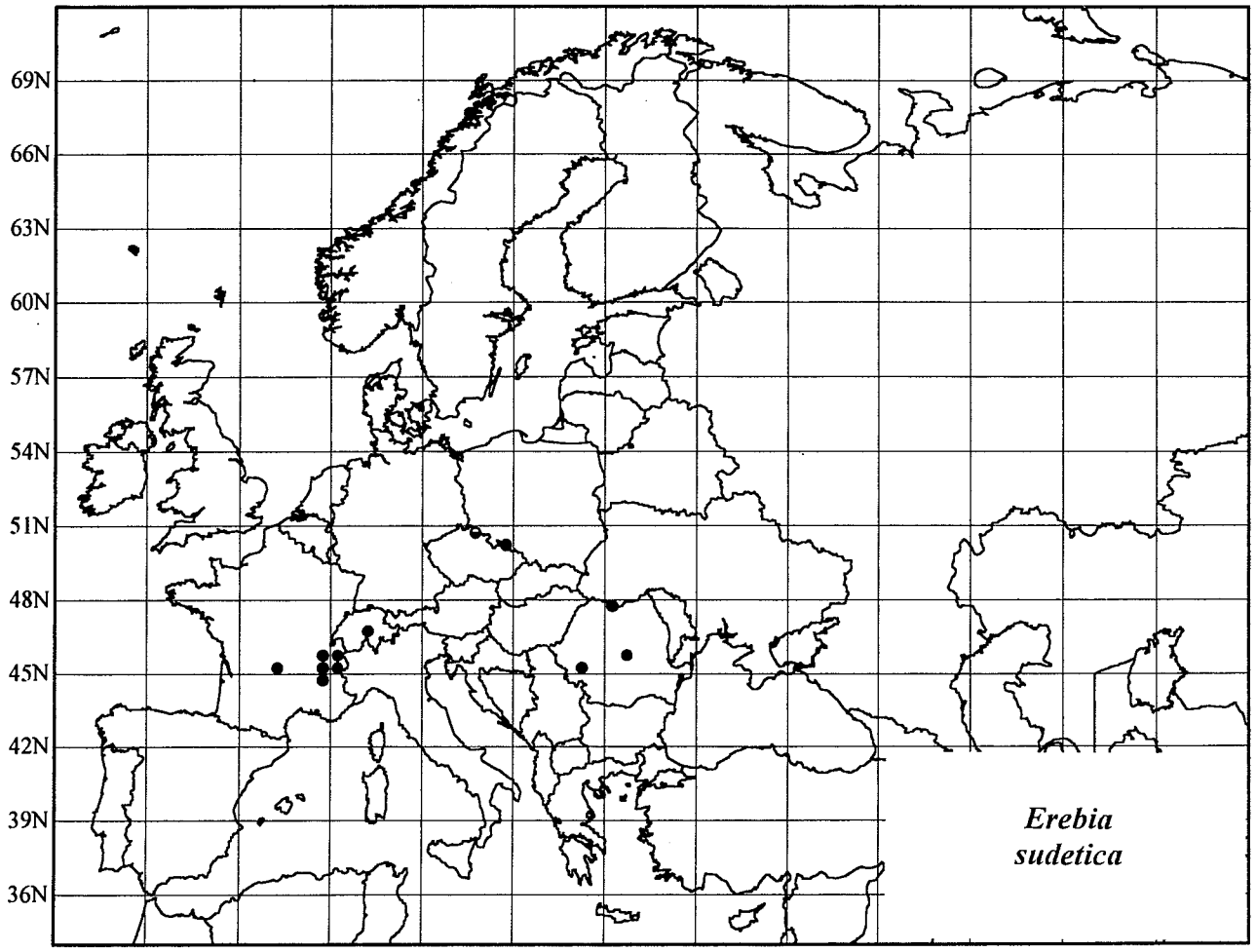
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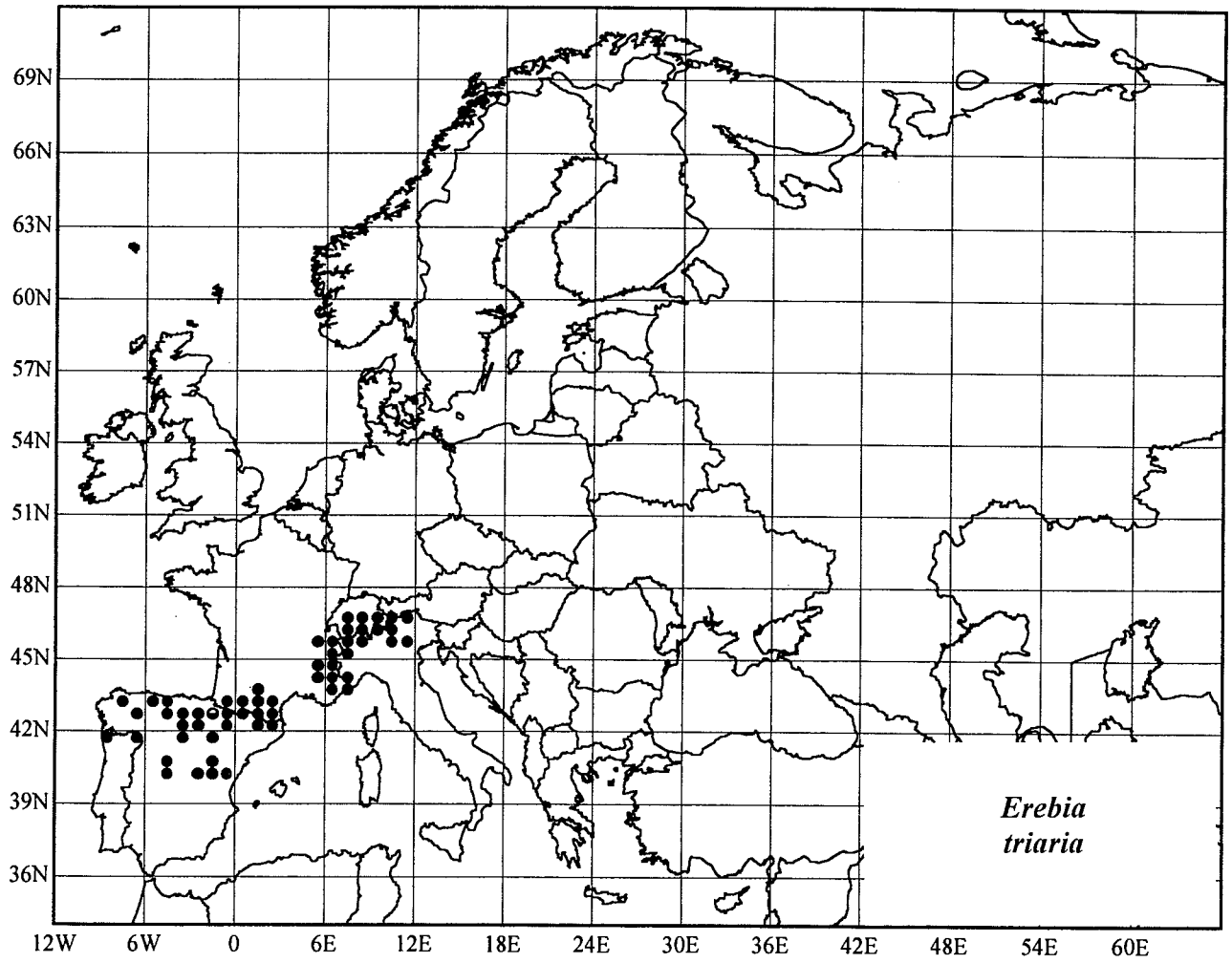
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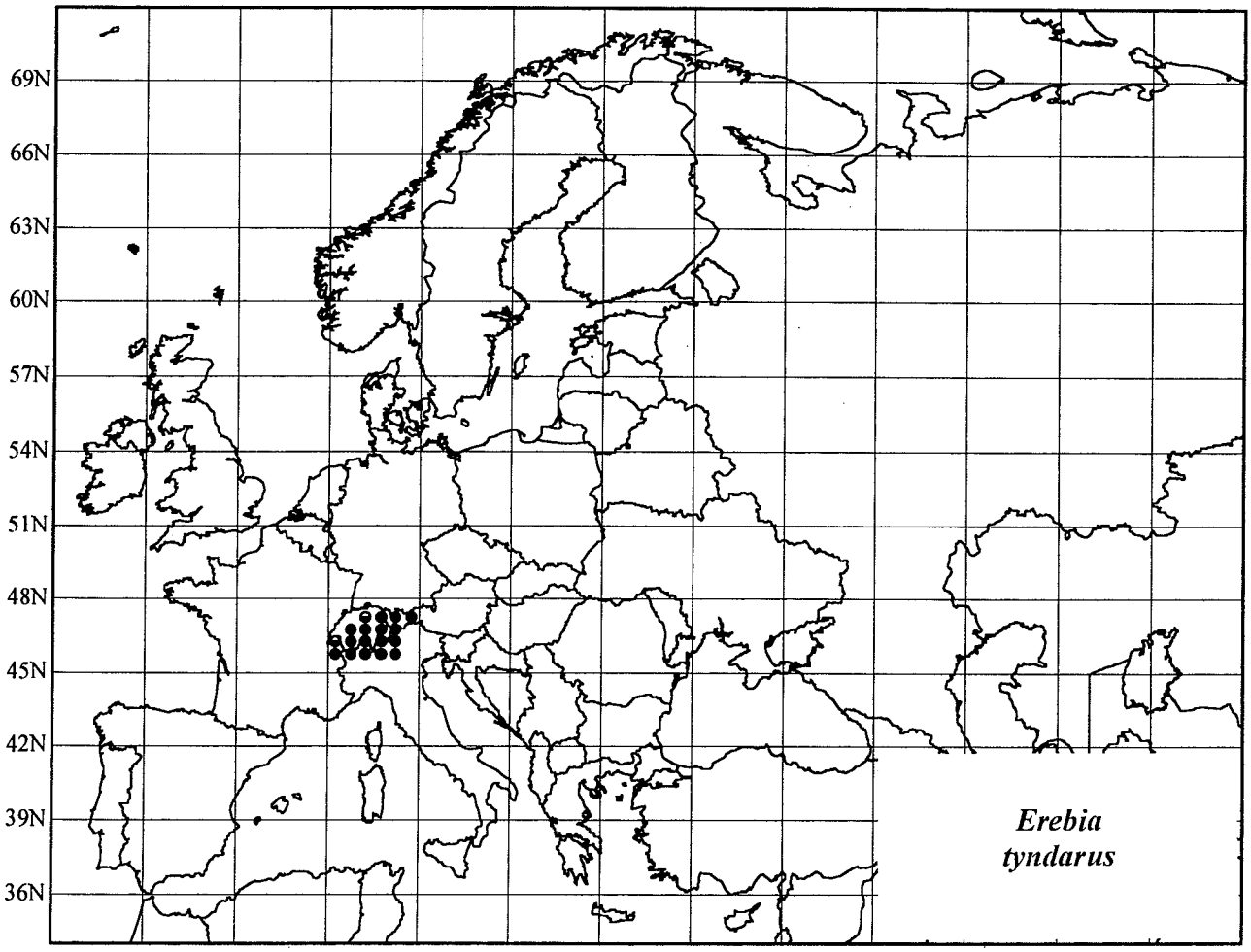
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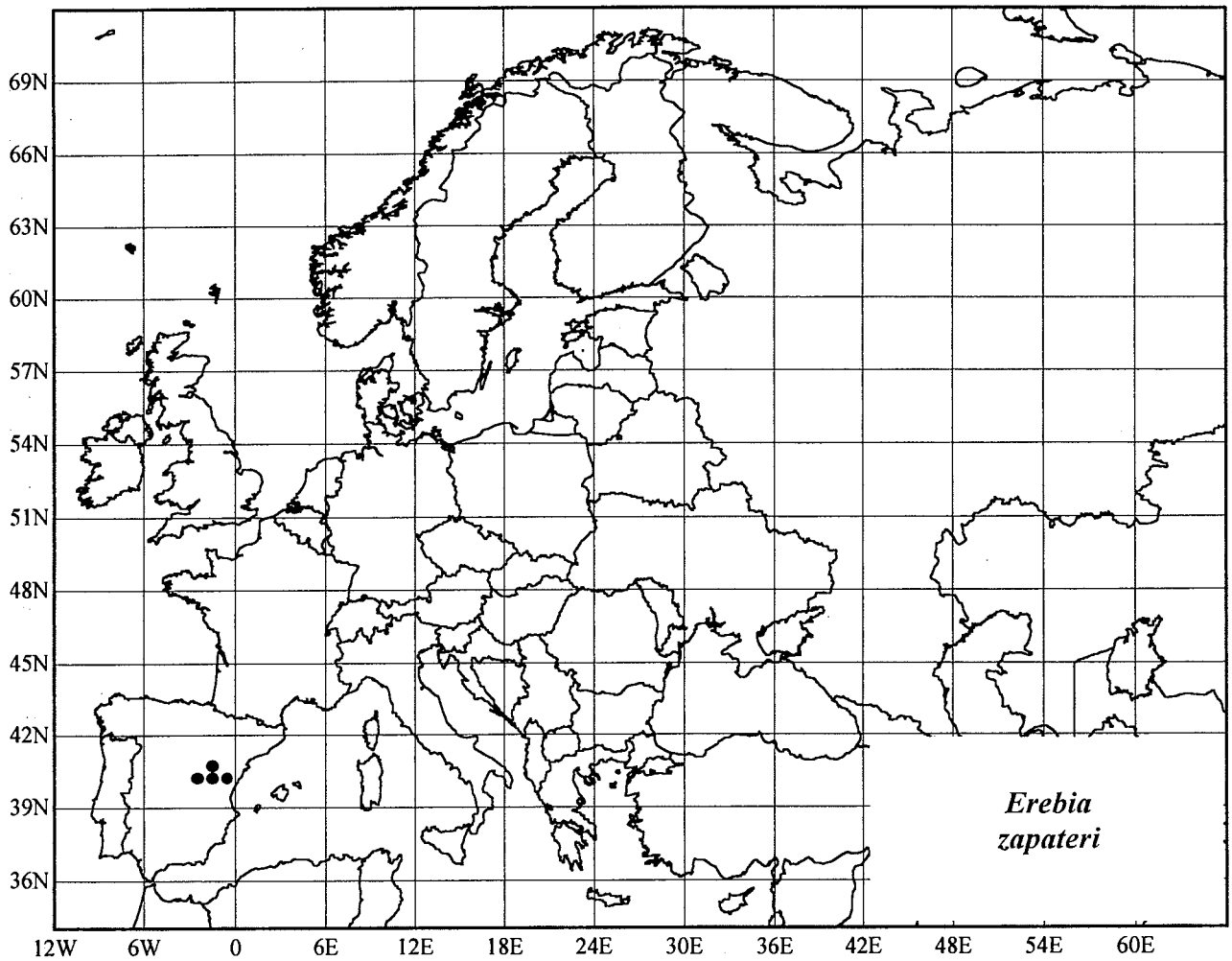
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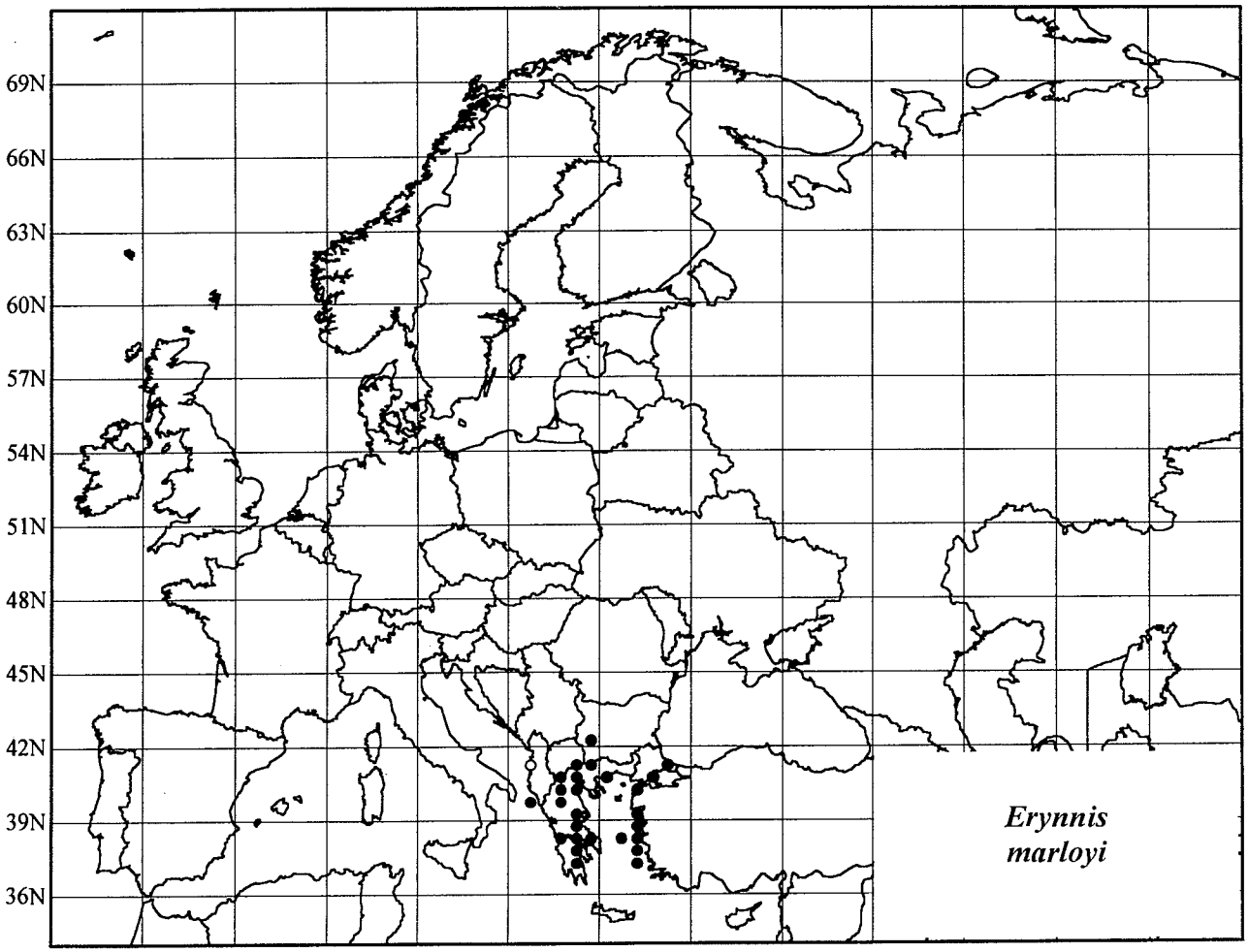
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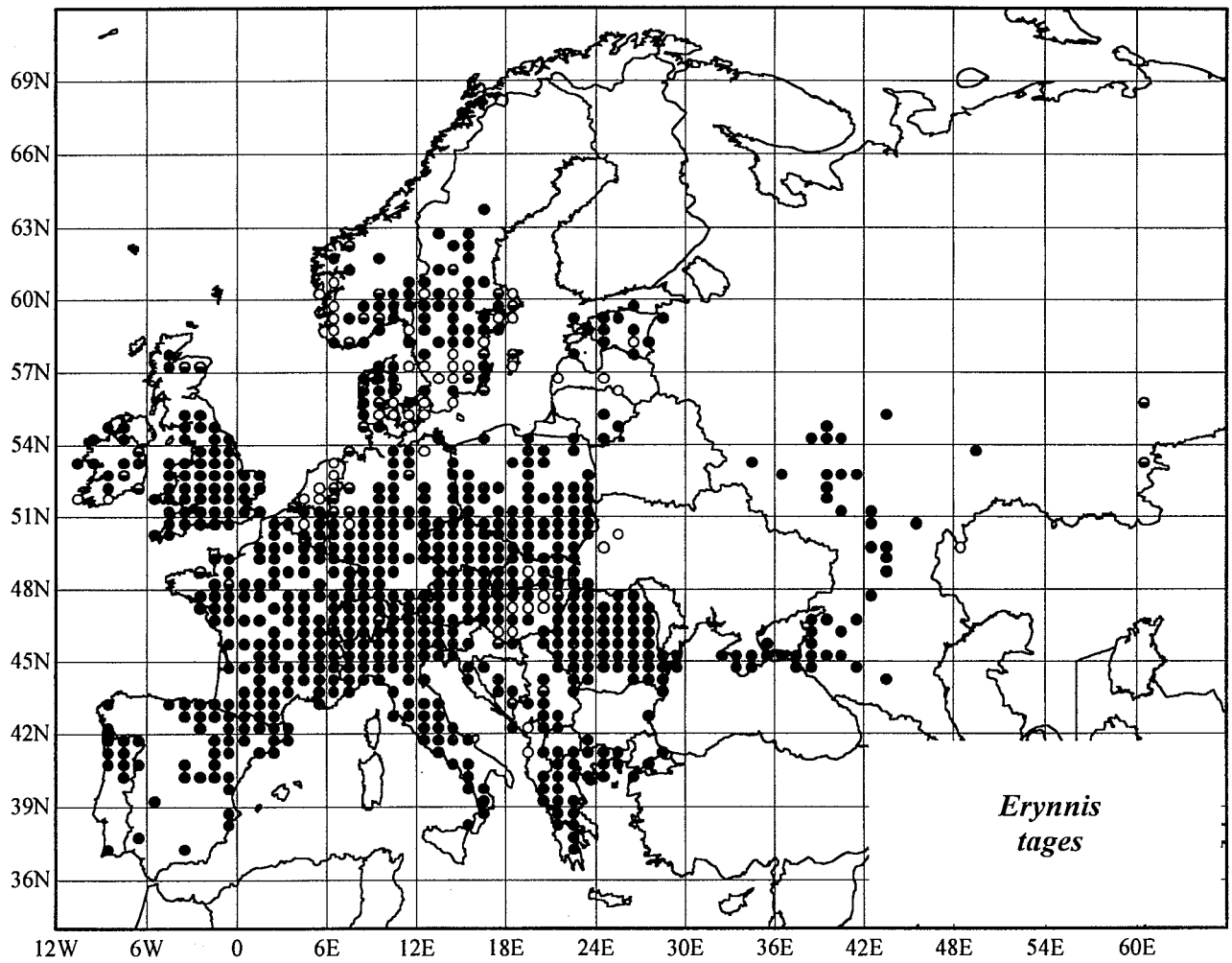
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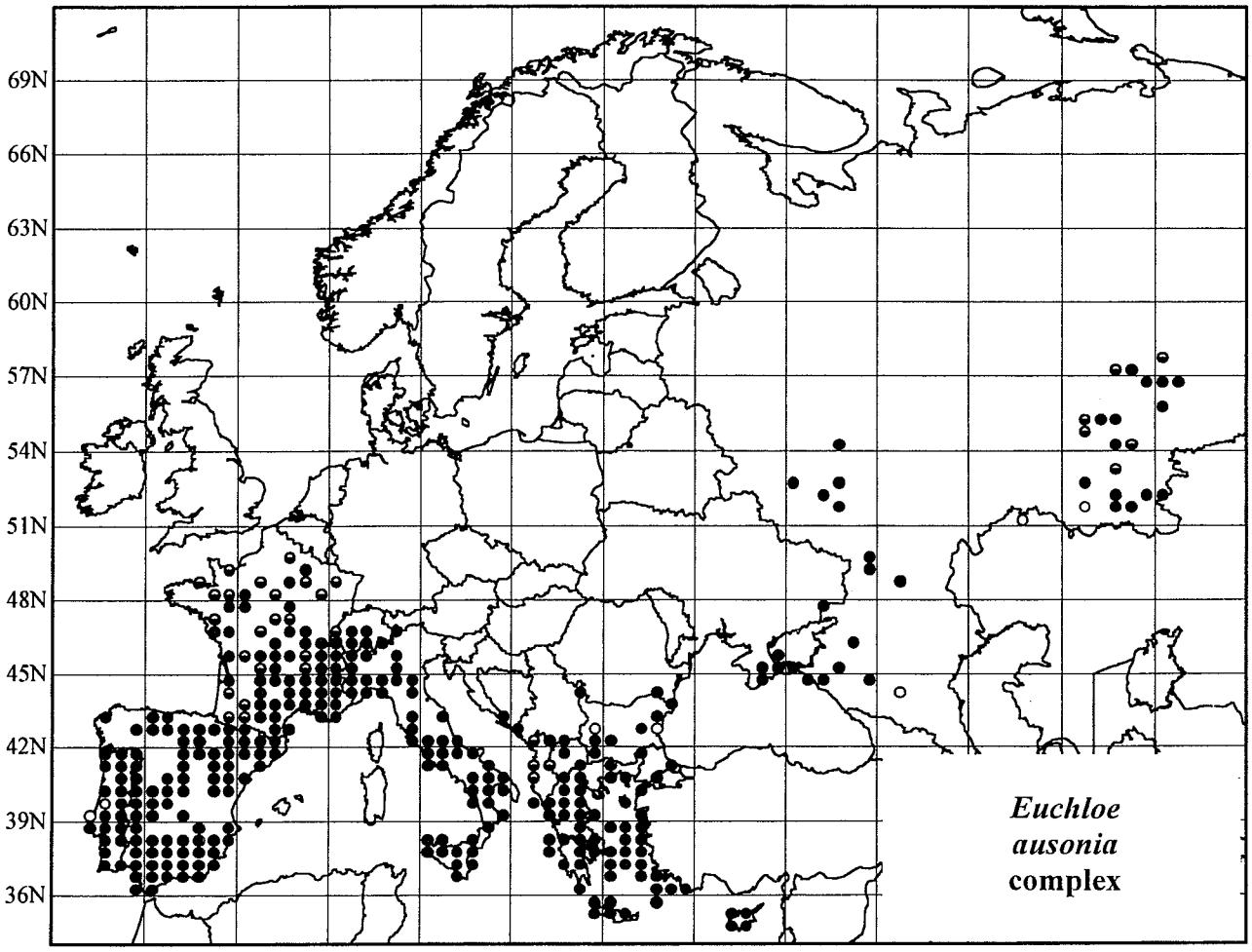
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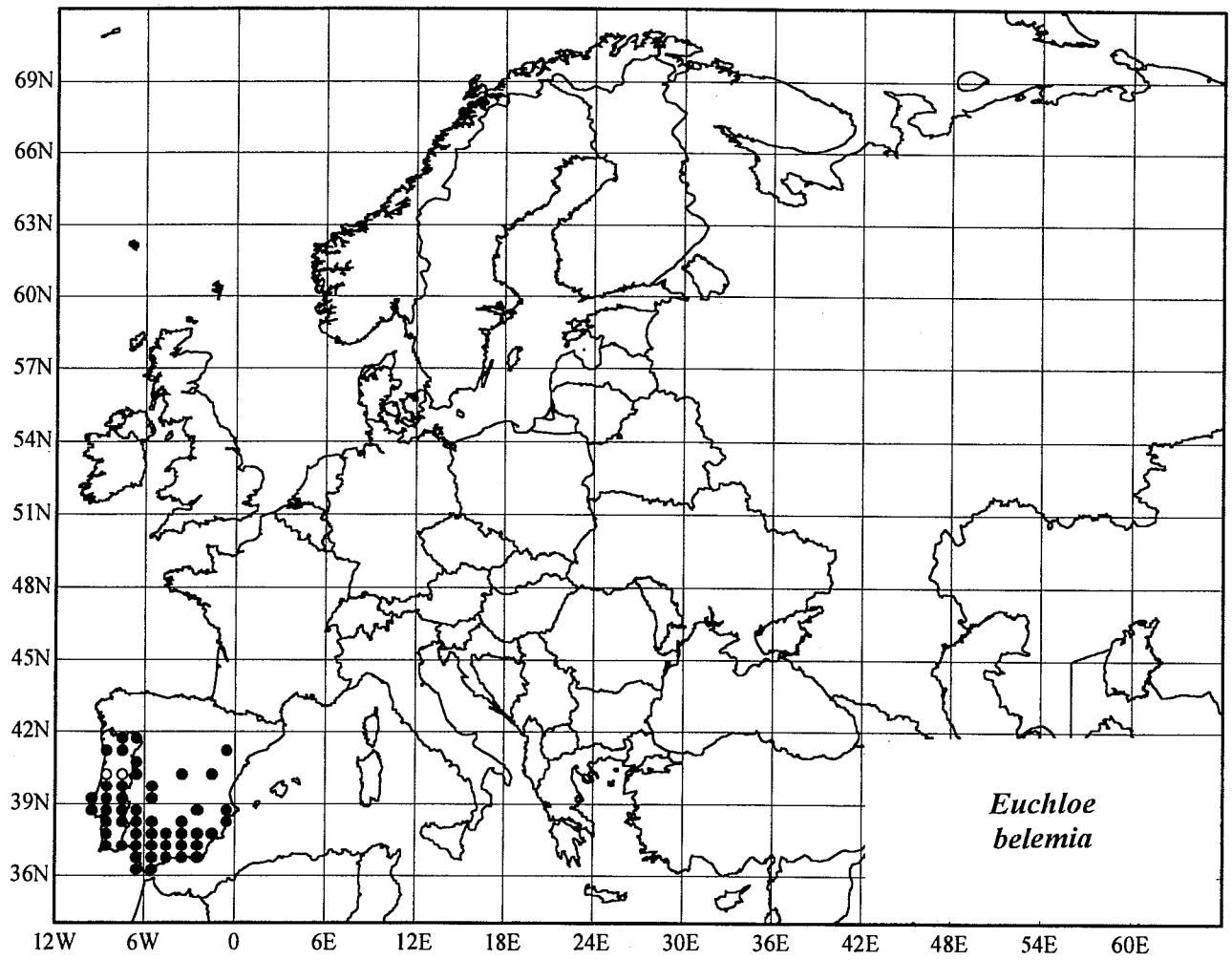
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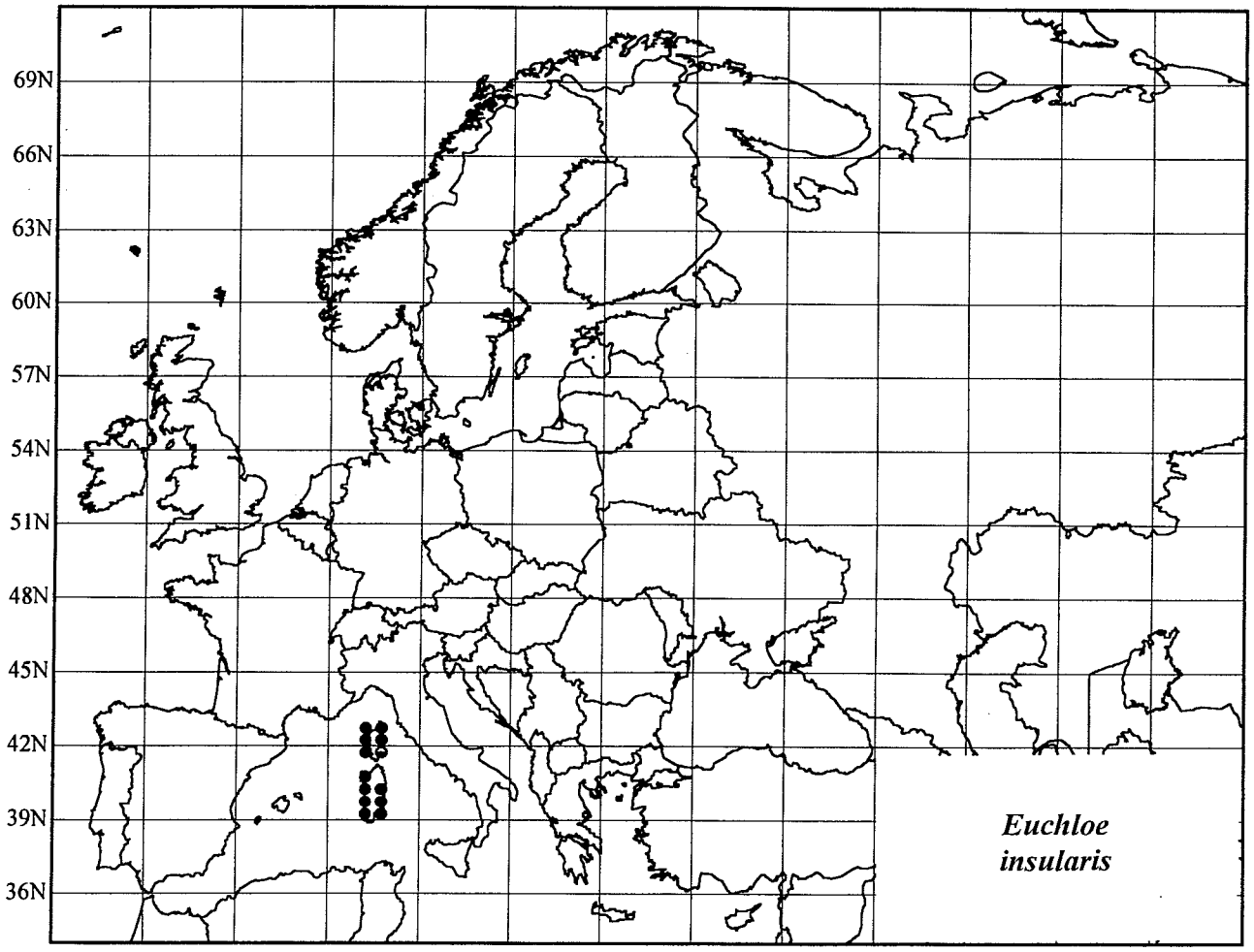
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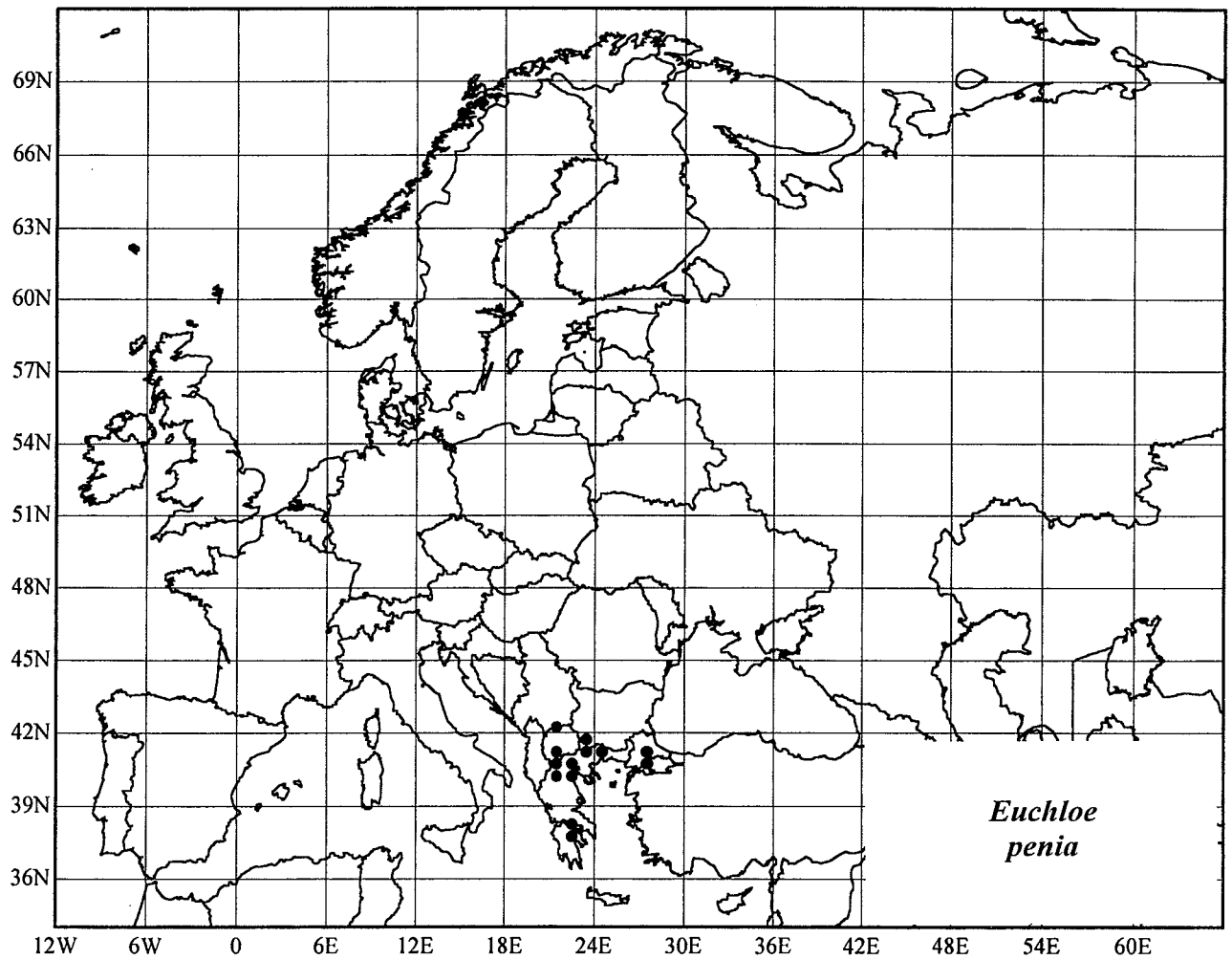
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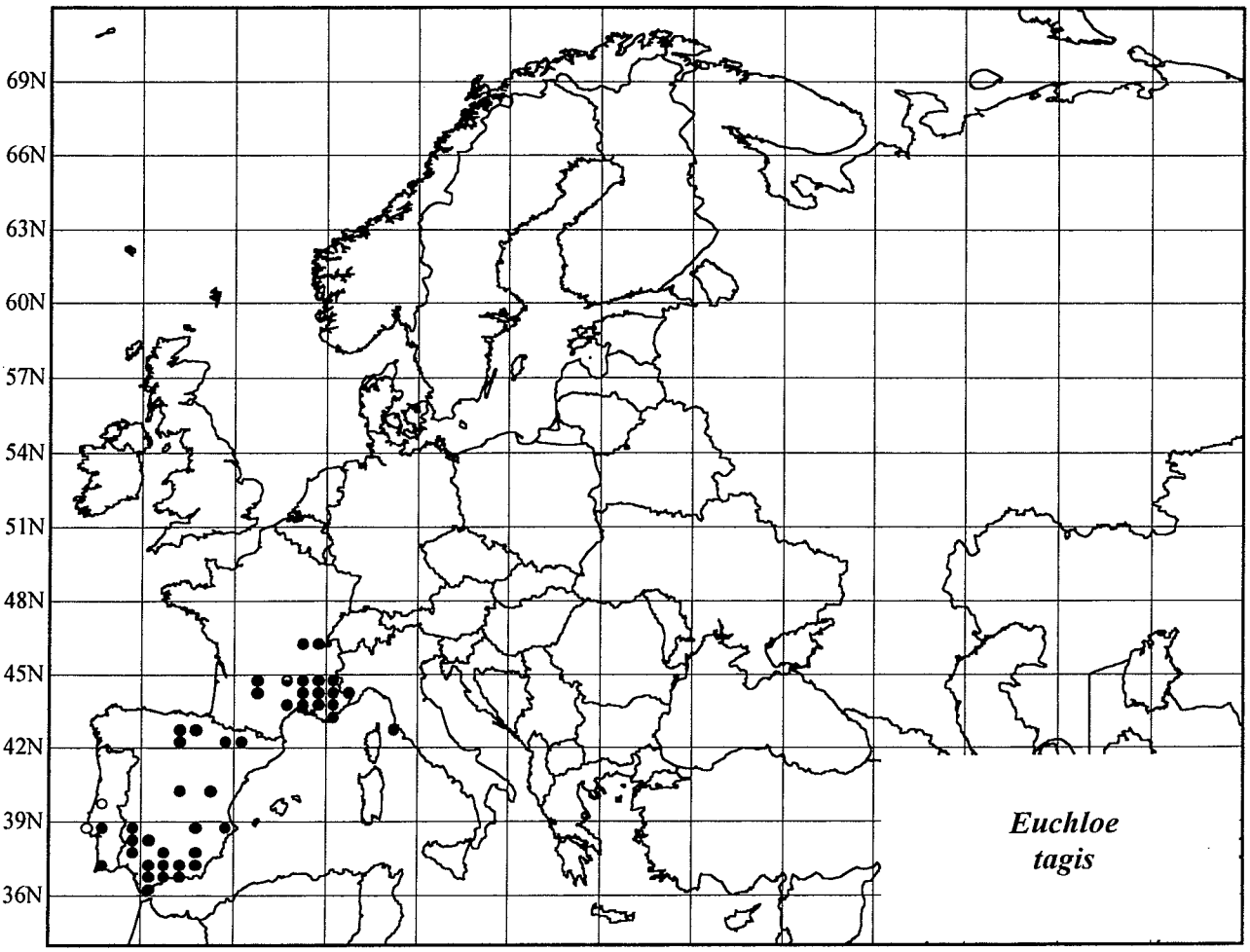
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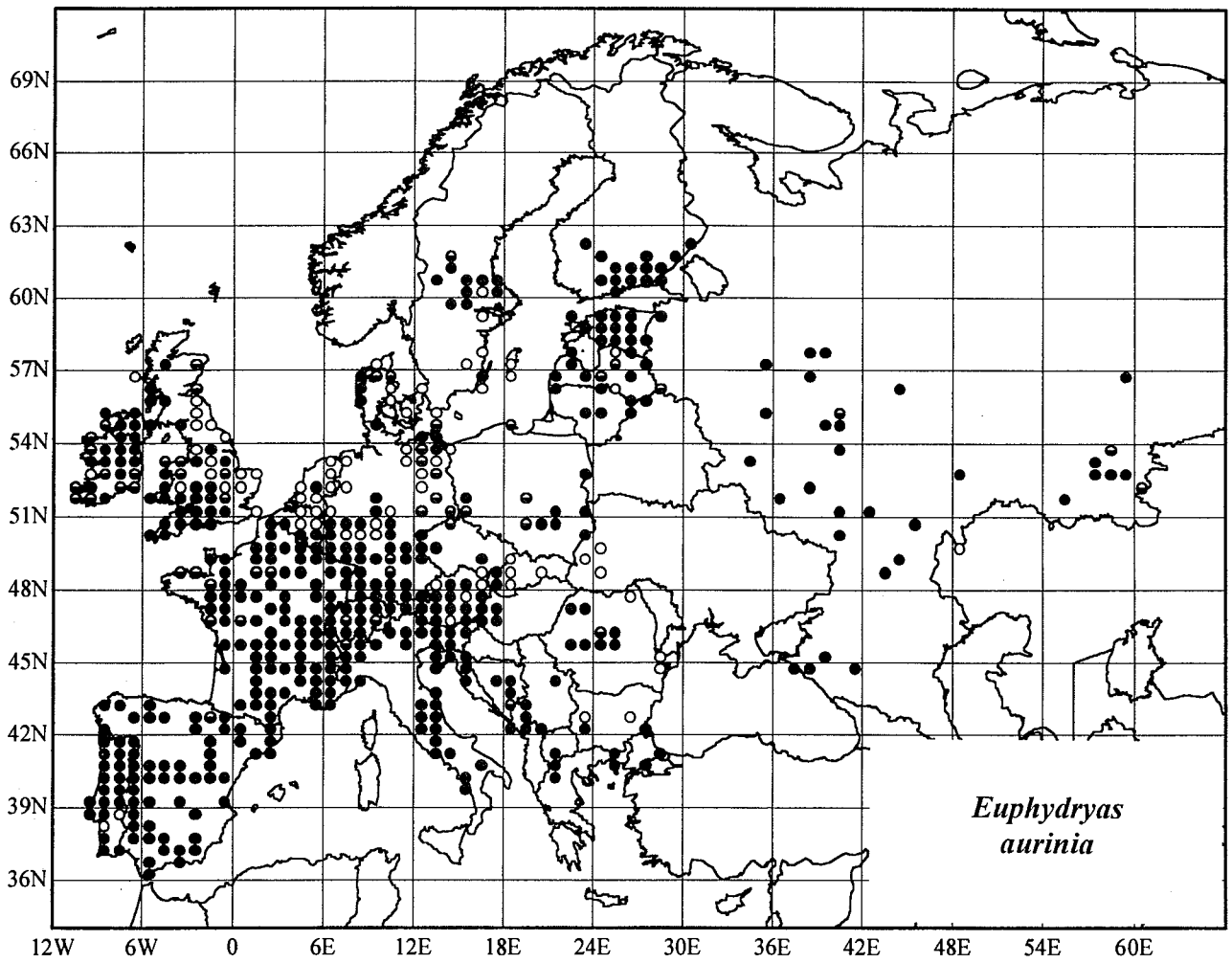
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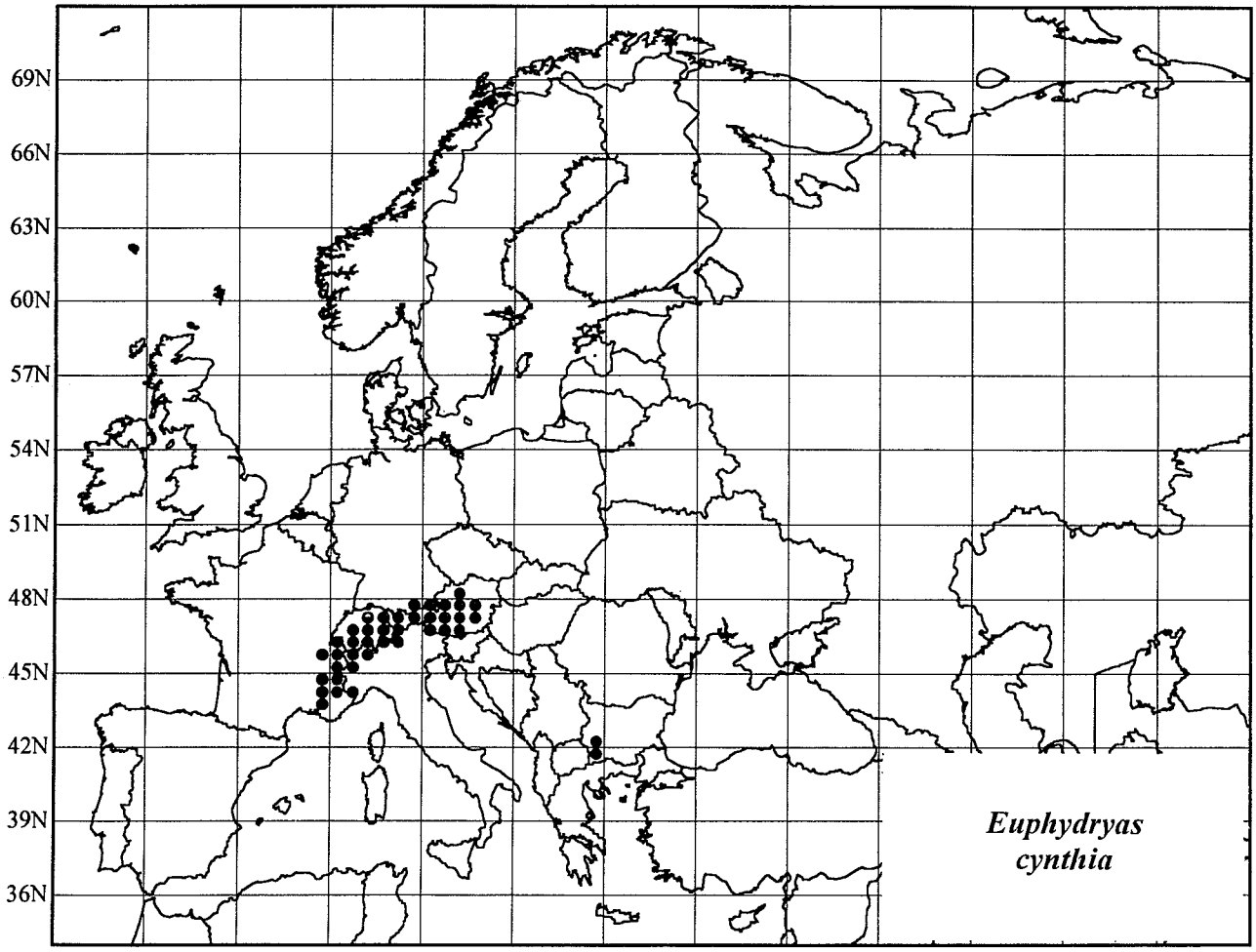
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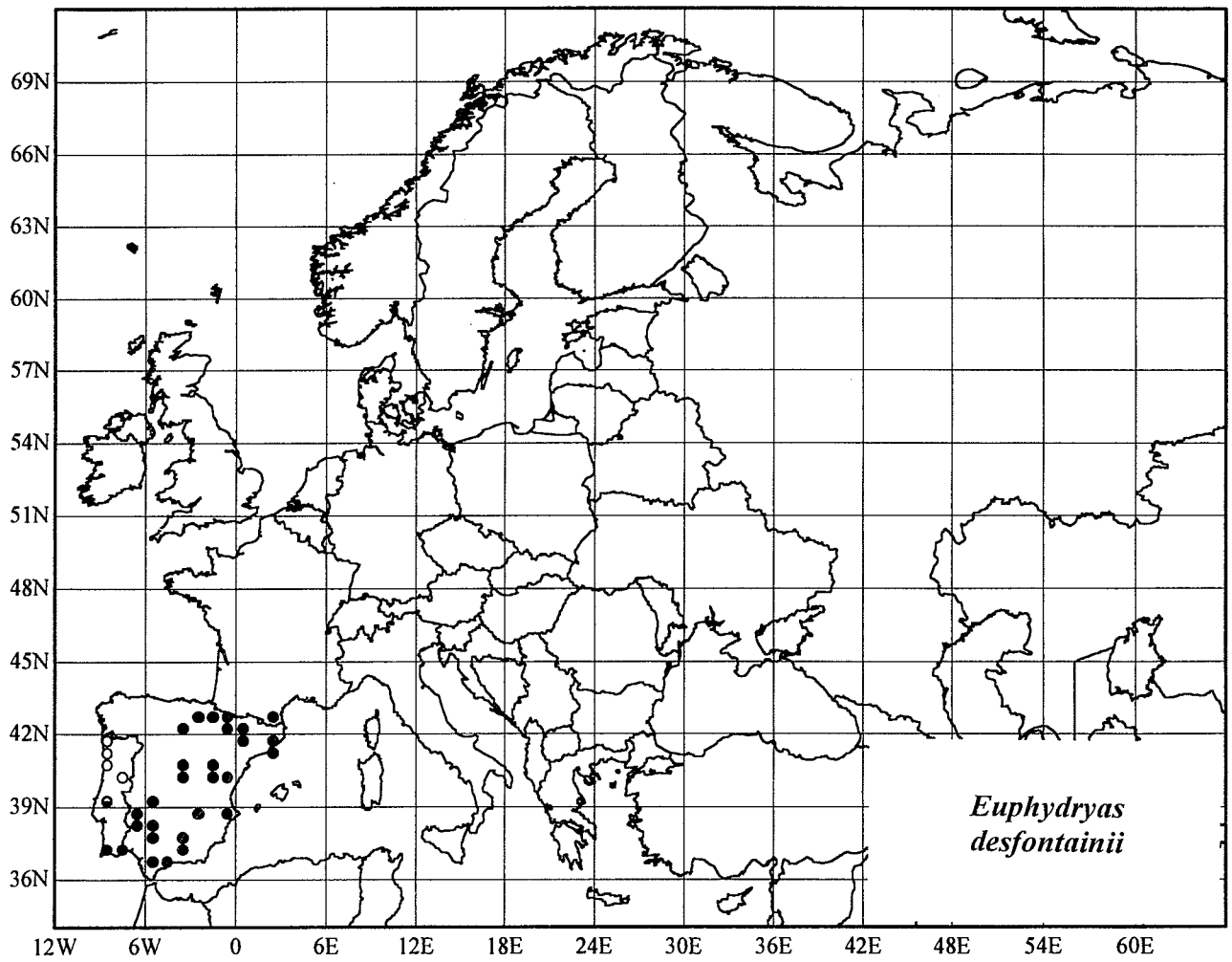
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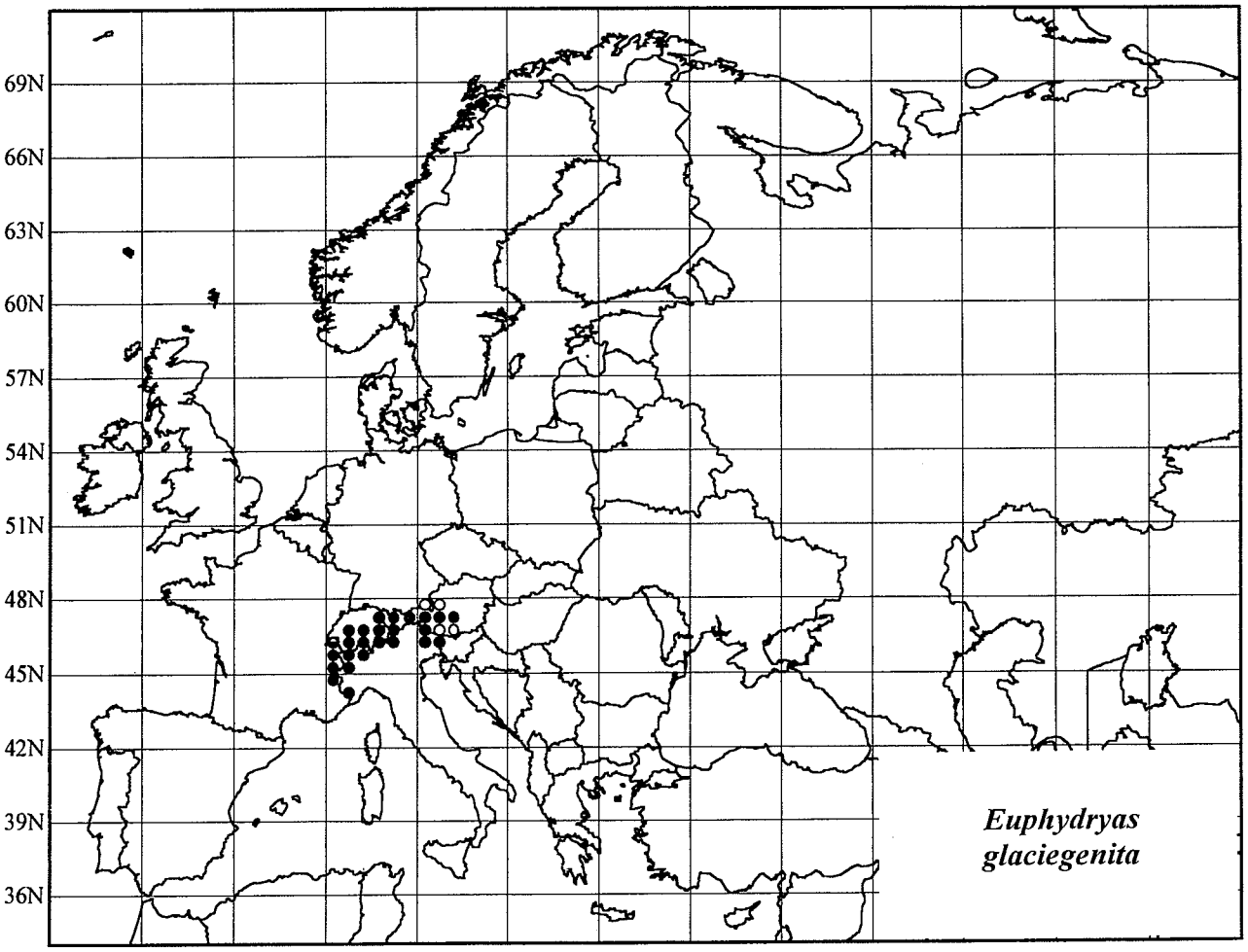
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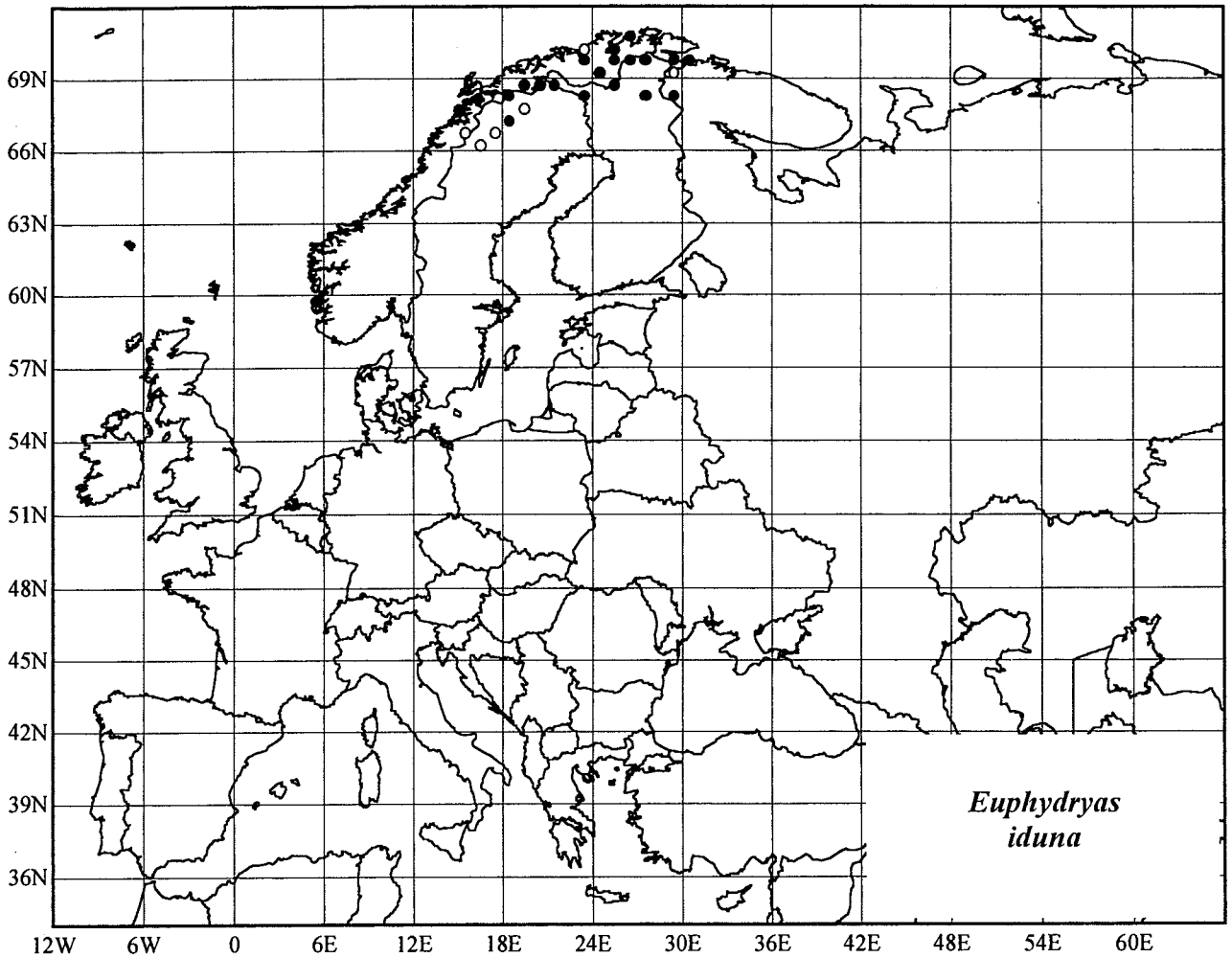
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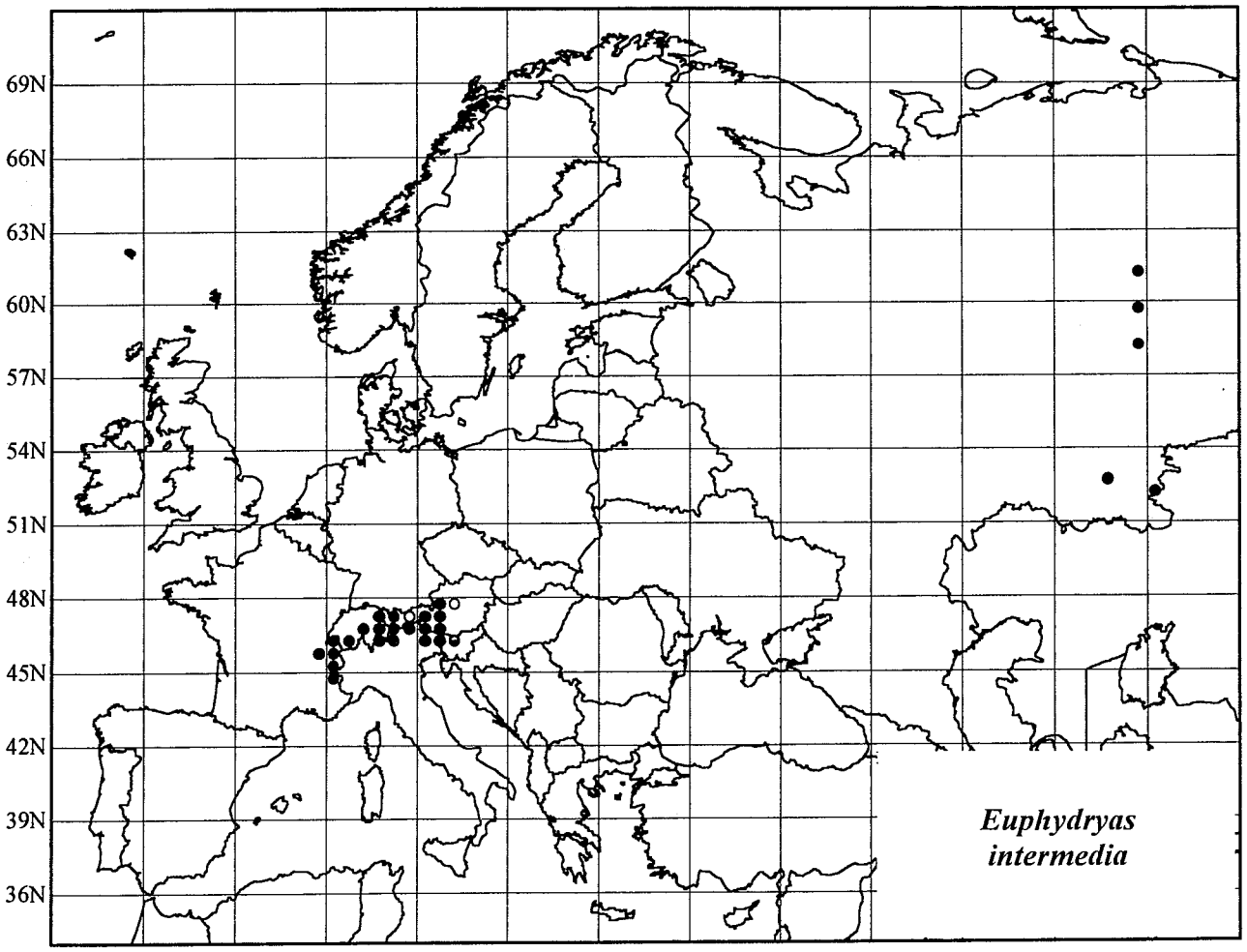
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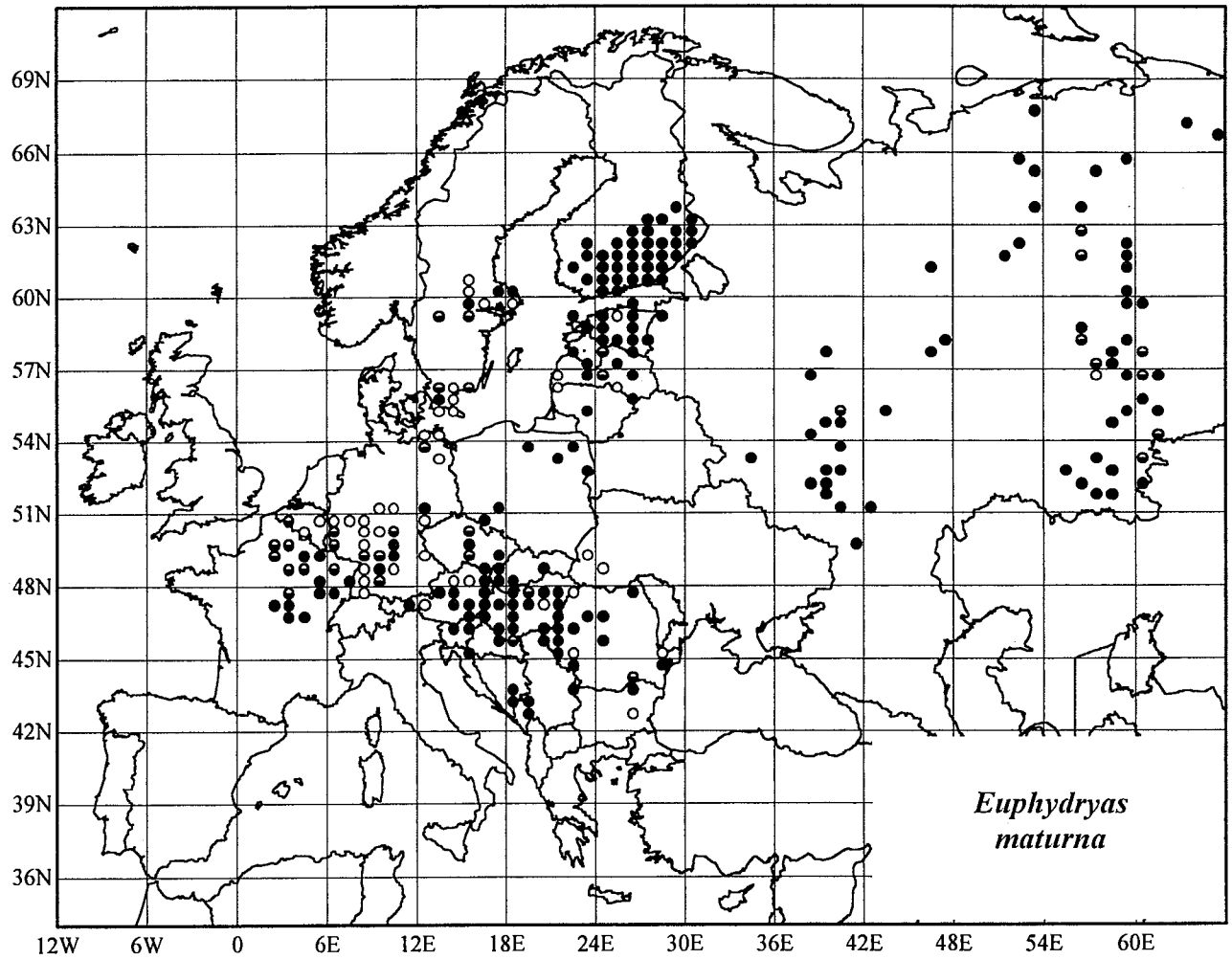
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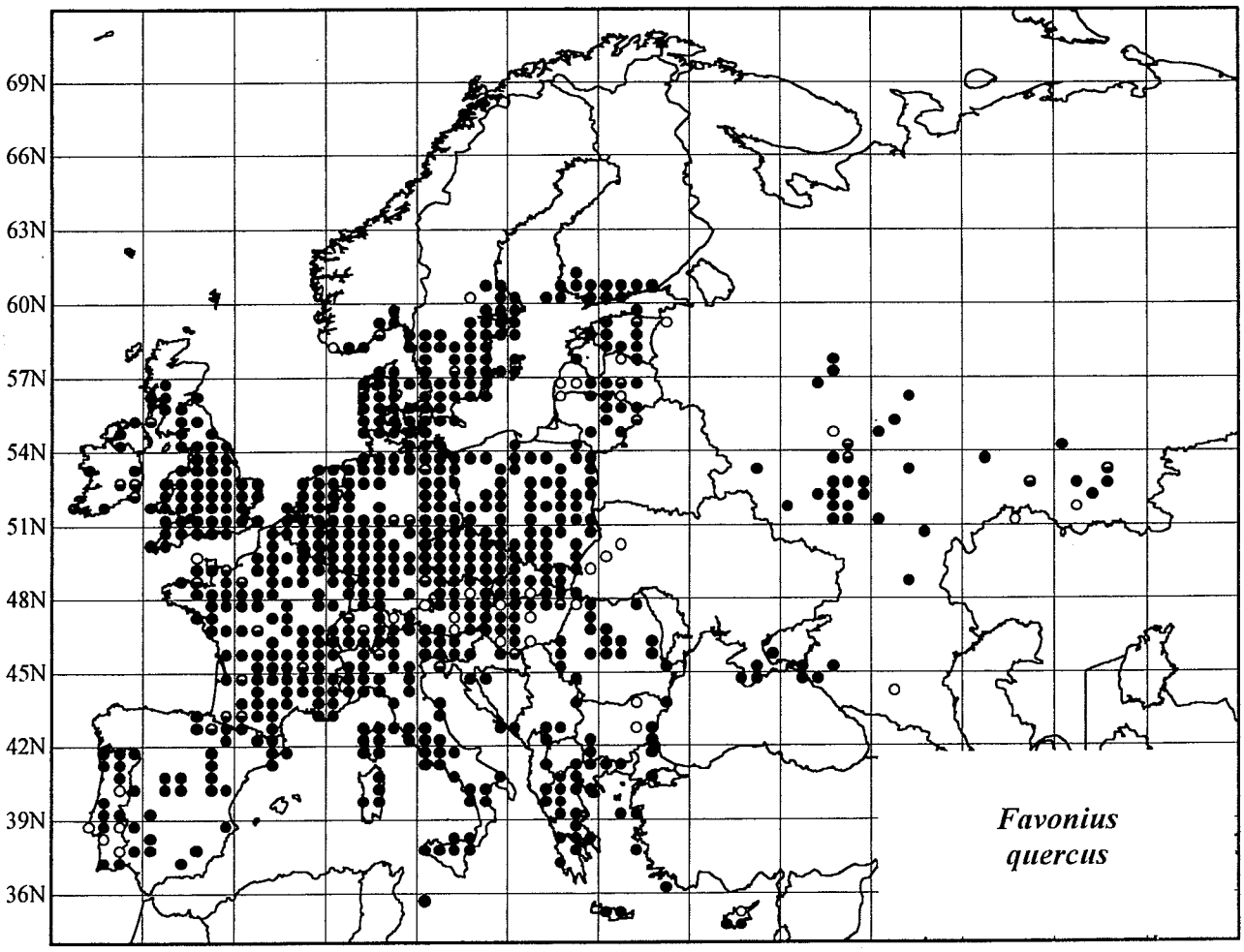
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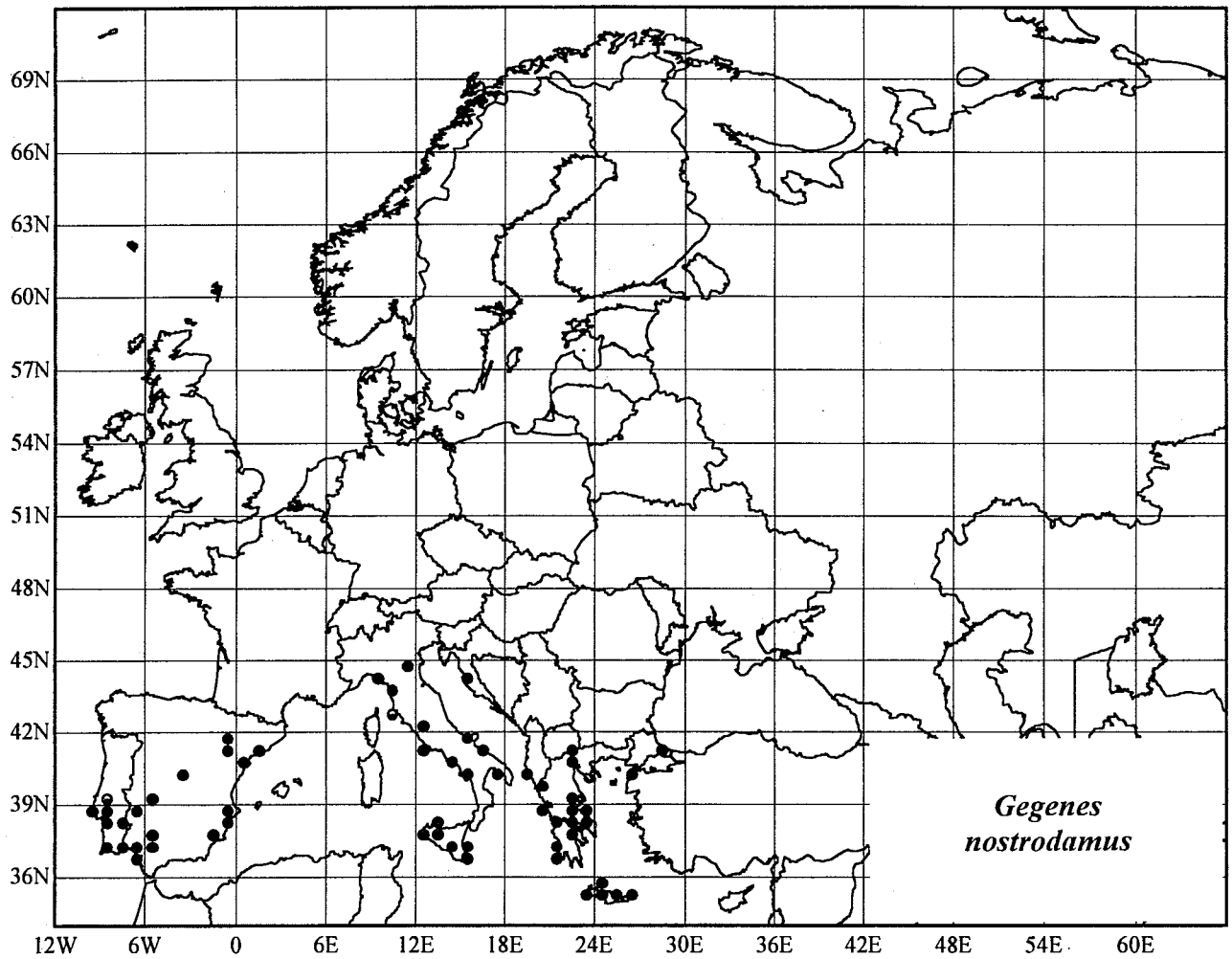
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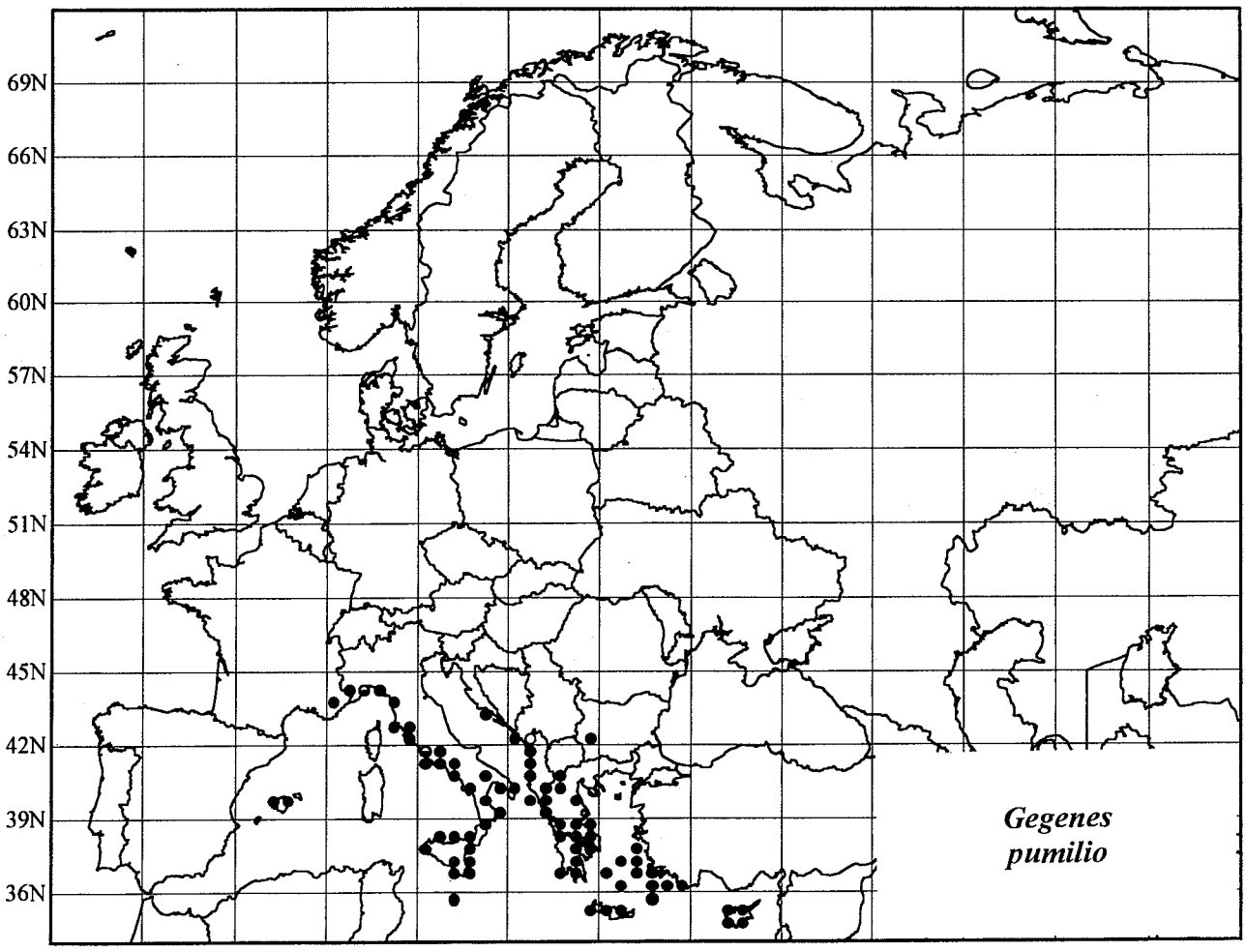
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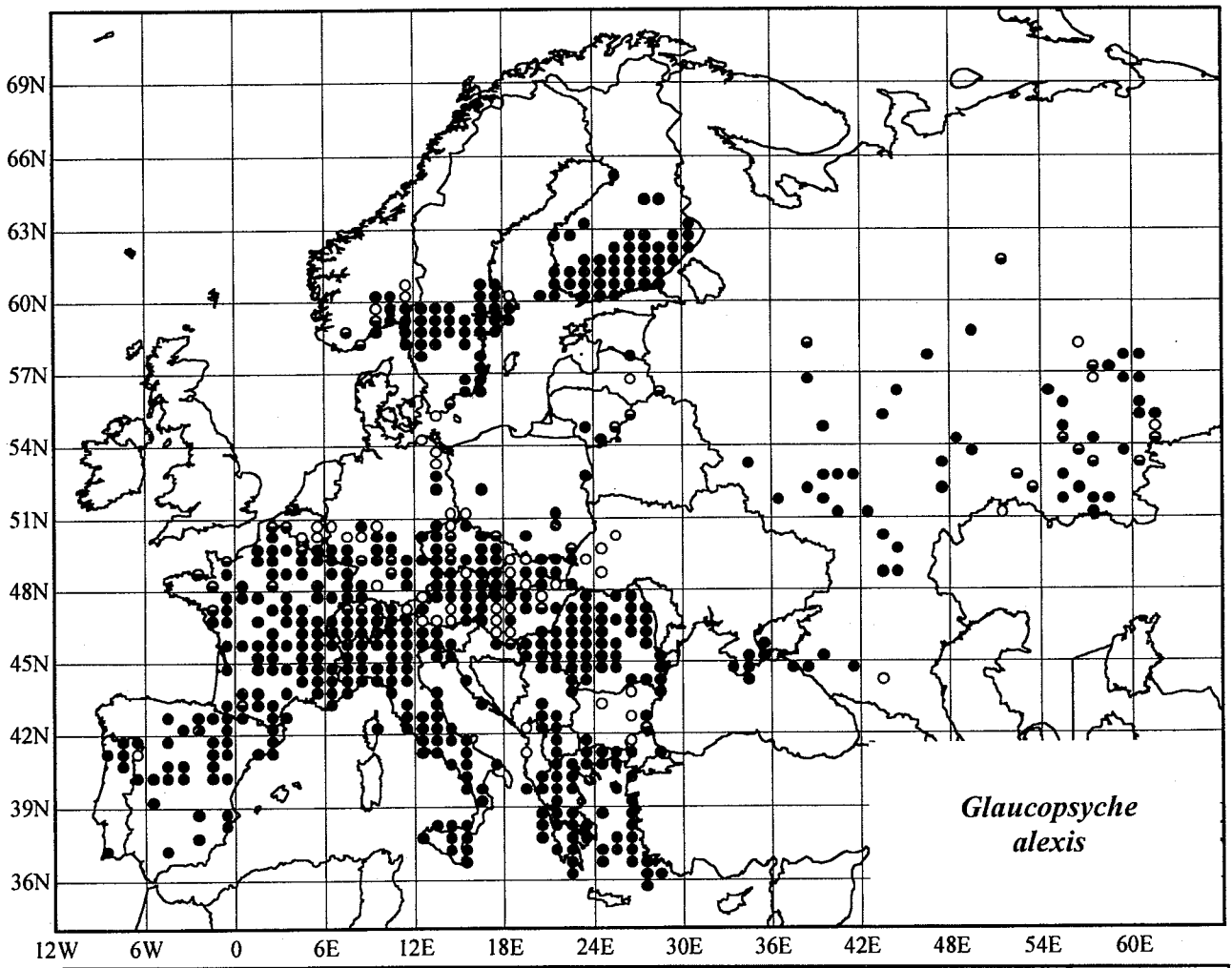
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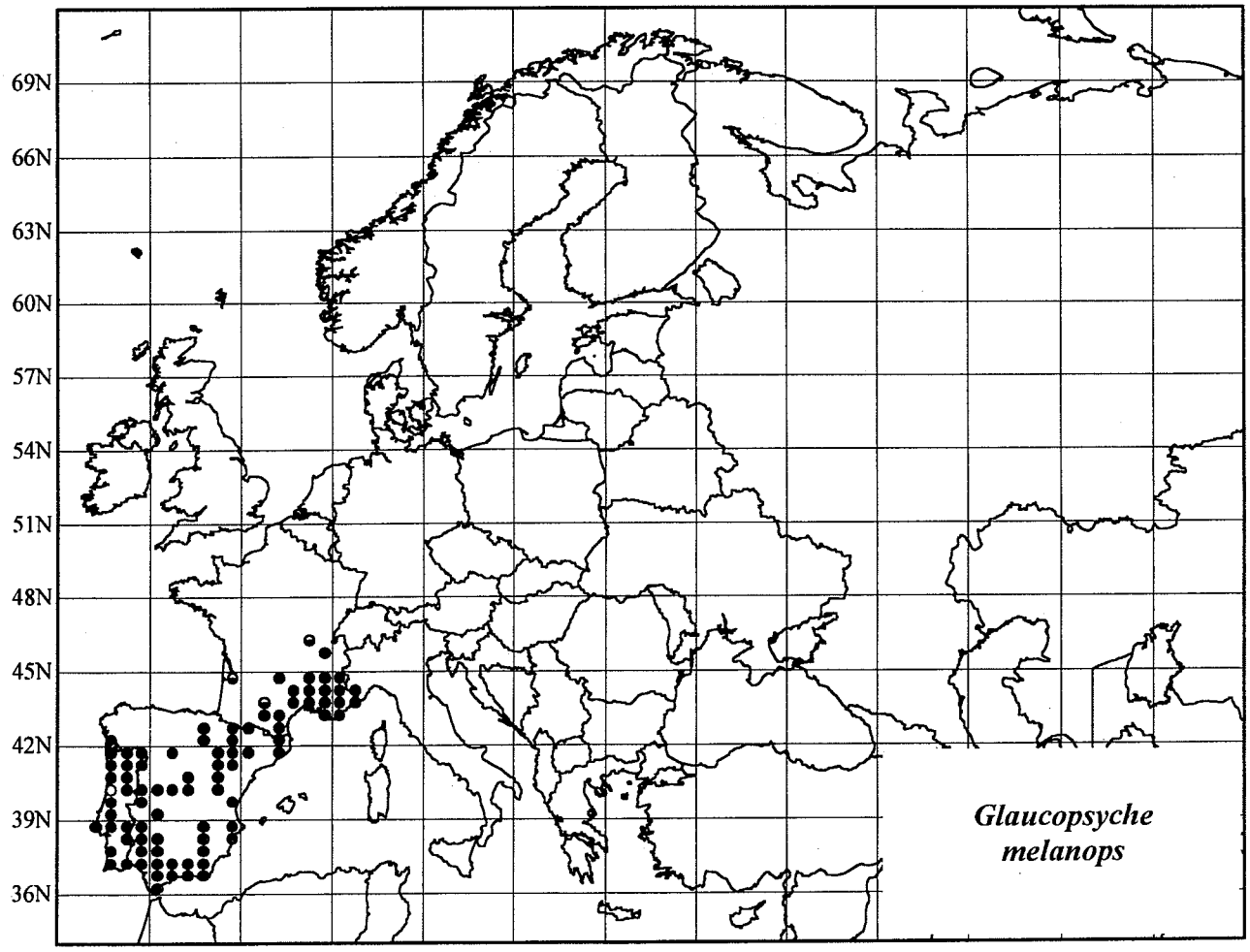
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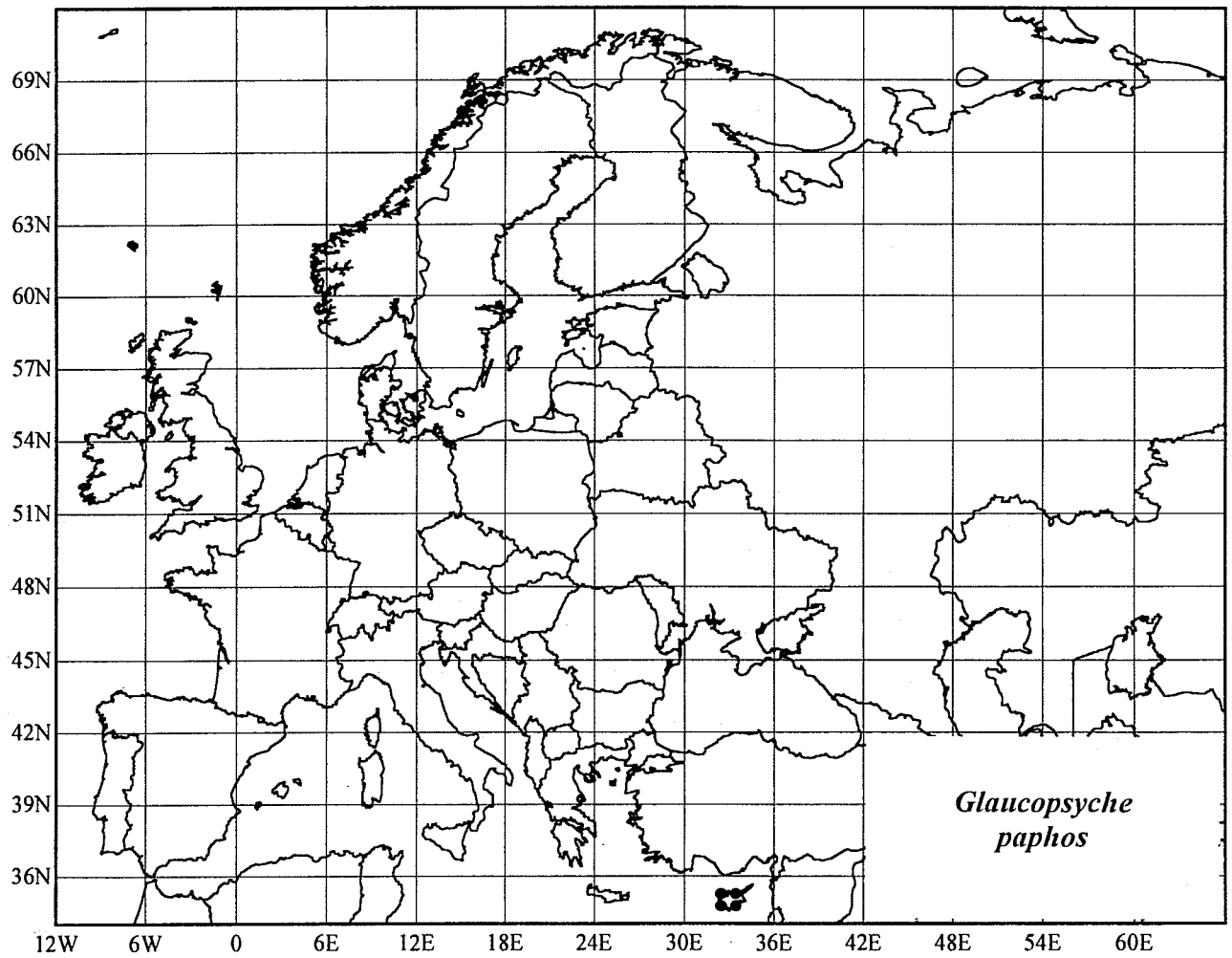
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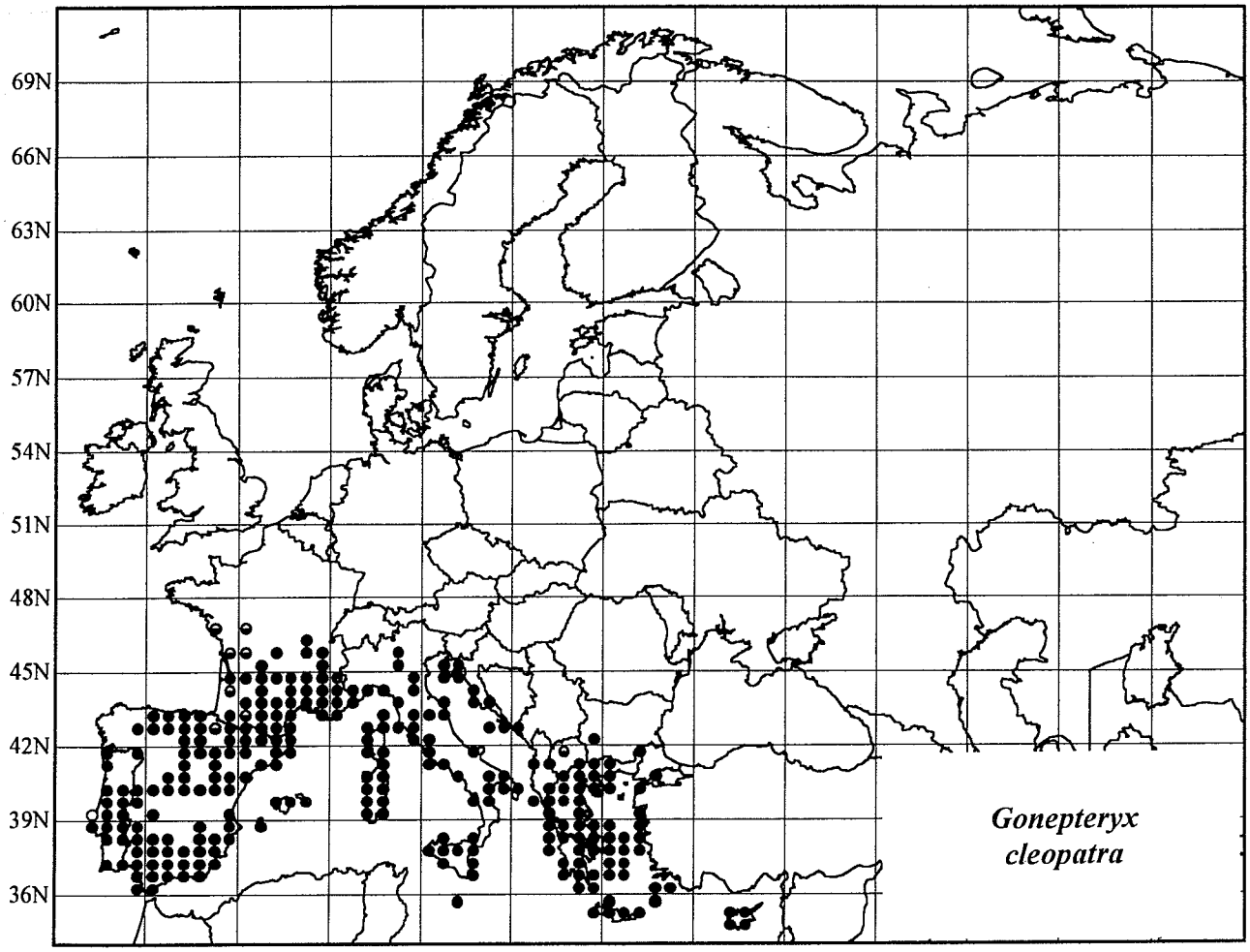
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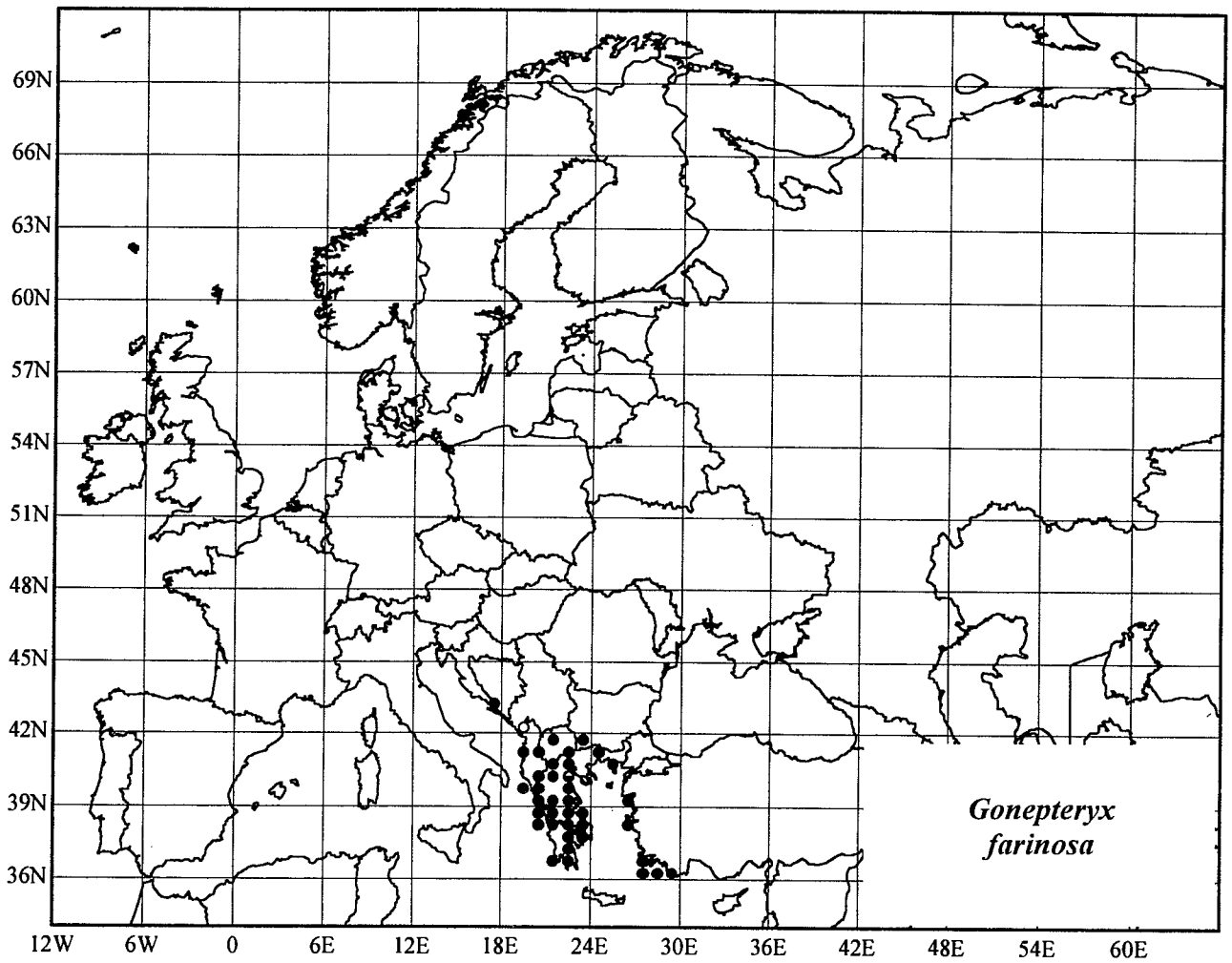
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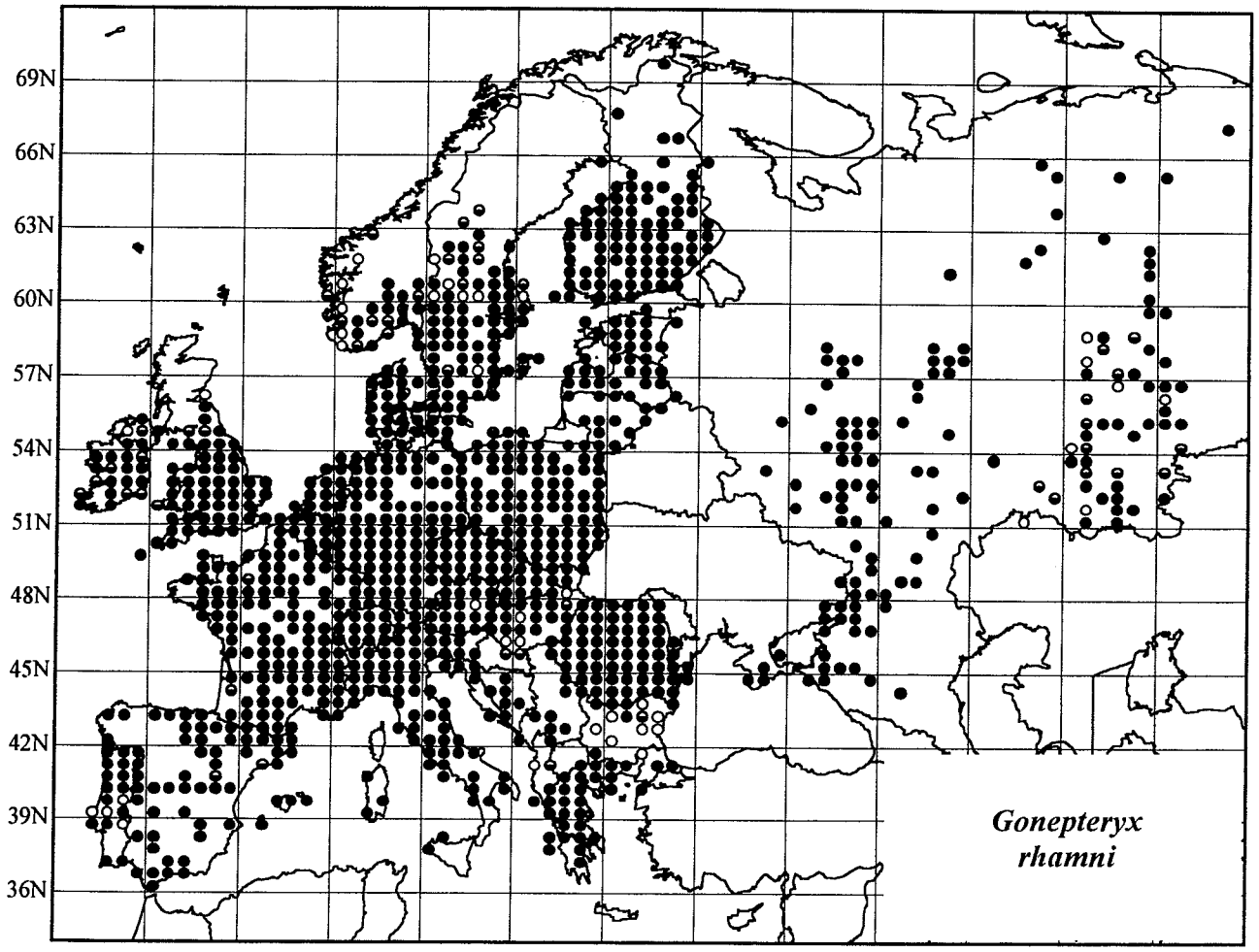
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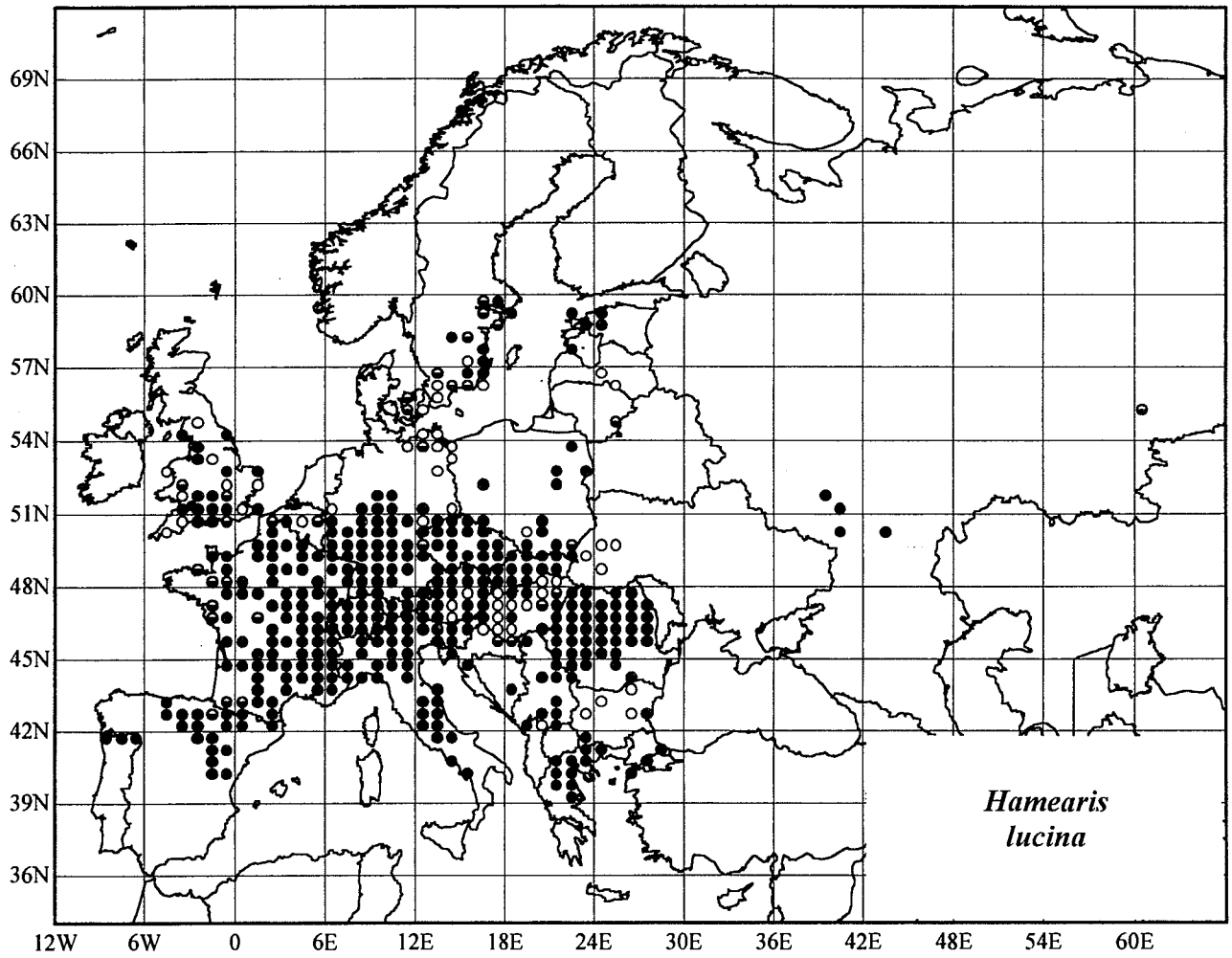
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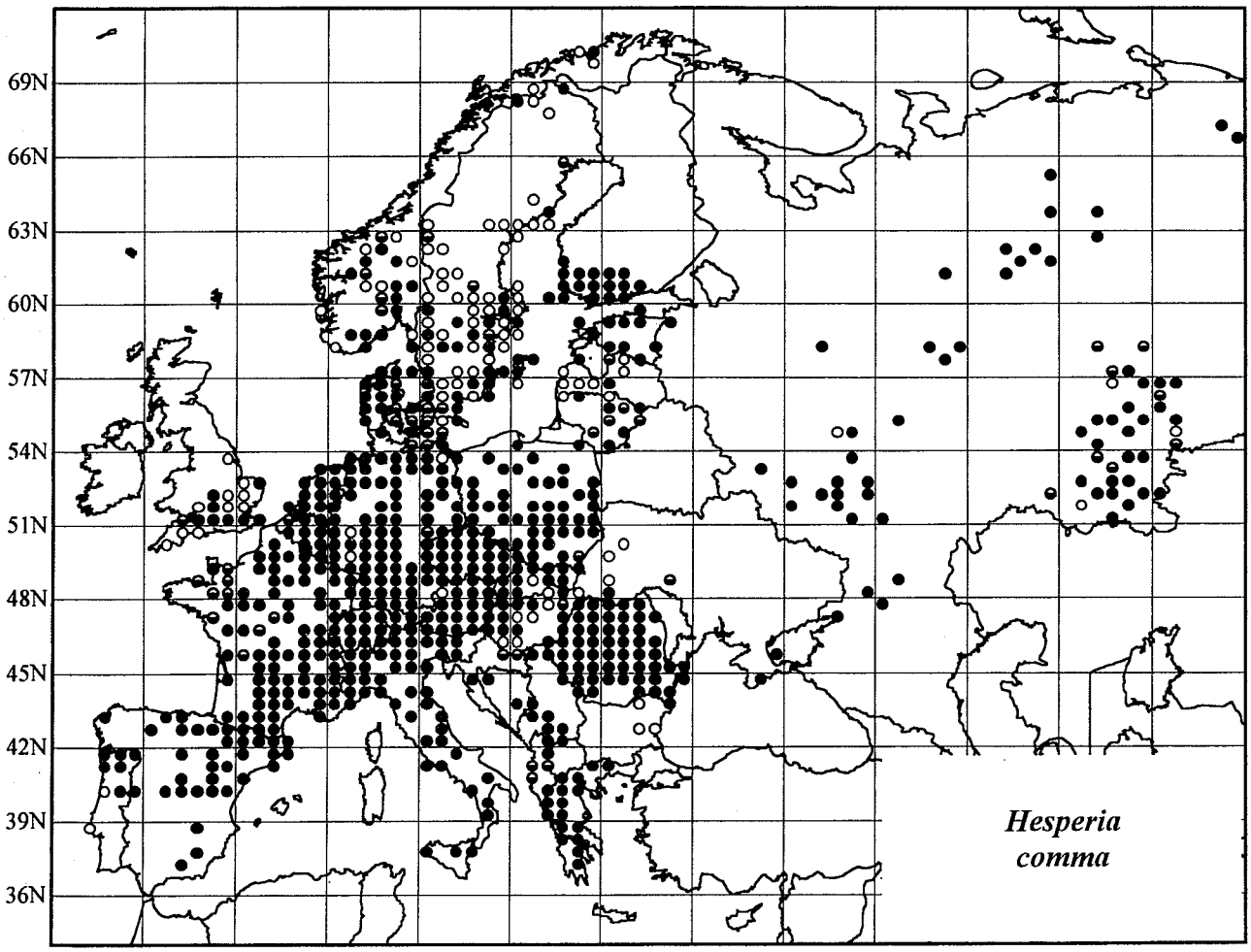
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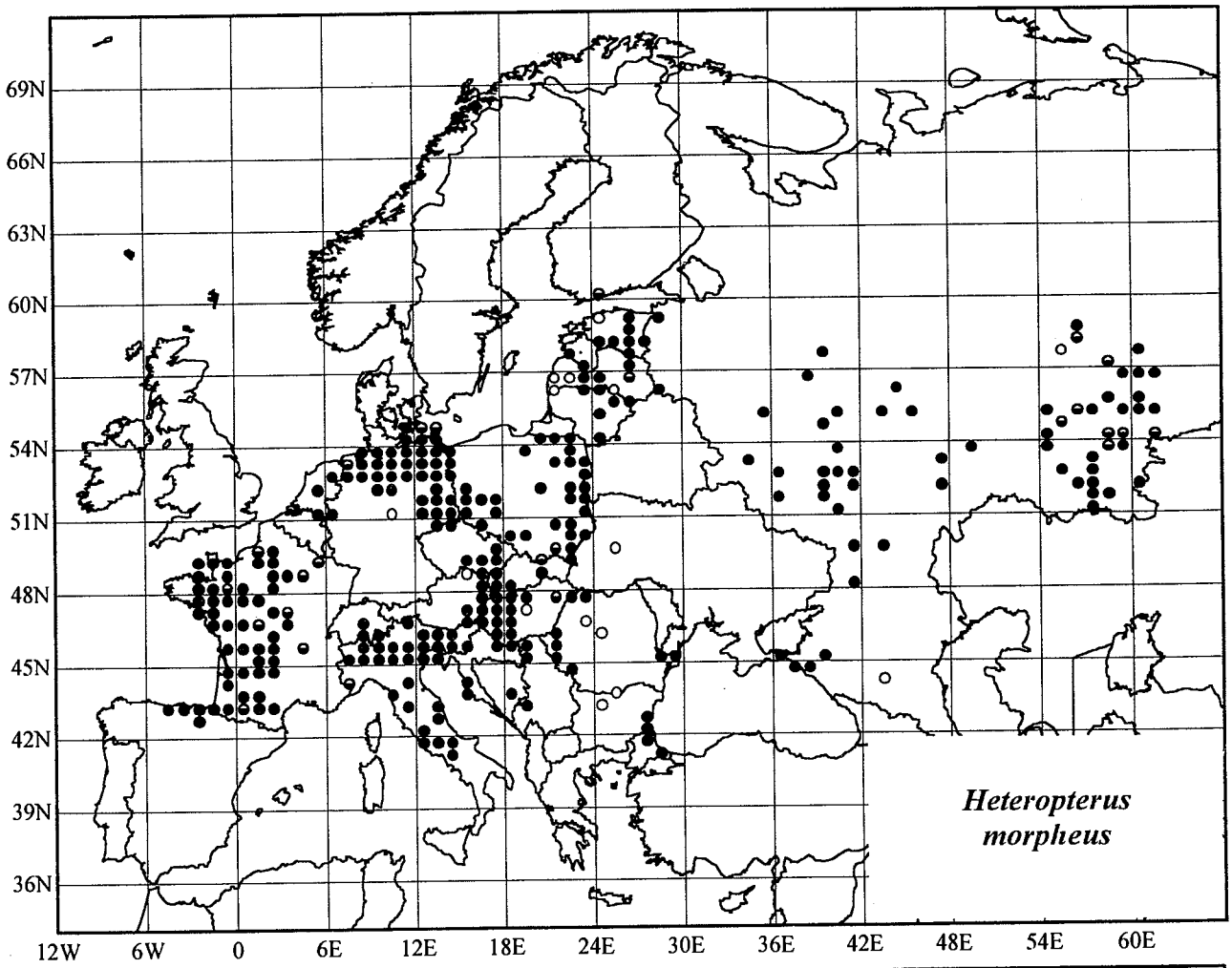
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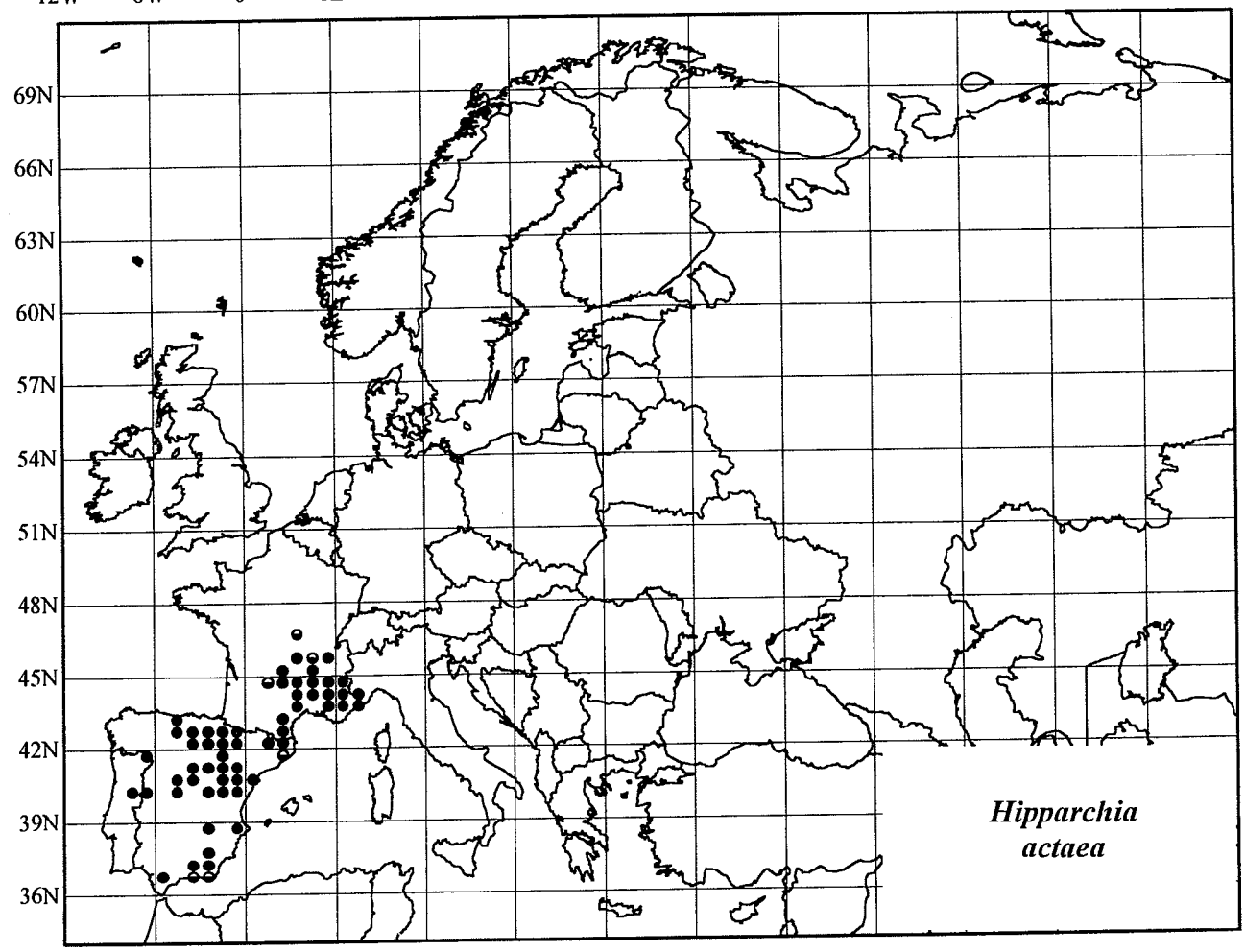
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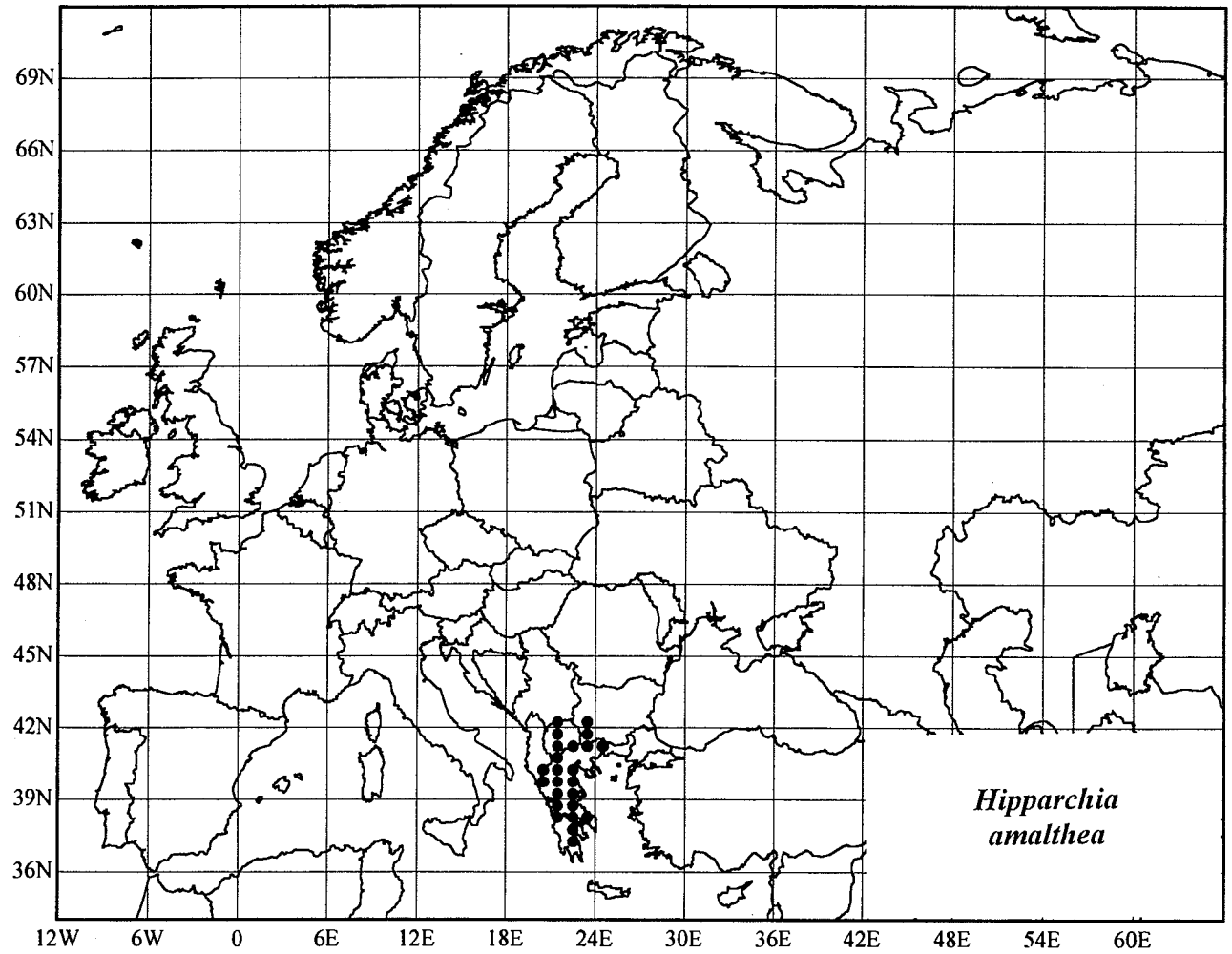
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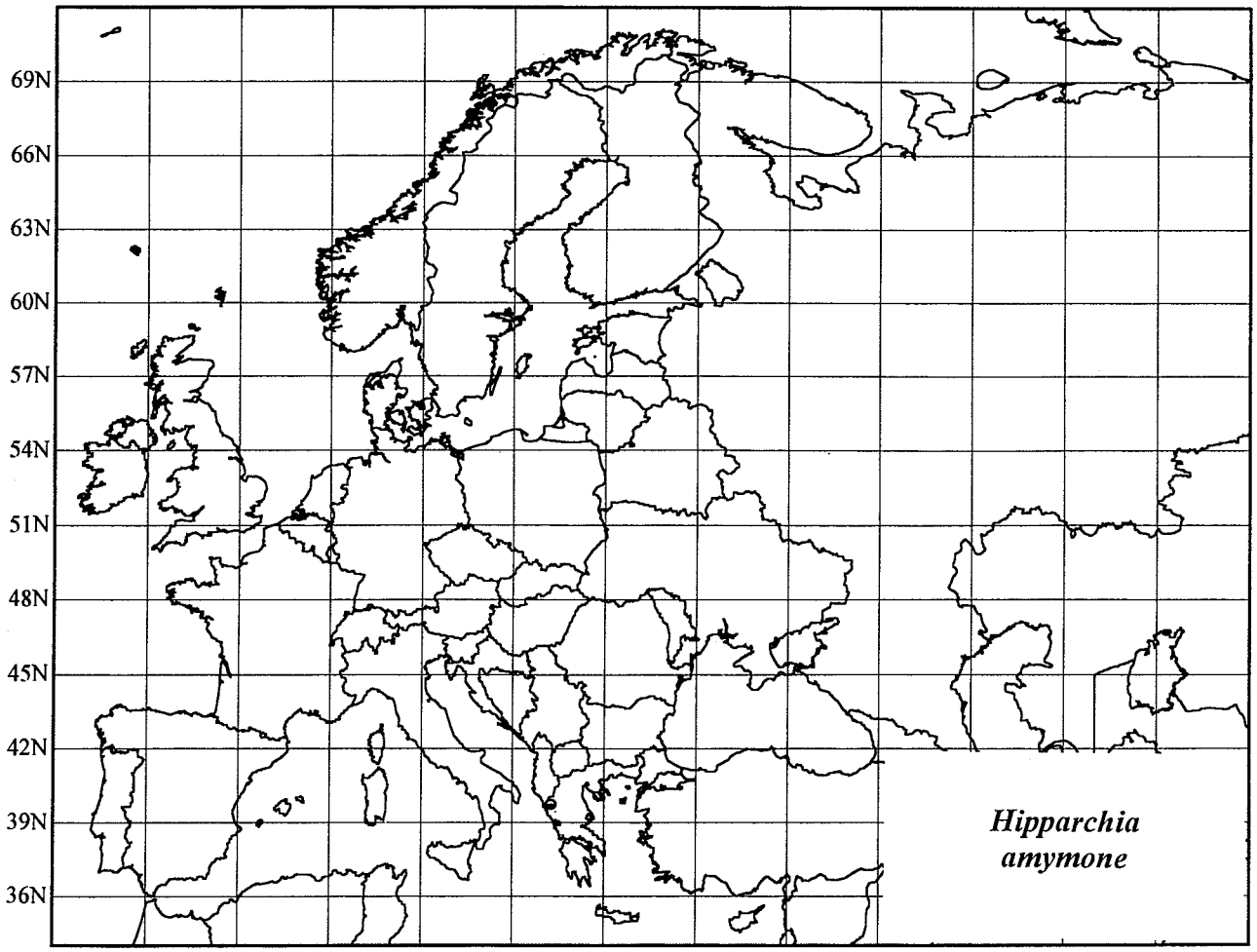
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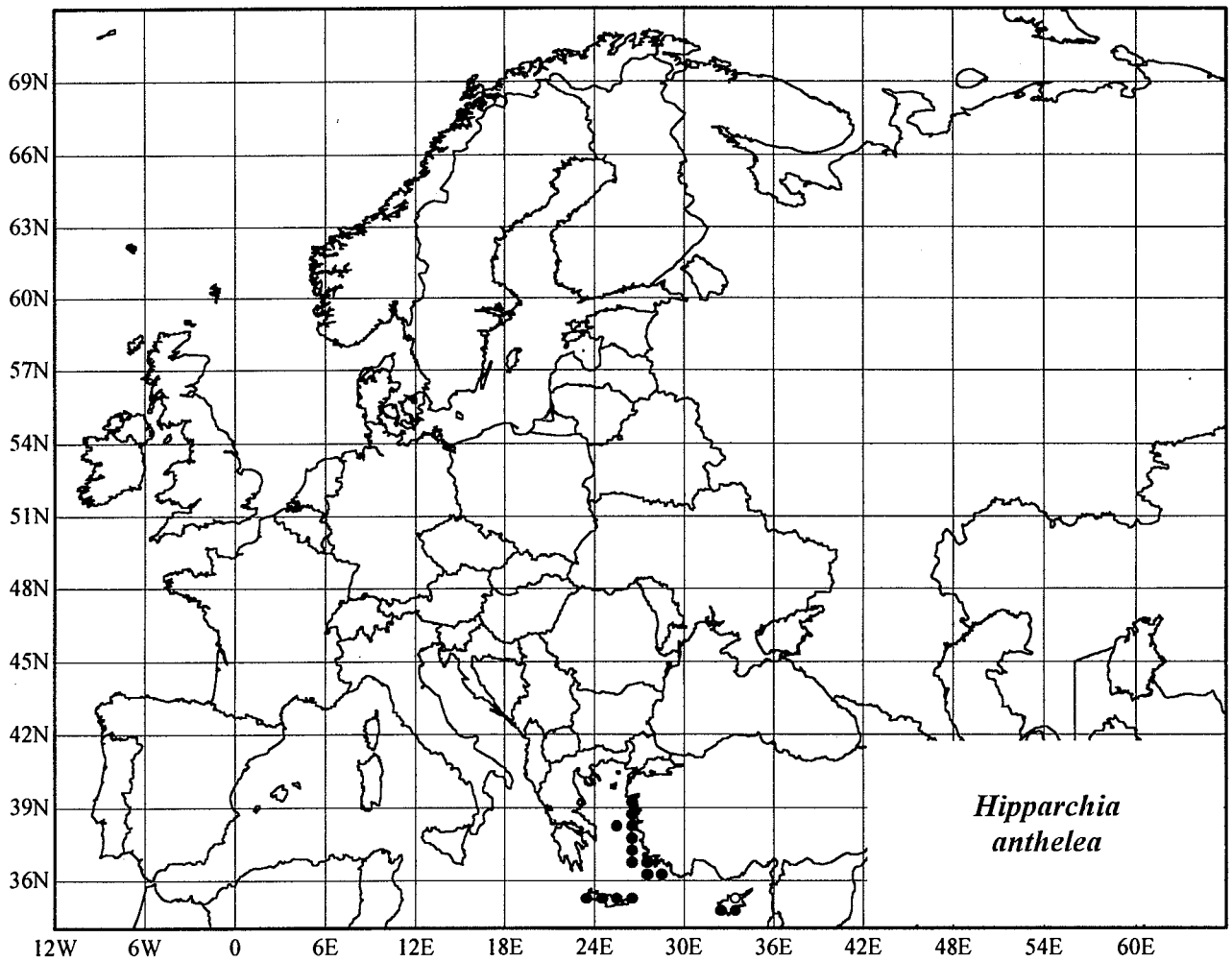
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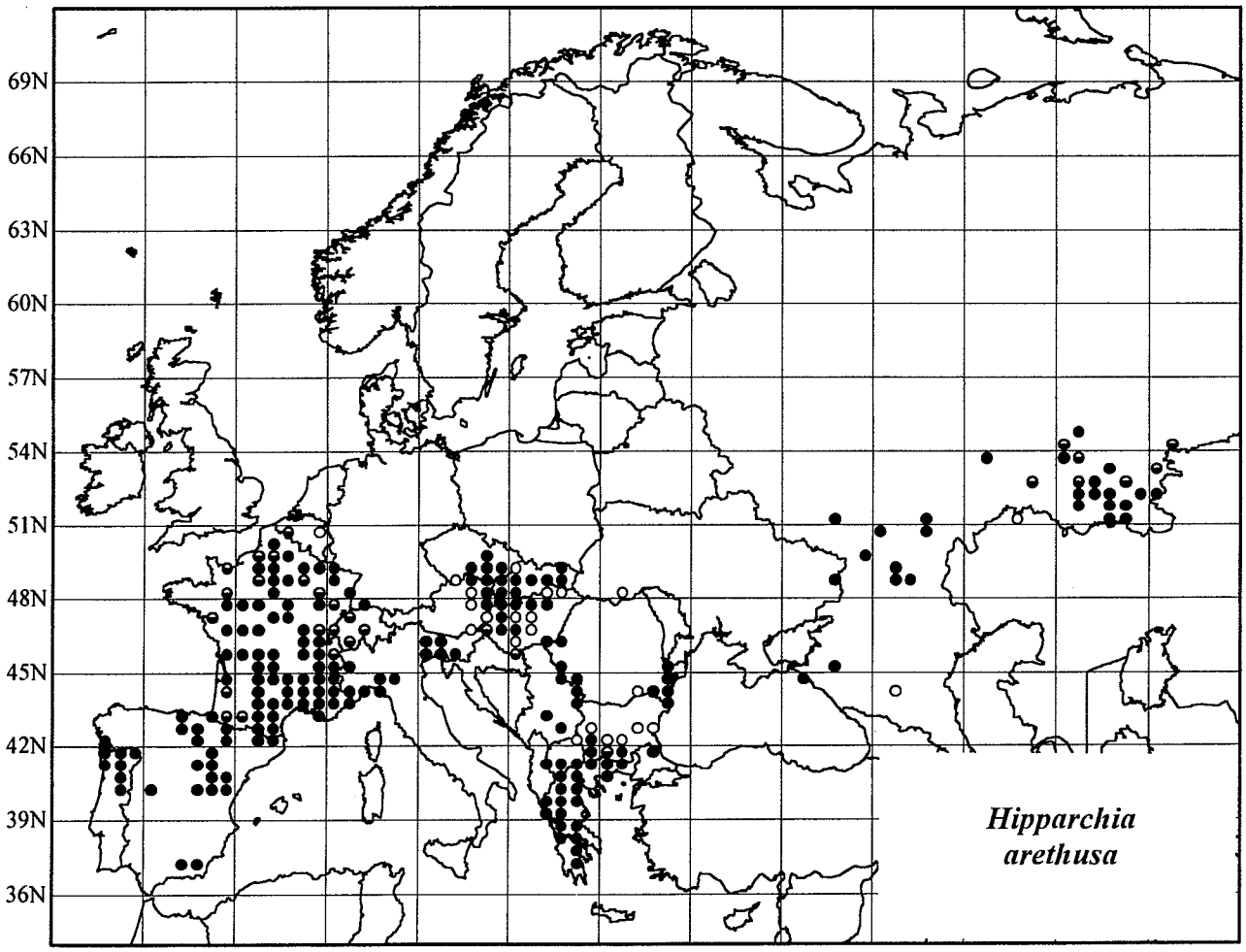
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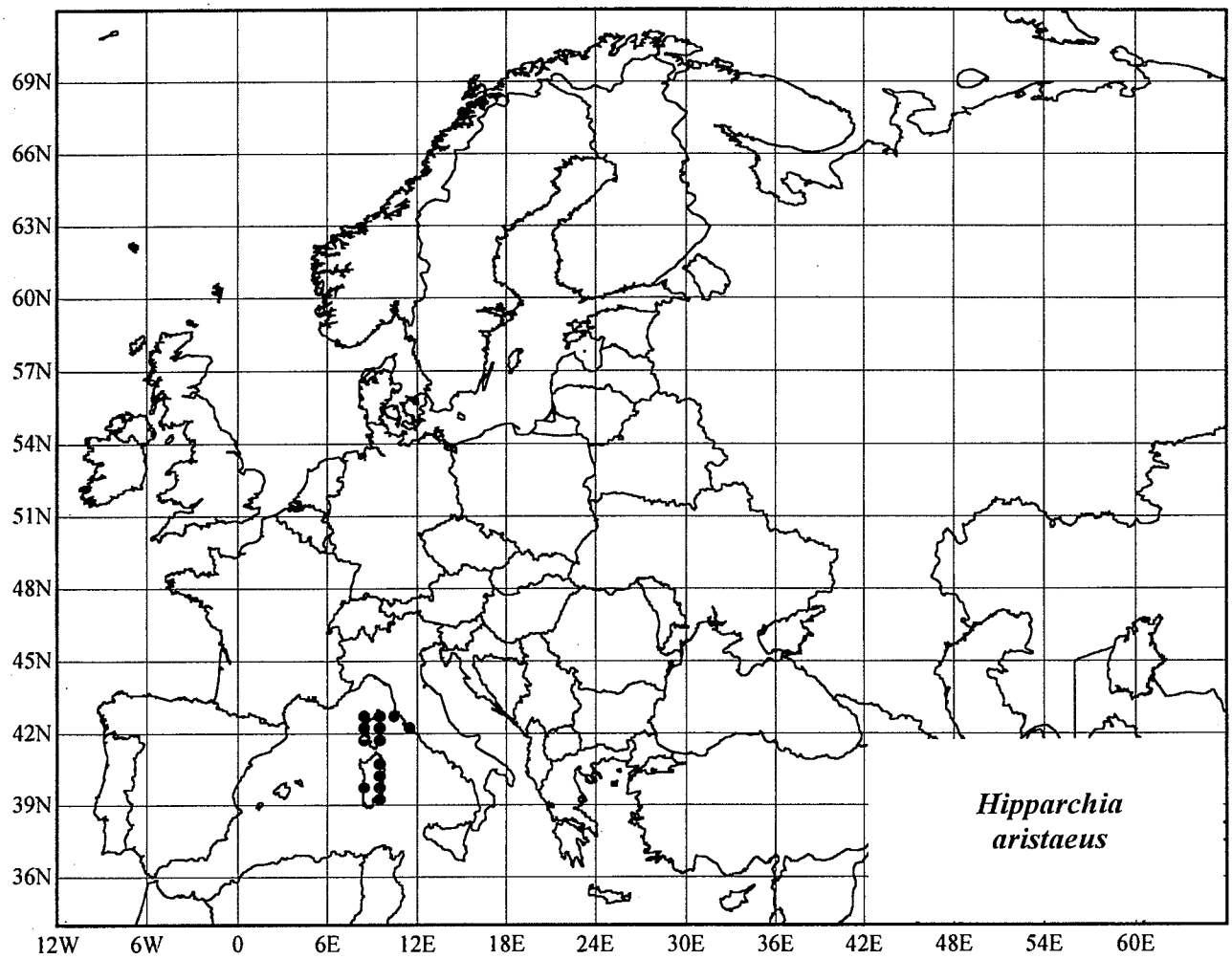
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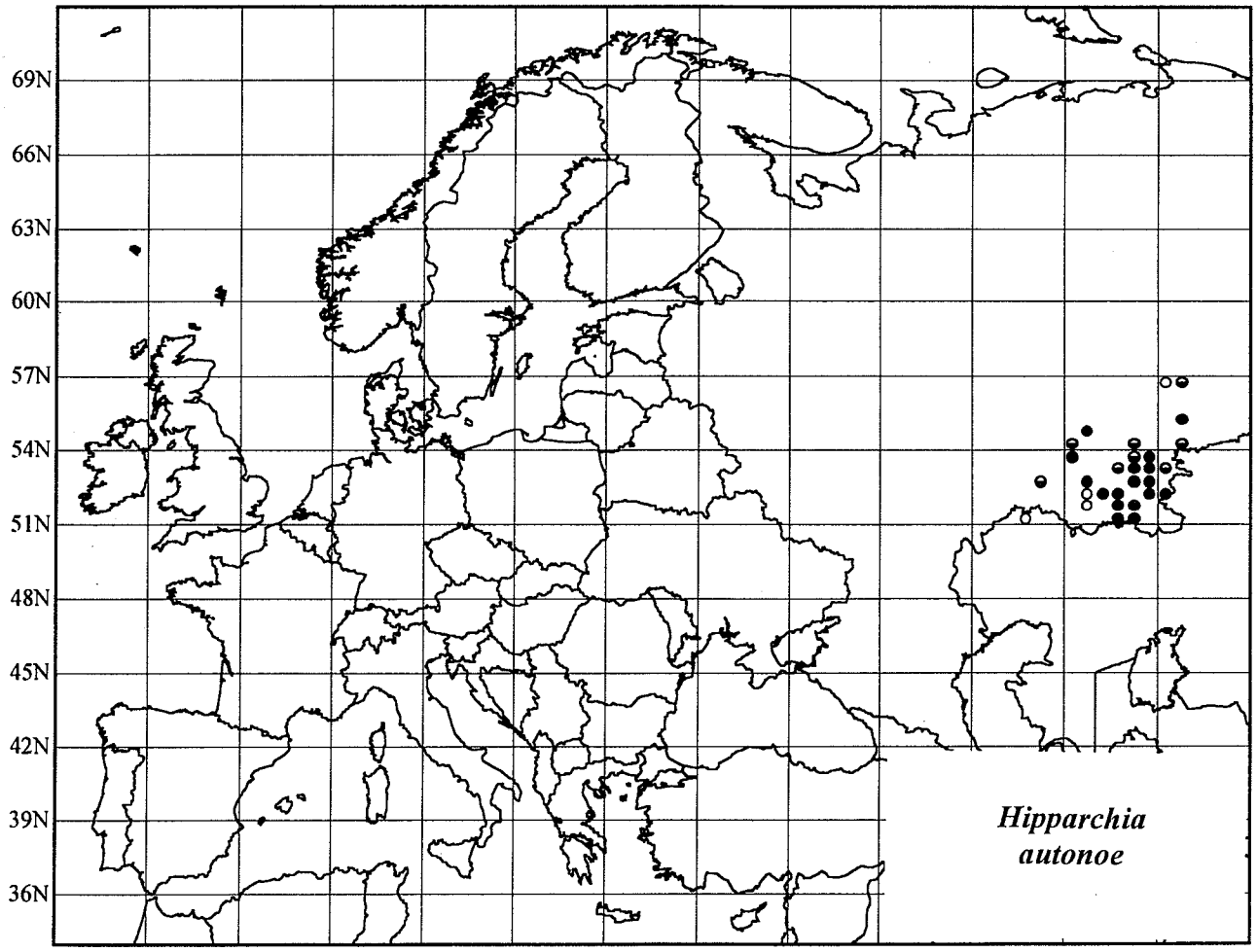
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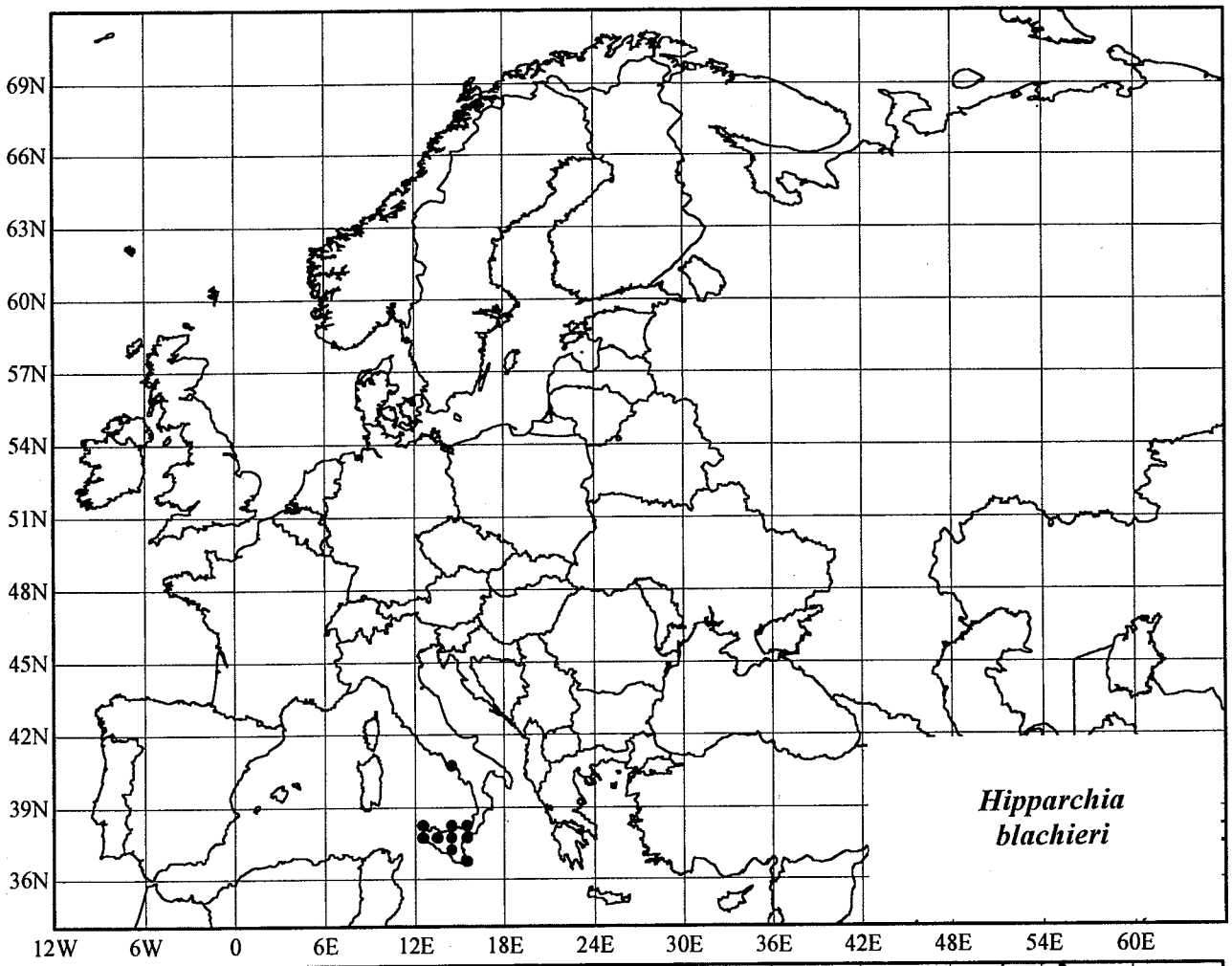
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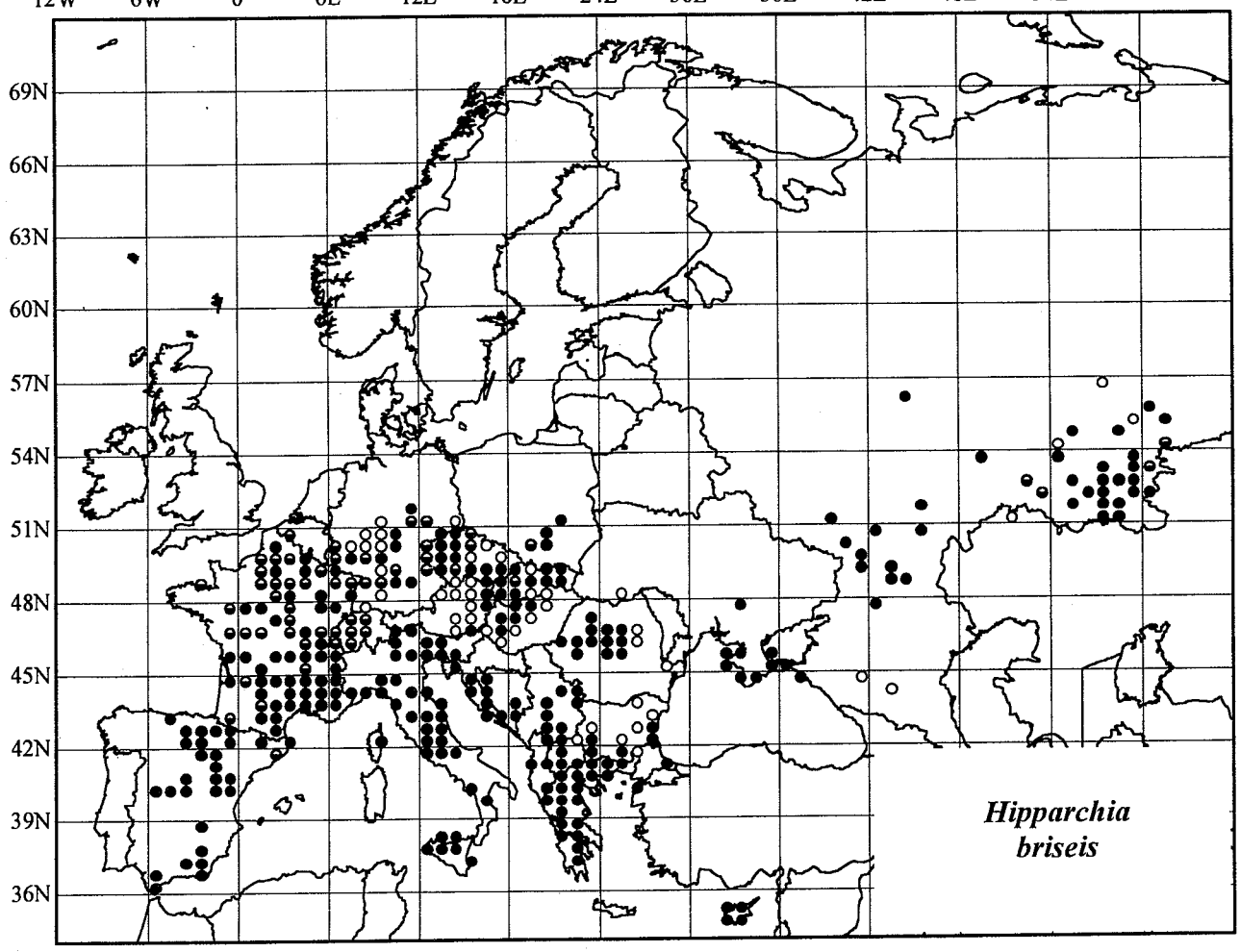
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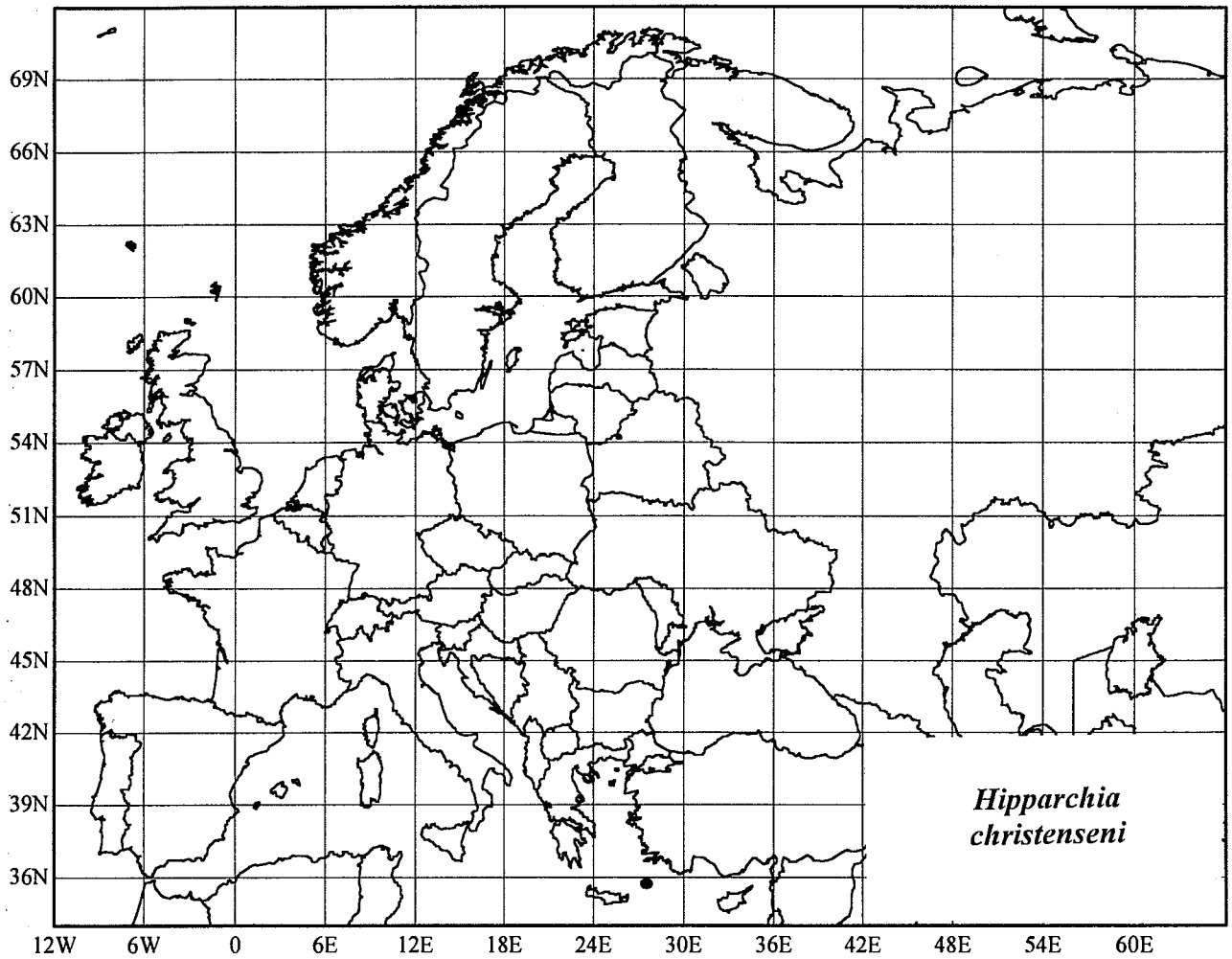
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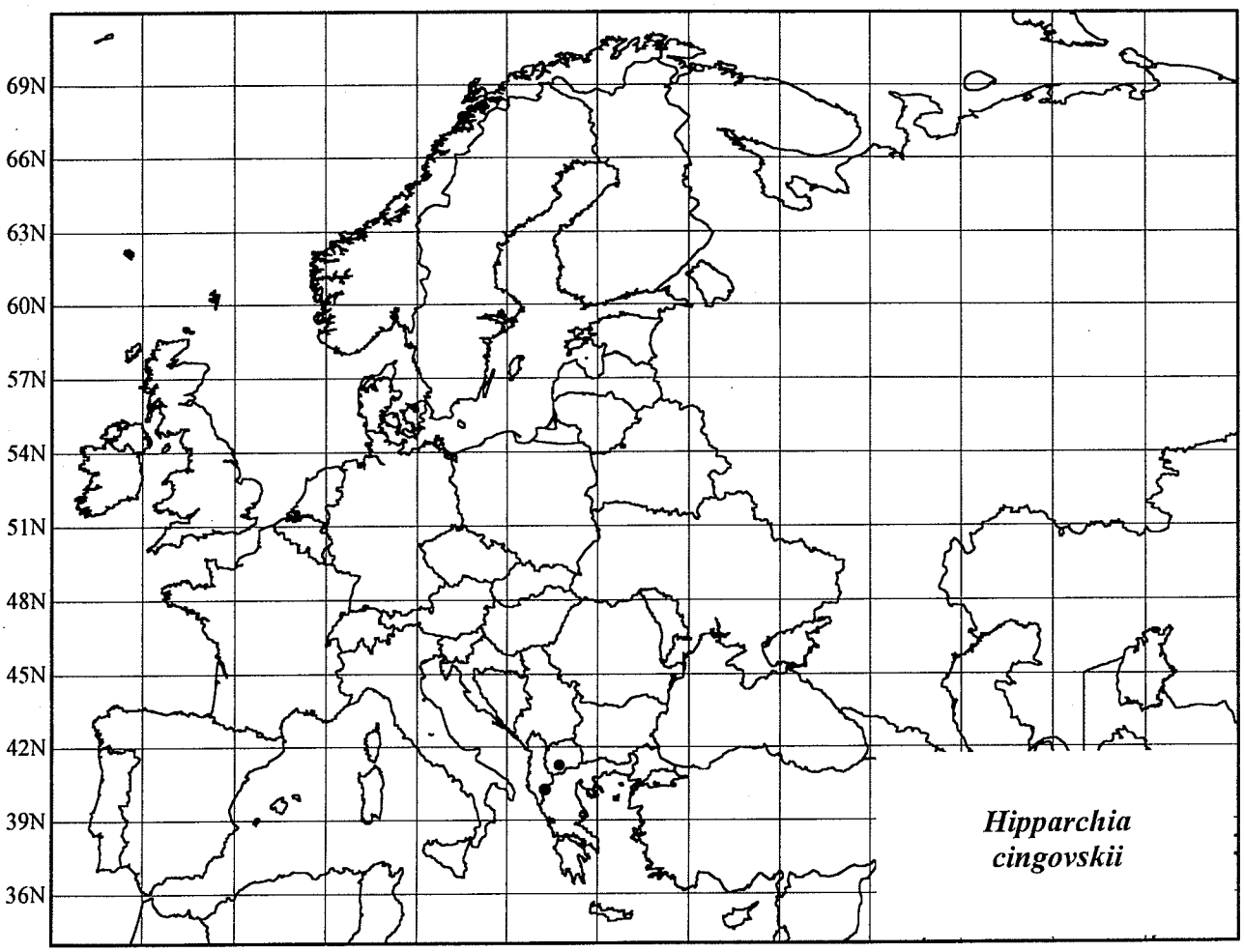
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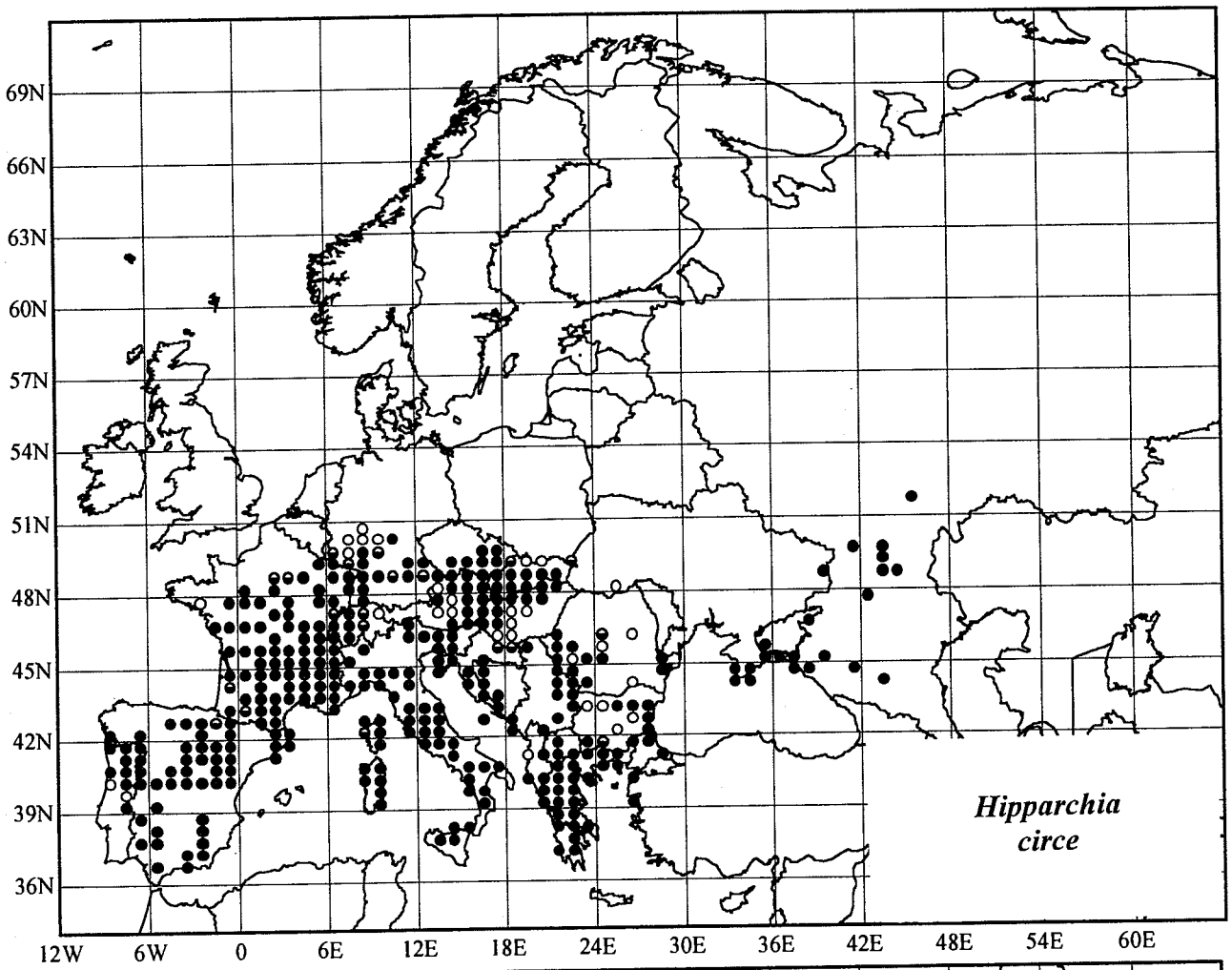
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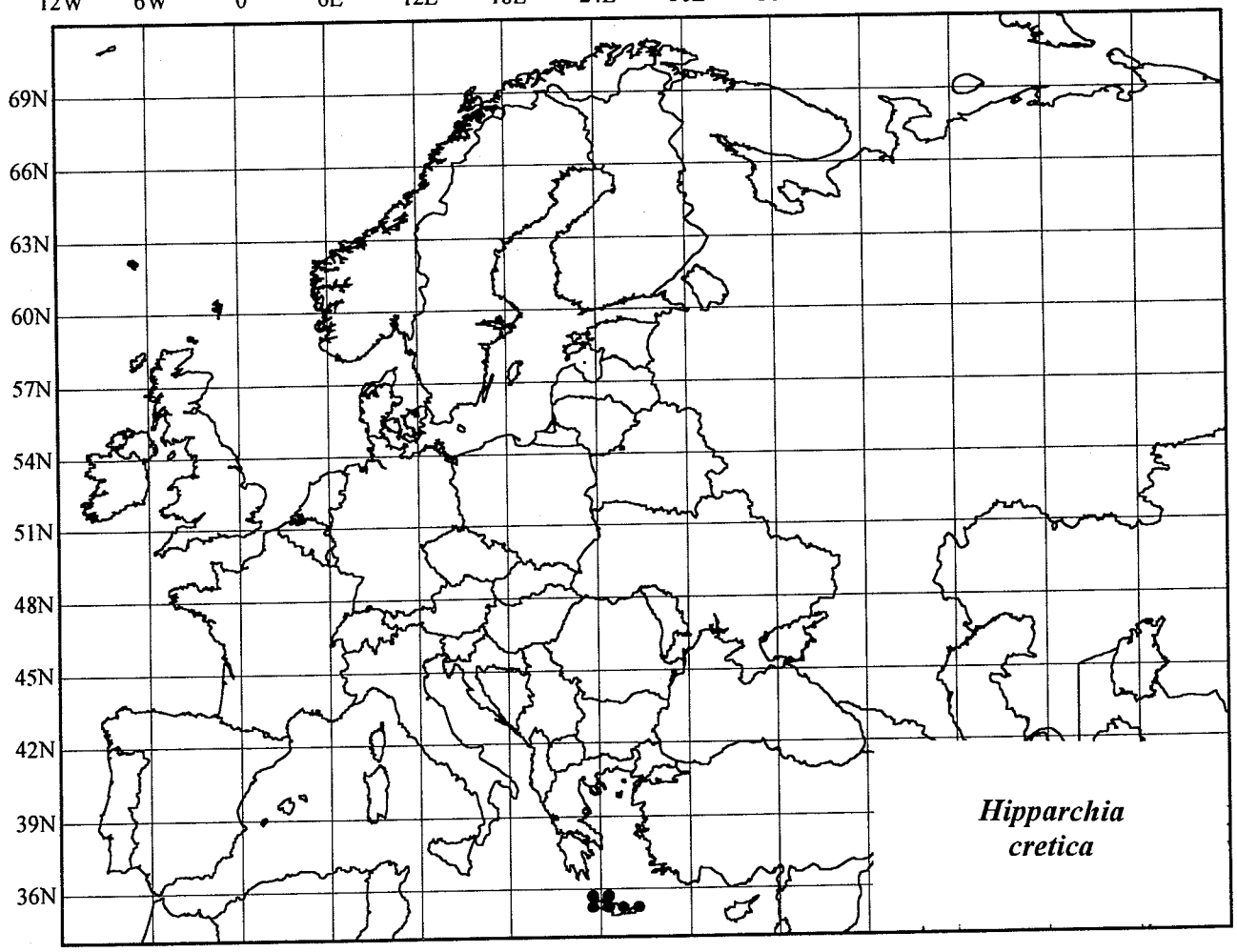
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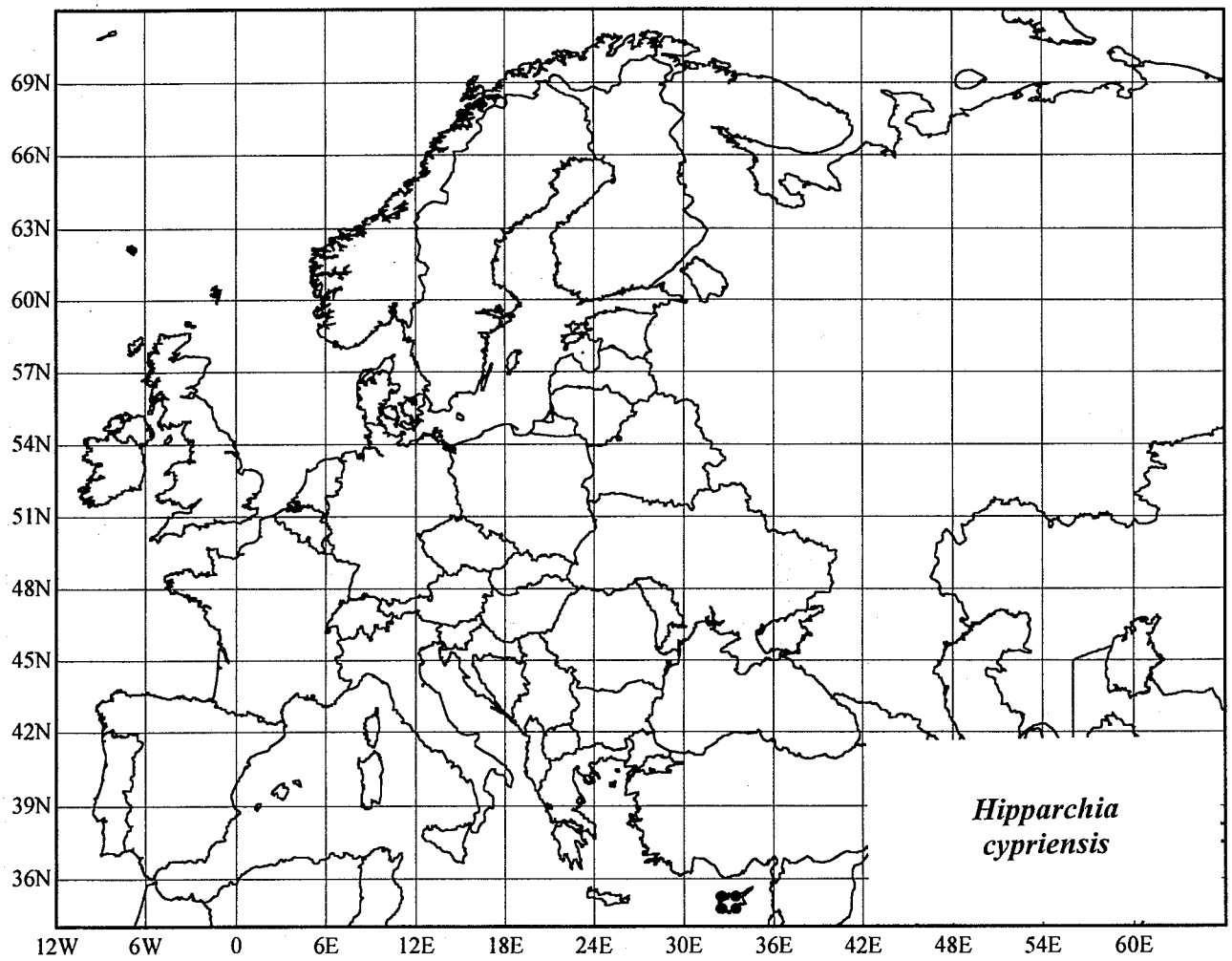
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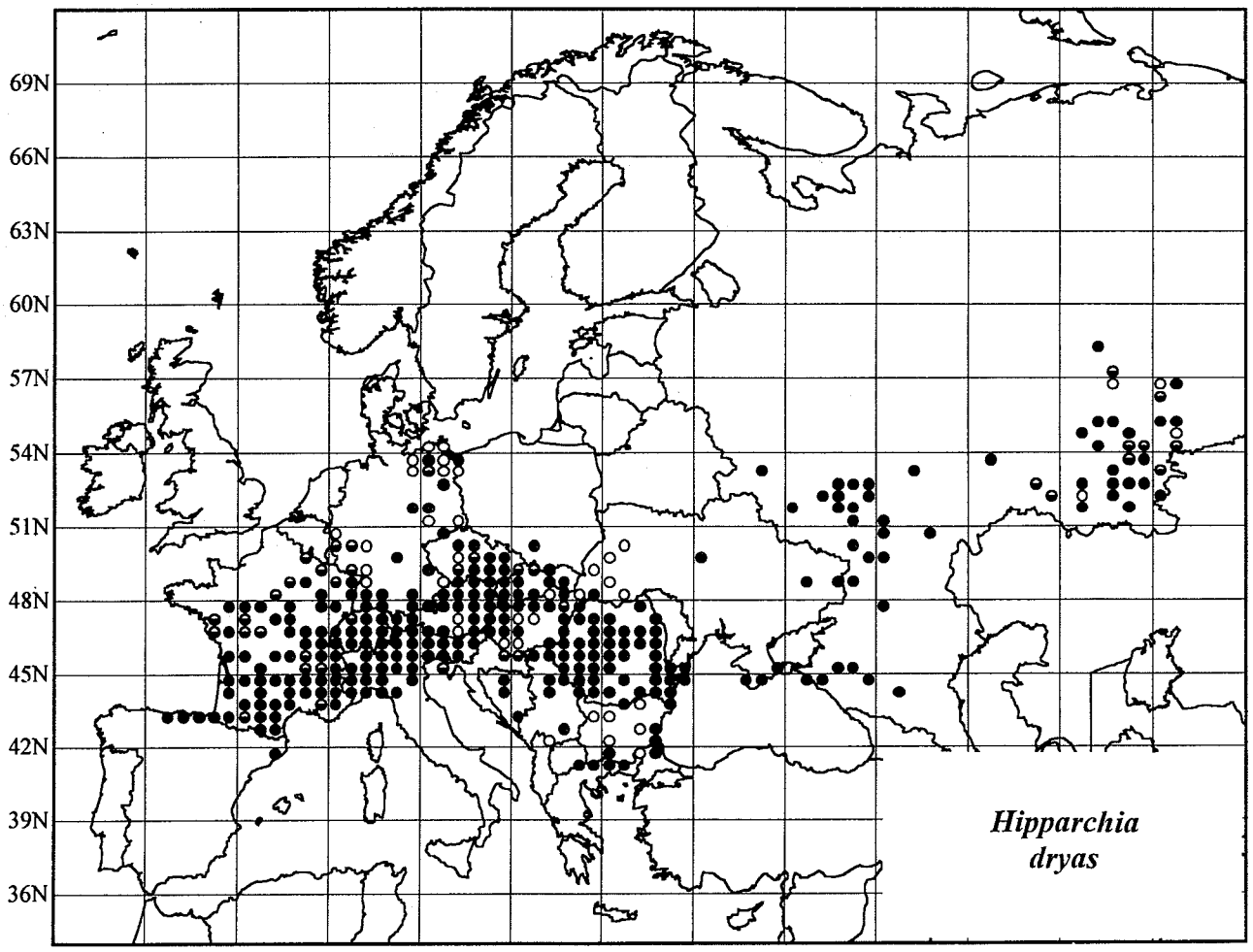
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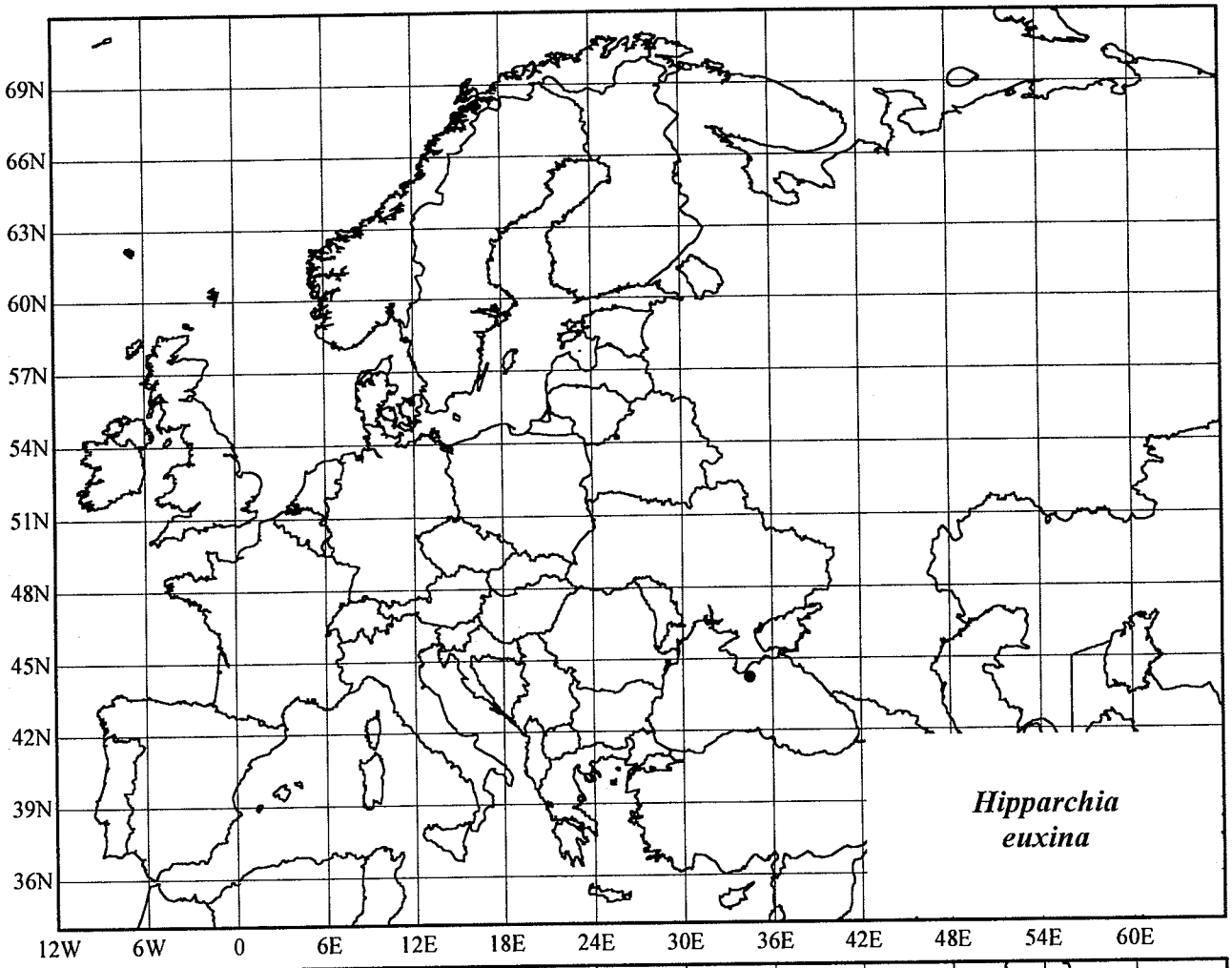
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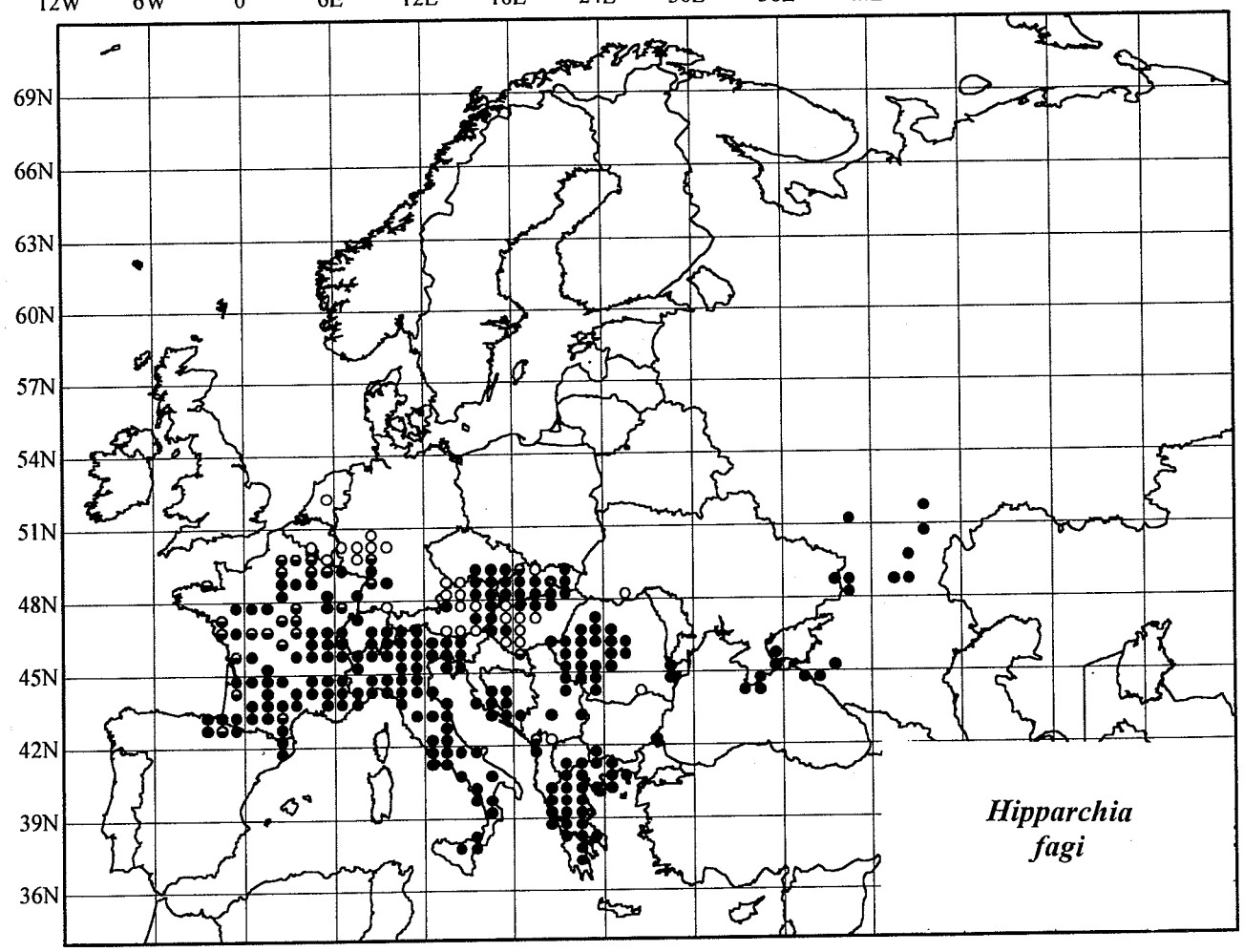
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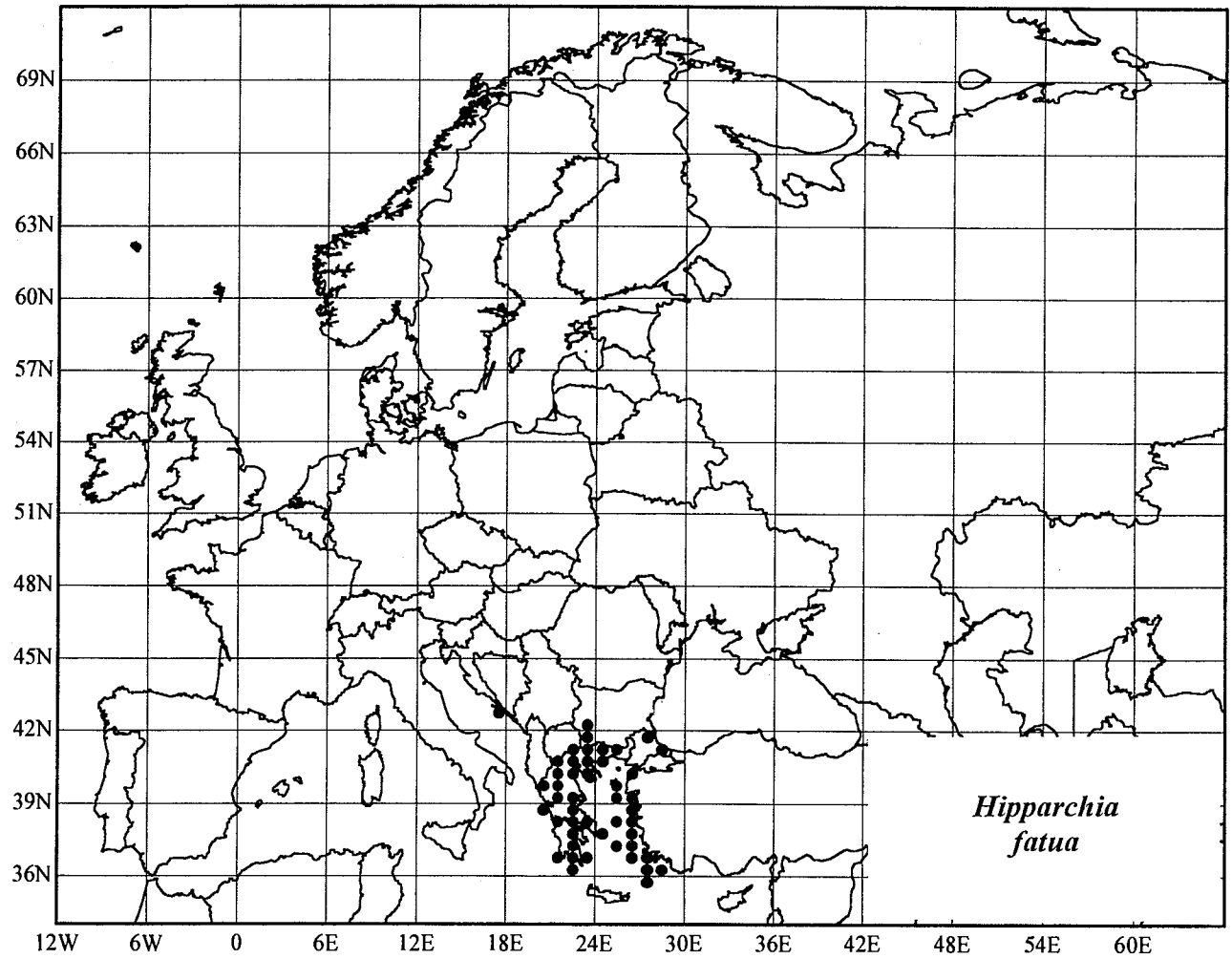
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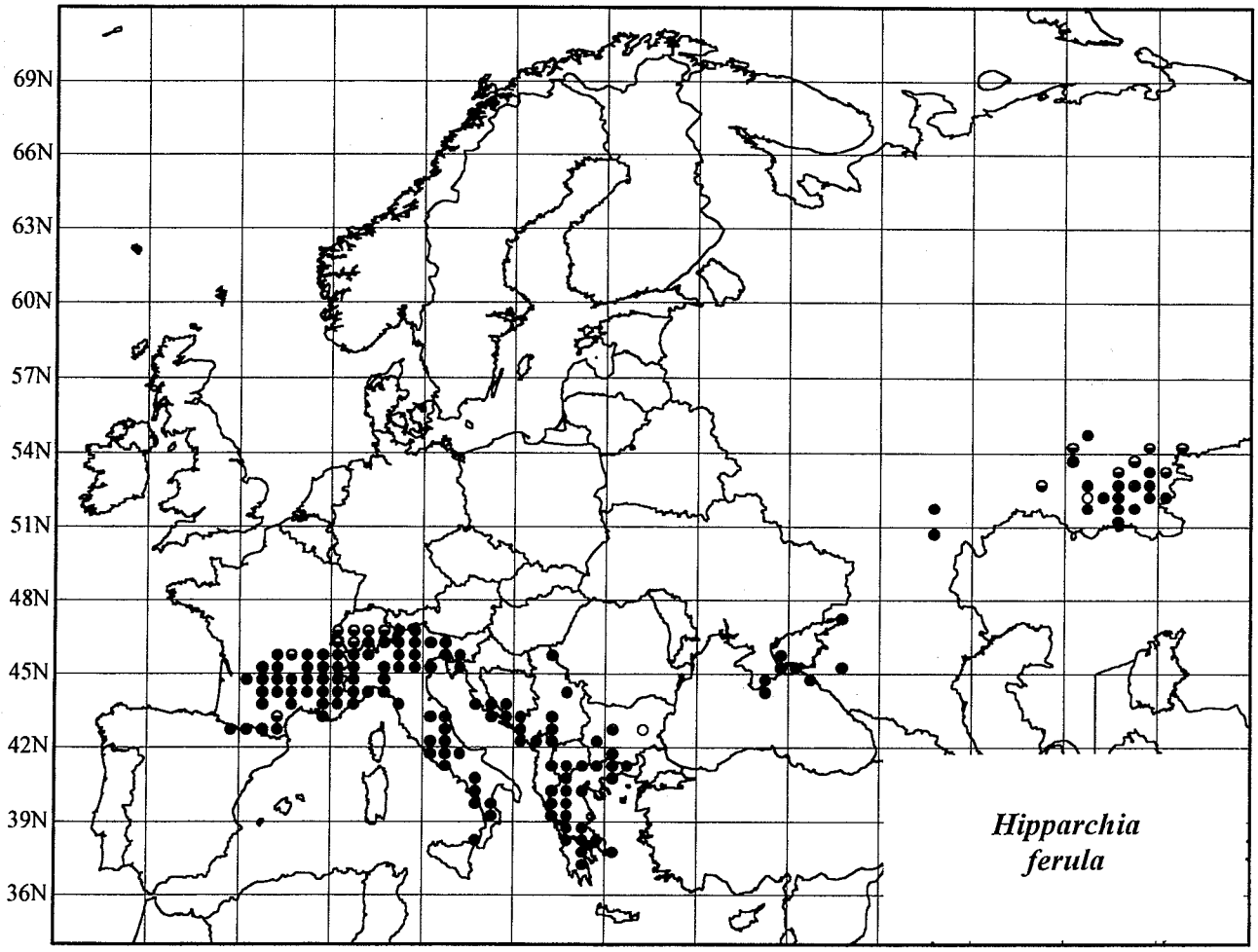
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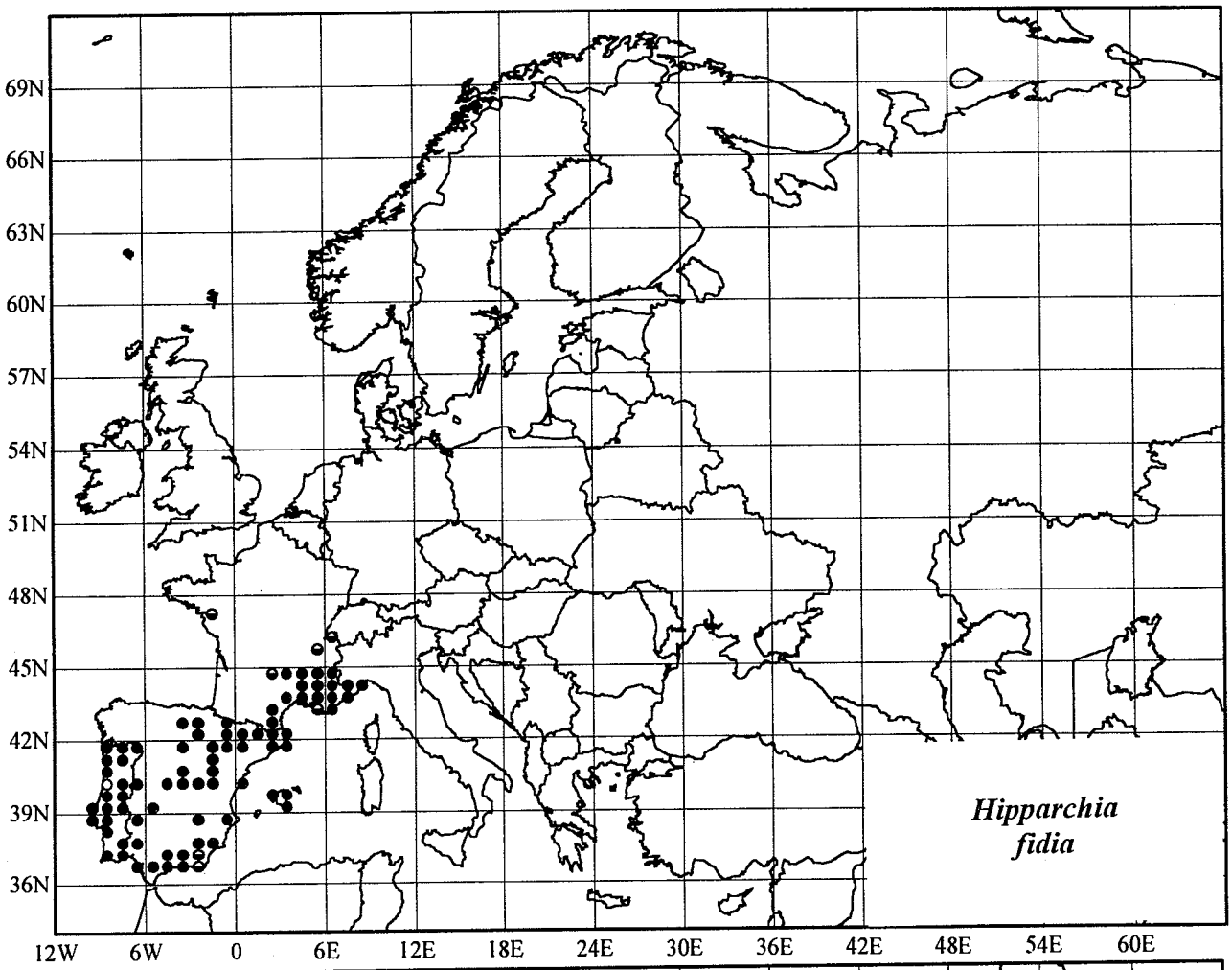
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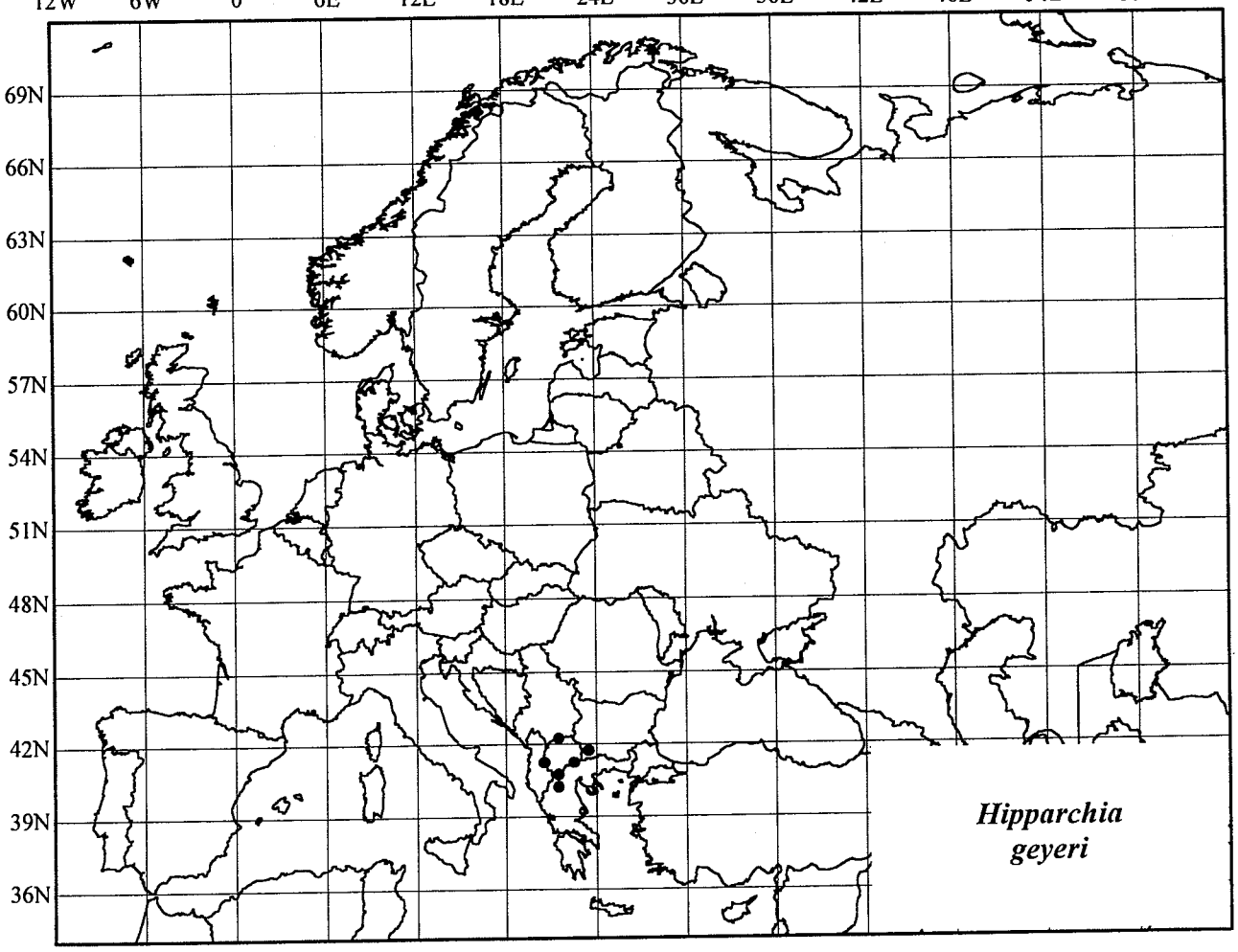
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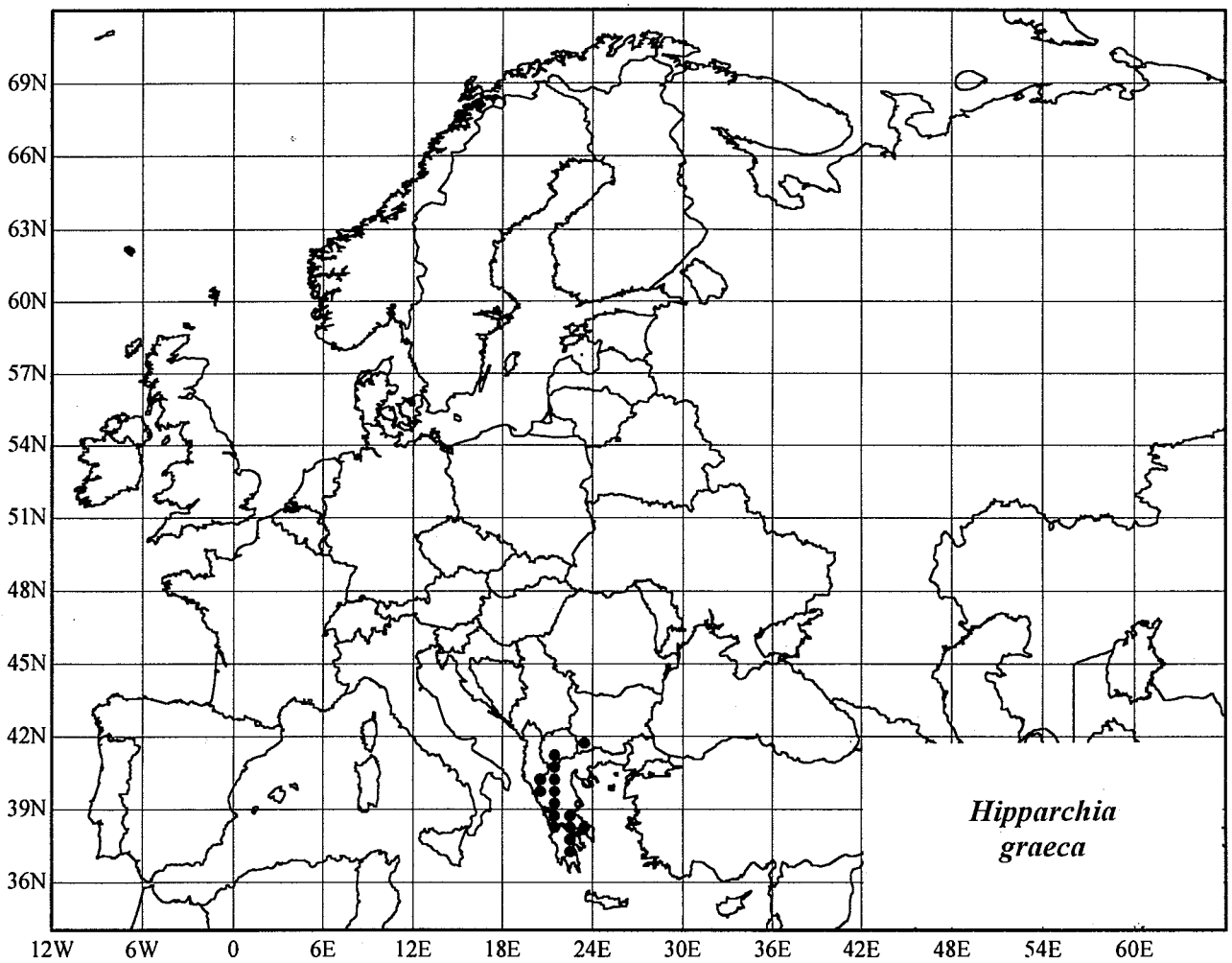
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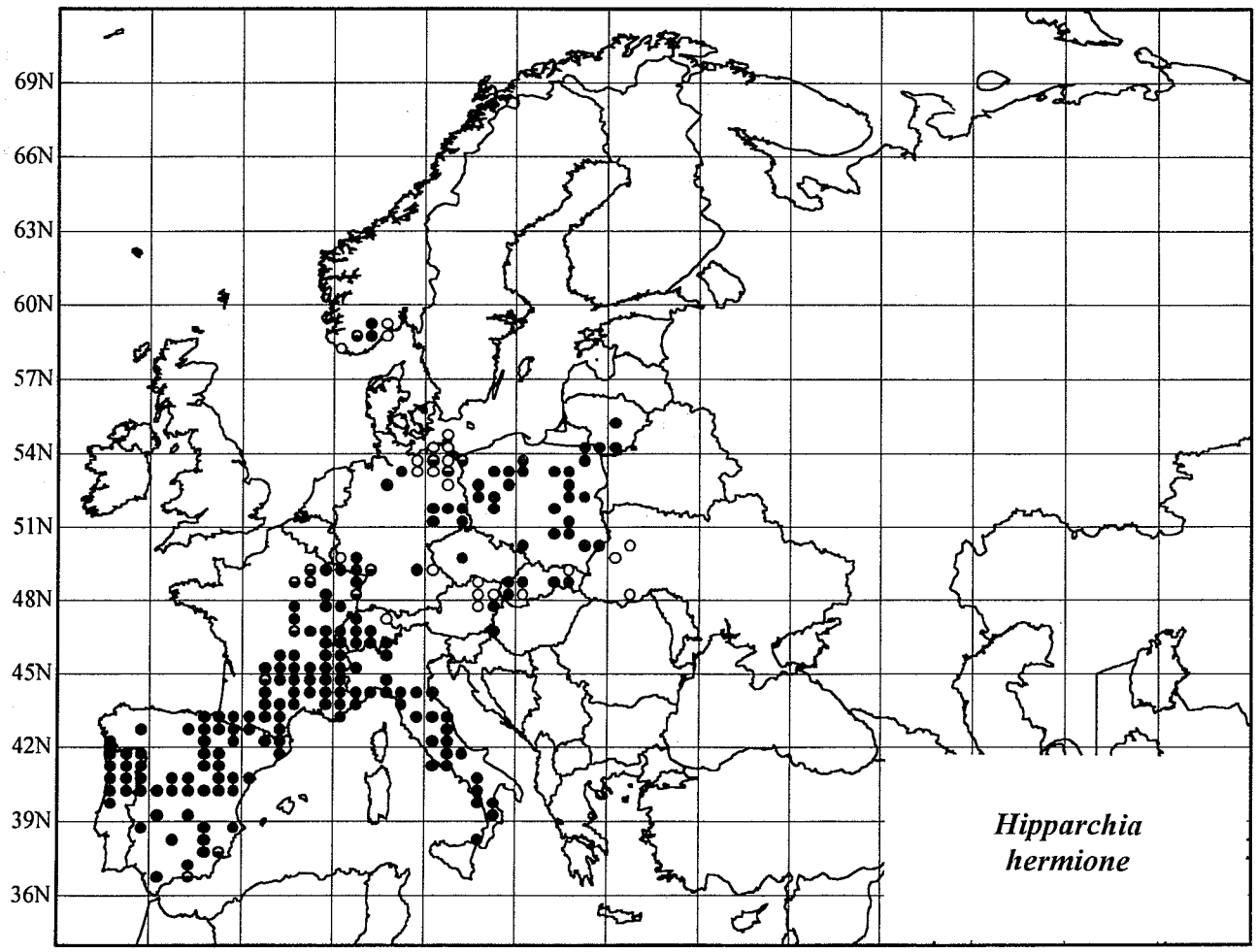
Hipparchia graeca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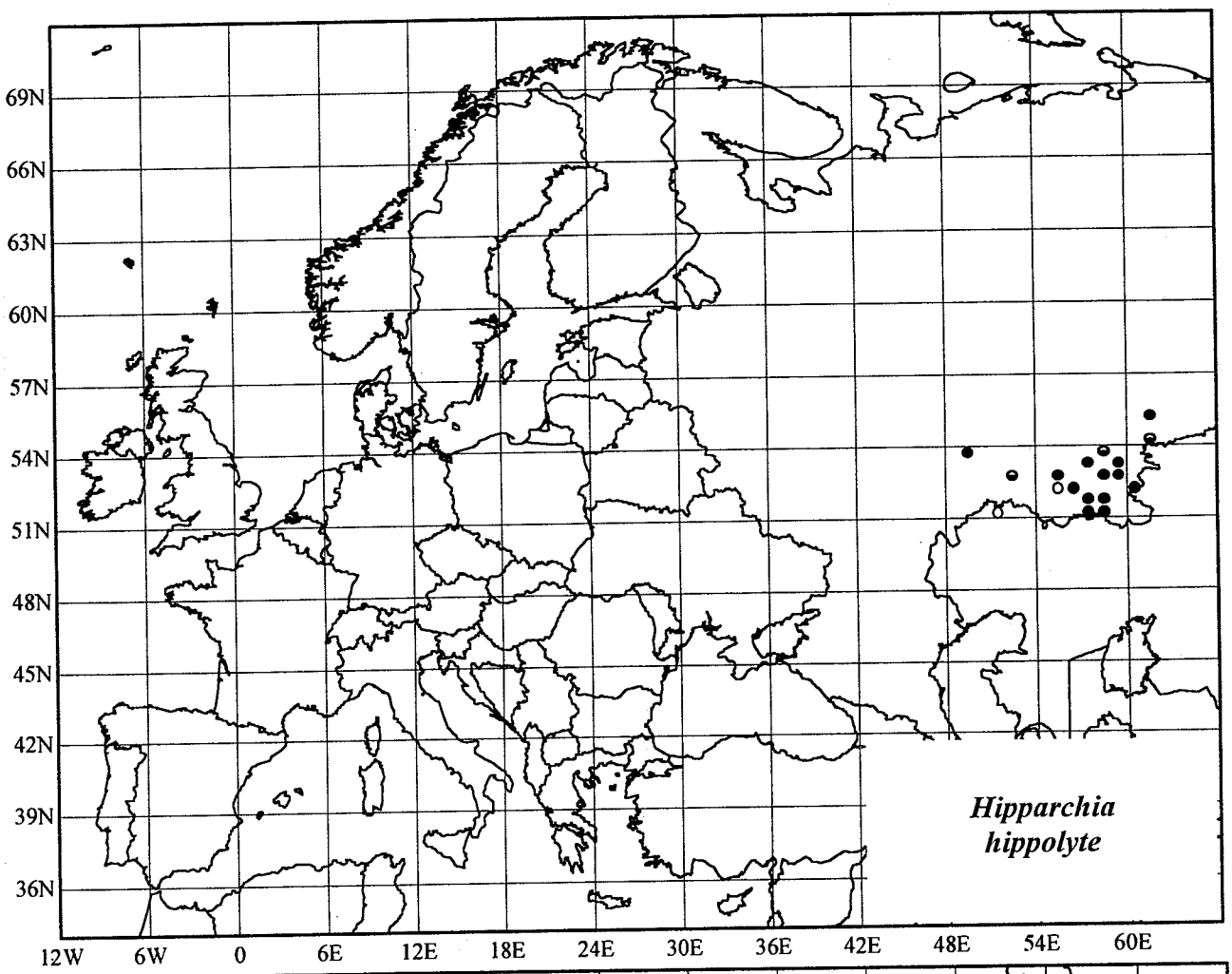
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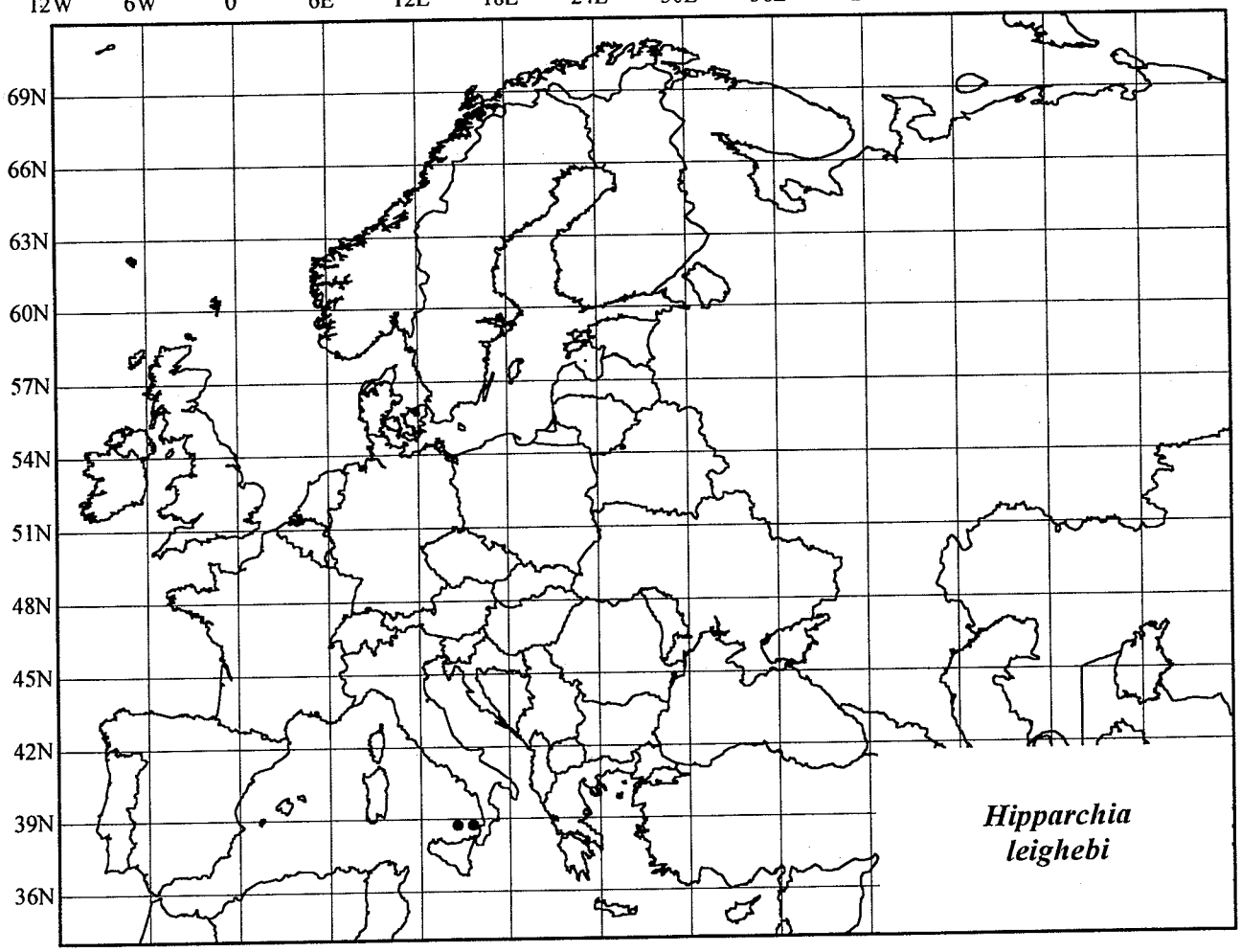
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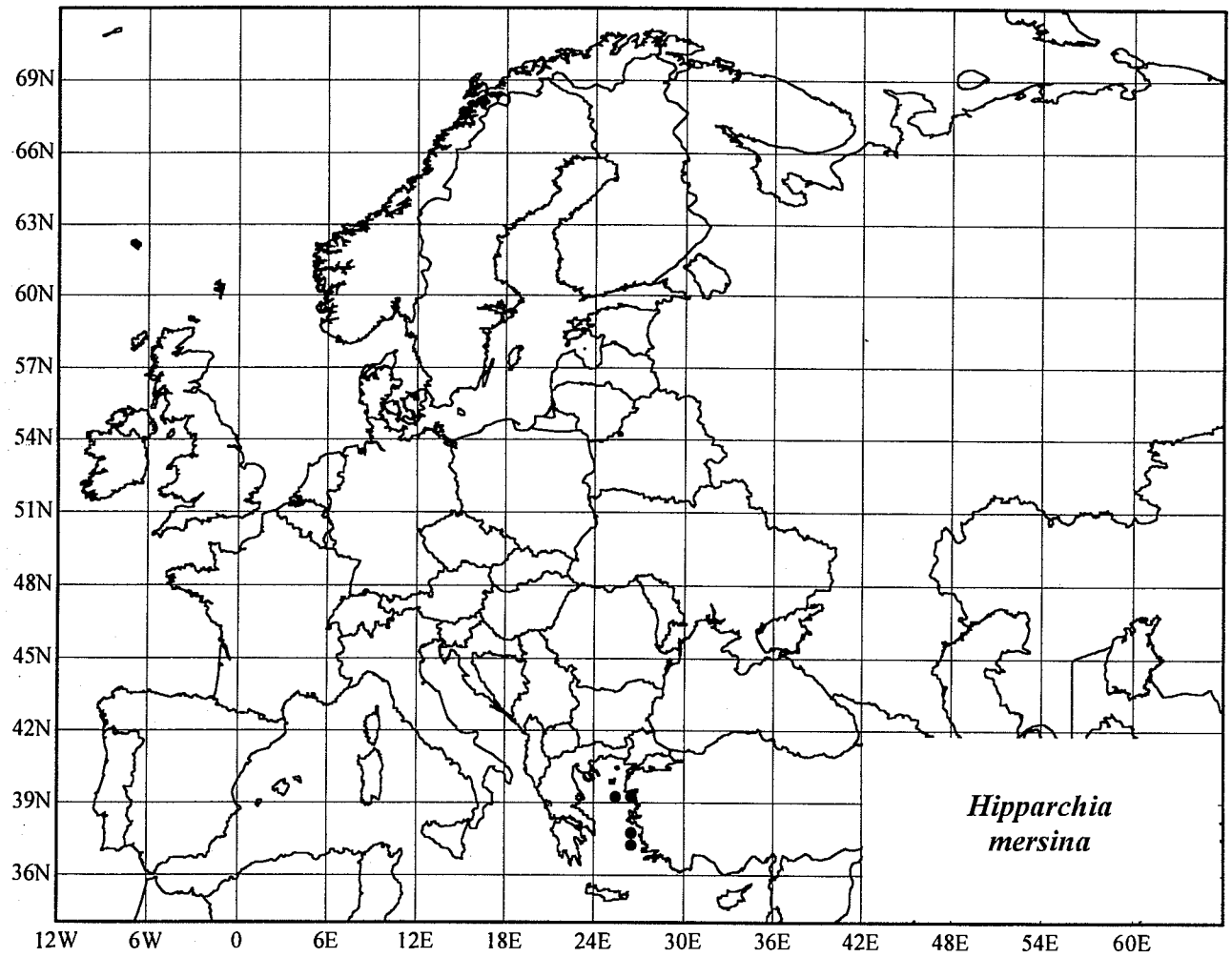
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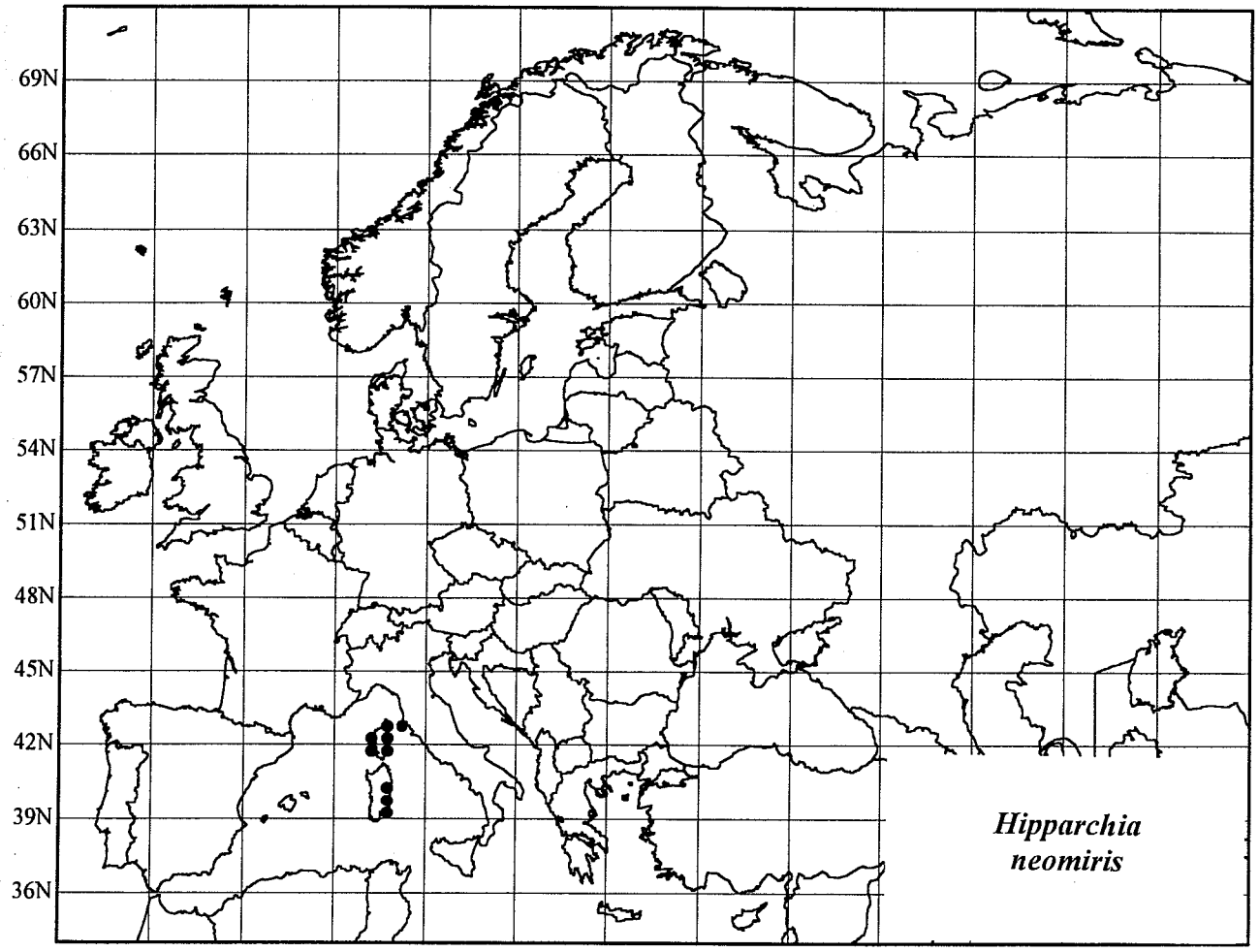
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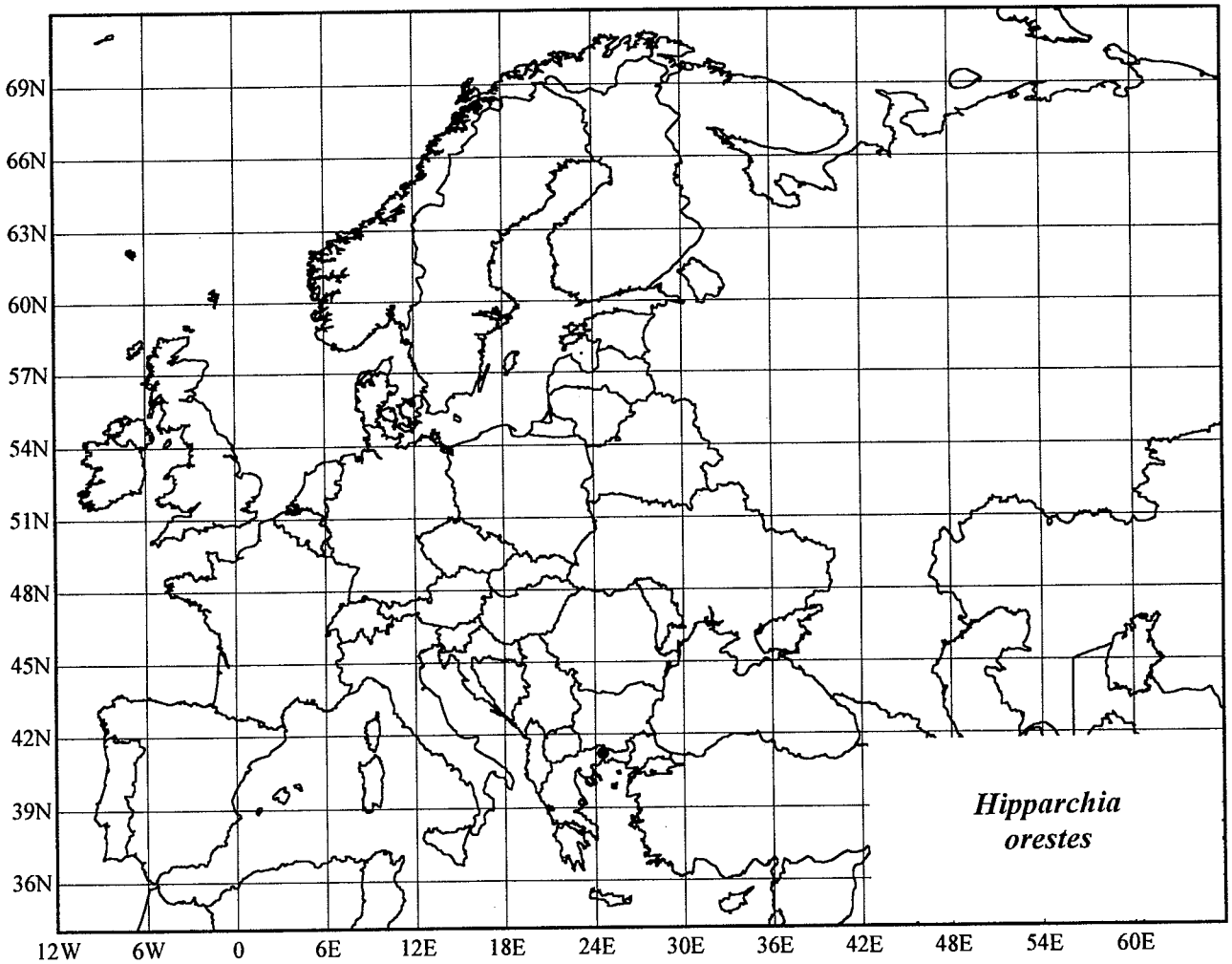
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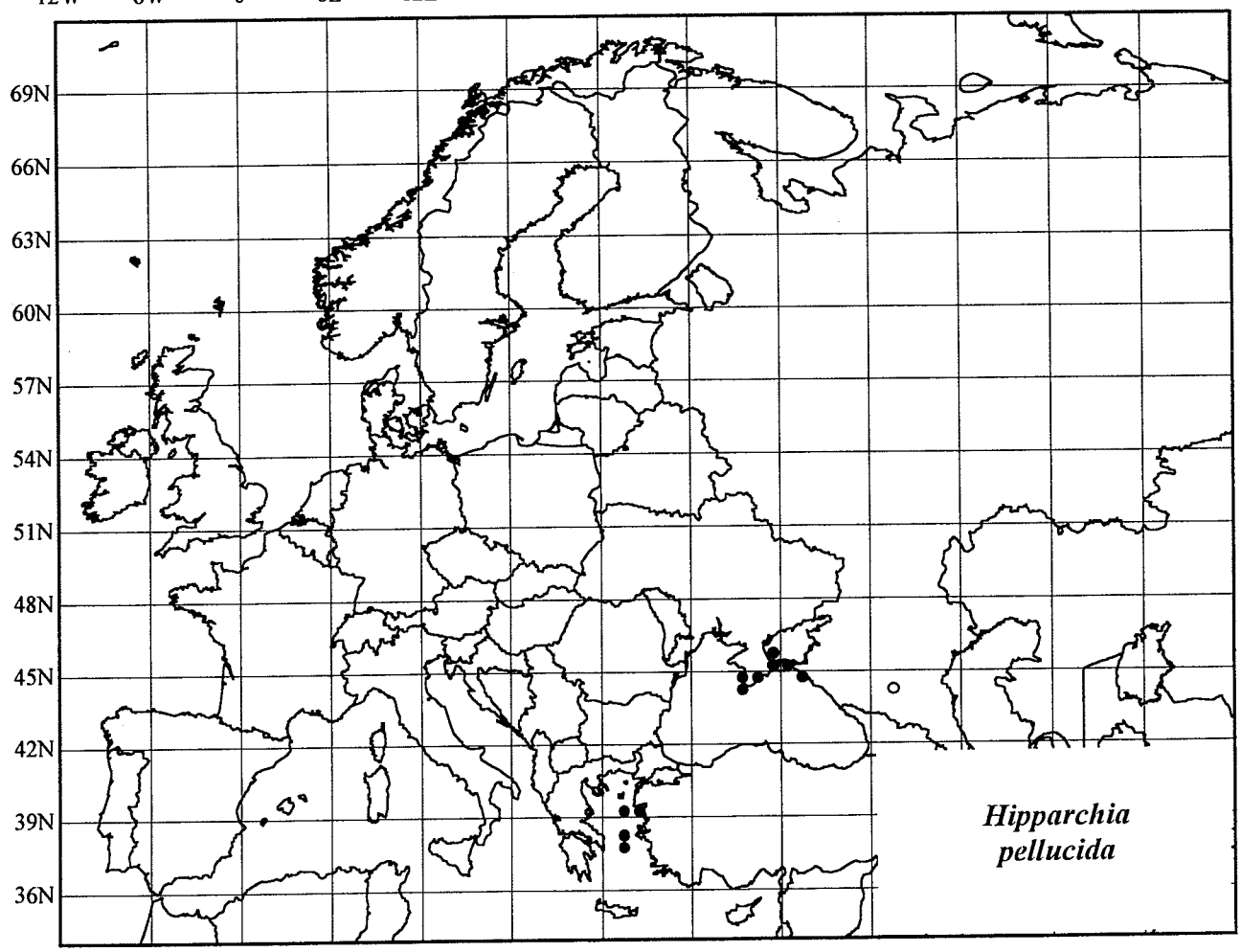
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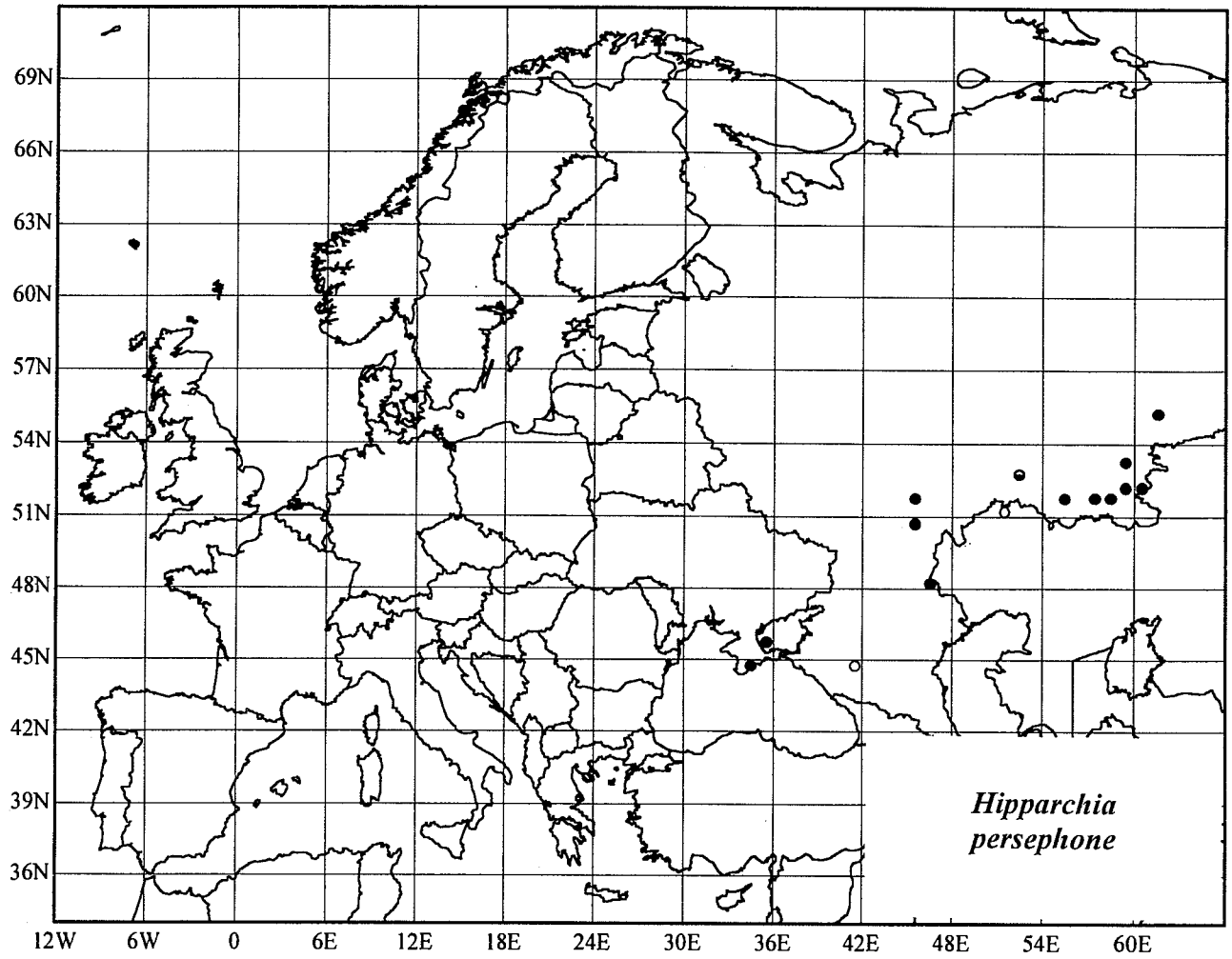
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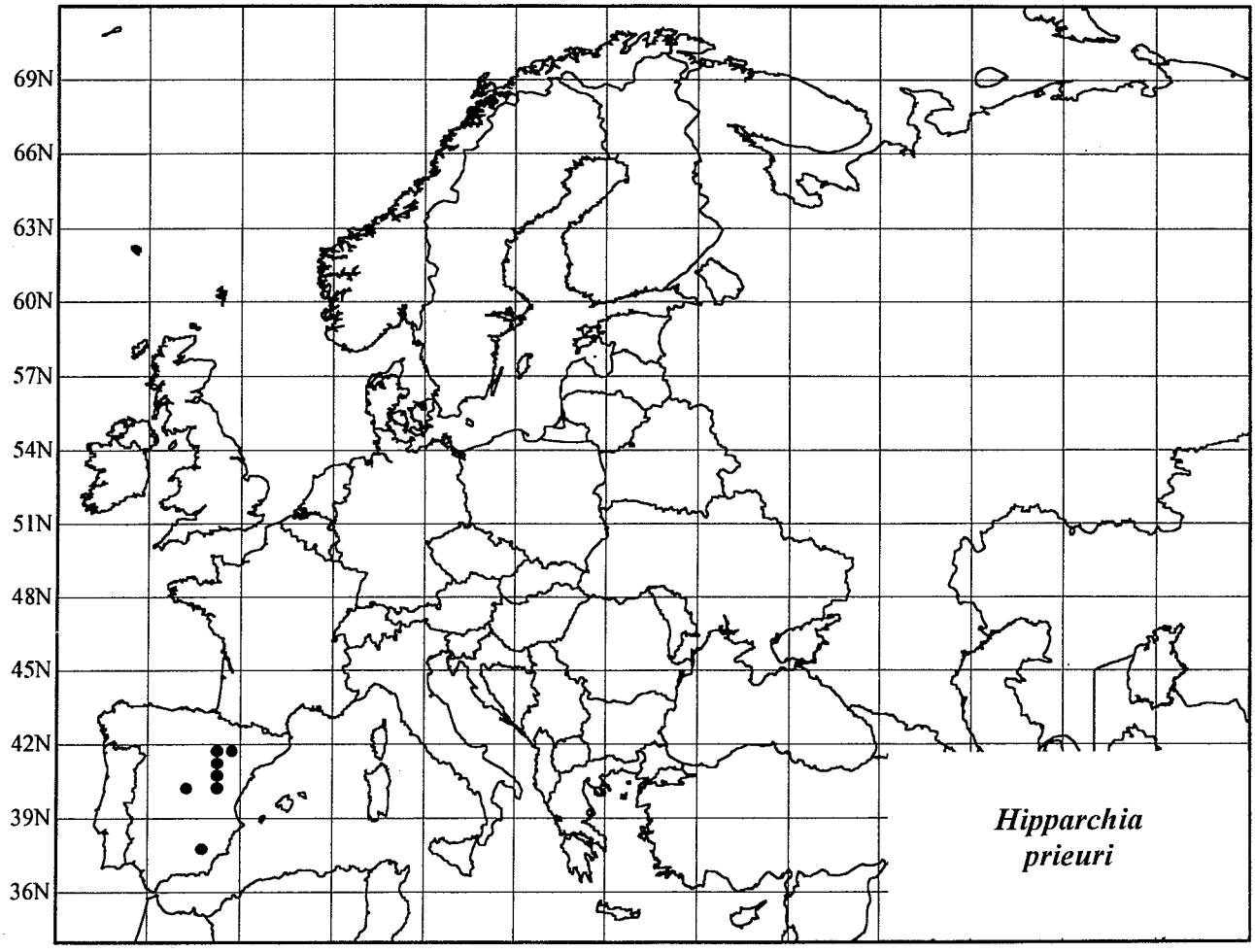
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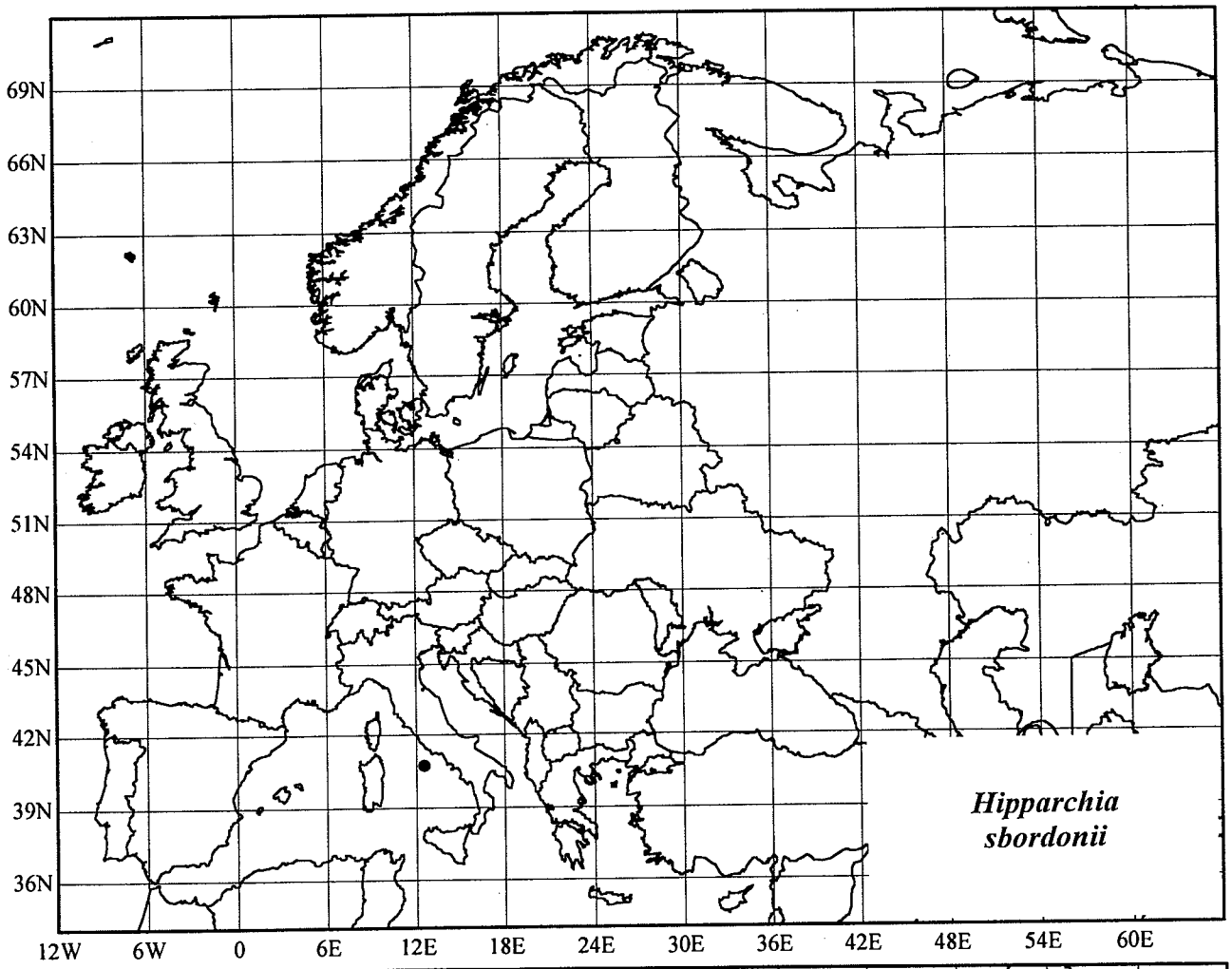
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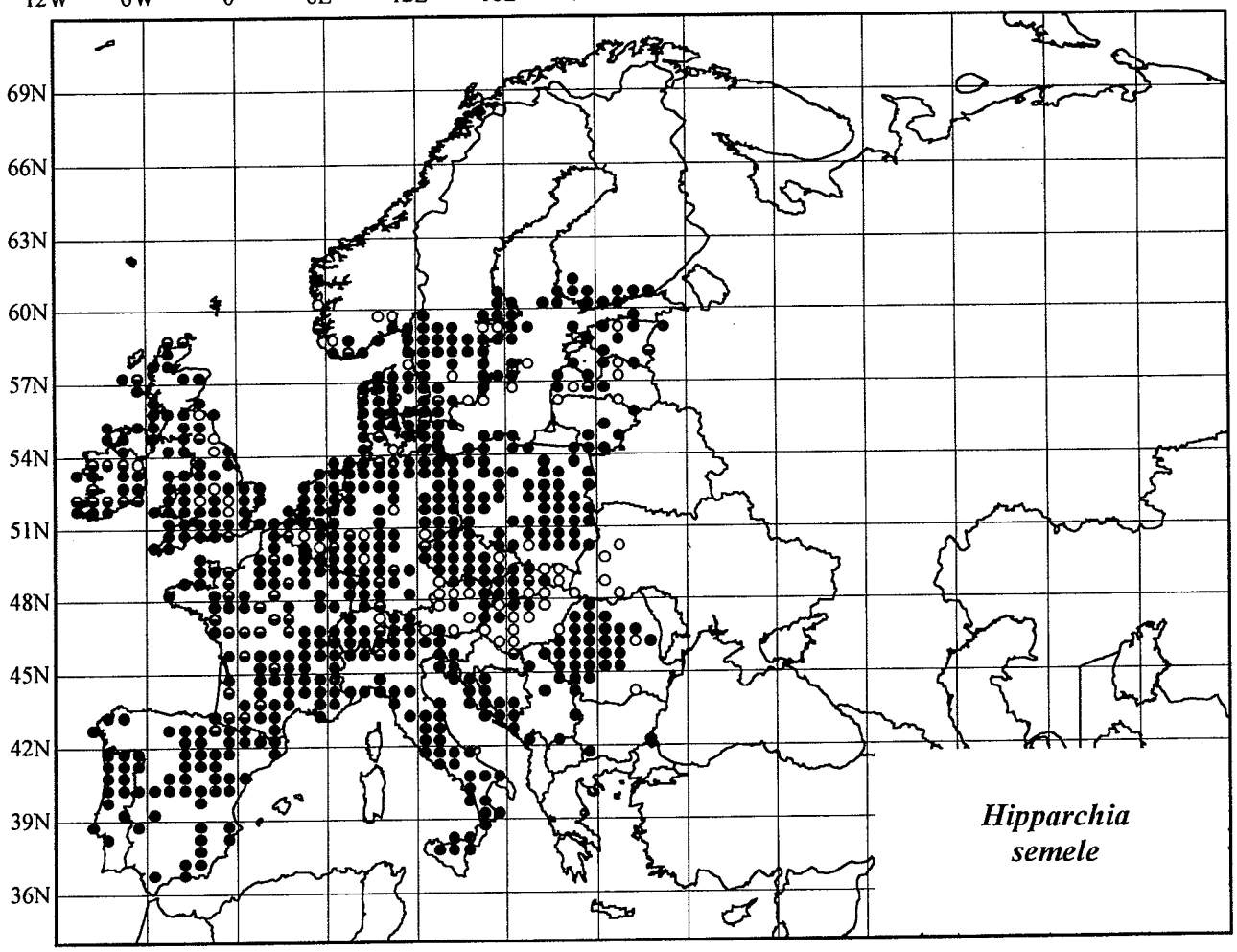
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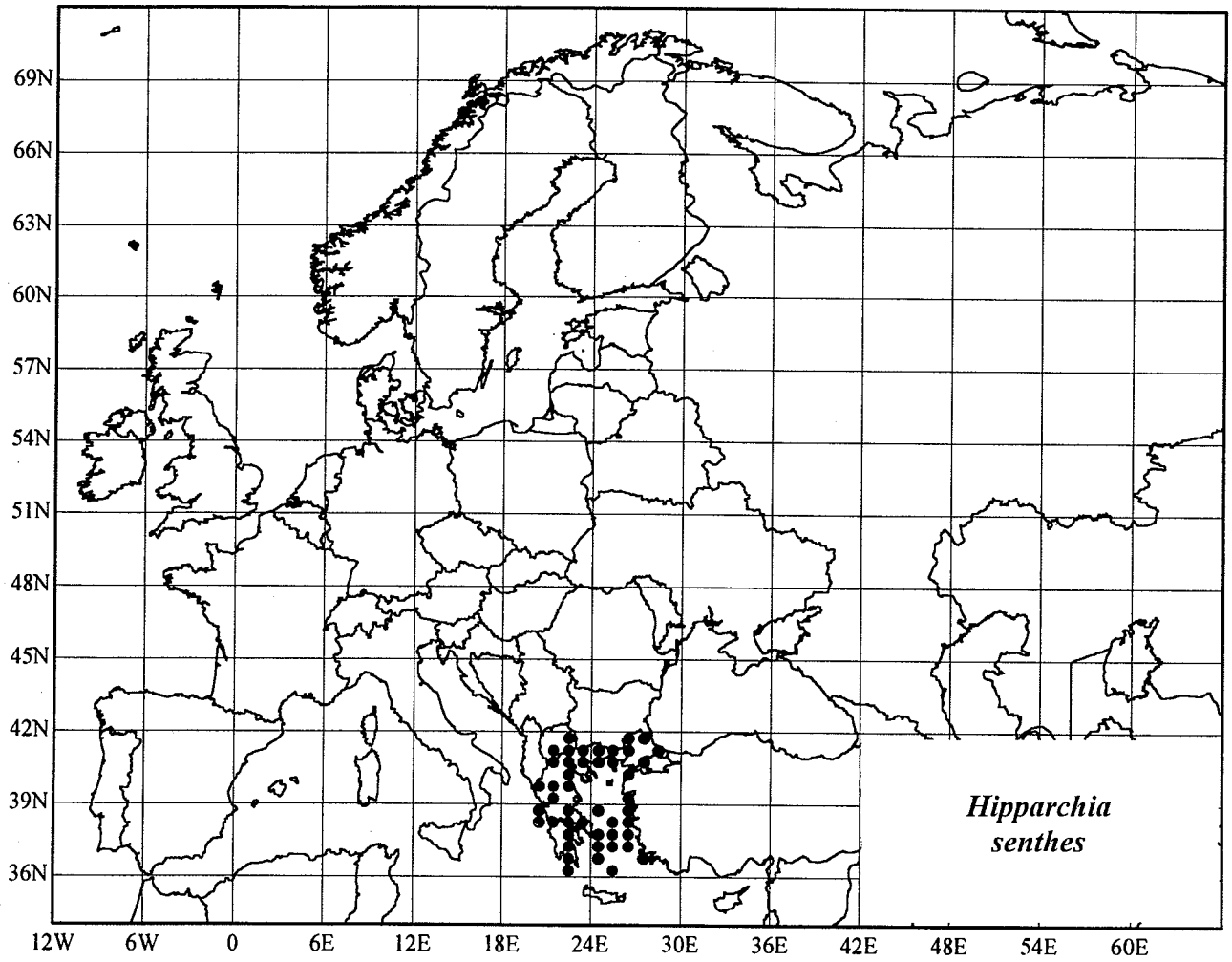
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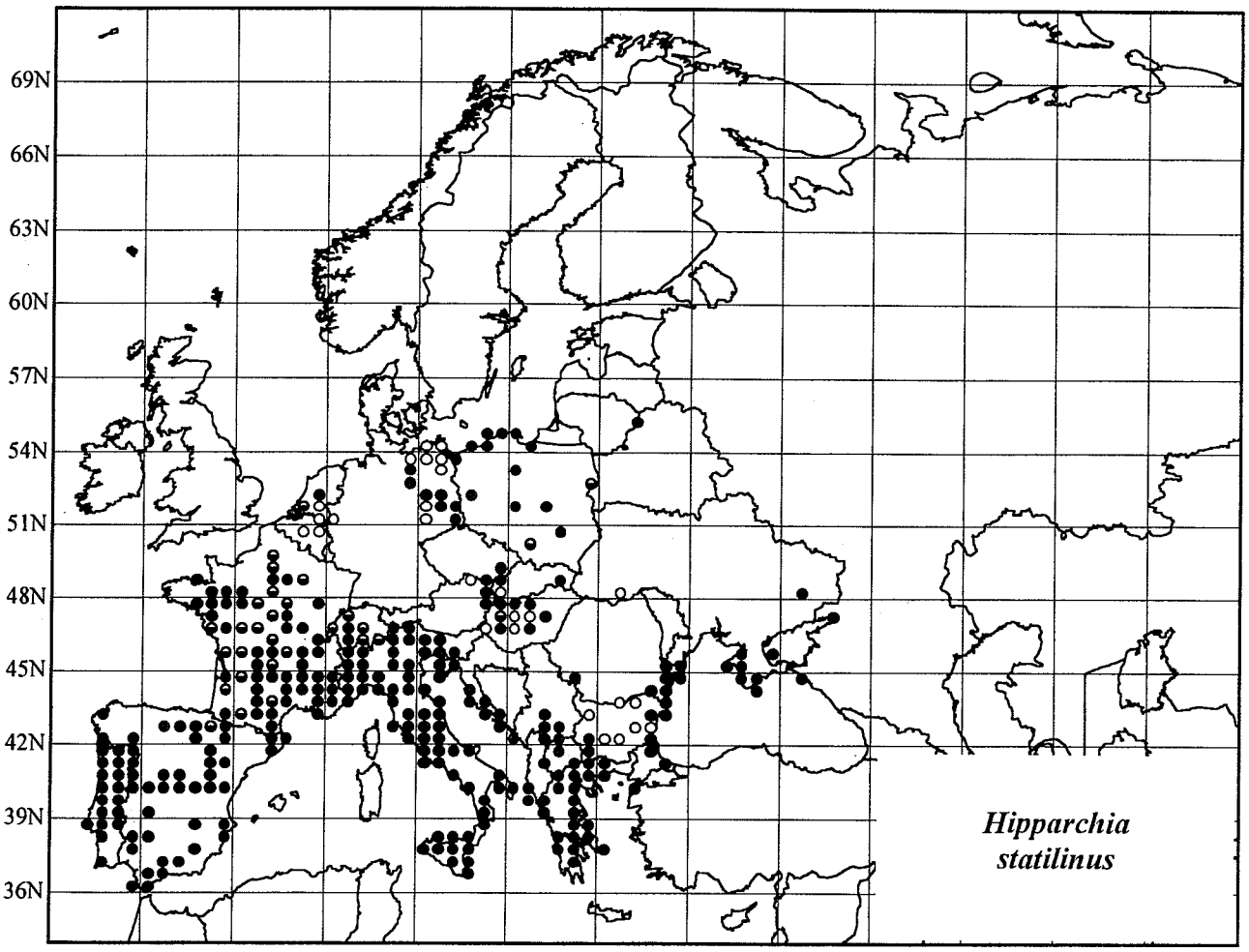
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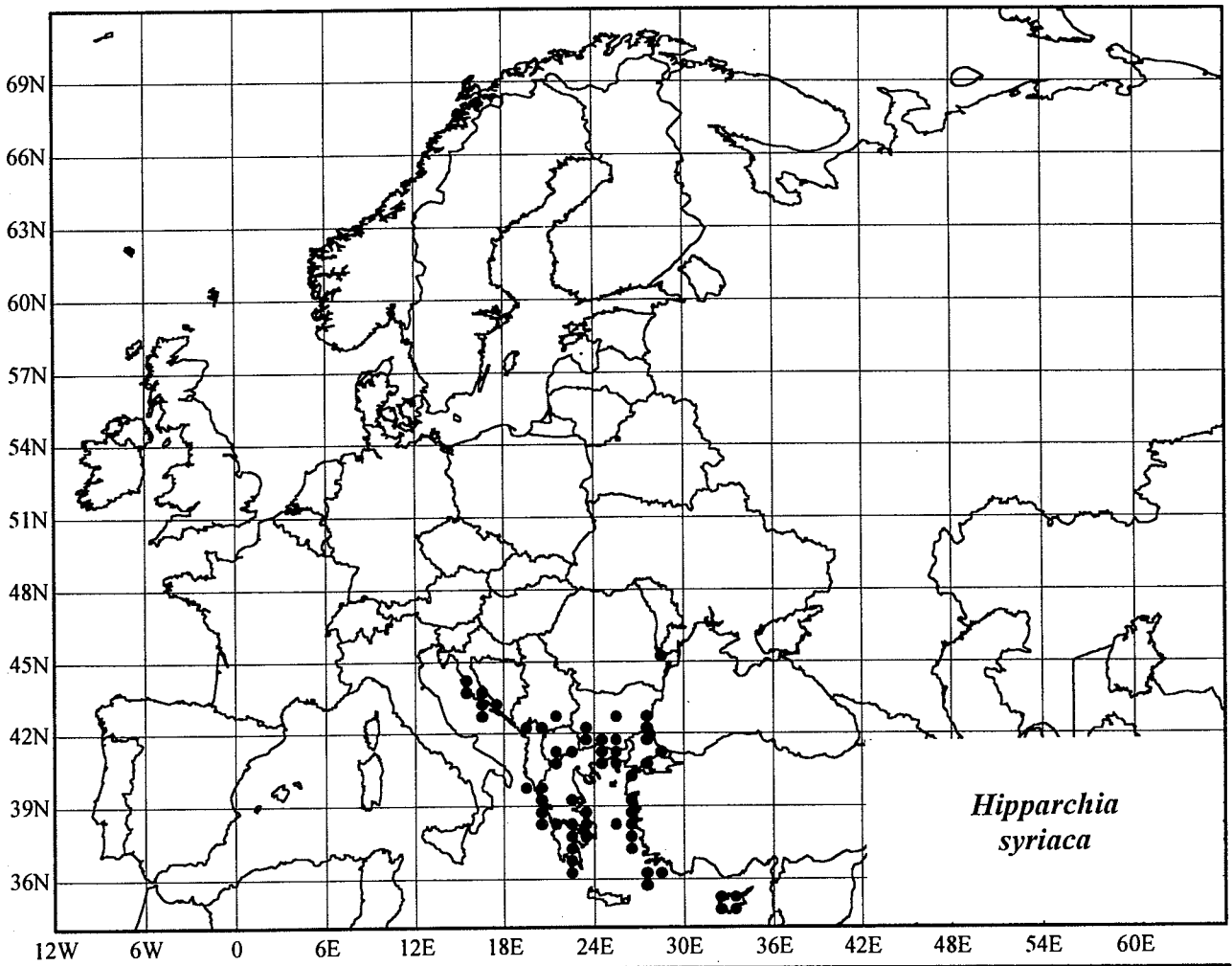
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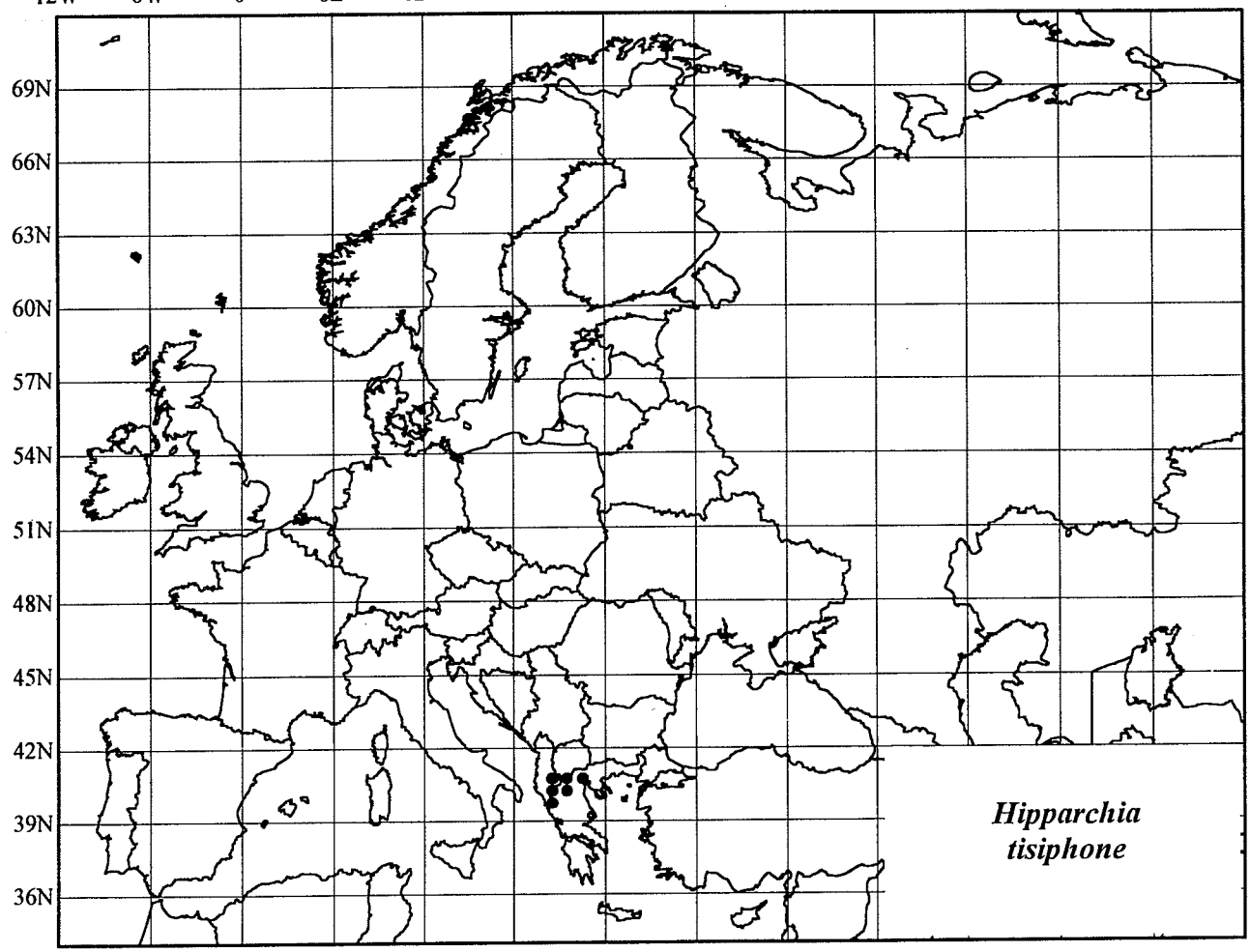
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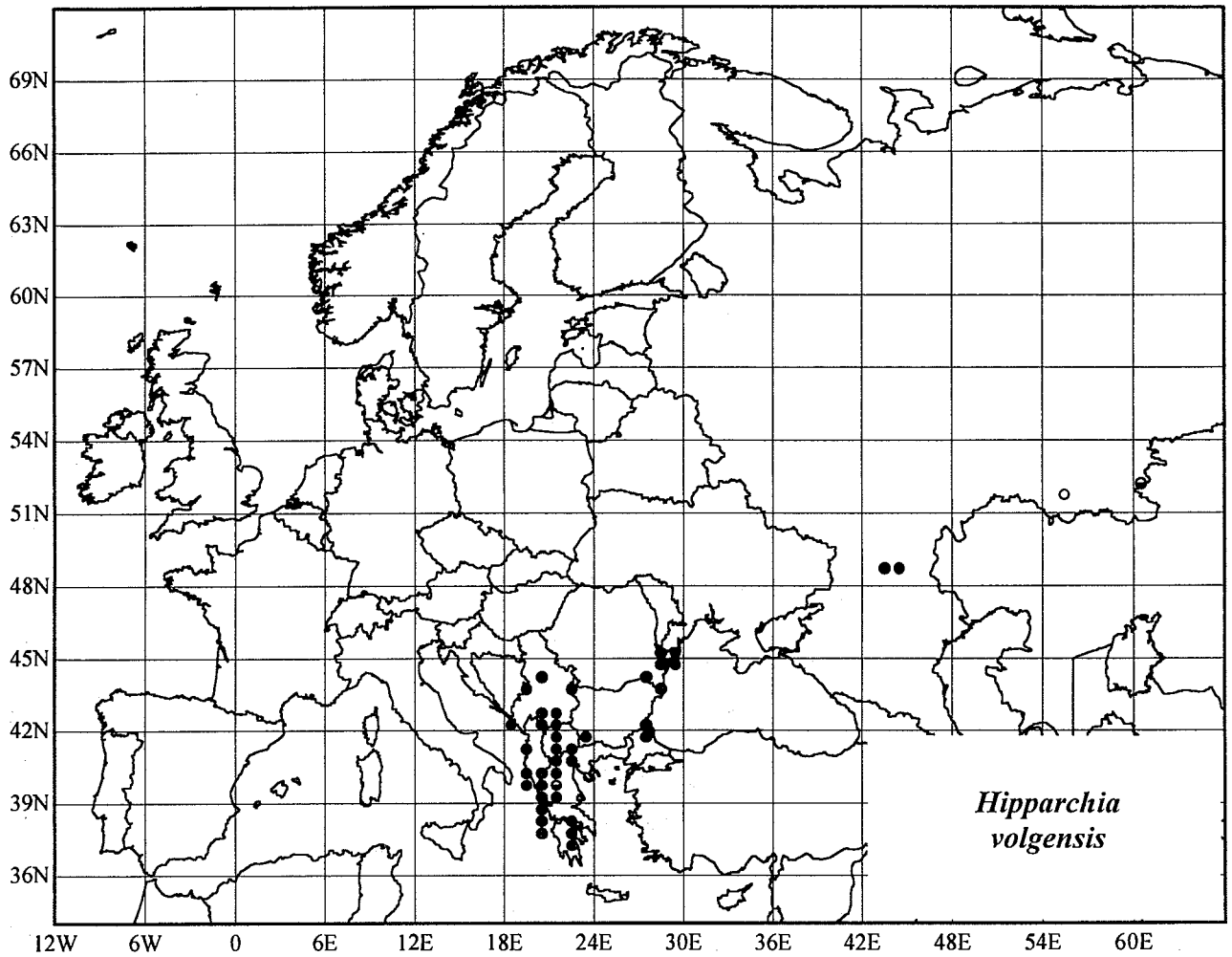
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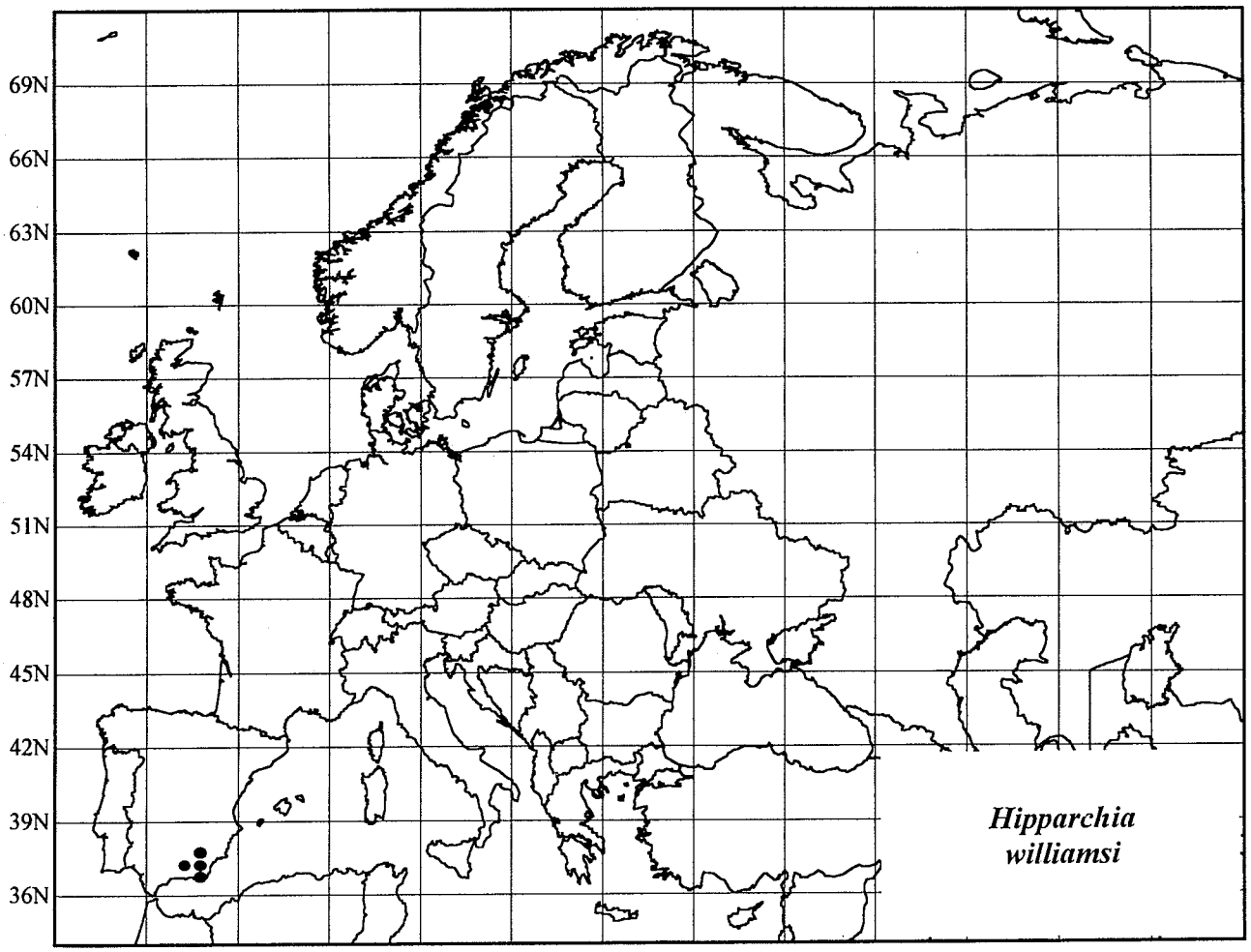
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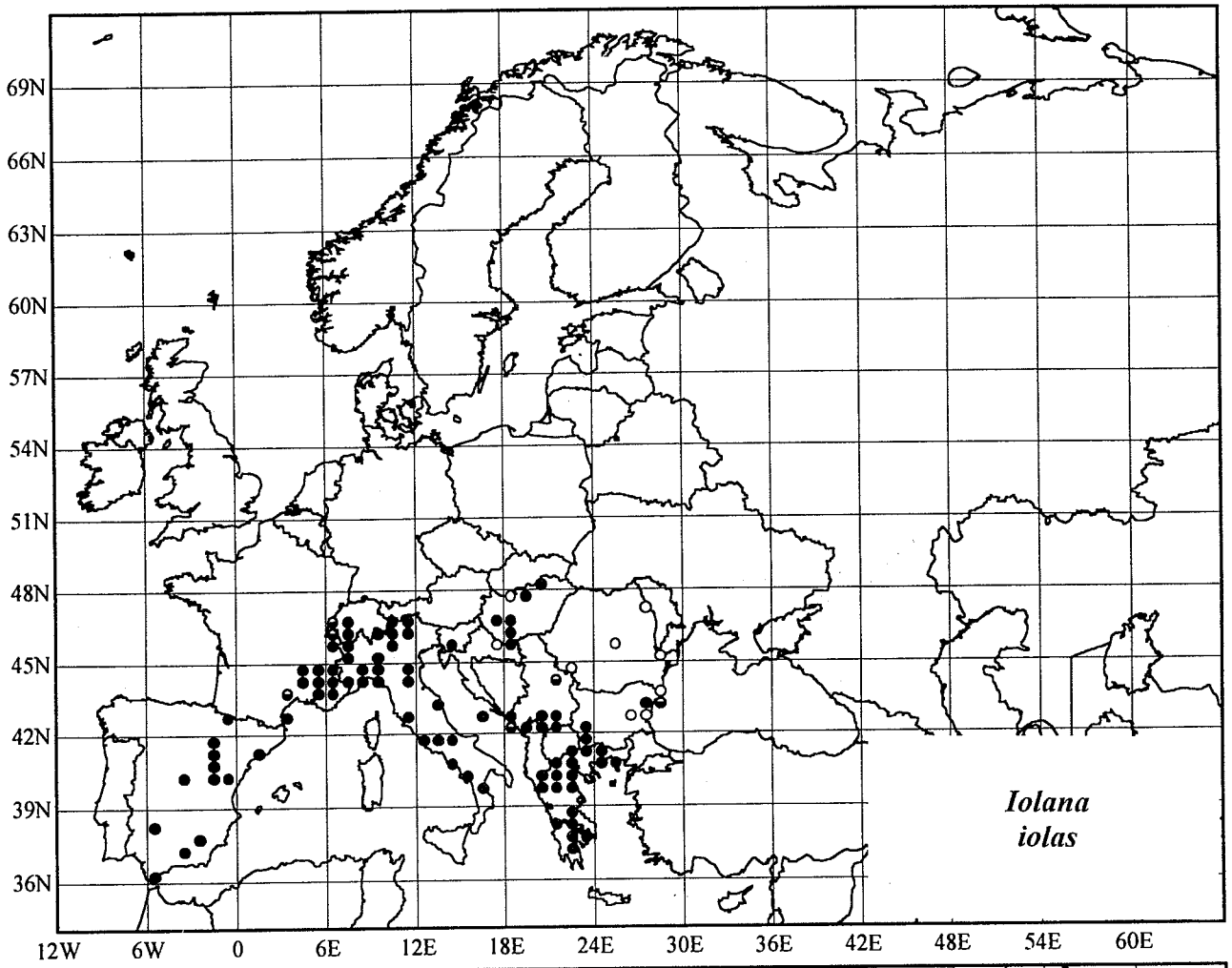
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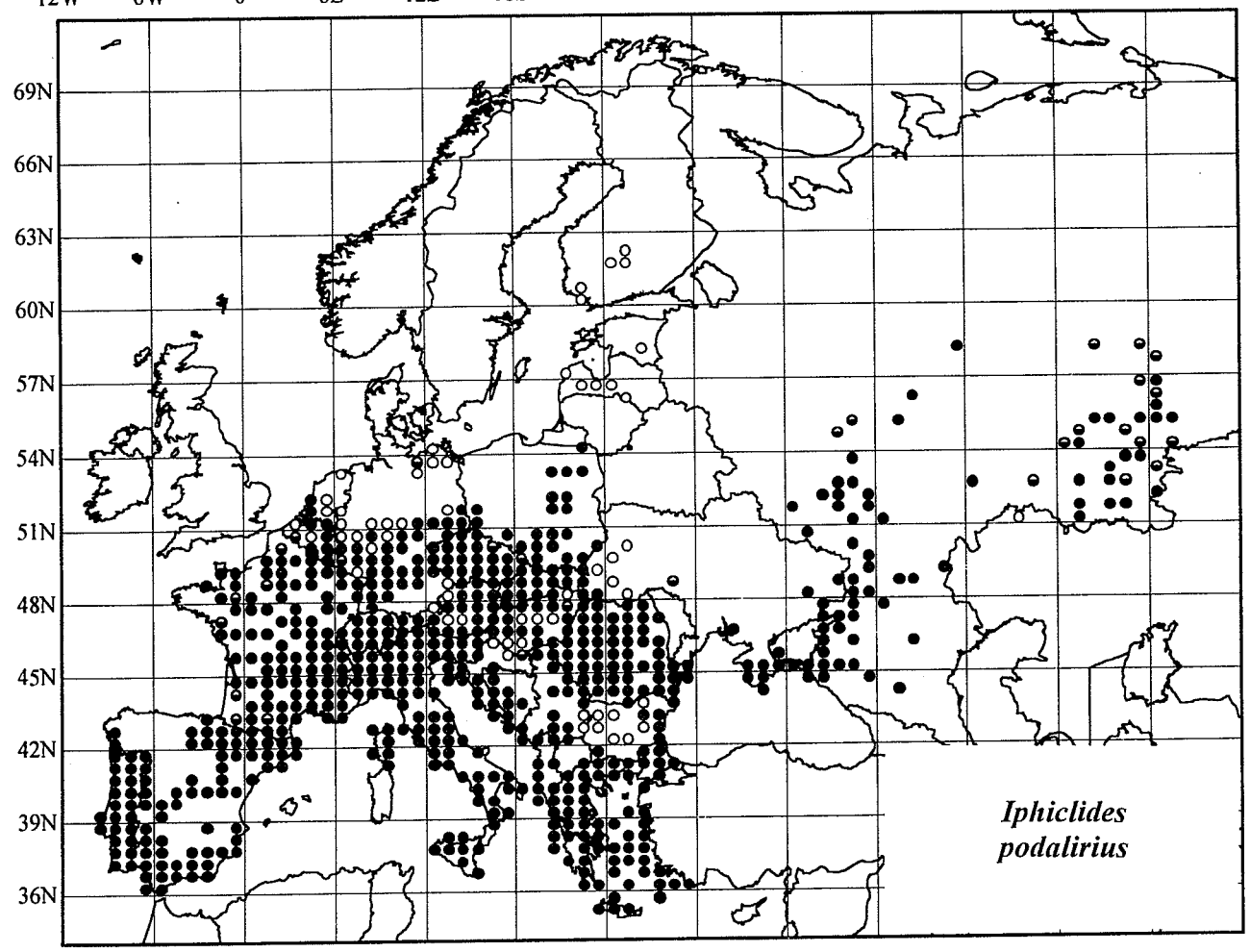
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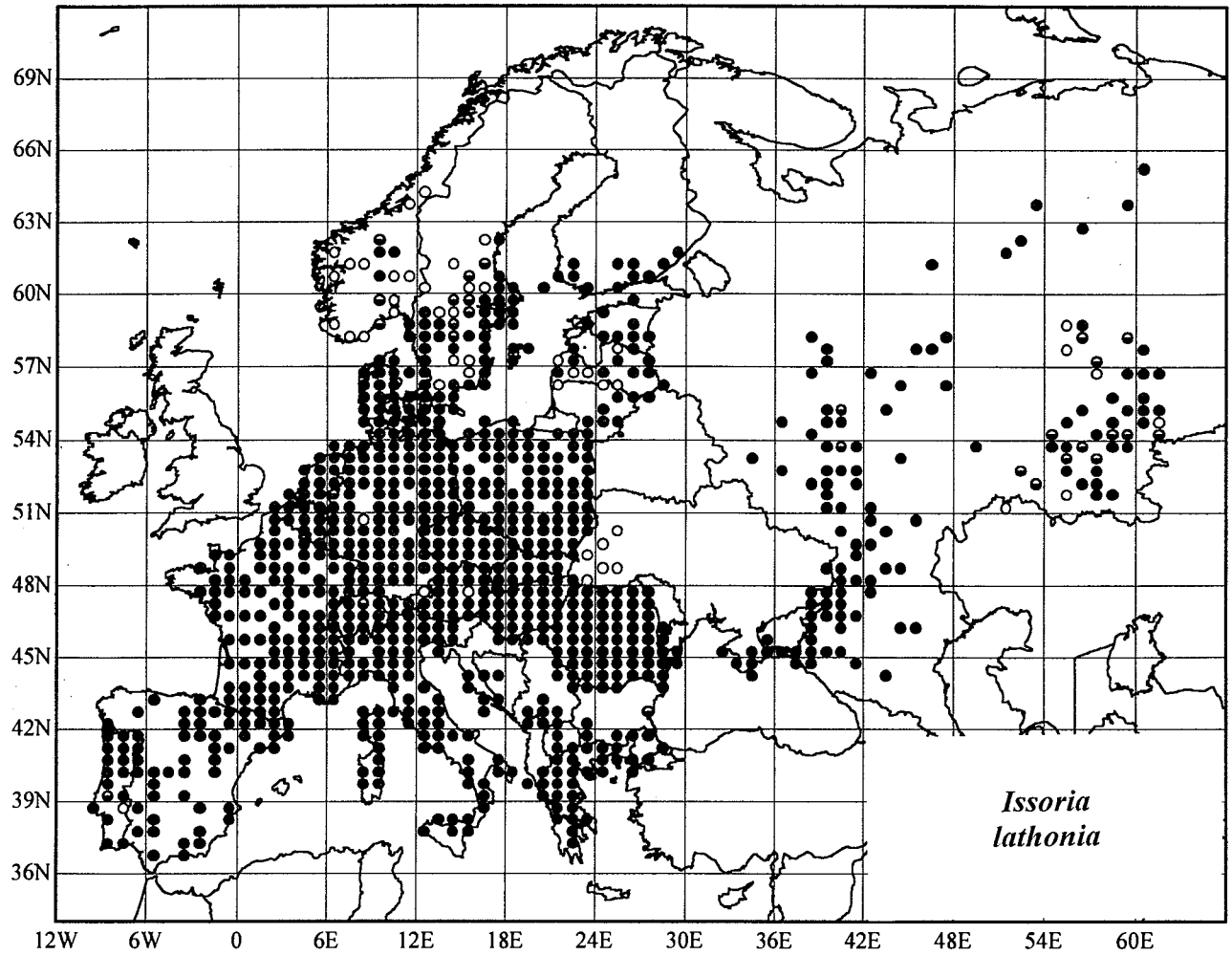
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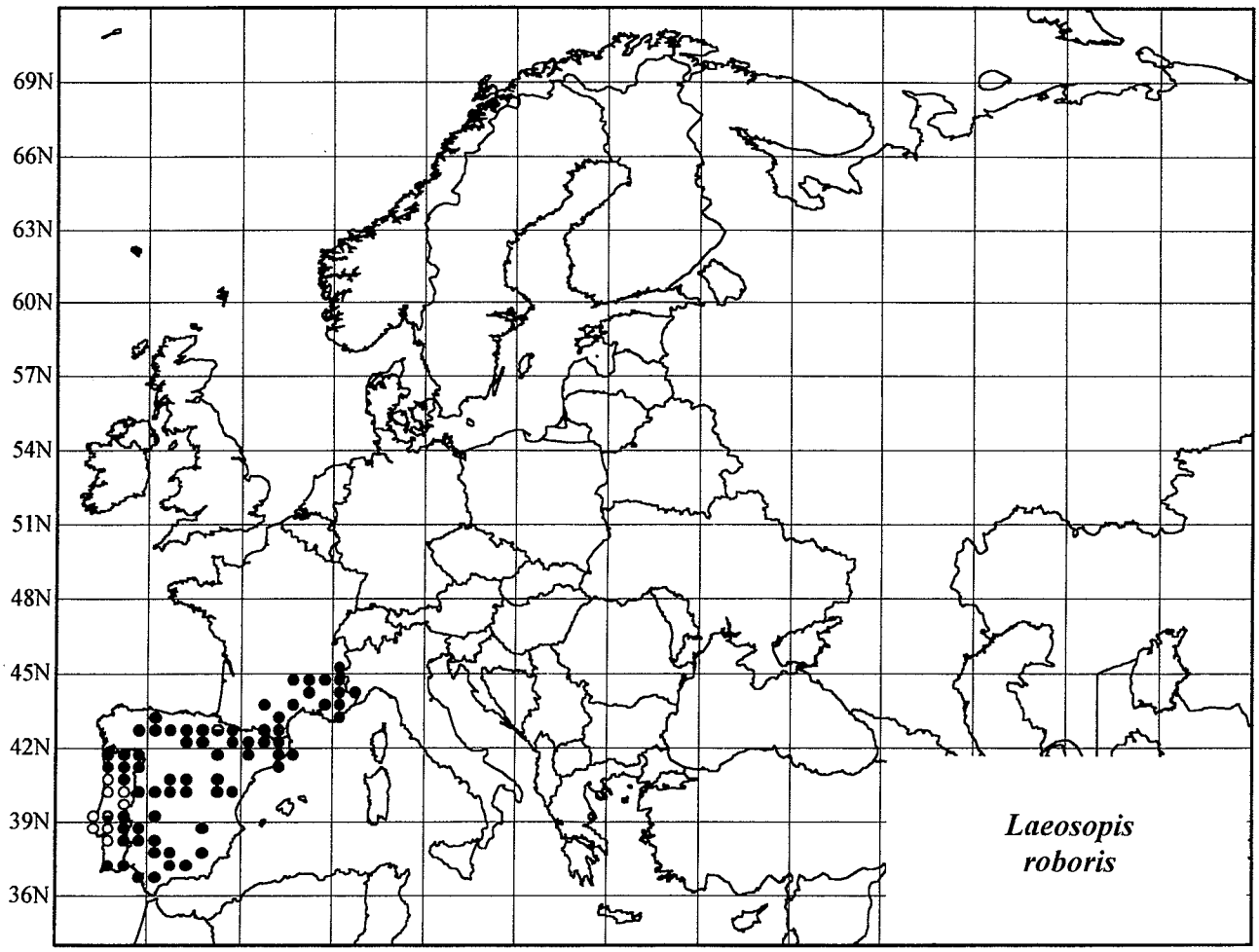
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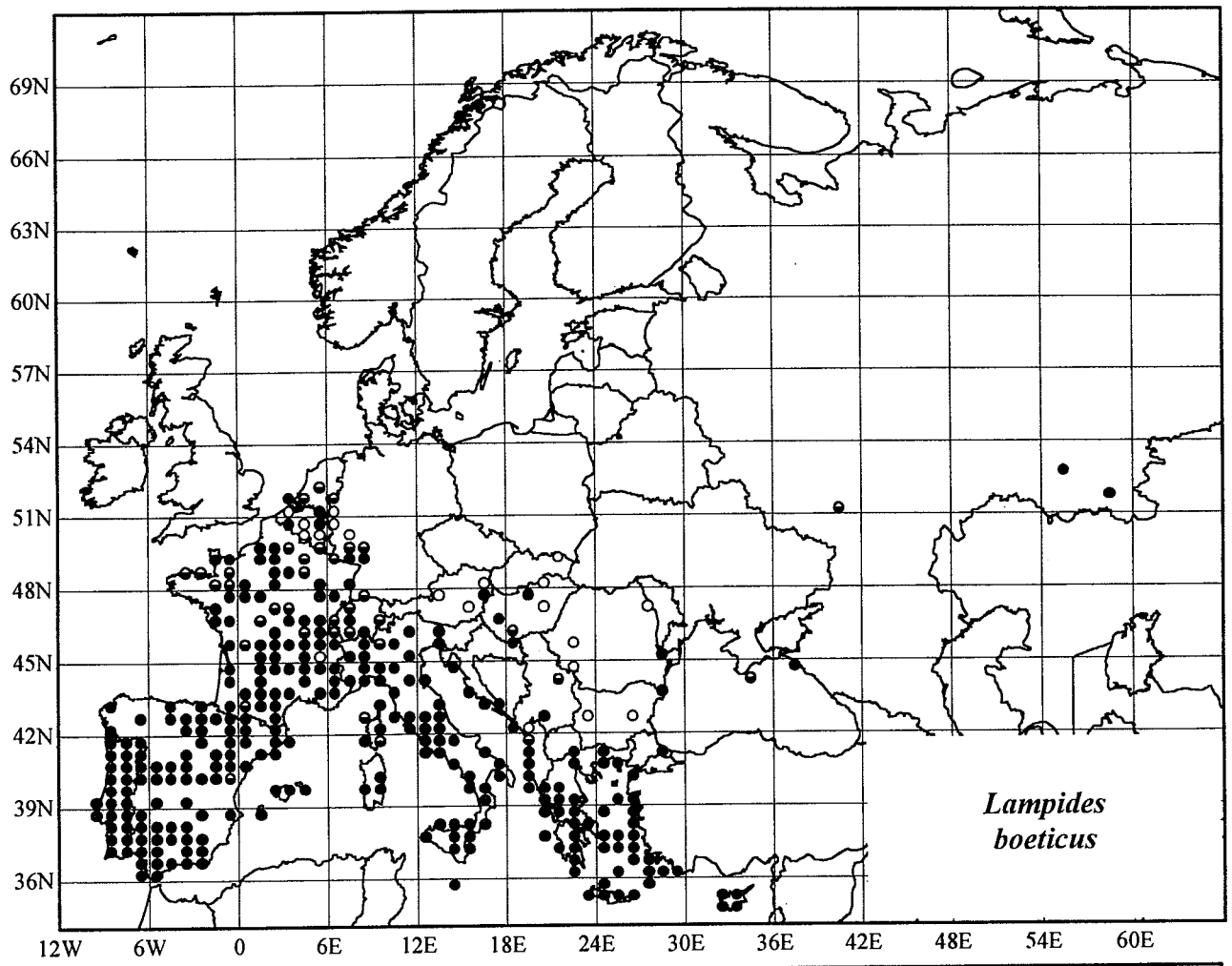
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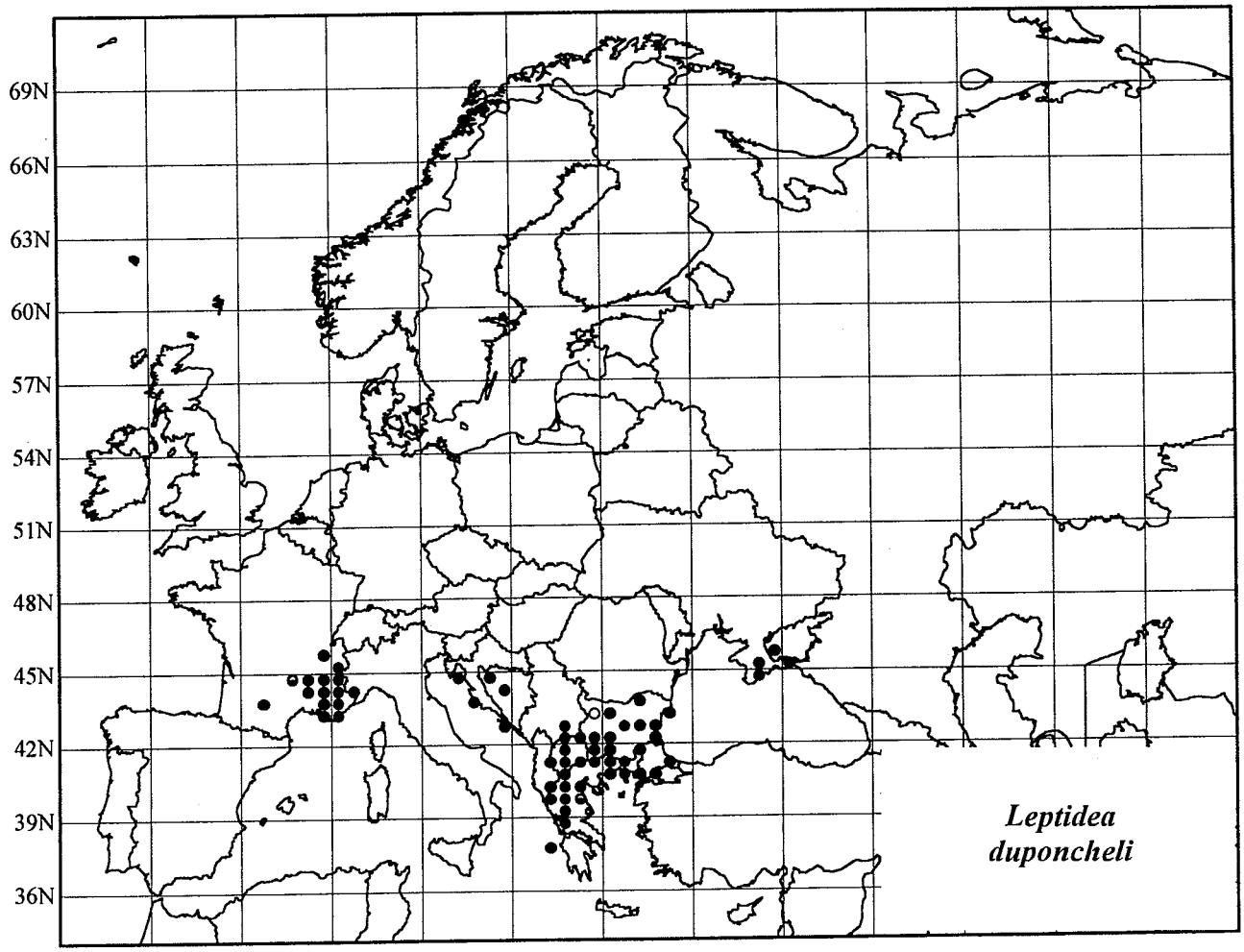
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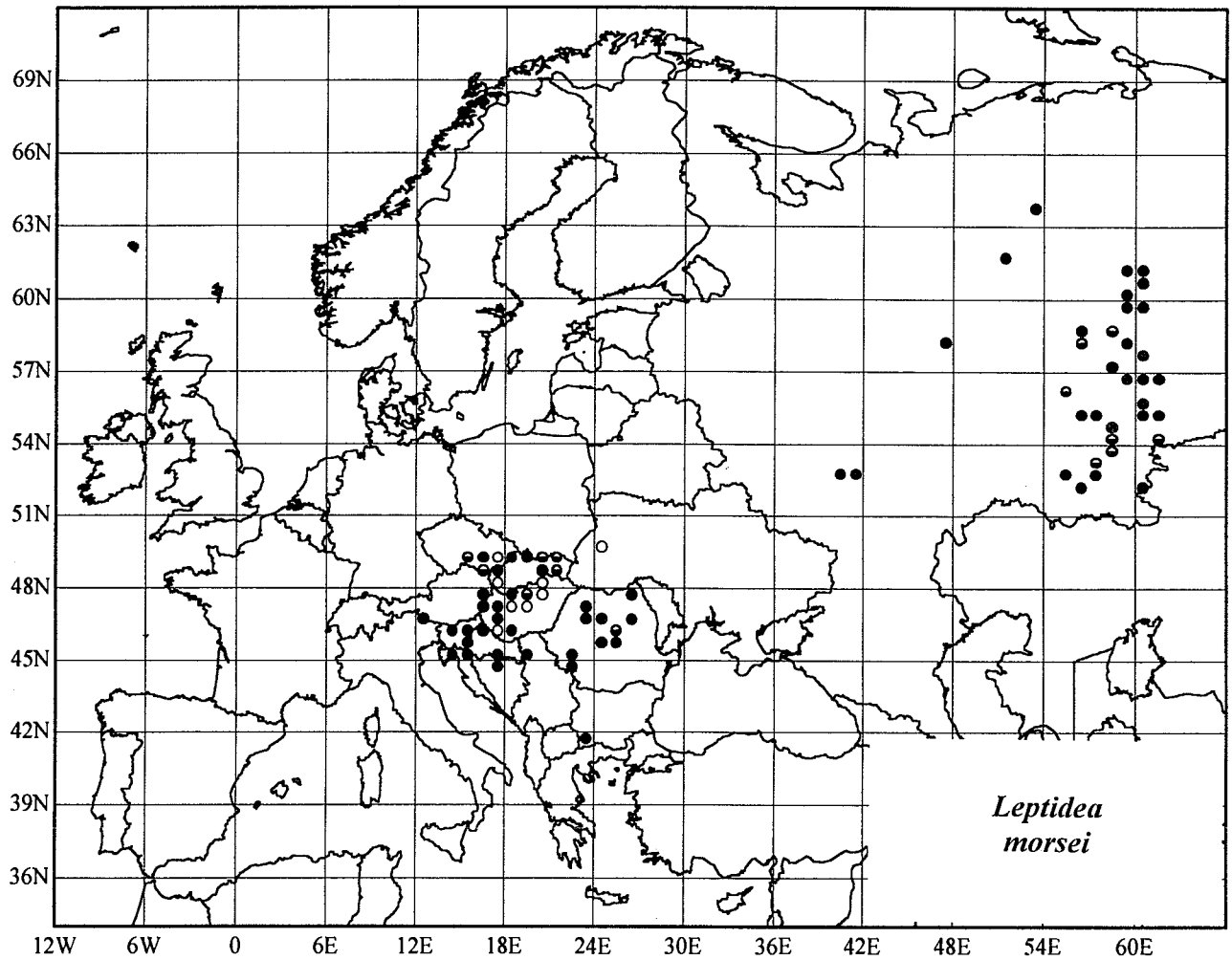
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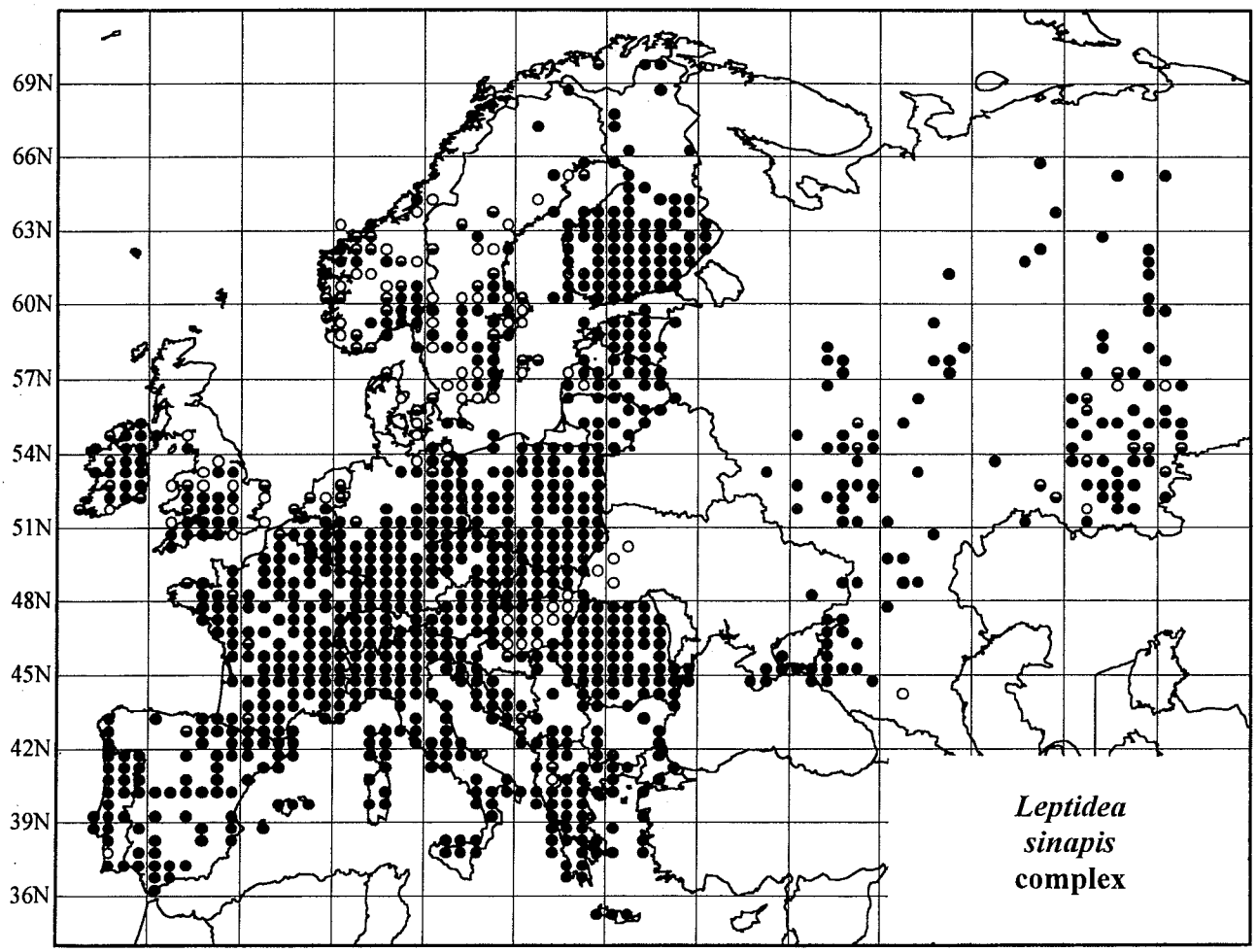
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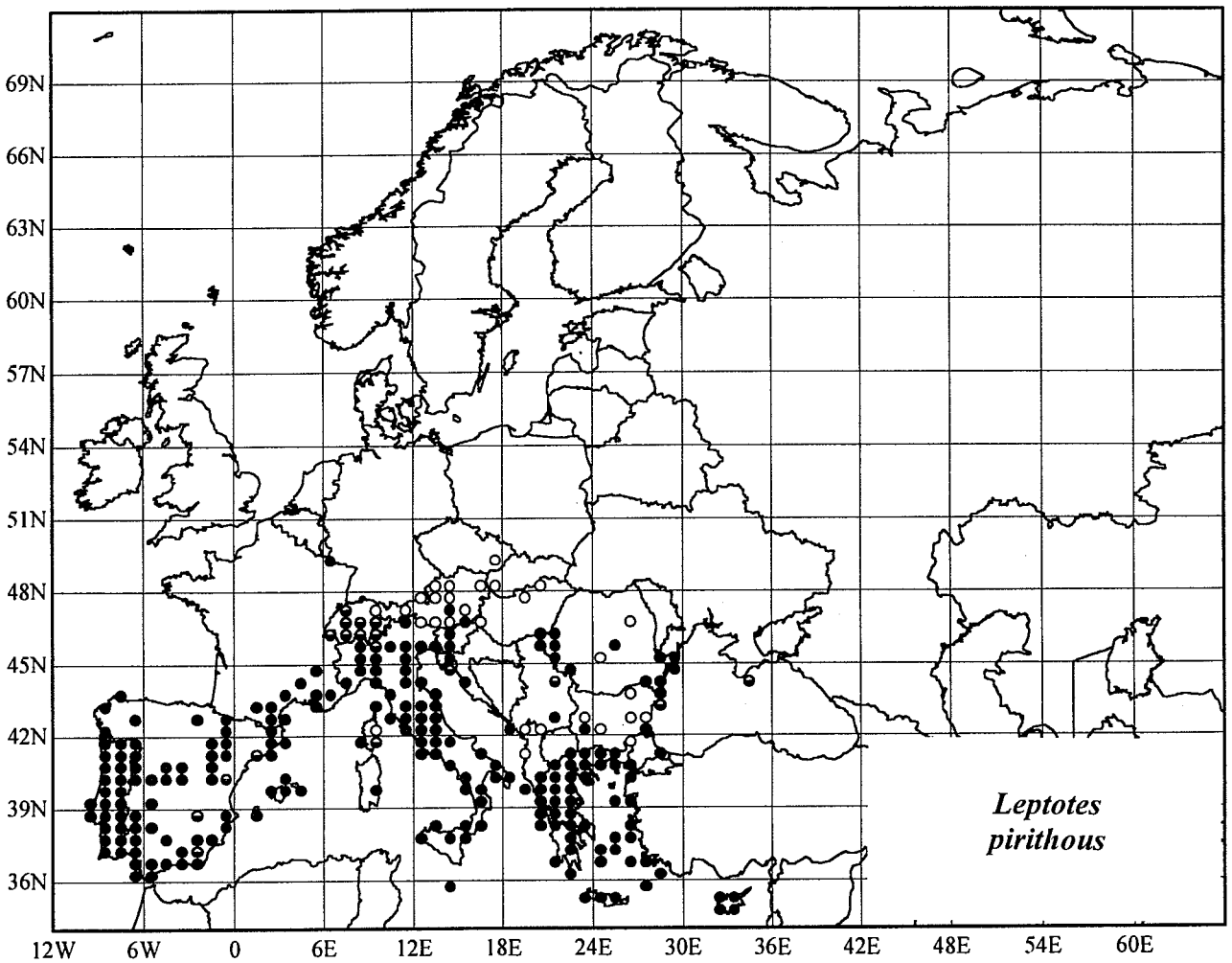
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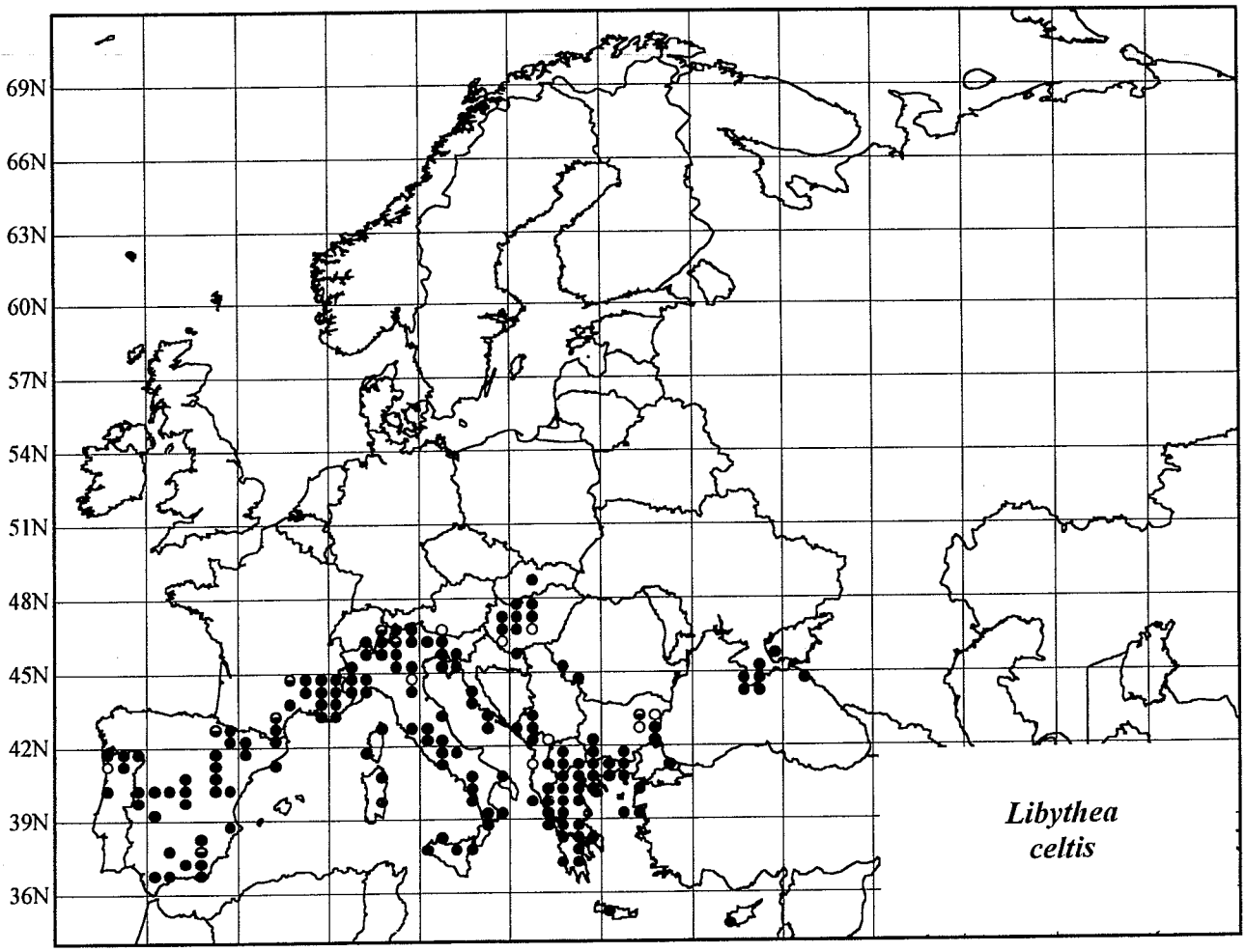
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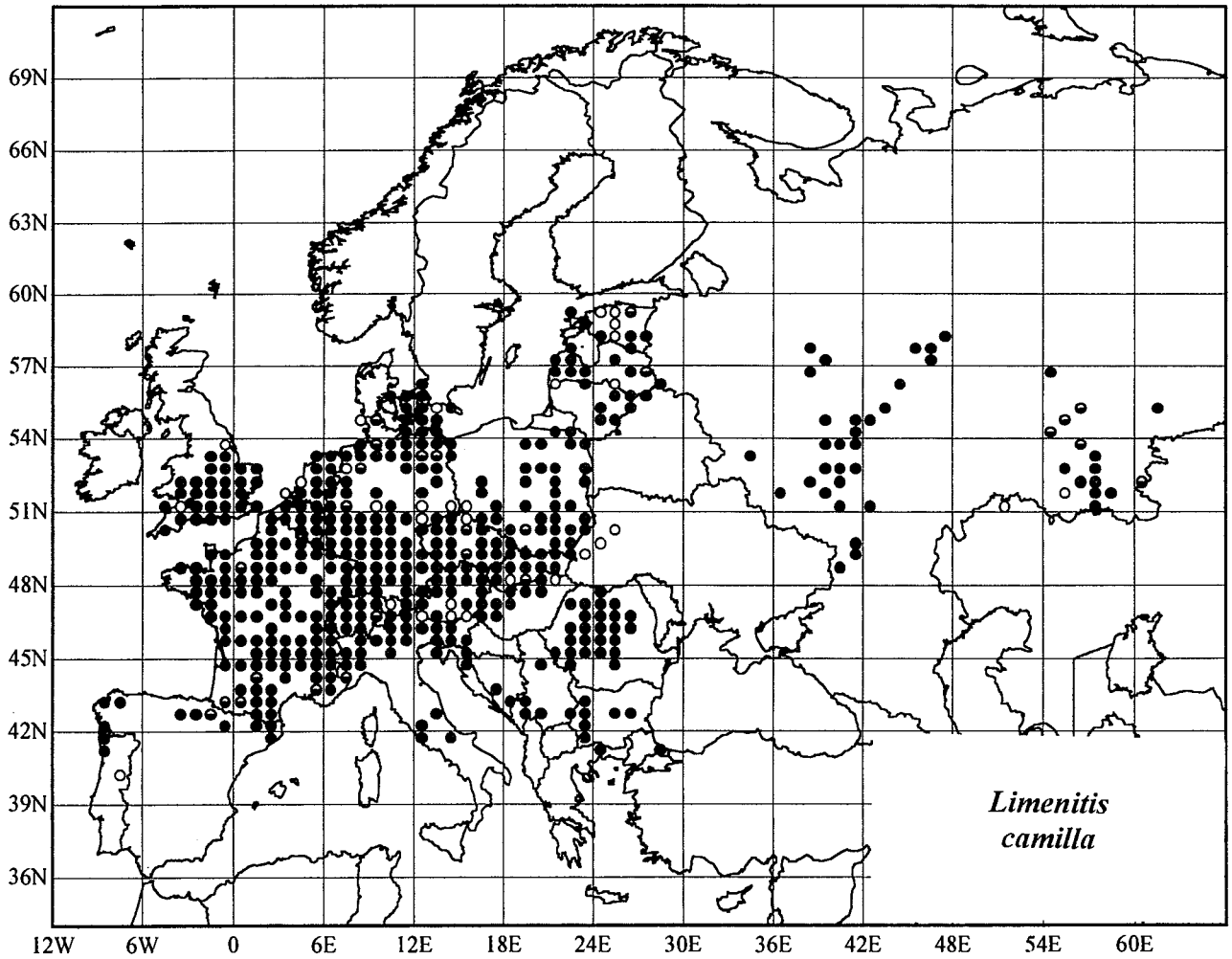
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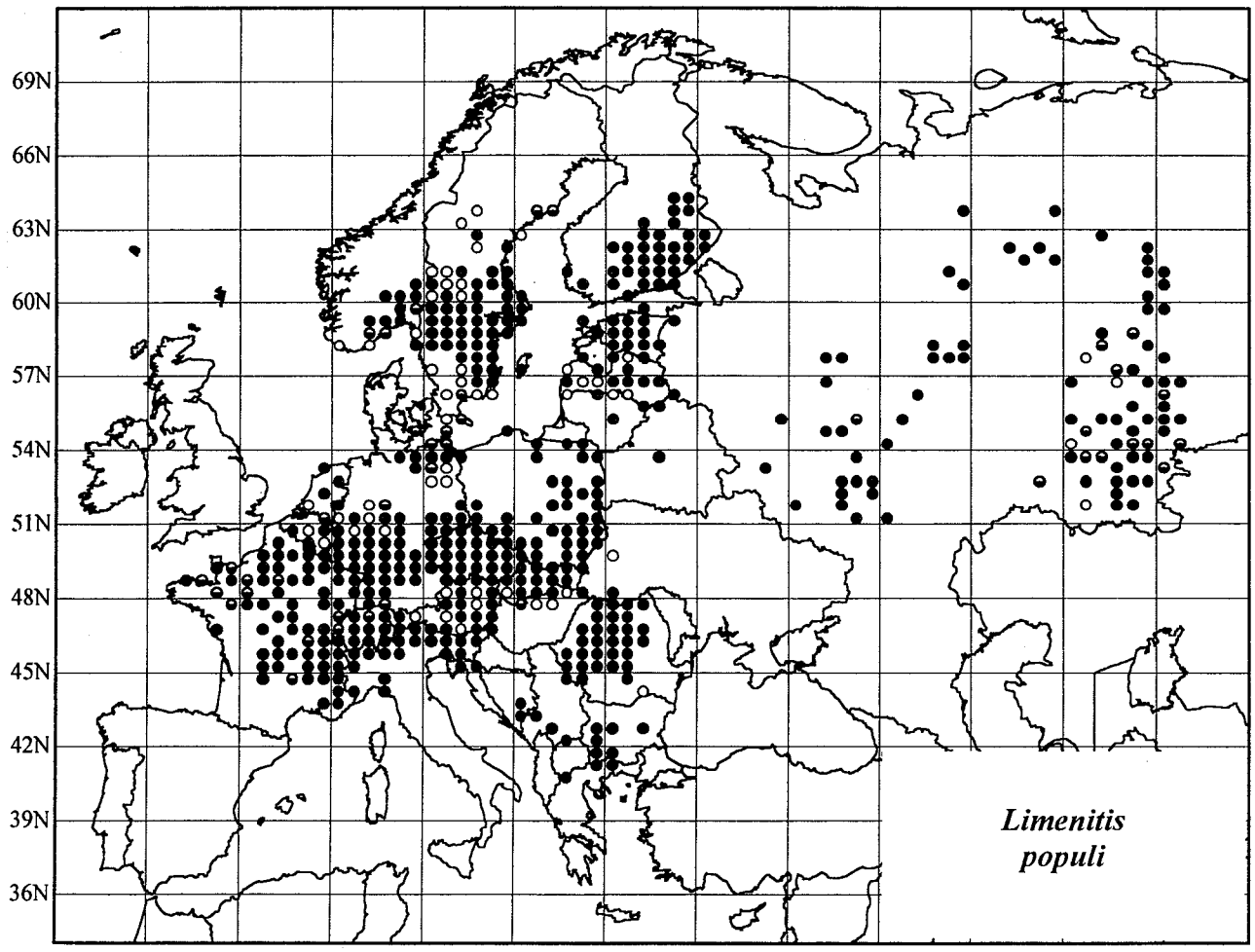
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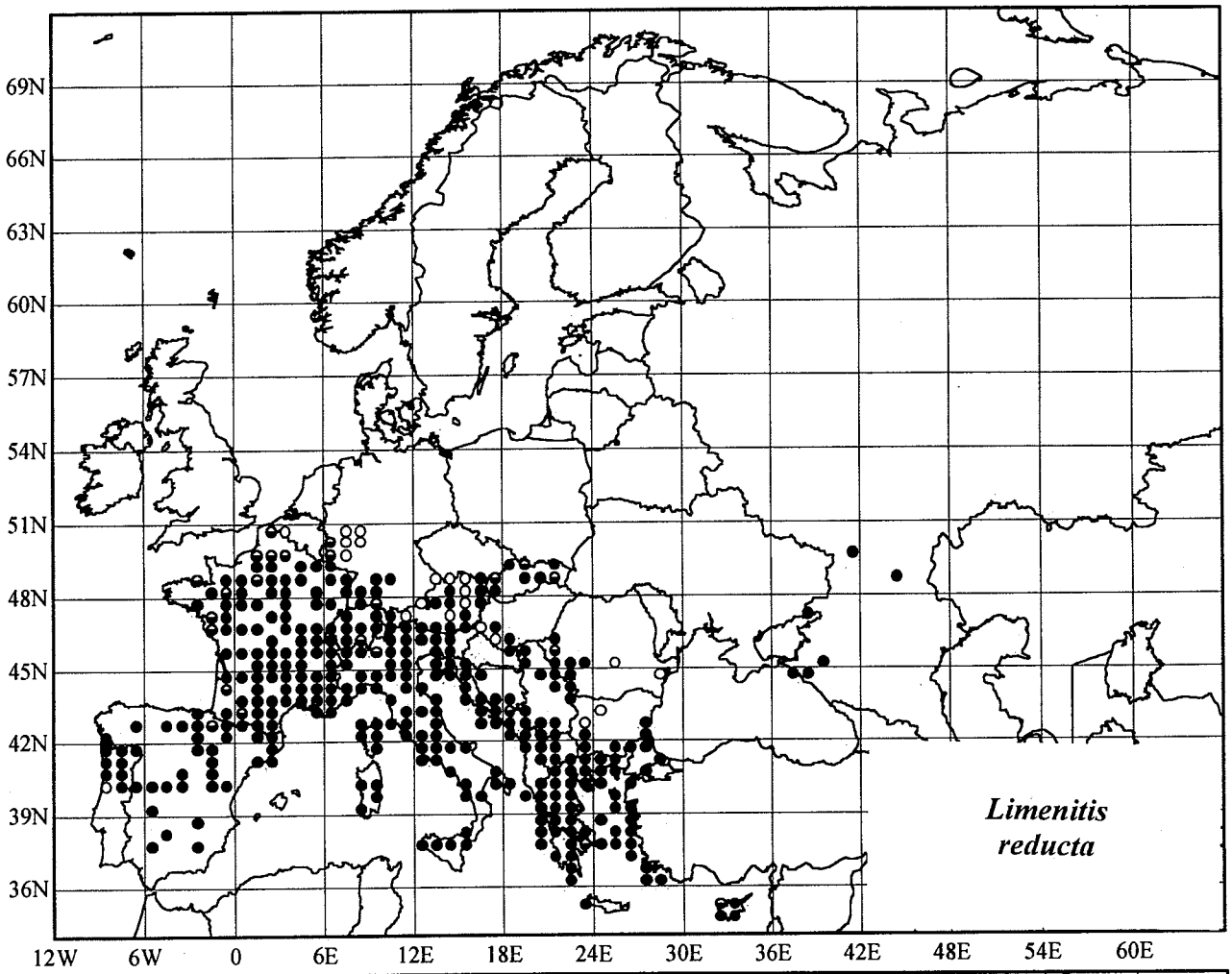
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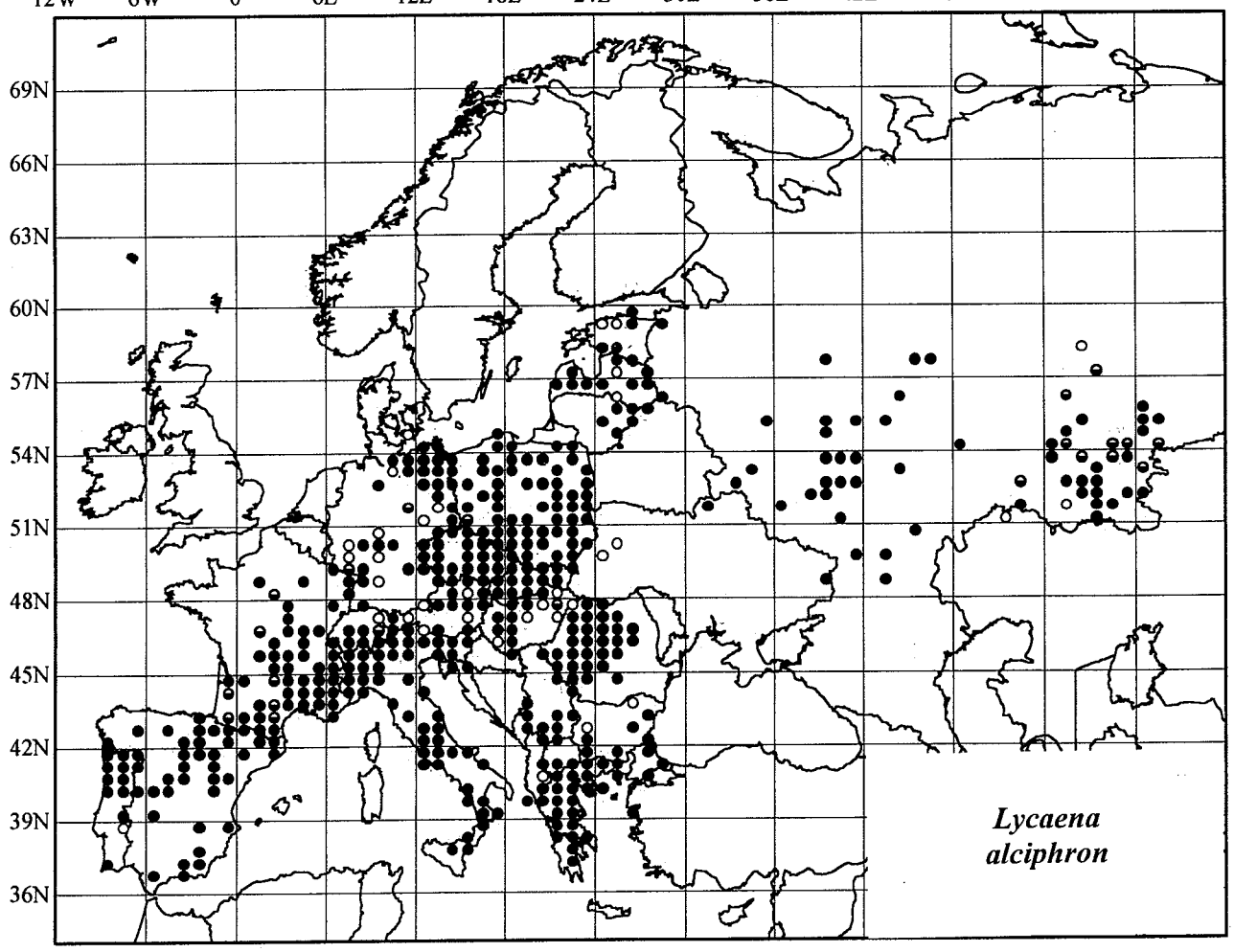
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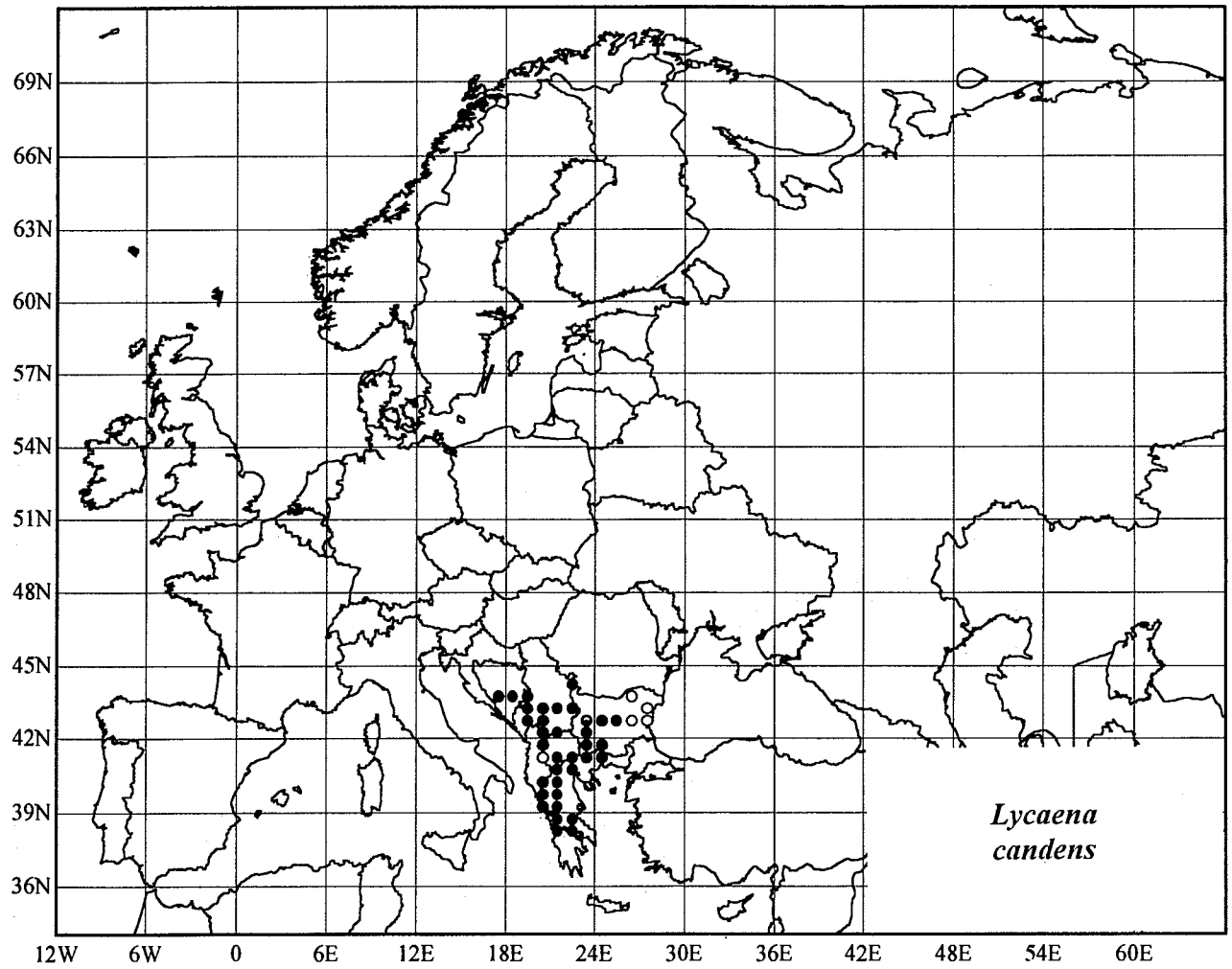
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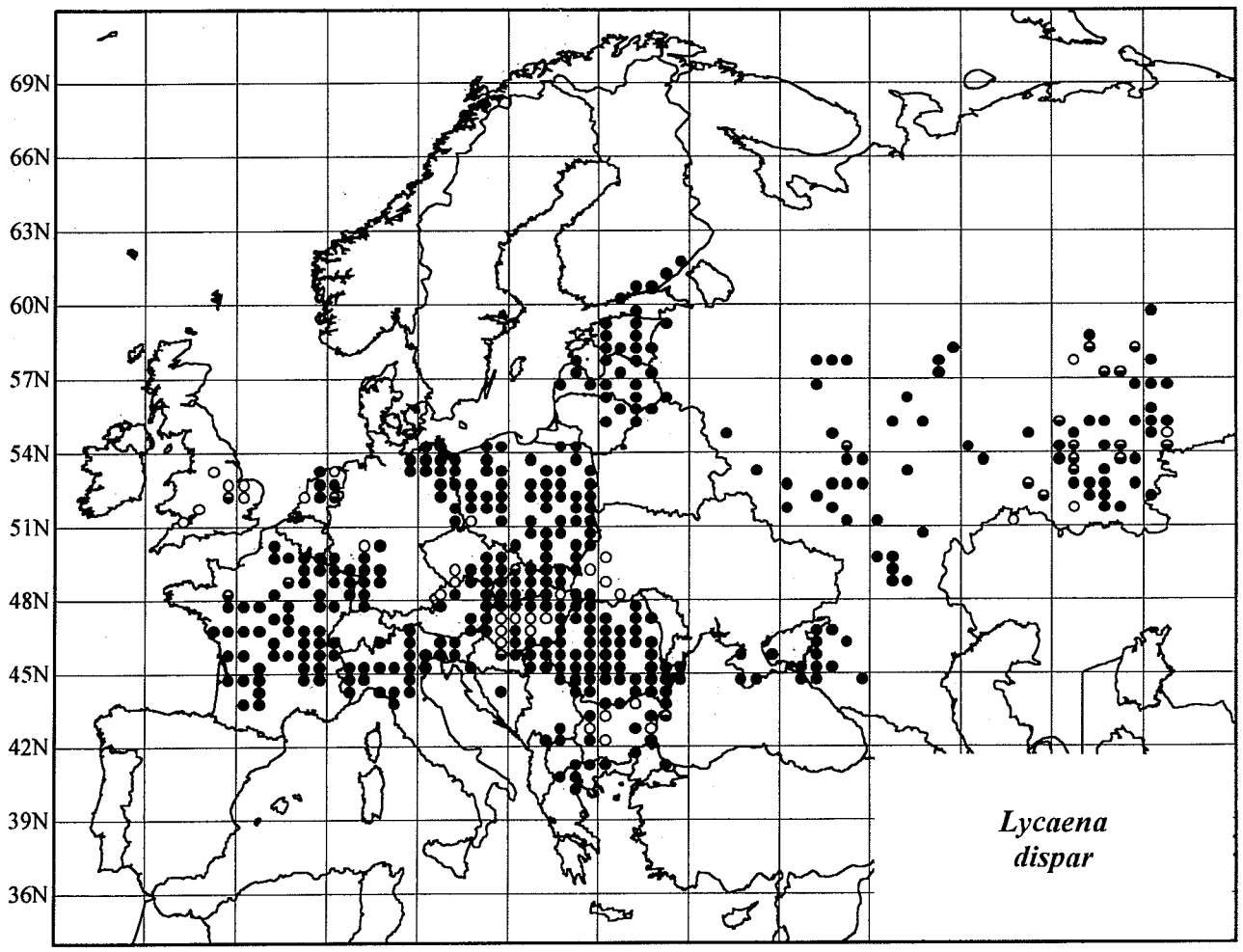
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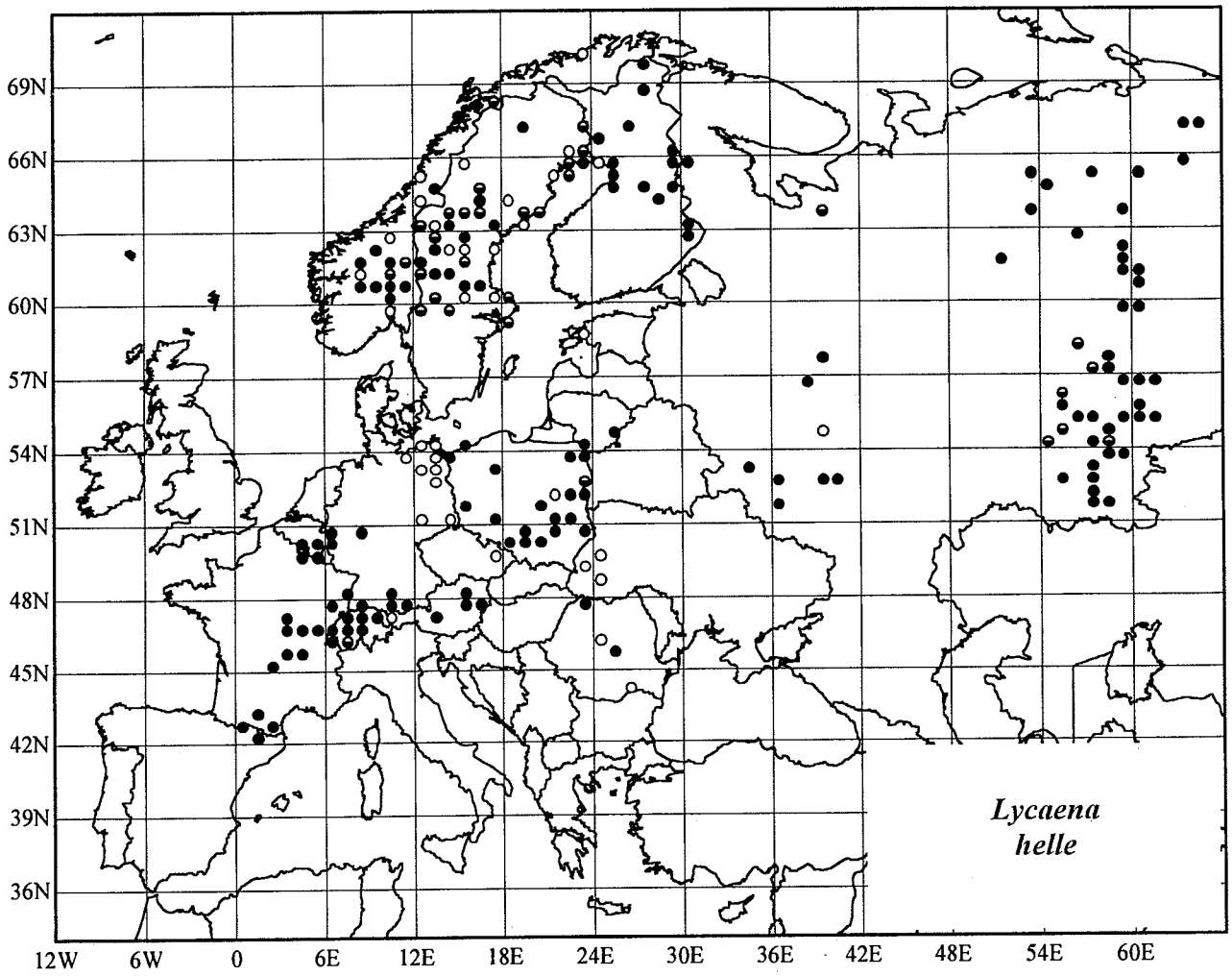
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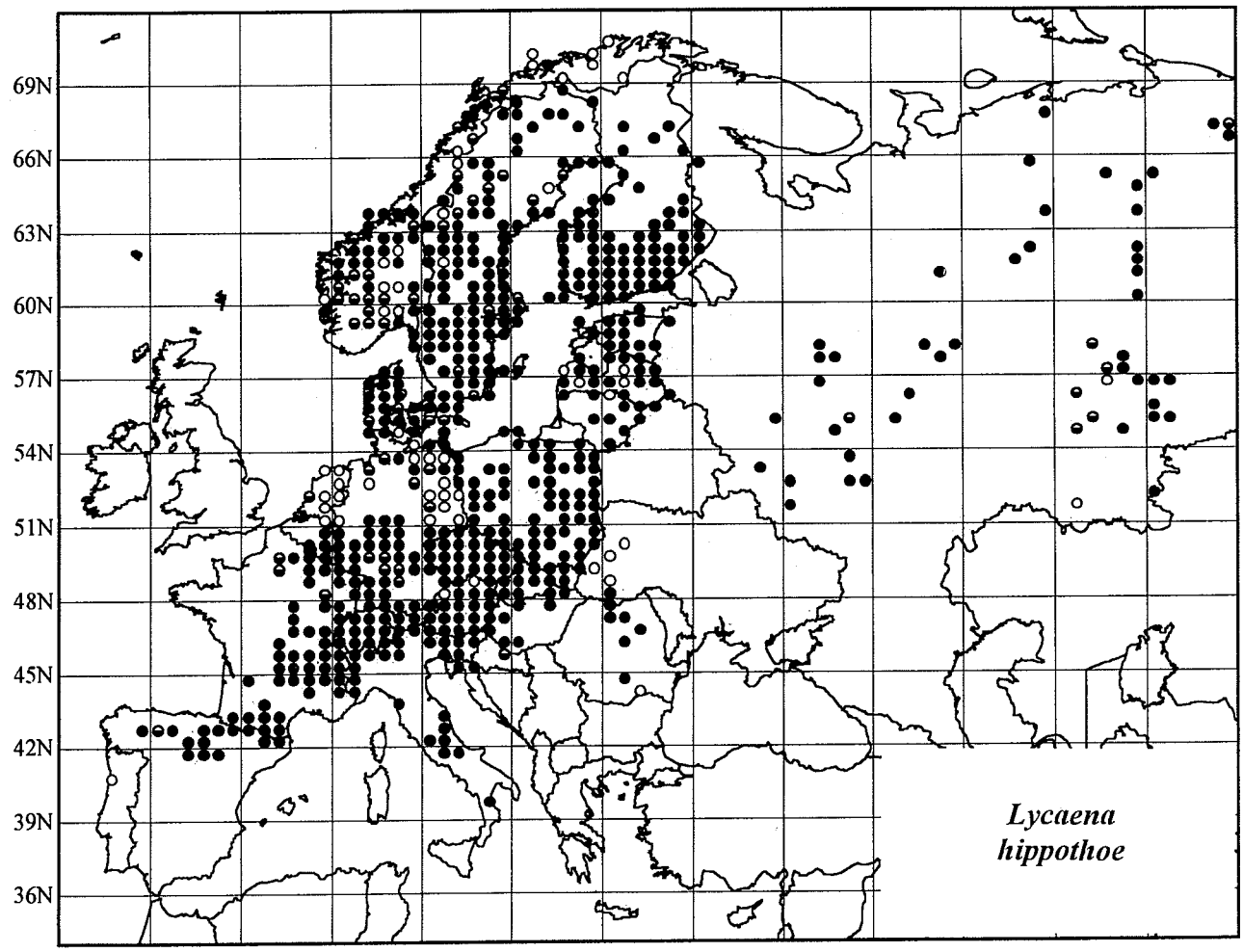
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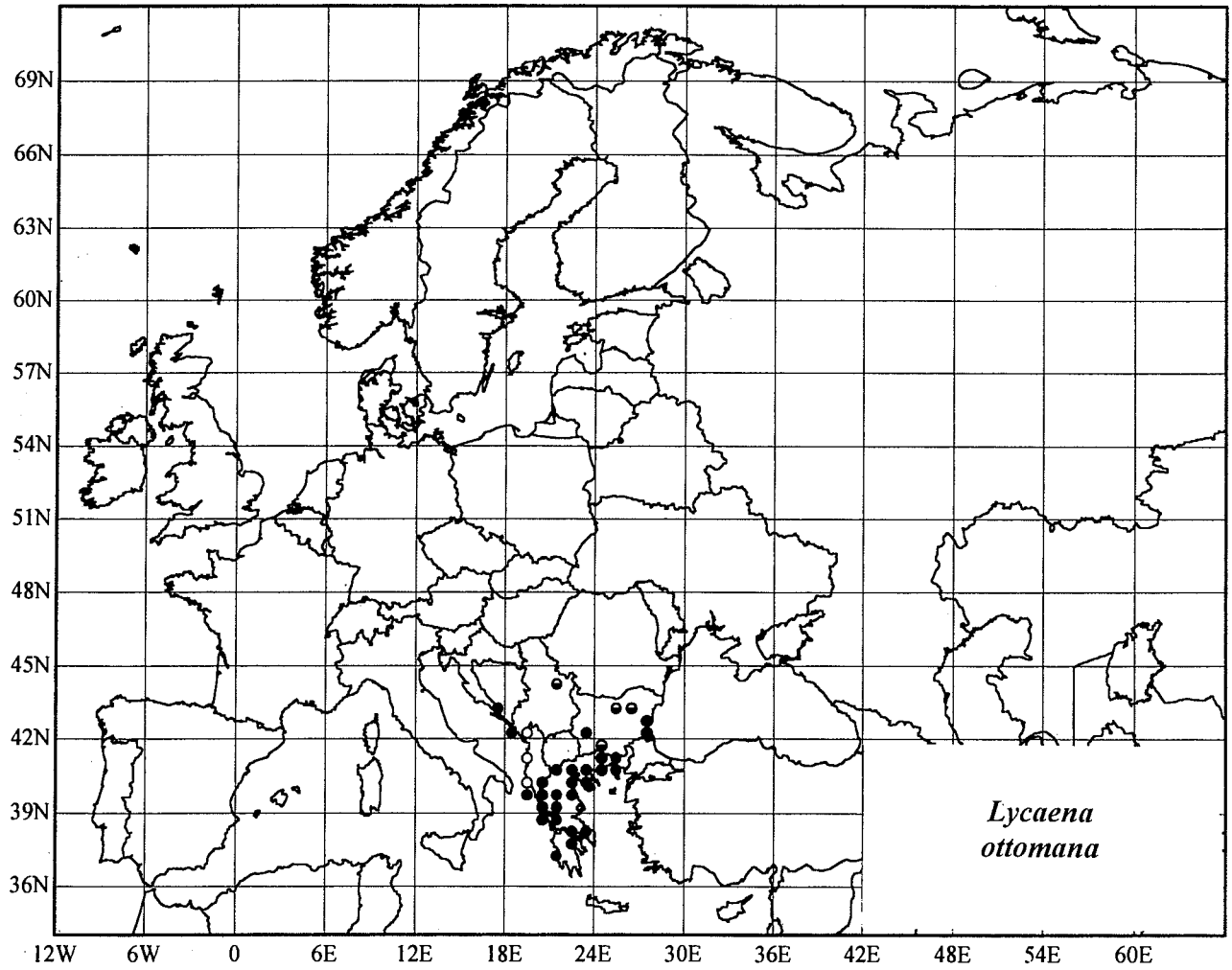
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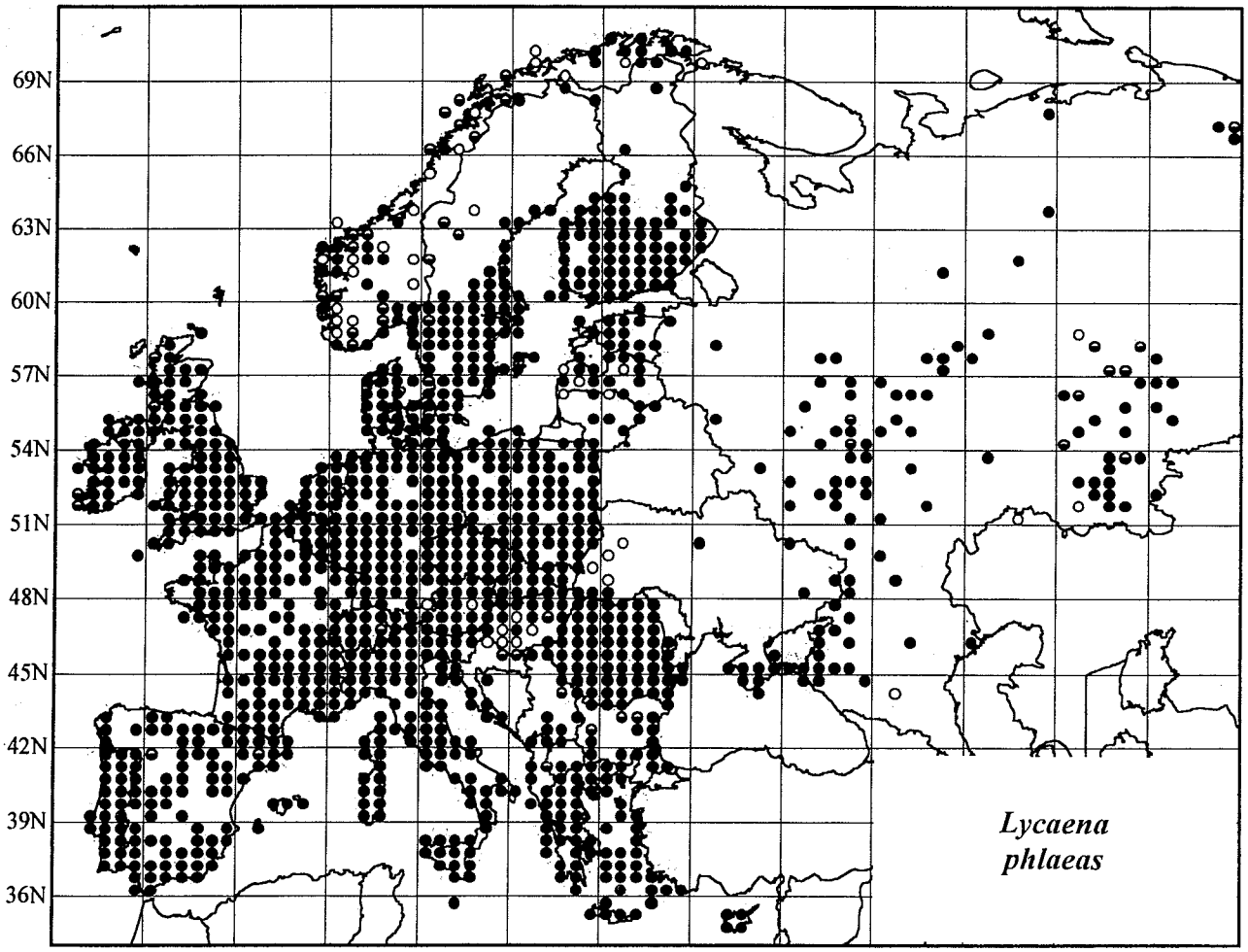
Lycaena ottomana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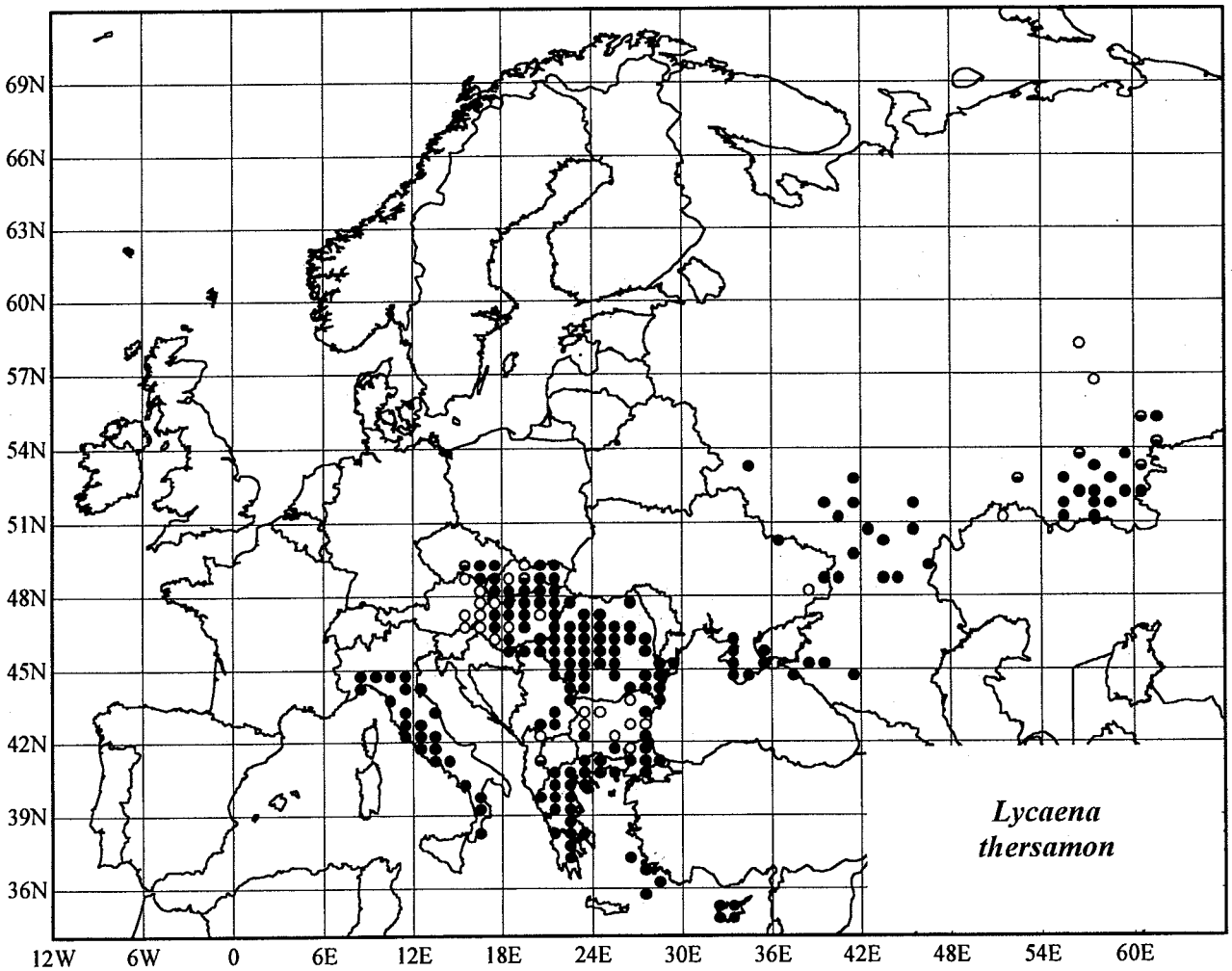
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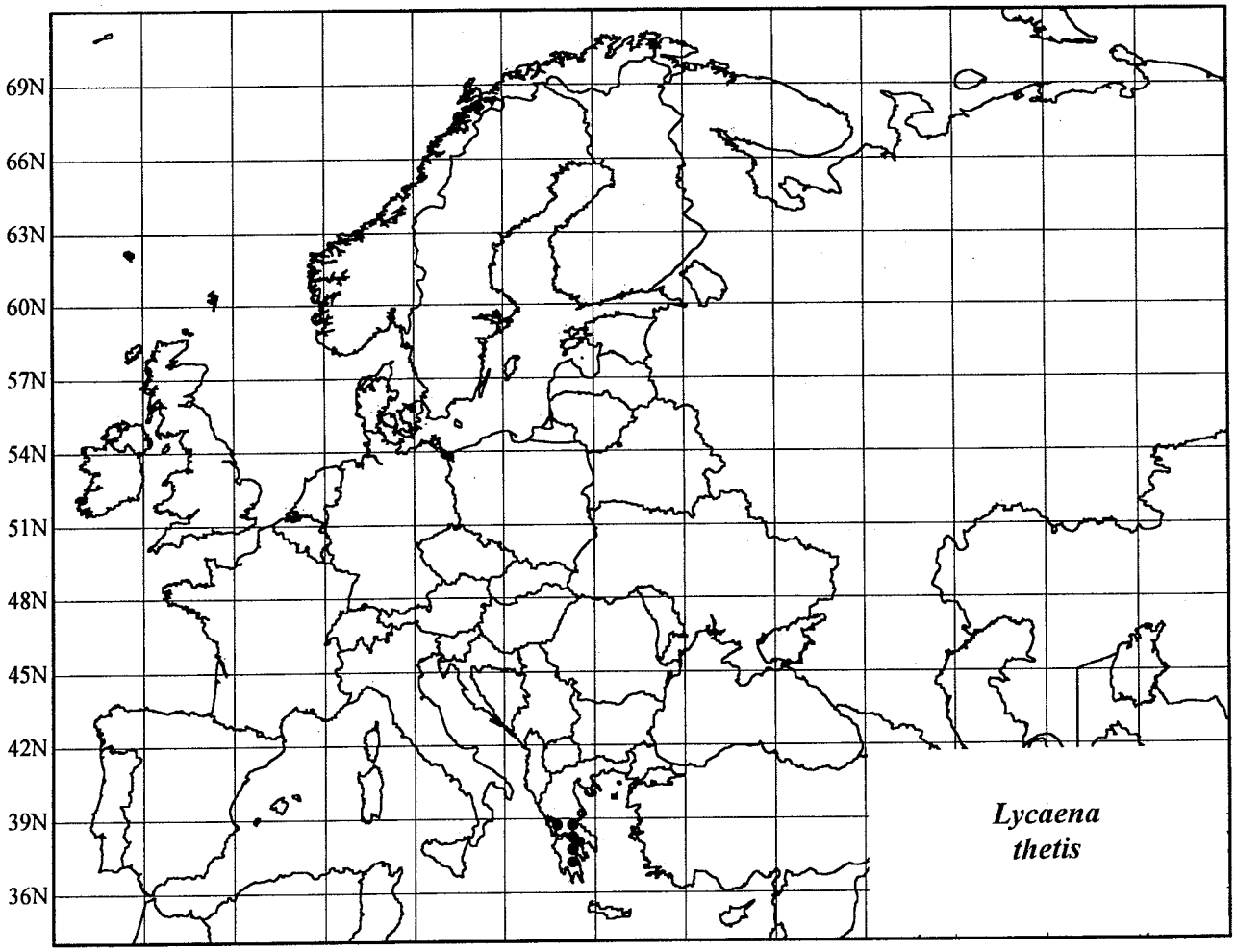
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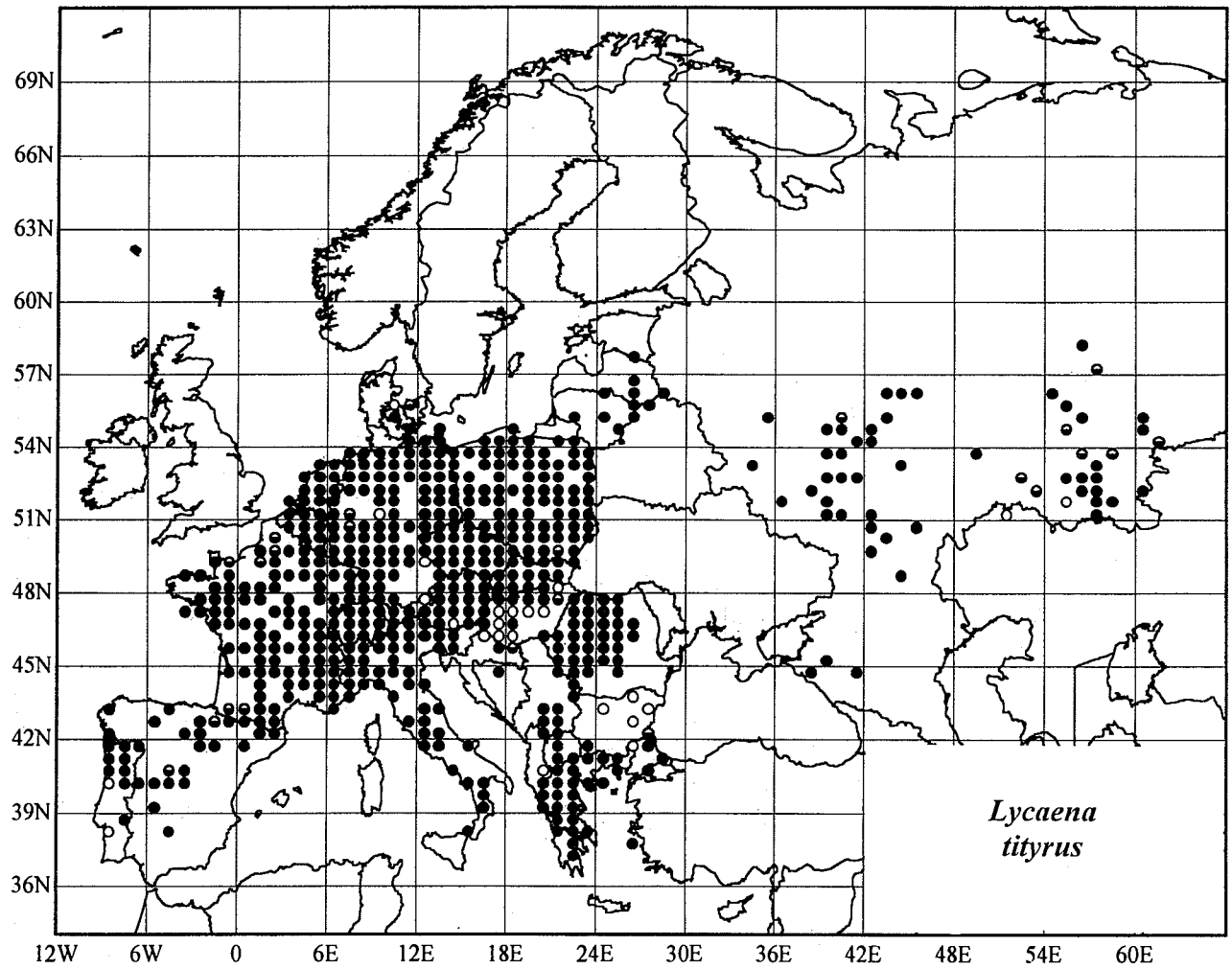
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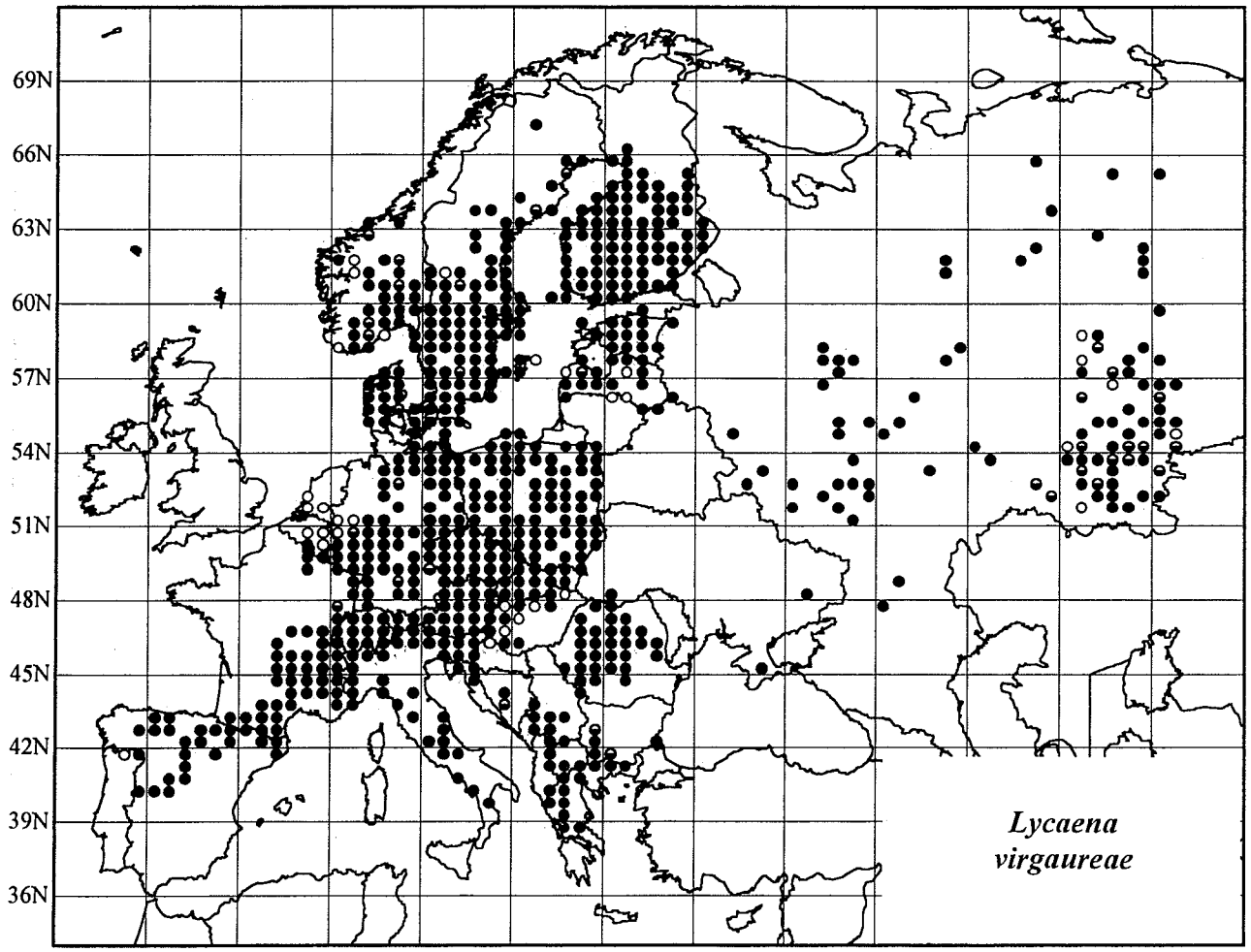
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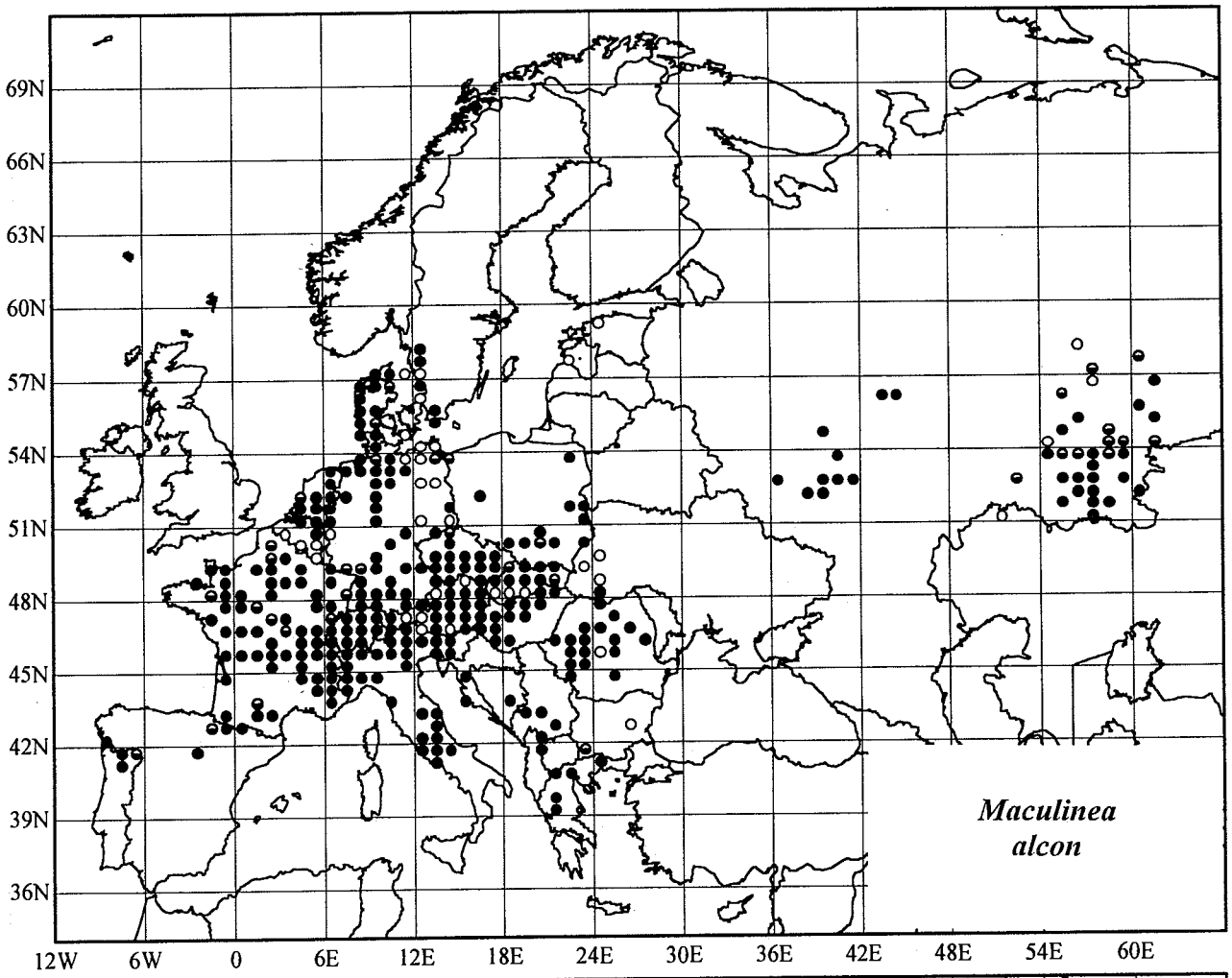
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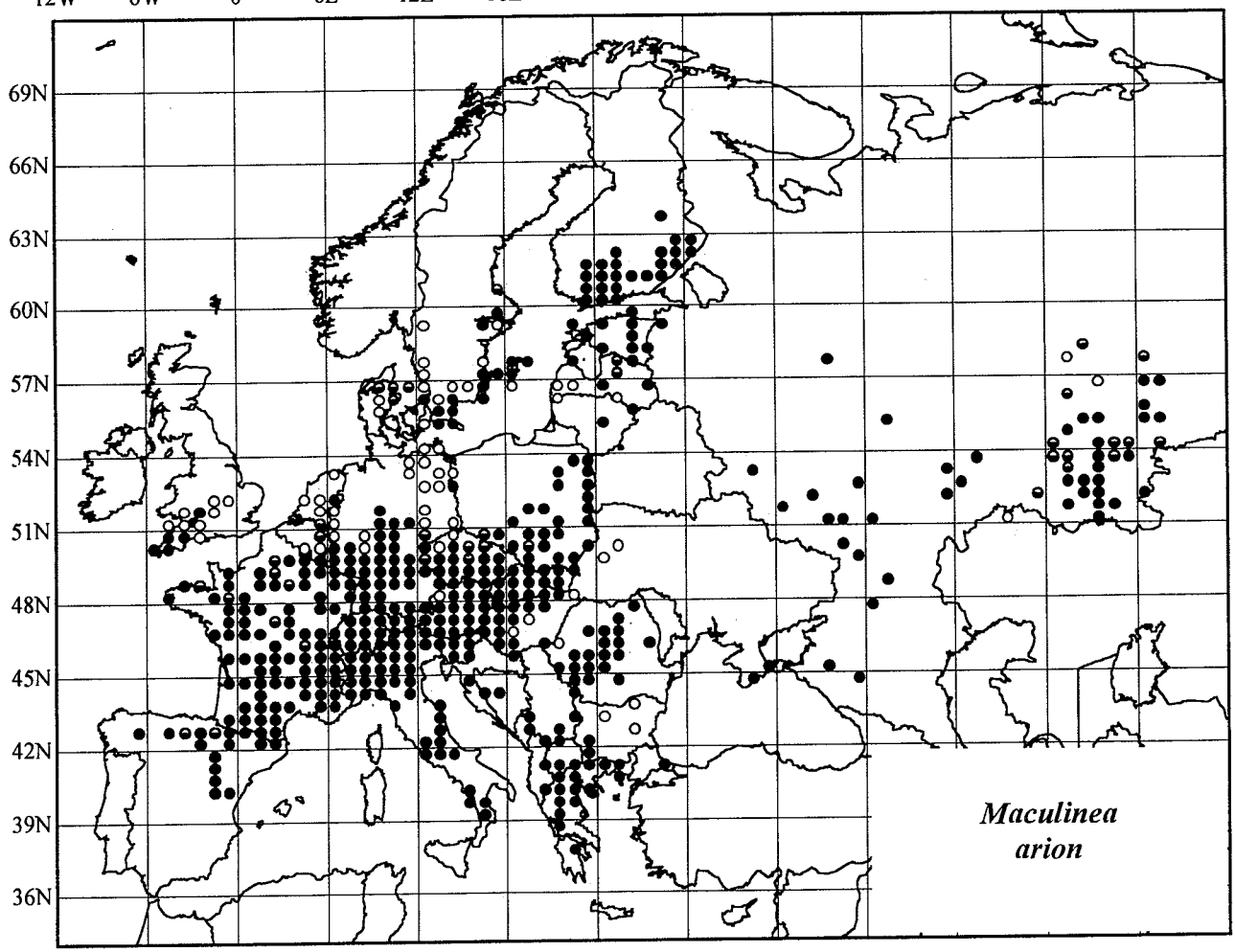
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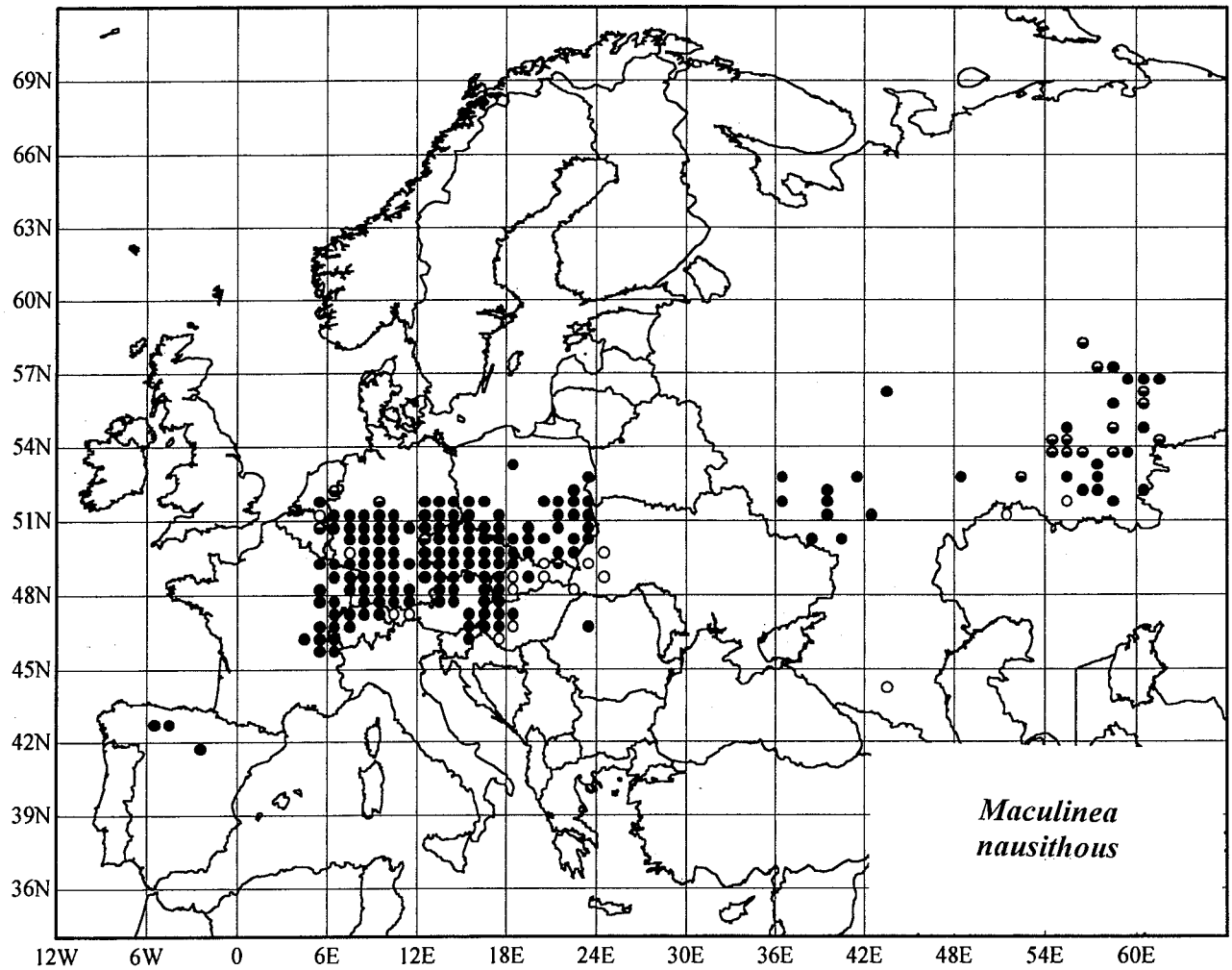
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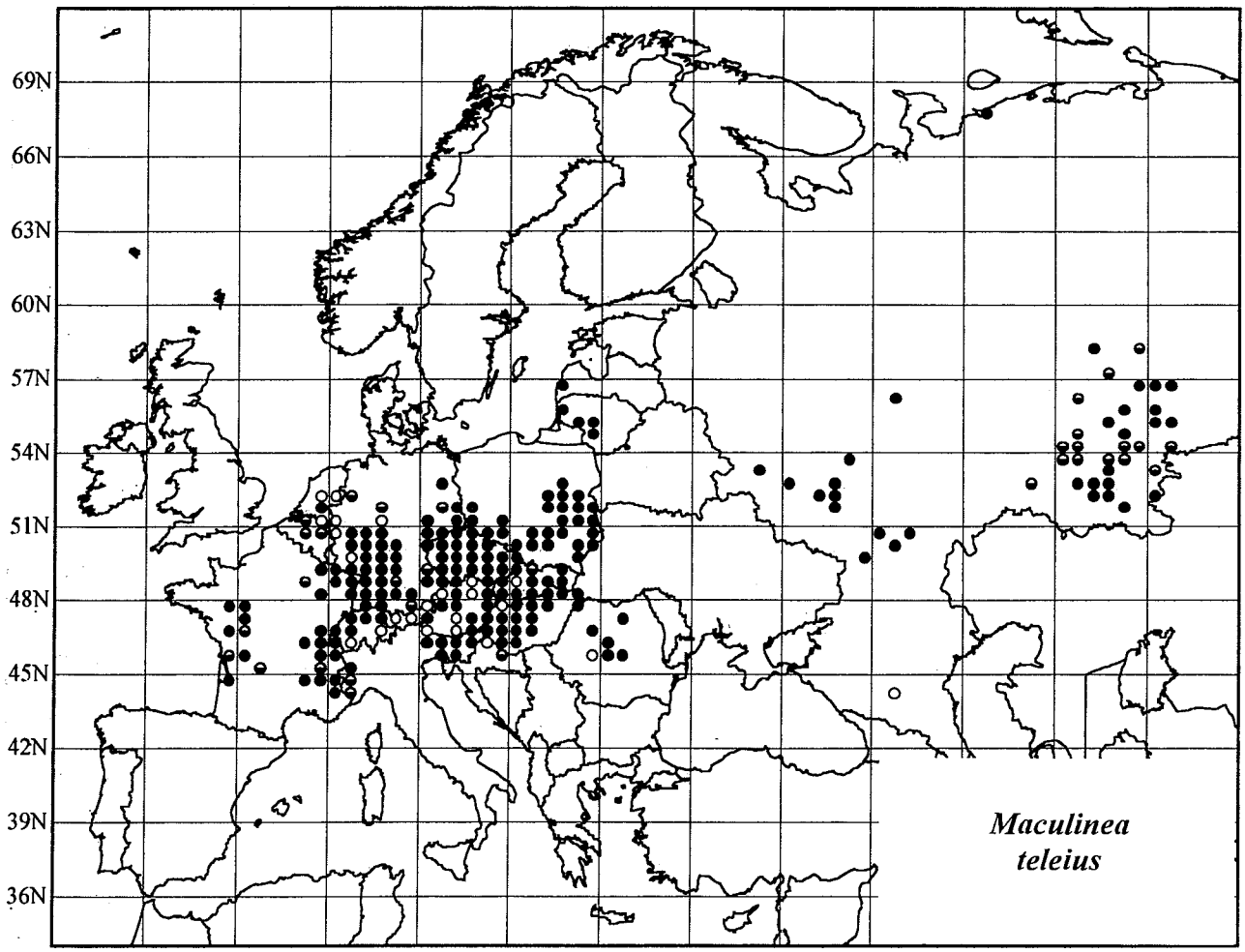
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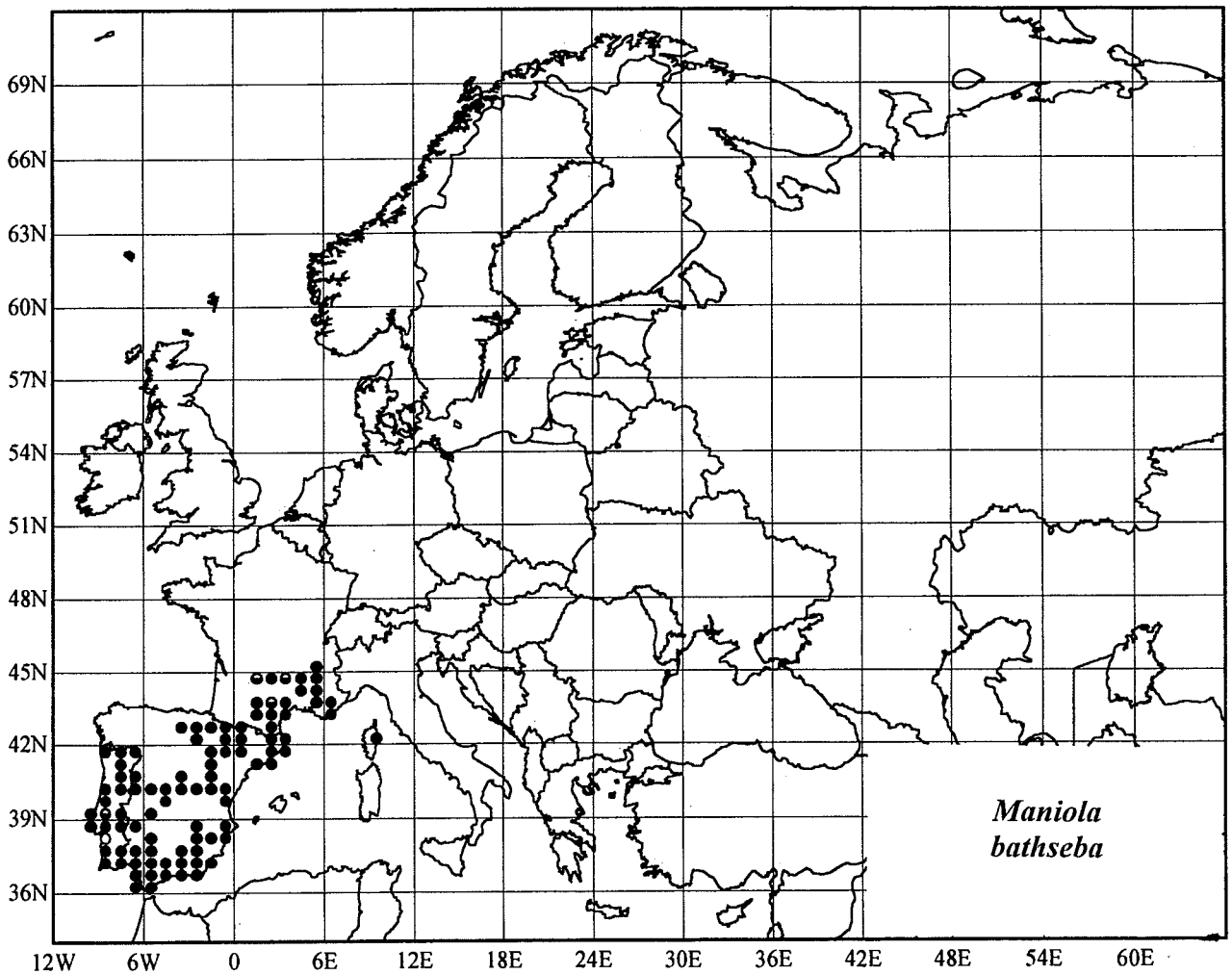
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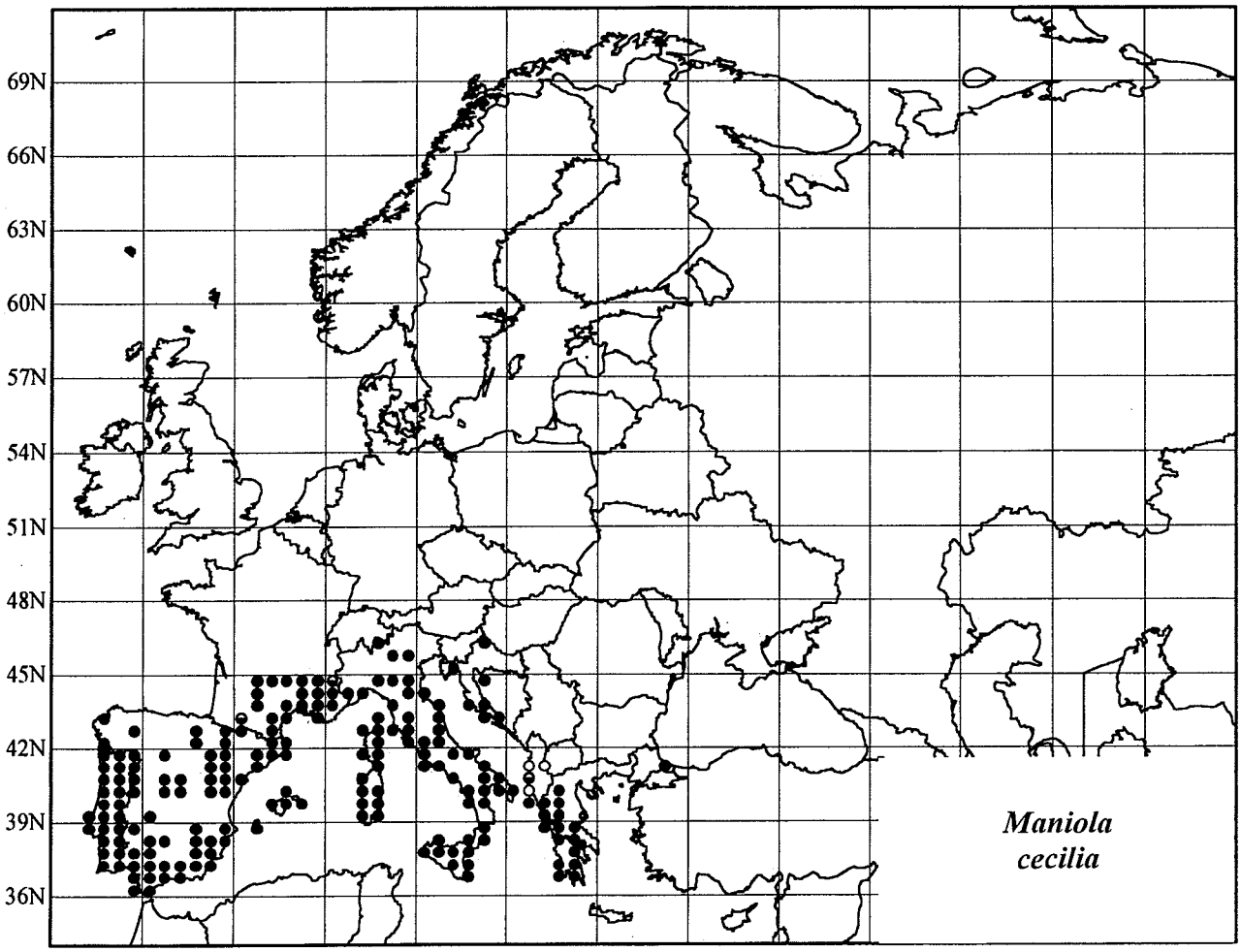
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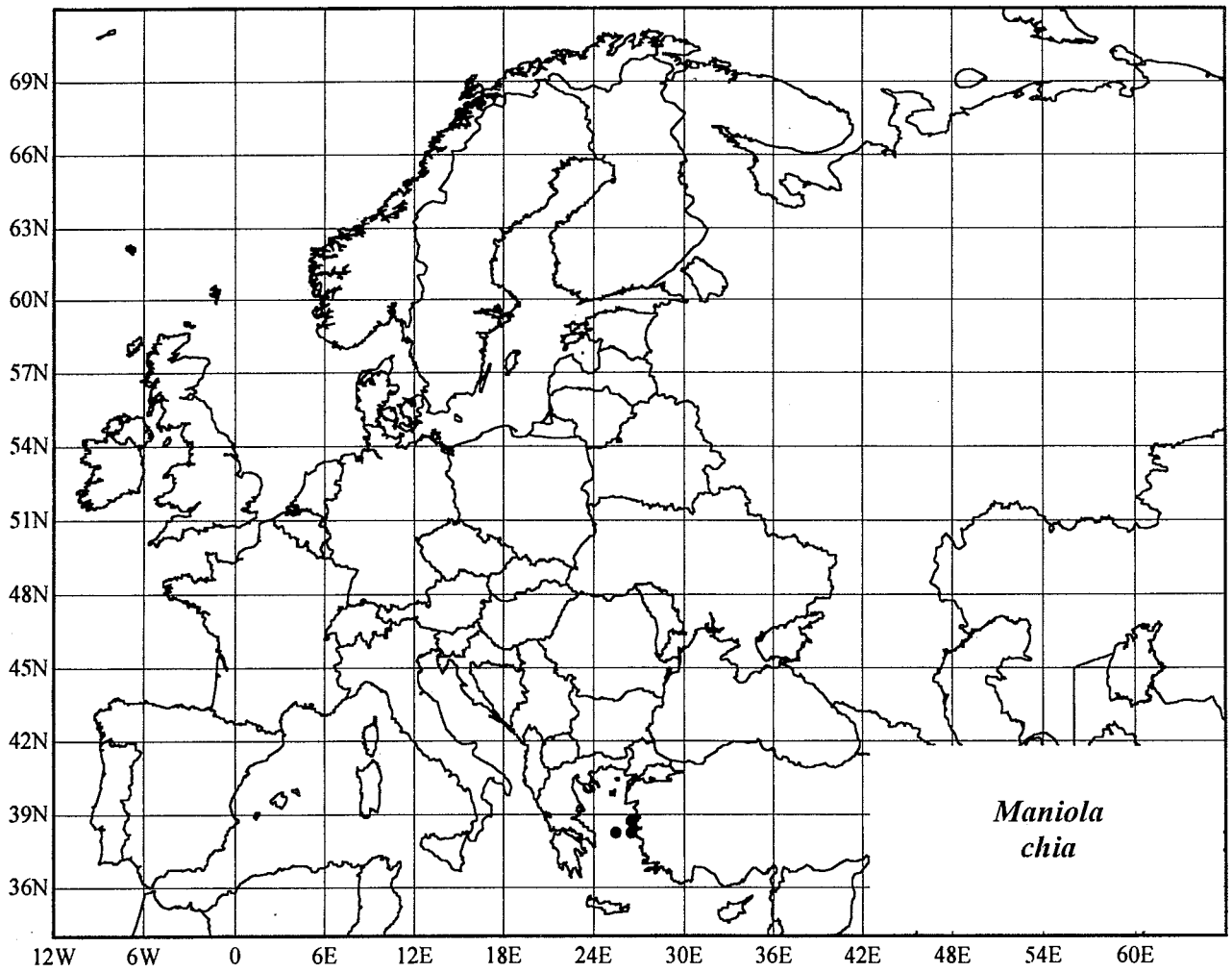
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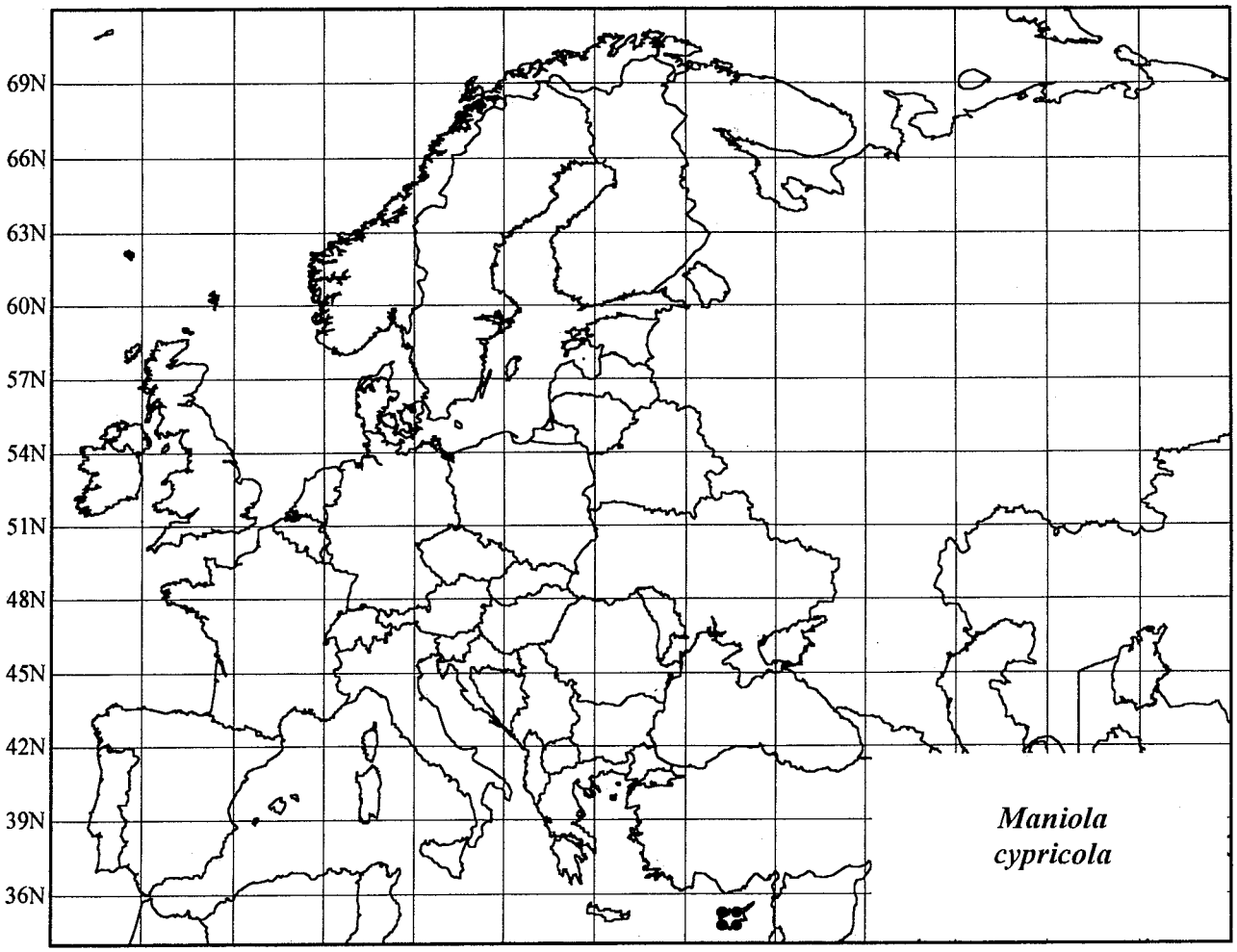
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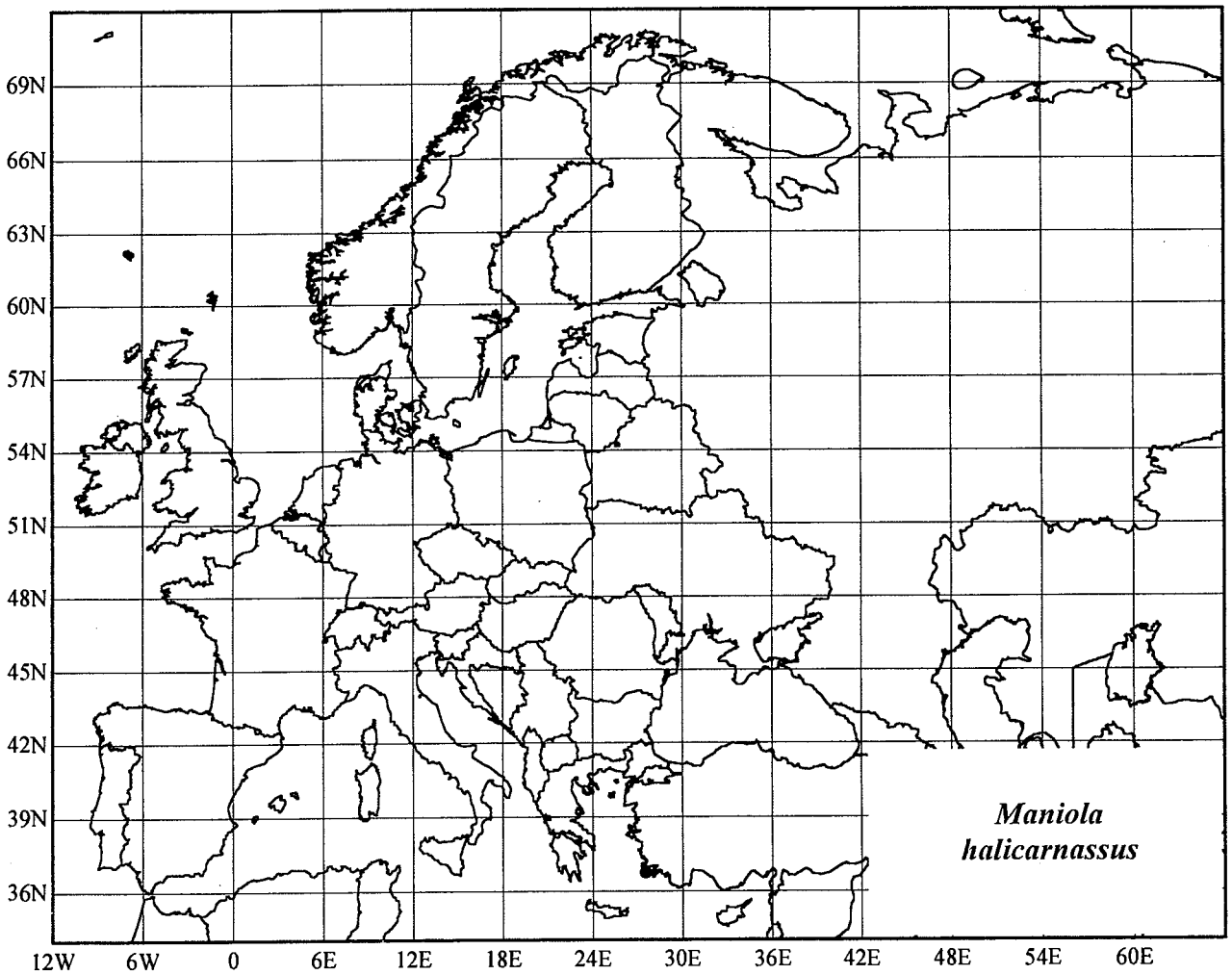
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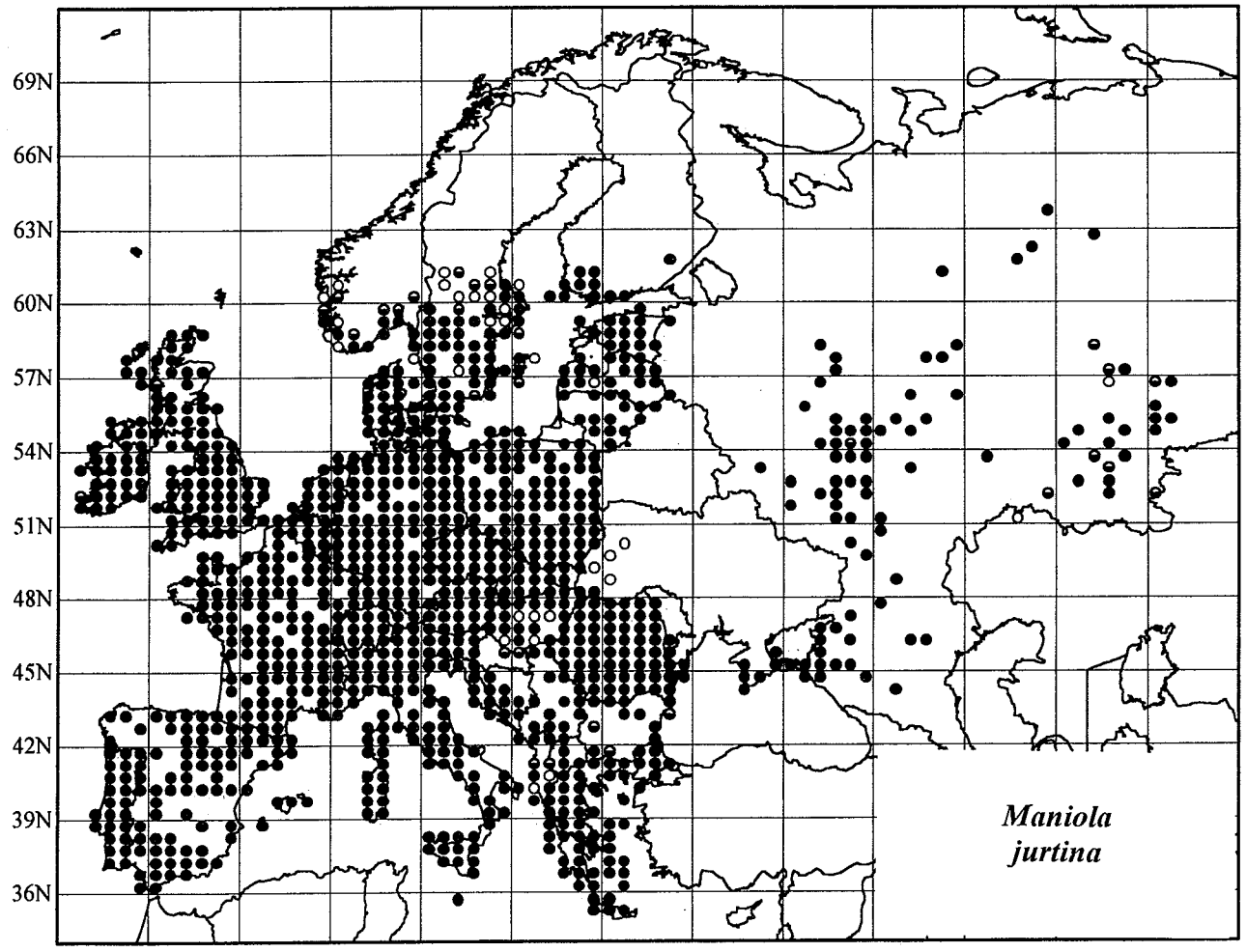
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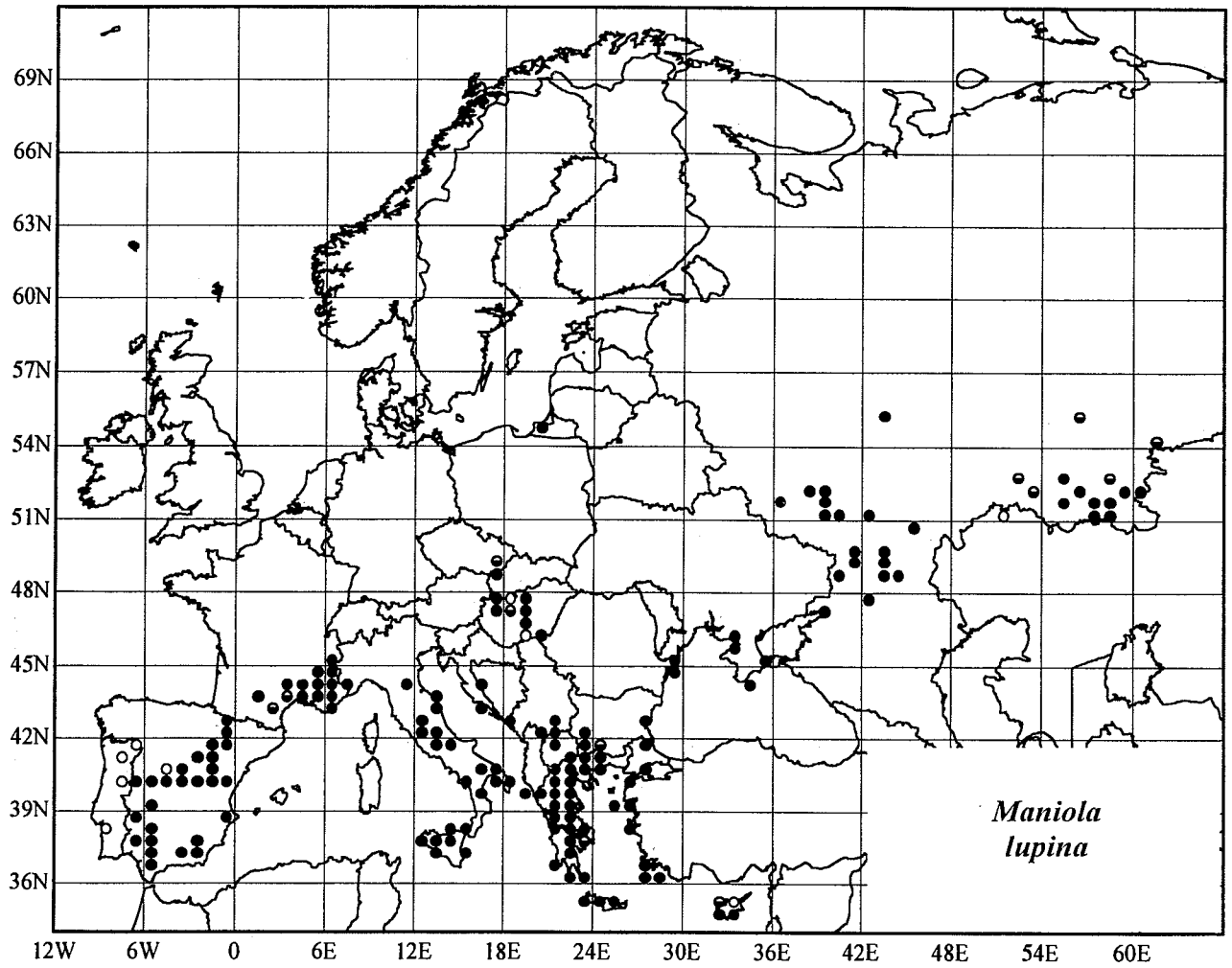
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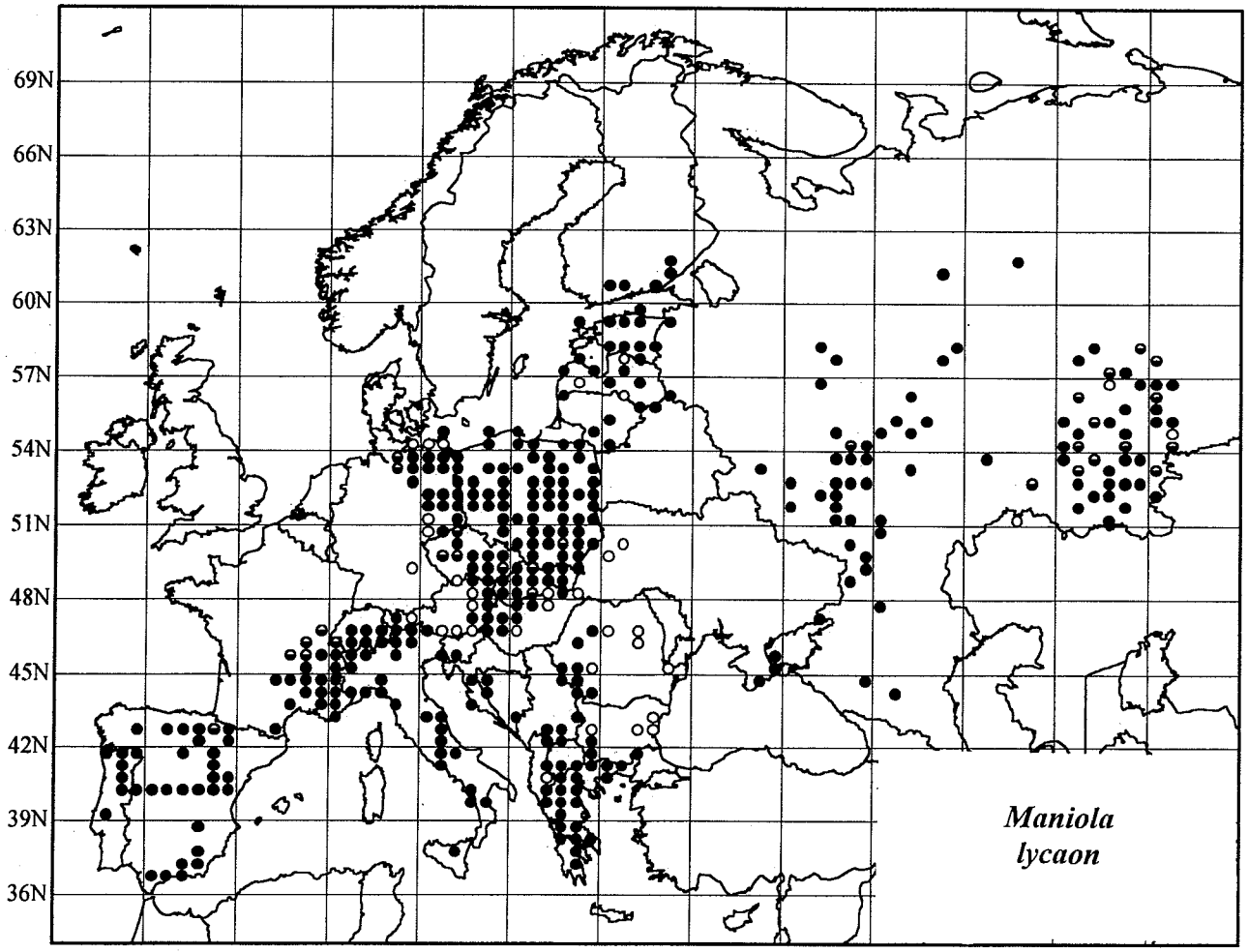
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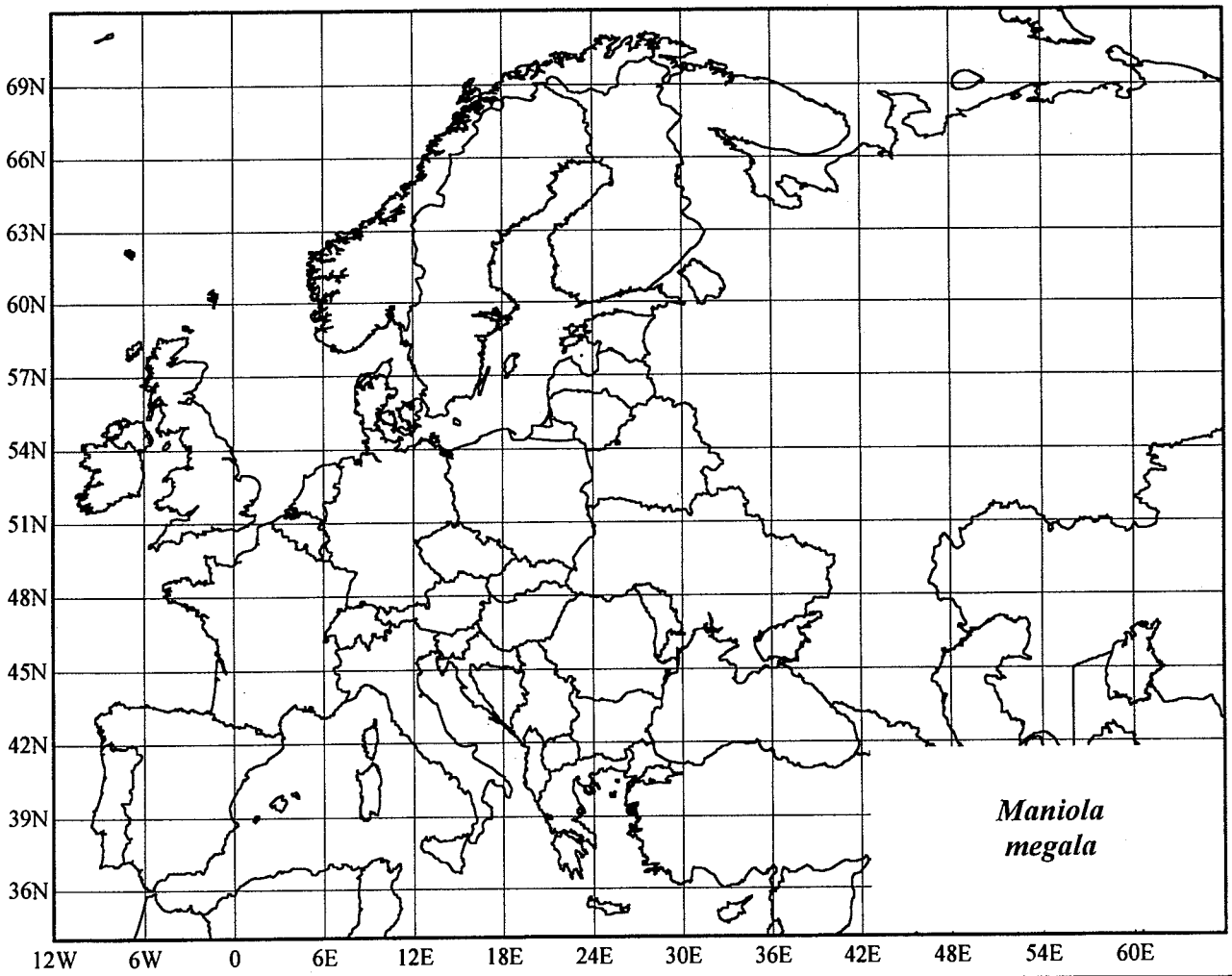
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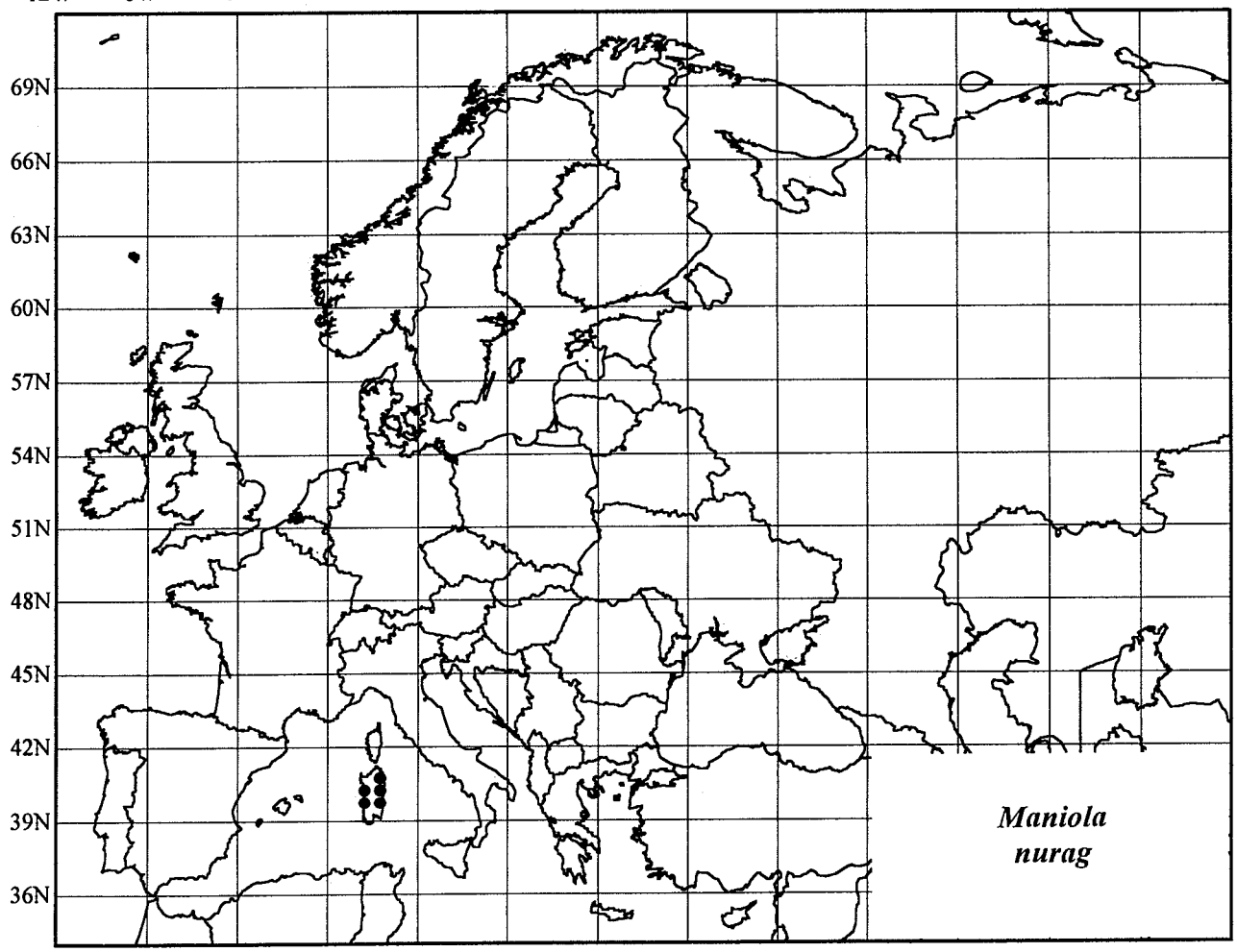
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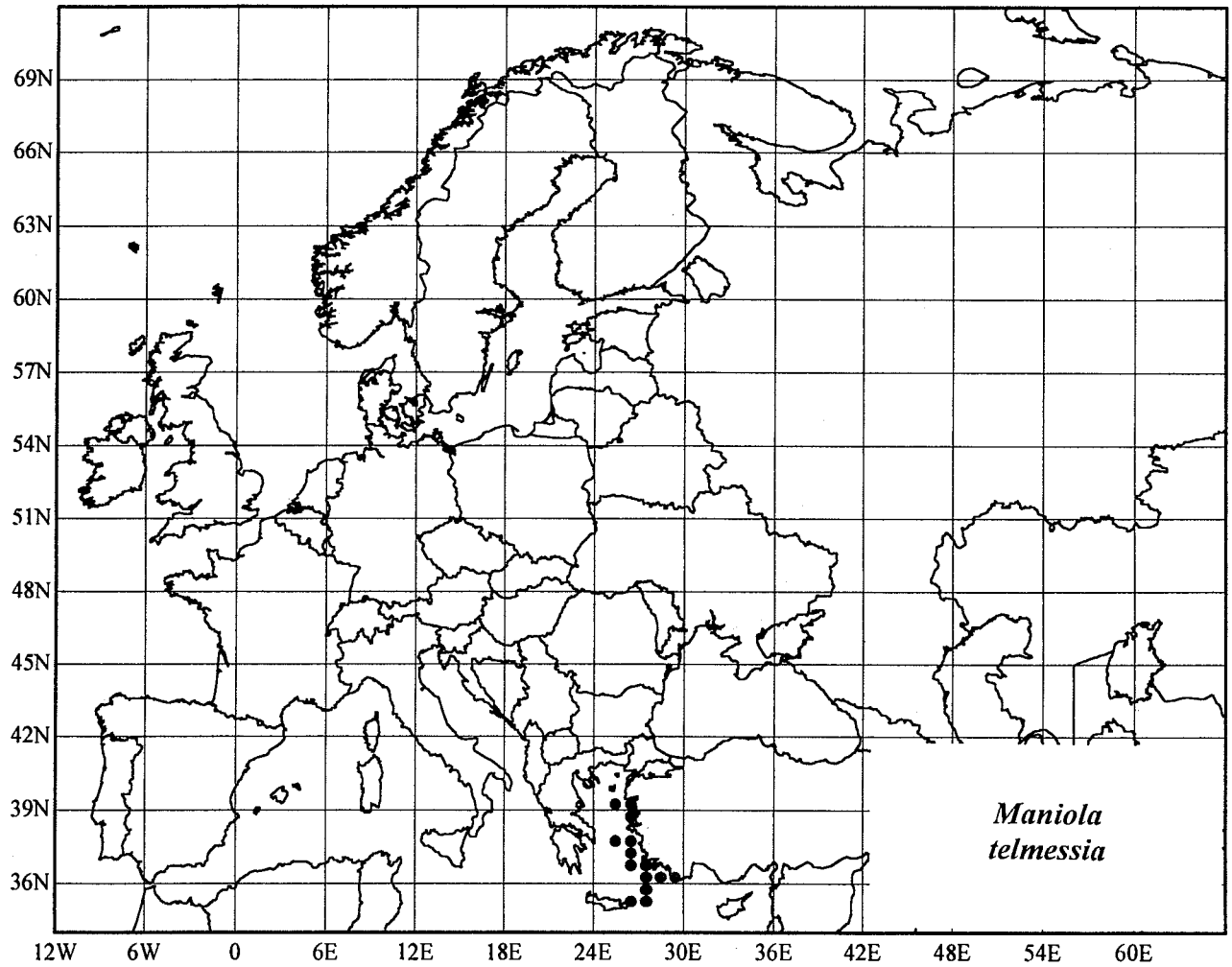
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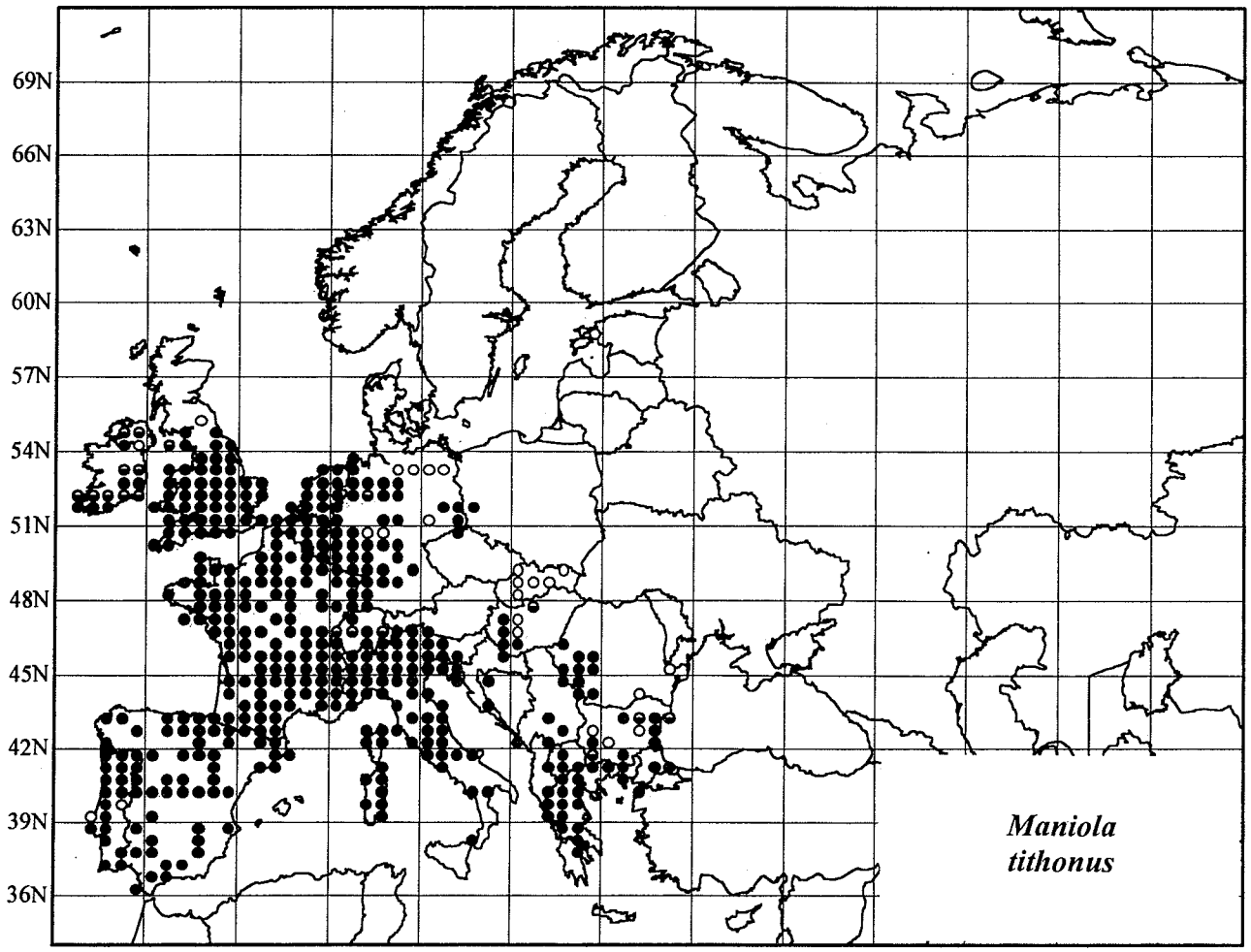
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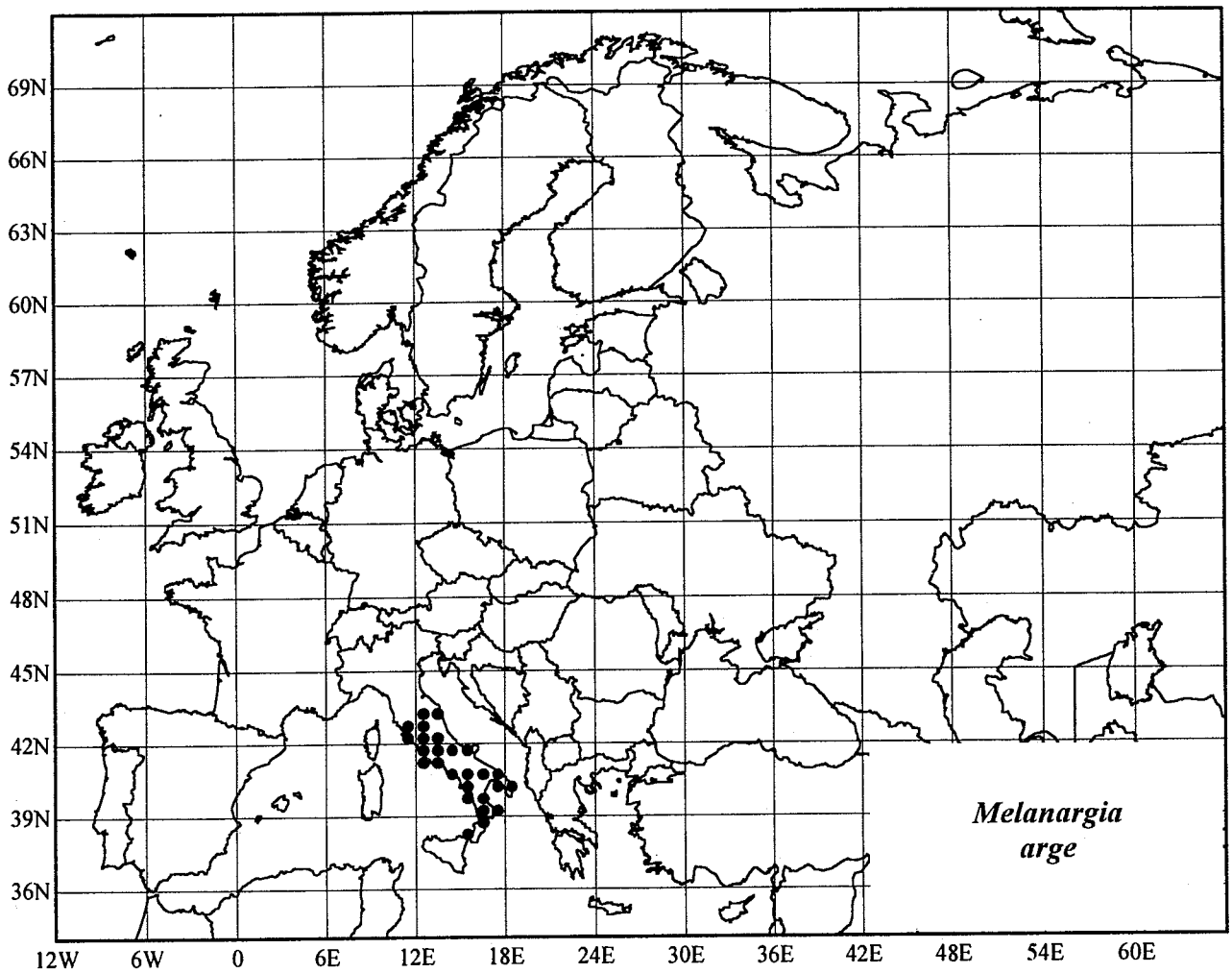
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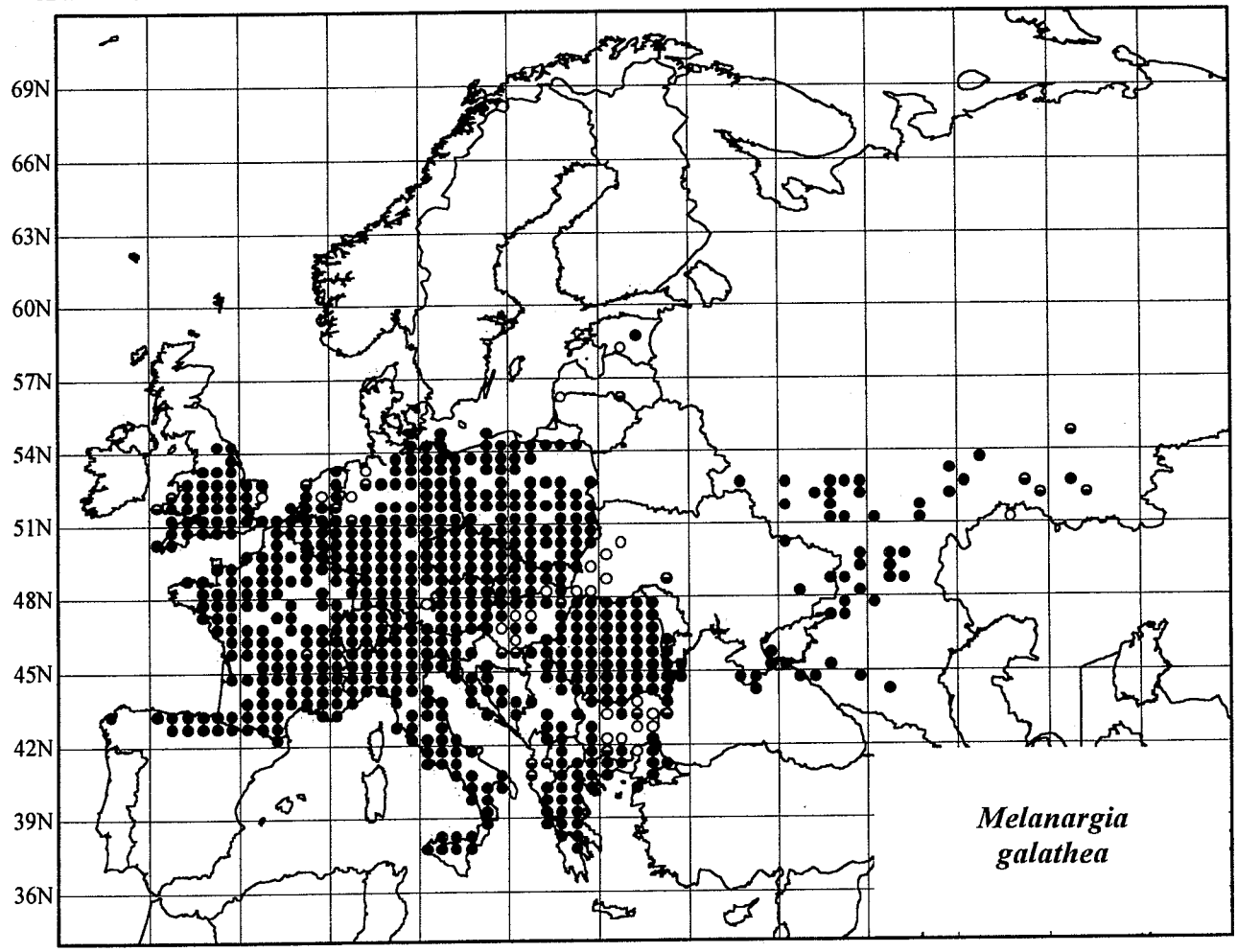
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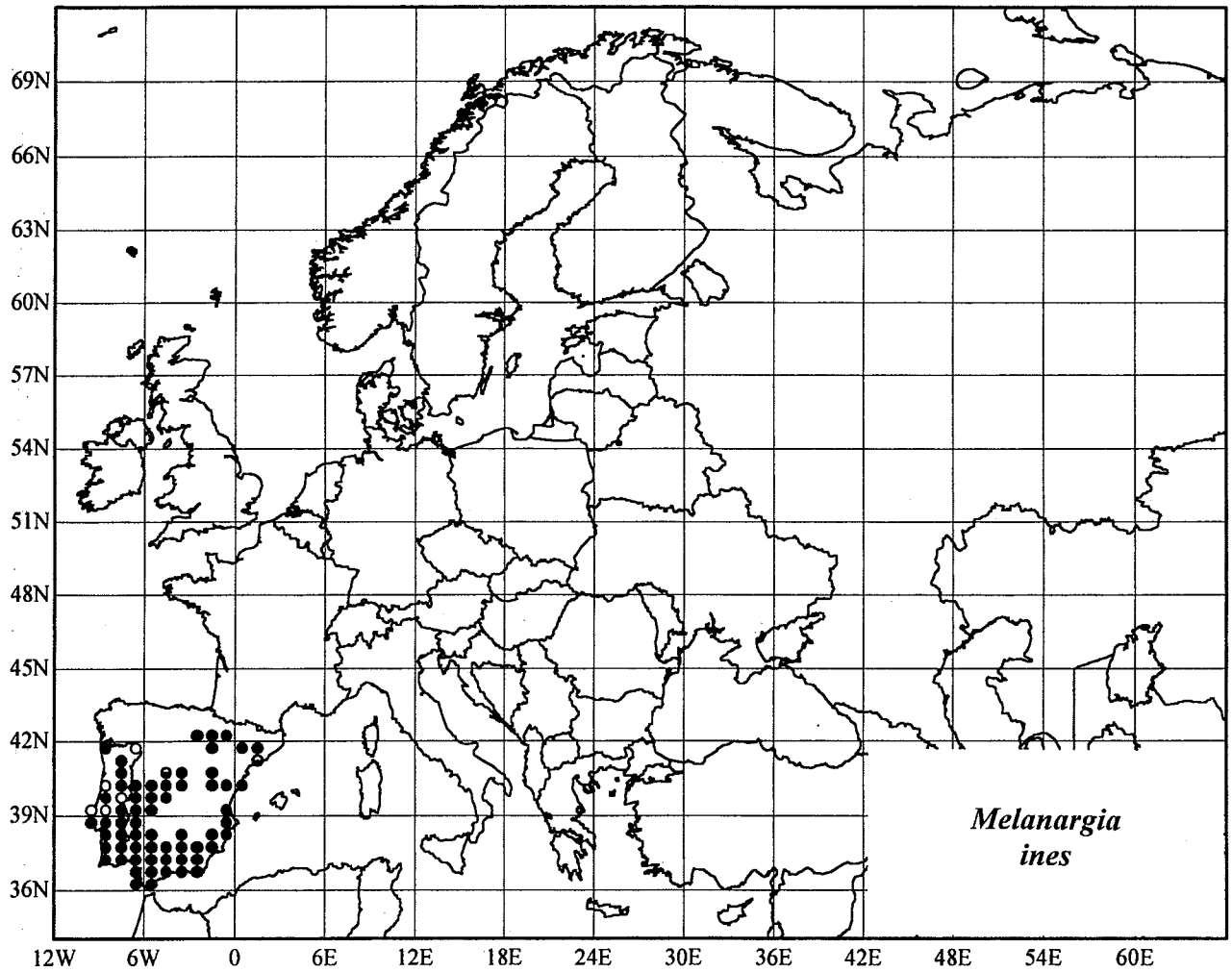
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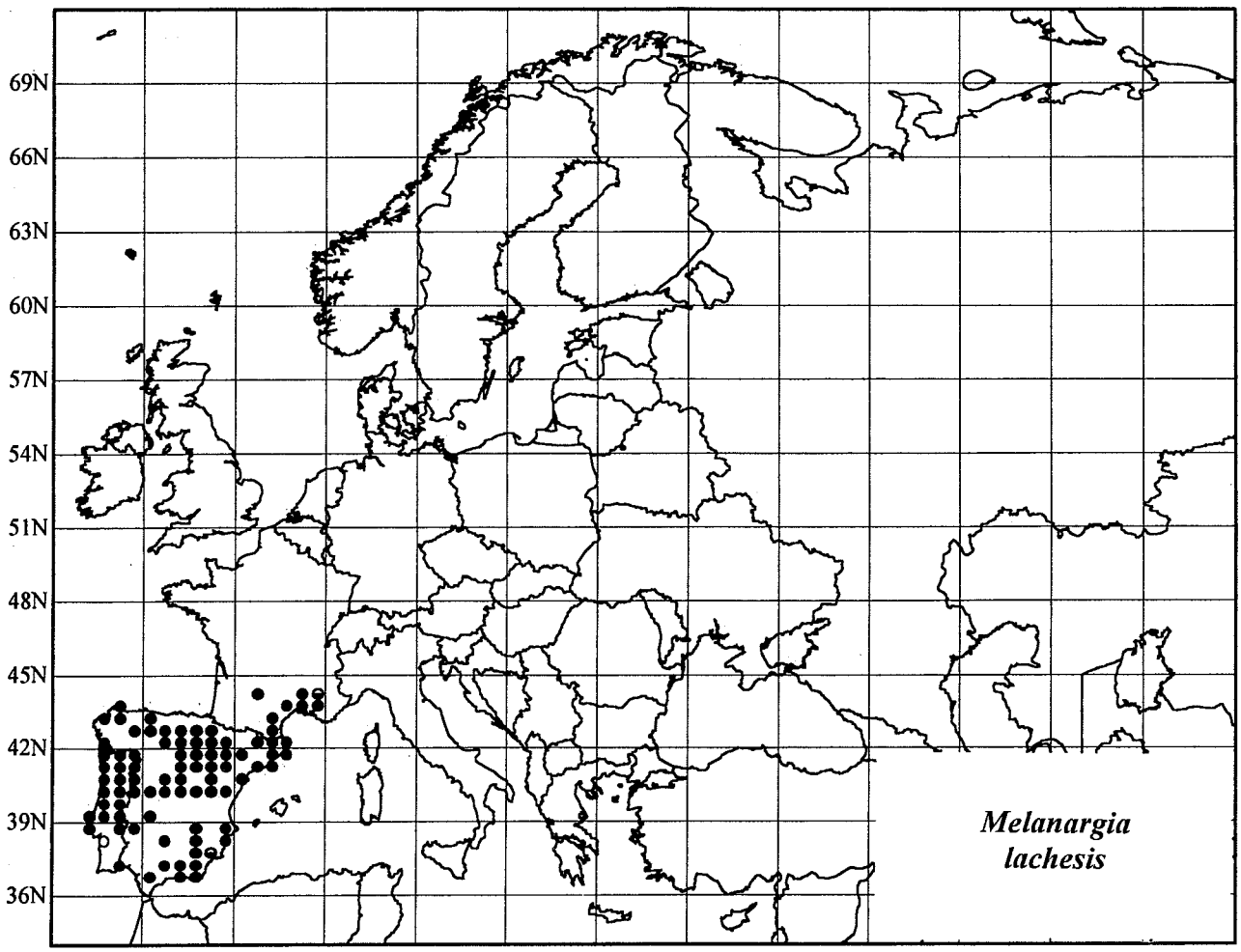
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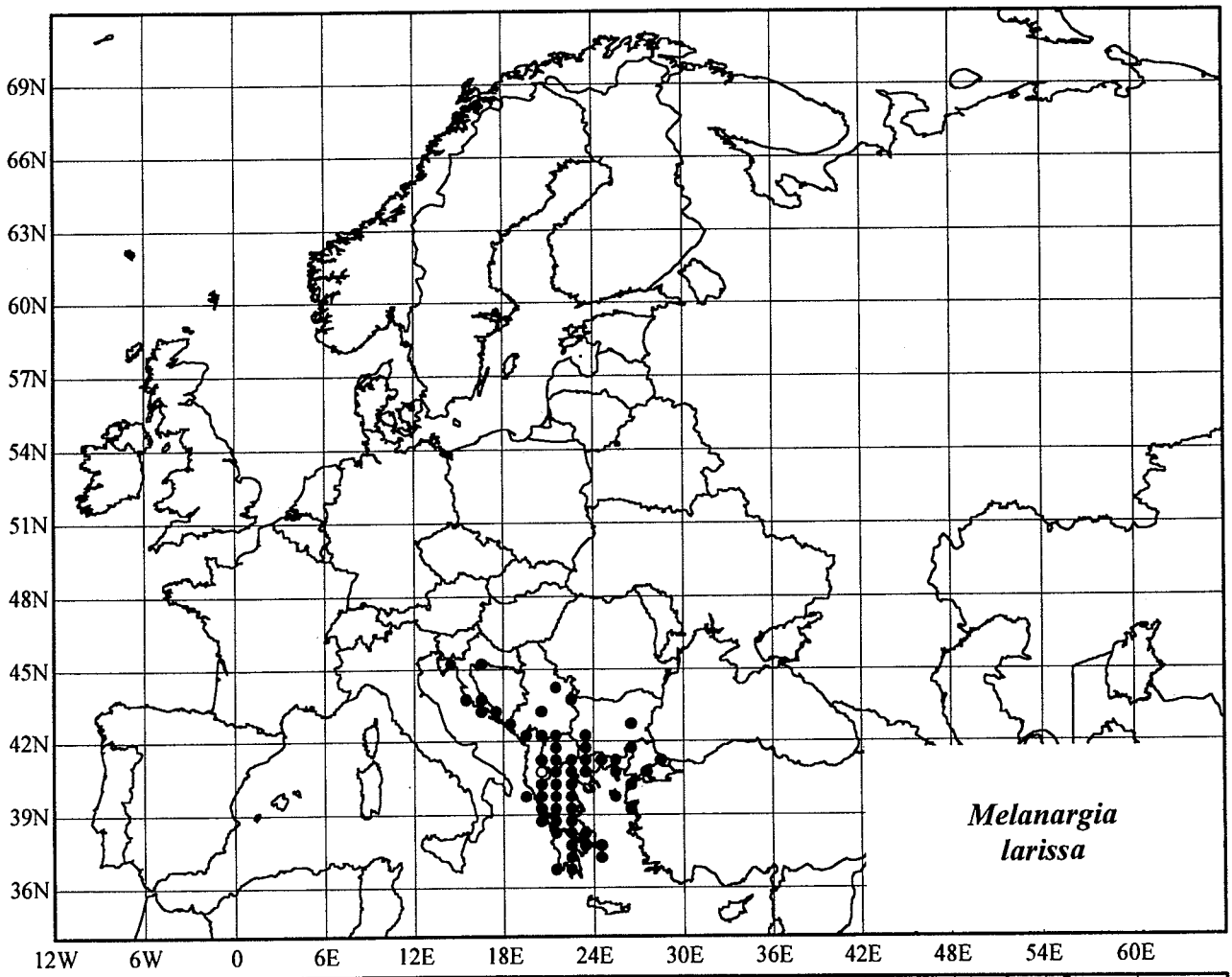
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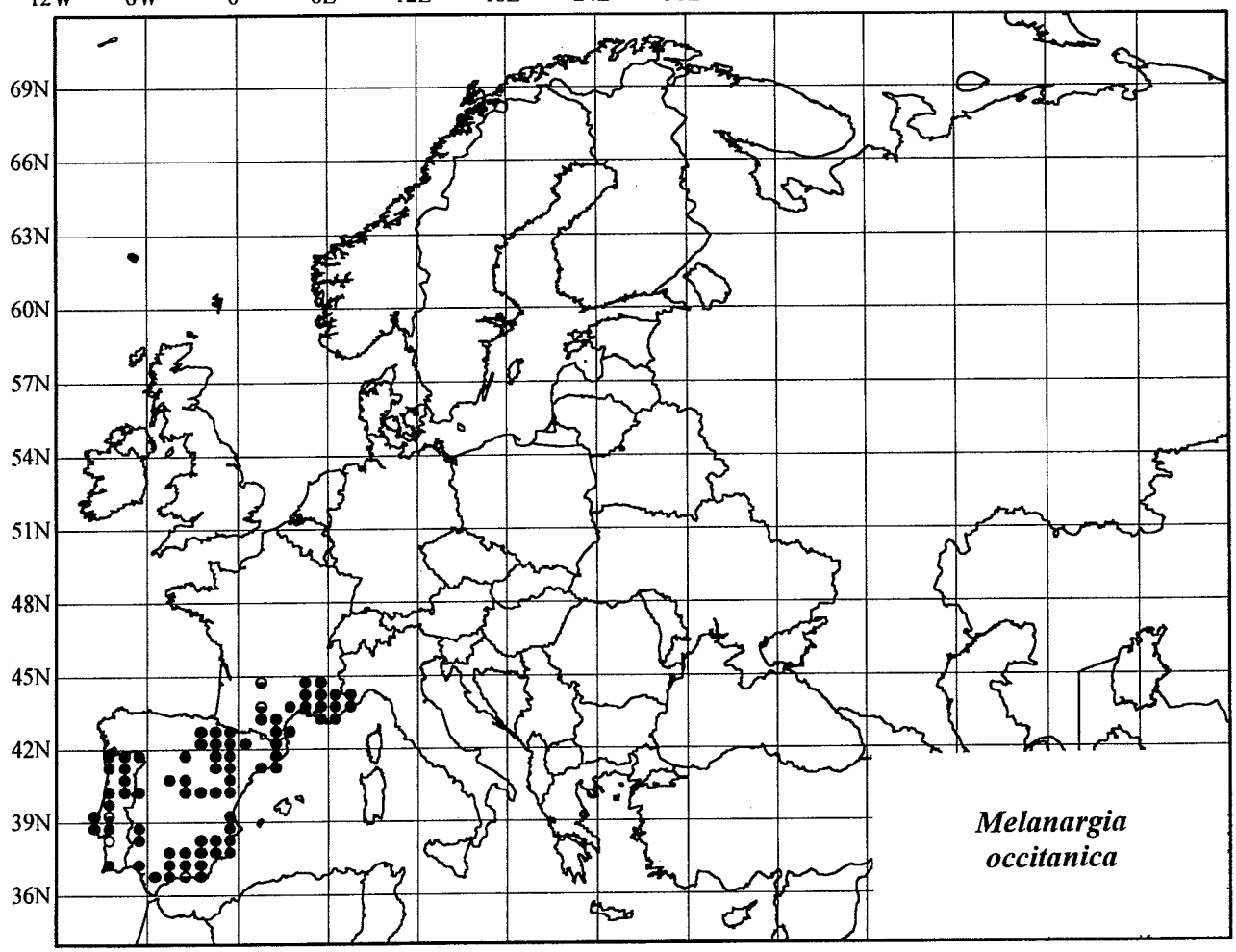
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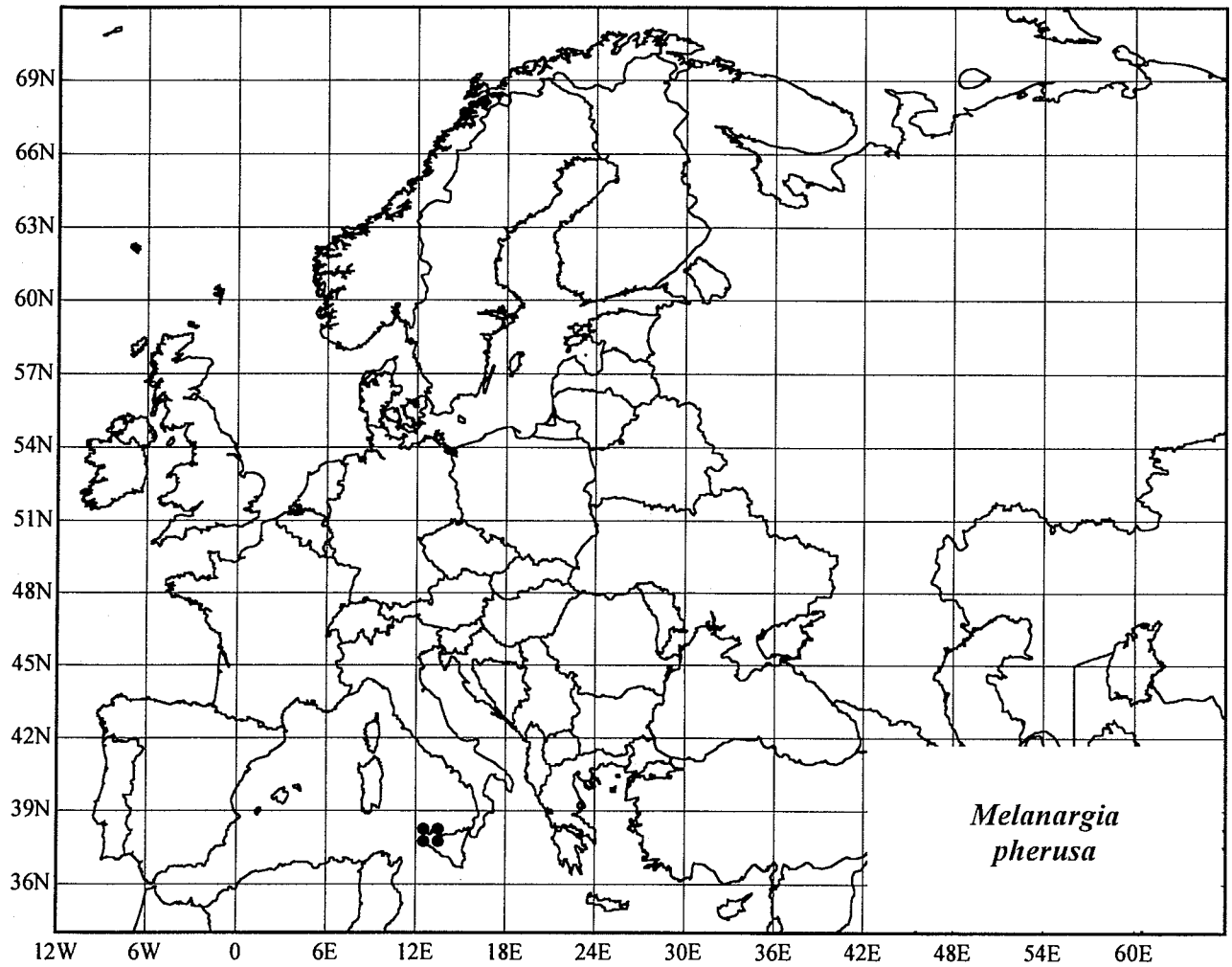
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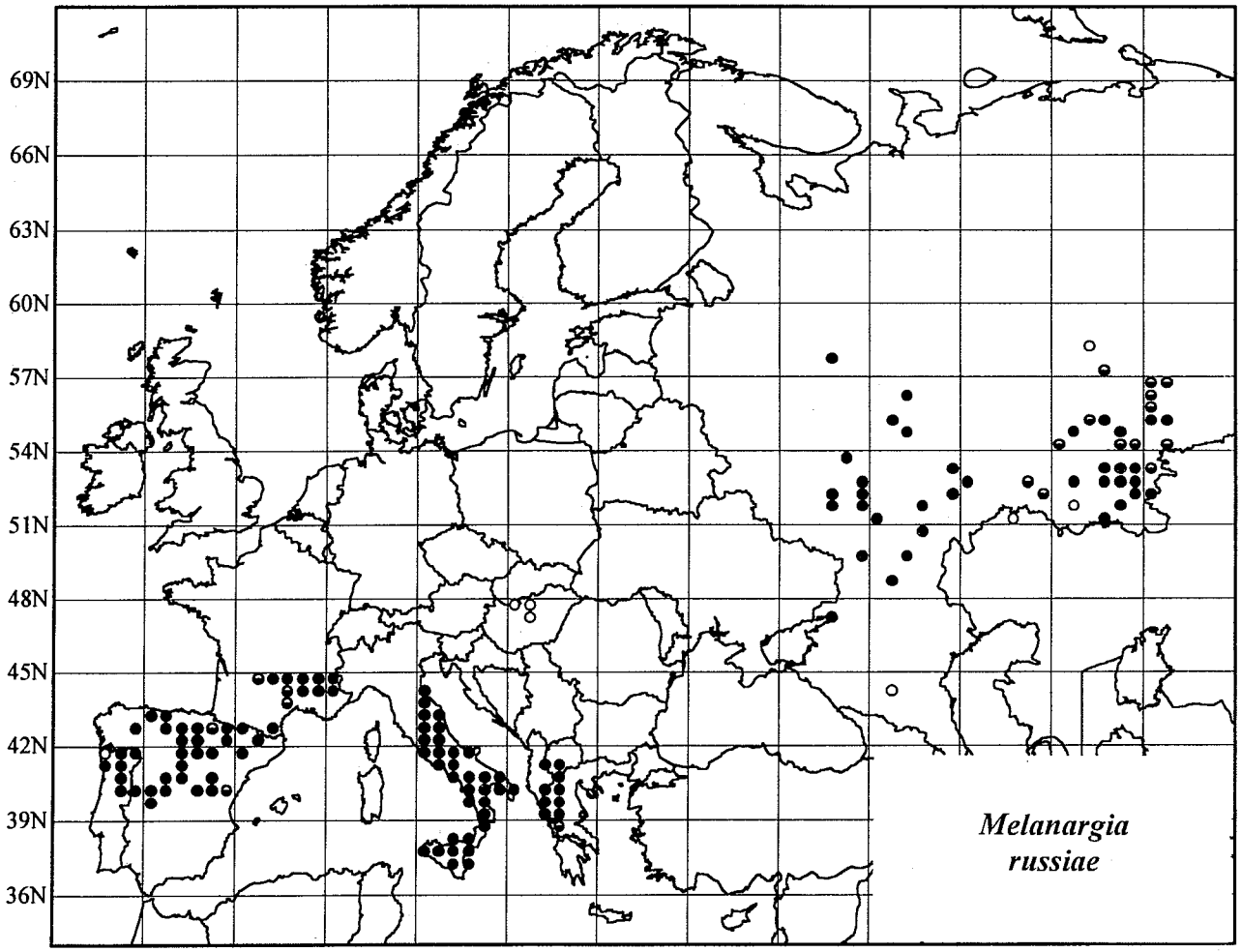
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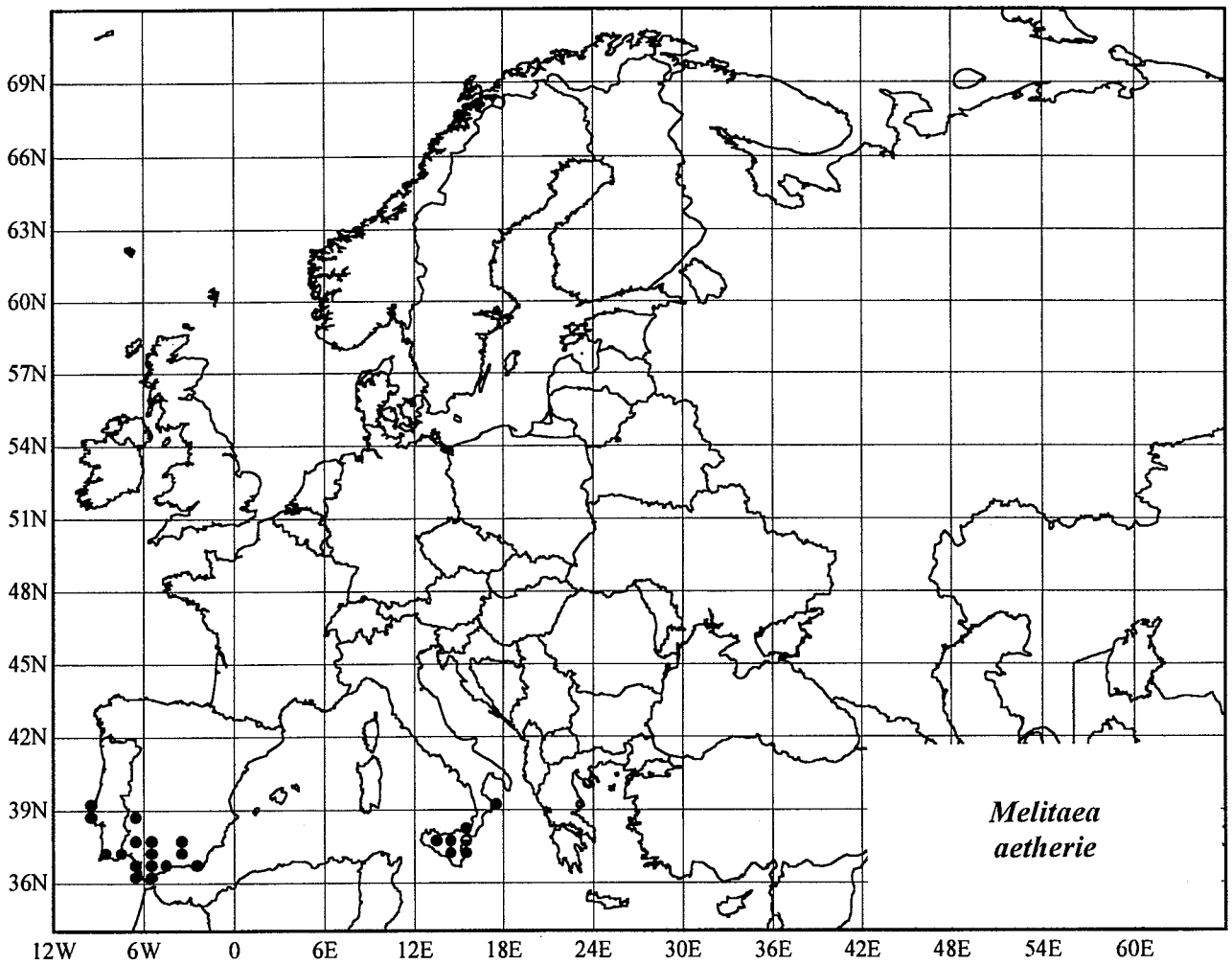
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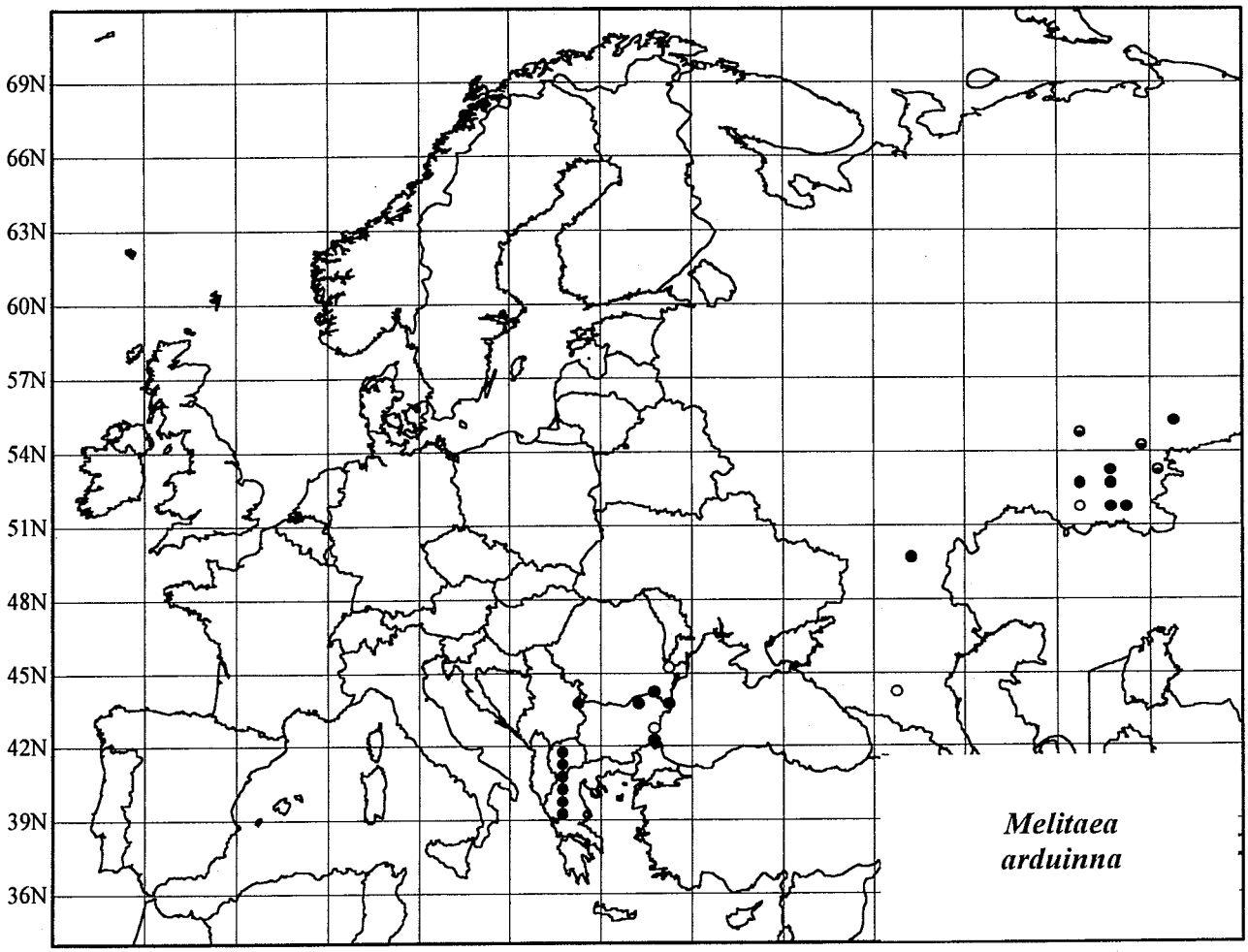
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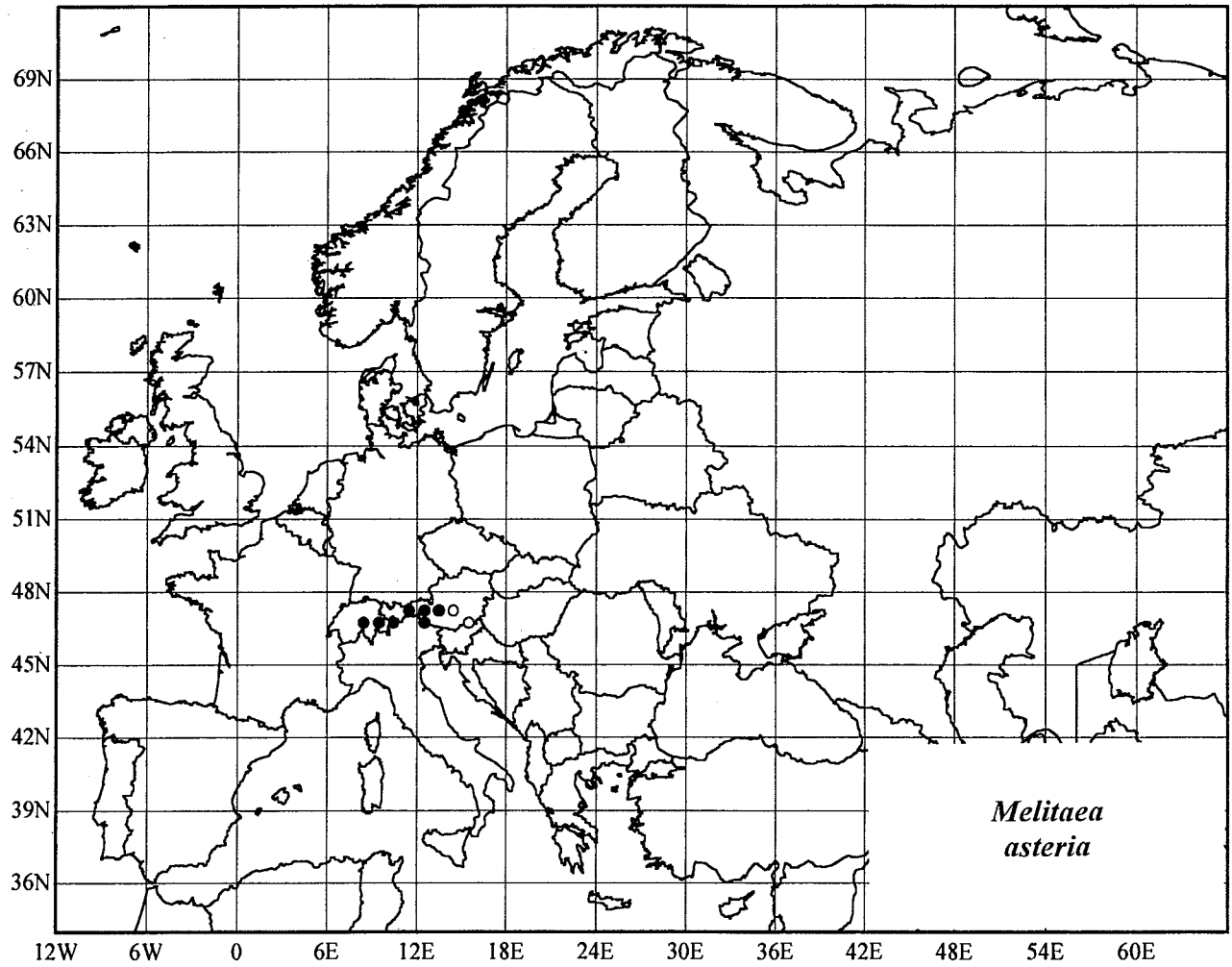
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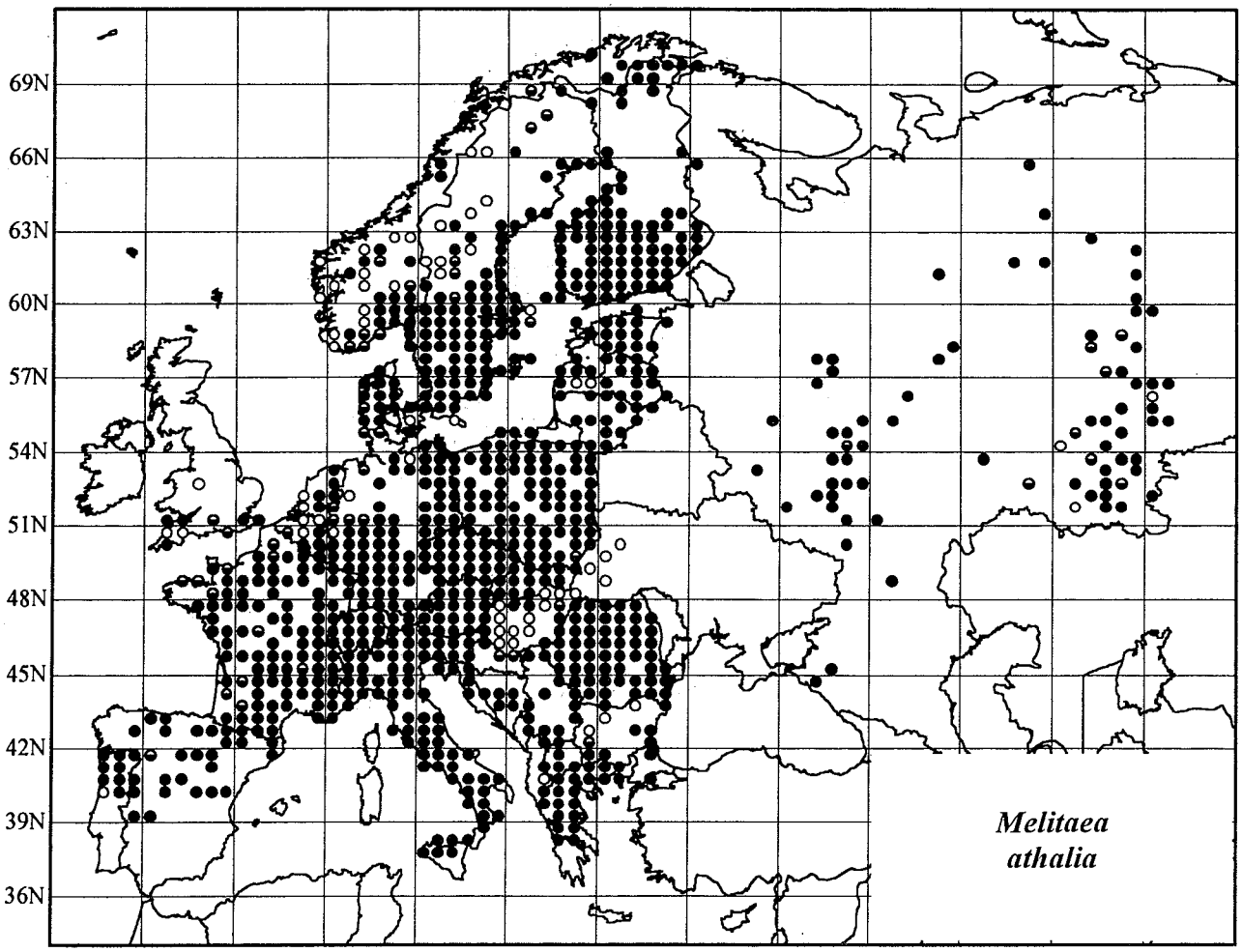
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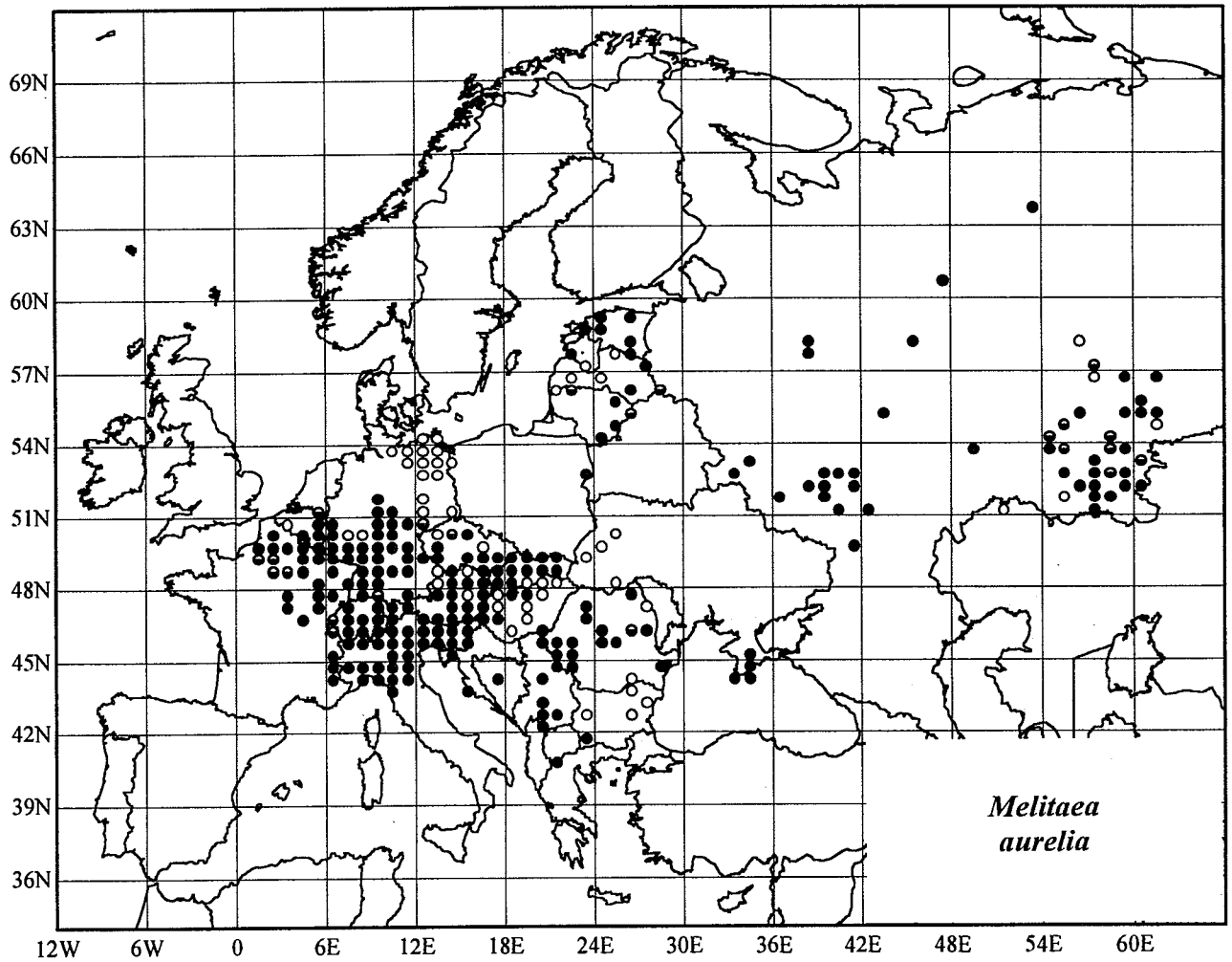
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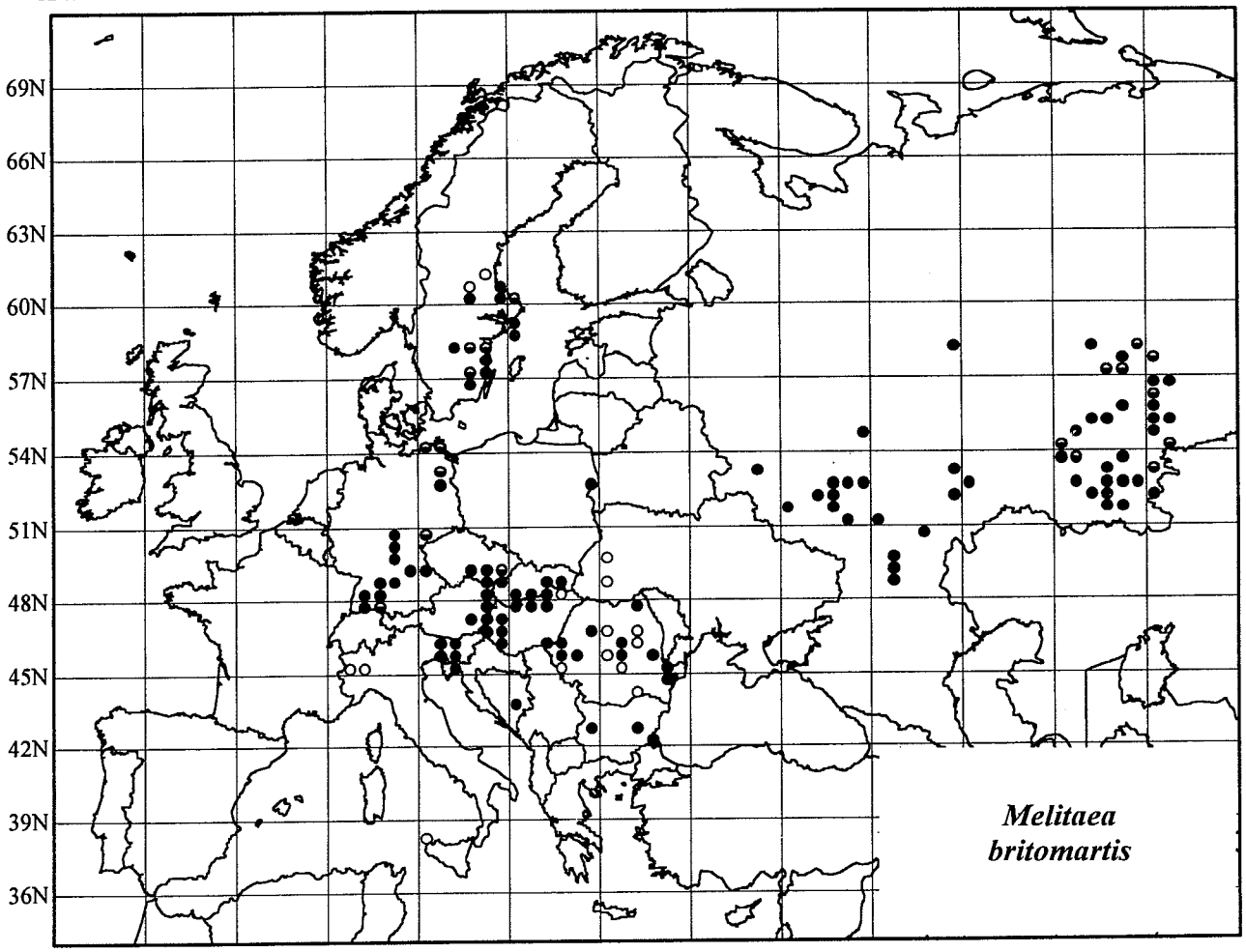
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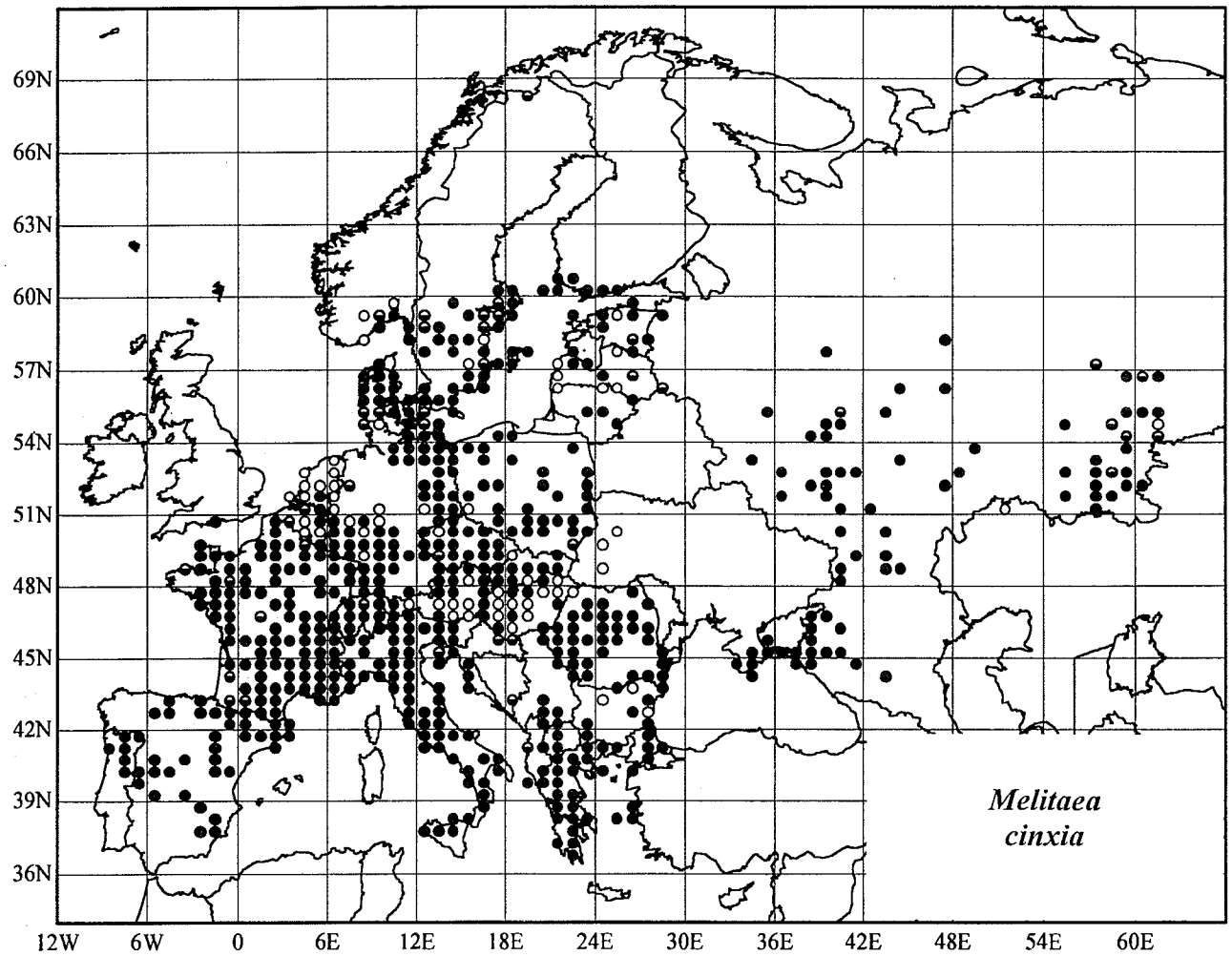
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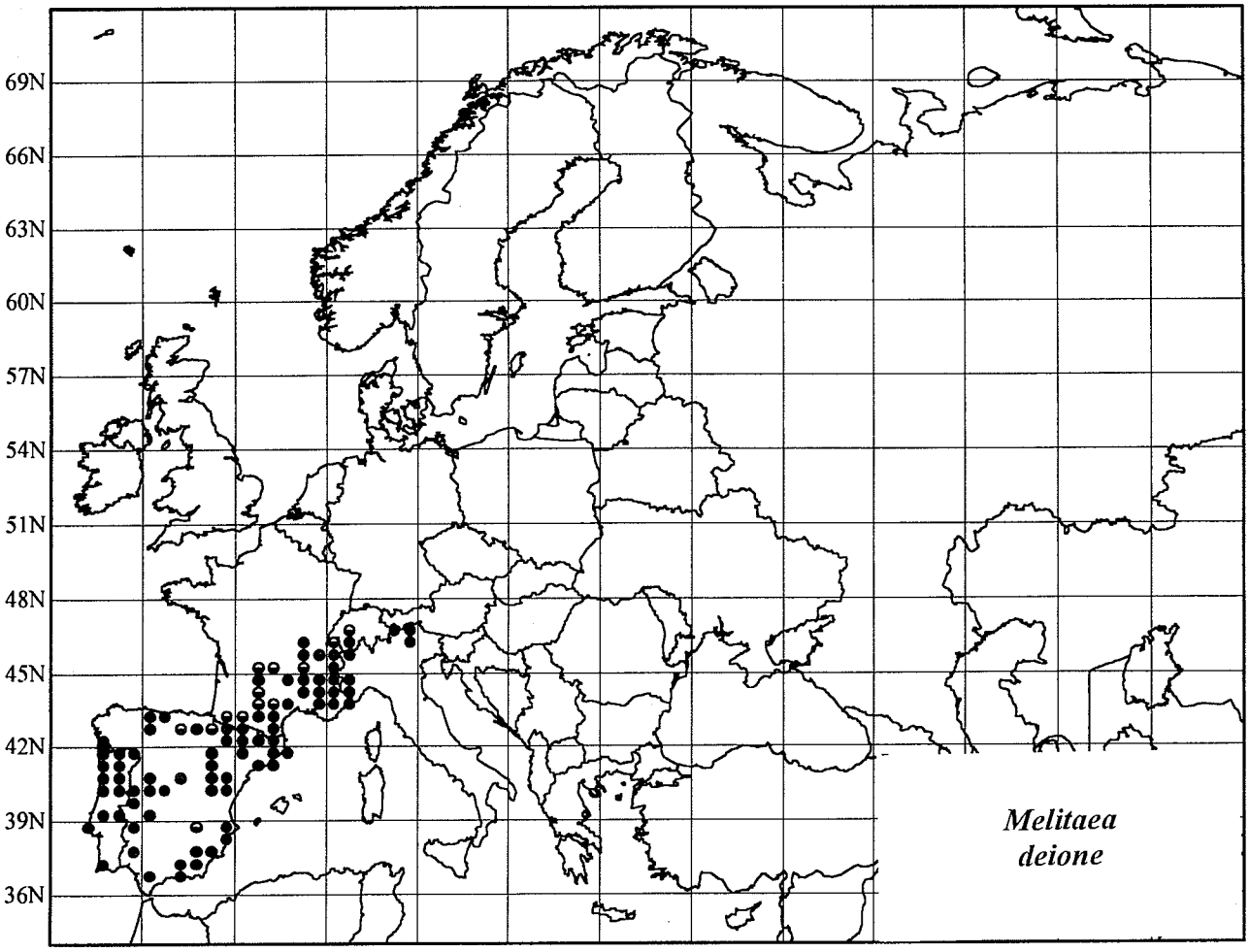
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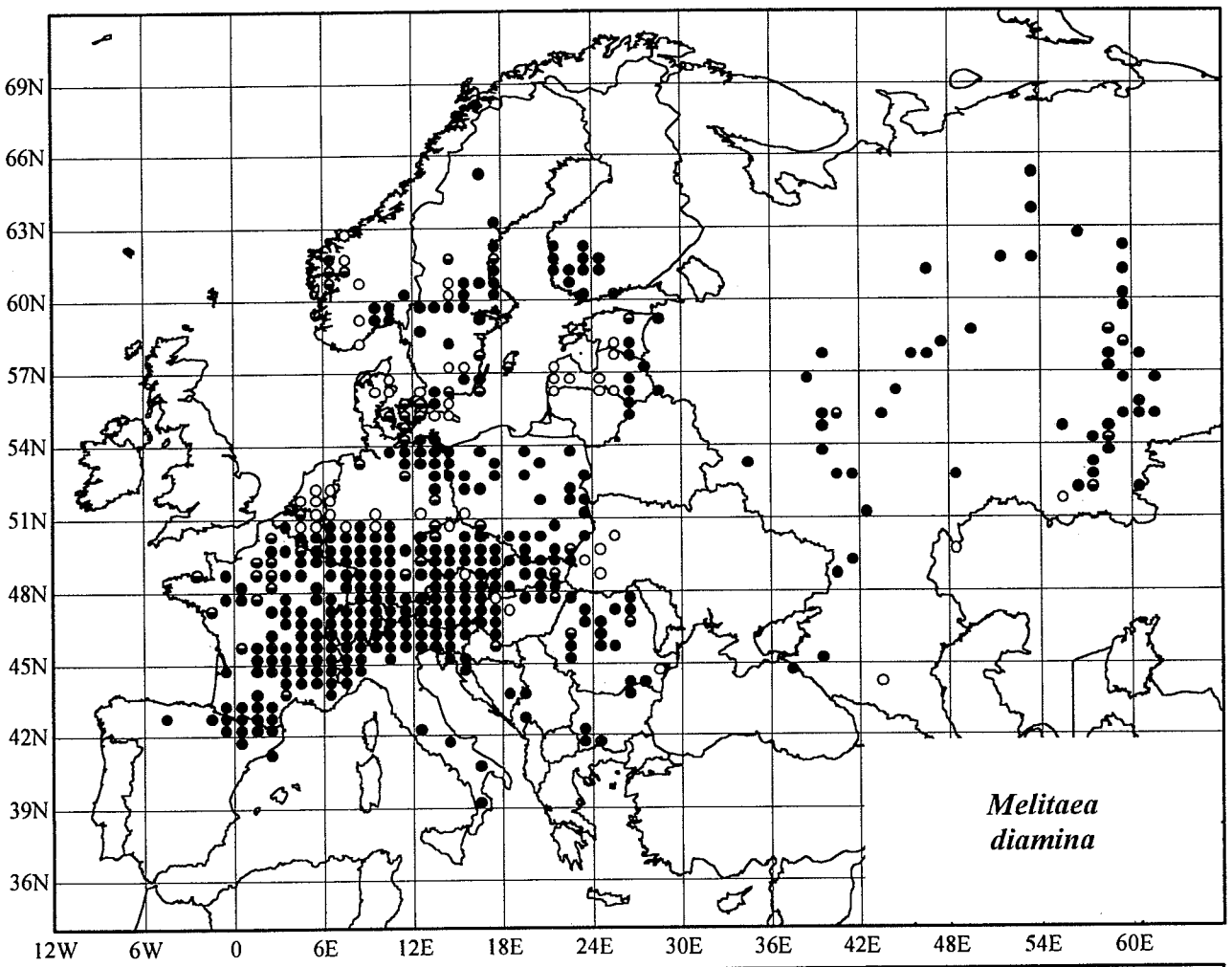
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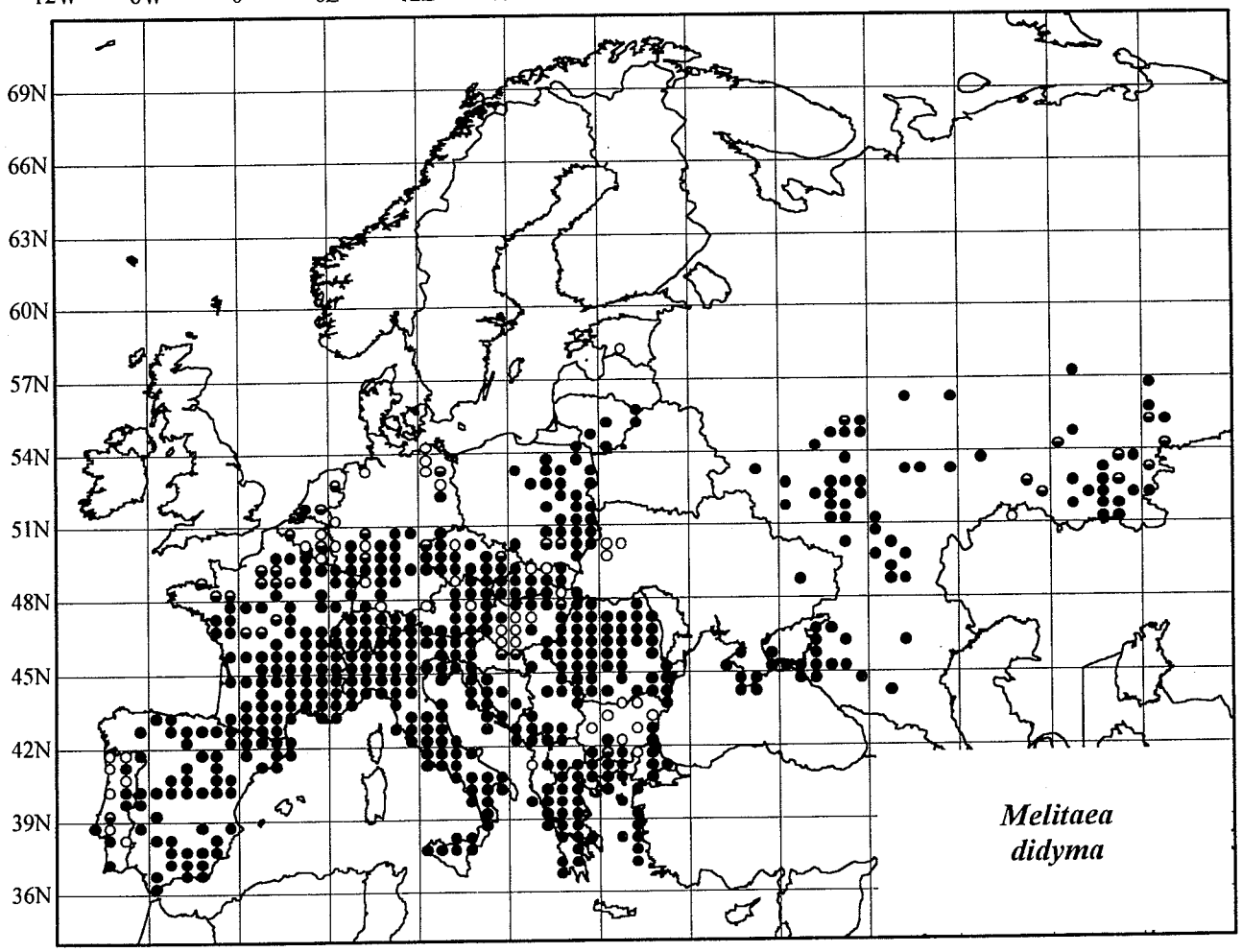
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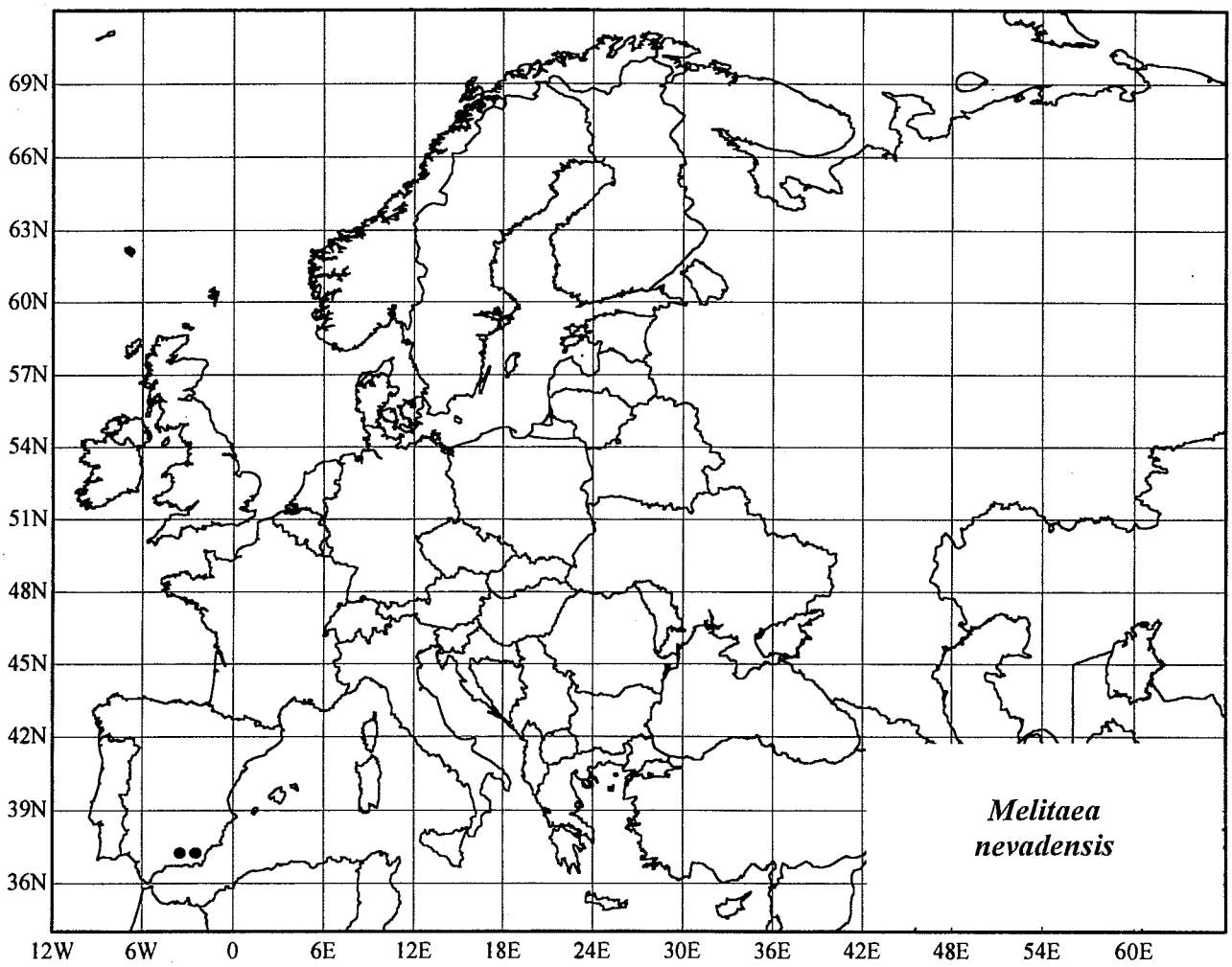
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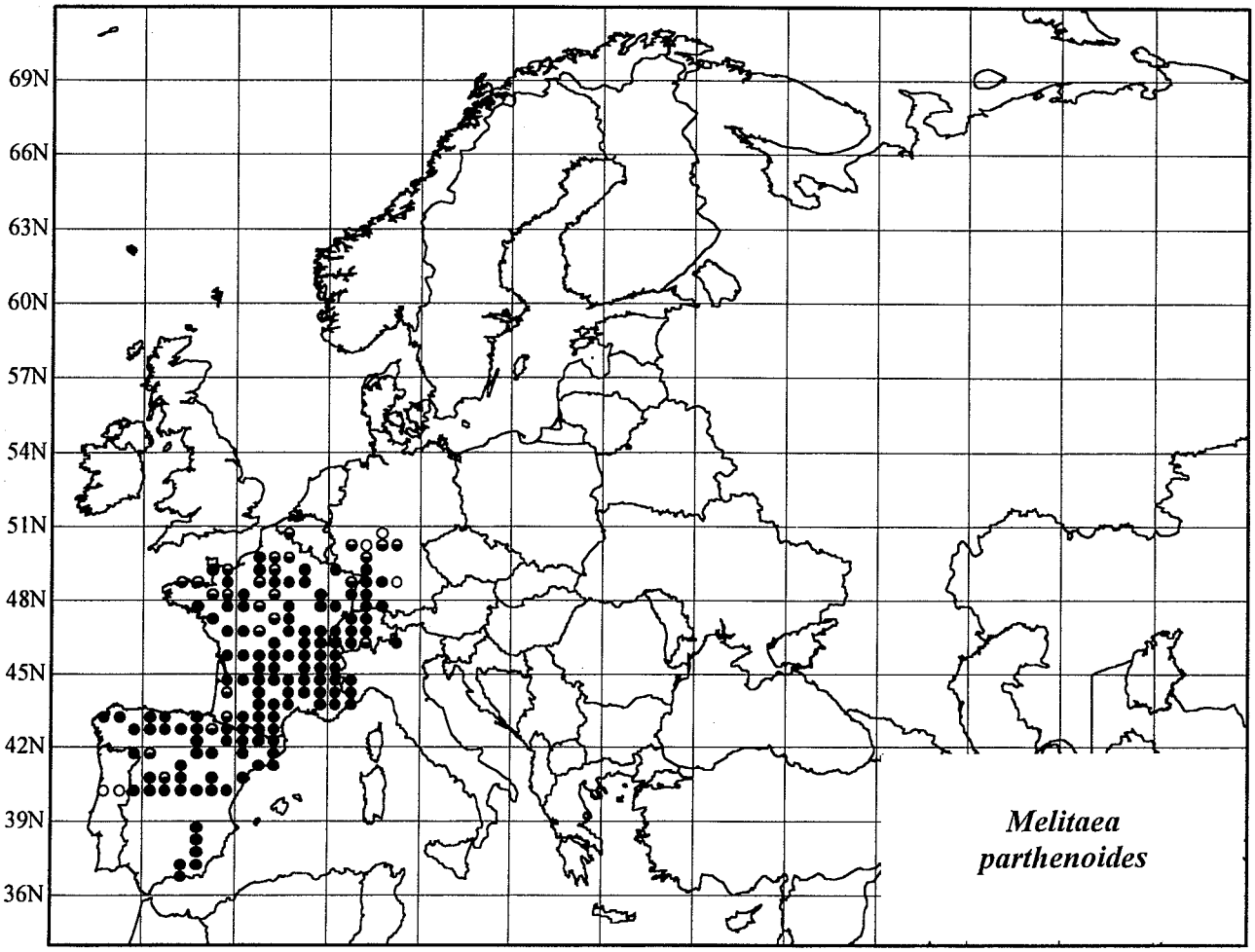
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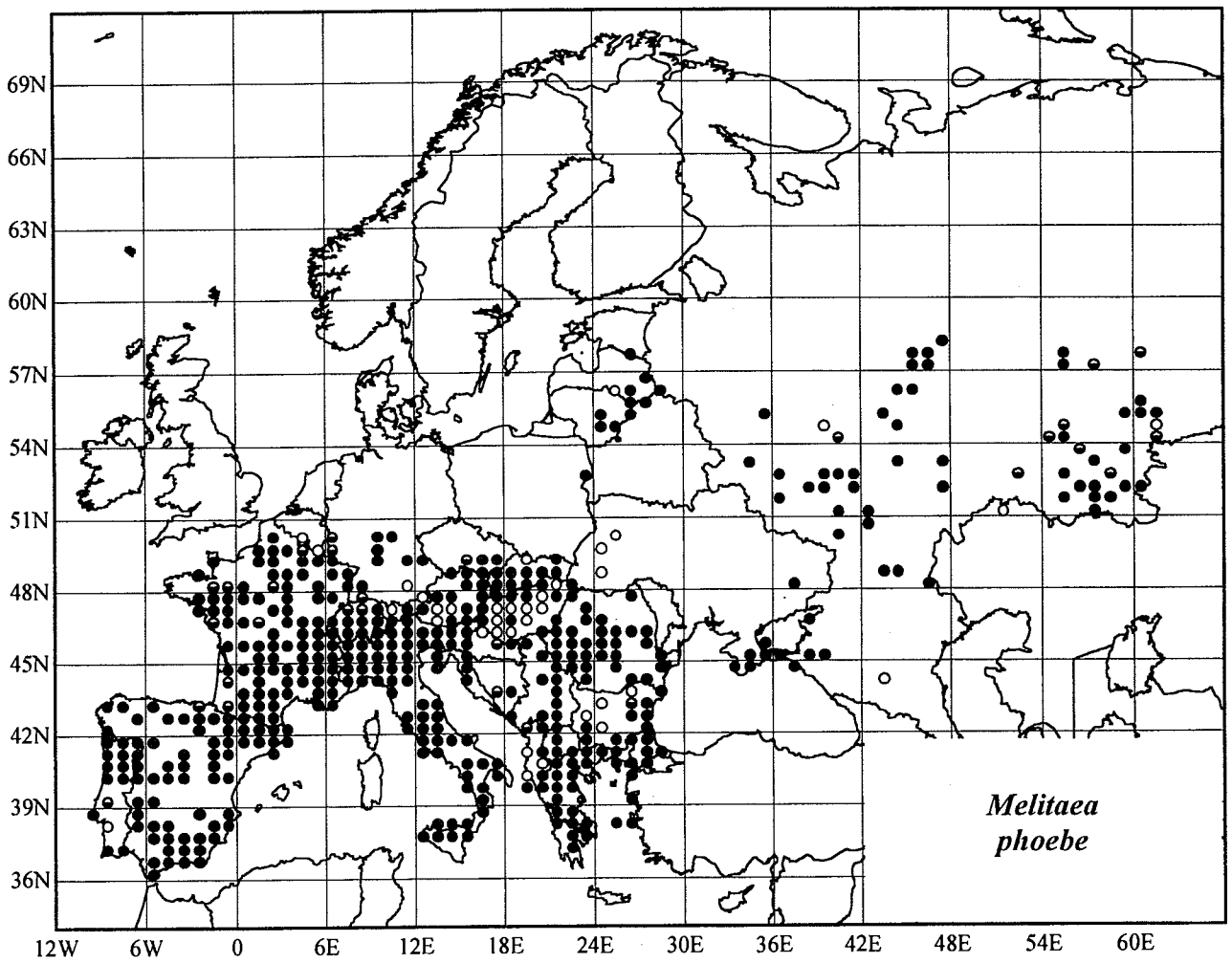
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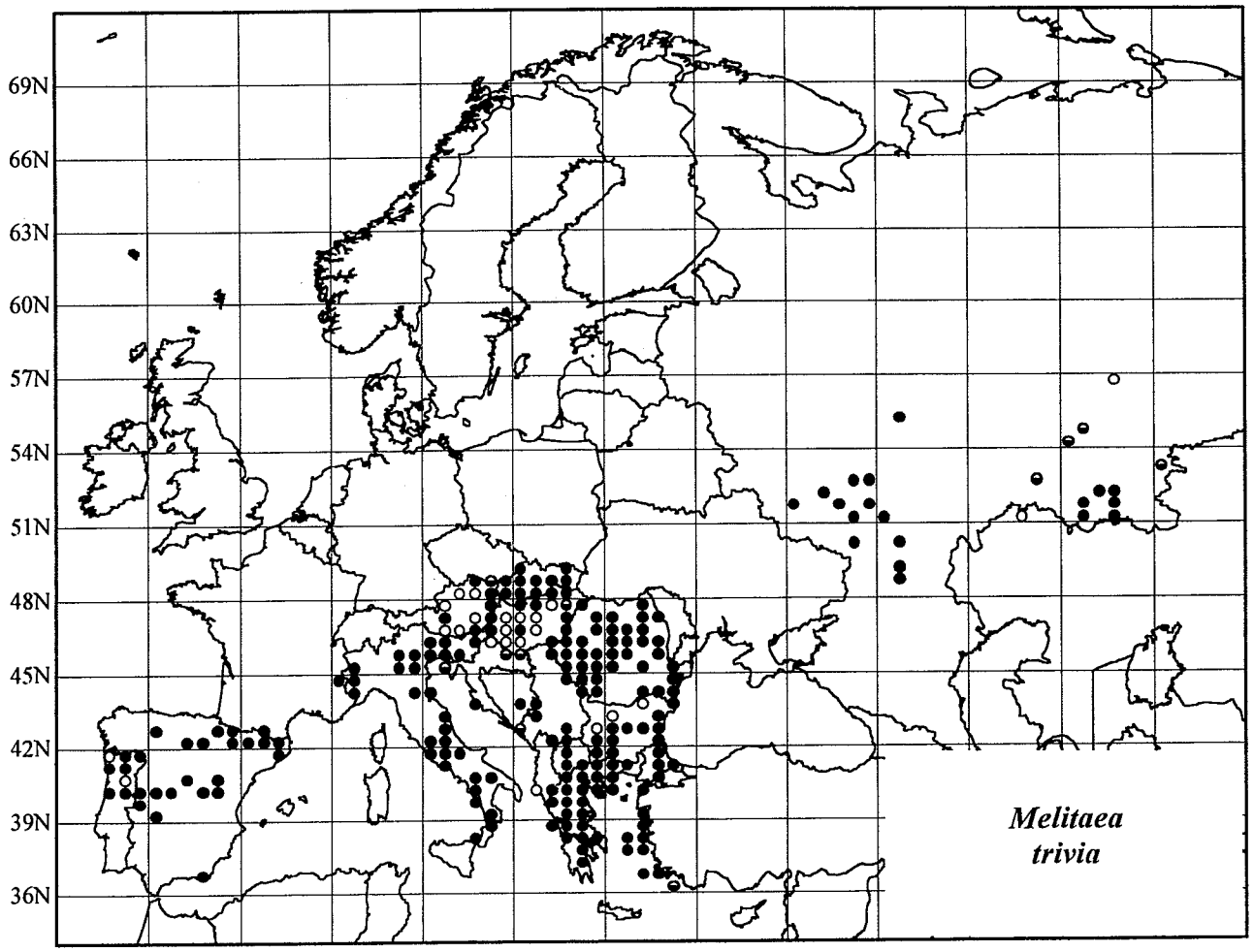
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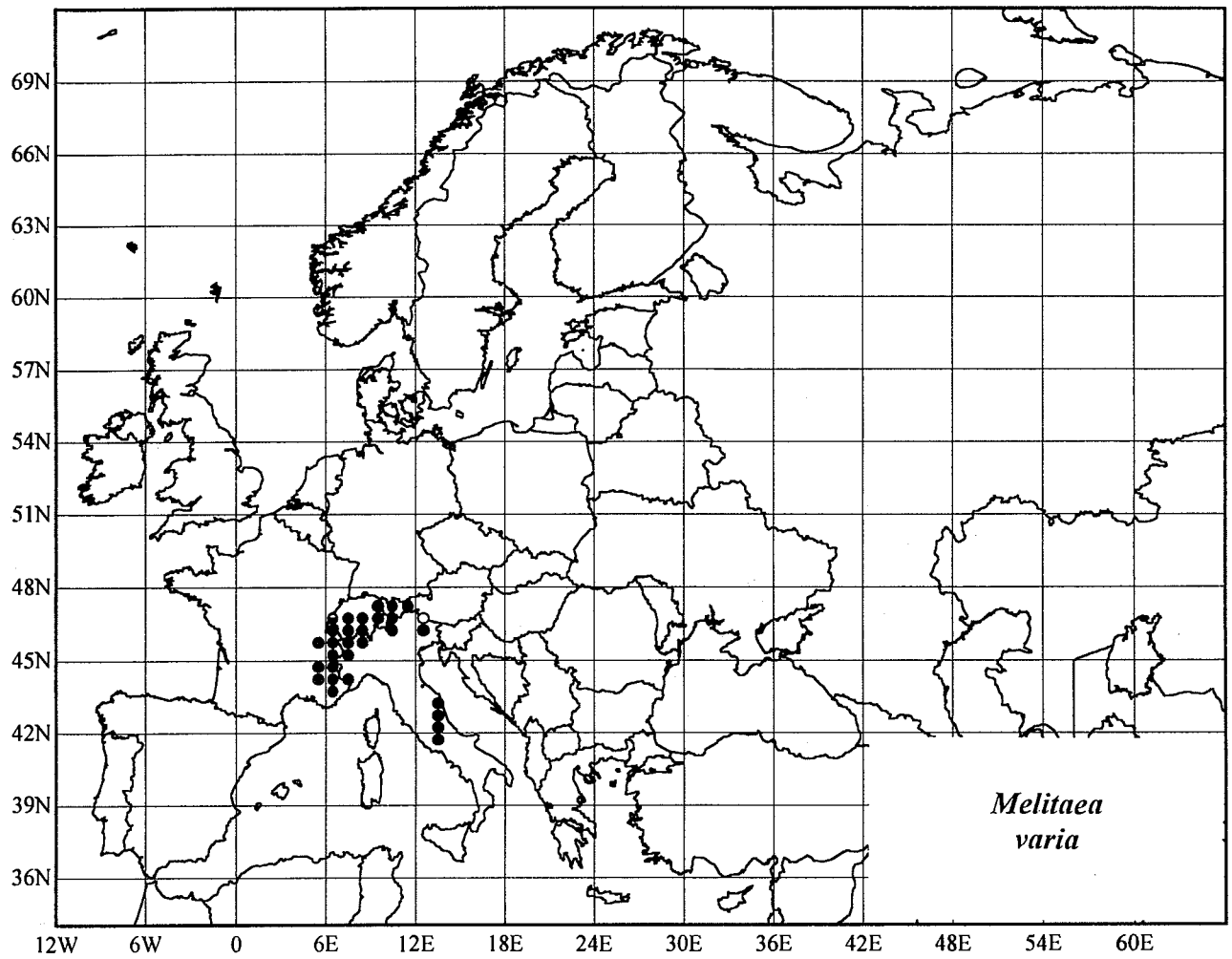
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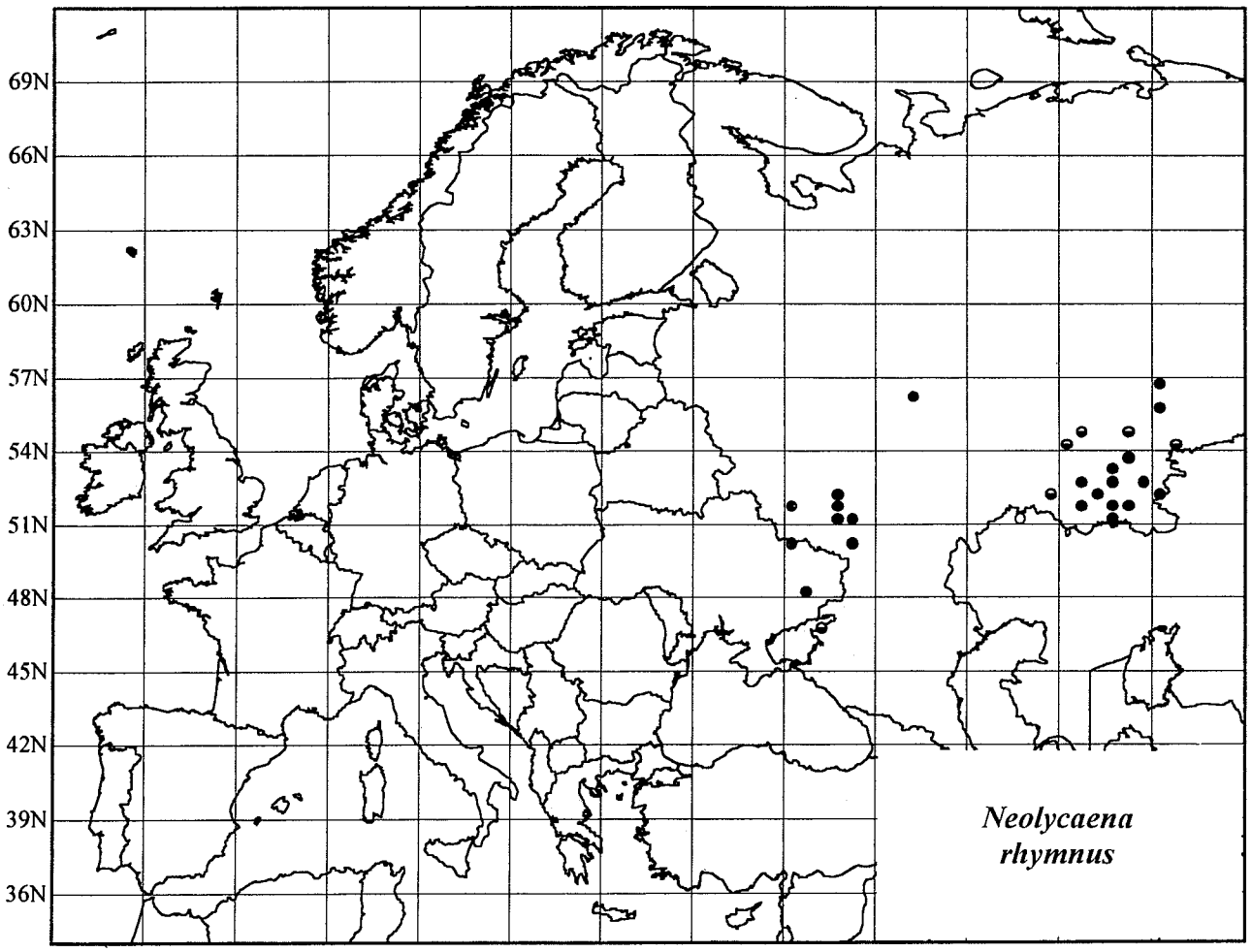
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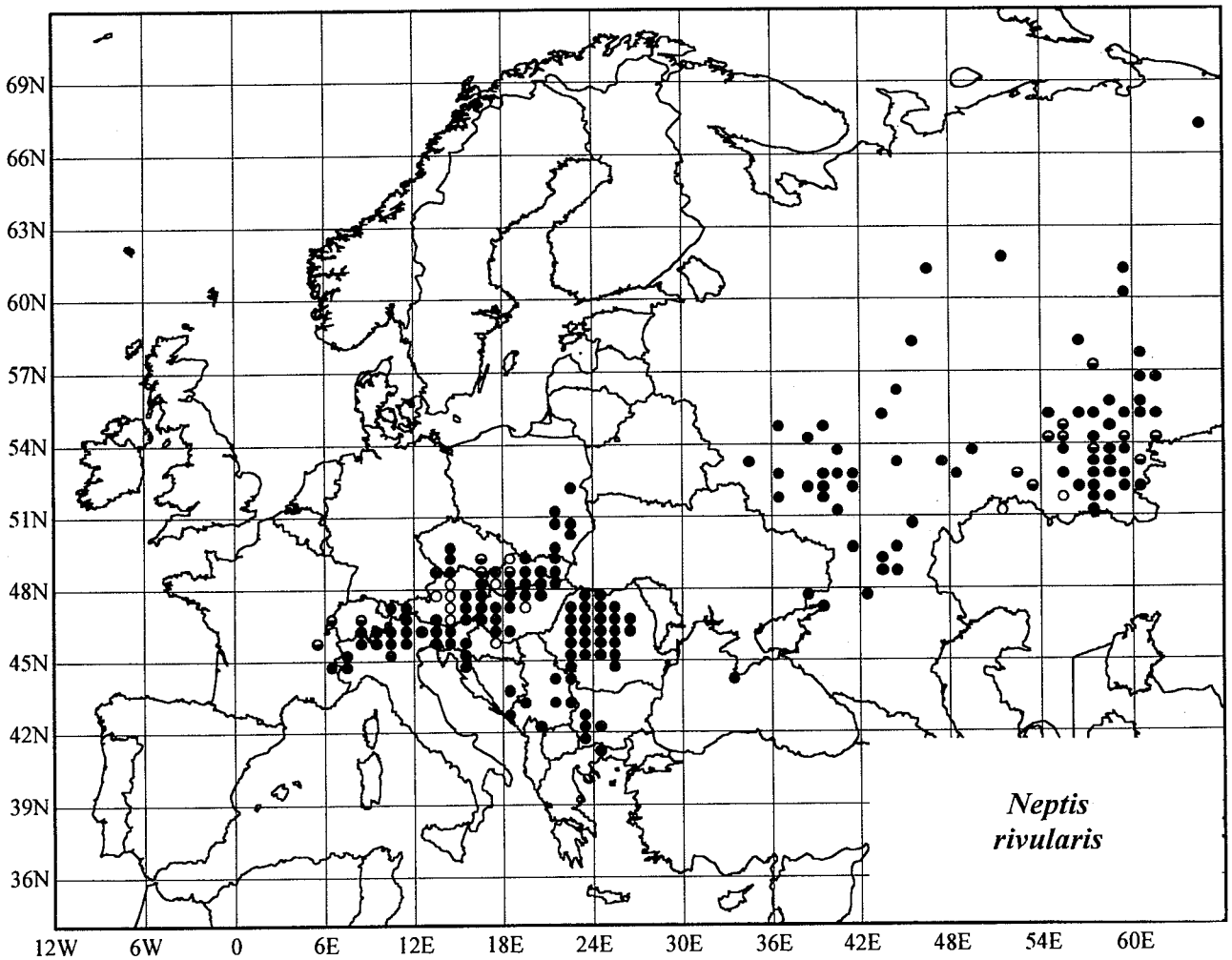
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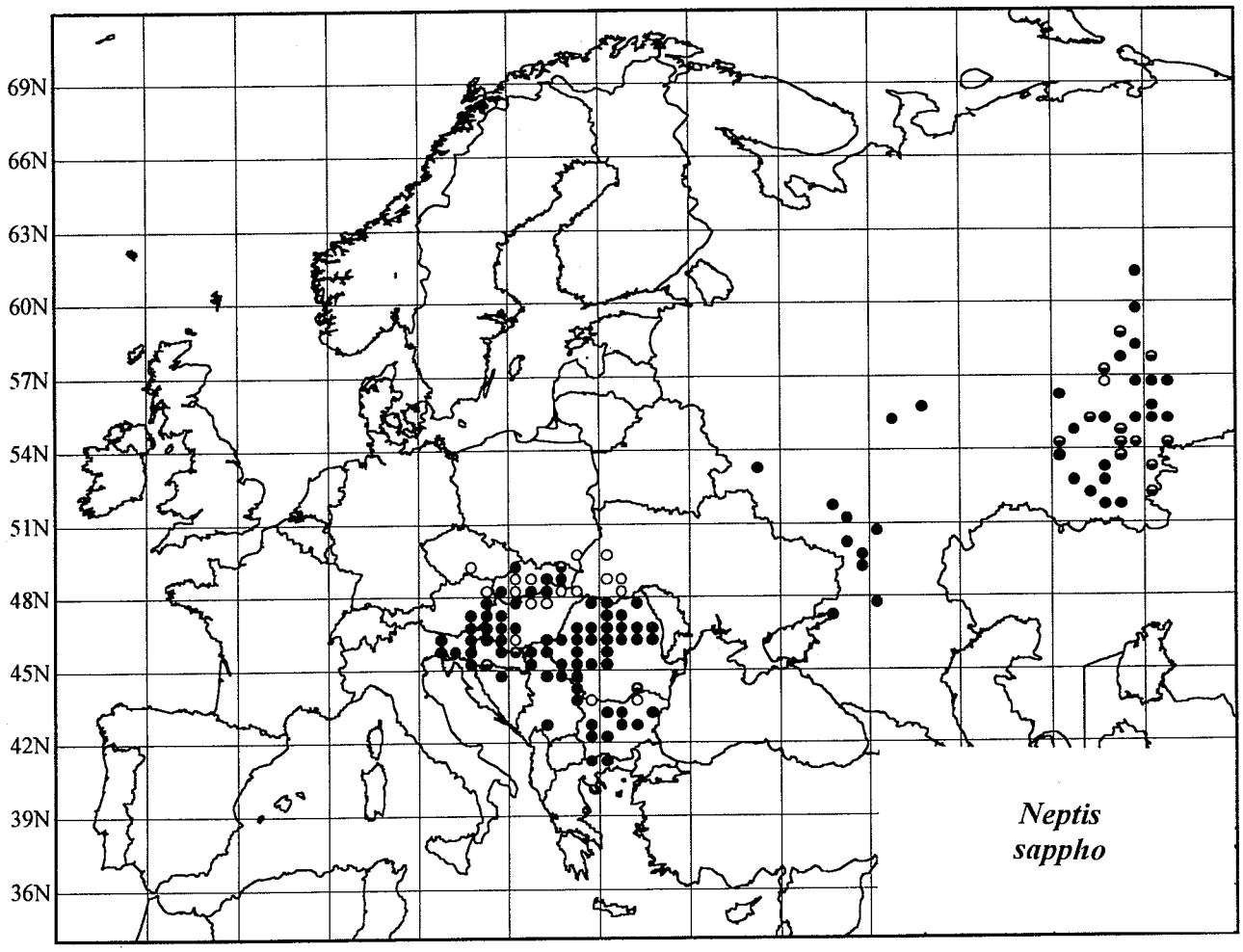
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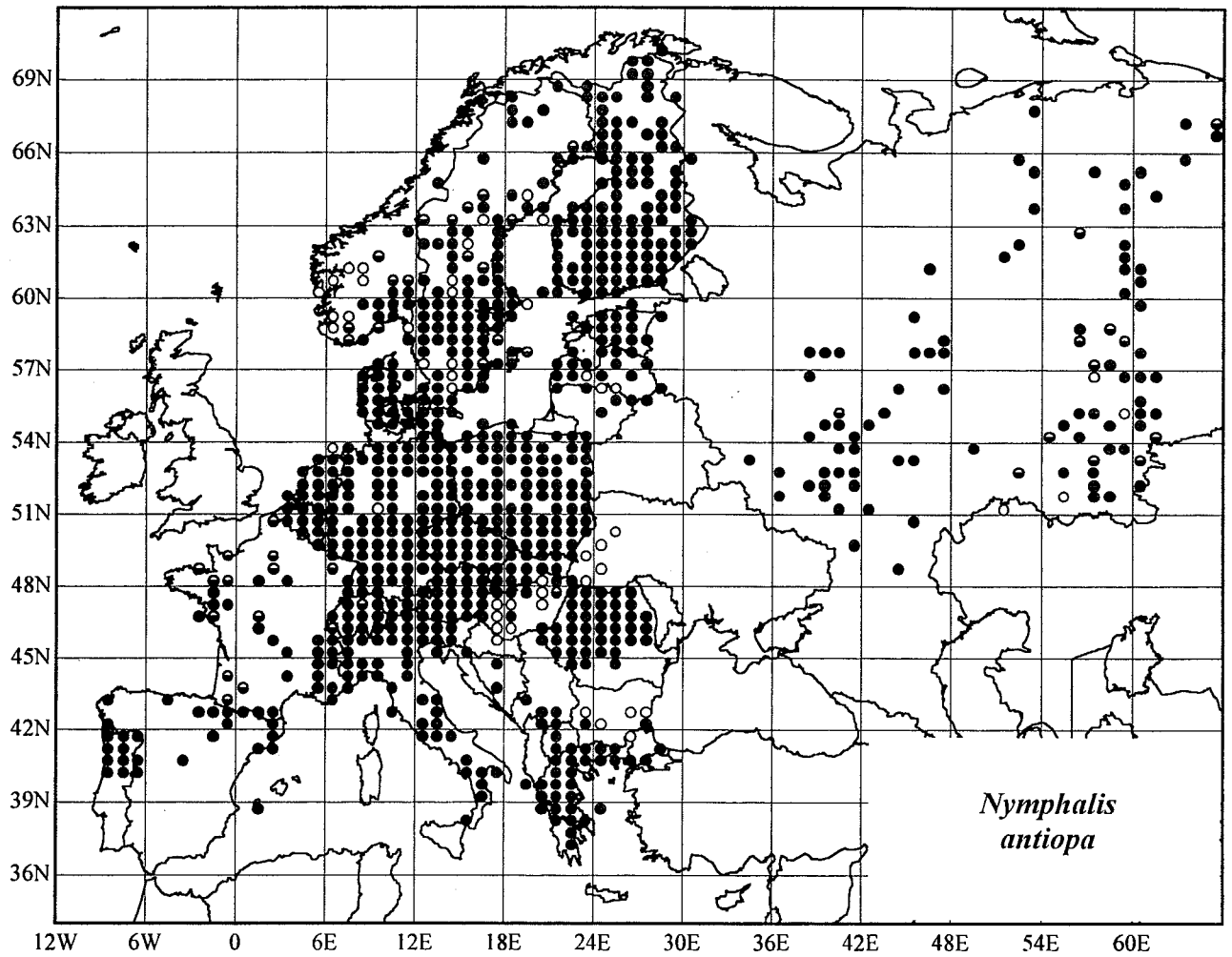
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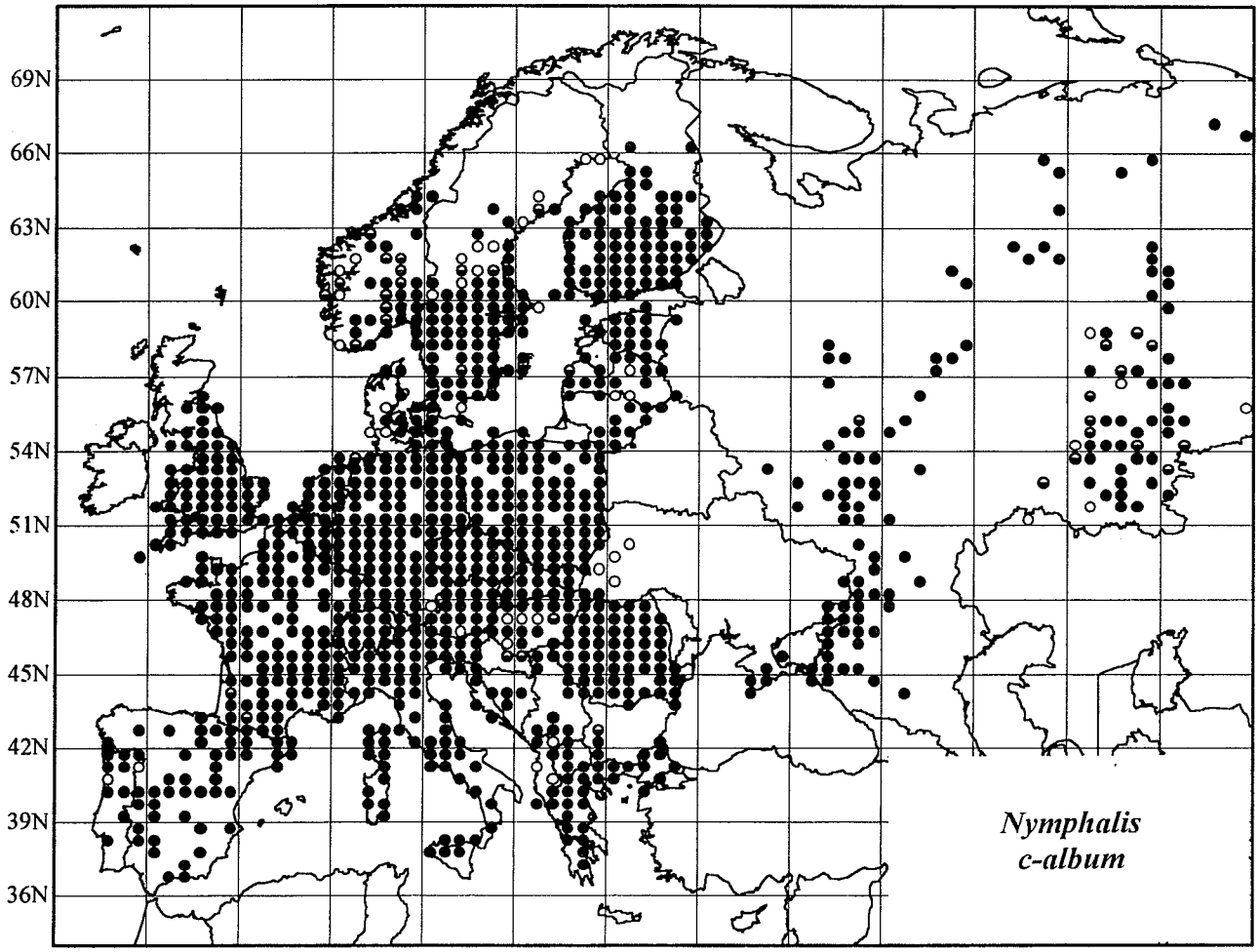
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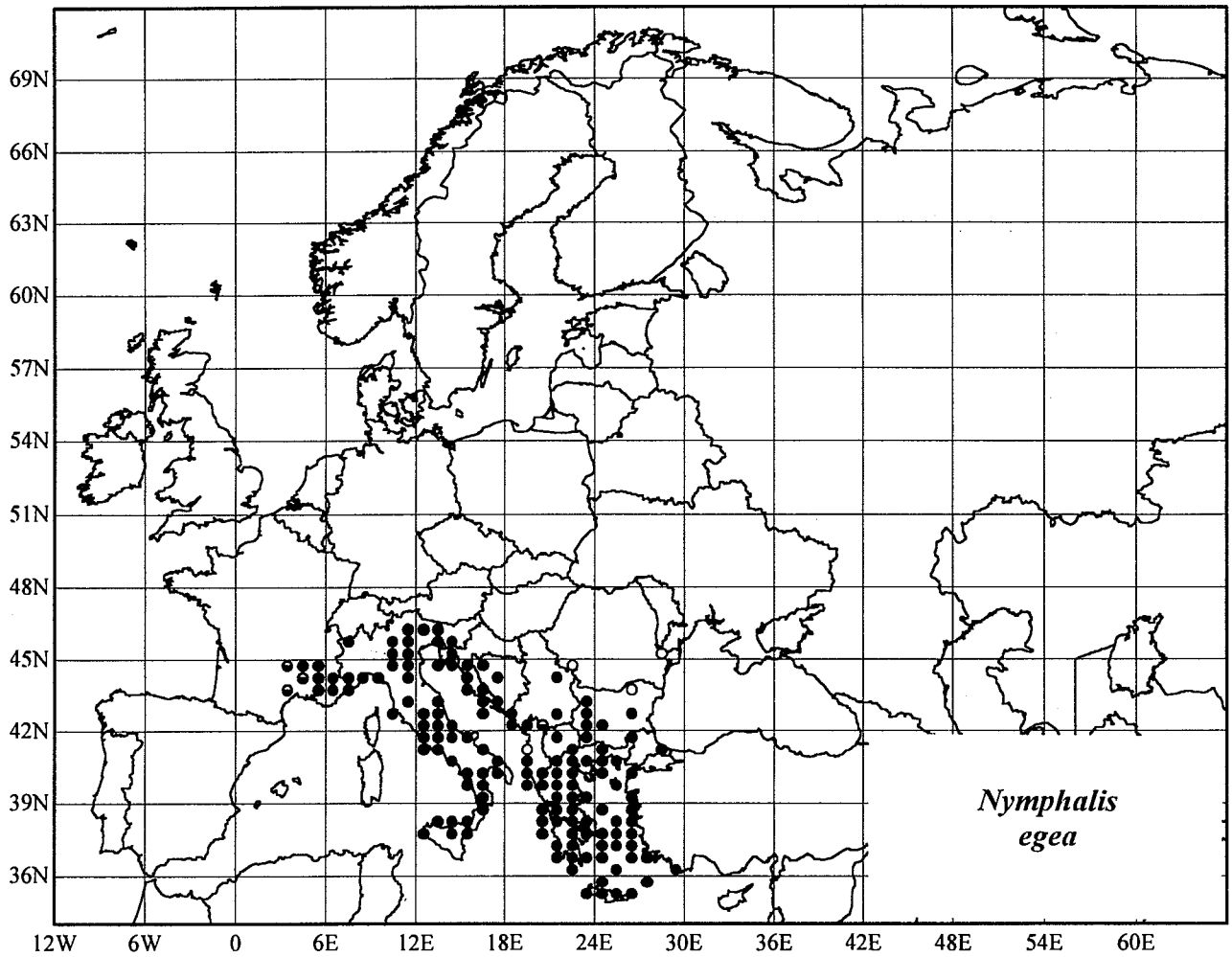
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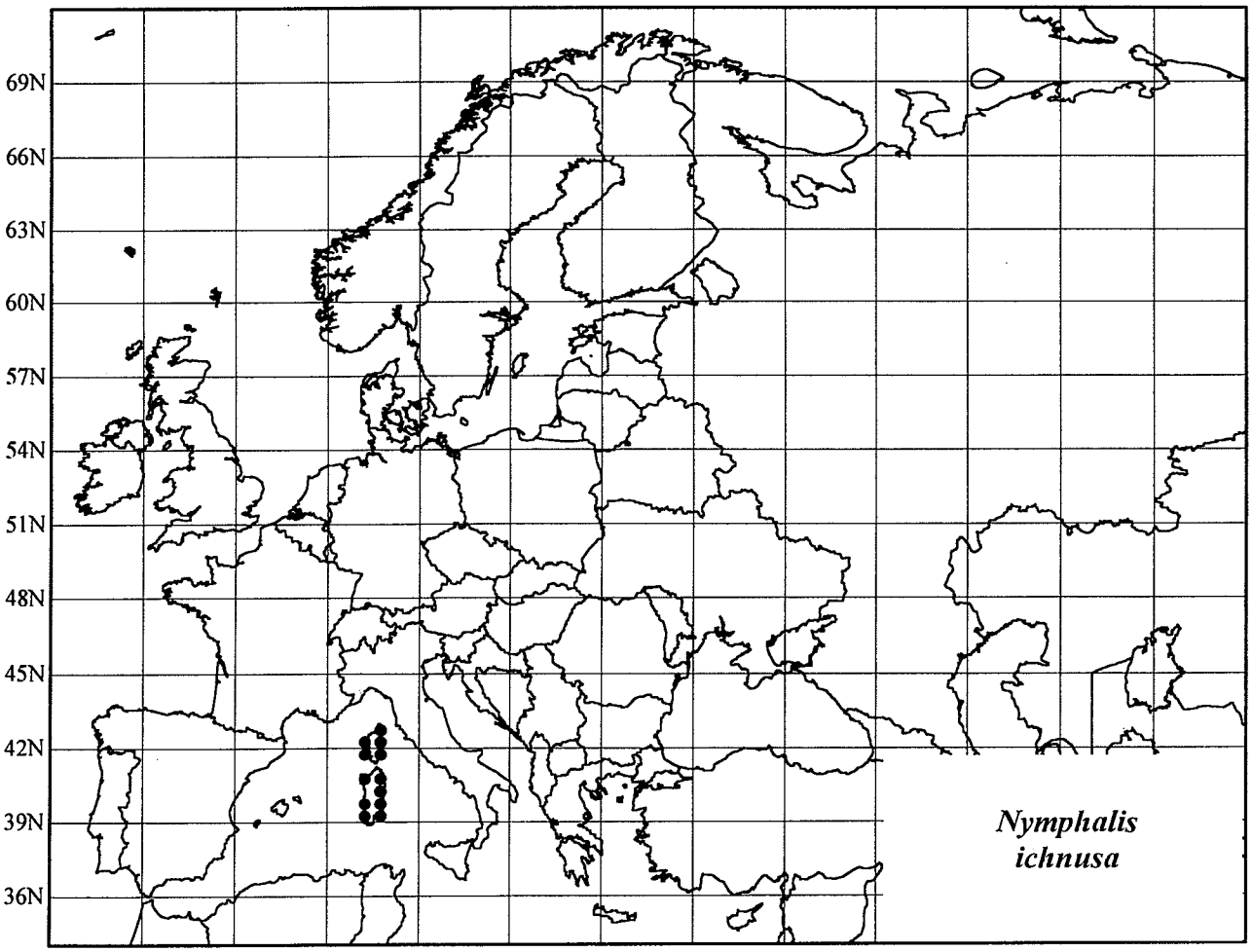
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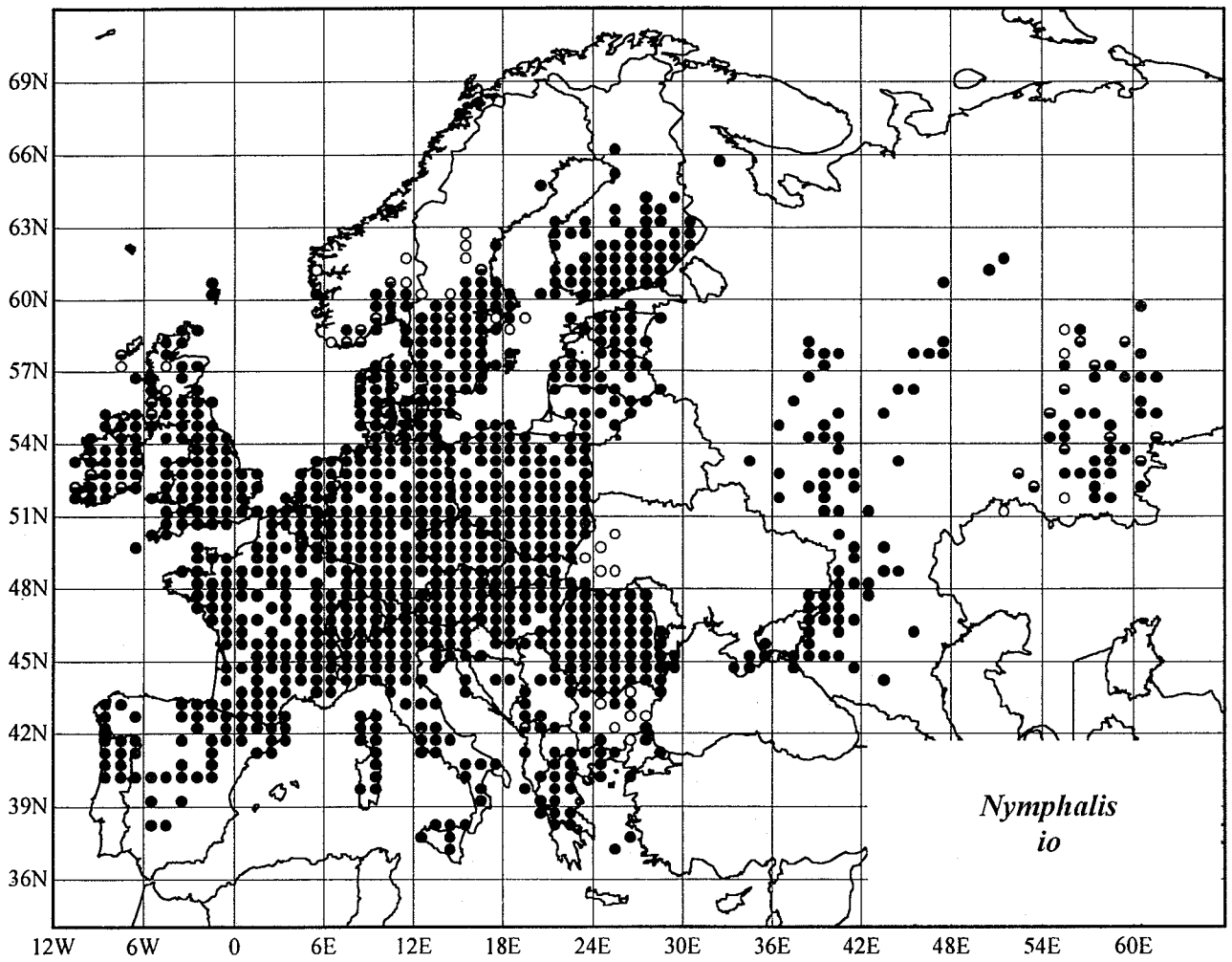
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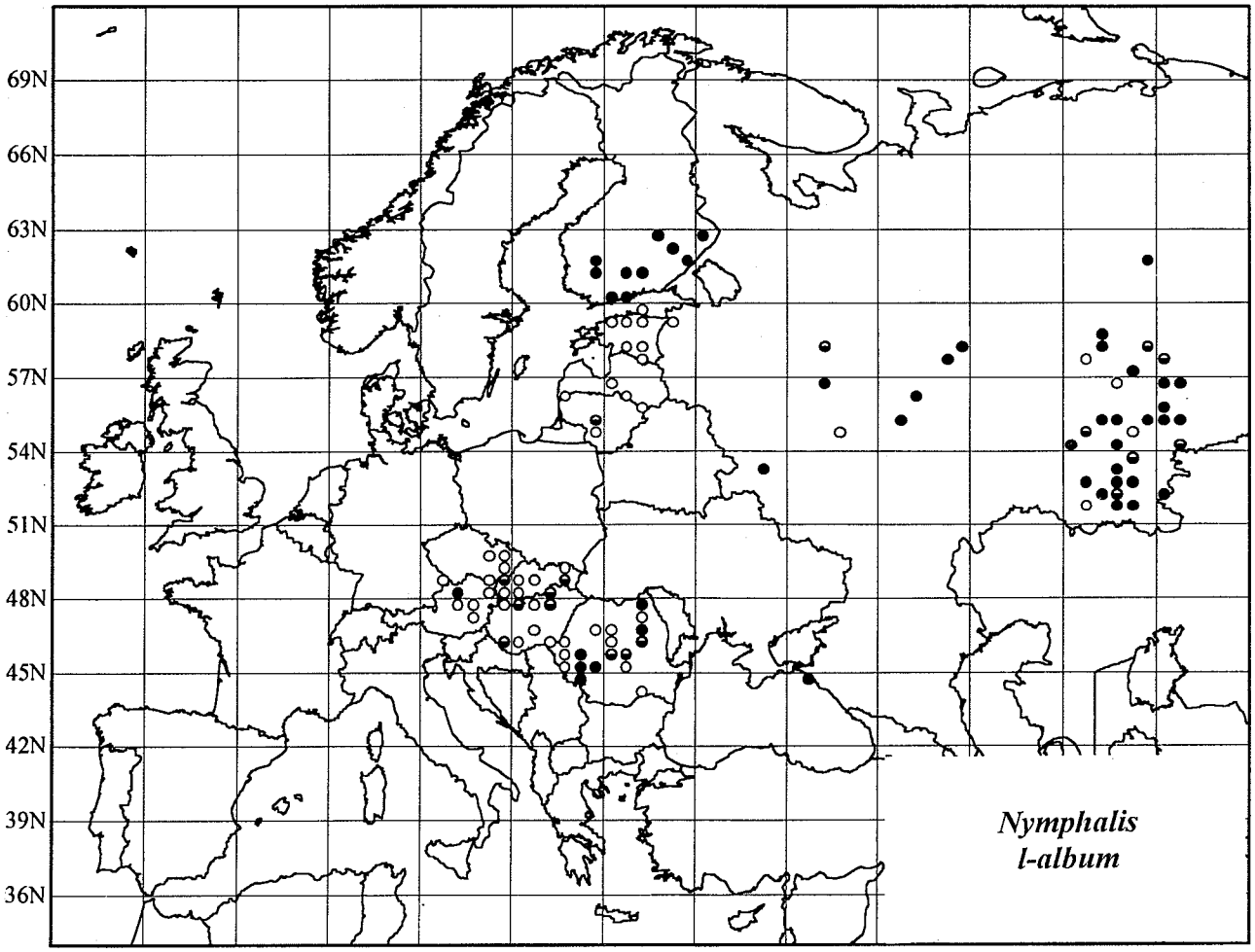
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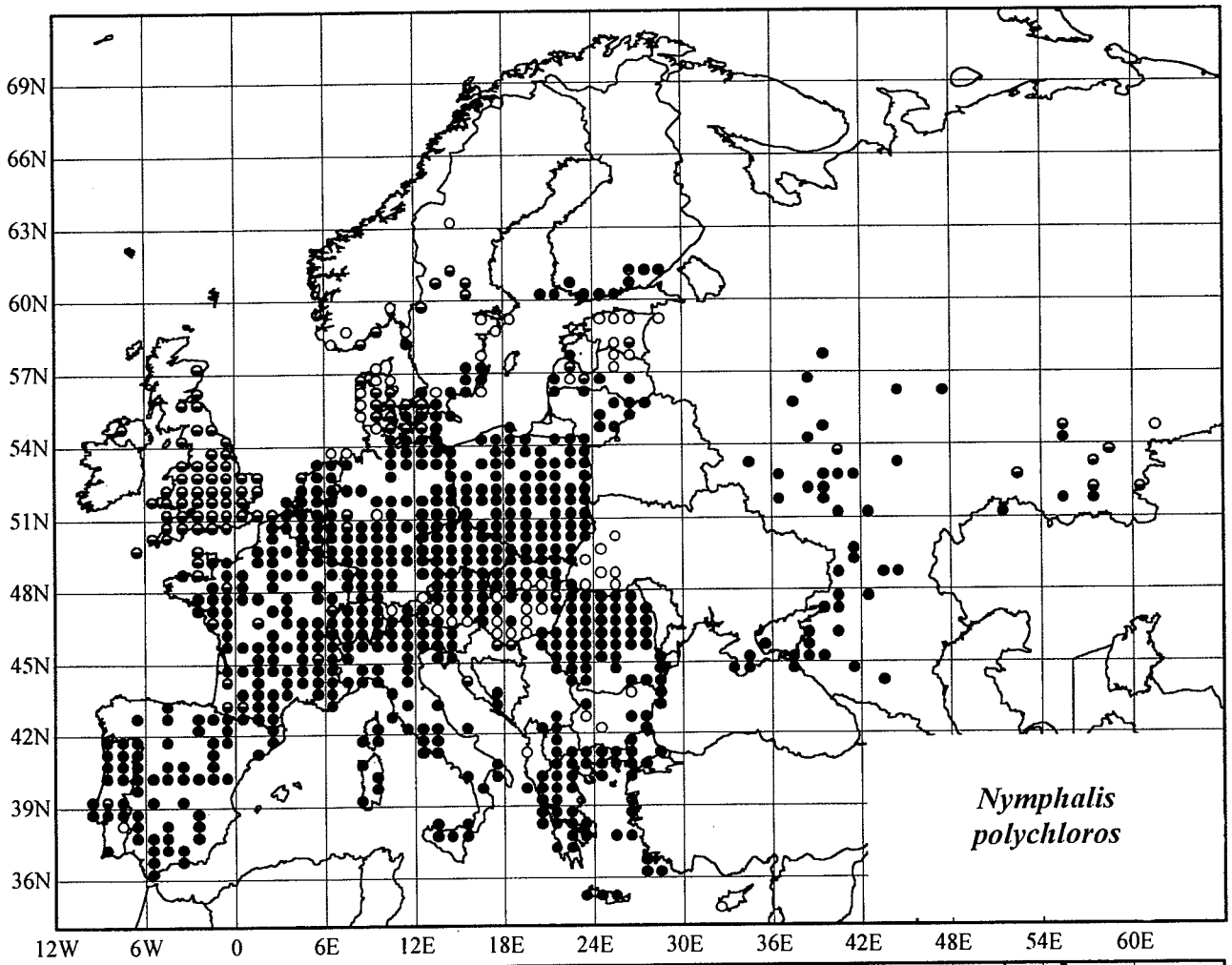
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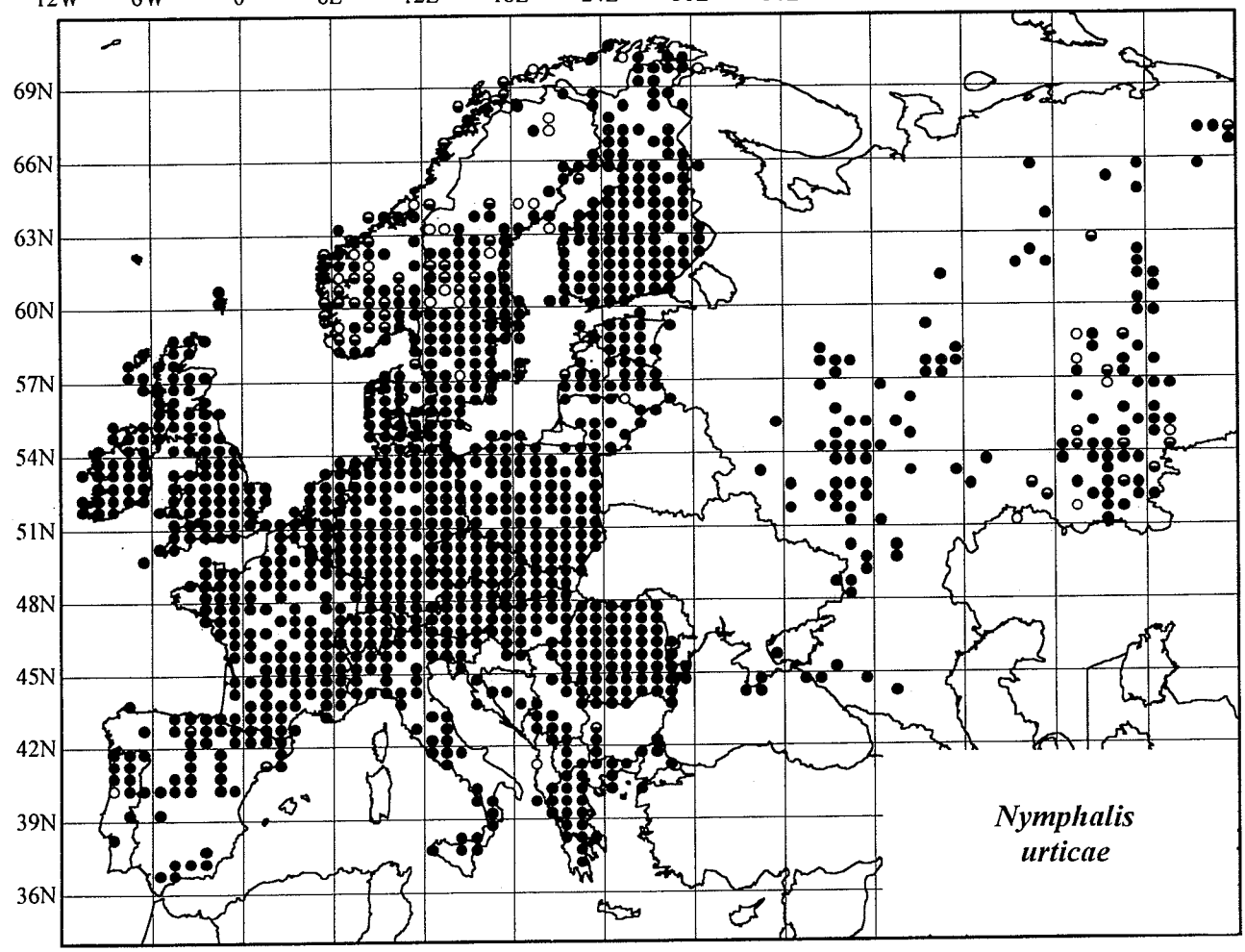
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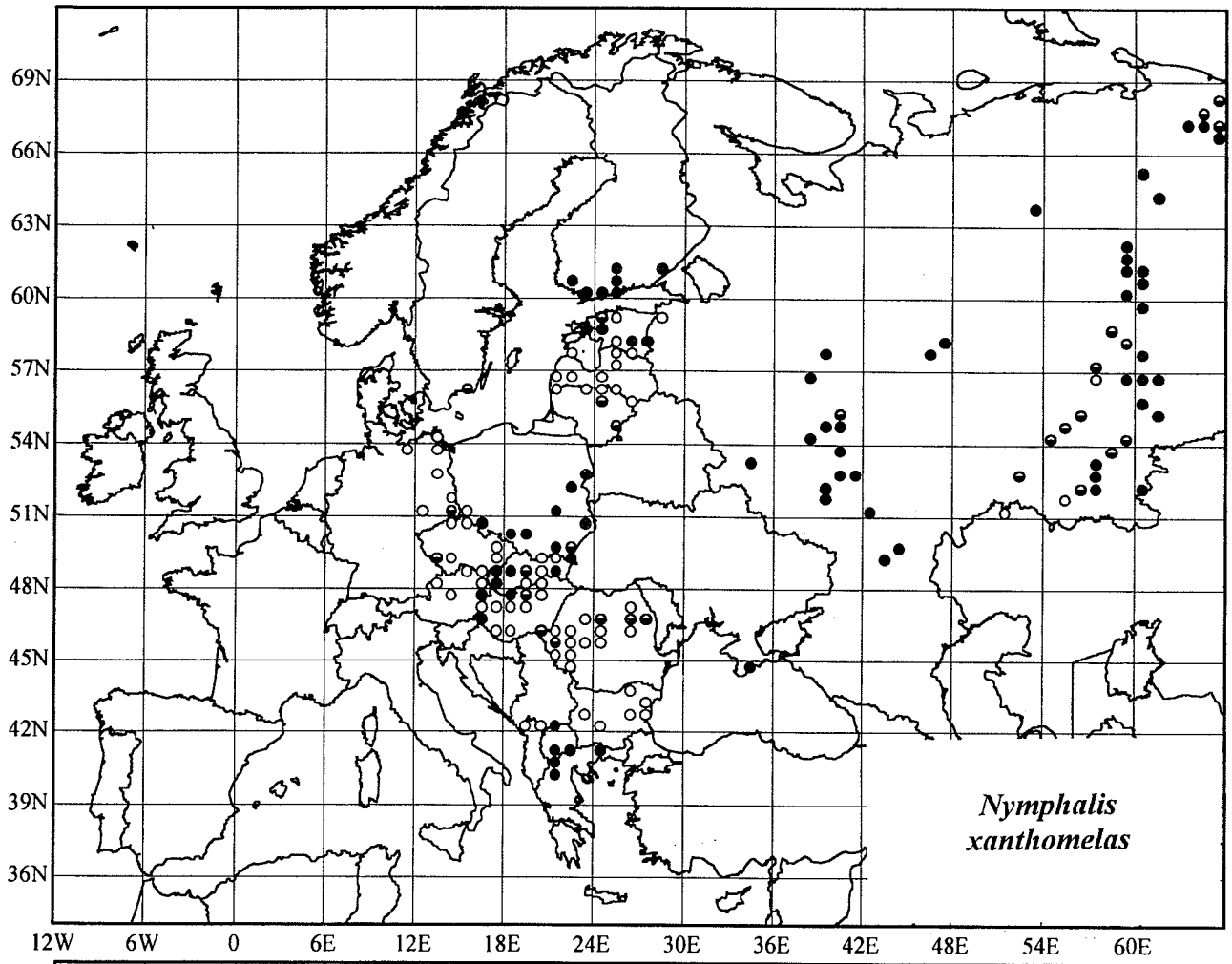
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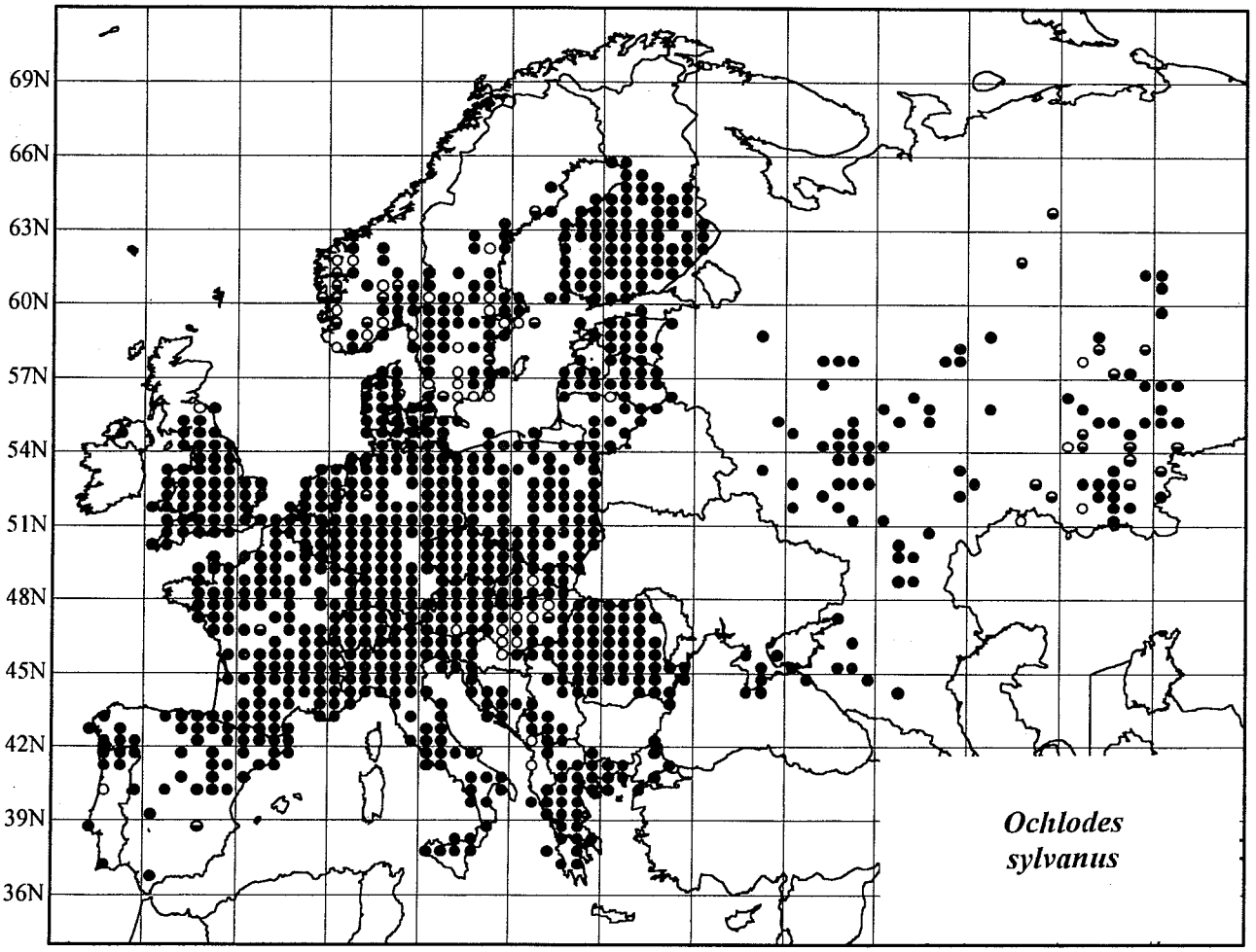
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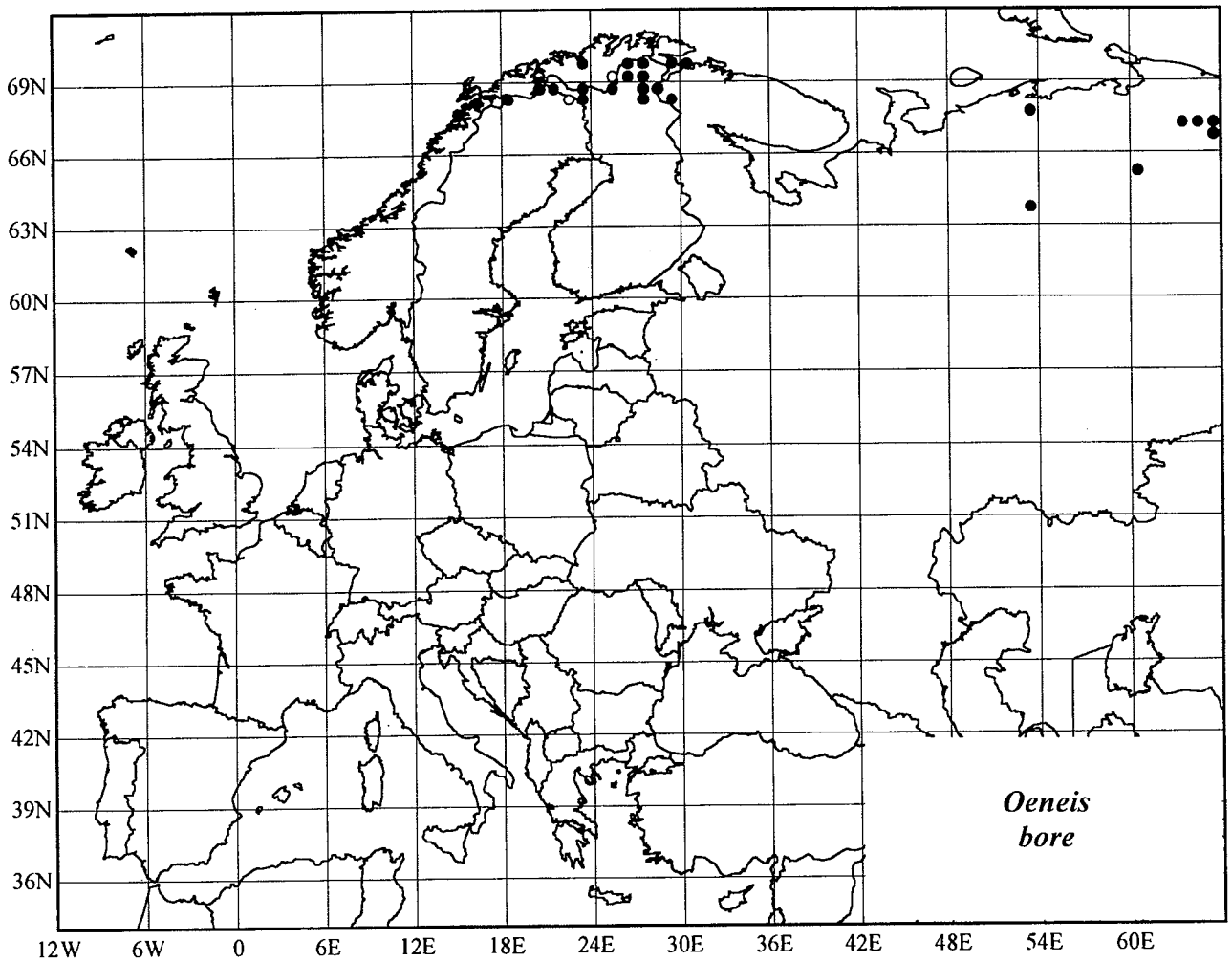
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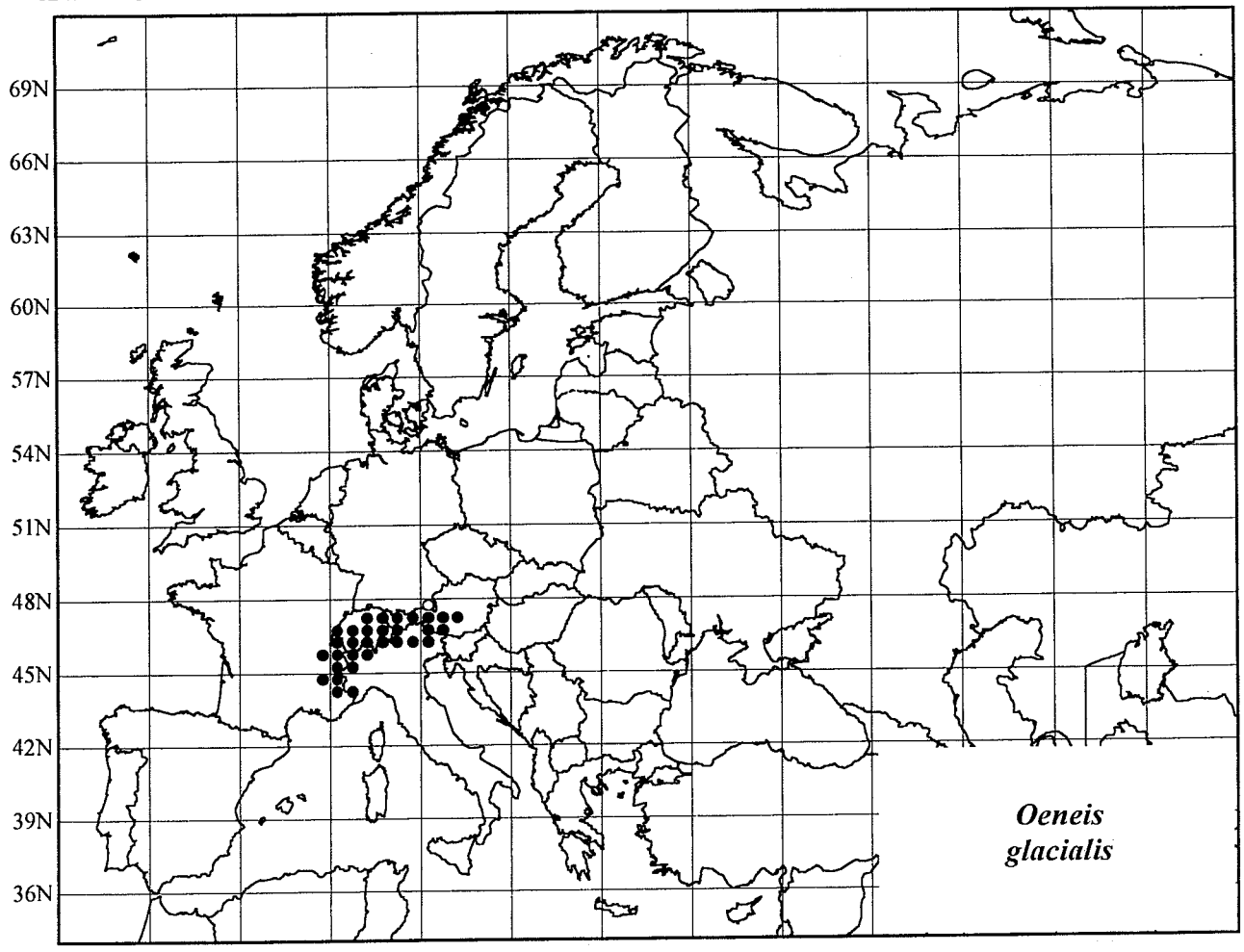
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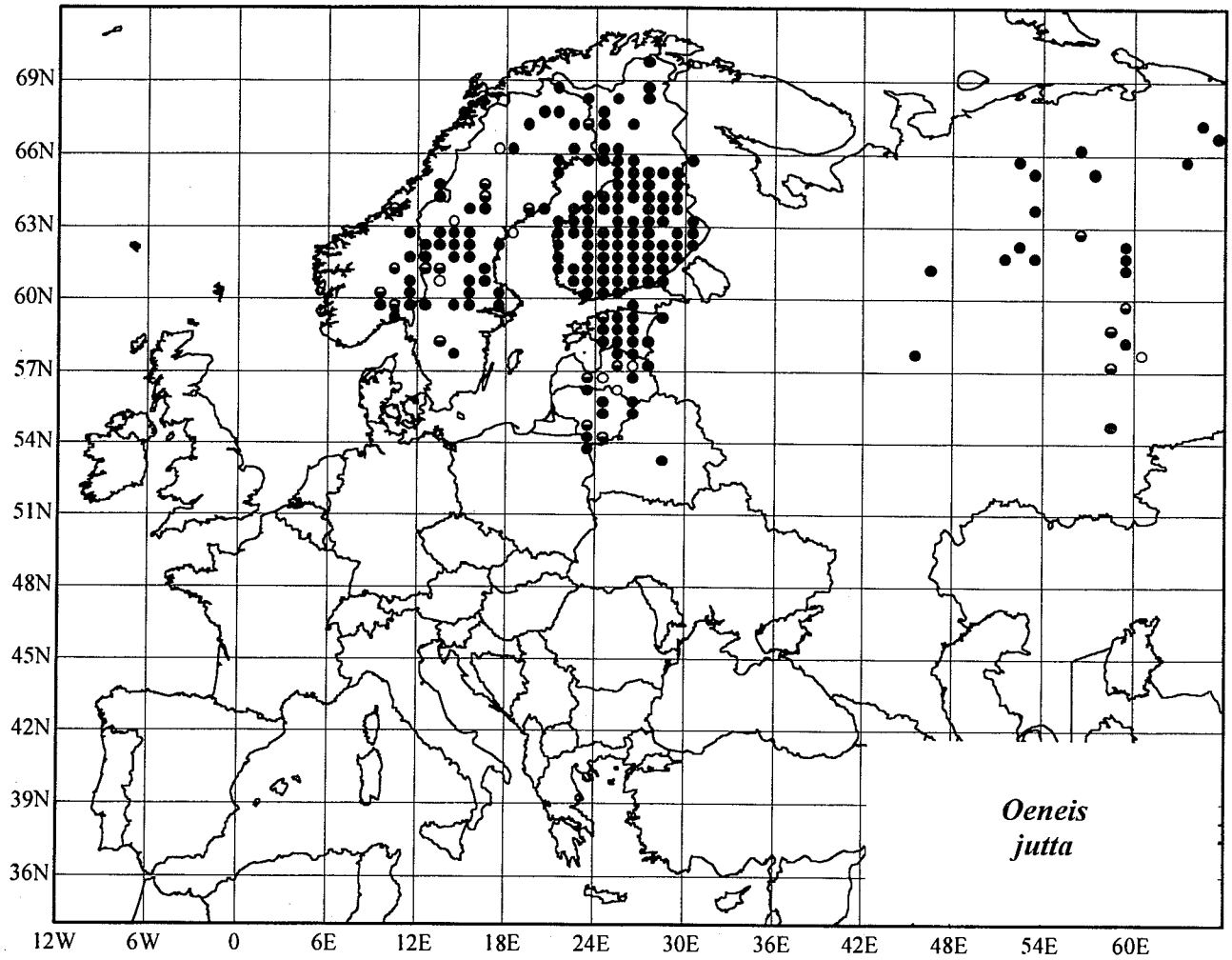
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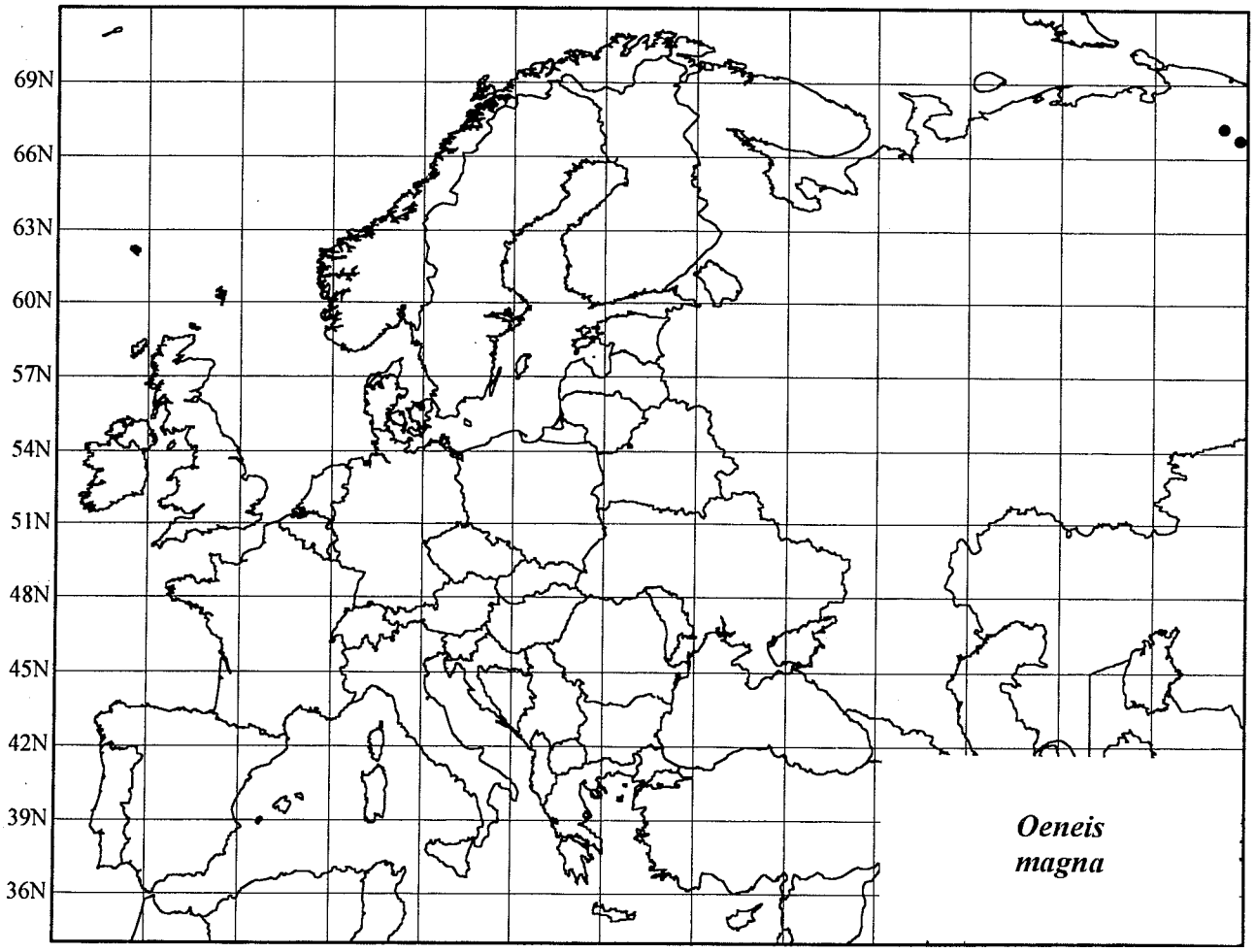
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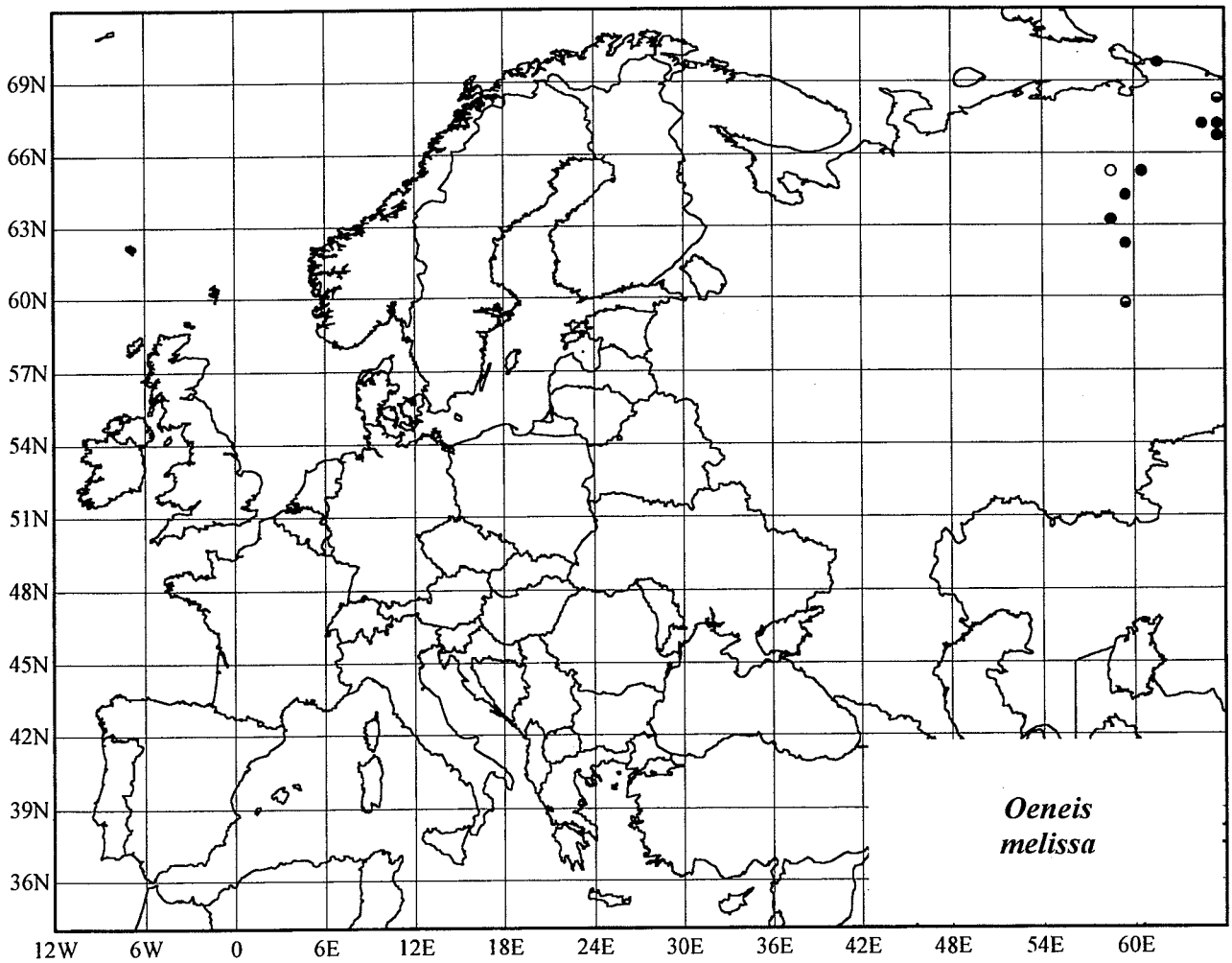
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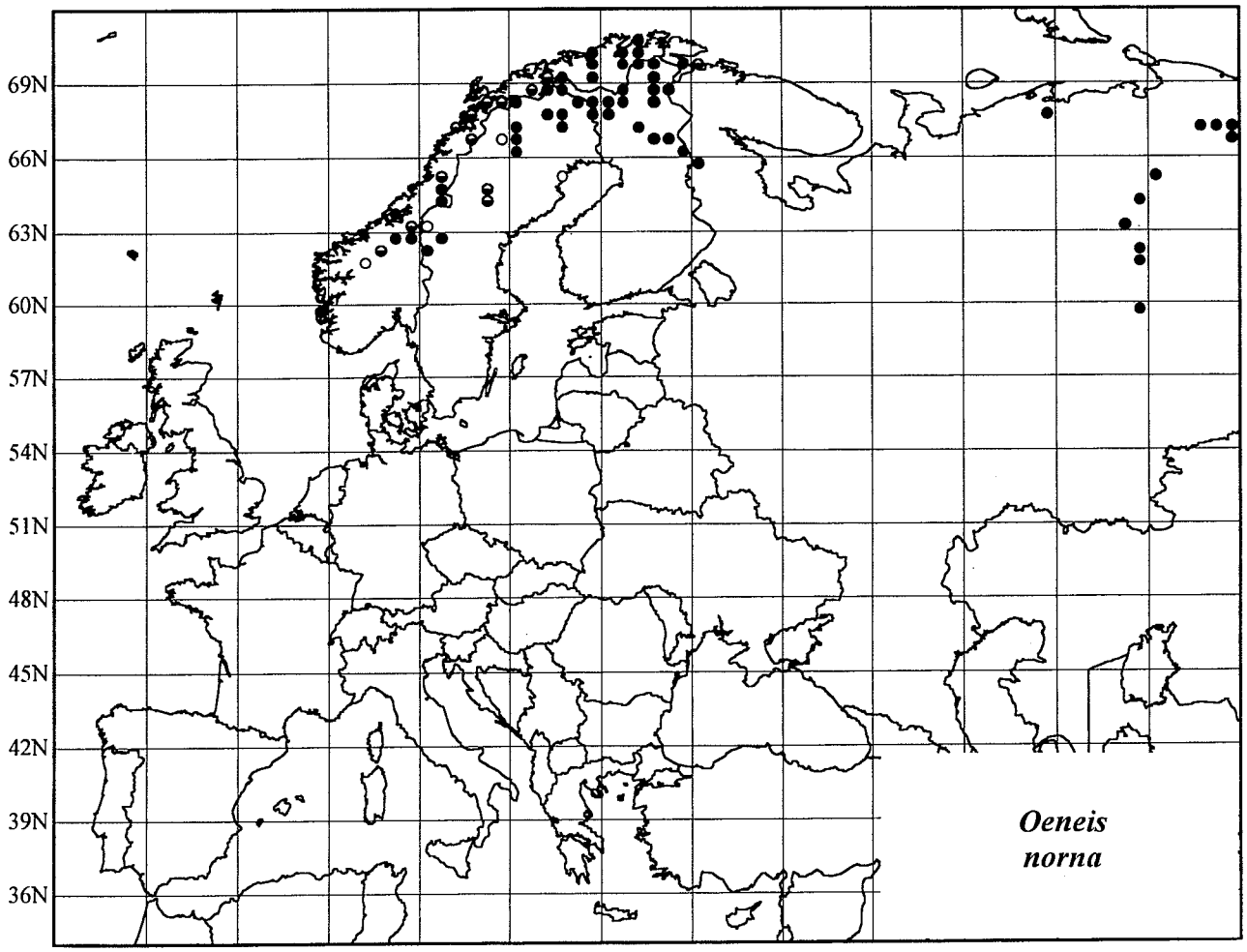
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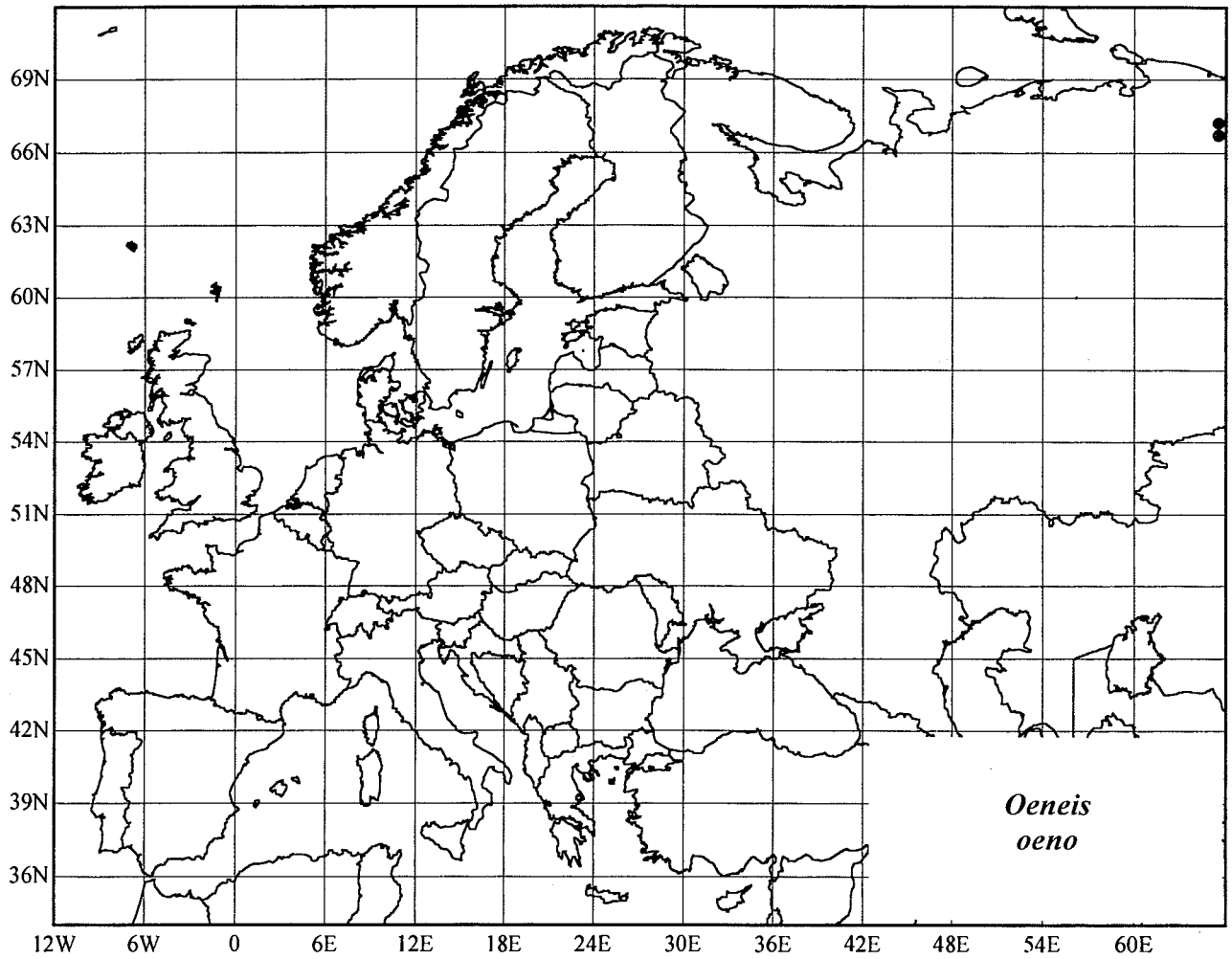
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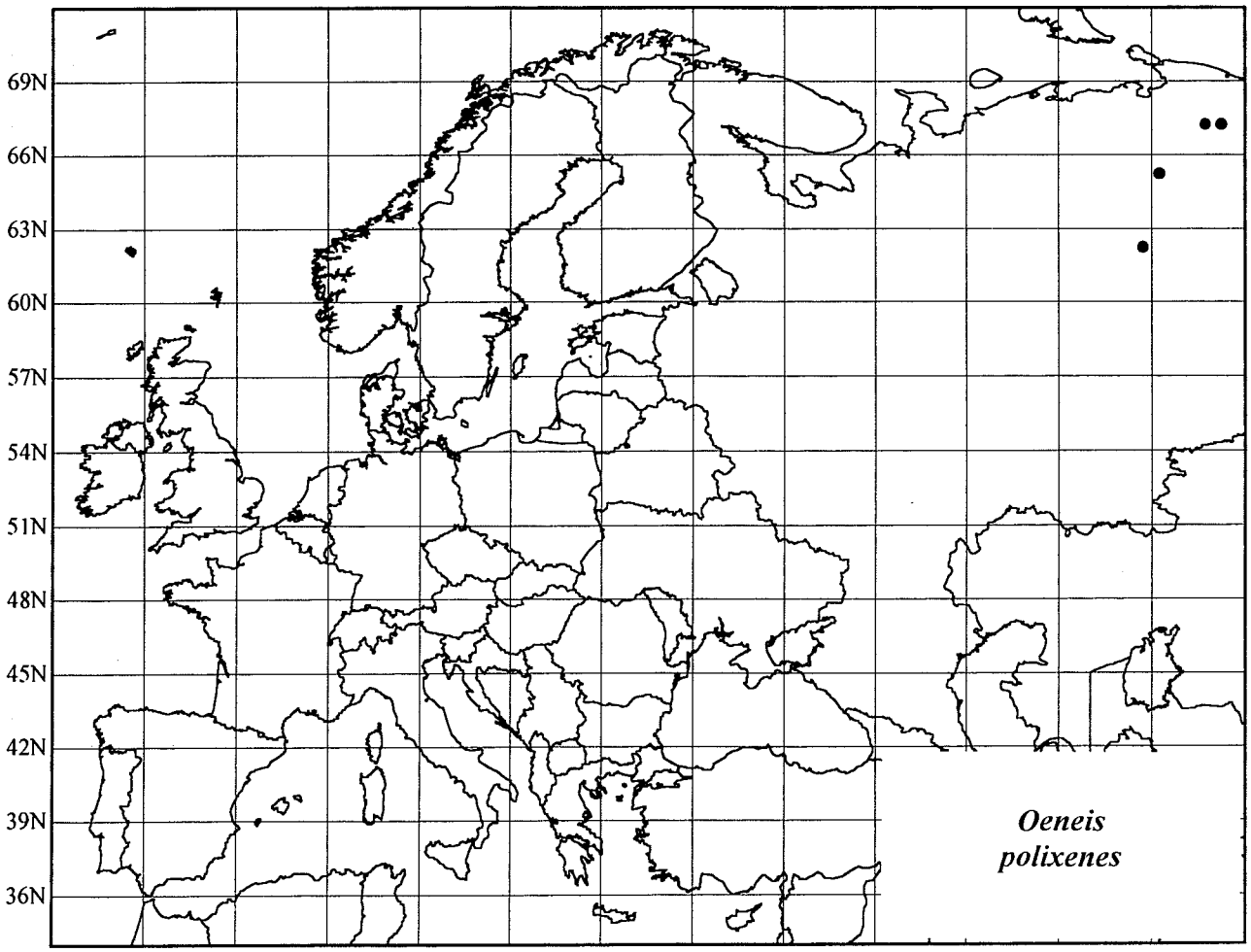
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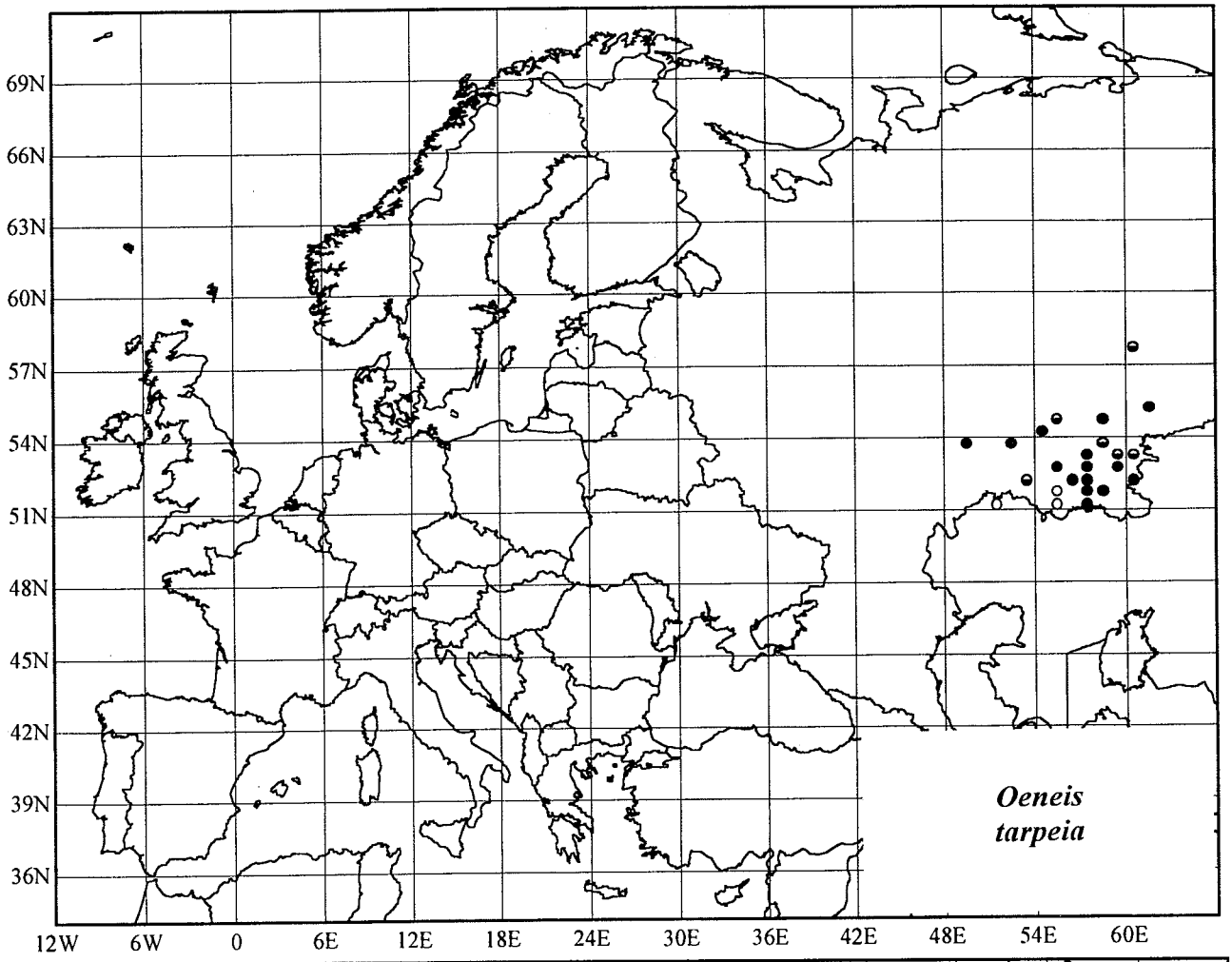
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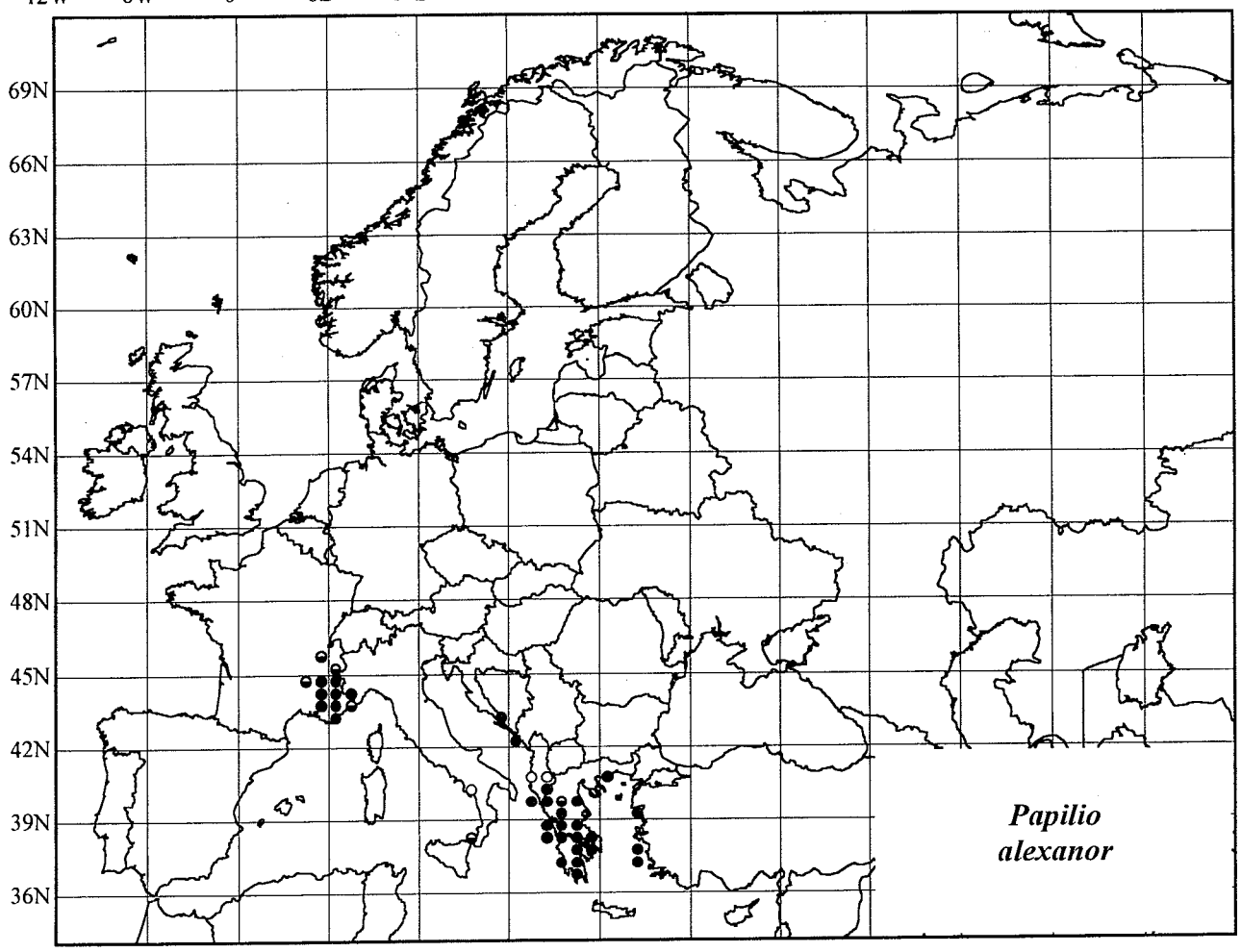
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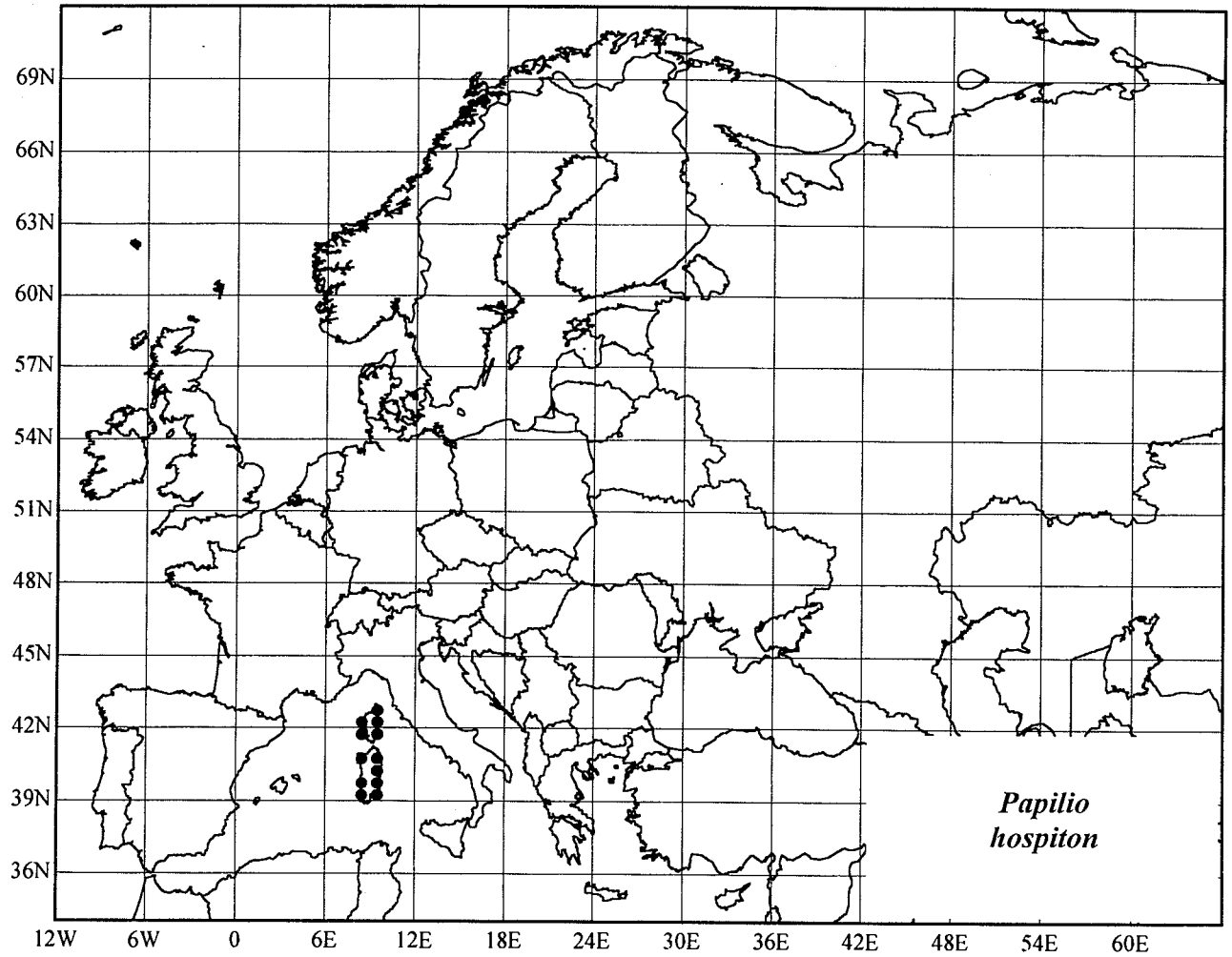
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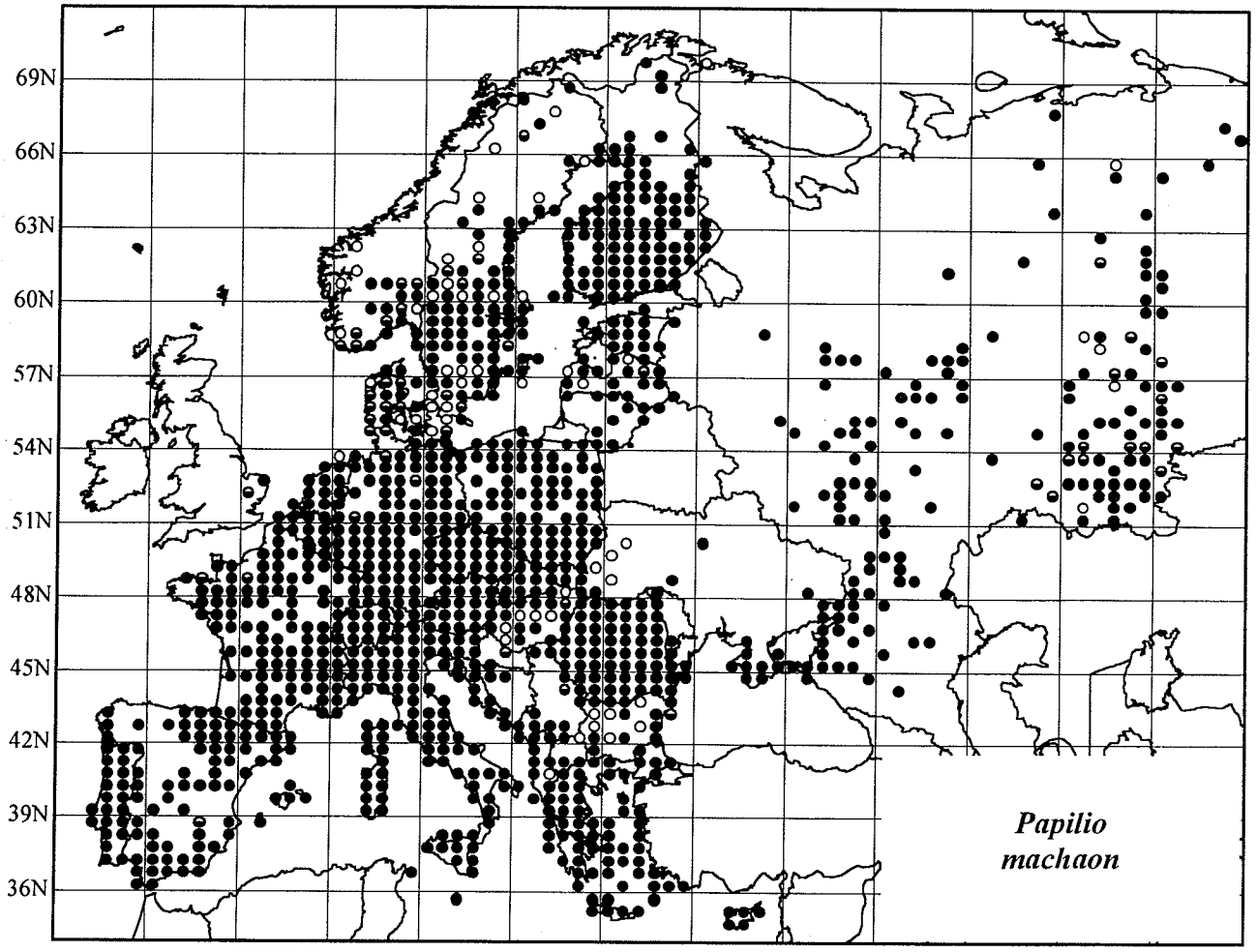
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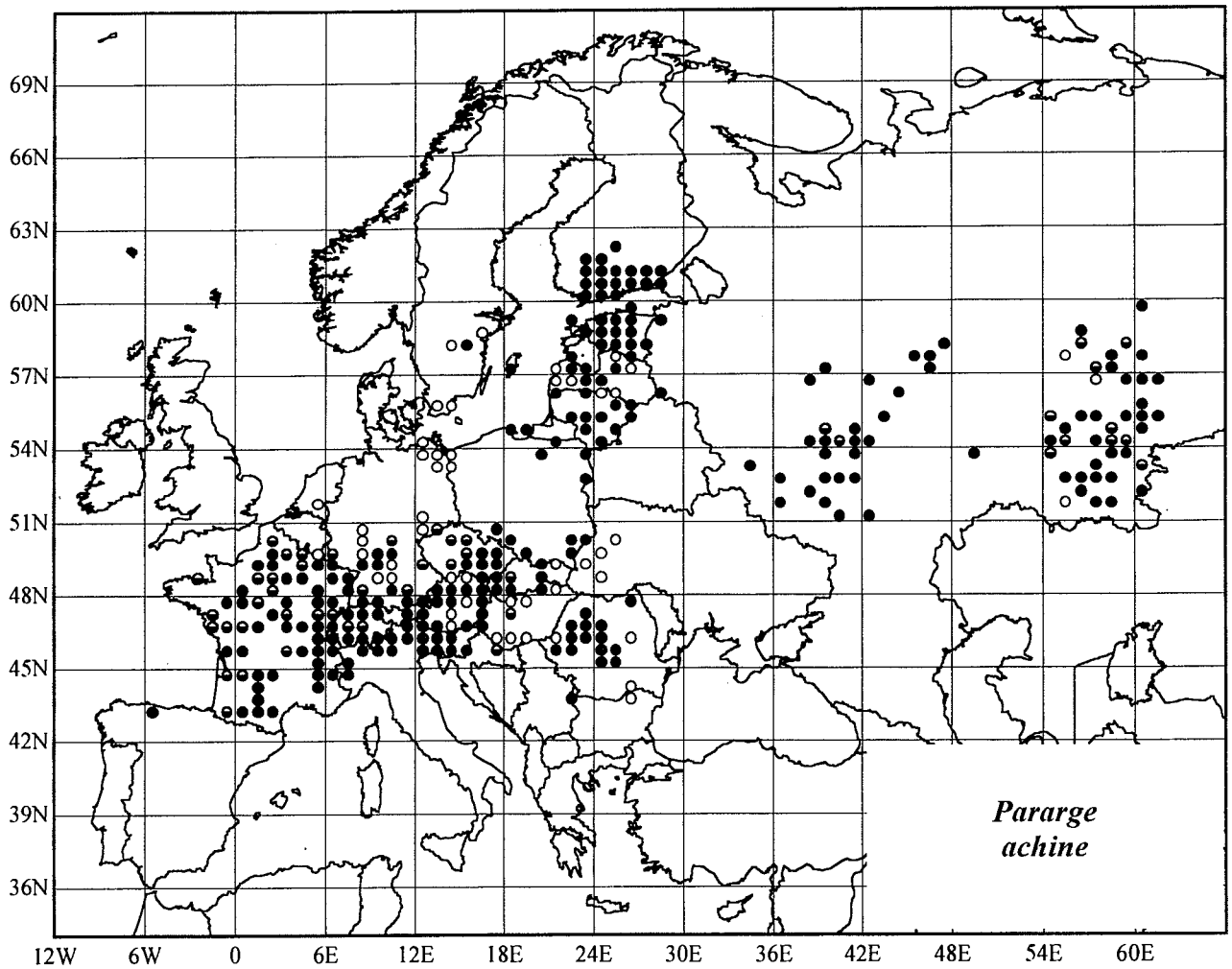
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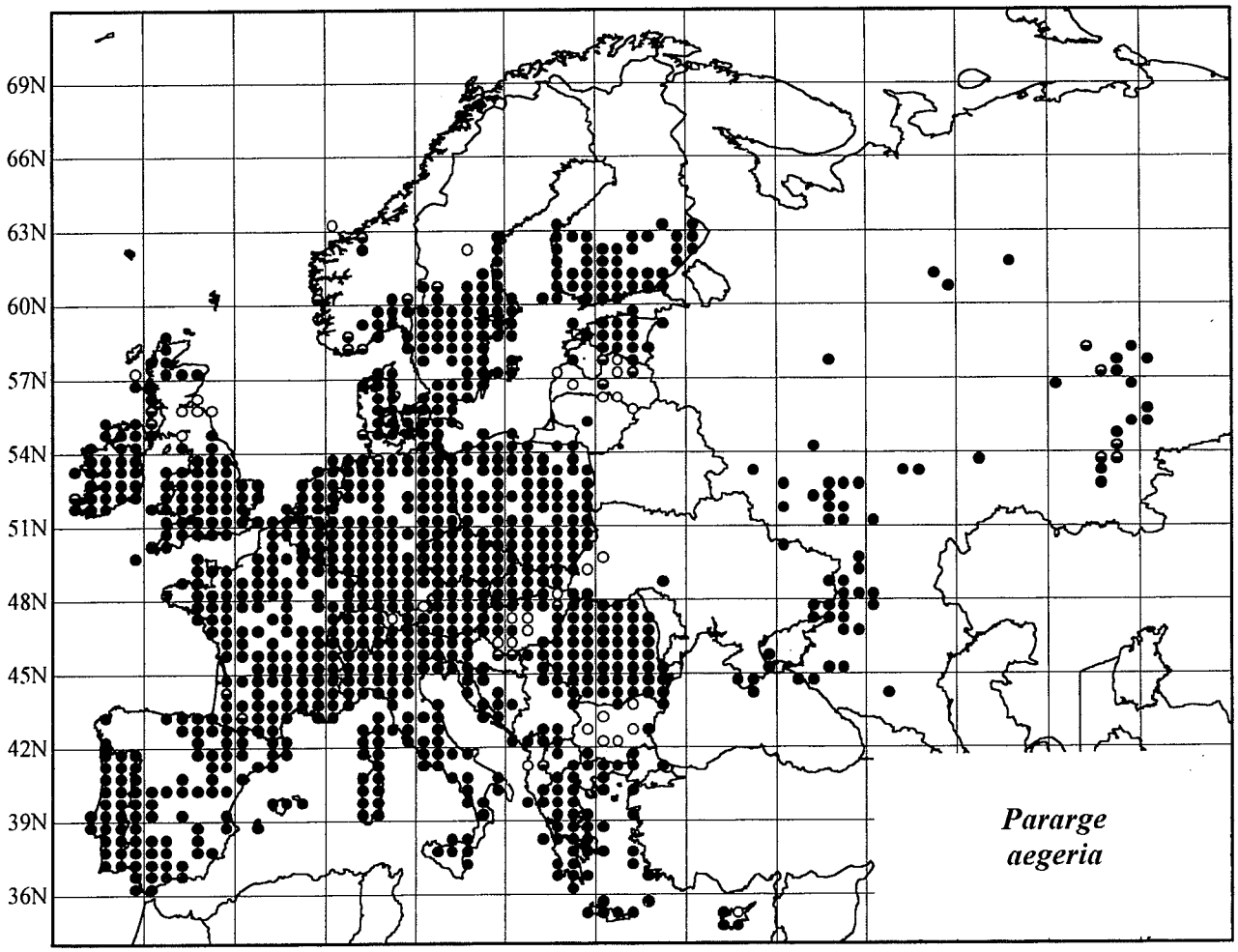
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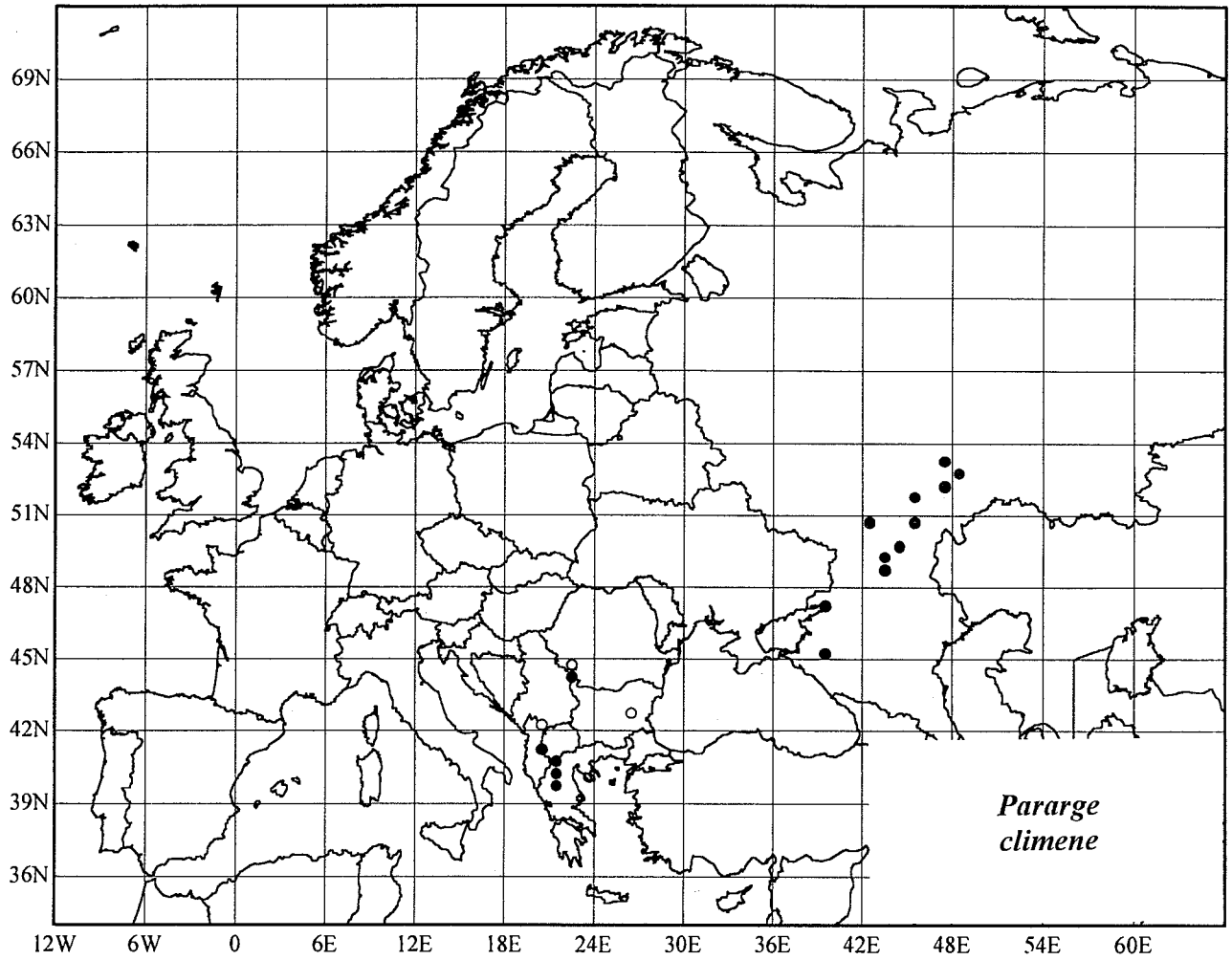
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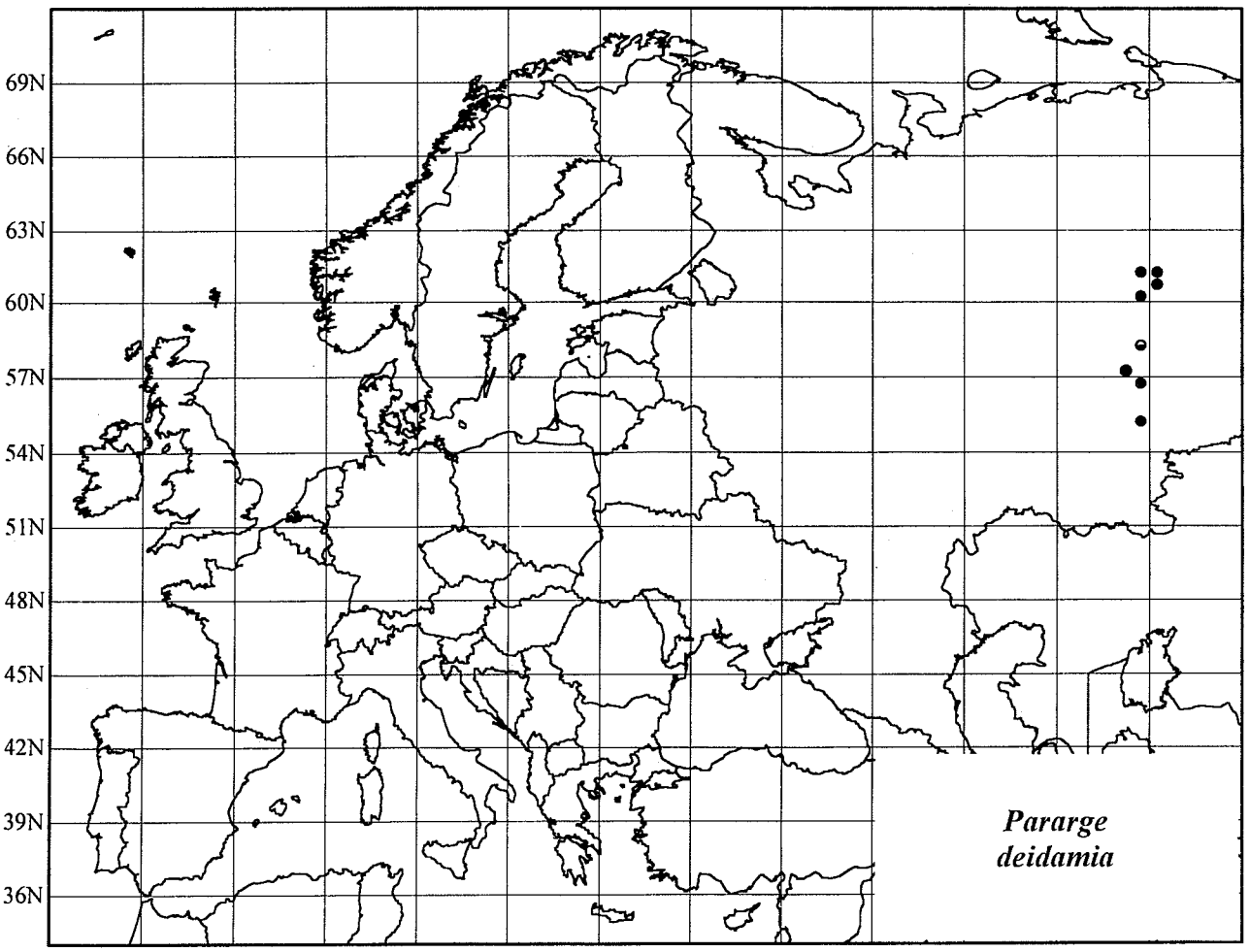
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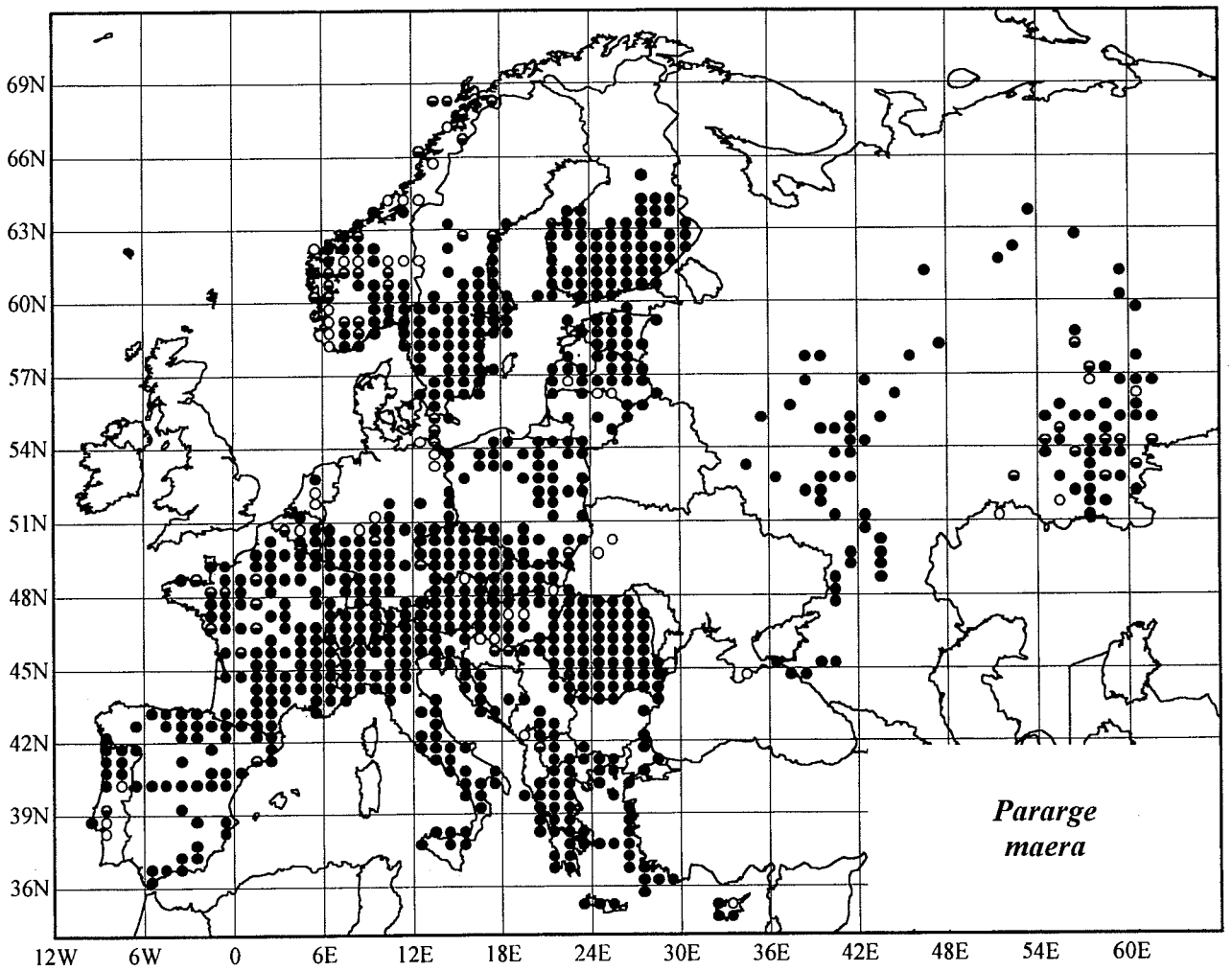
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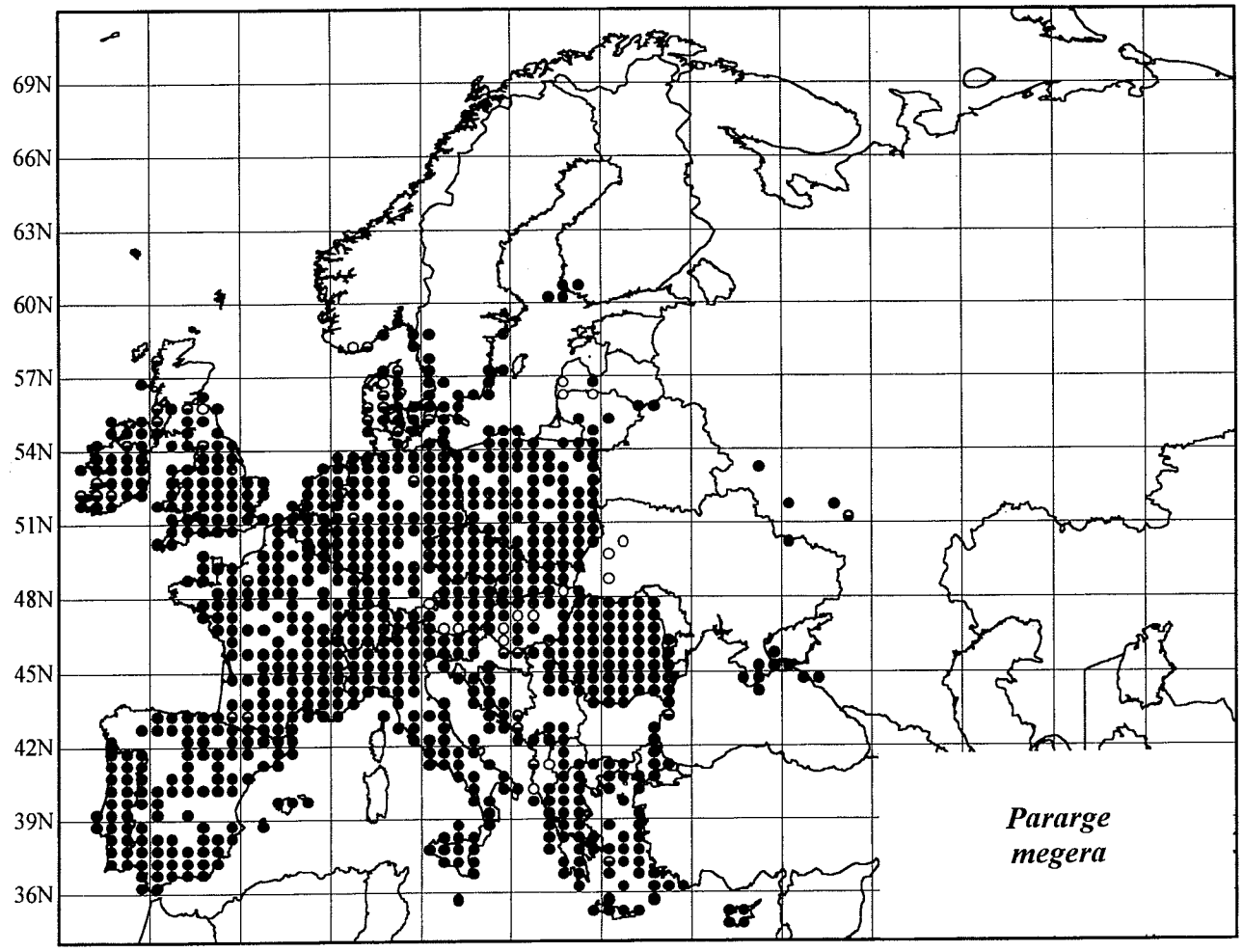
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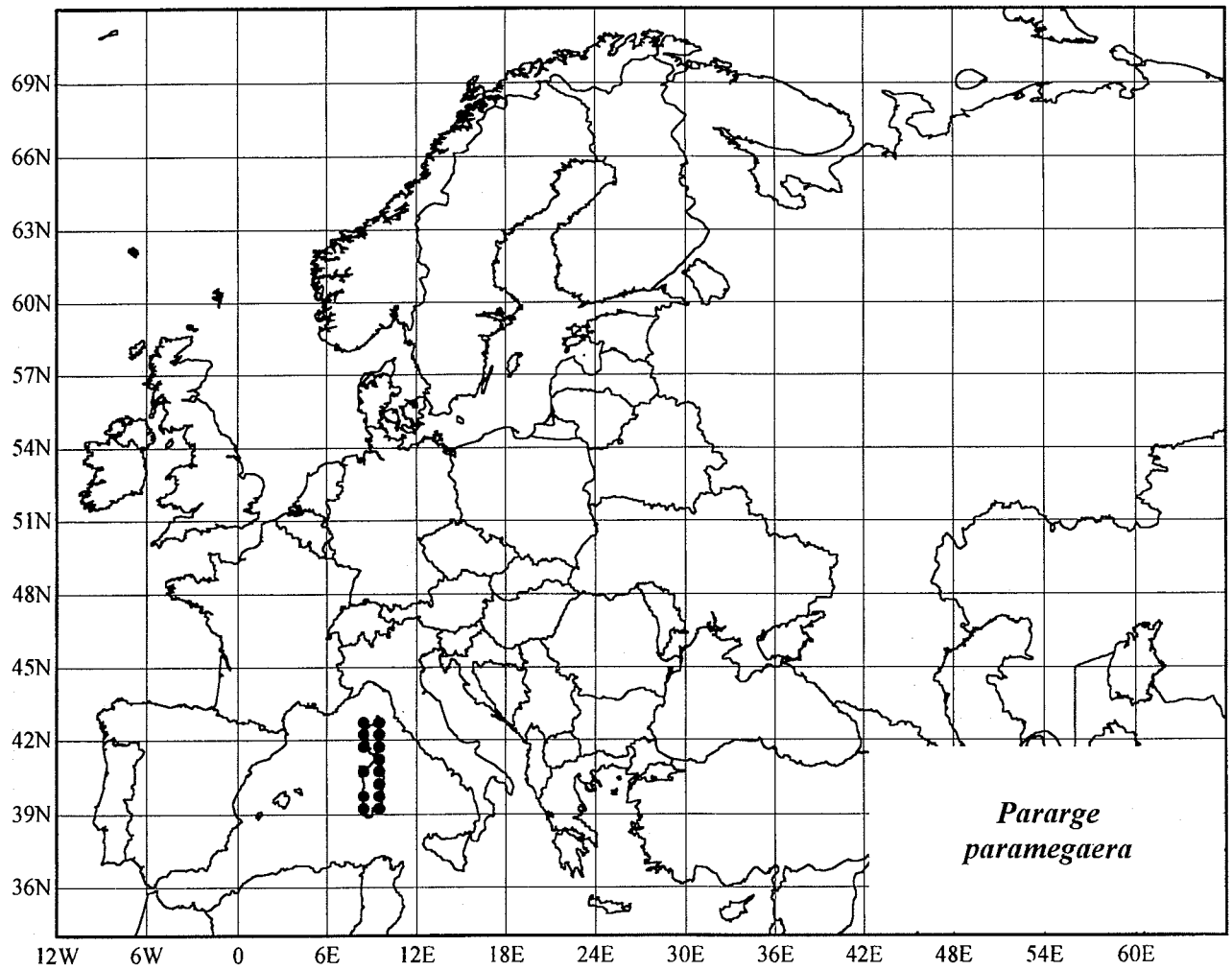
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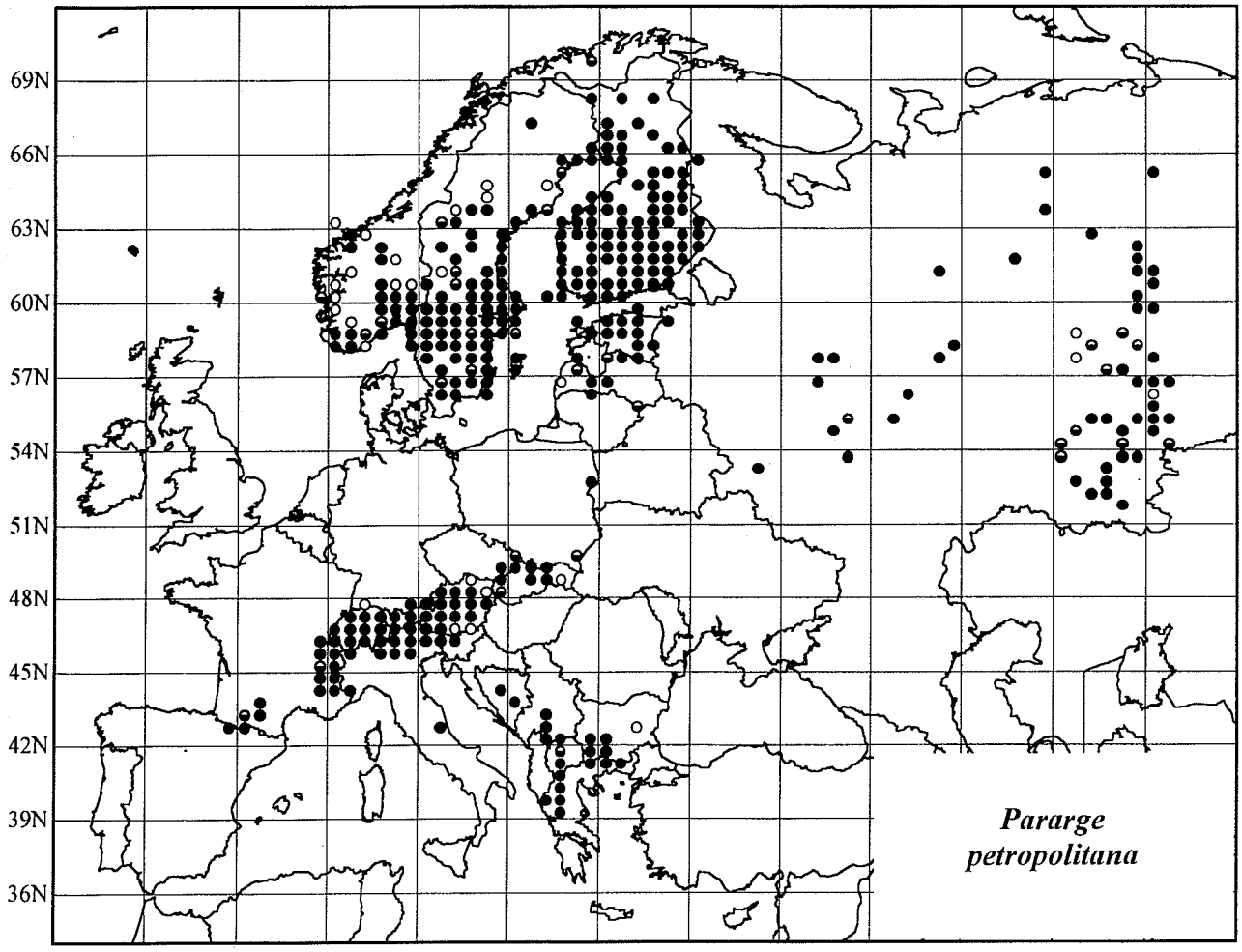
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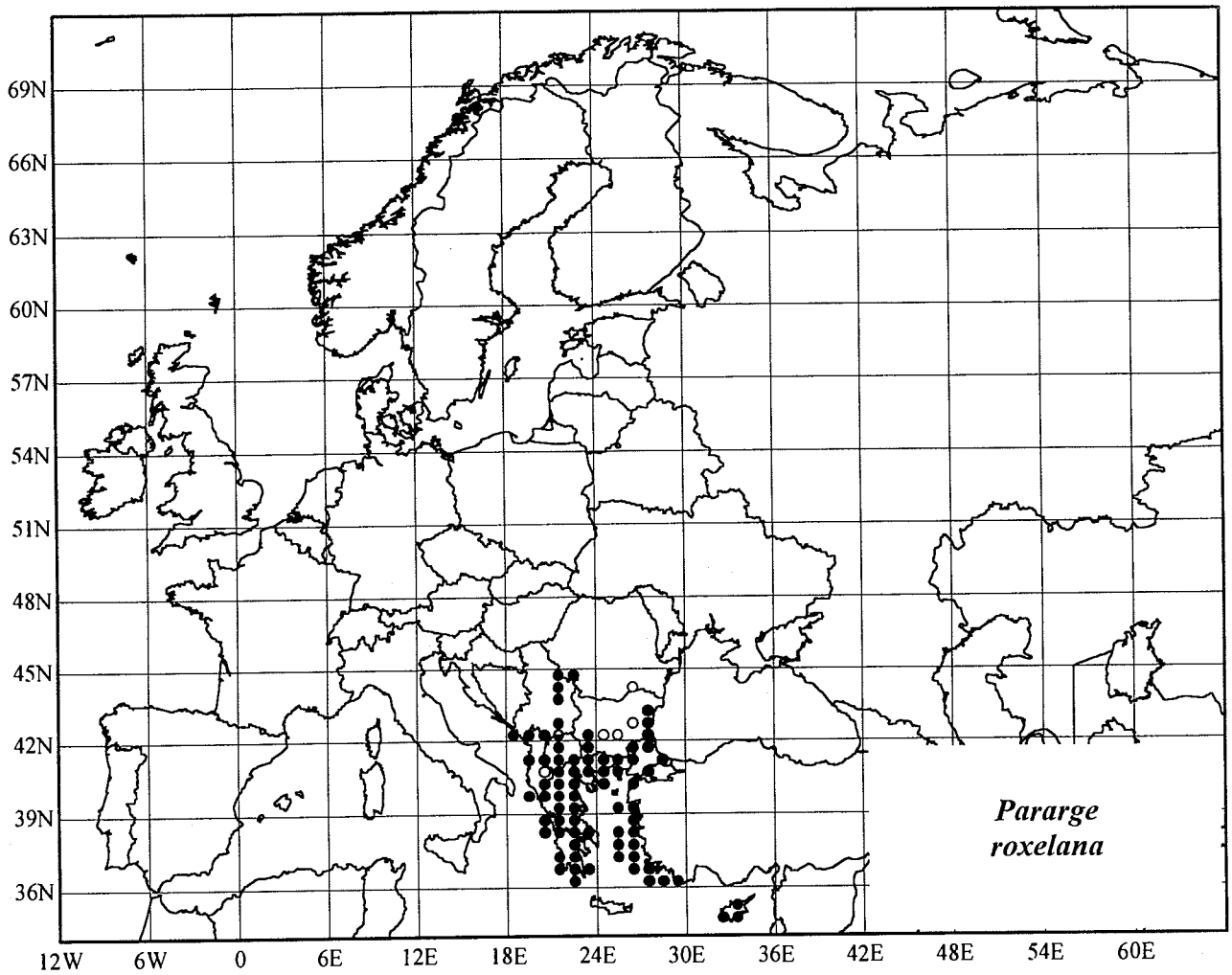
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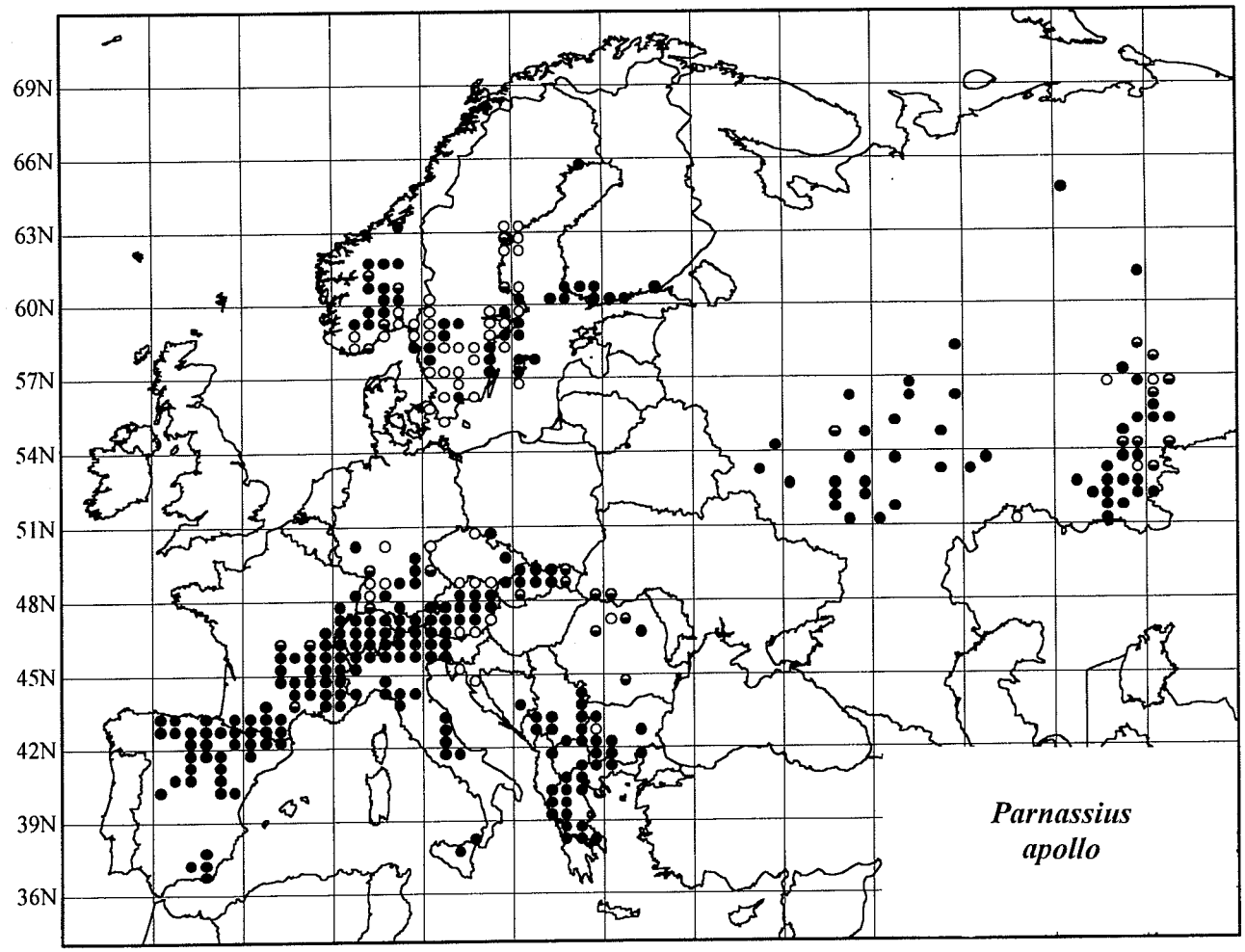
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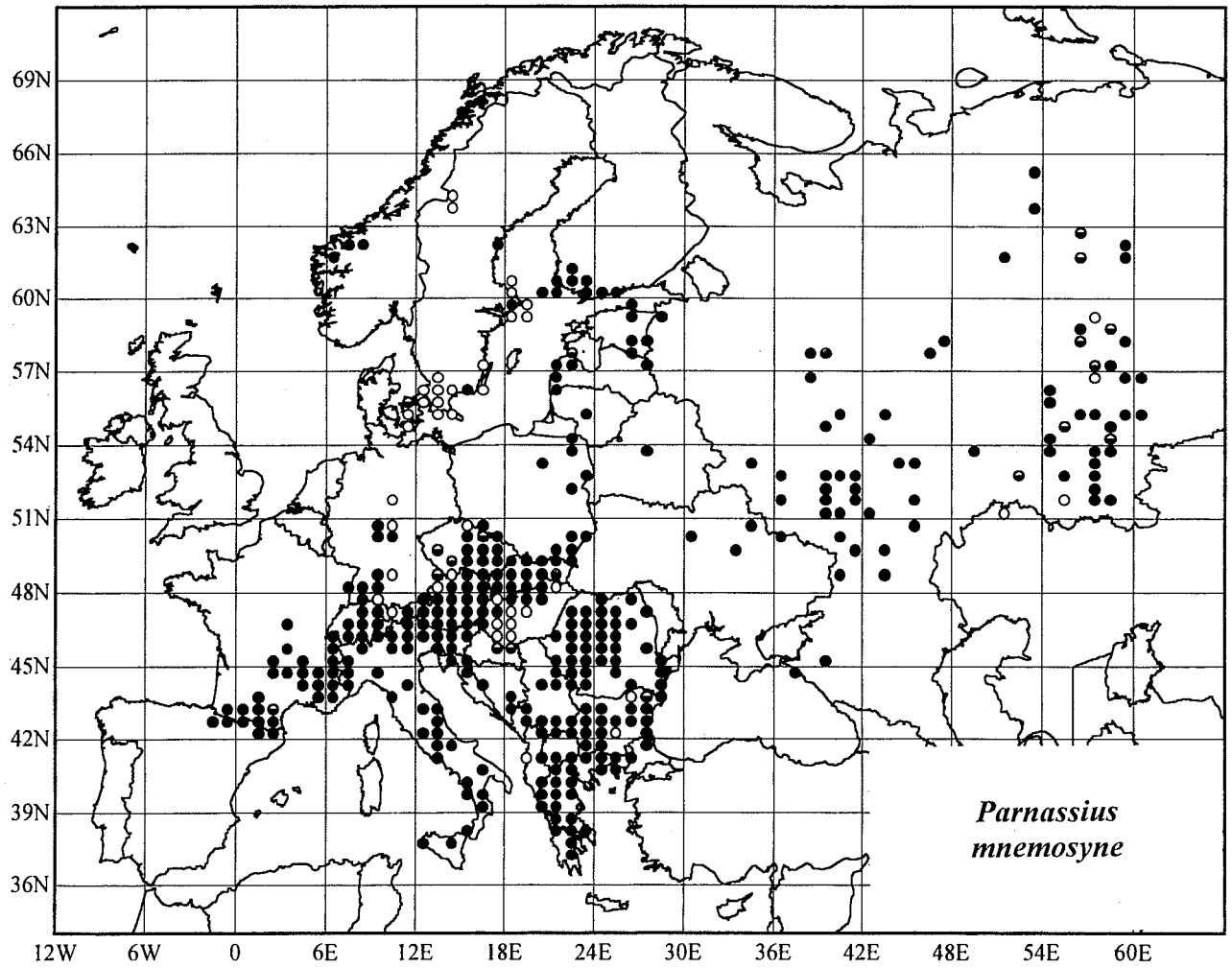
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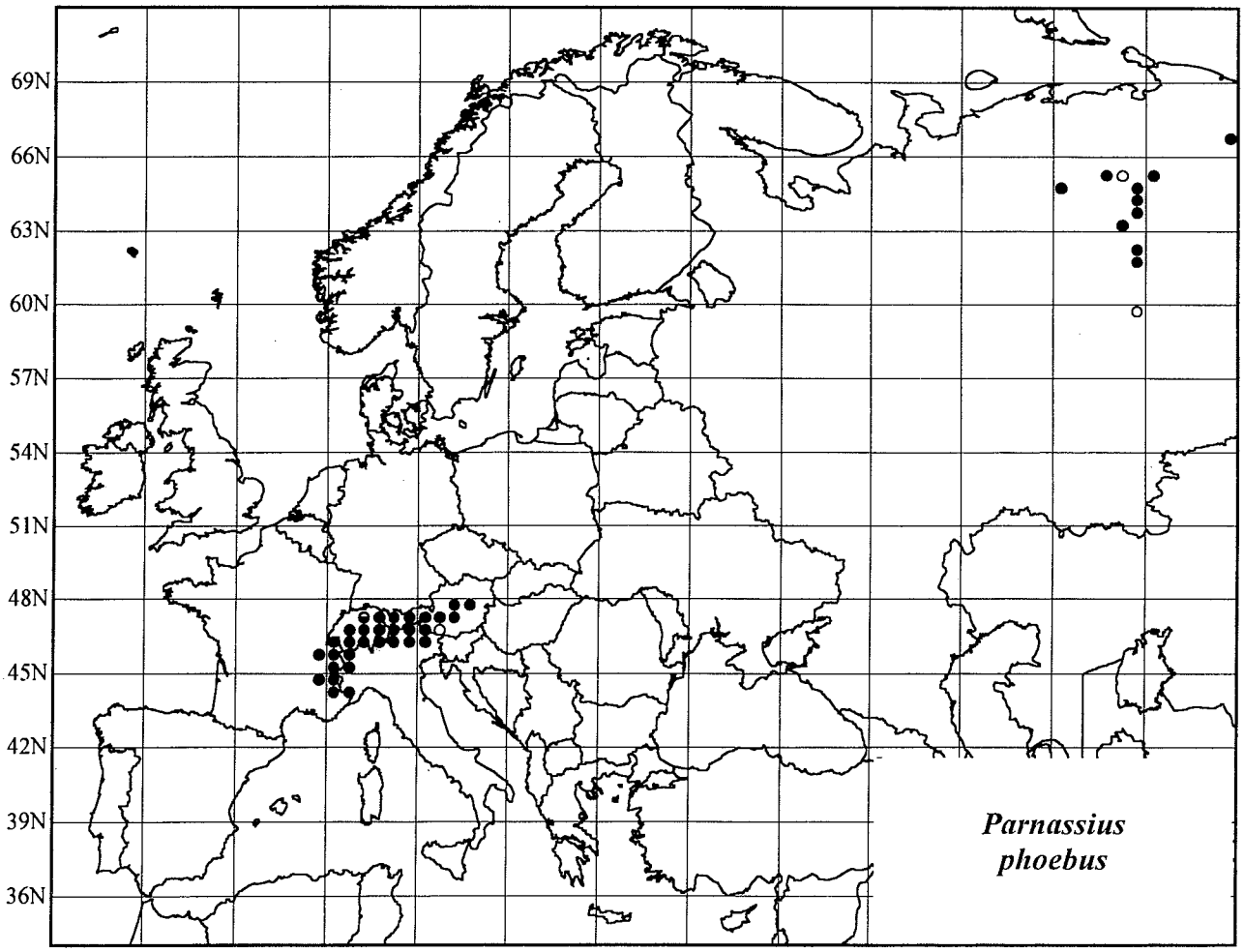
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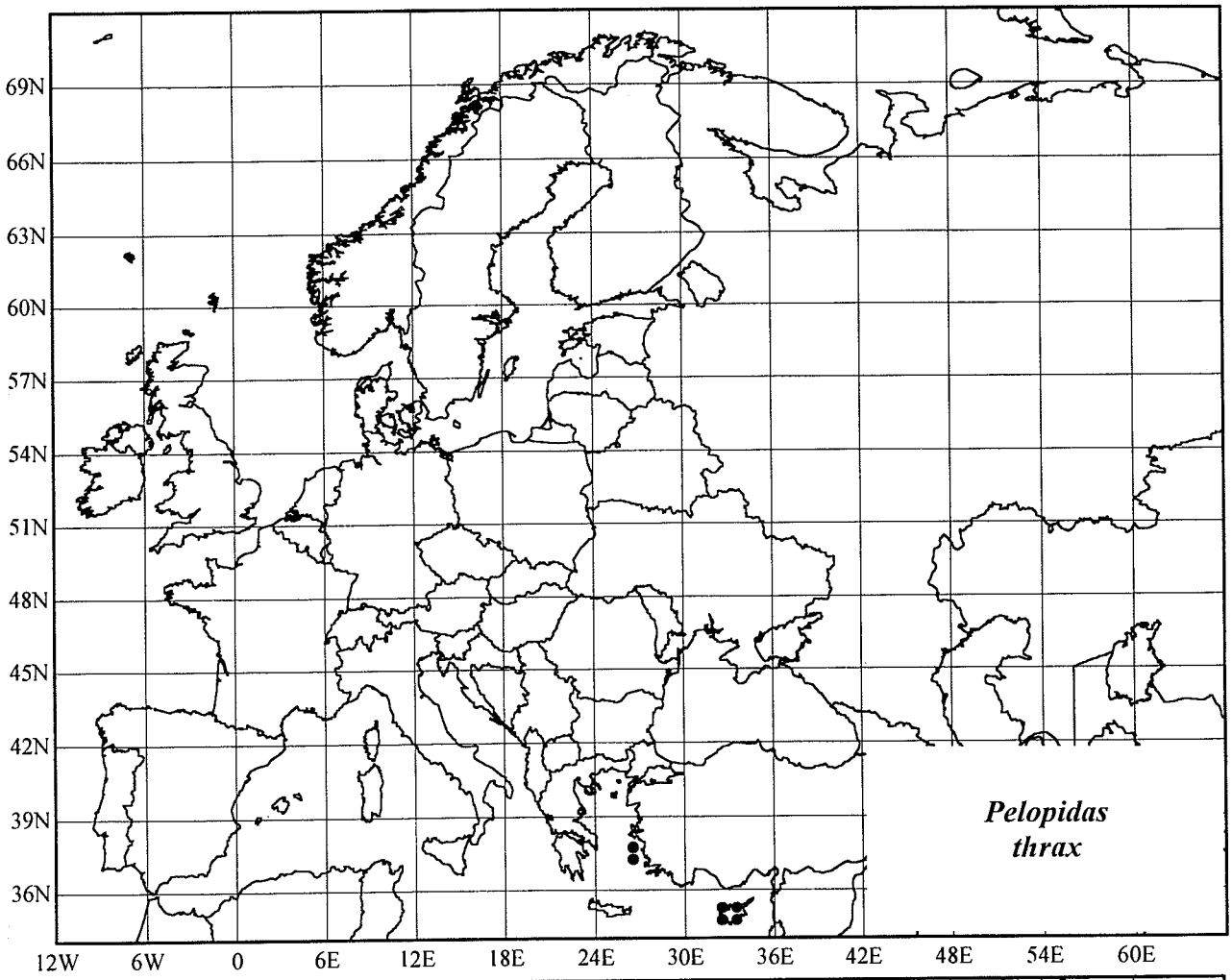
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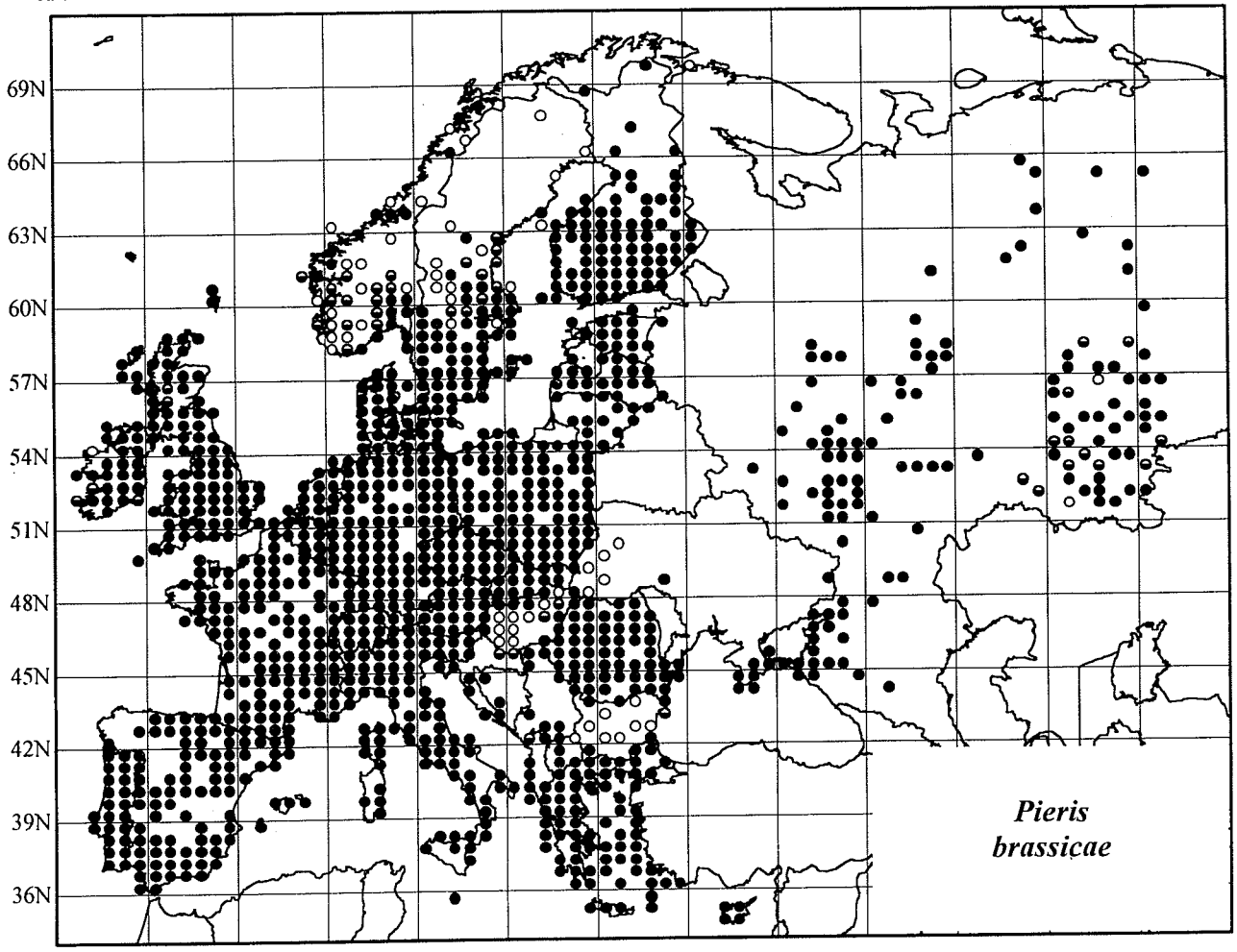
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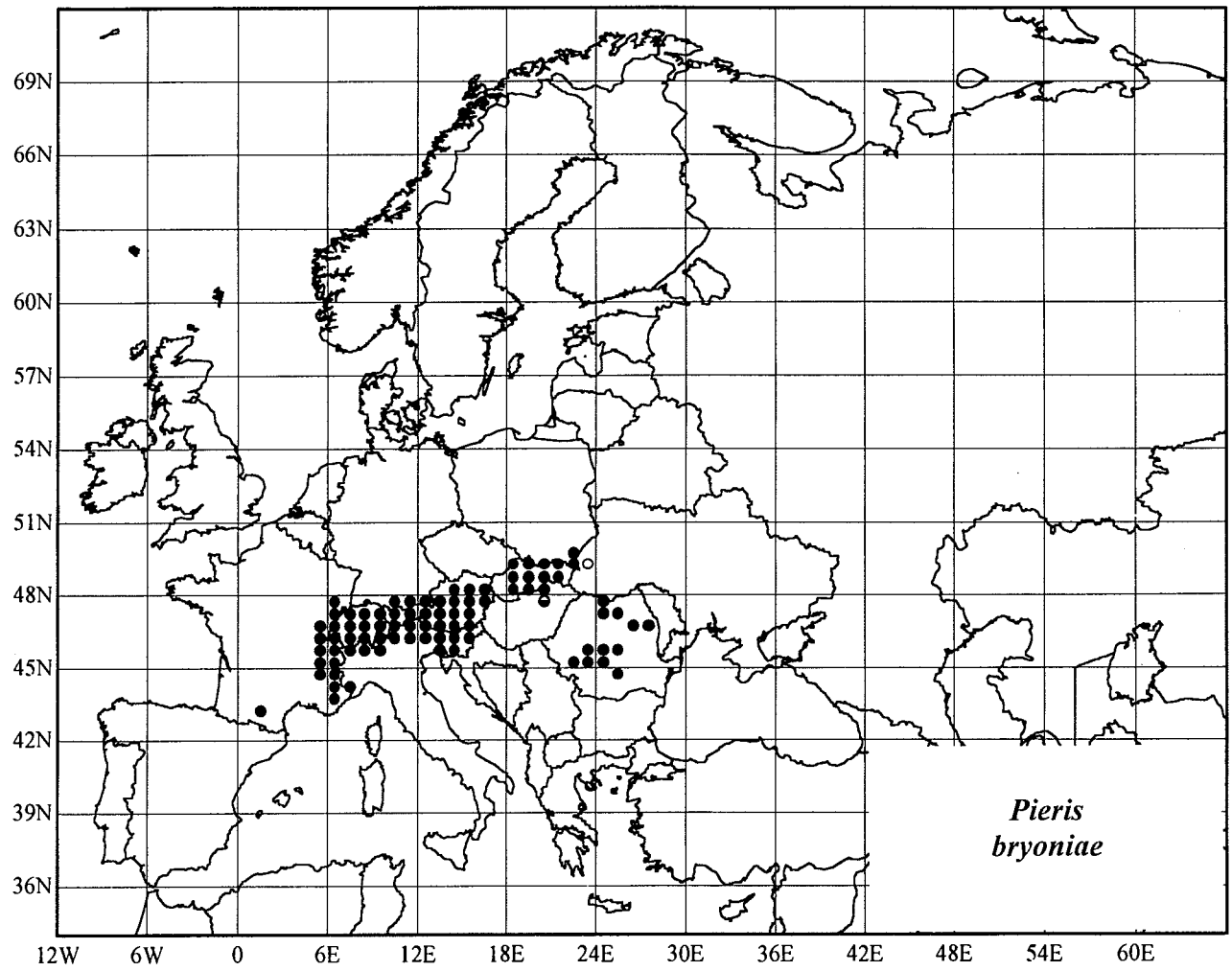
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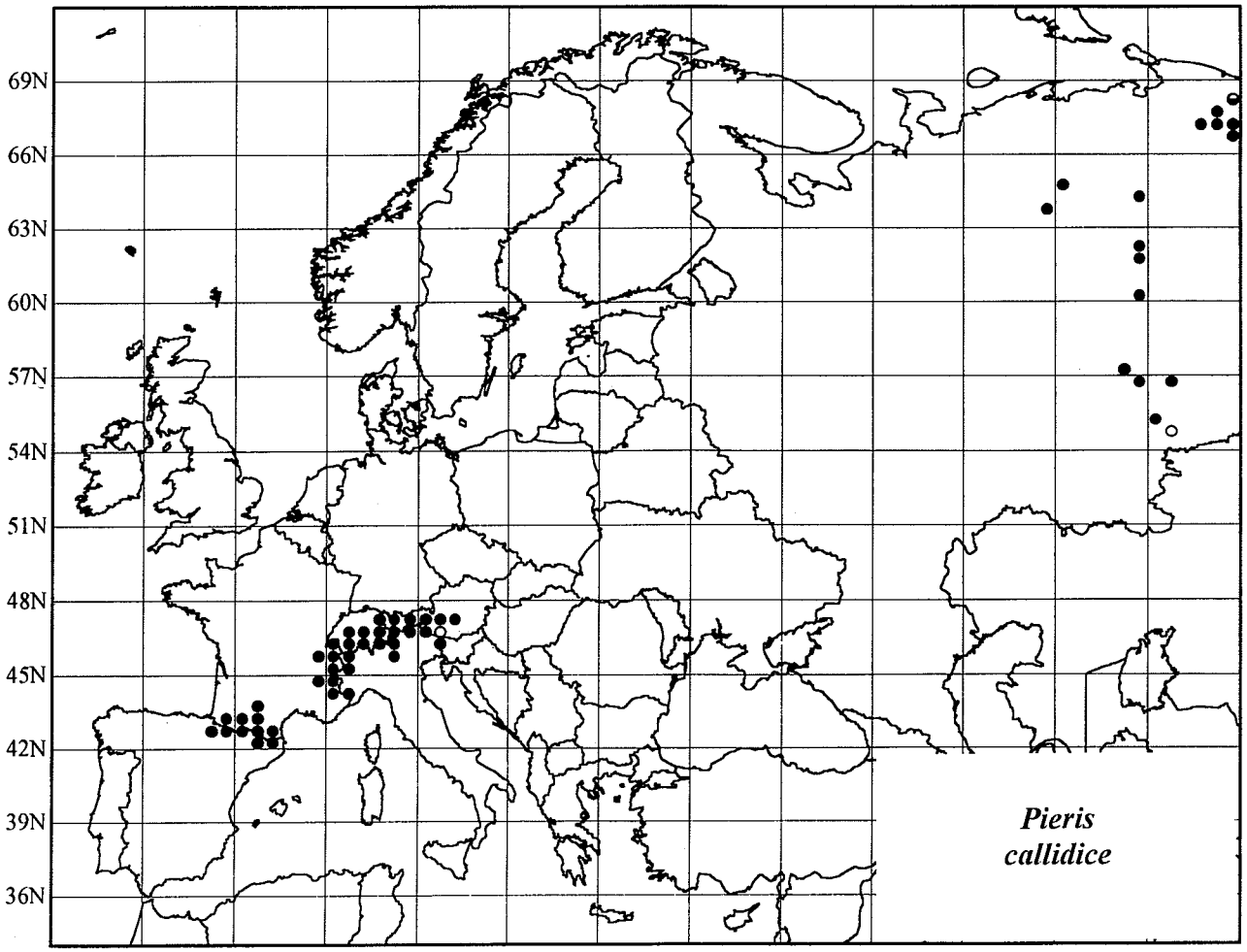
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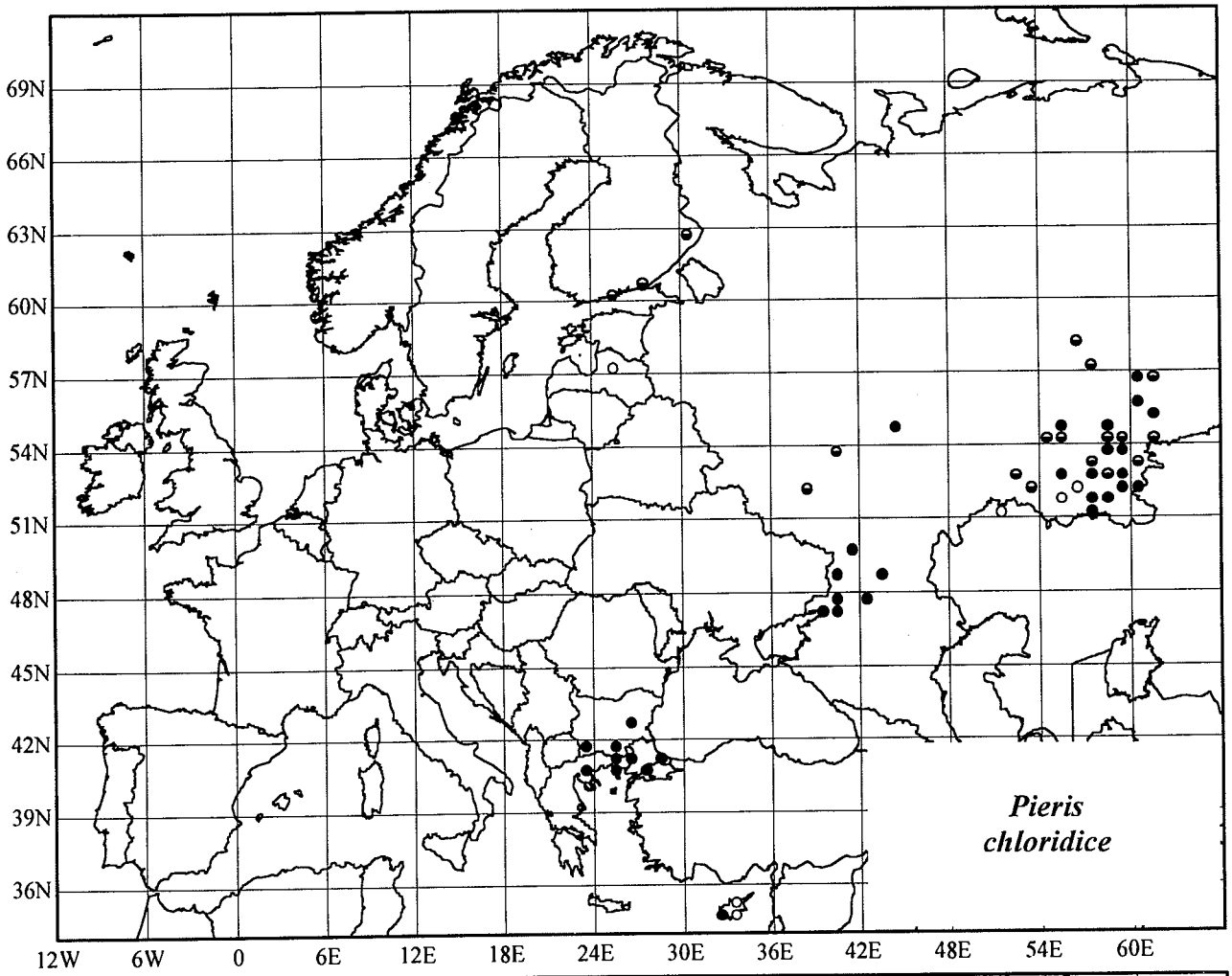
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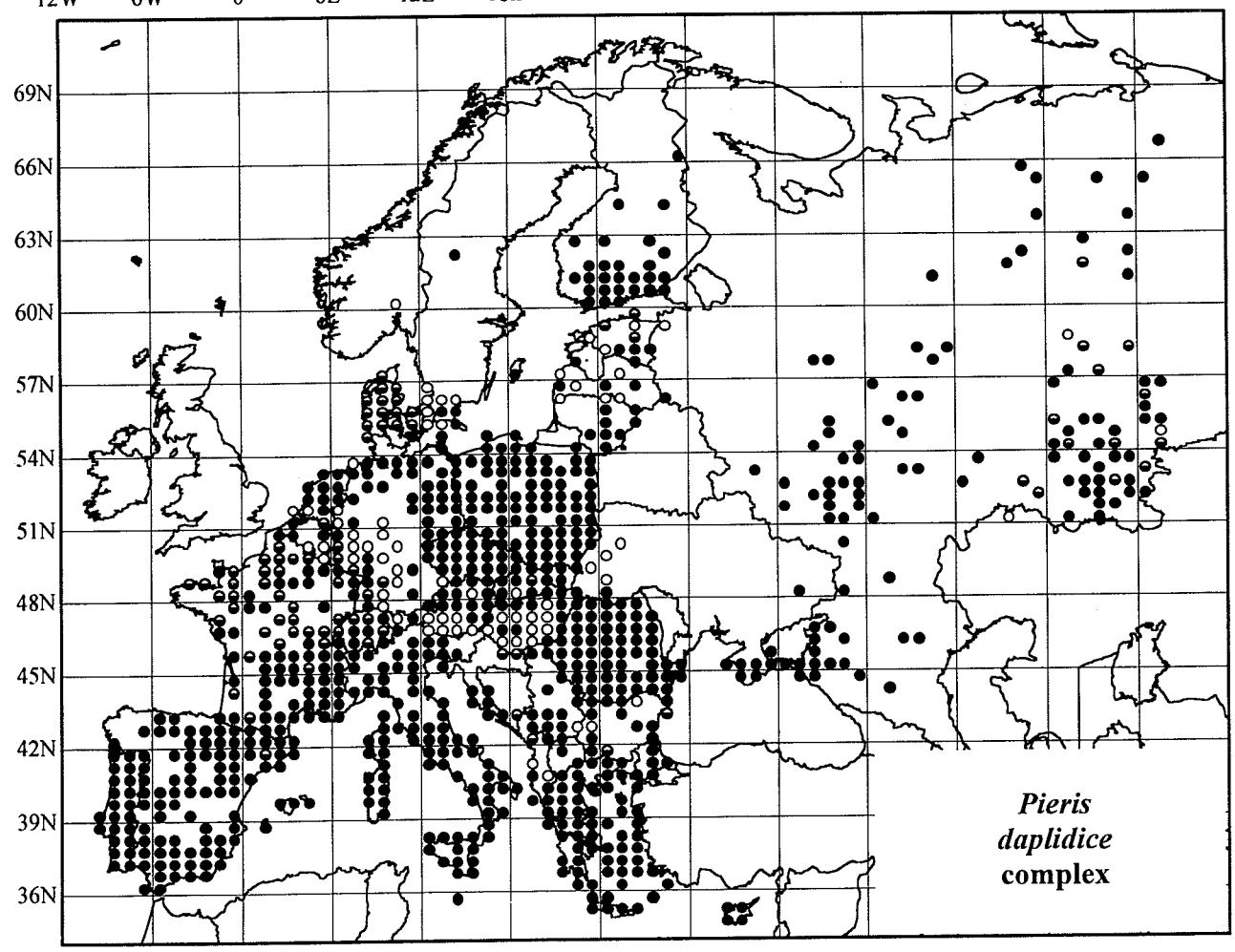
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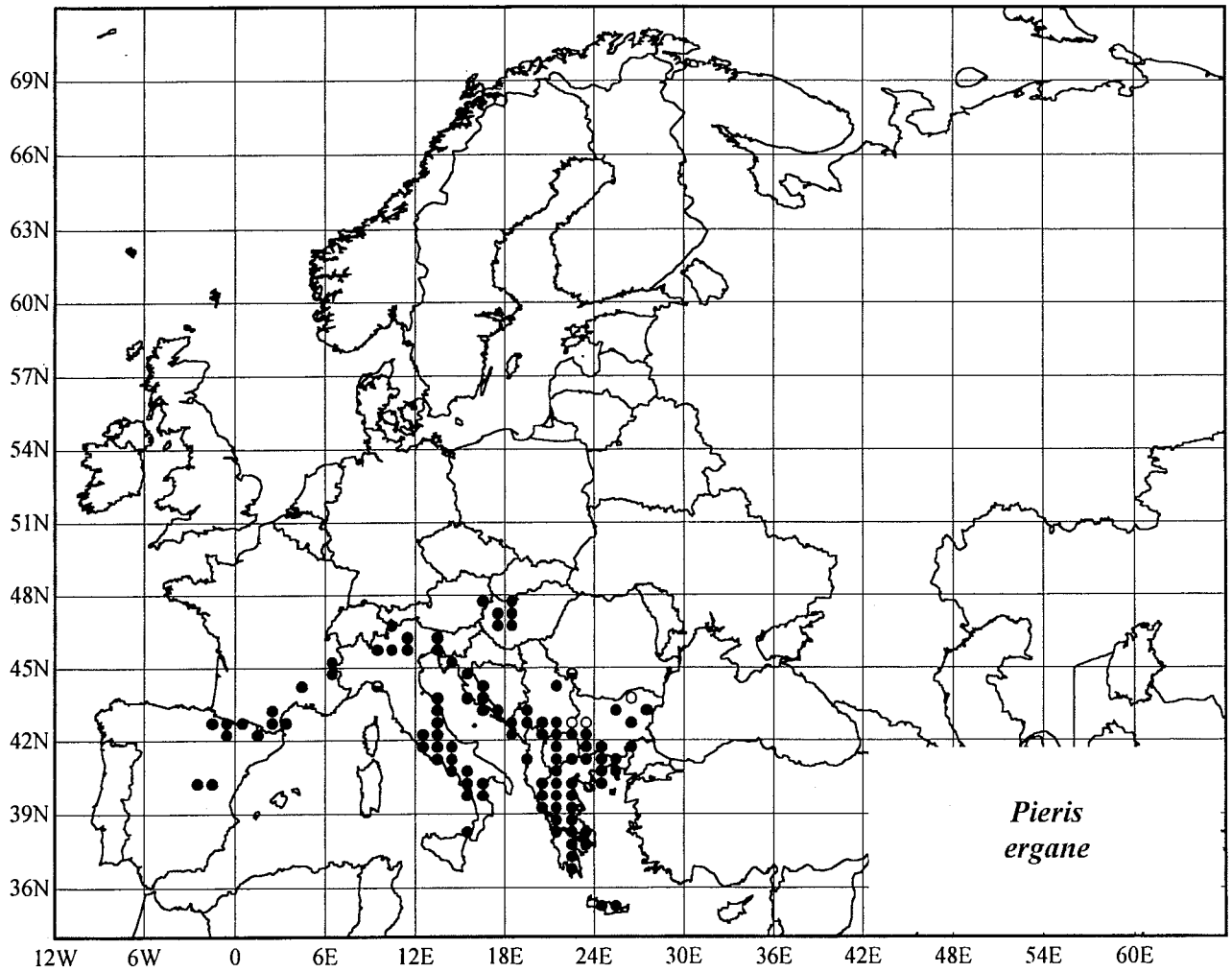
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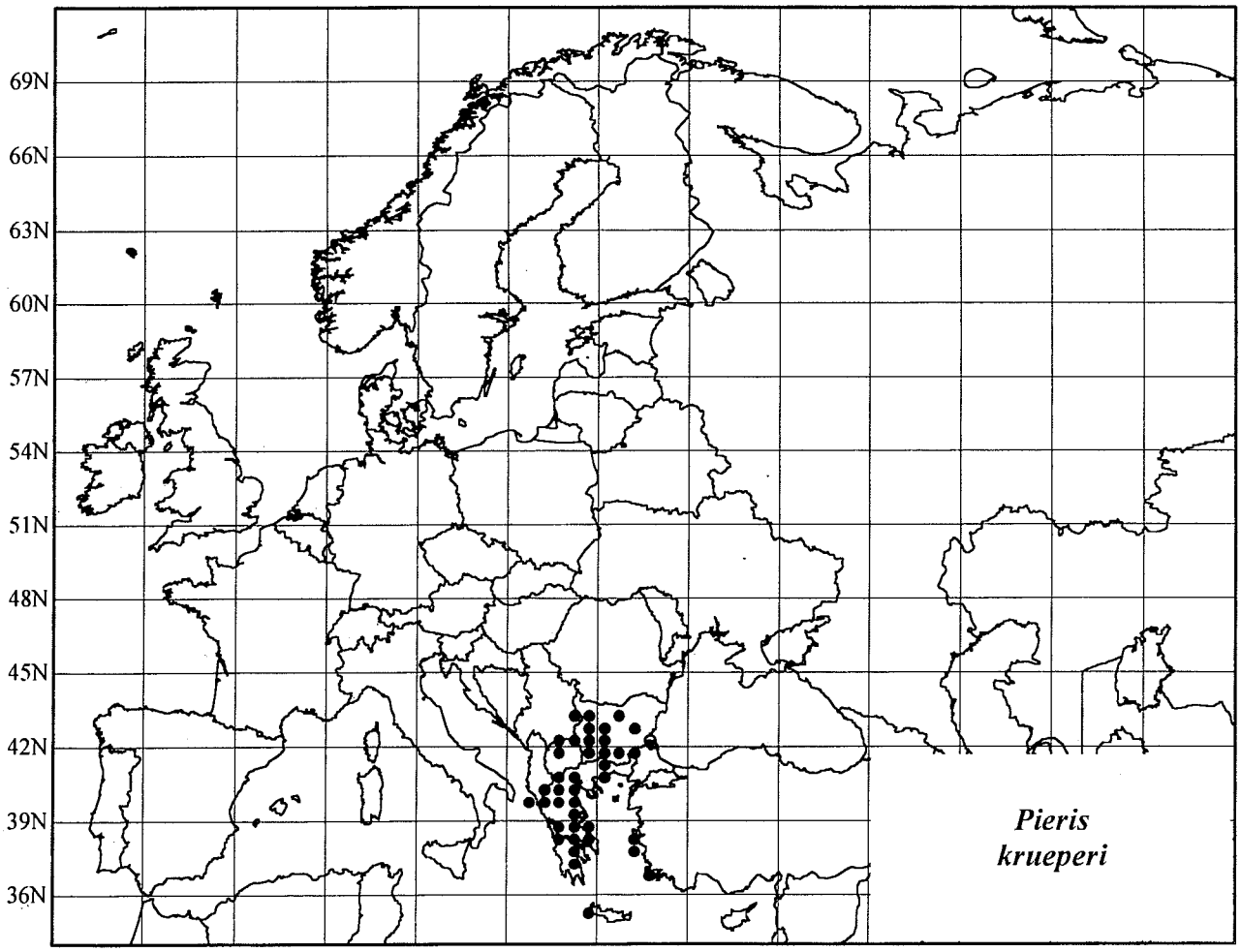
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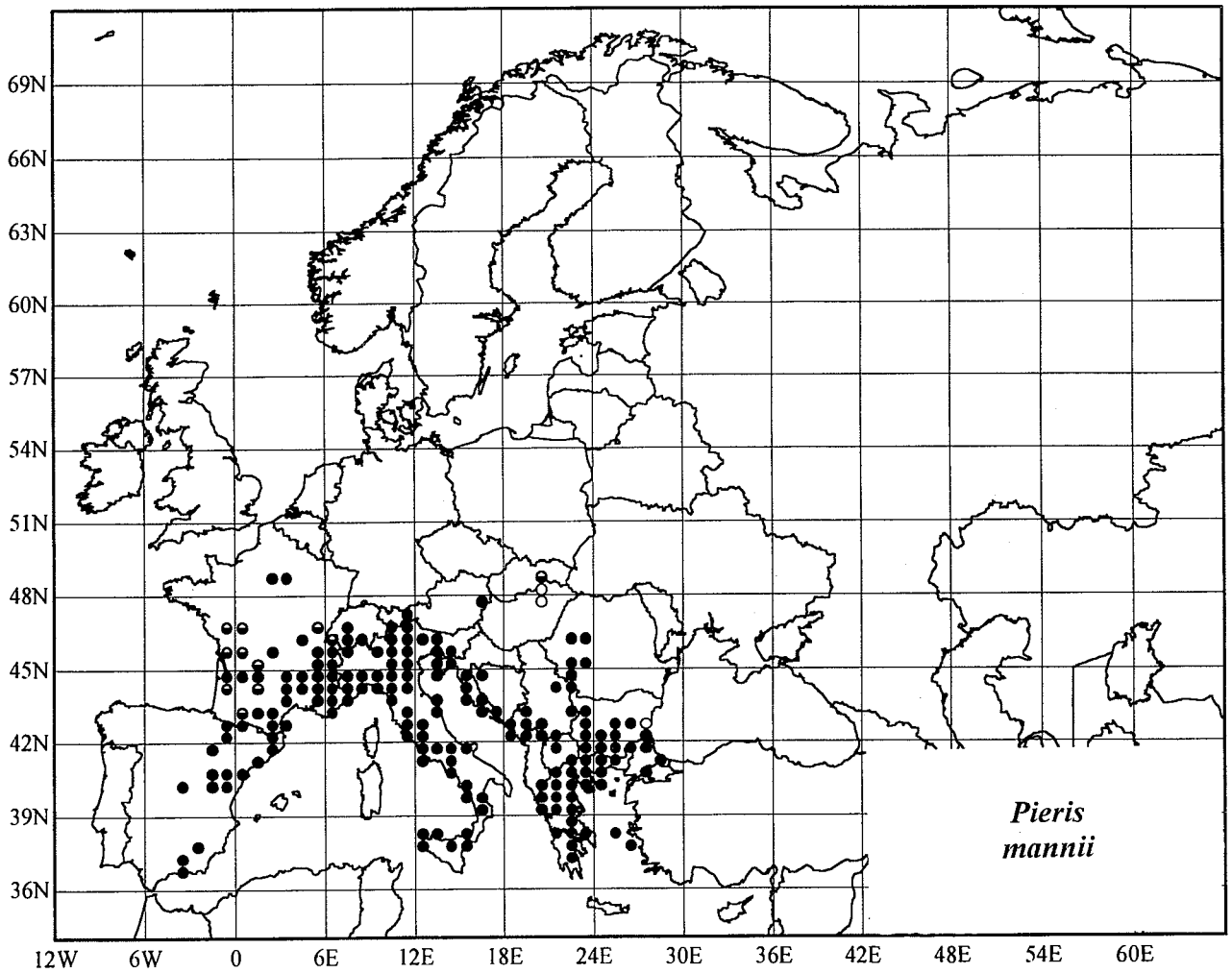
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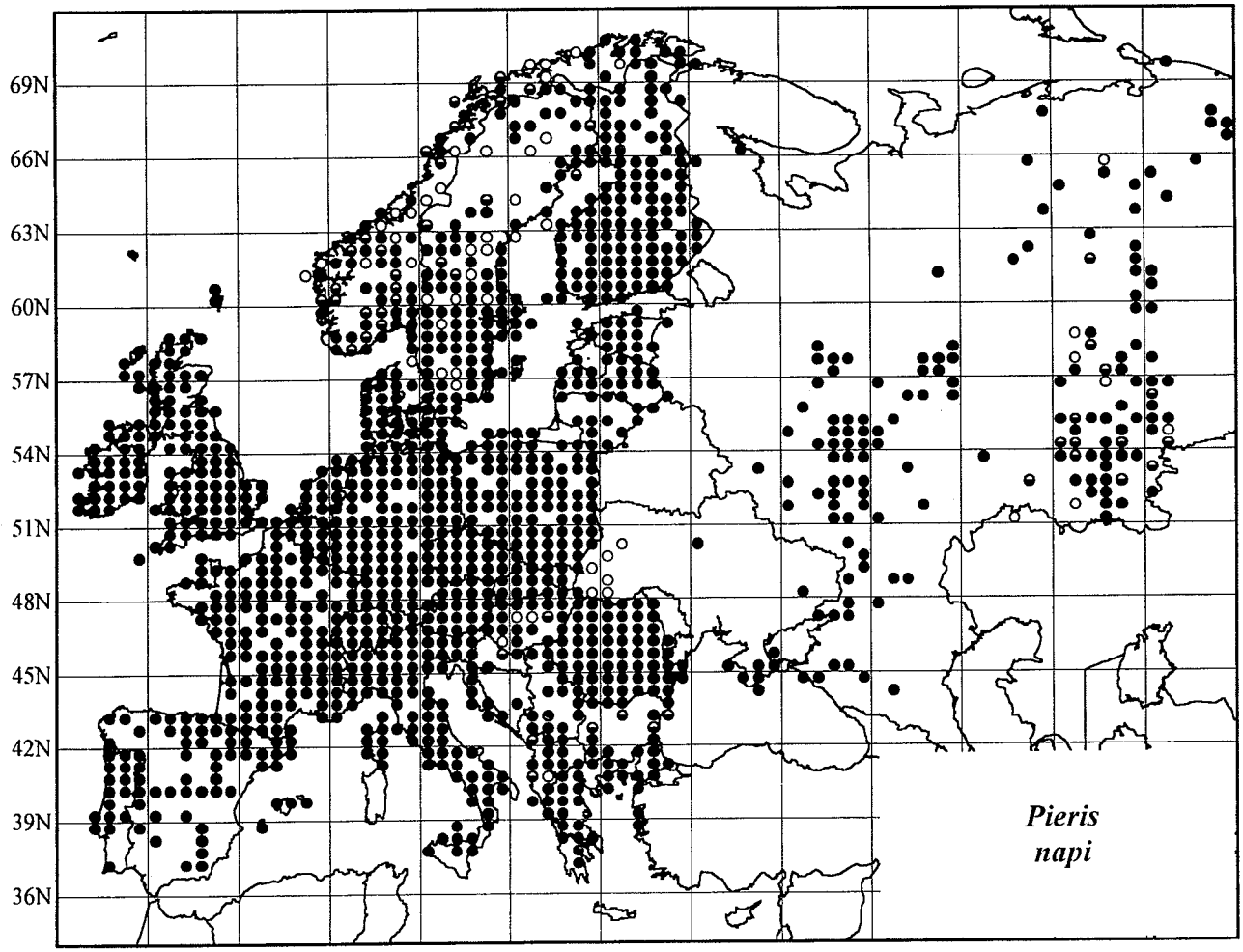
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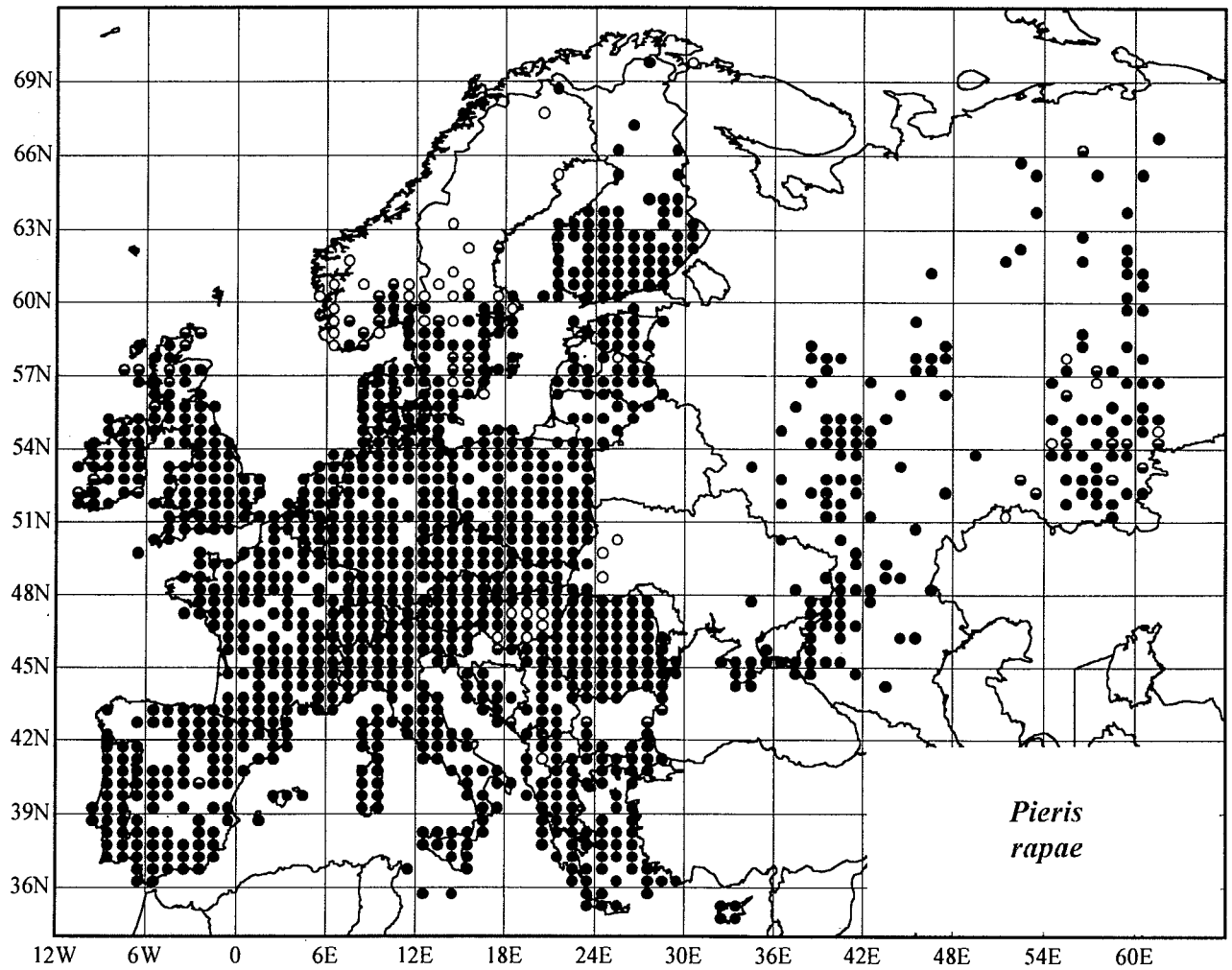
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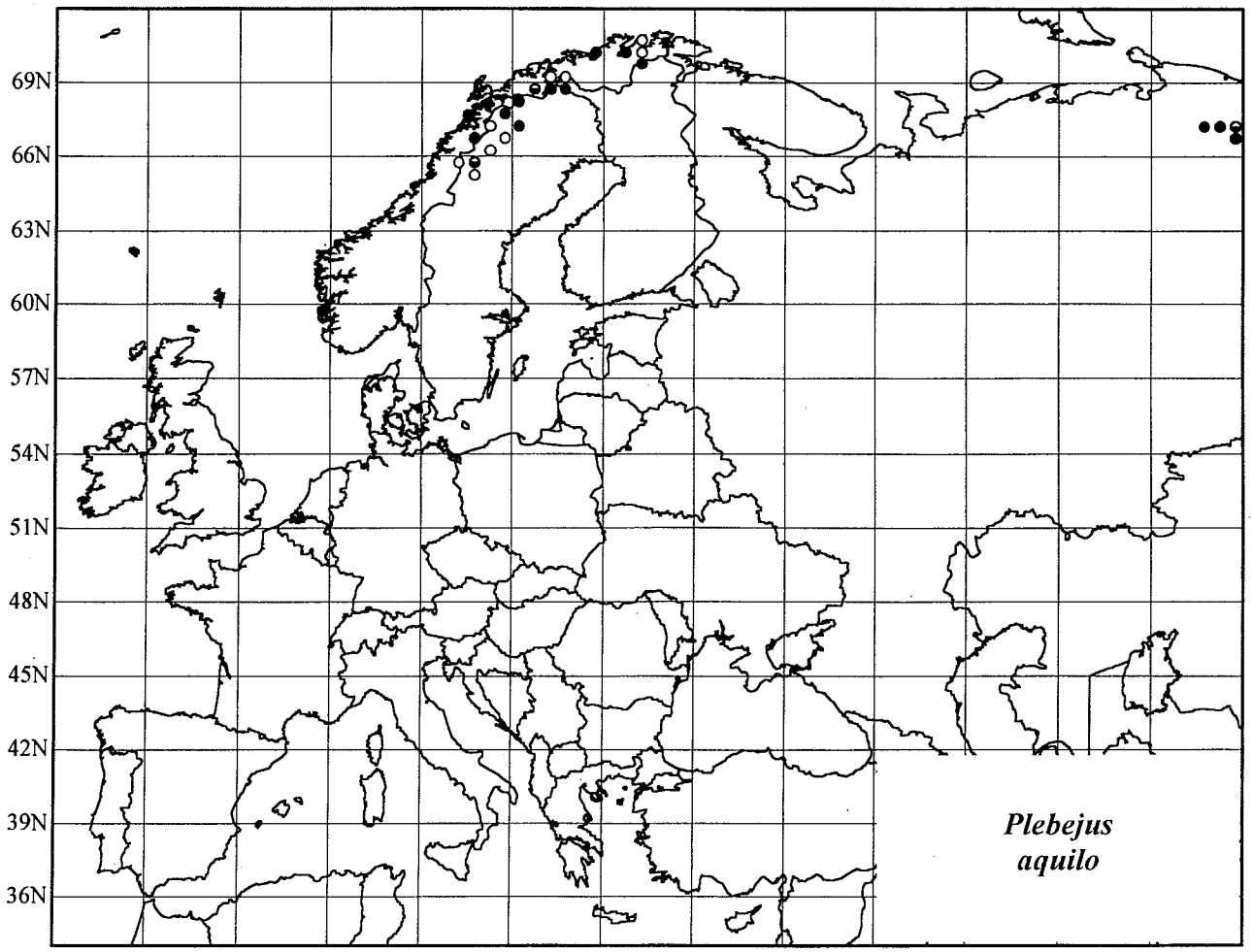
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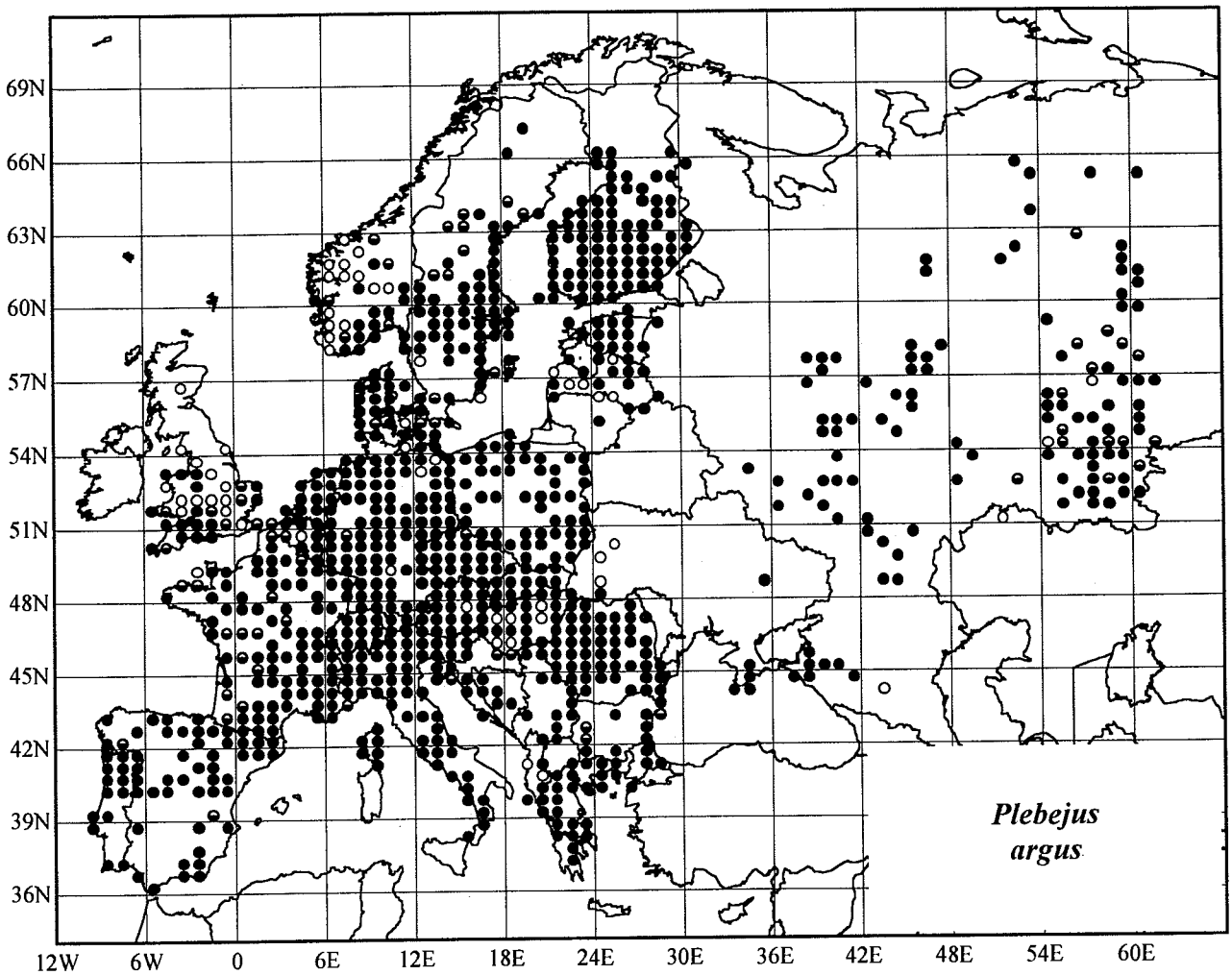
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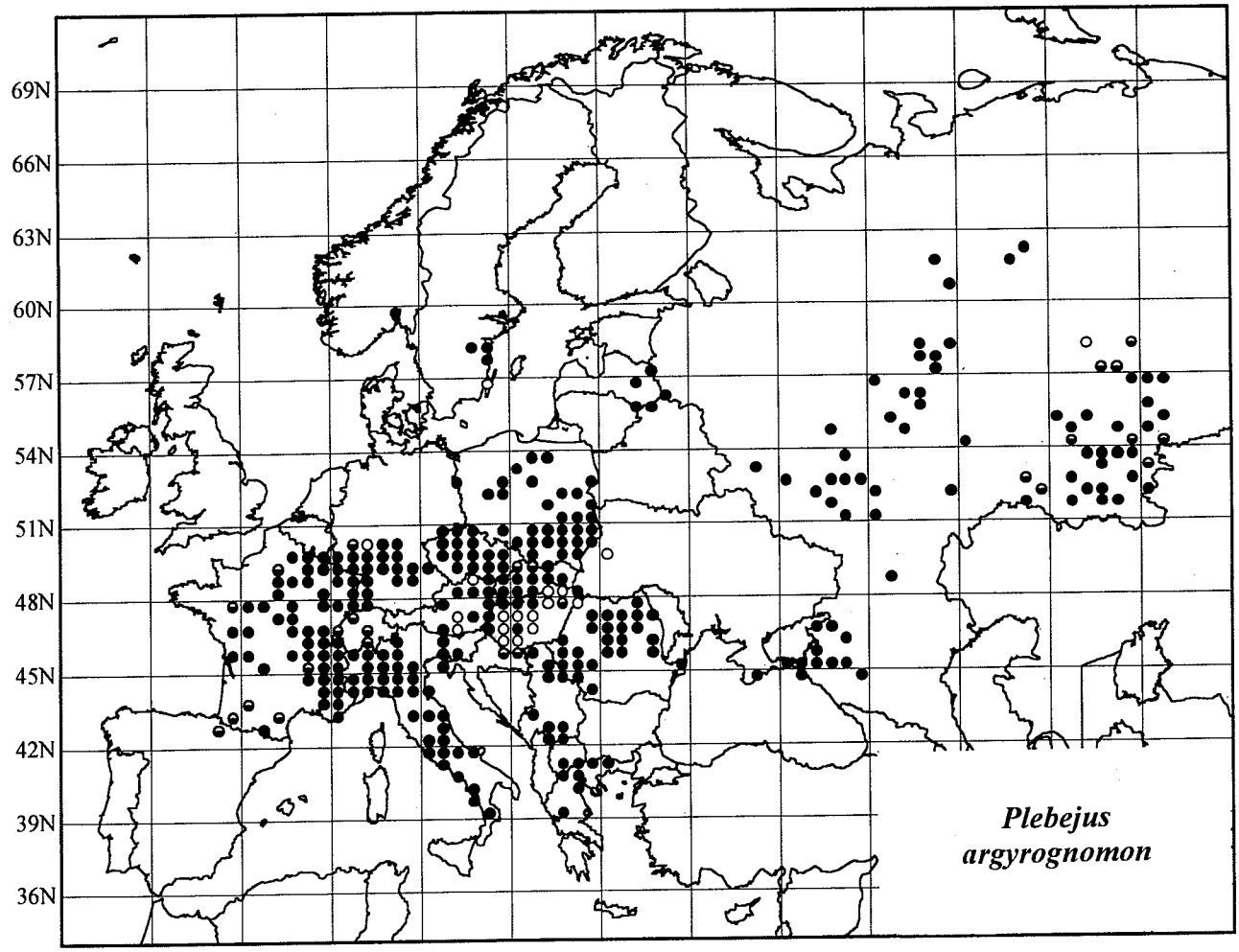
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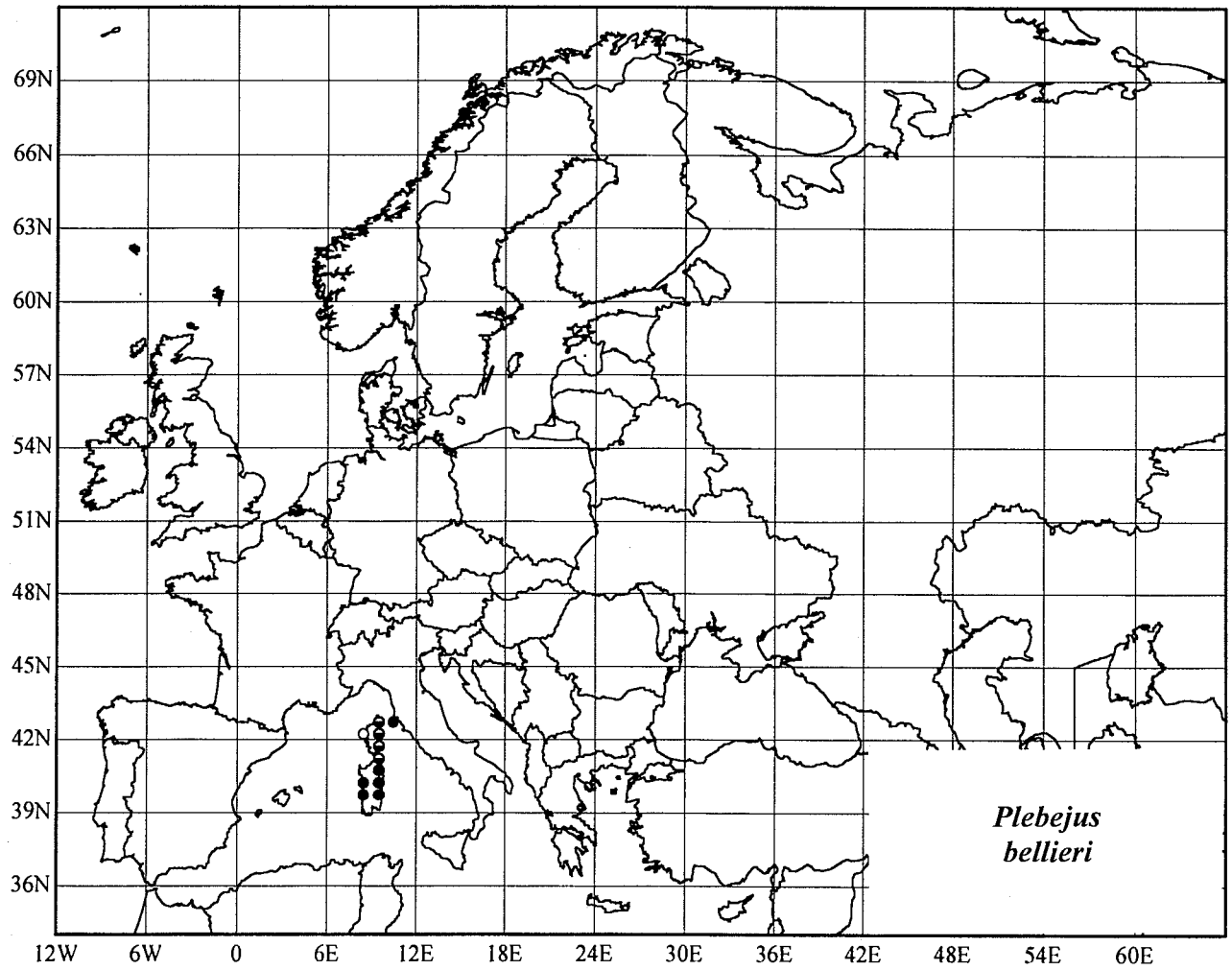
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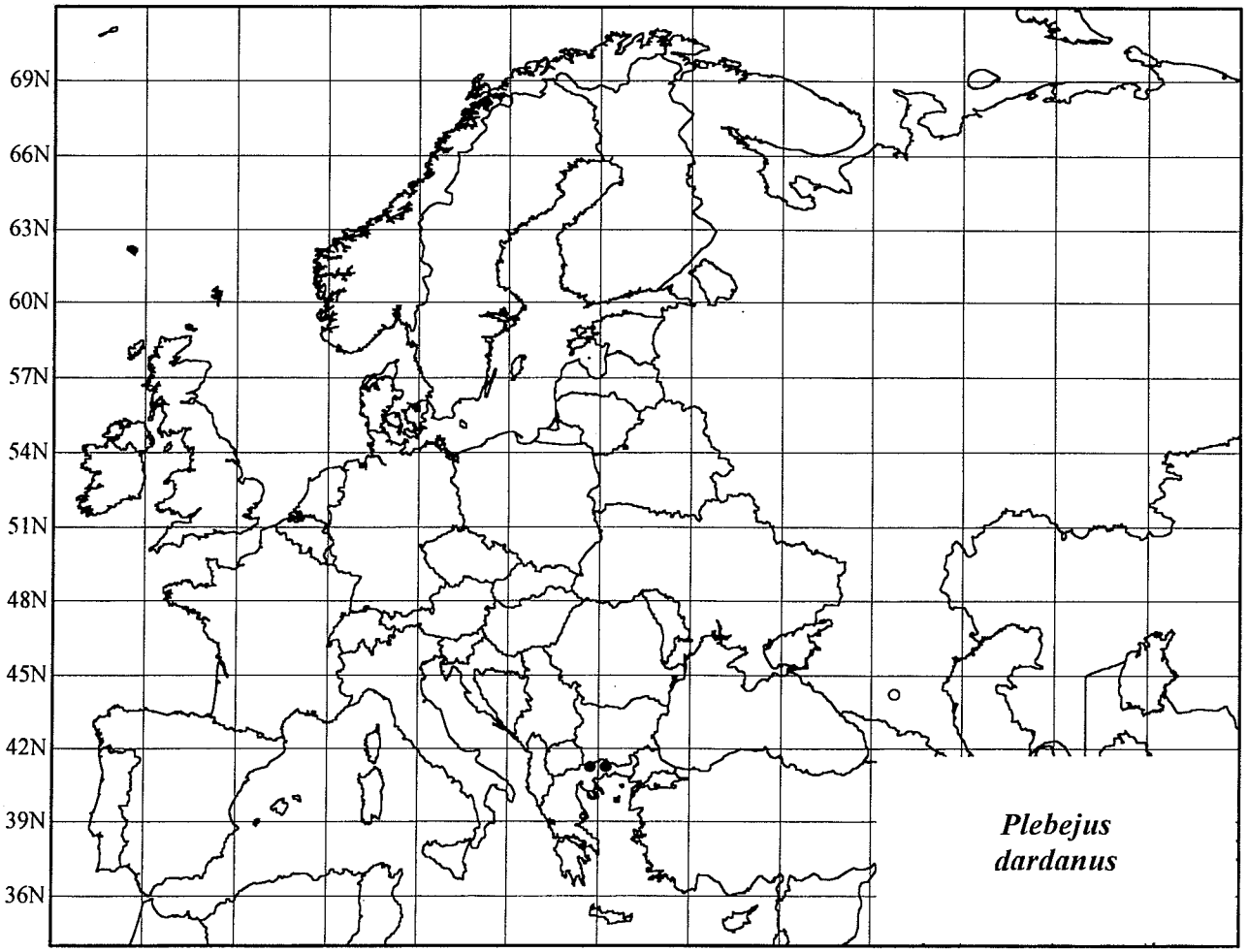
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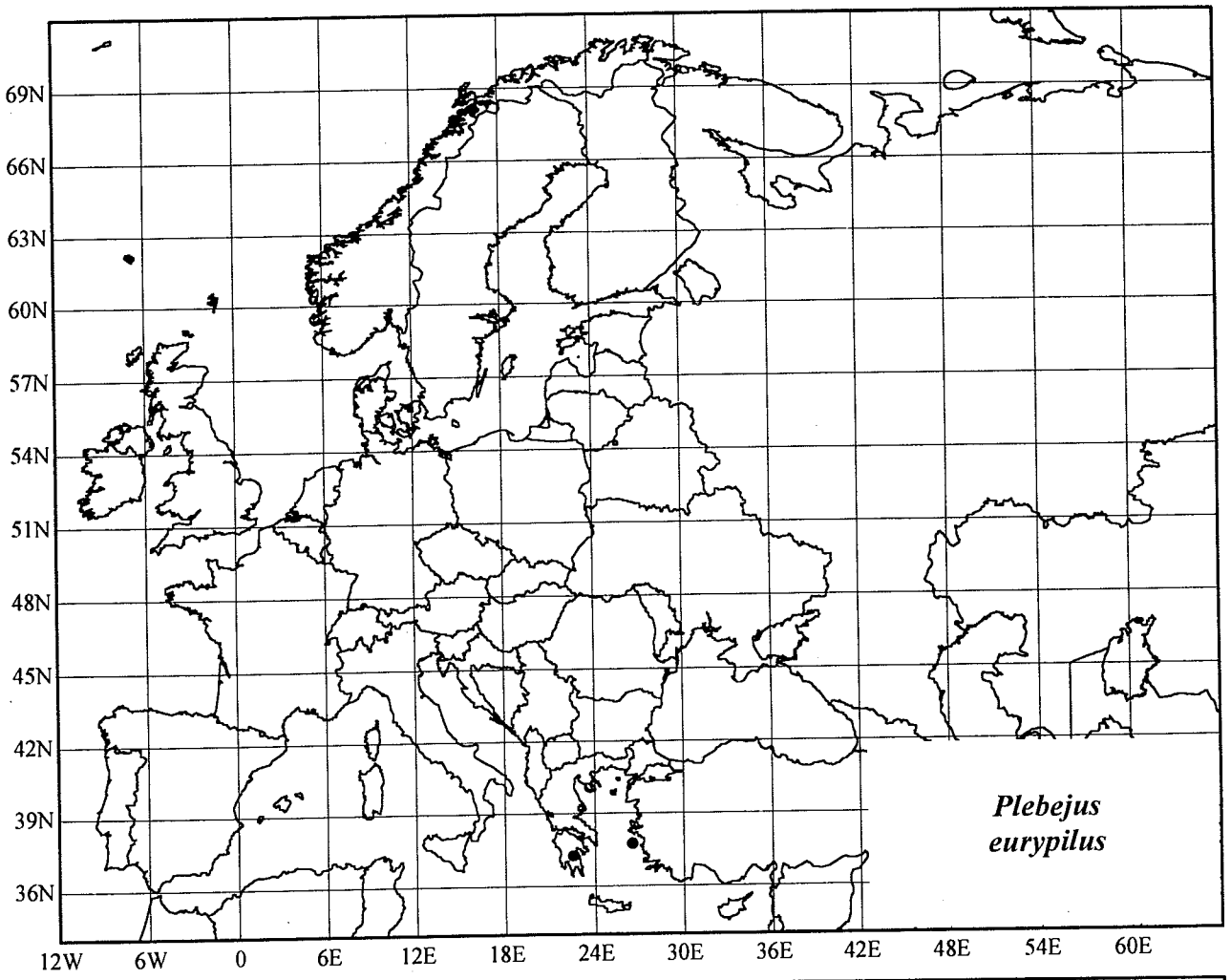
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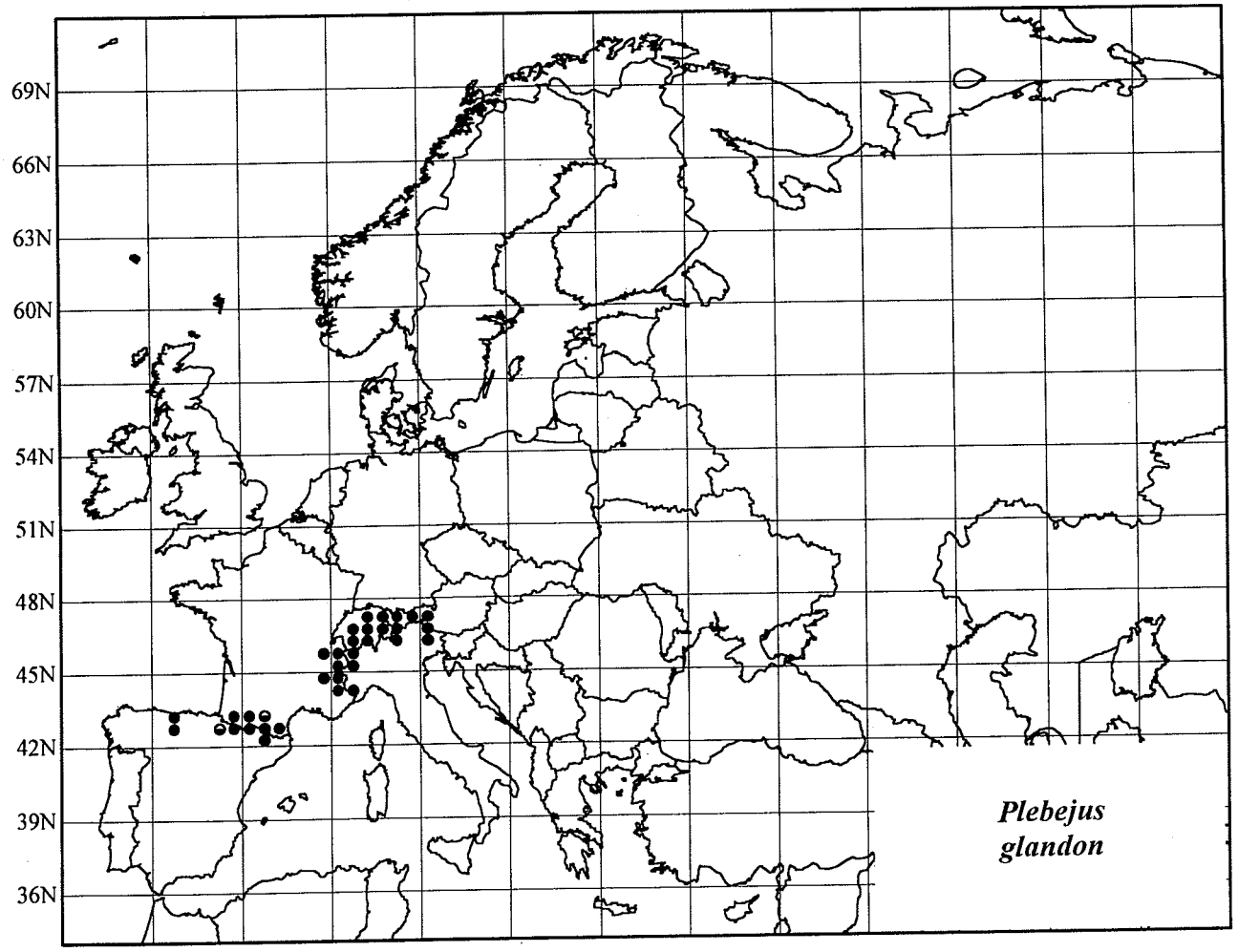
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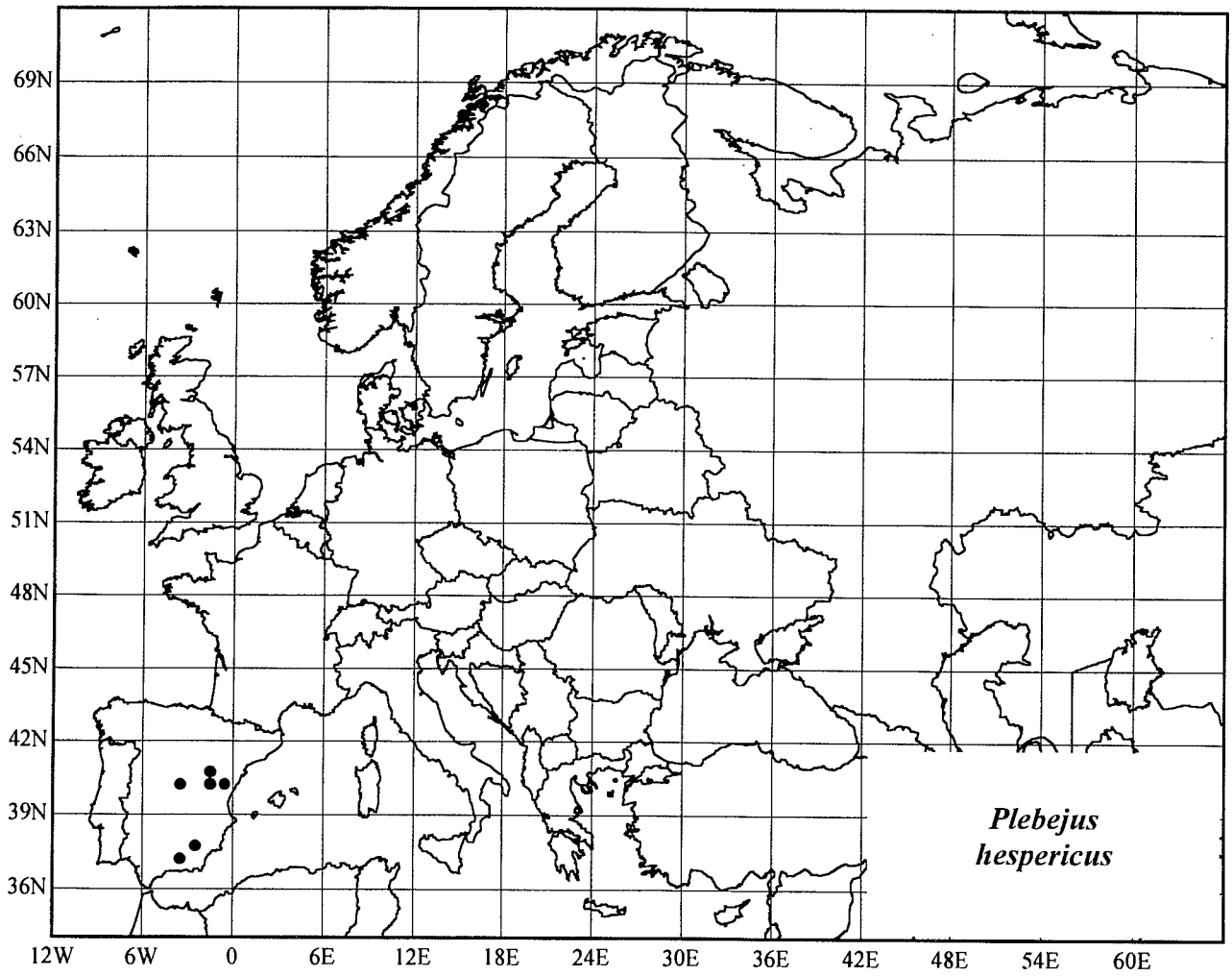
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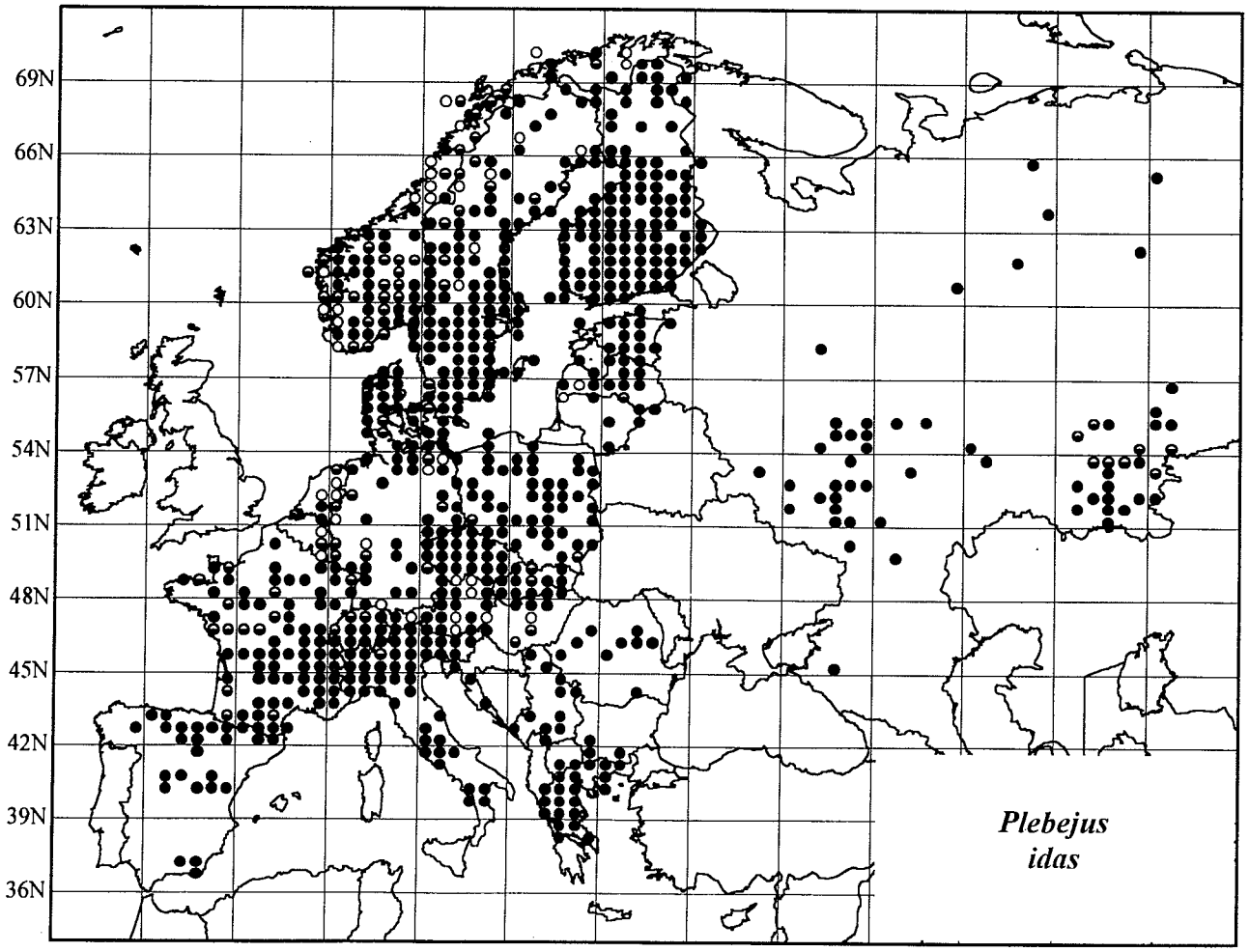
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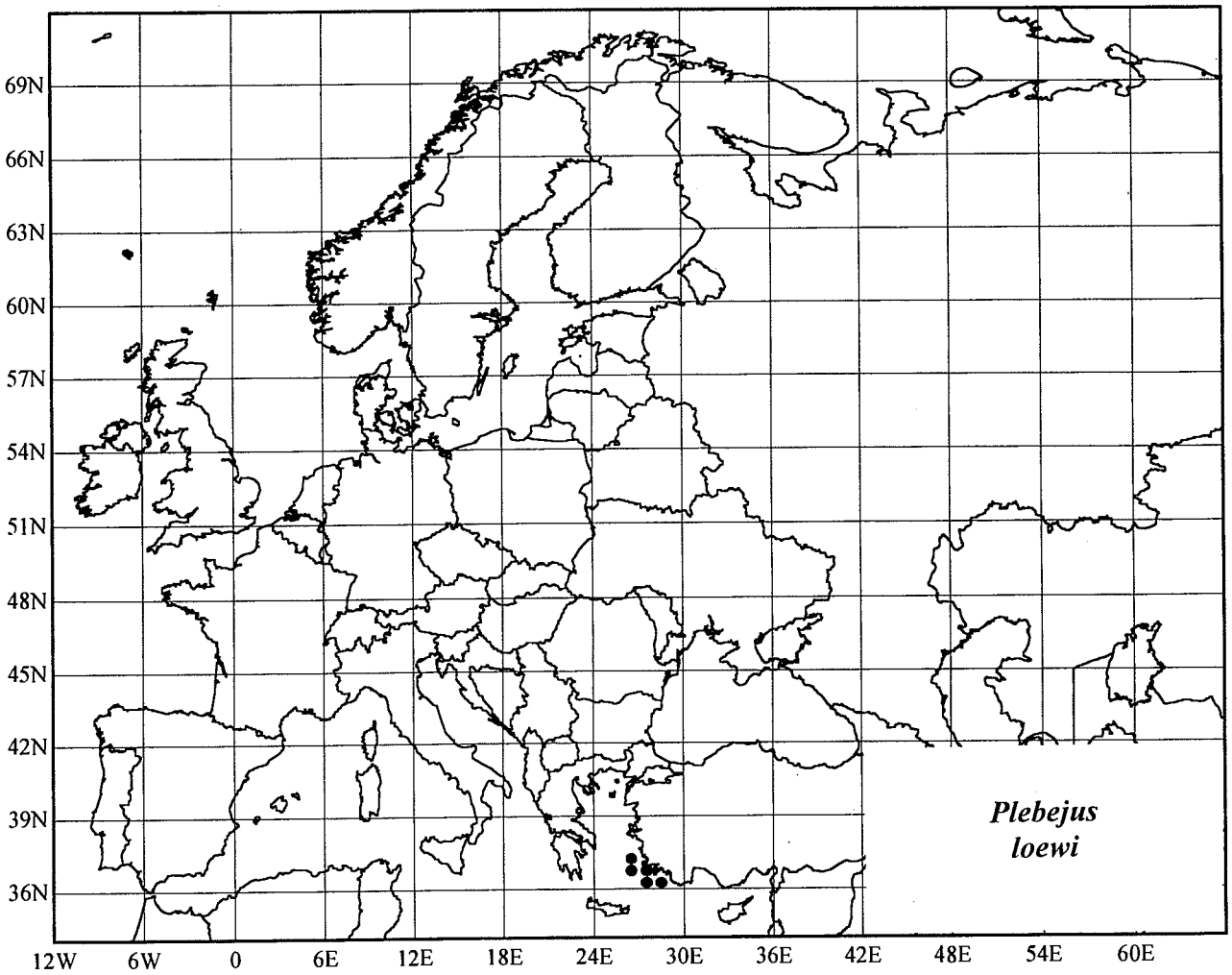
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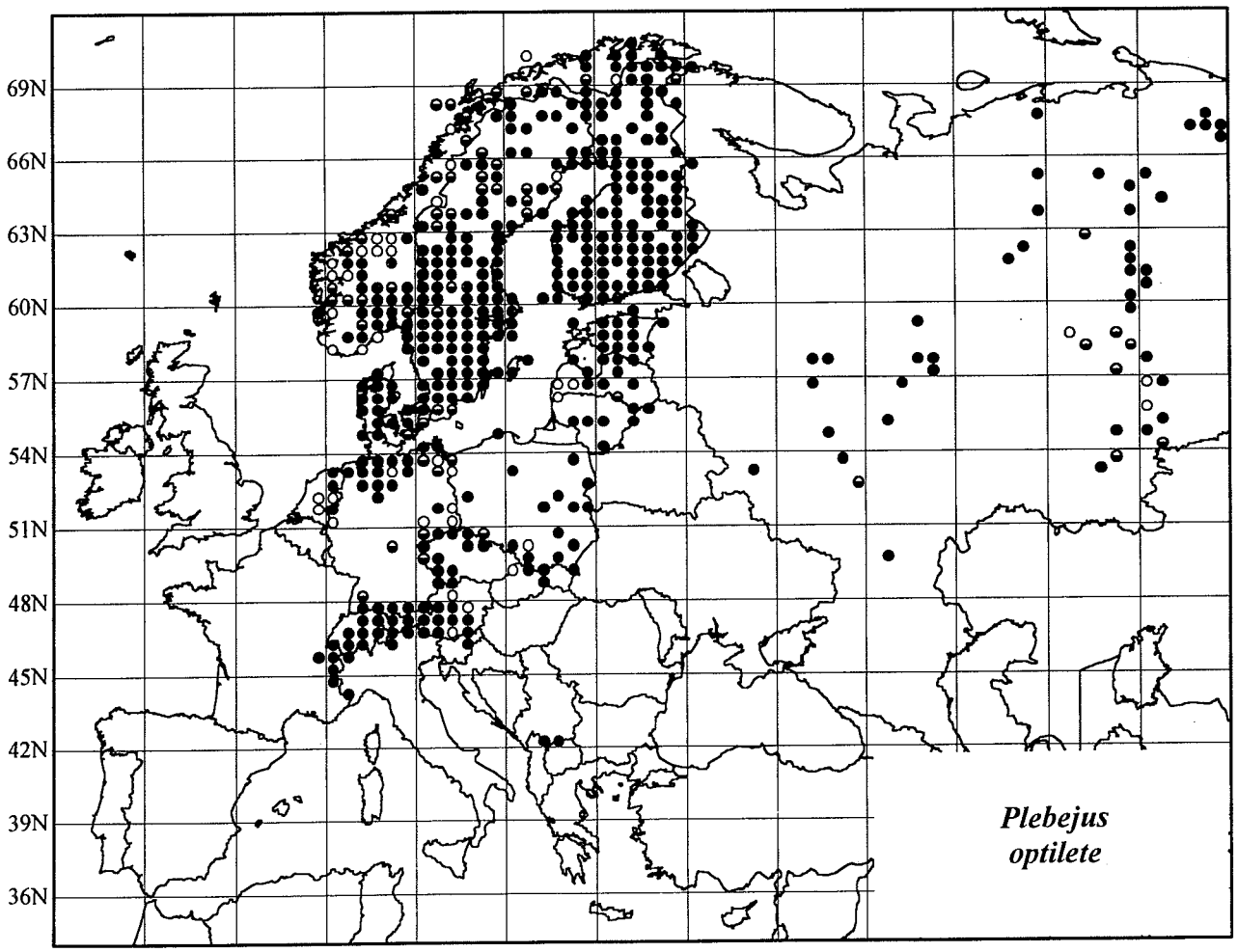
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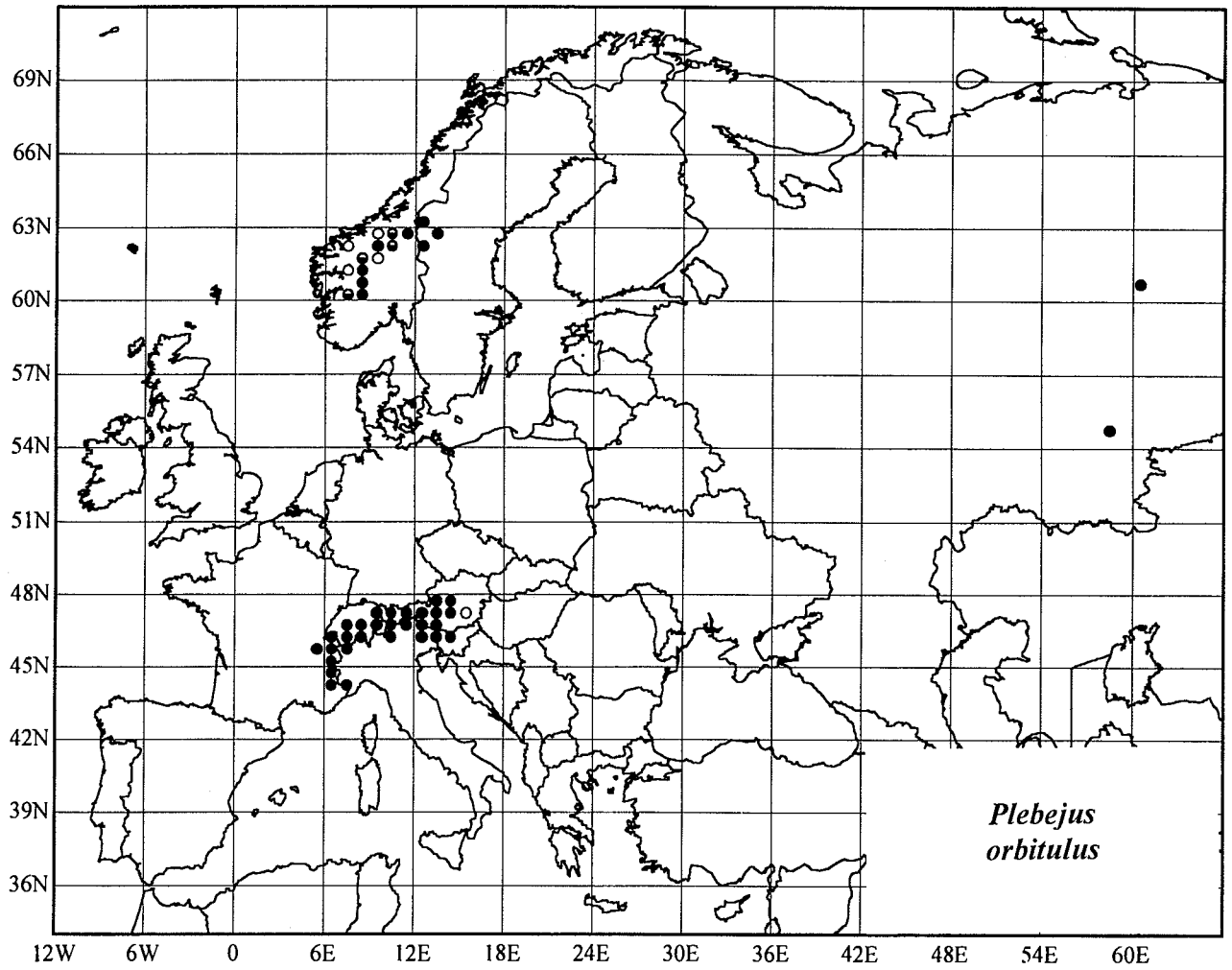
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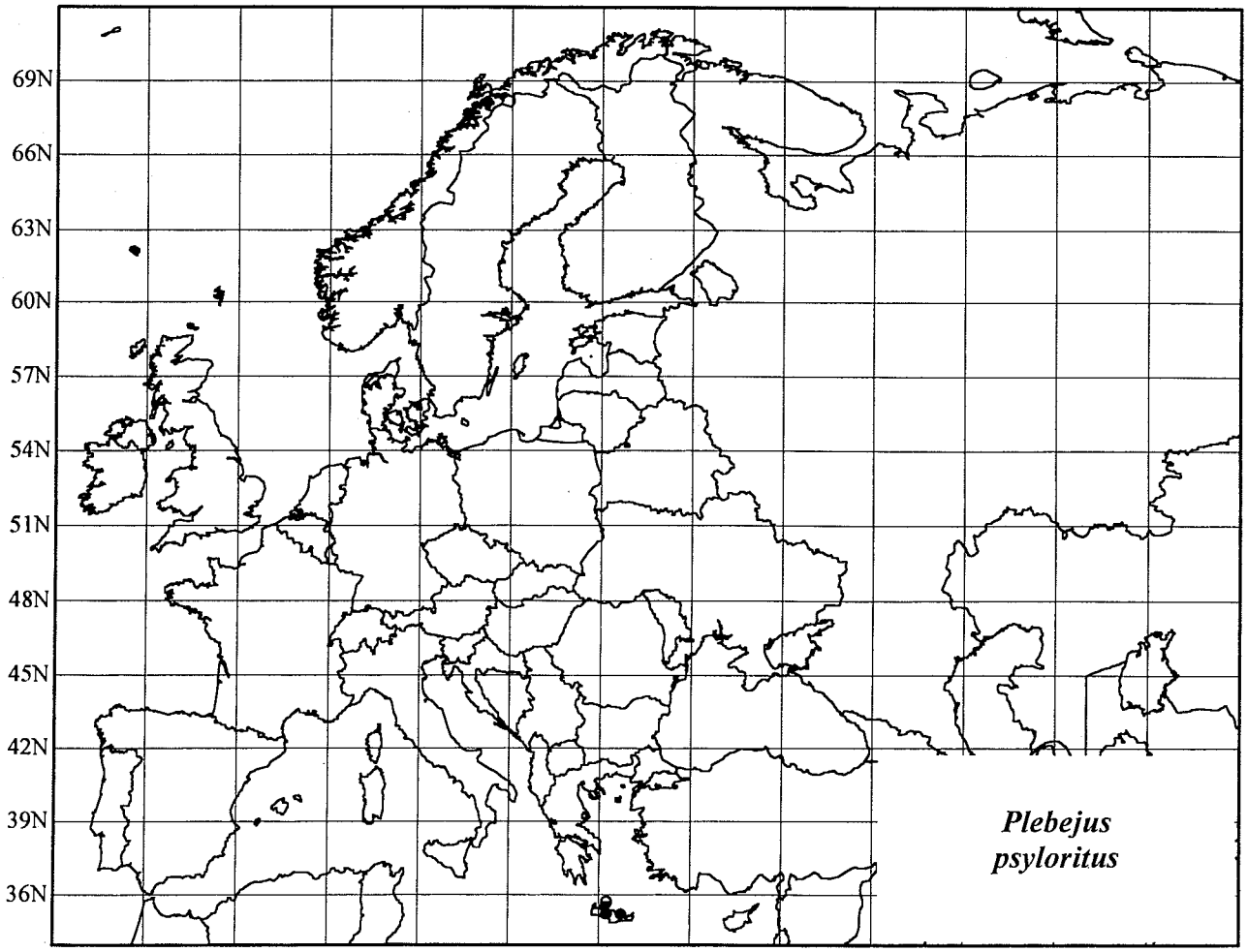
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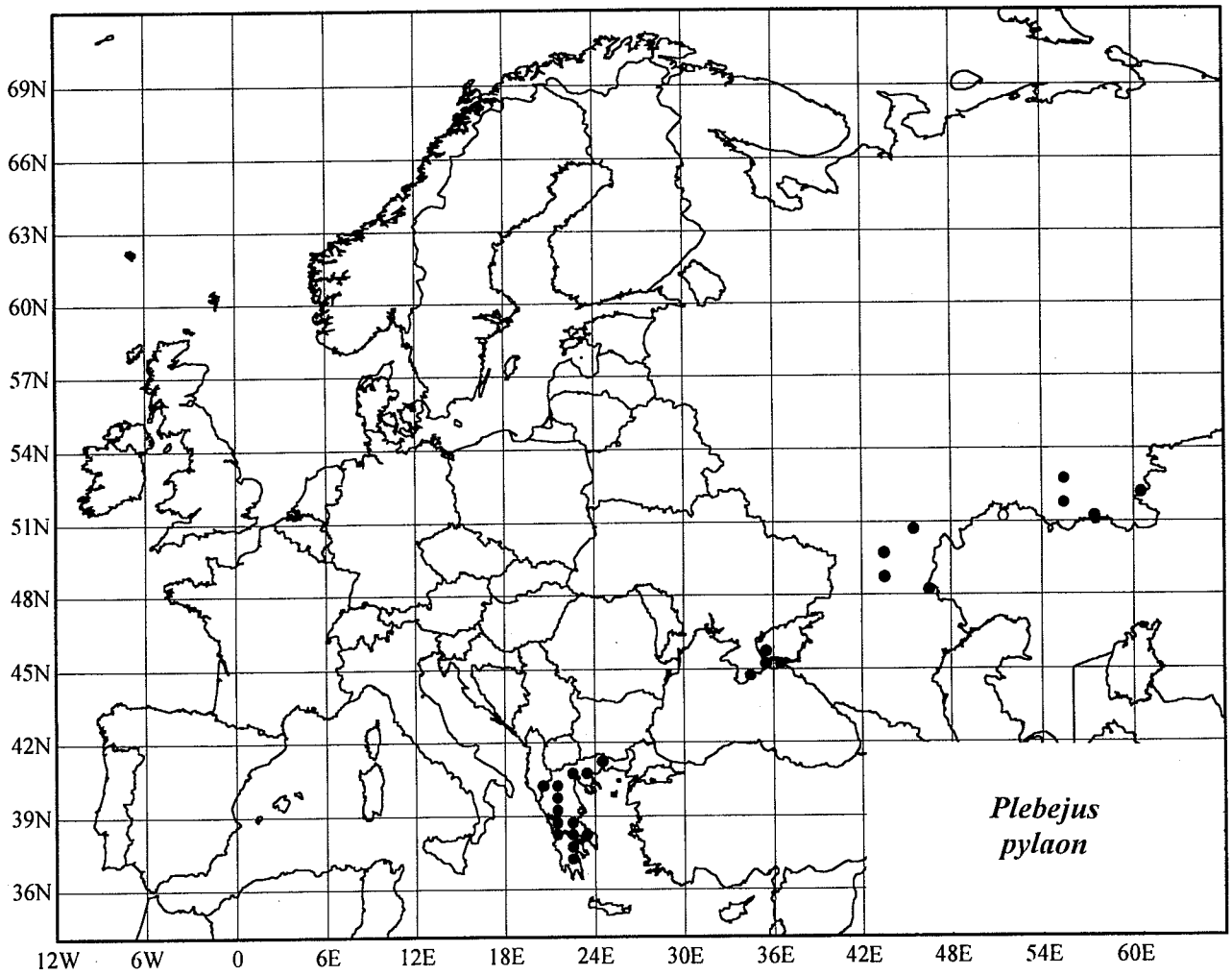
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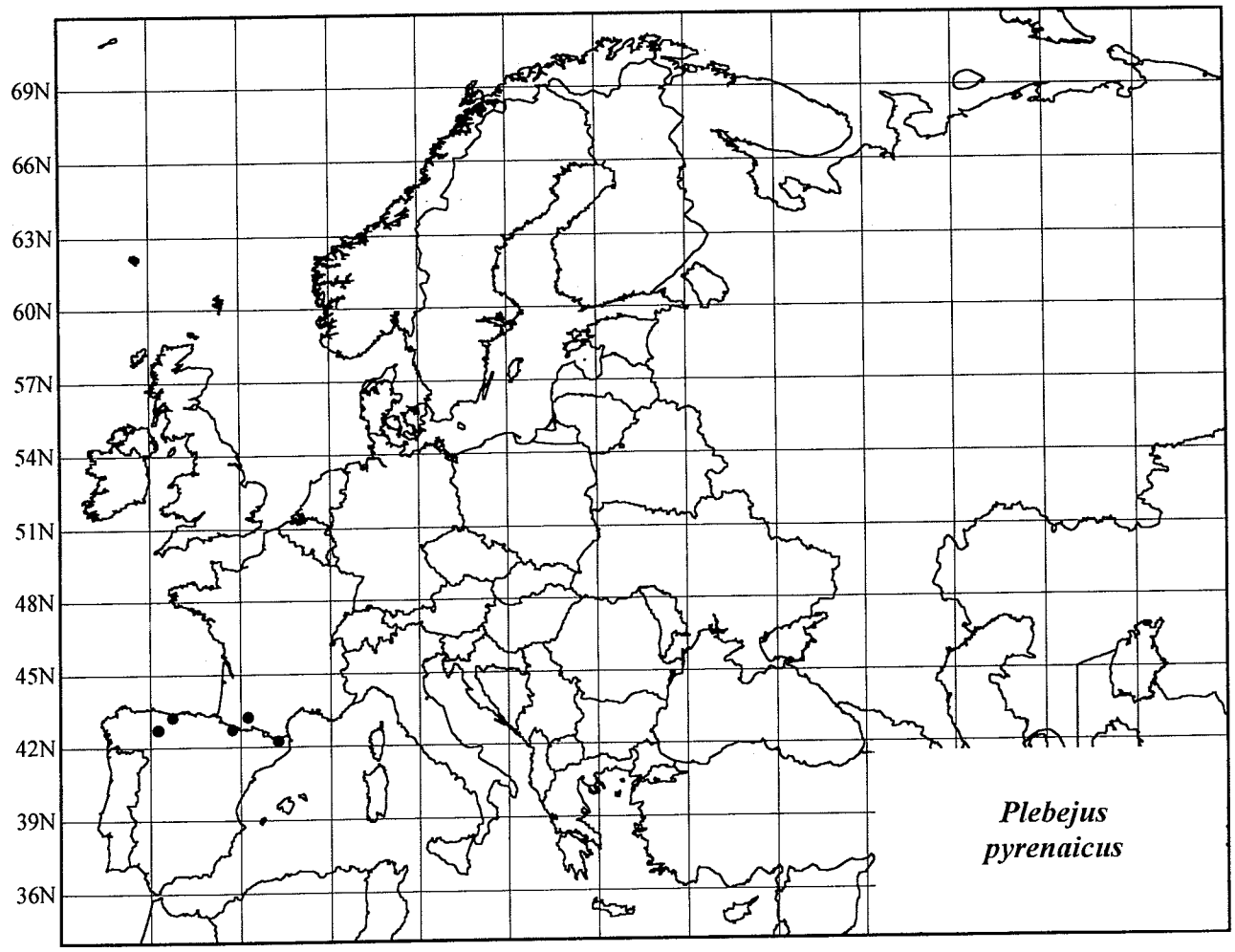
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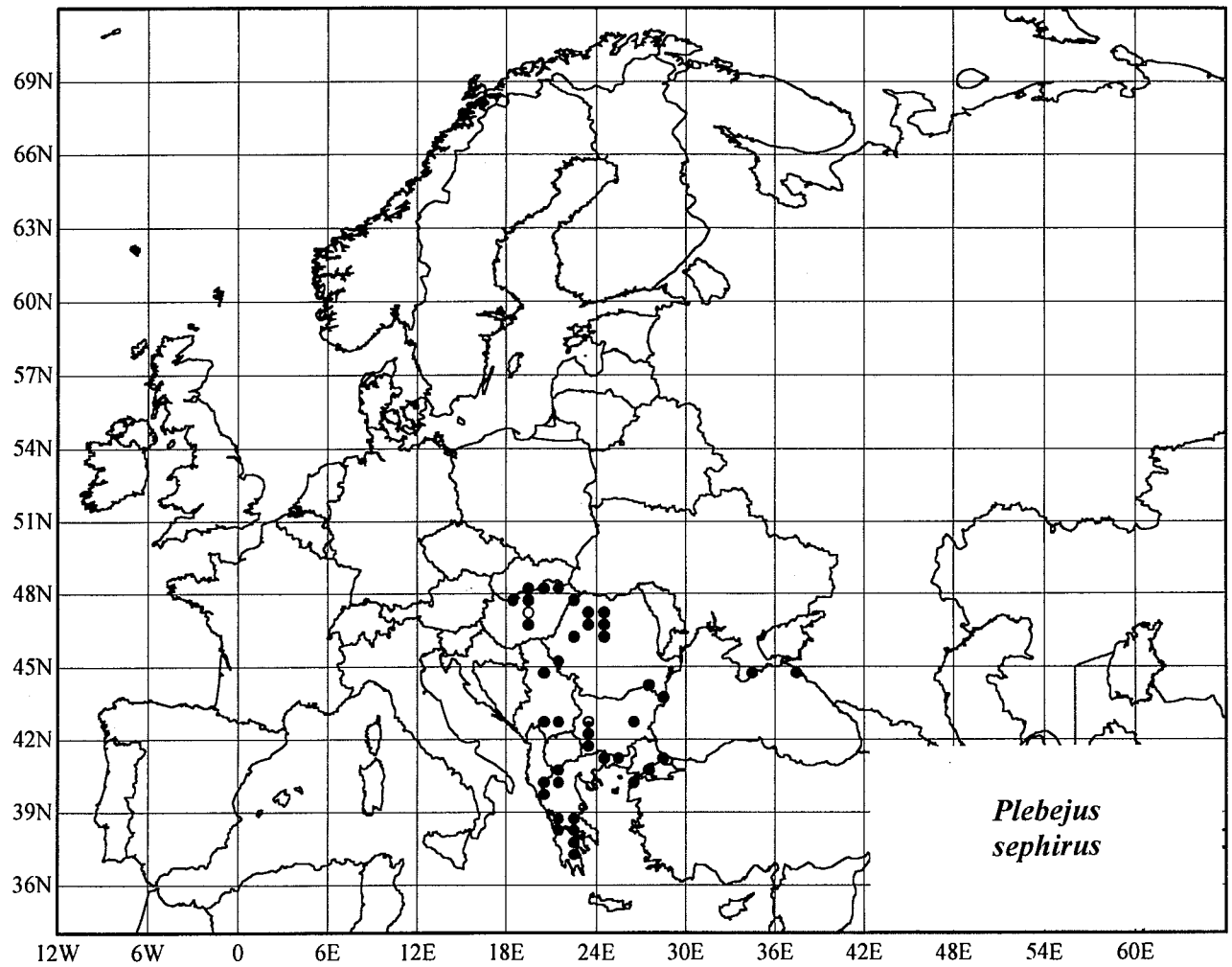
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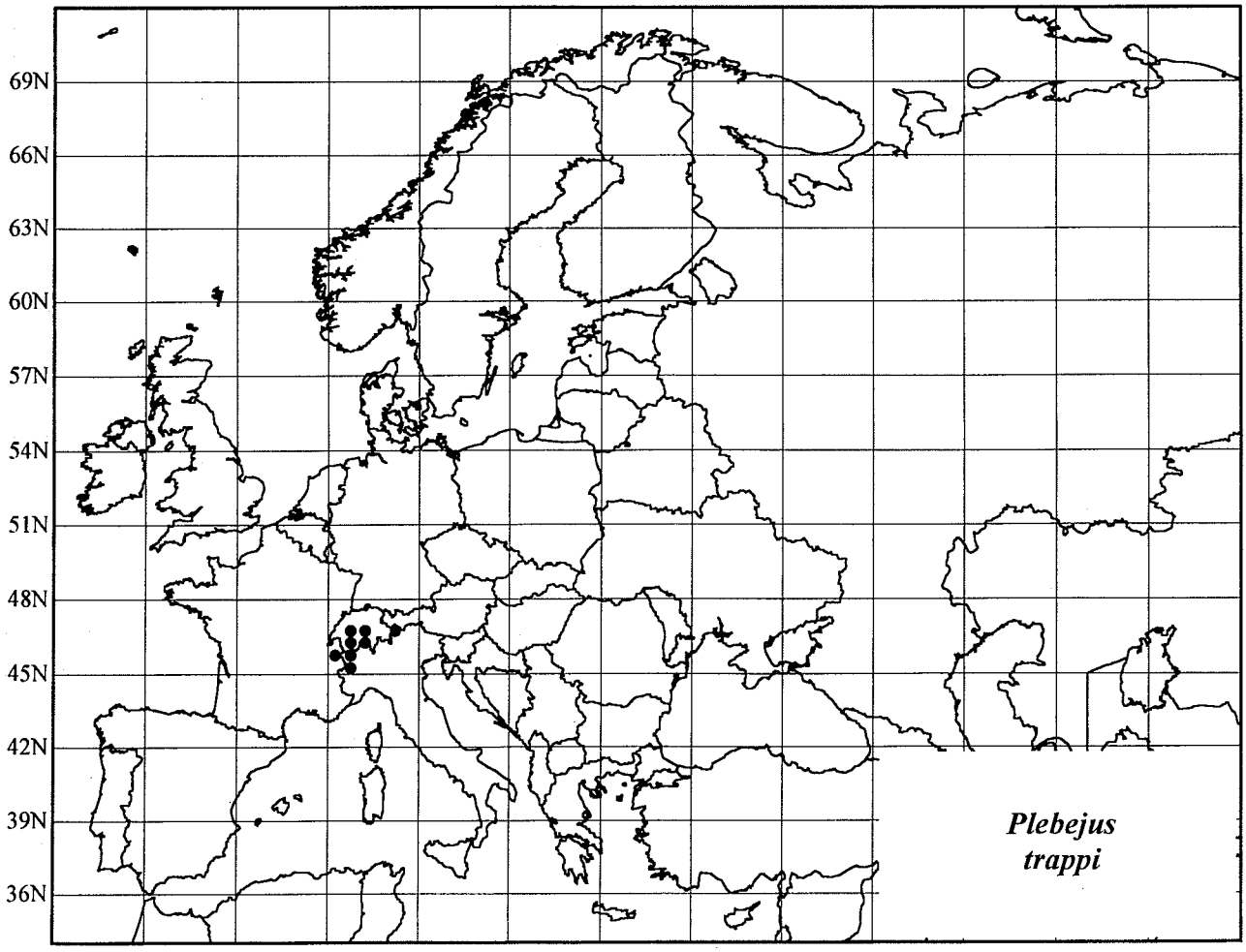
Plebejus sephirus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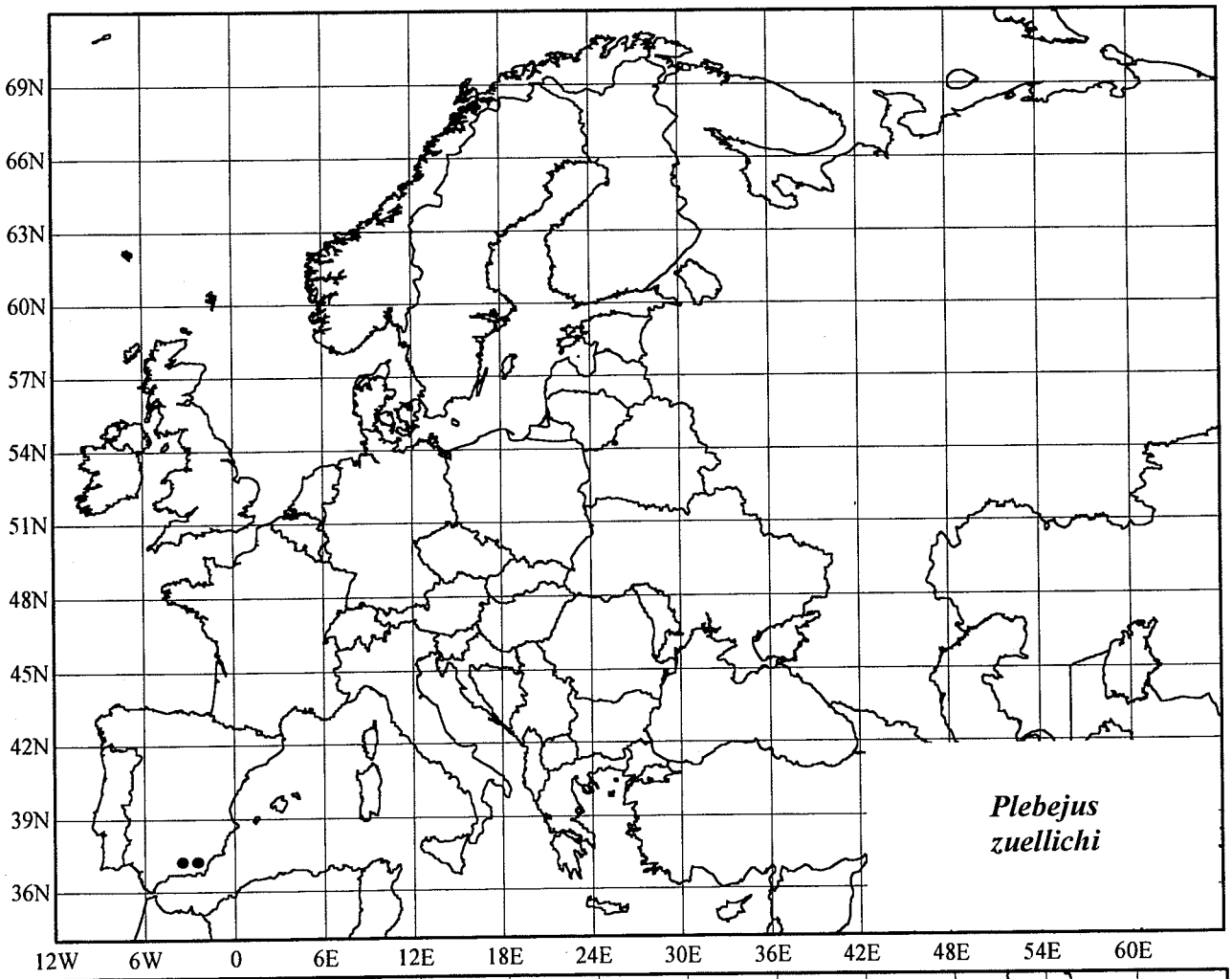
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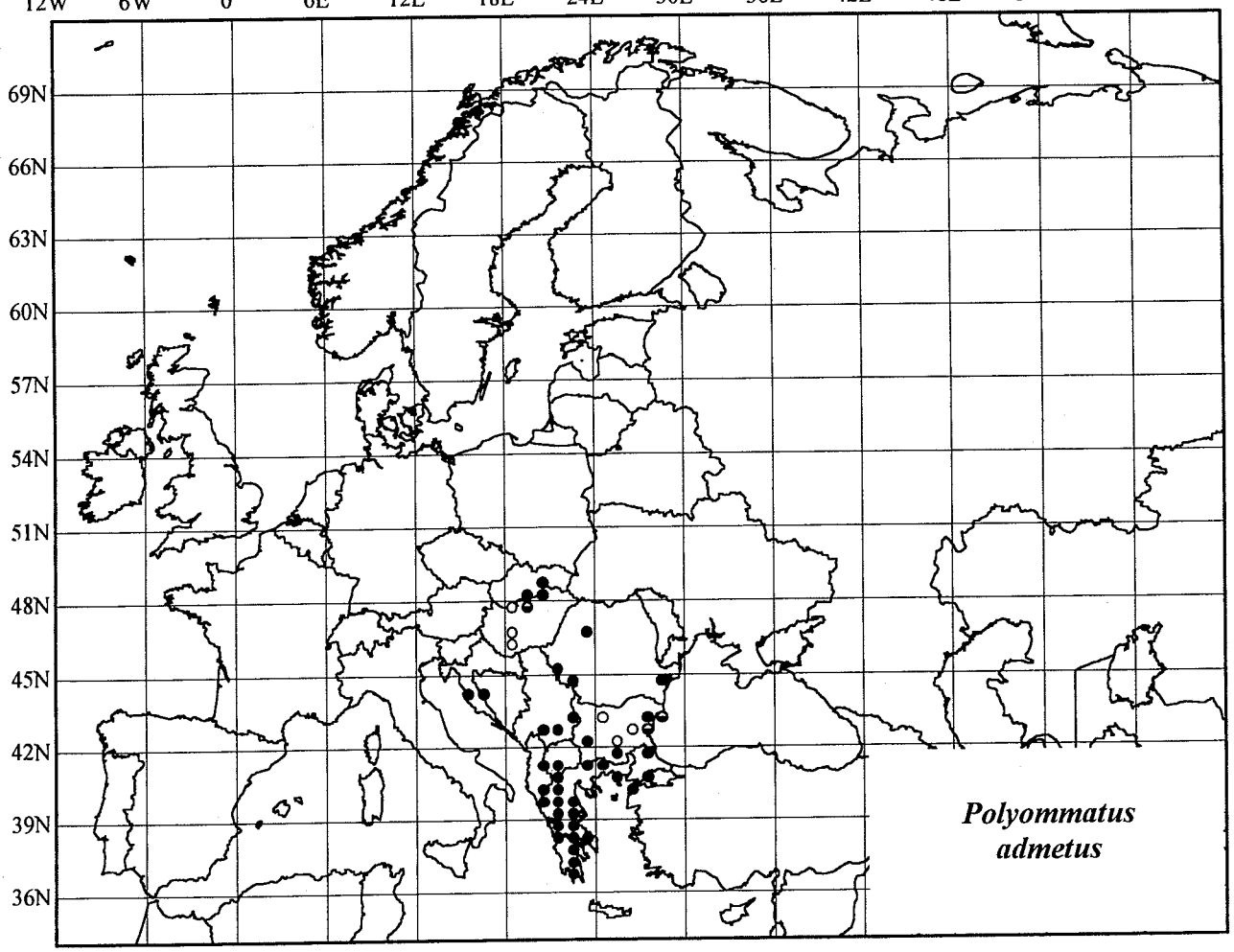
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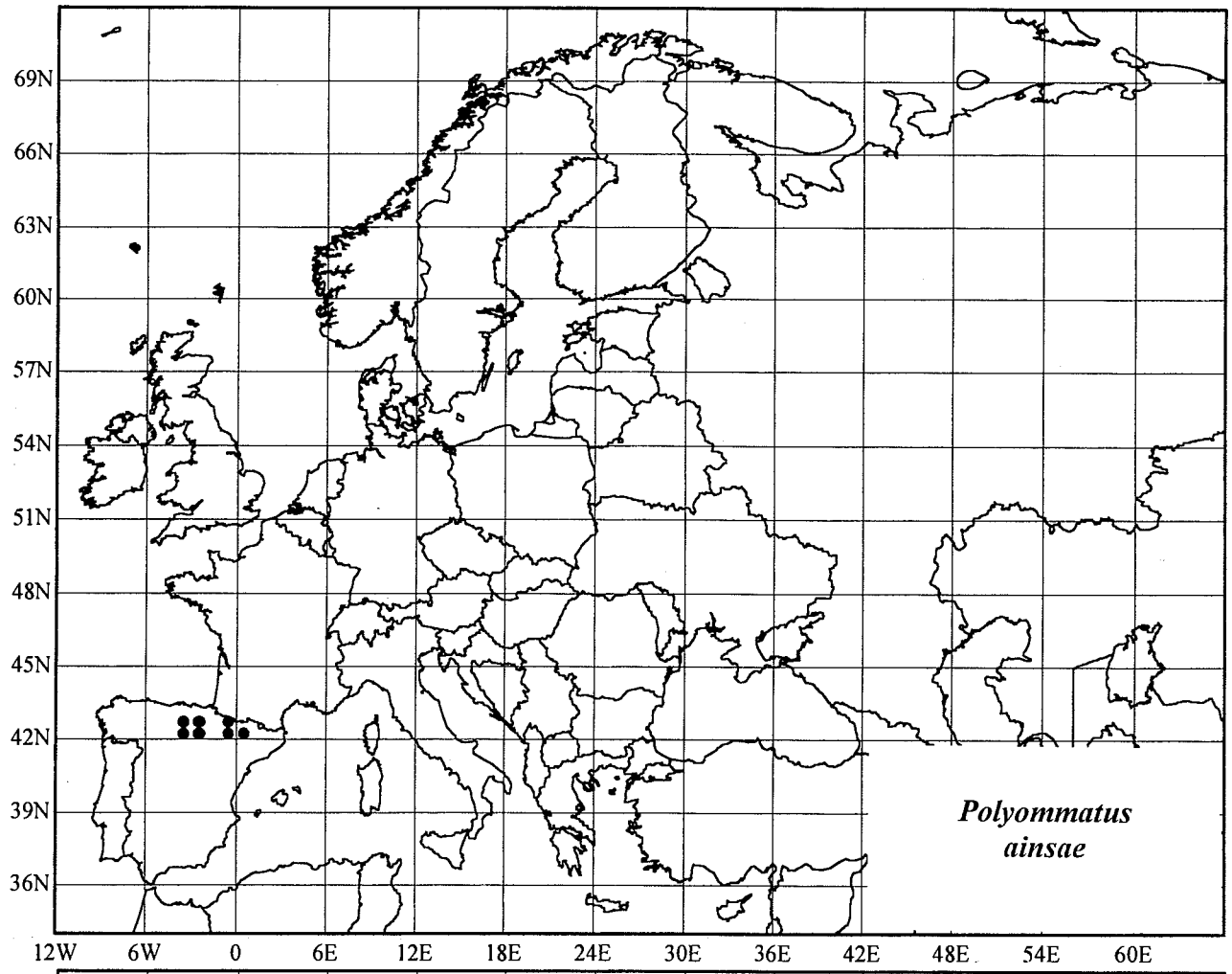
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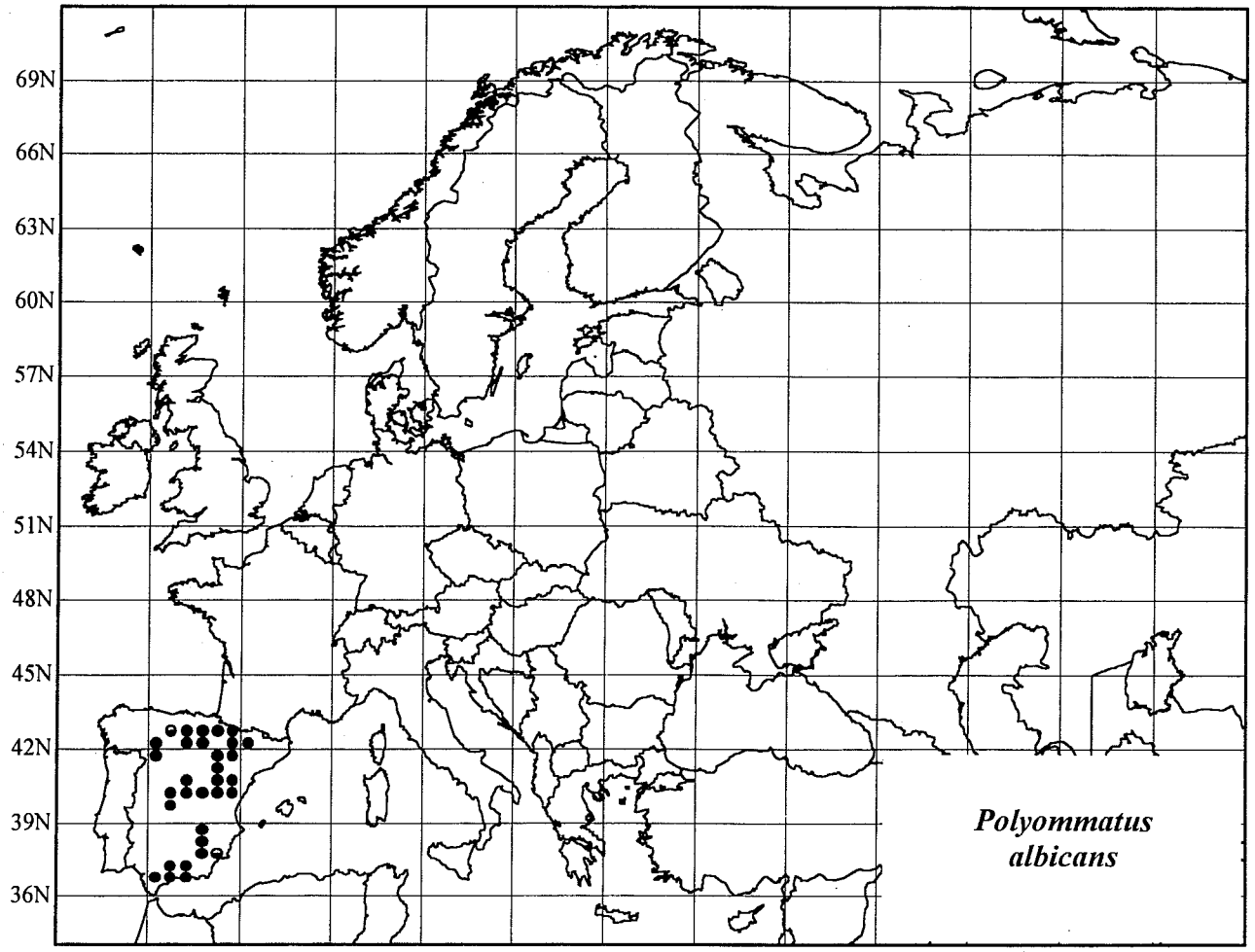
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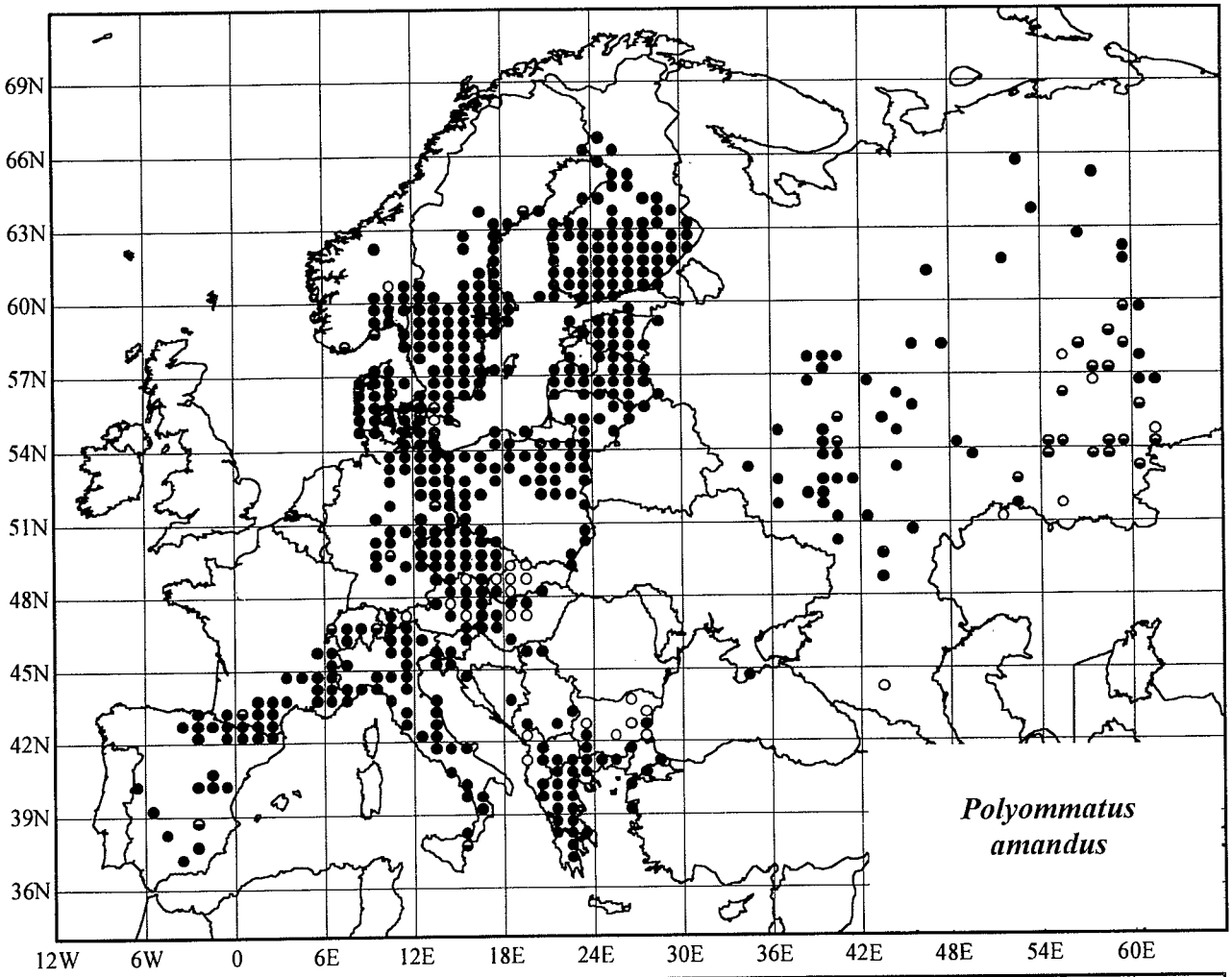
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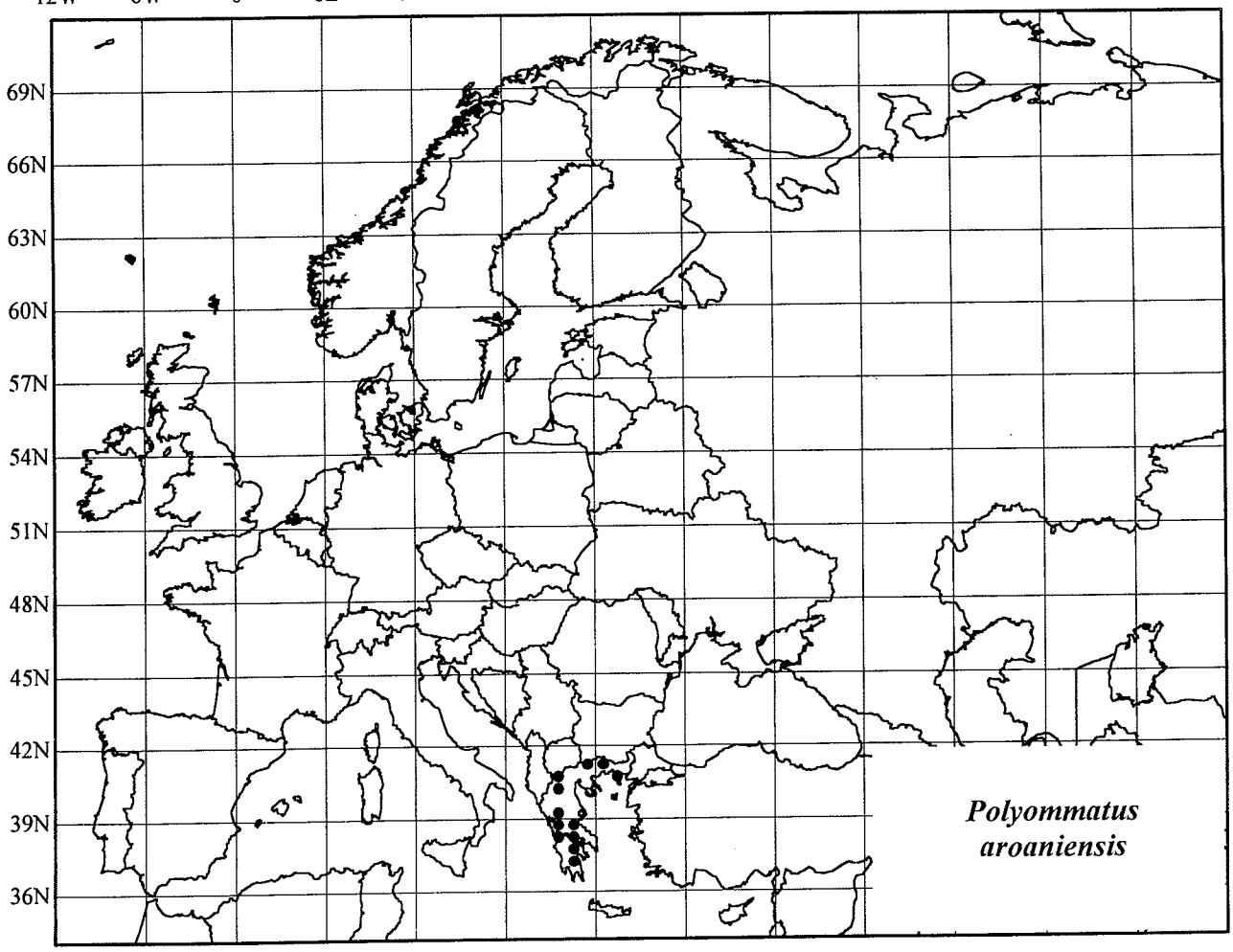
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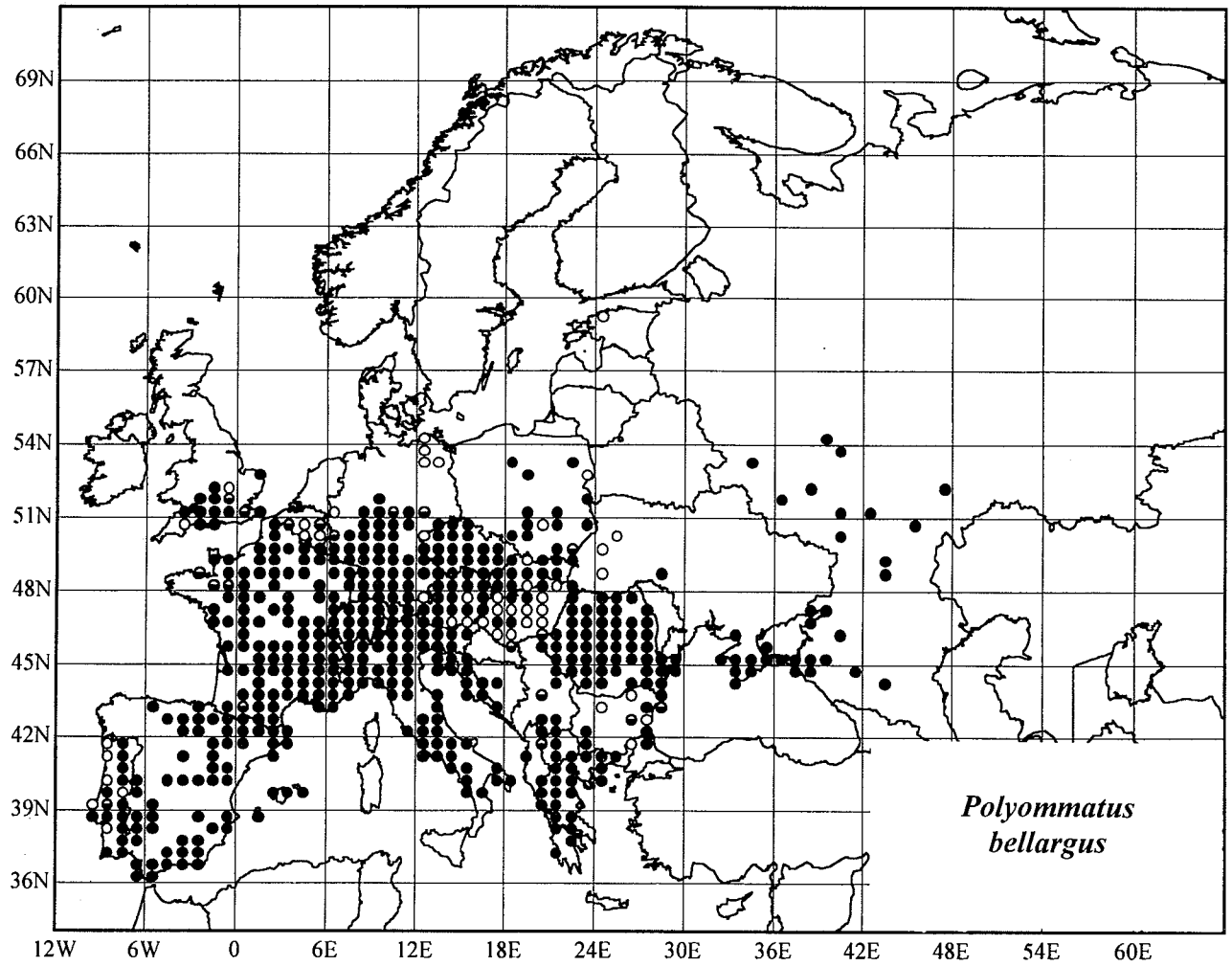
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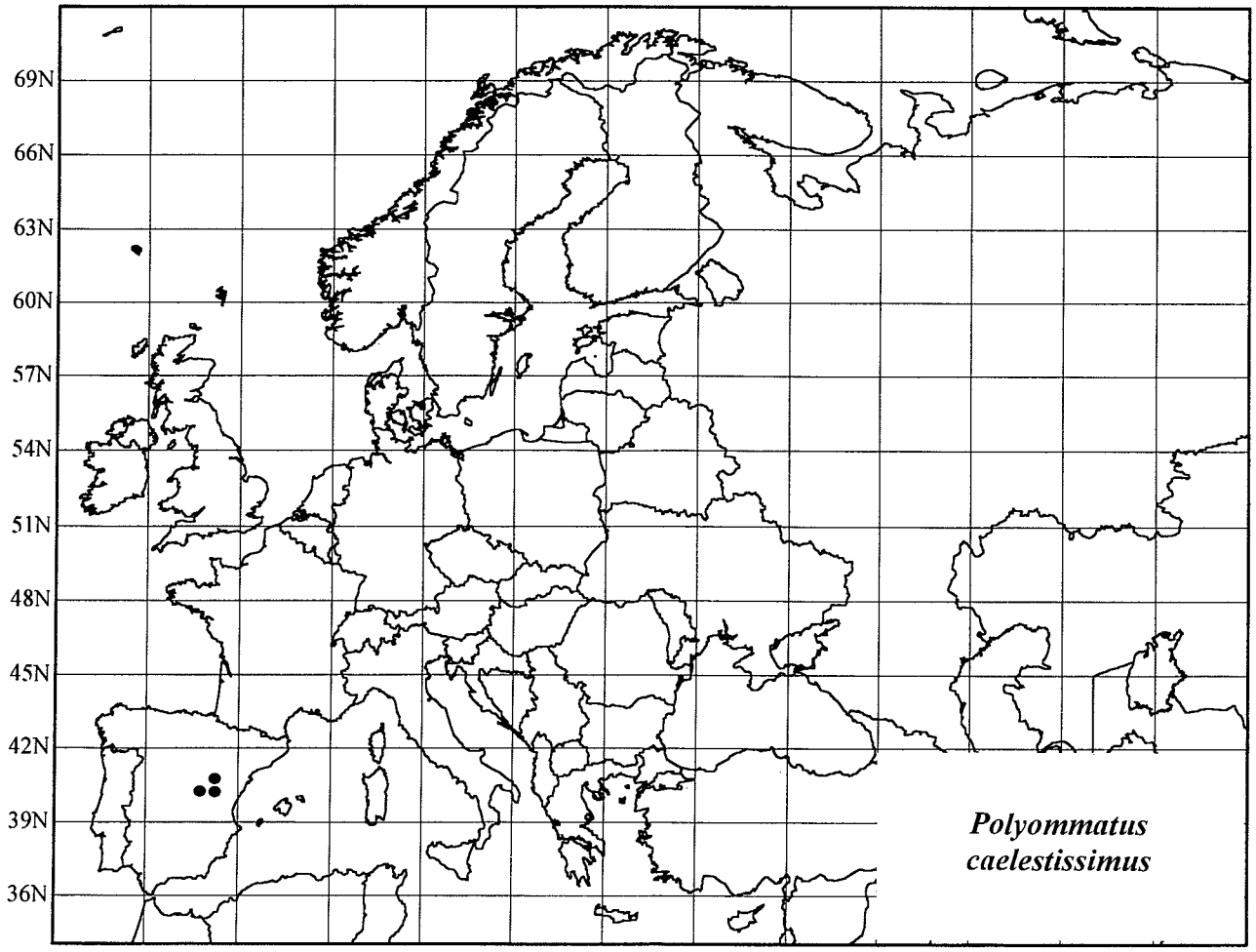
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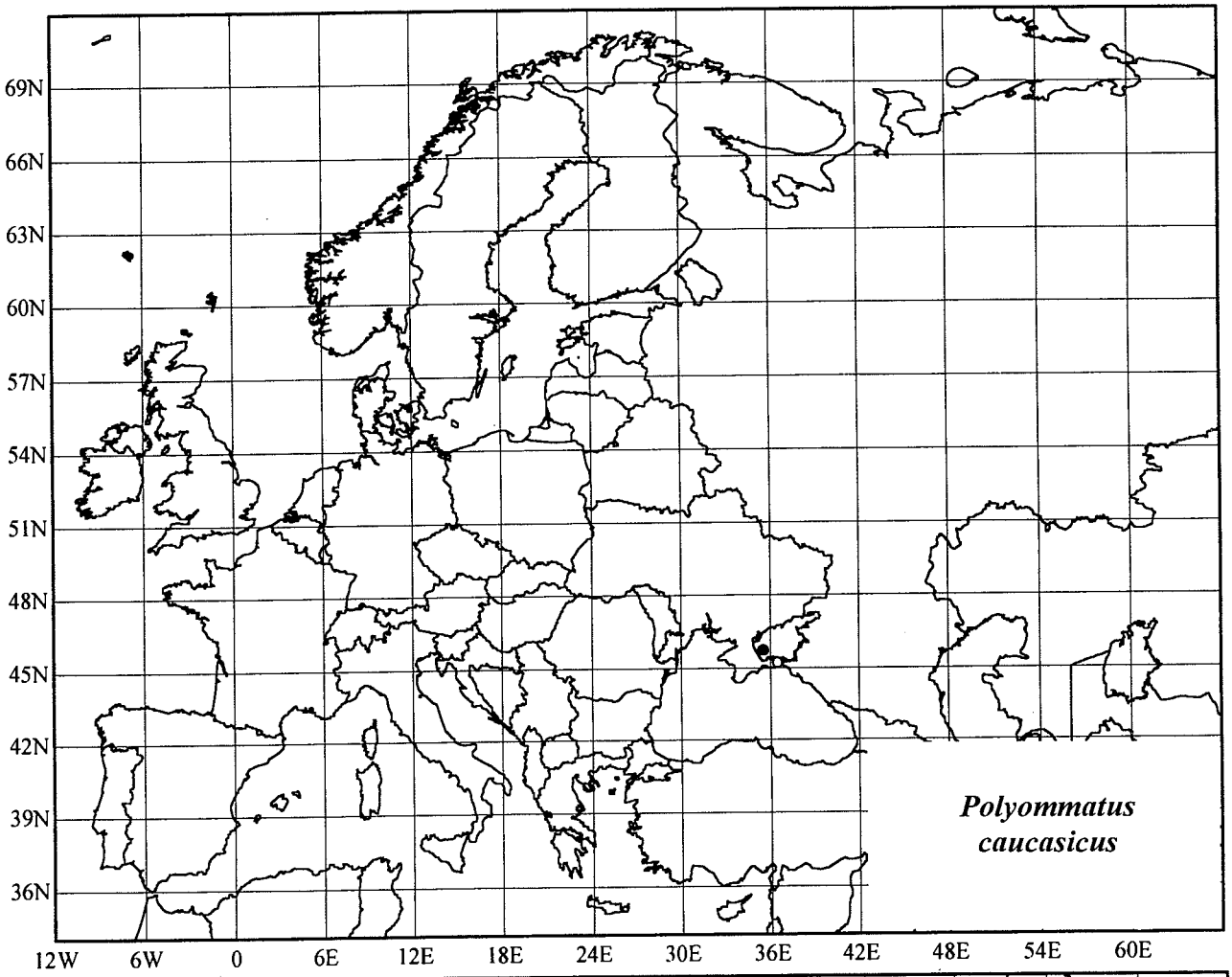
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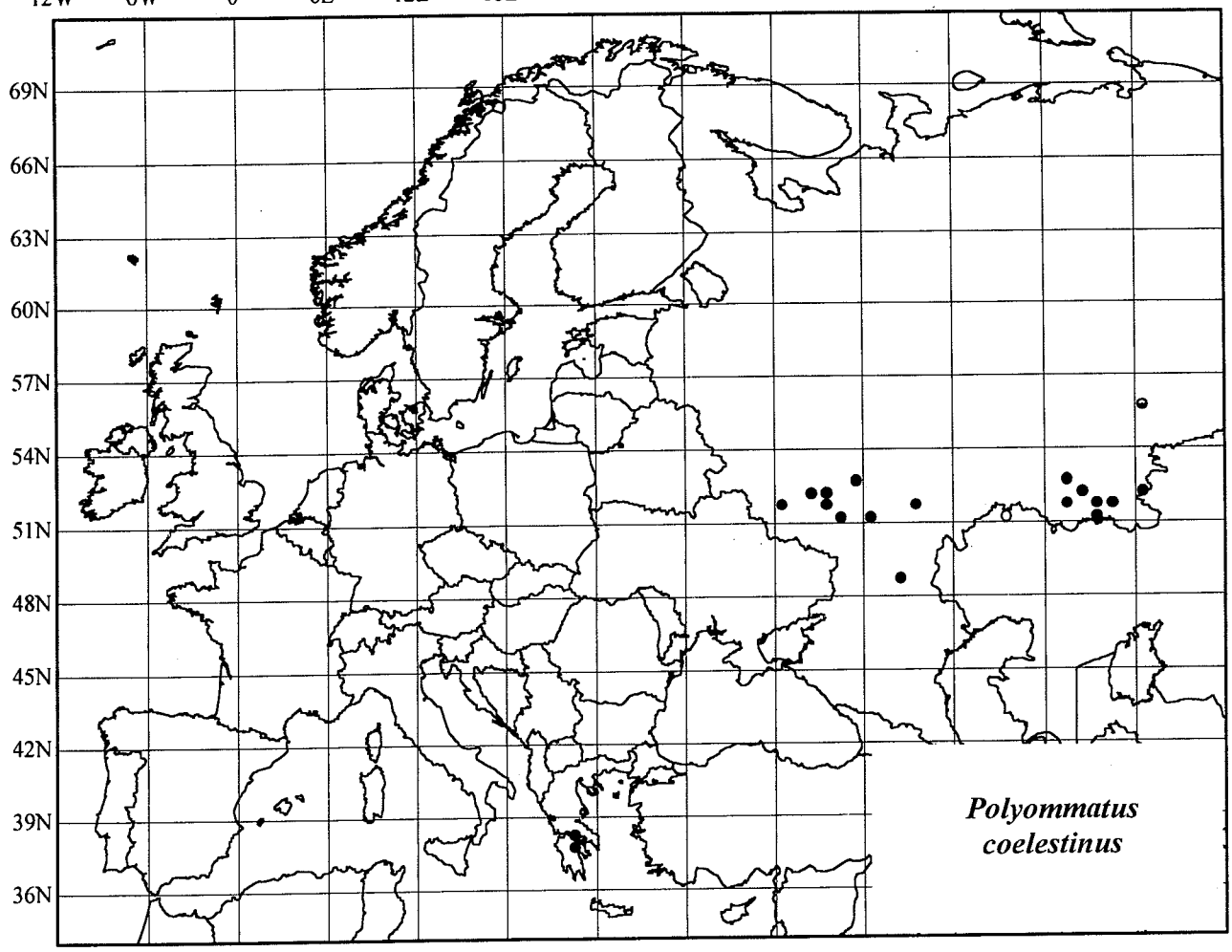
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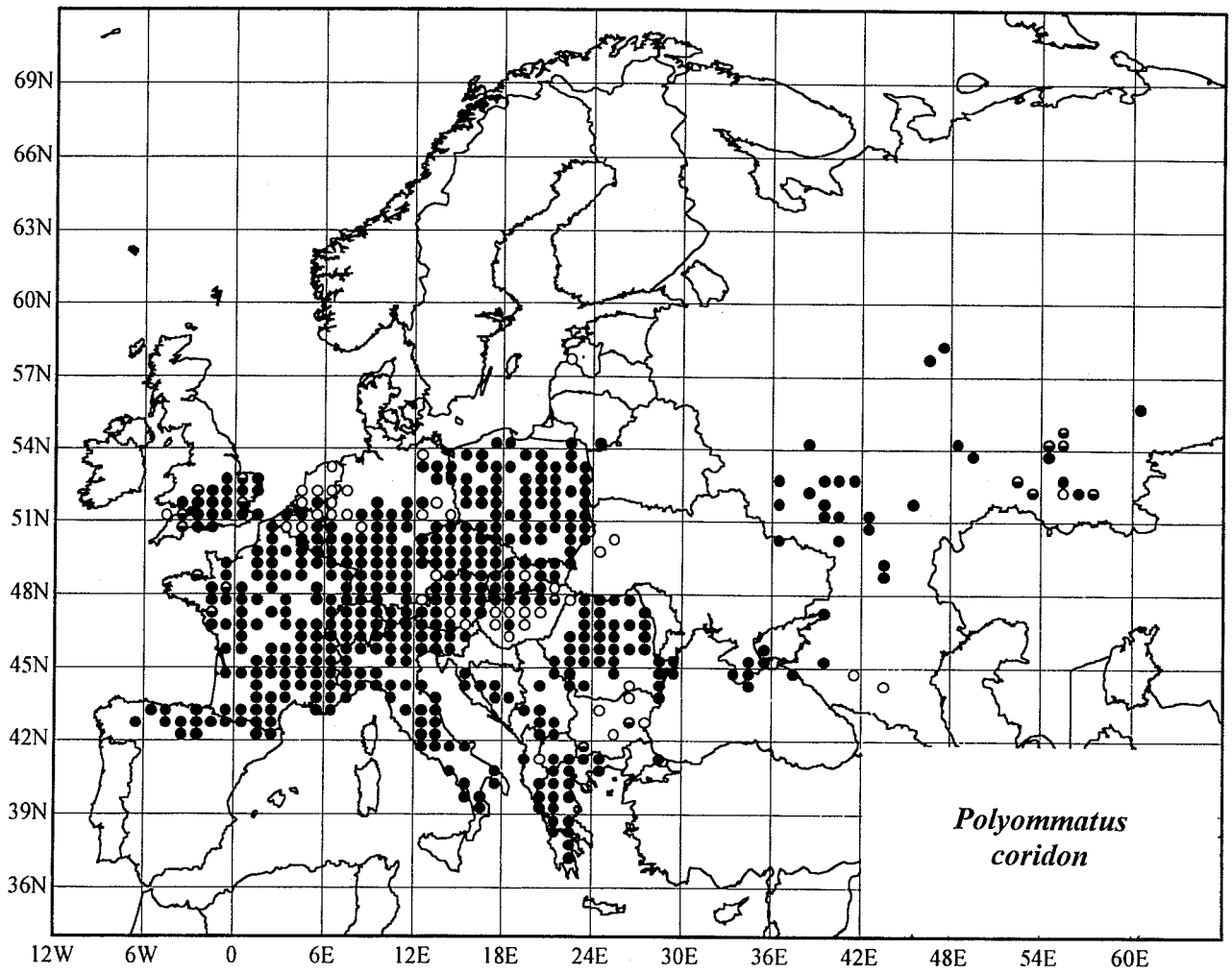
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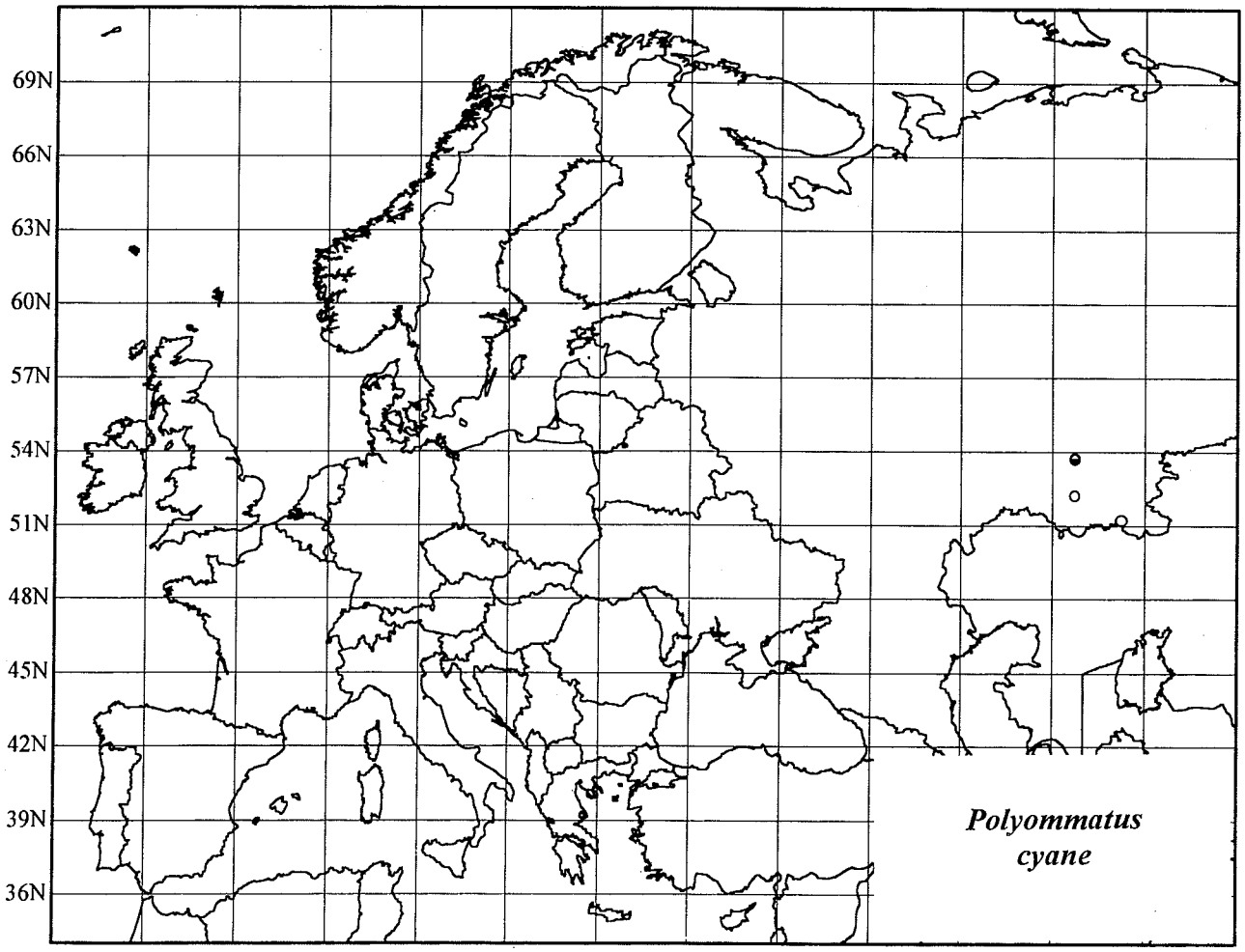
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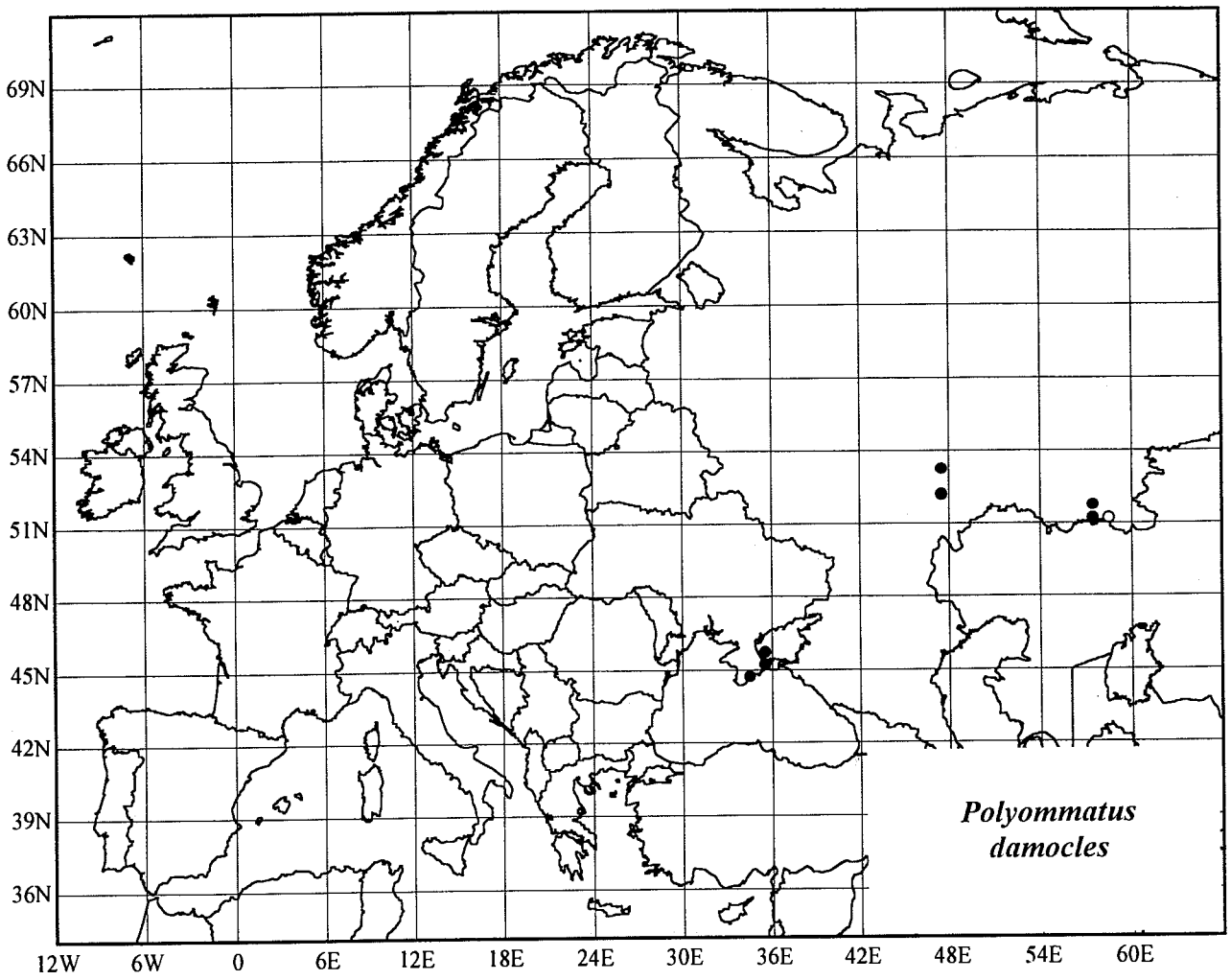
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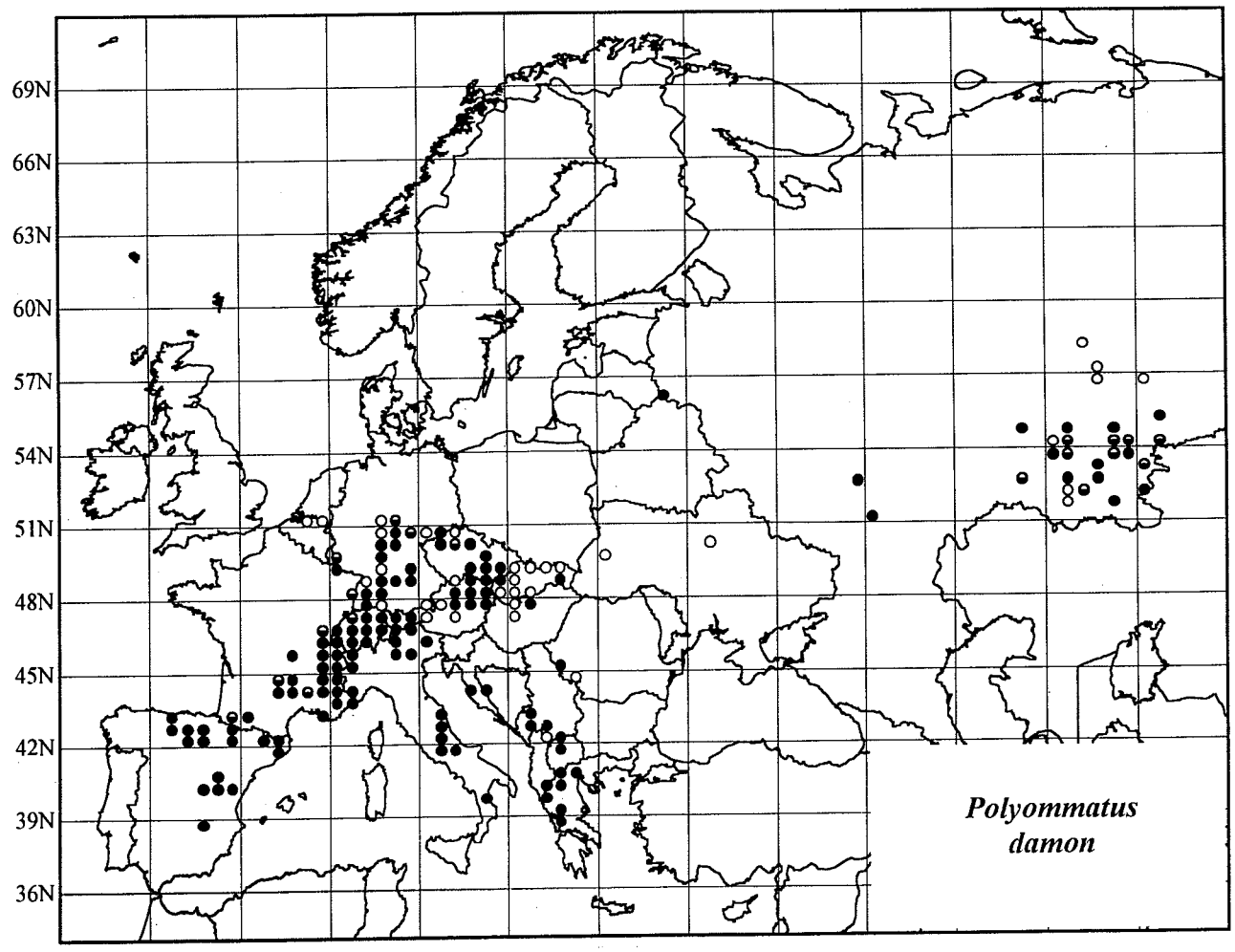
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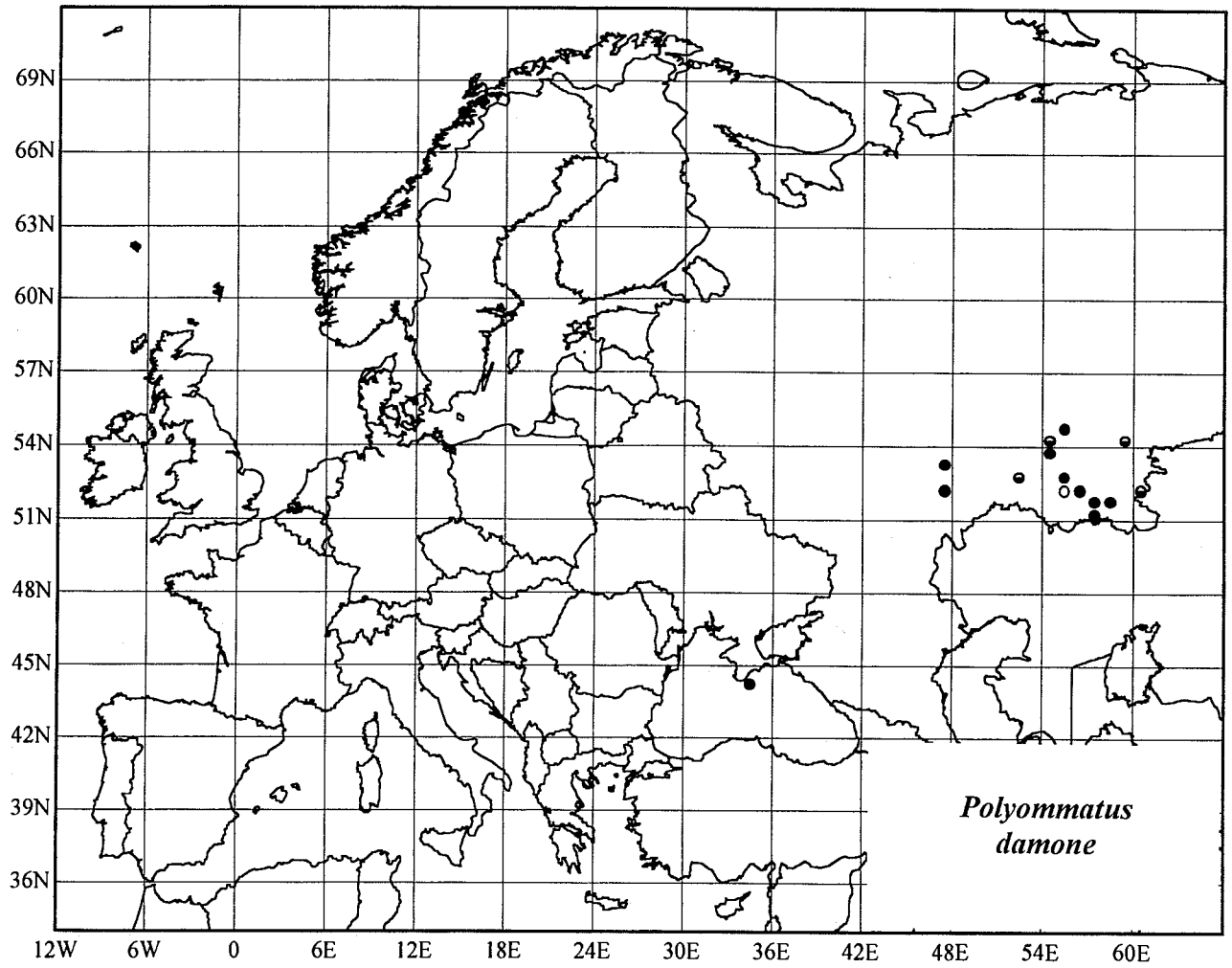
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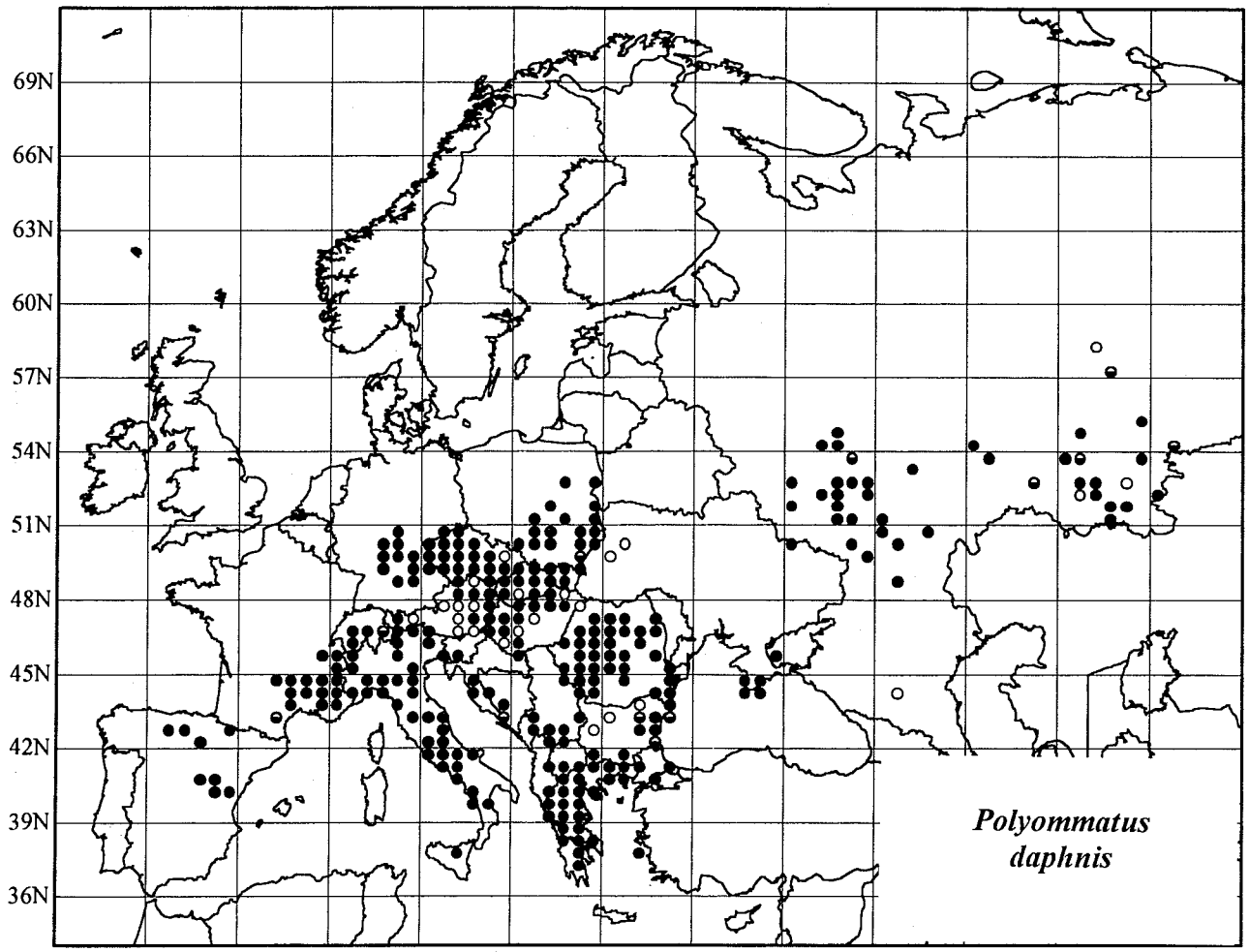
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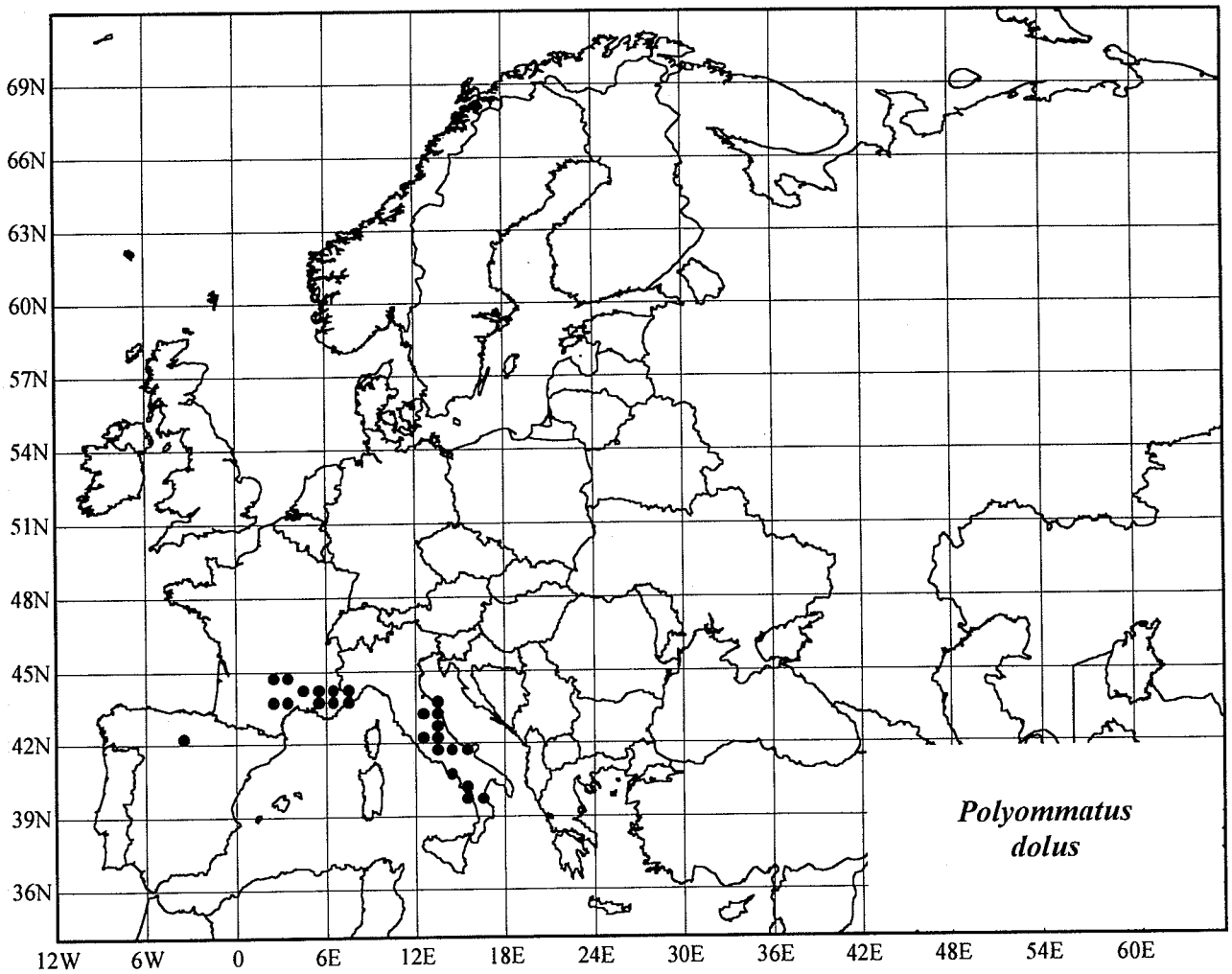
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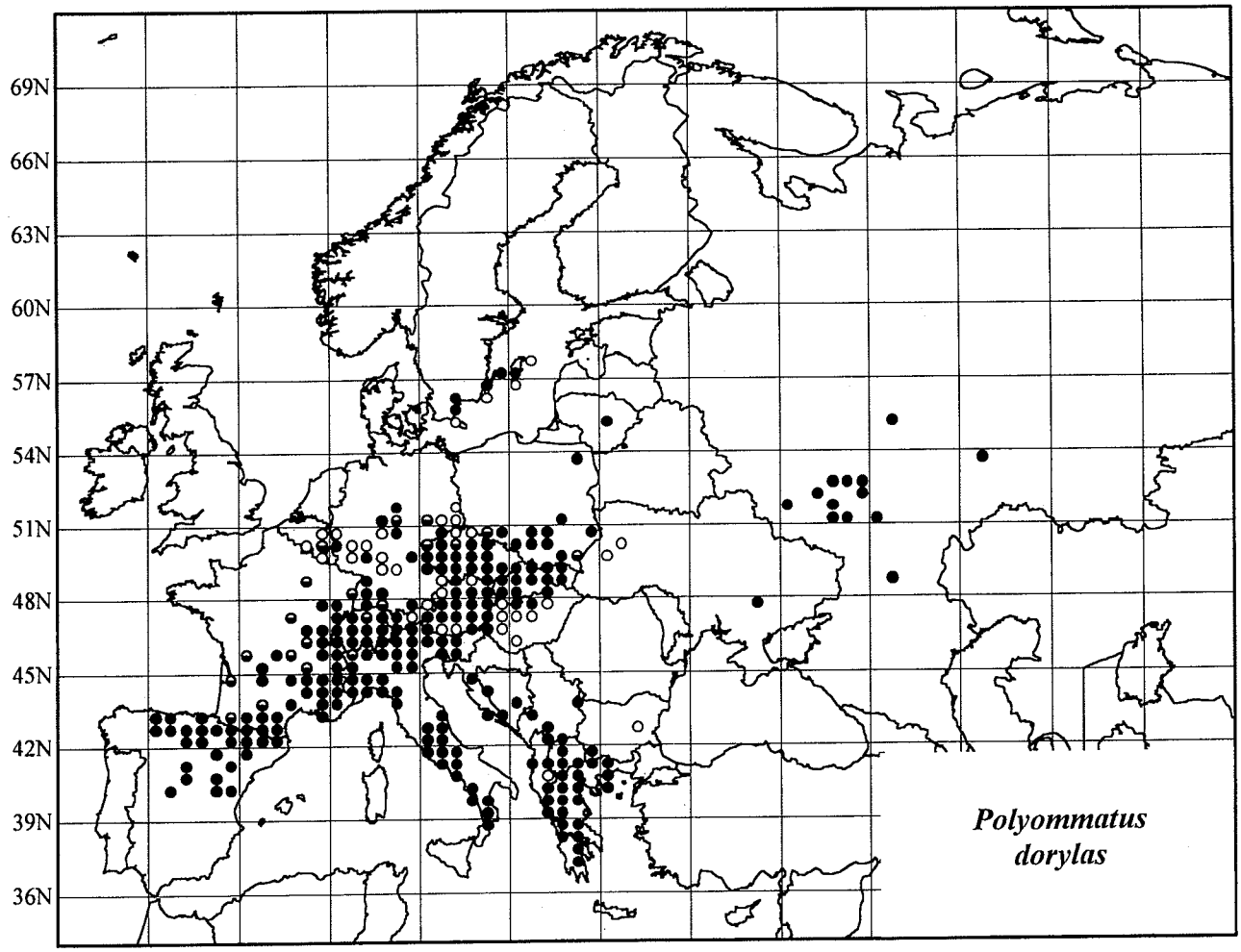
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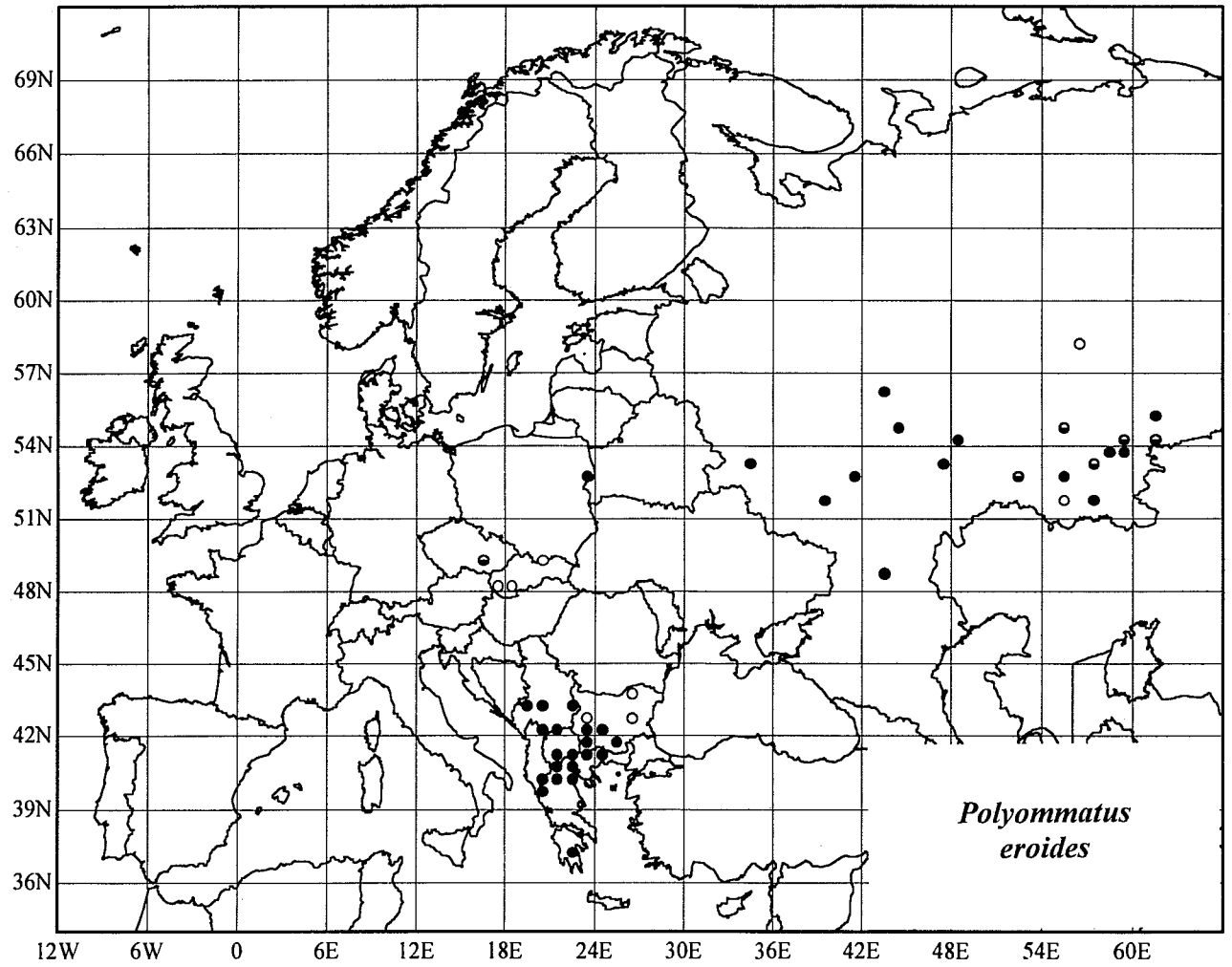
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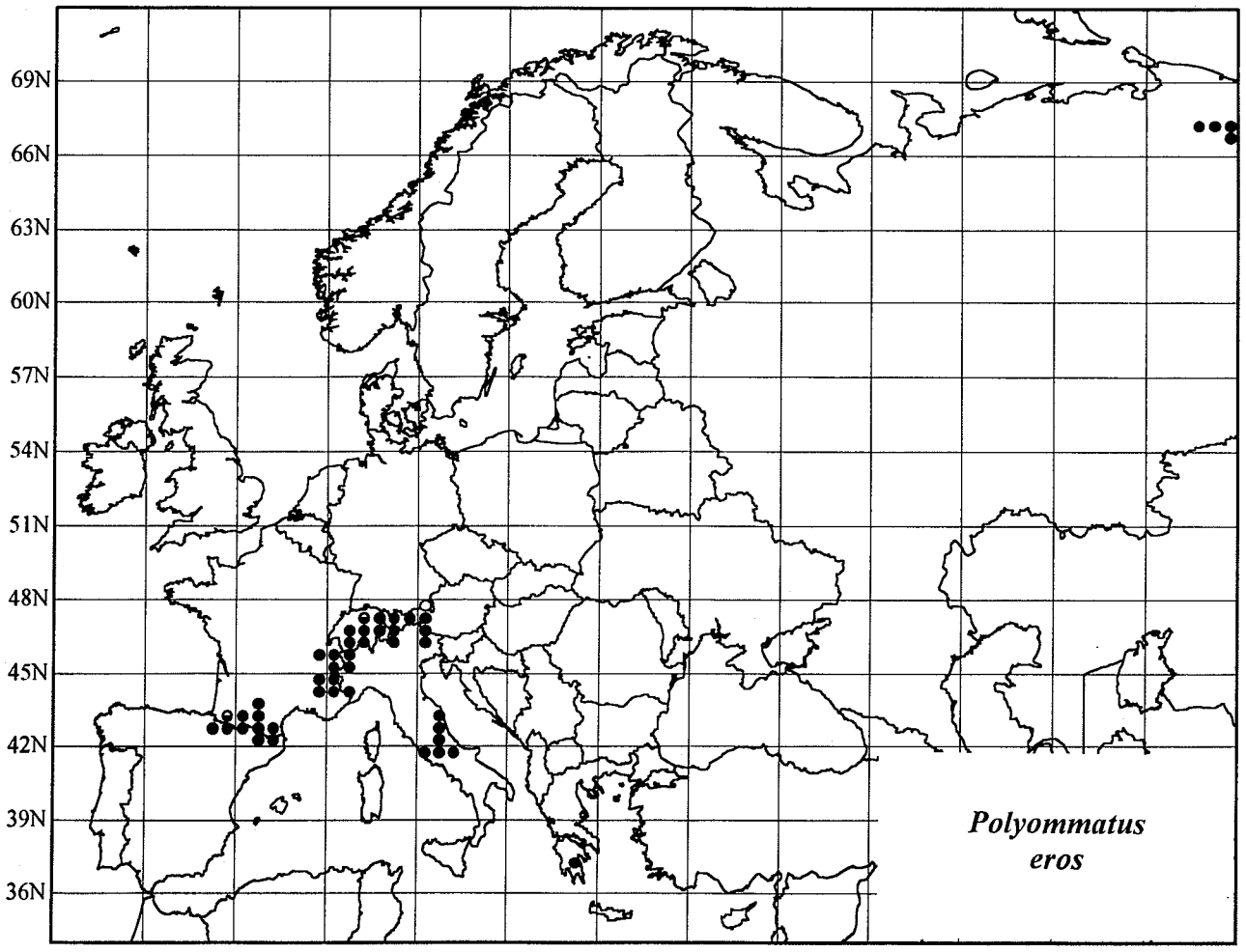
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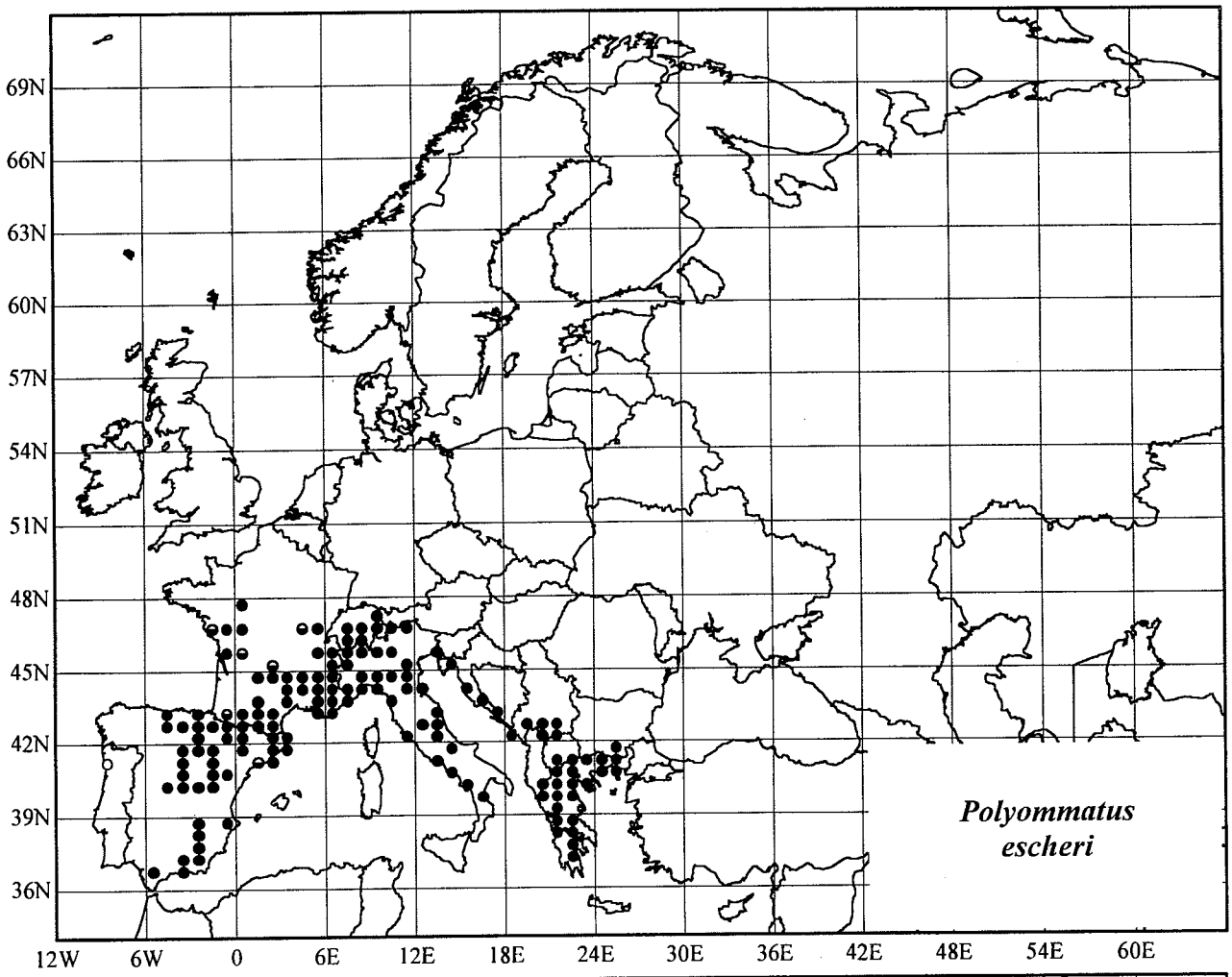
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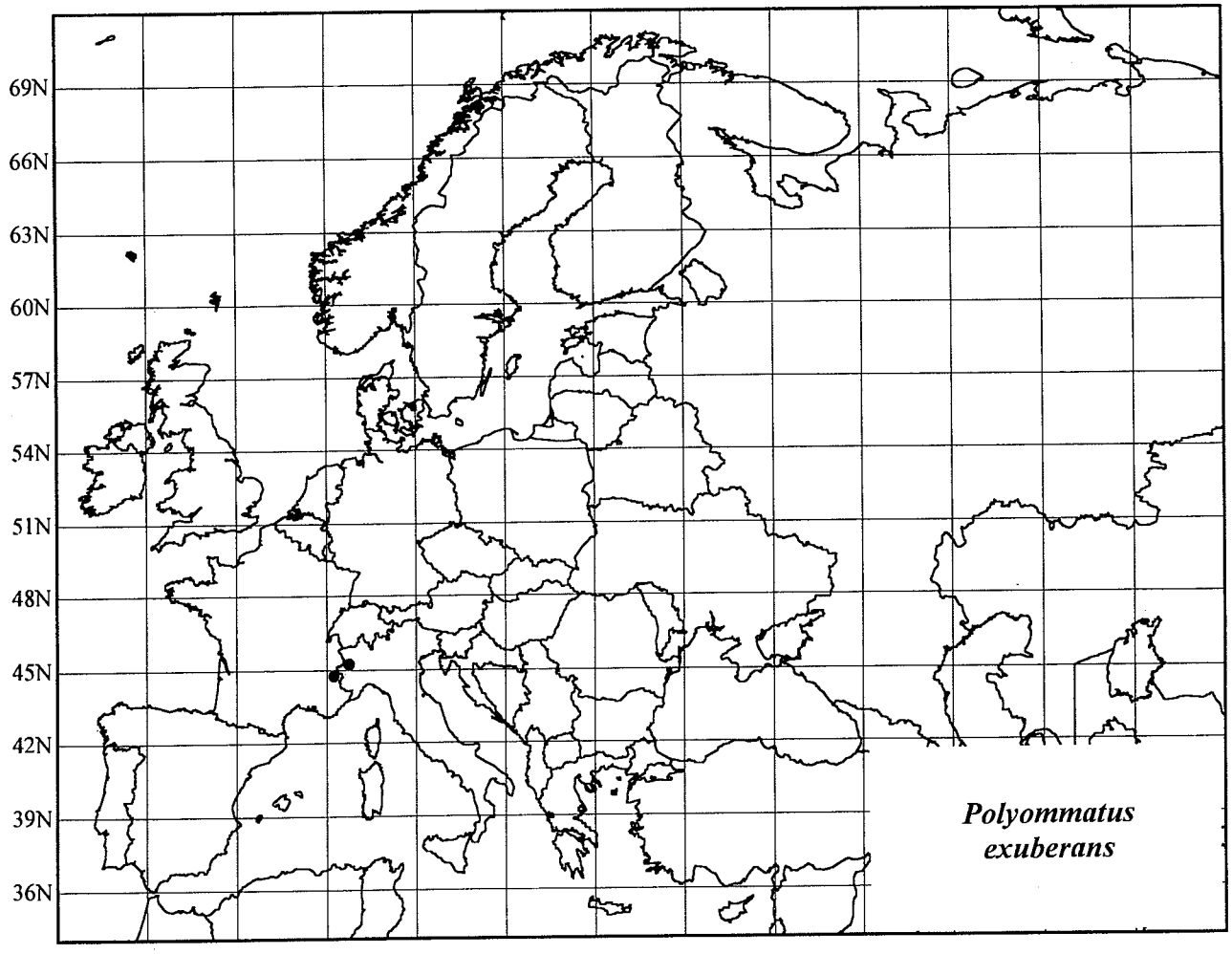
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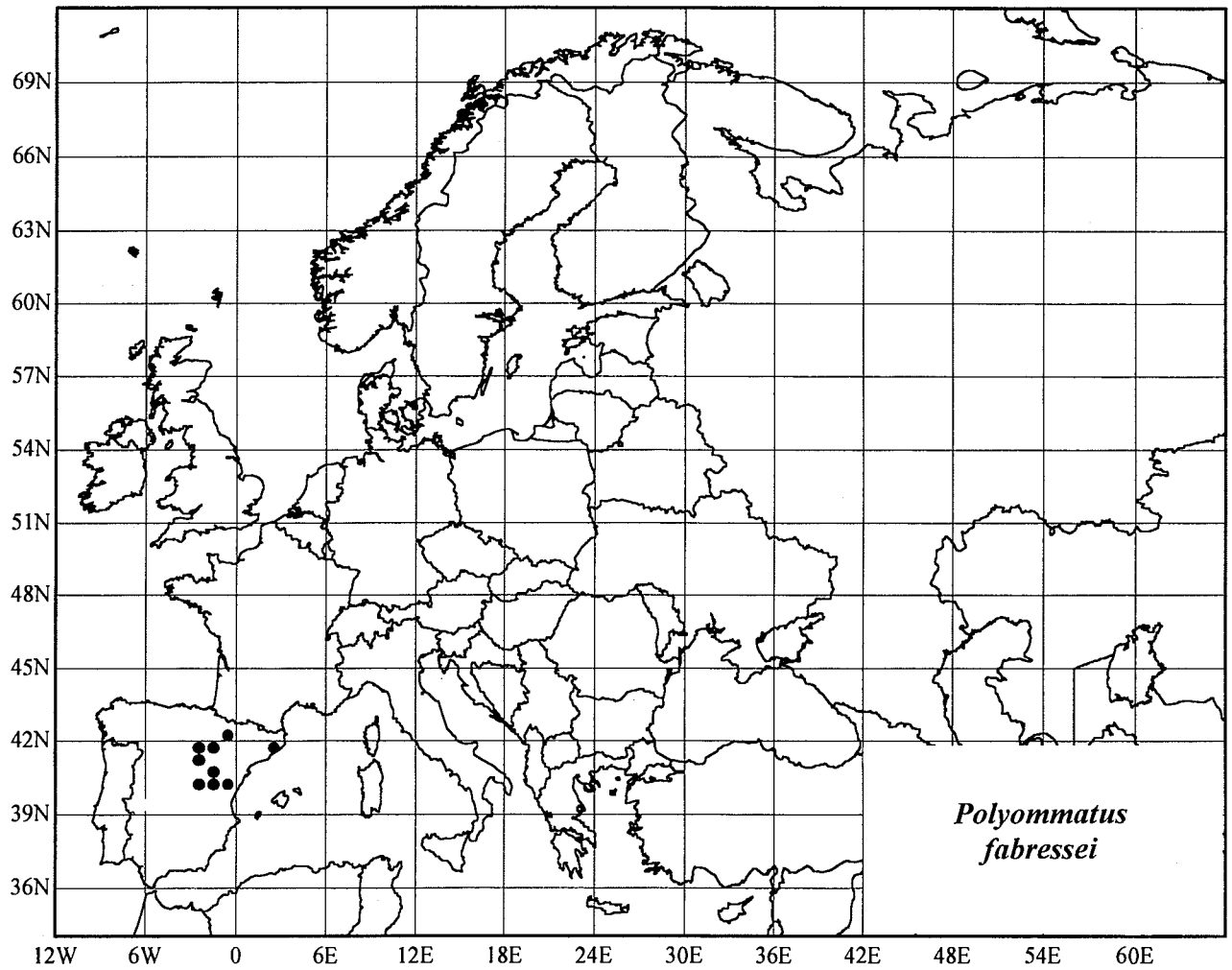
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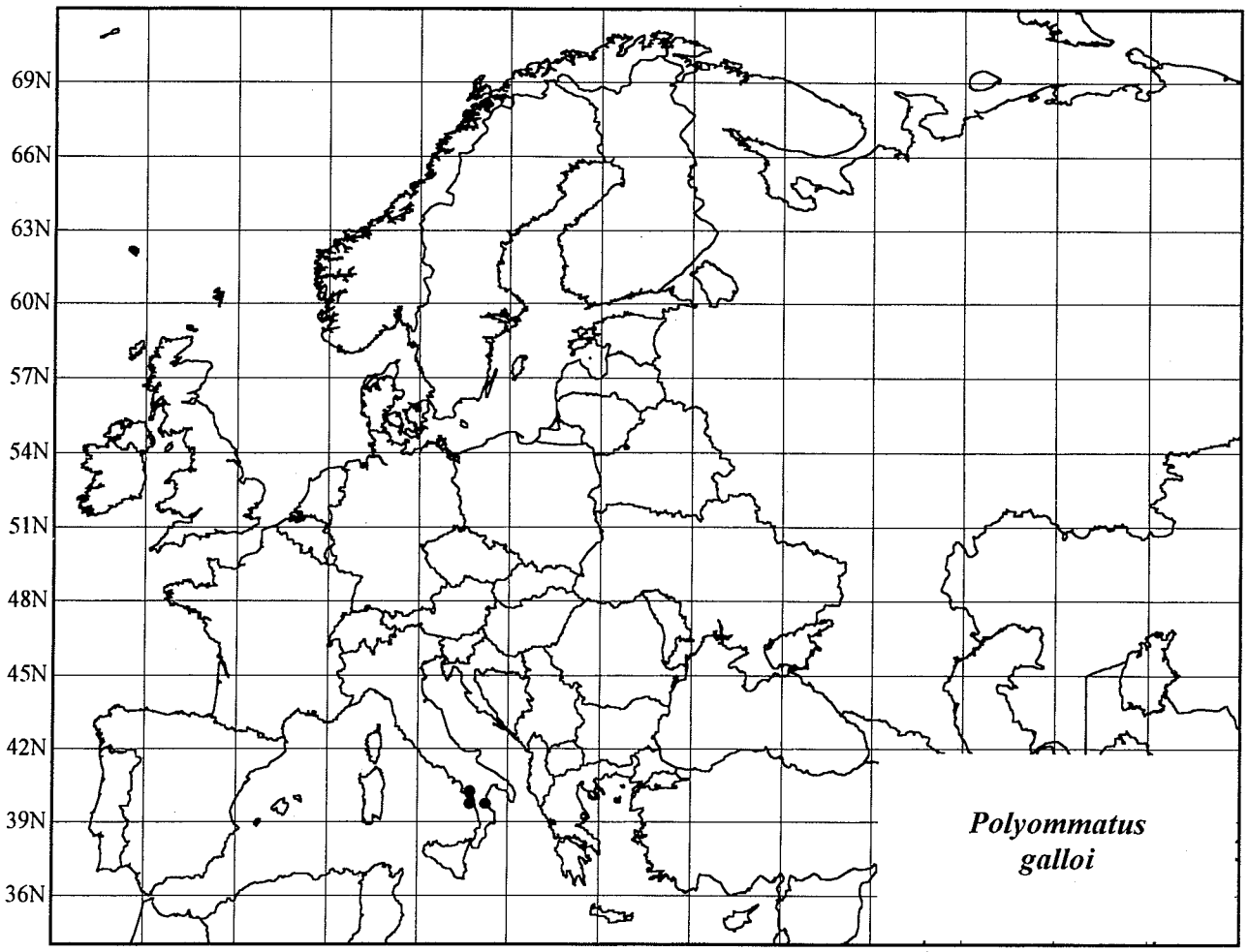
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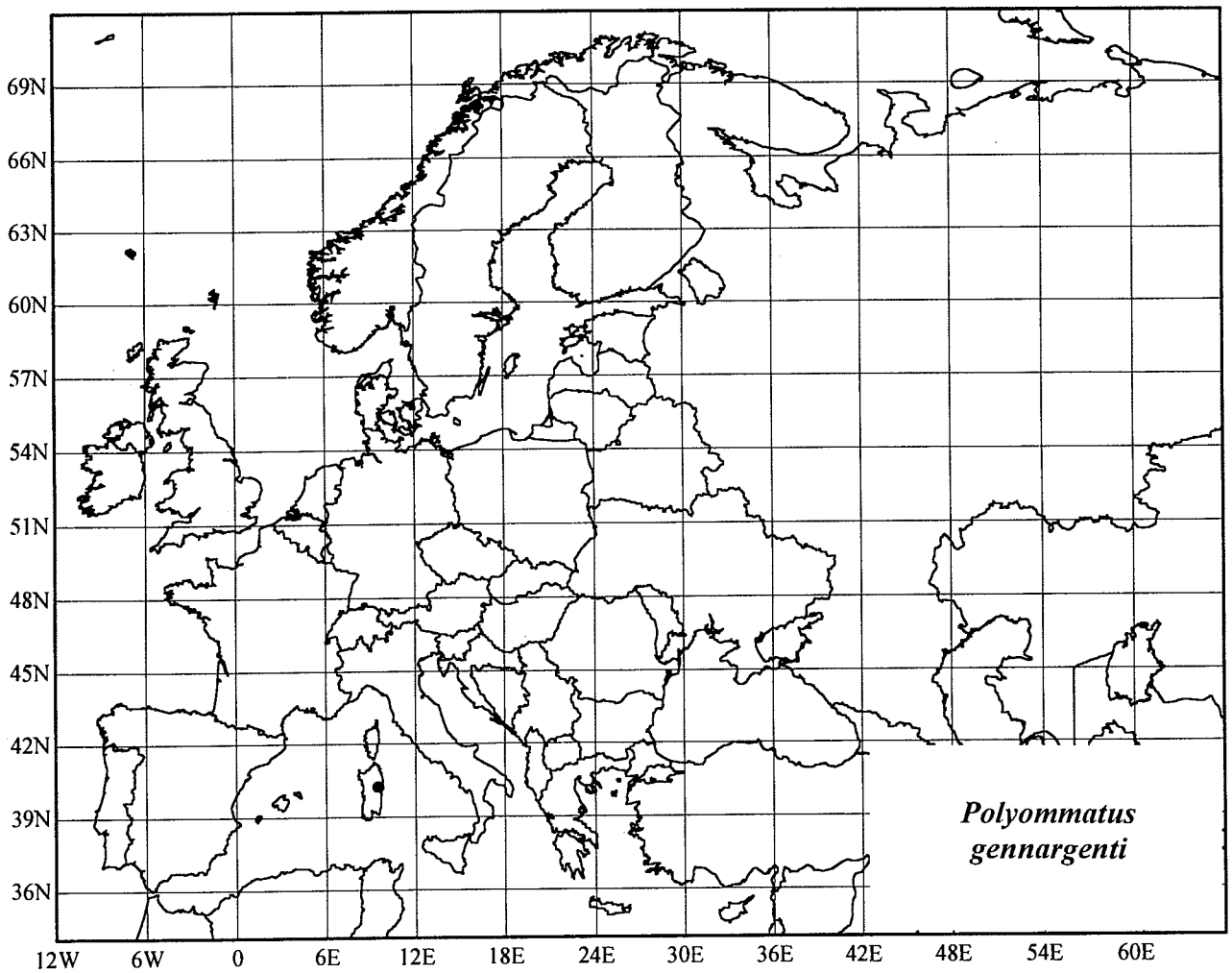
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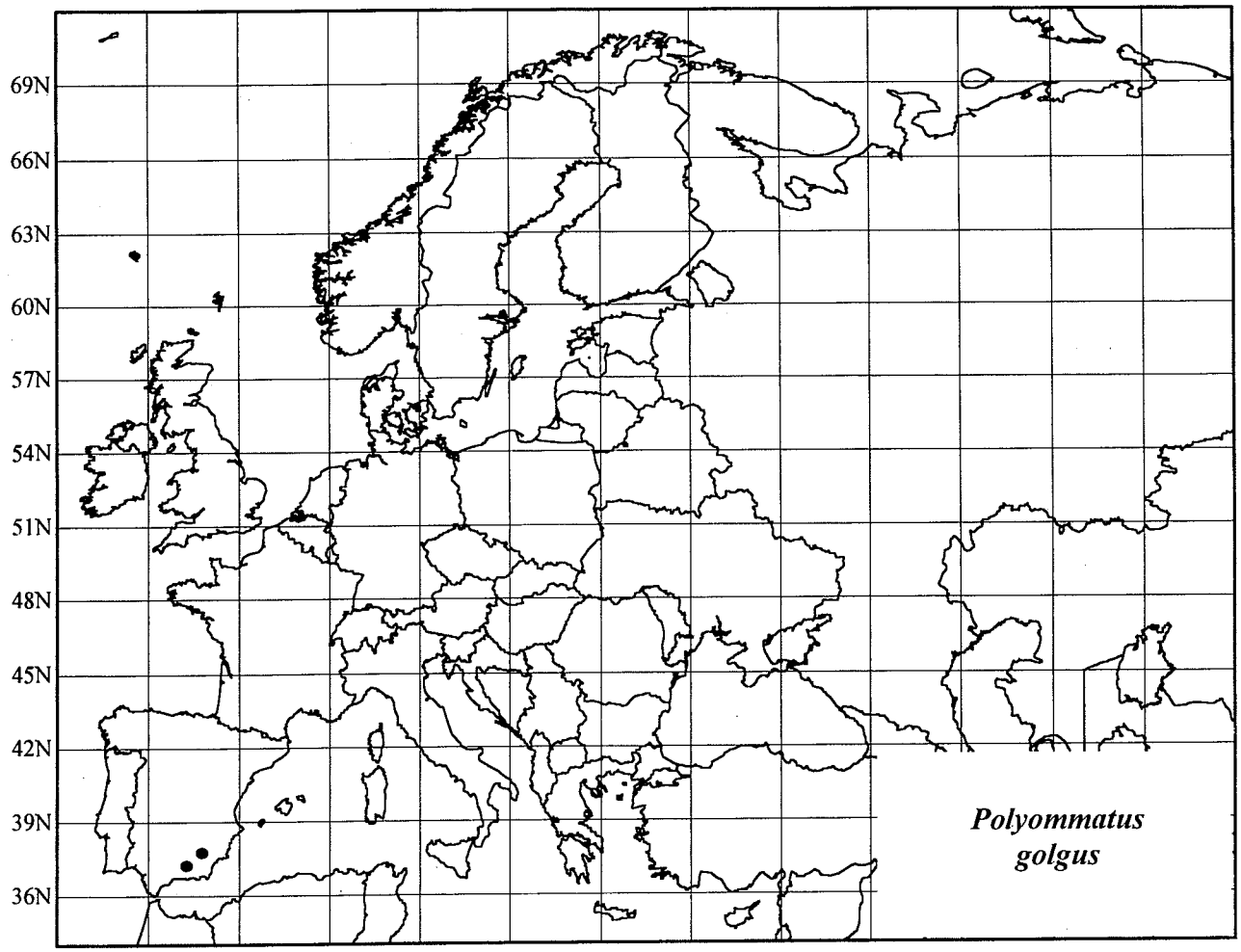
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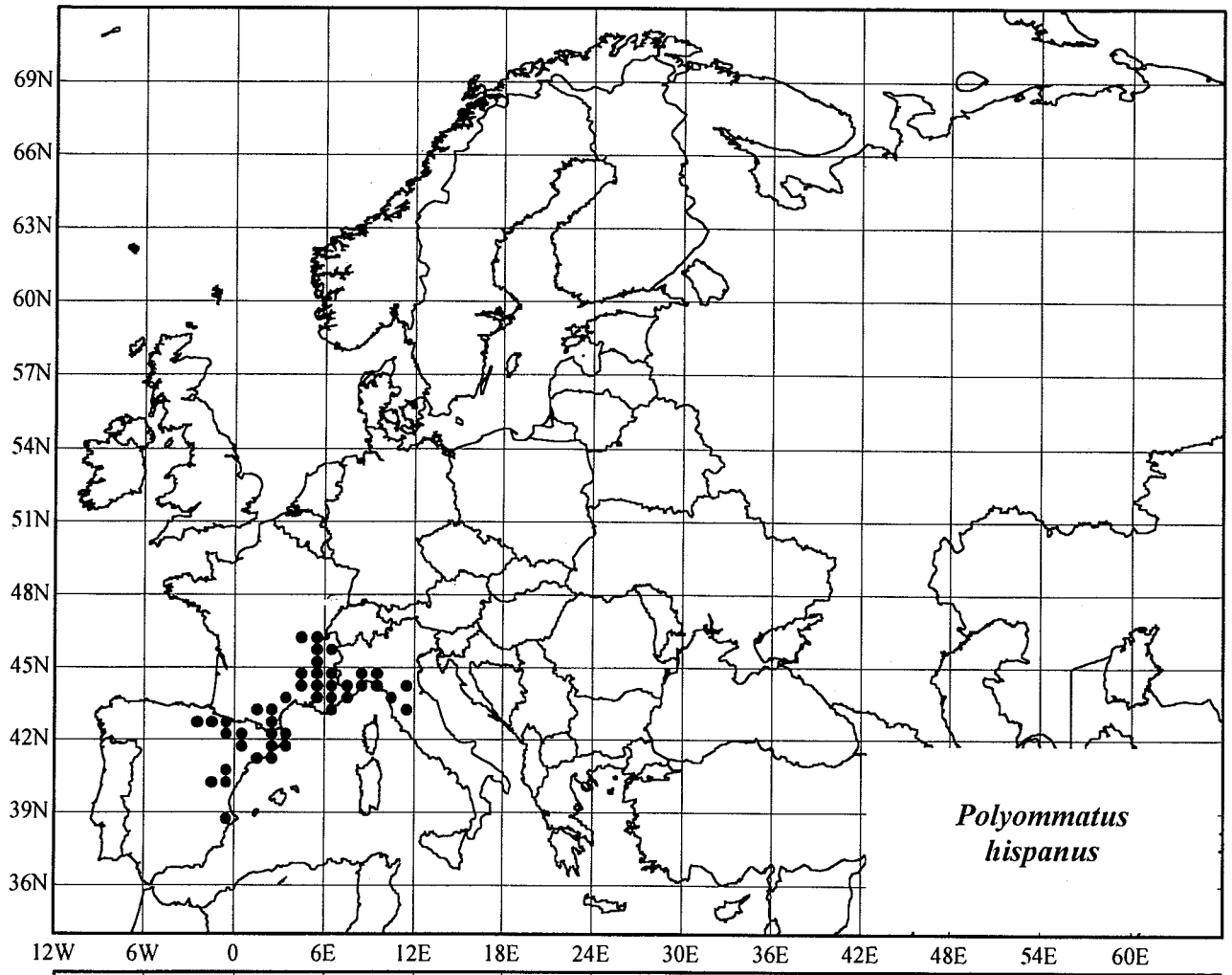
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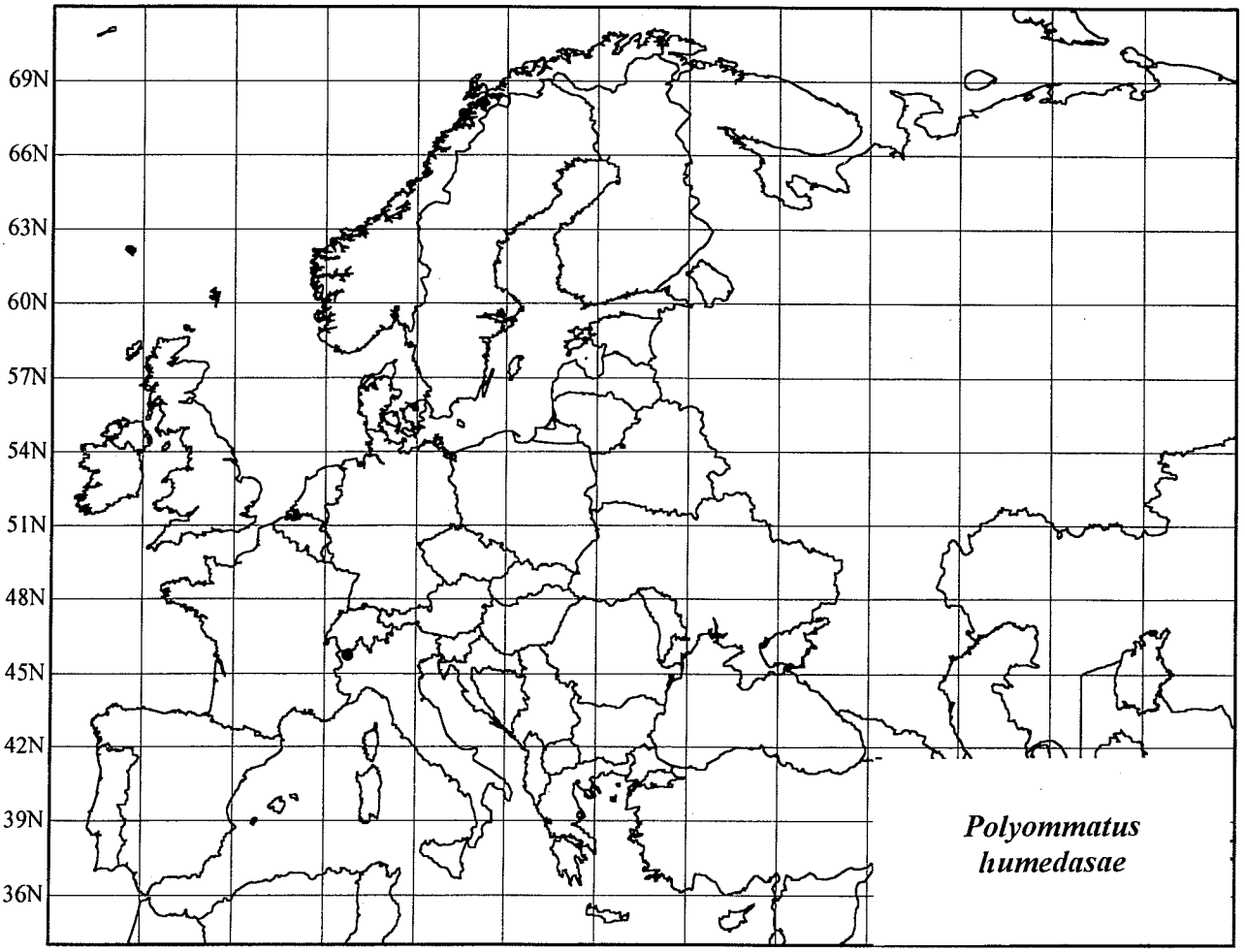
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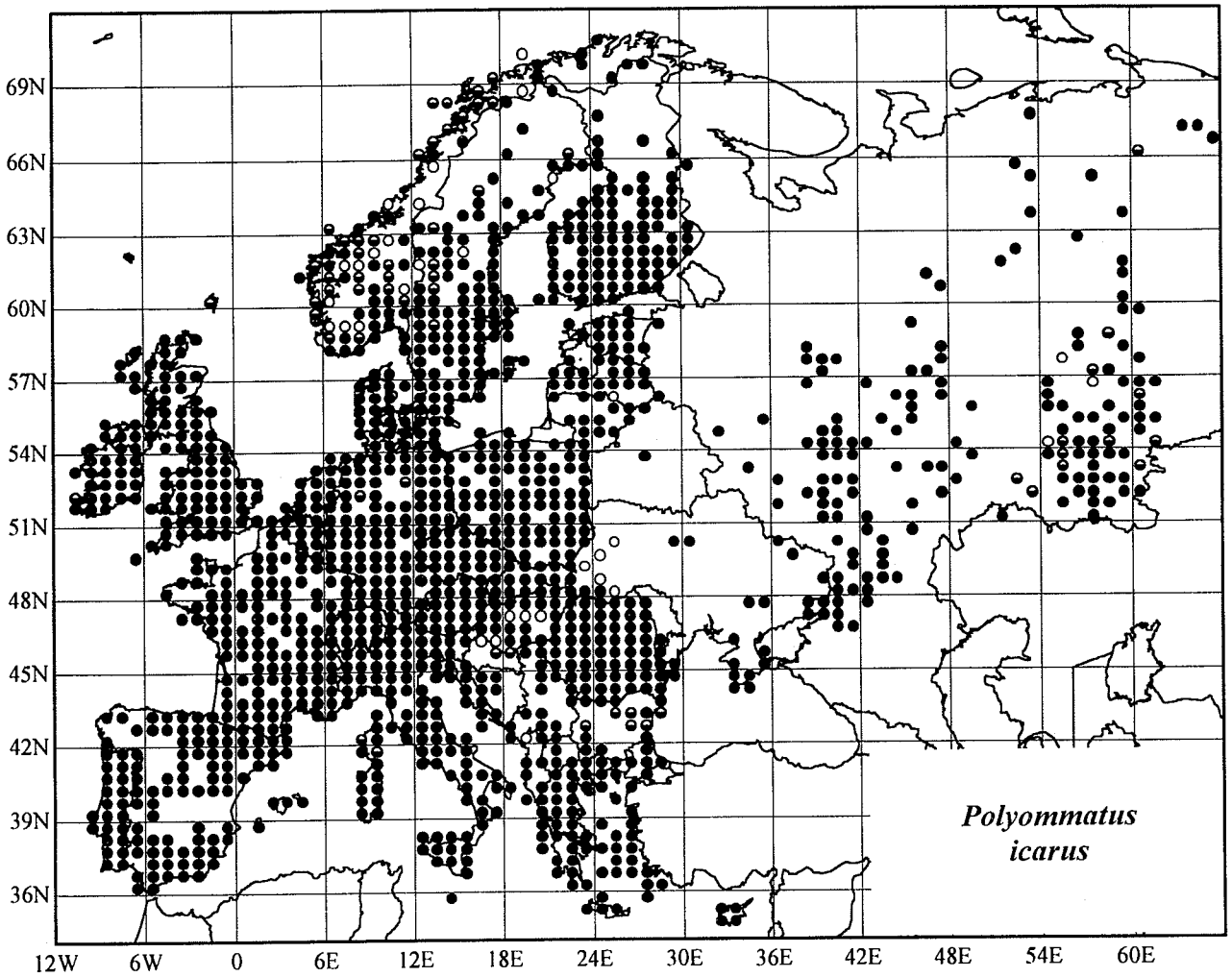
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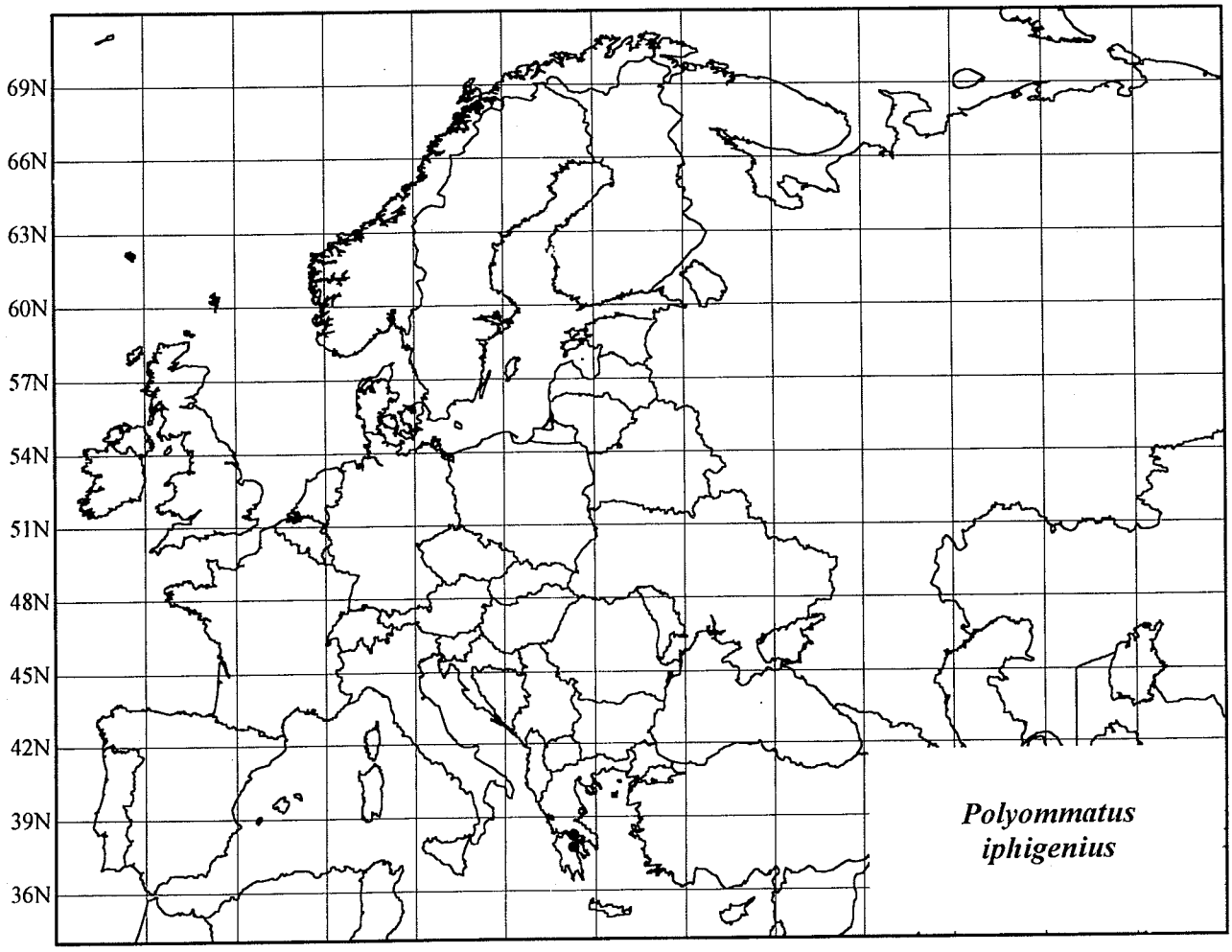
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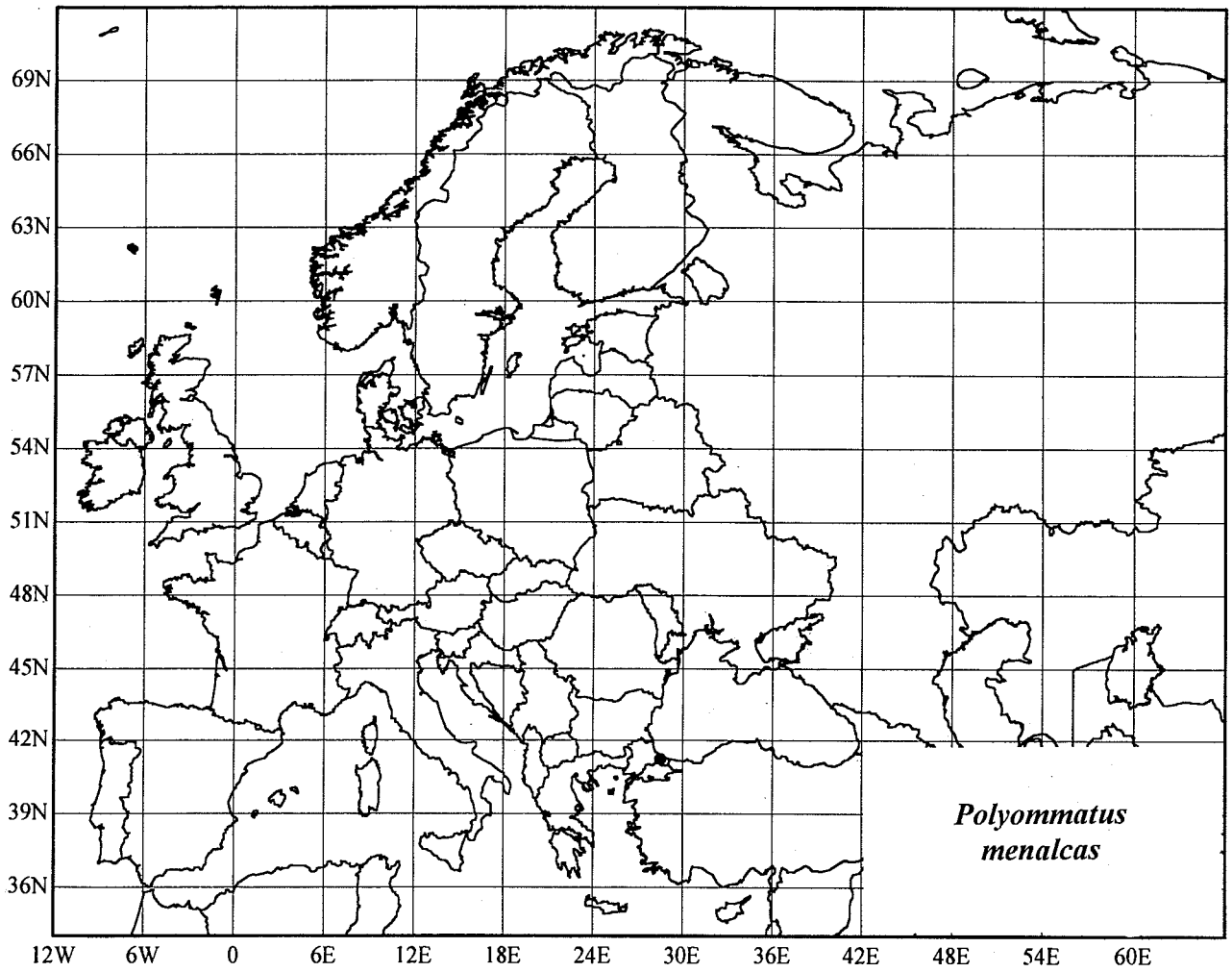
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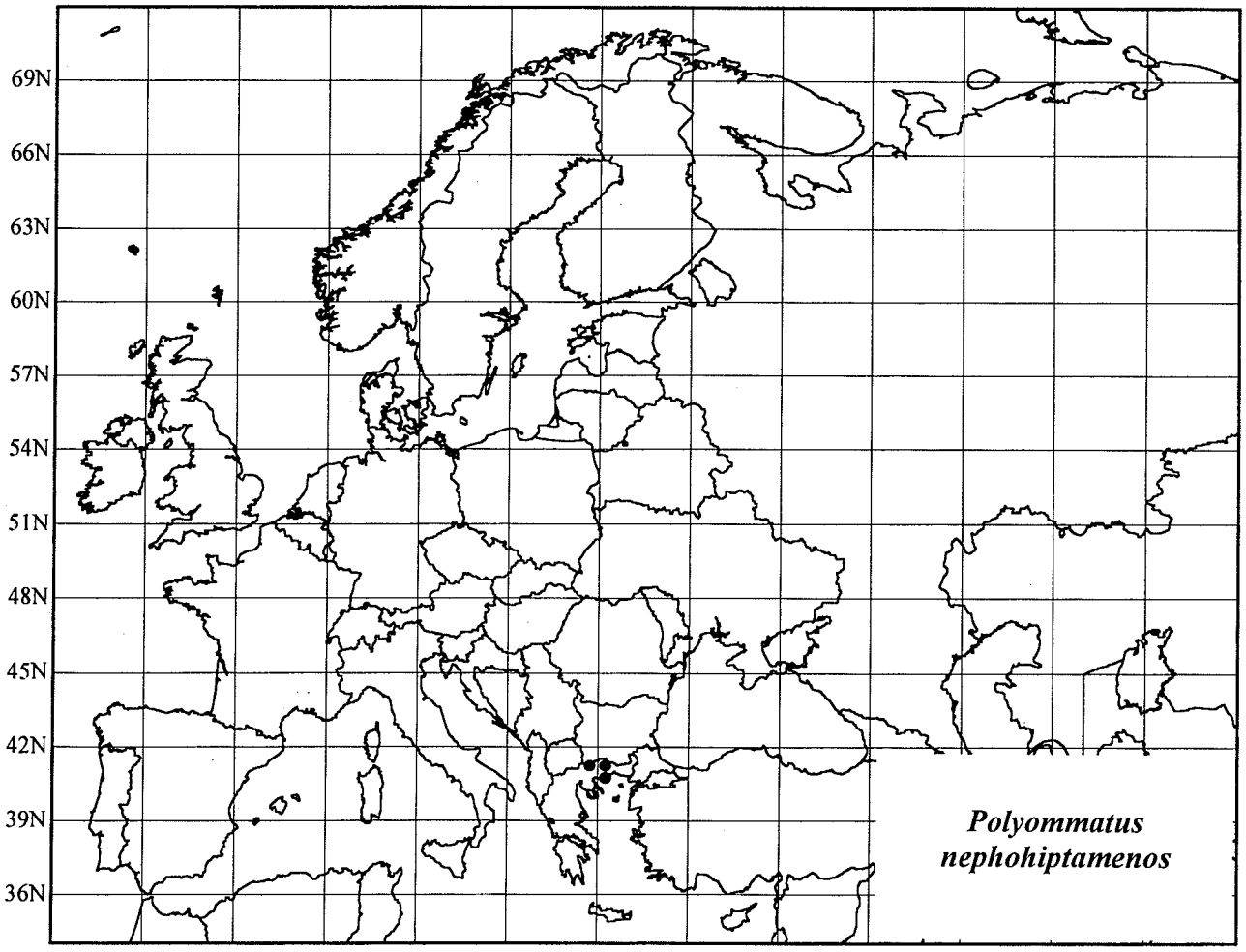
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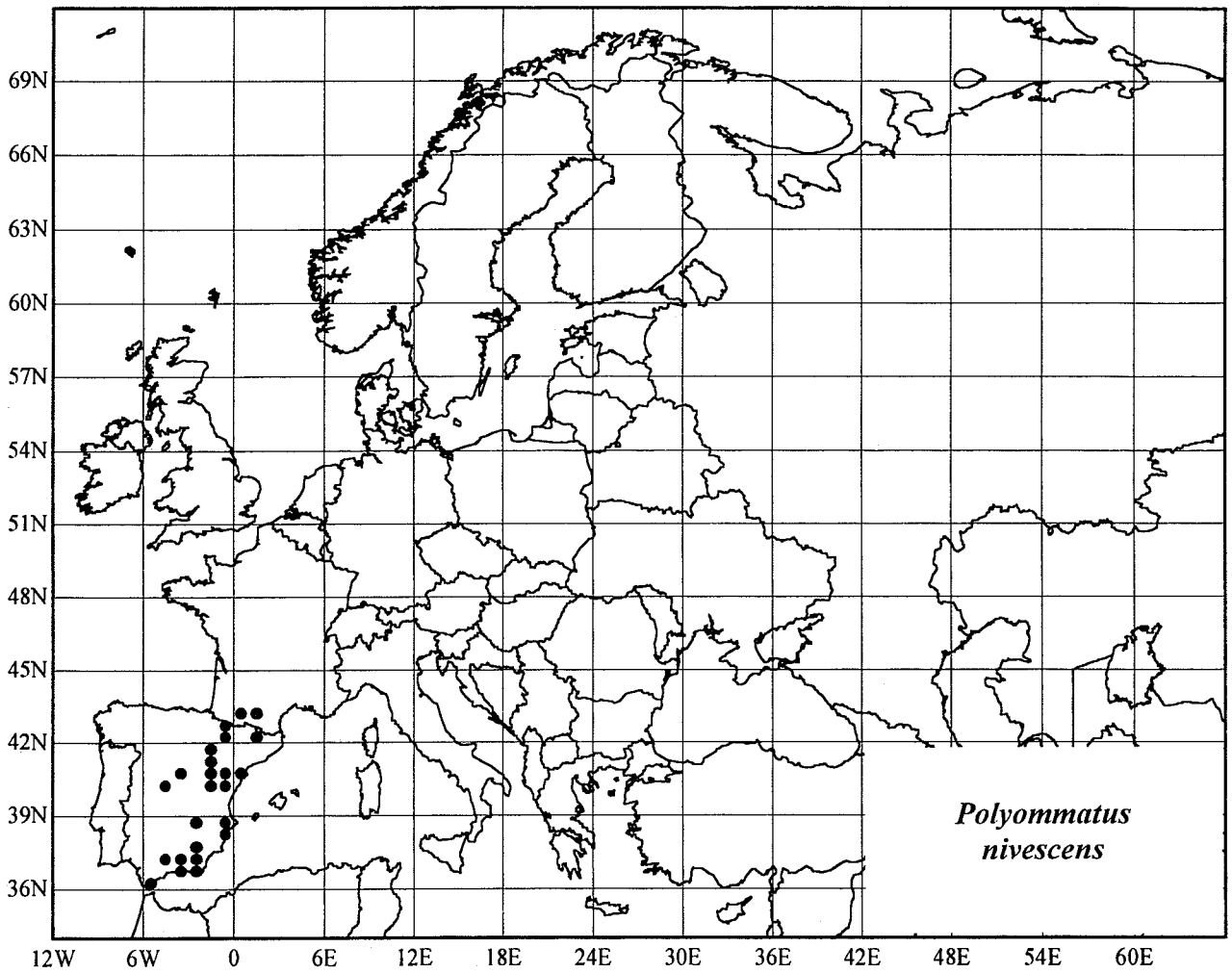
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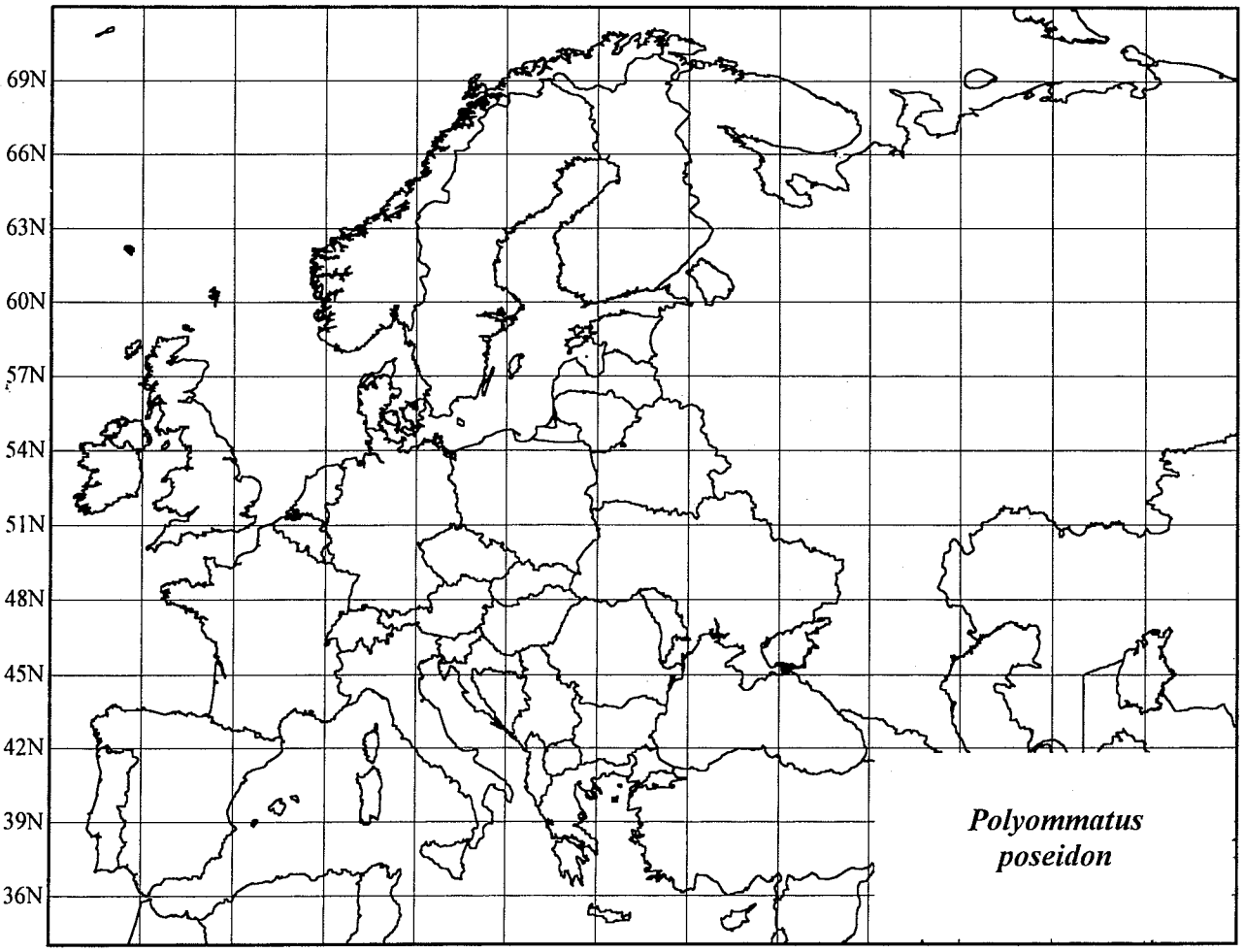
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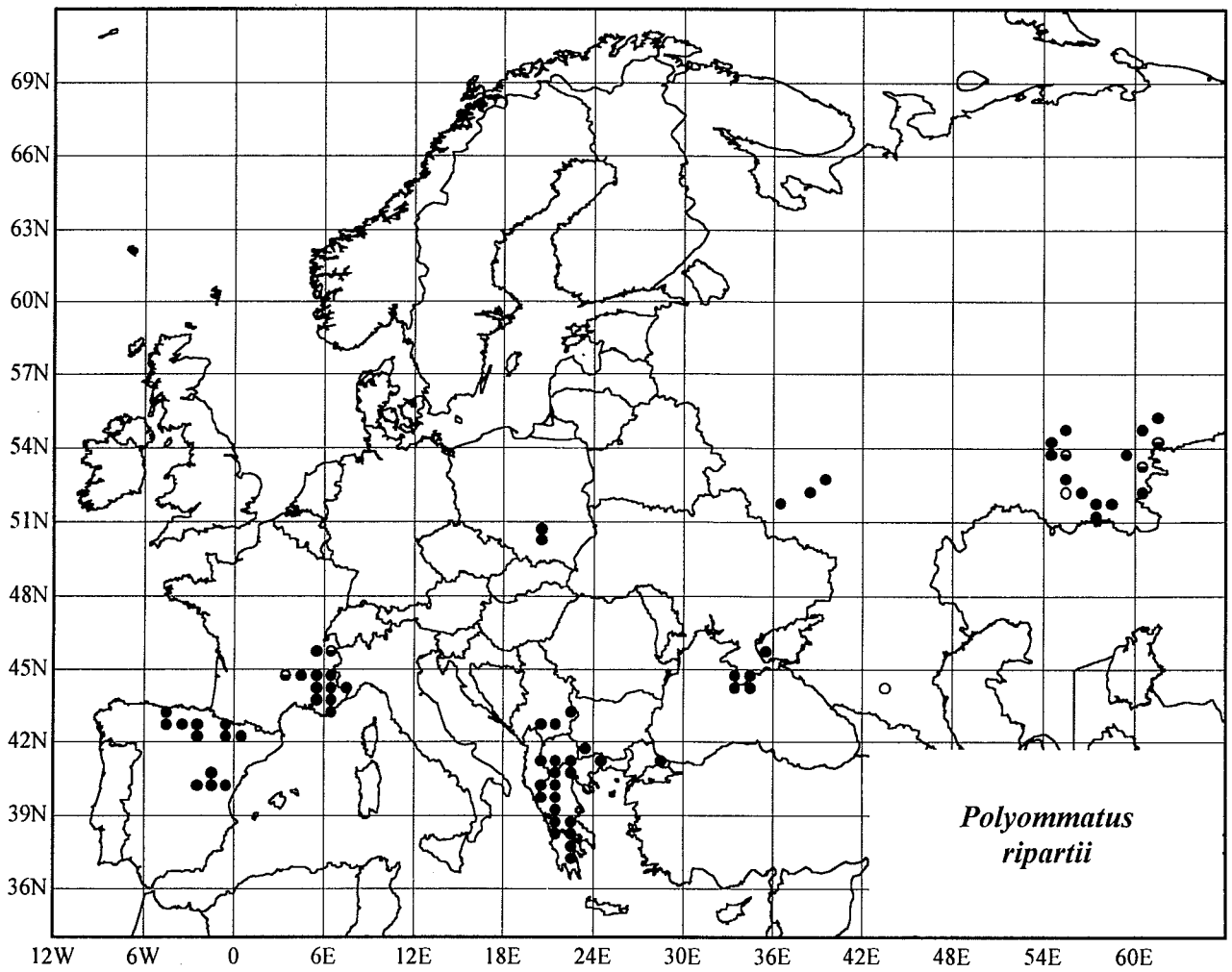
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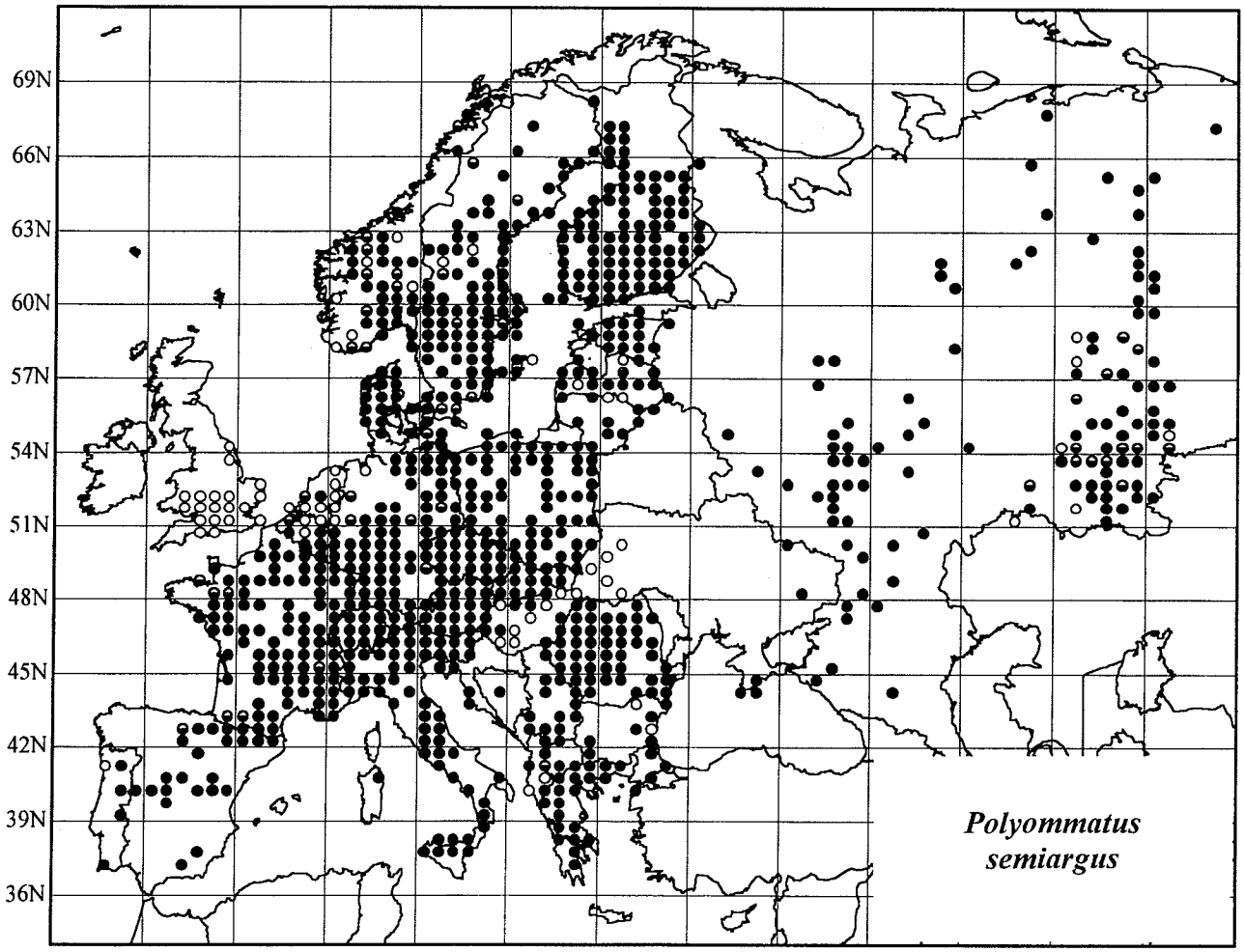
Polyommatus ripartii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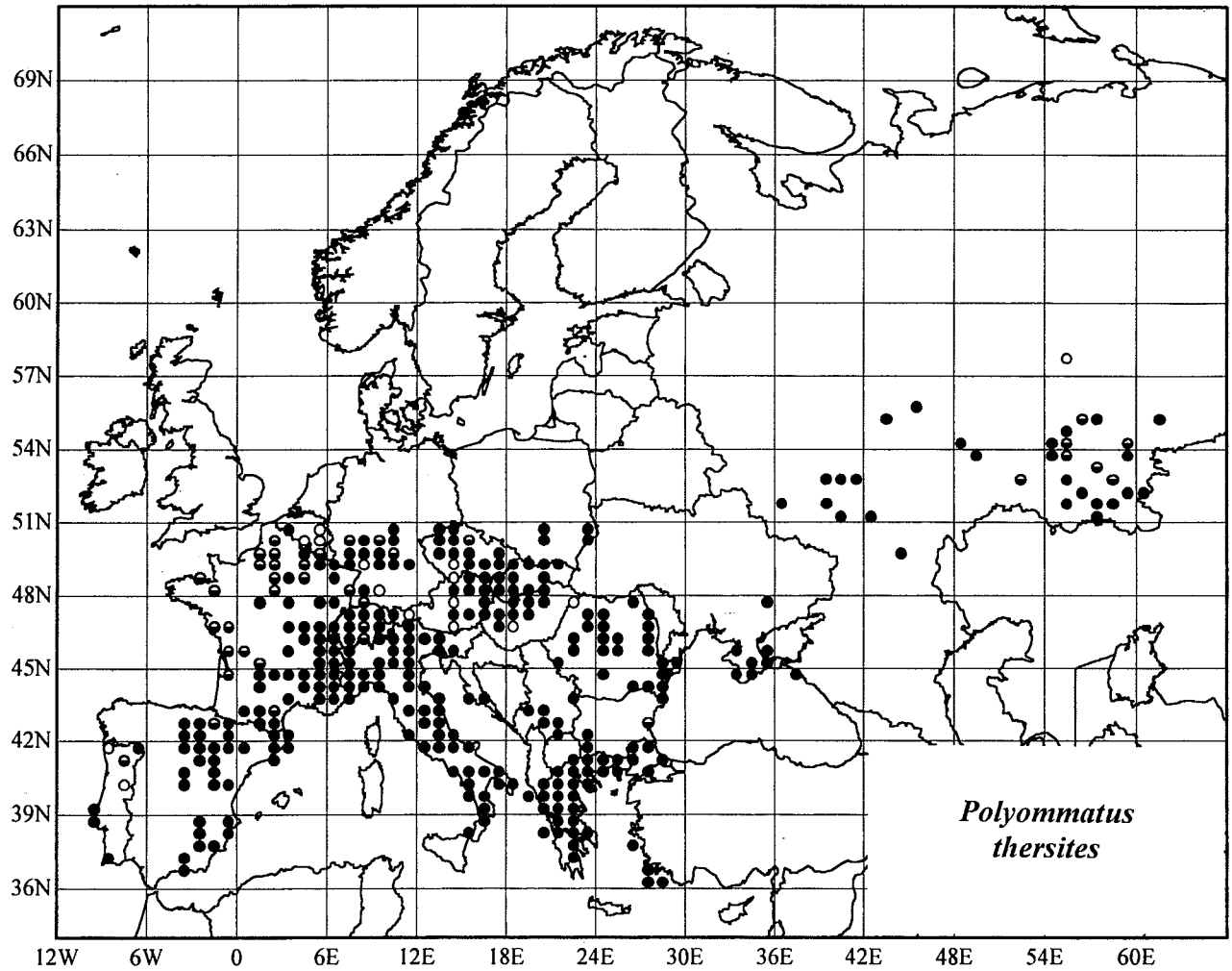
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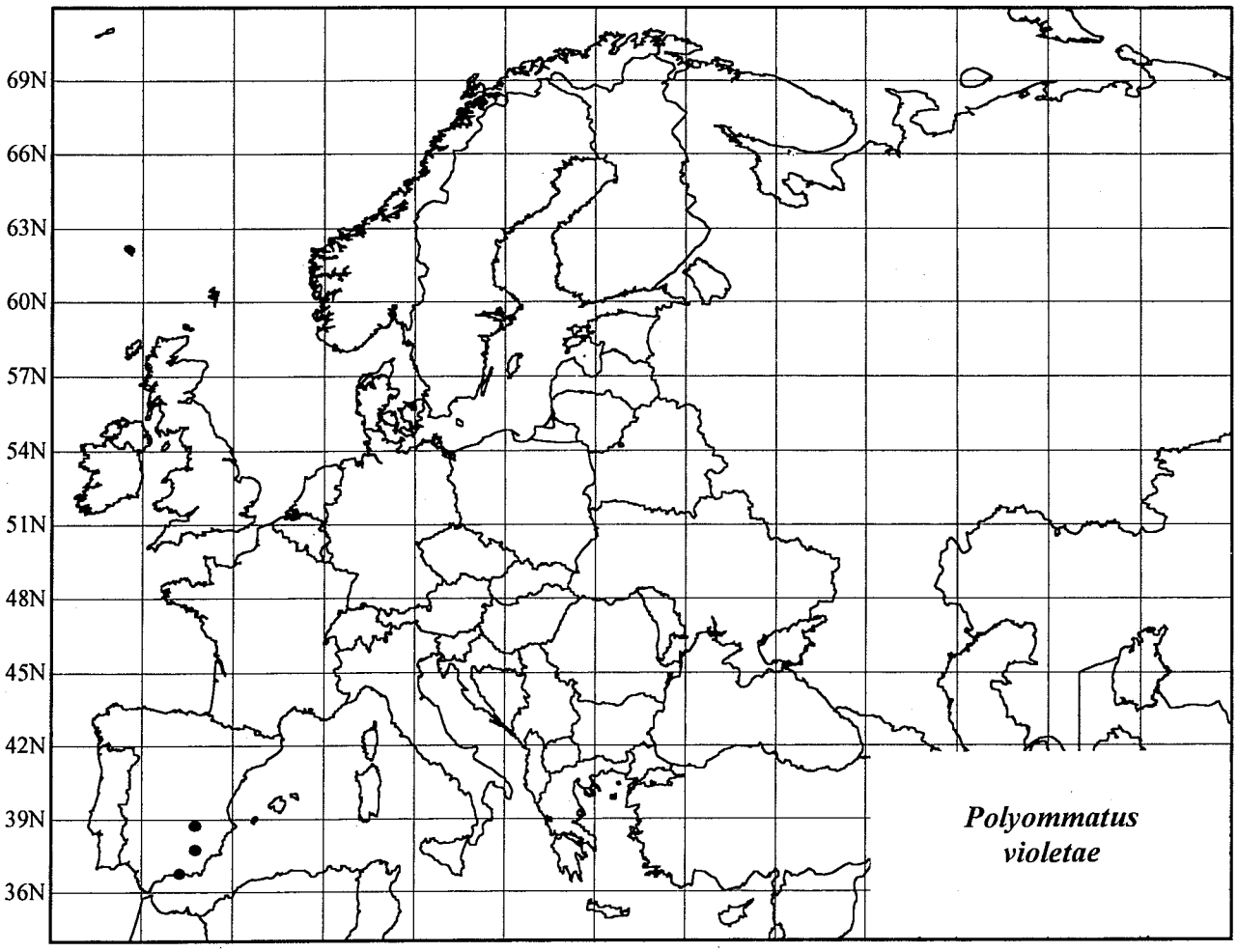
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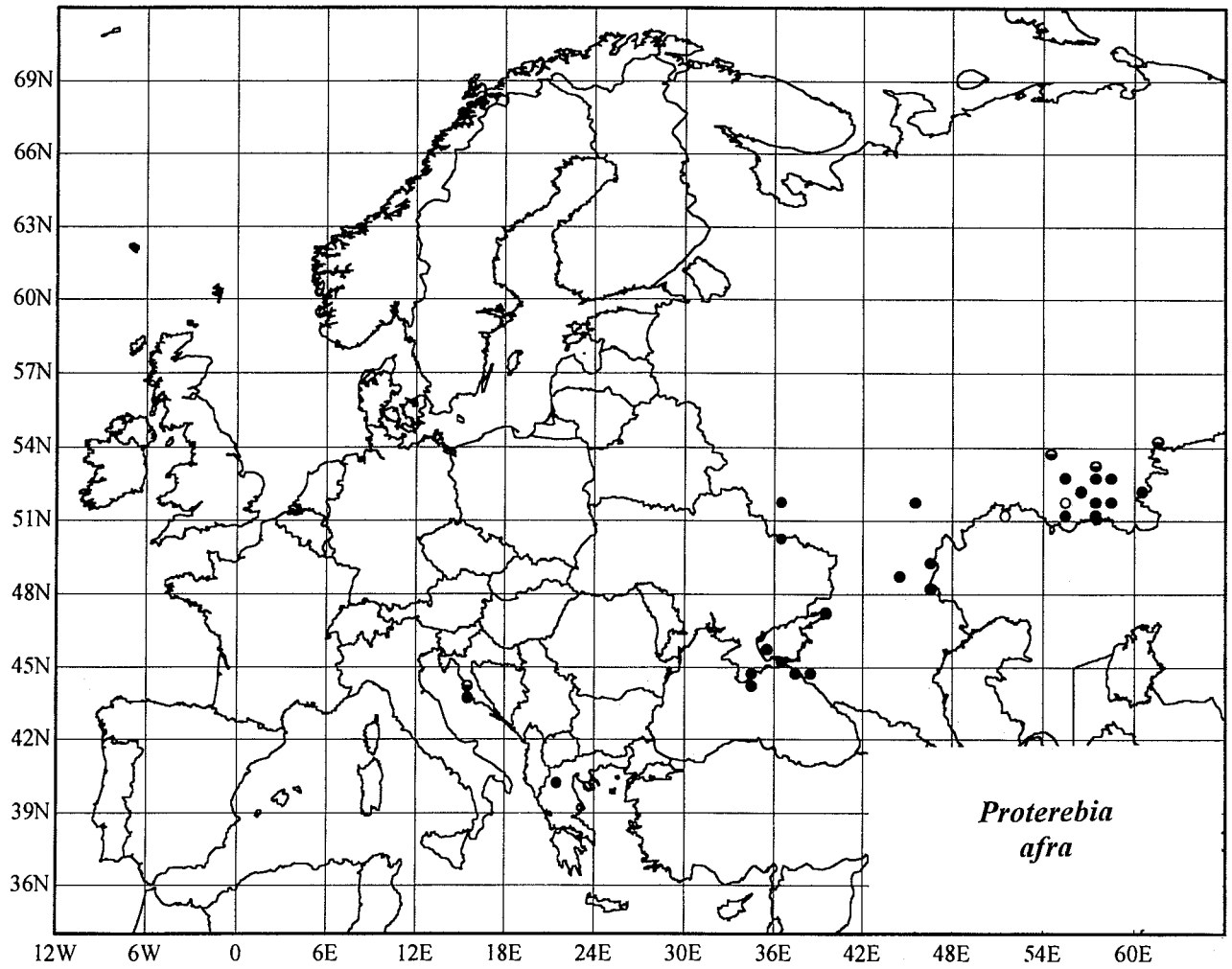
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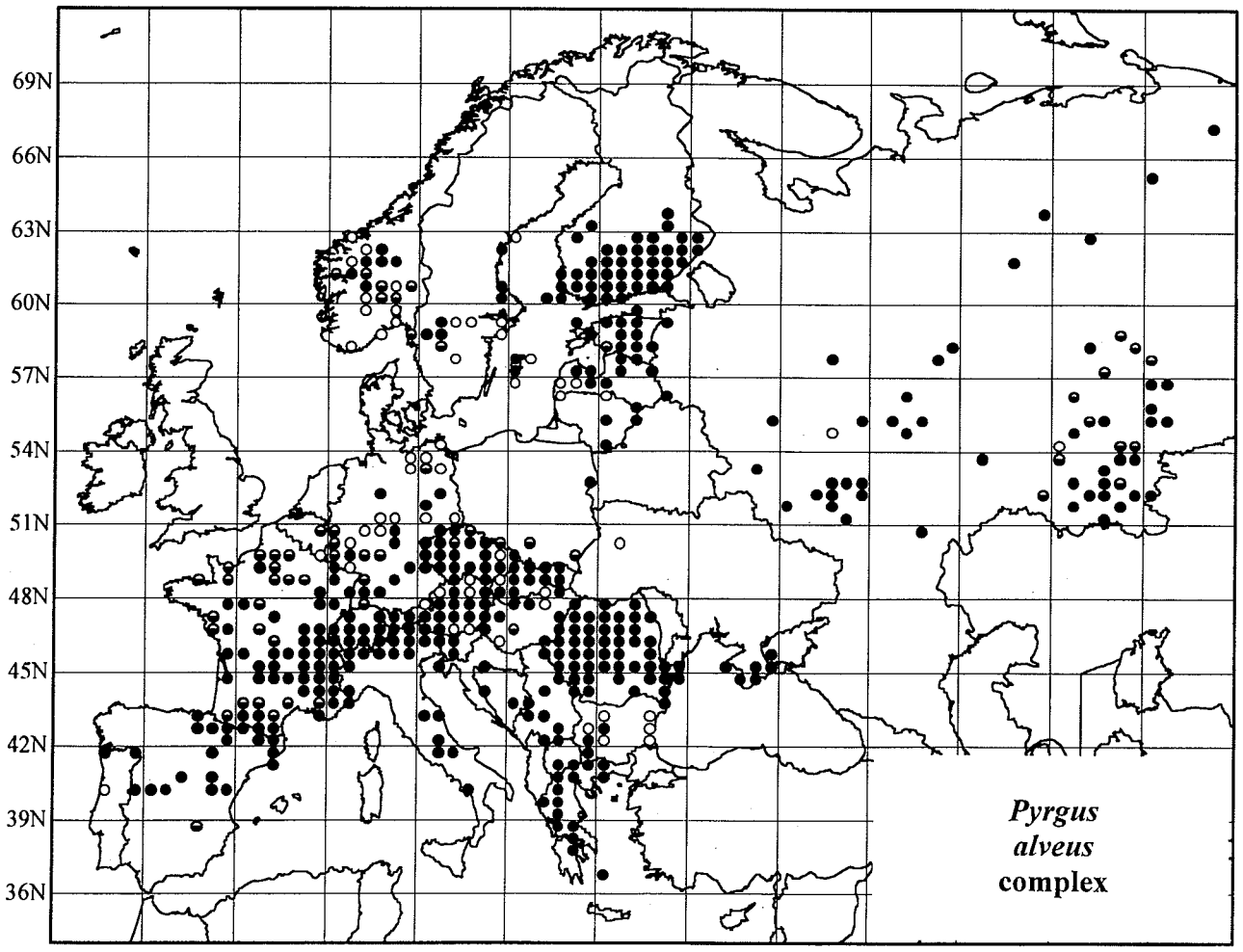
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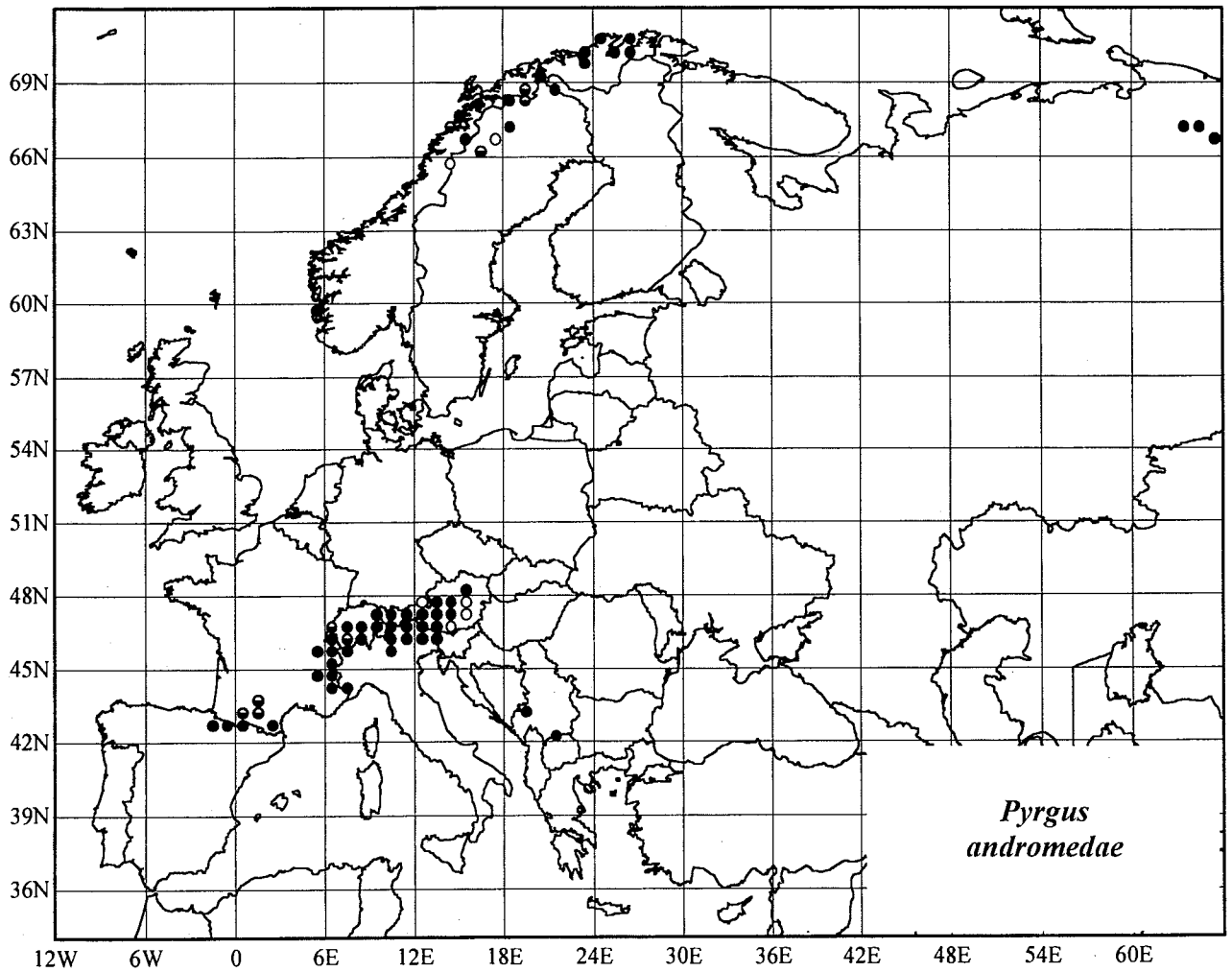
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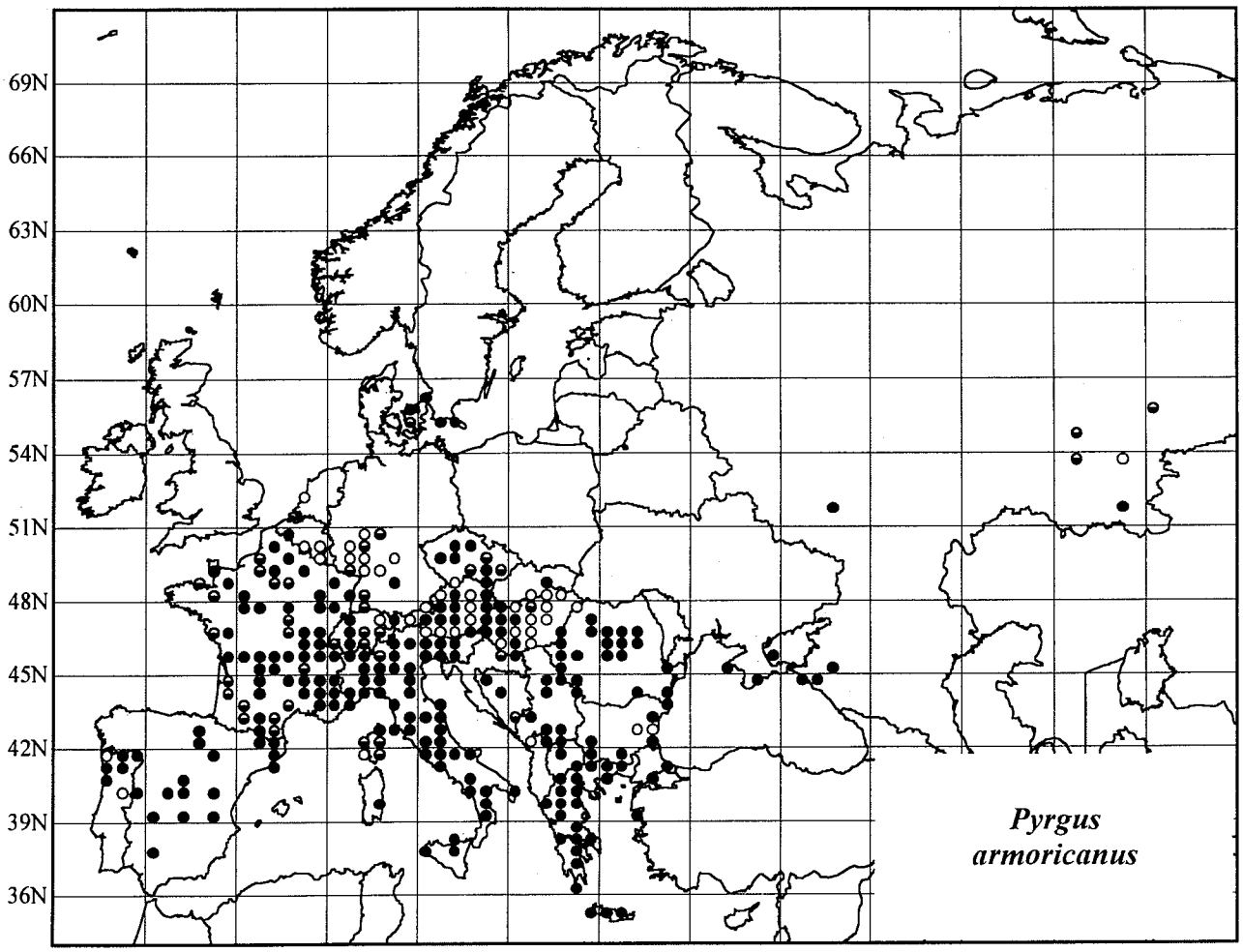
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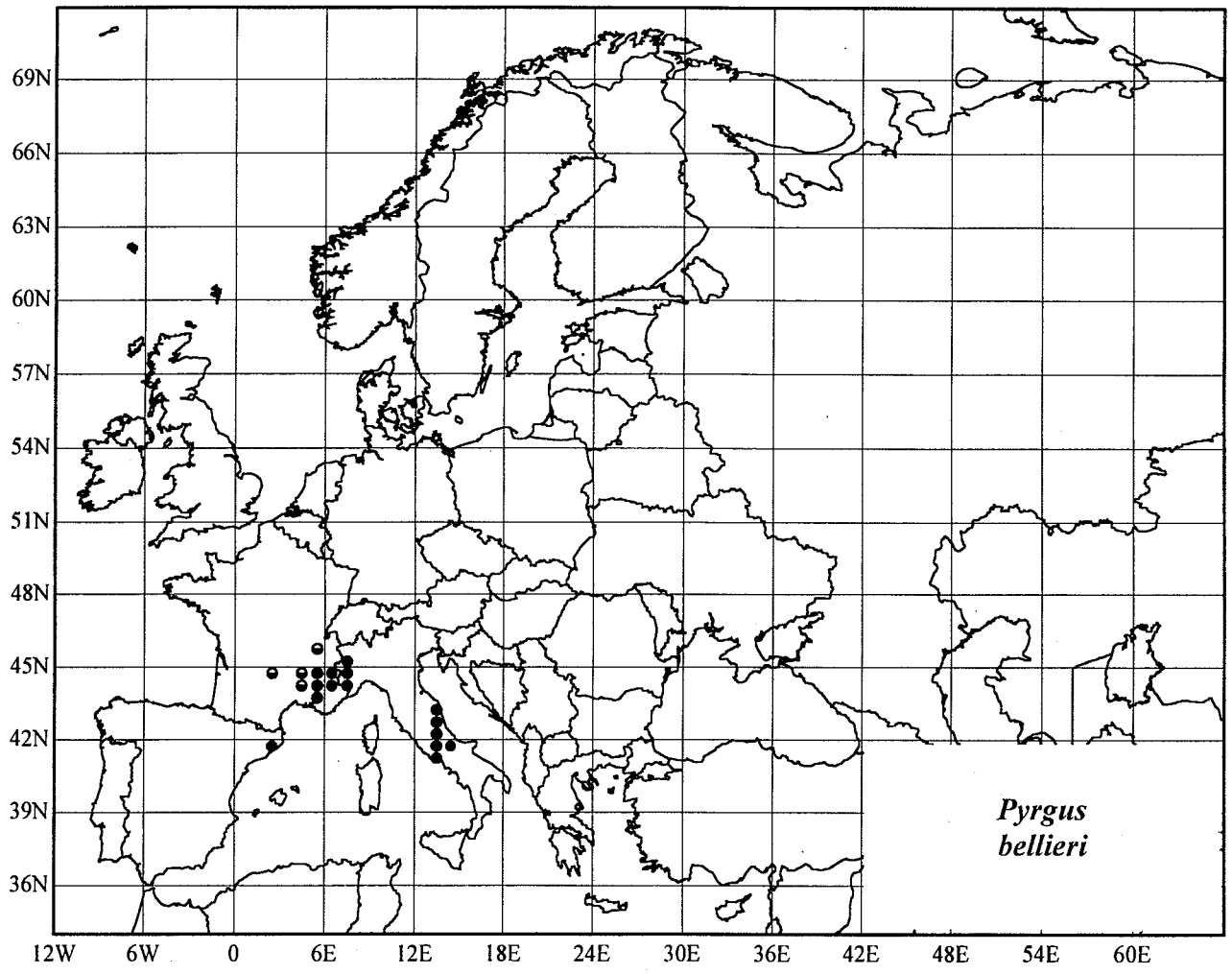
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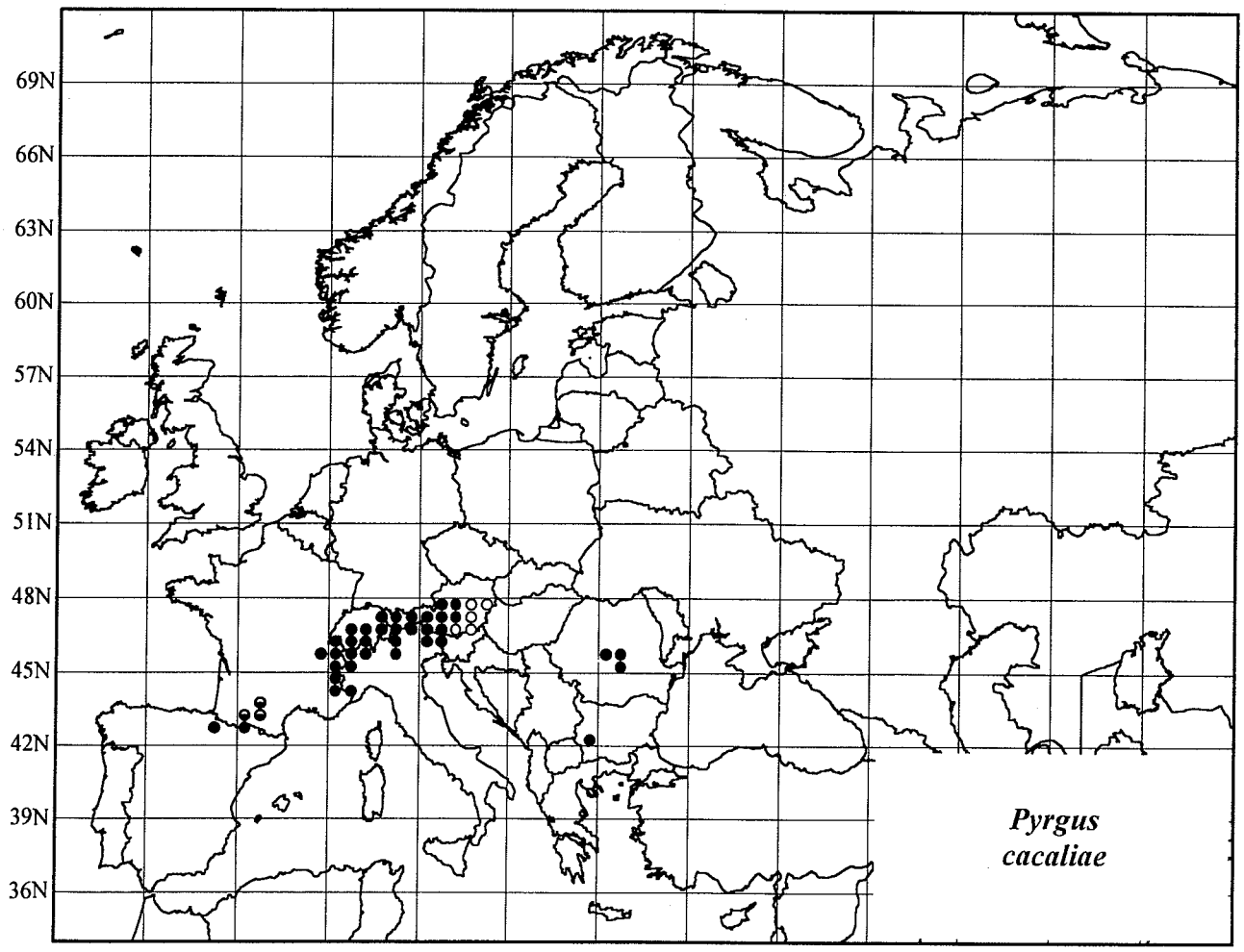
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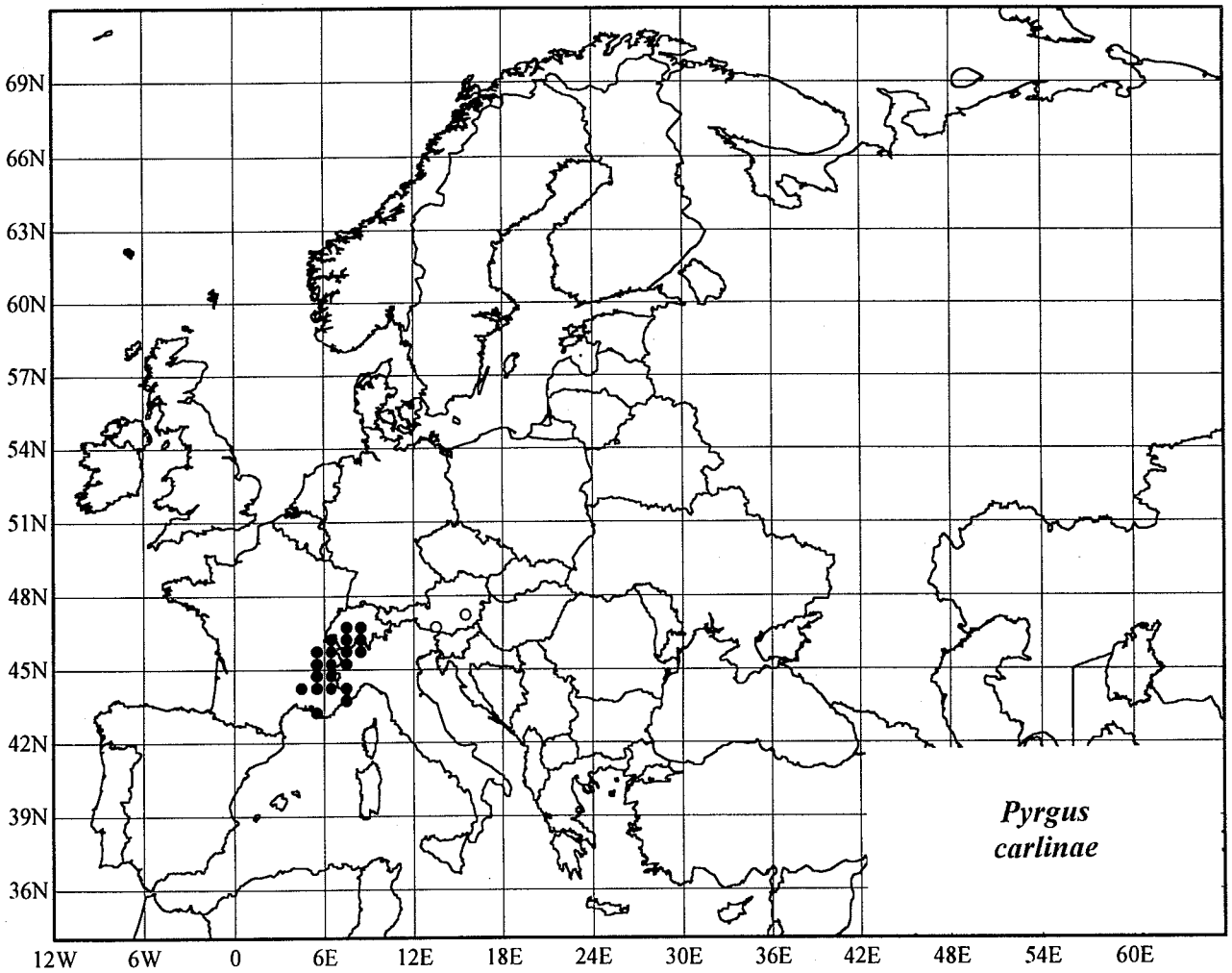
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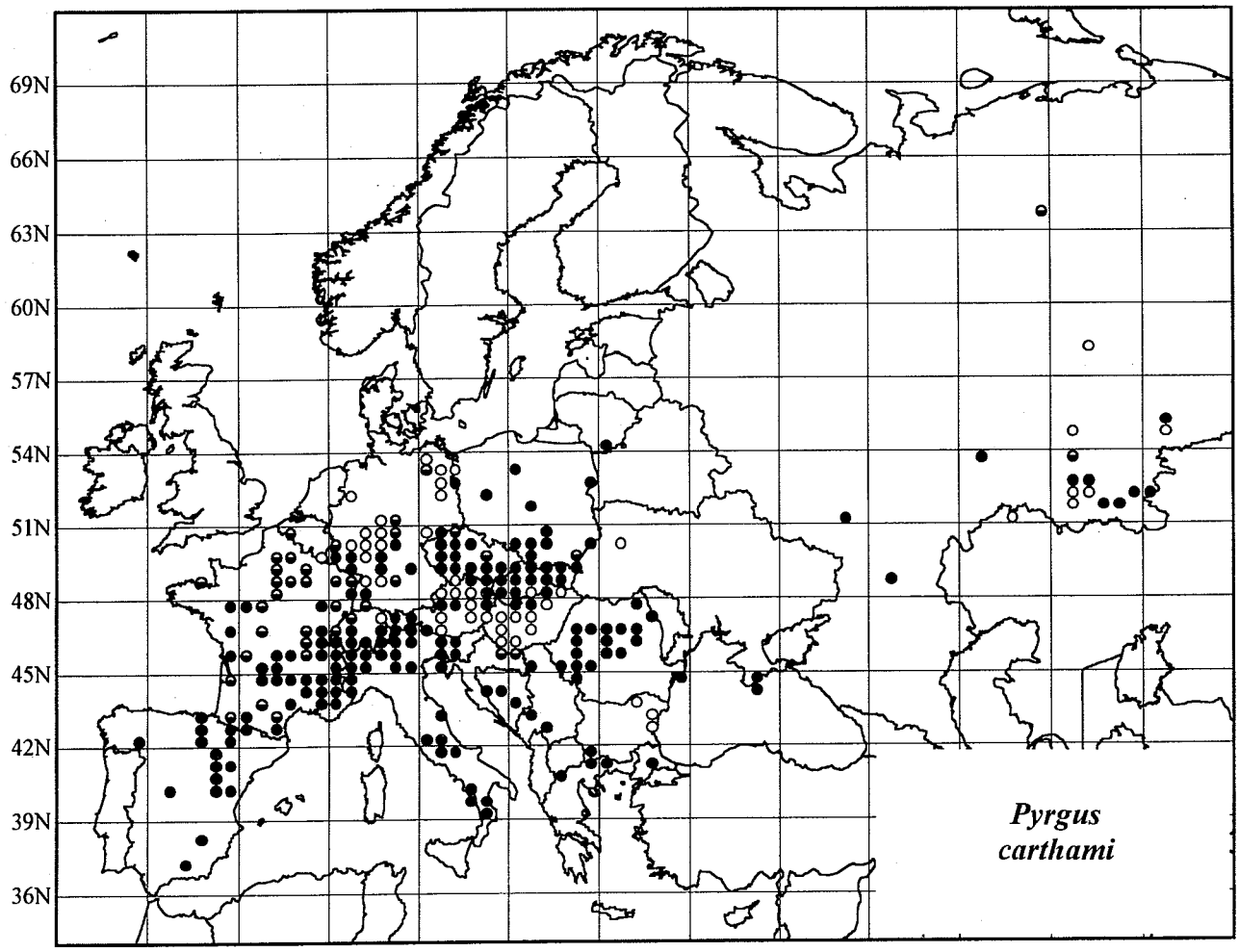
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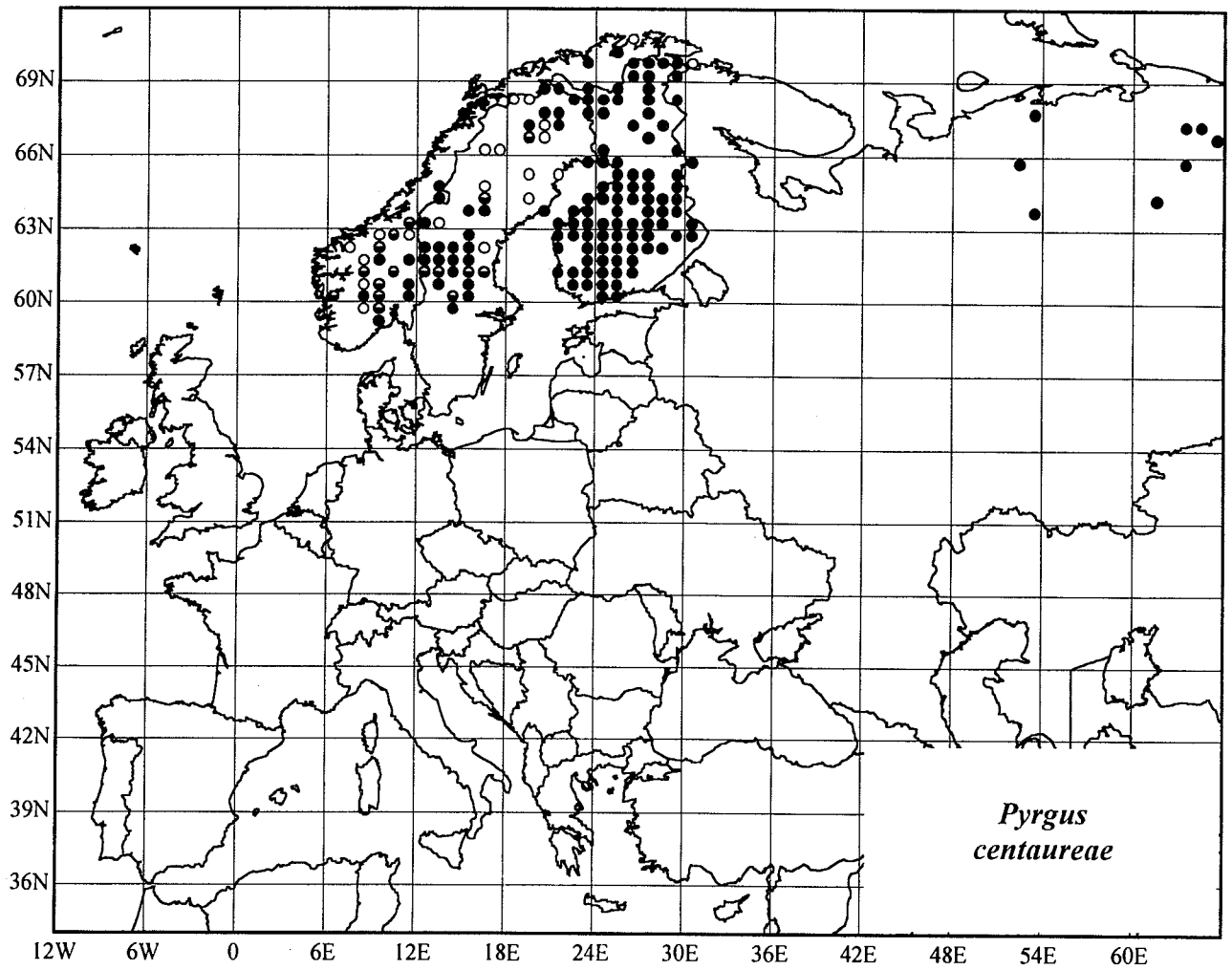
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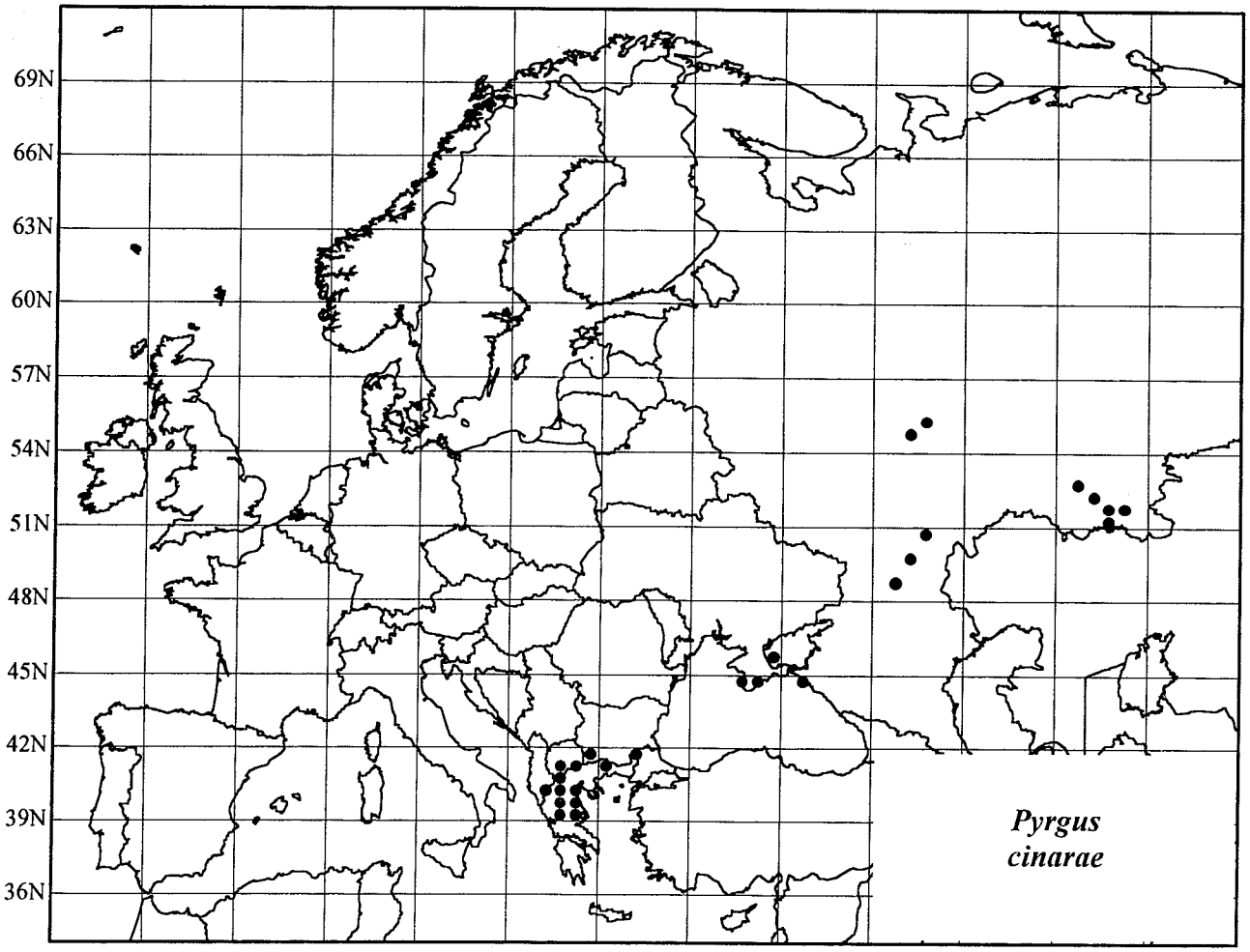
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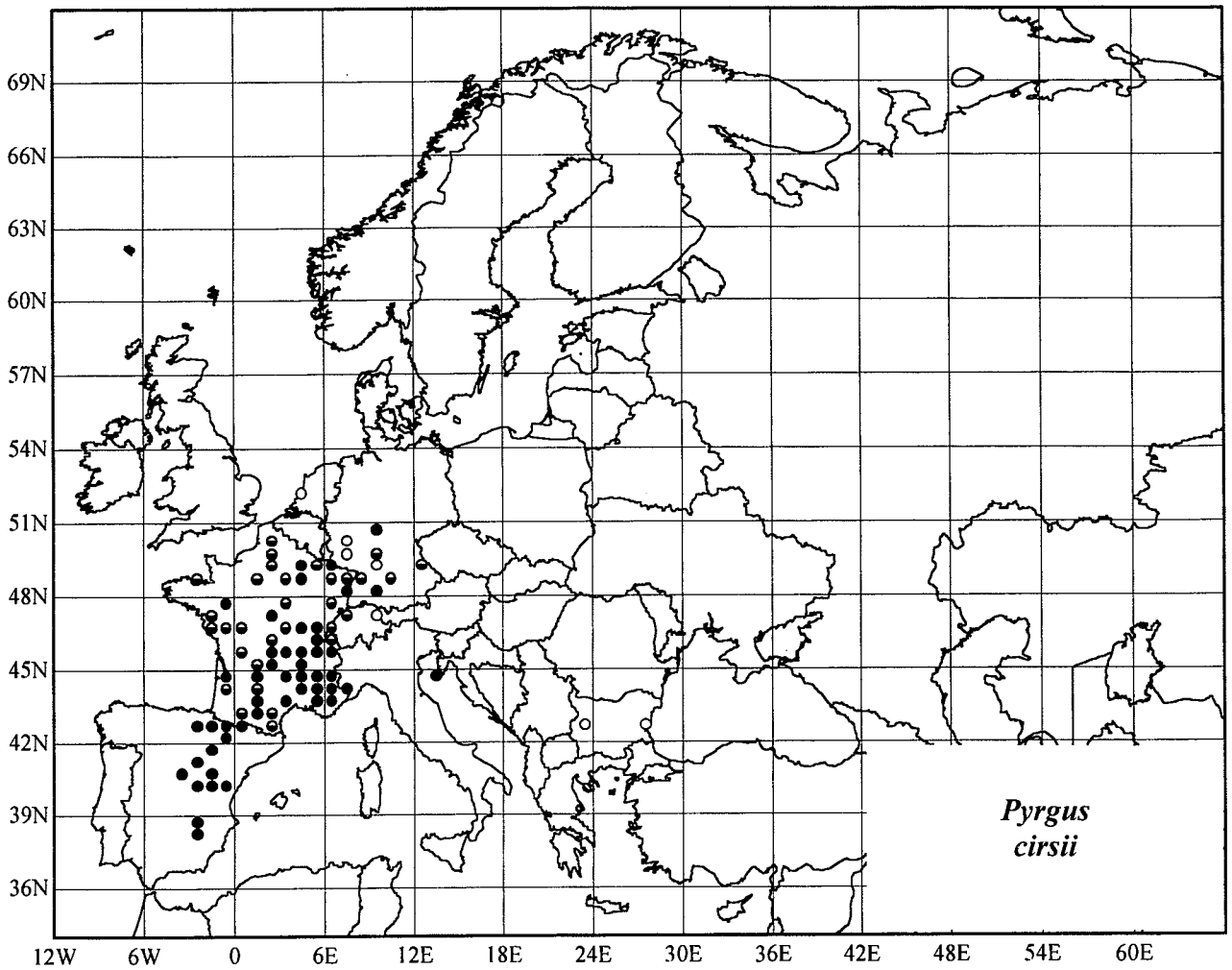
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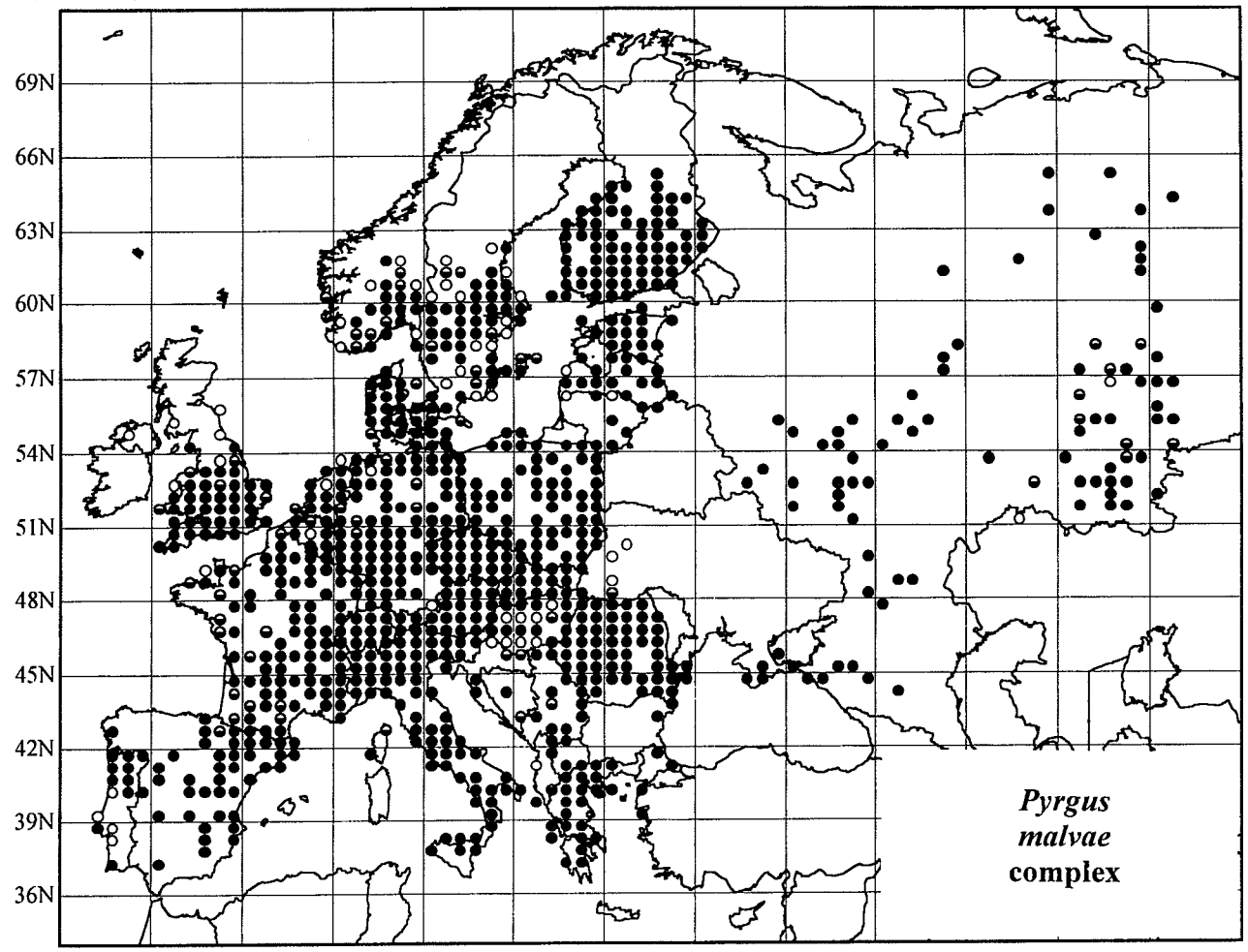
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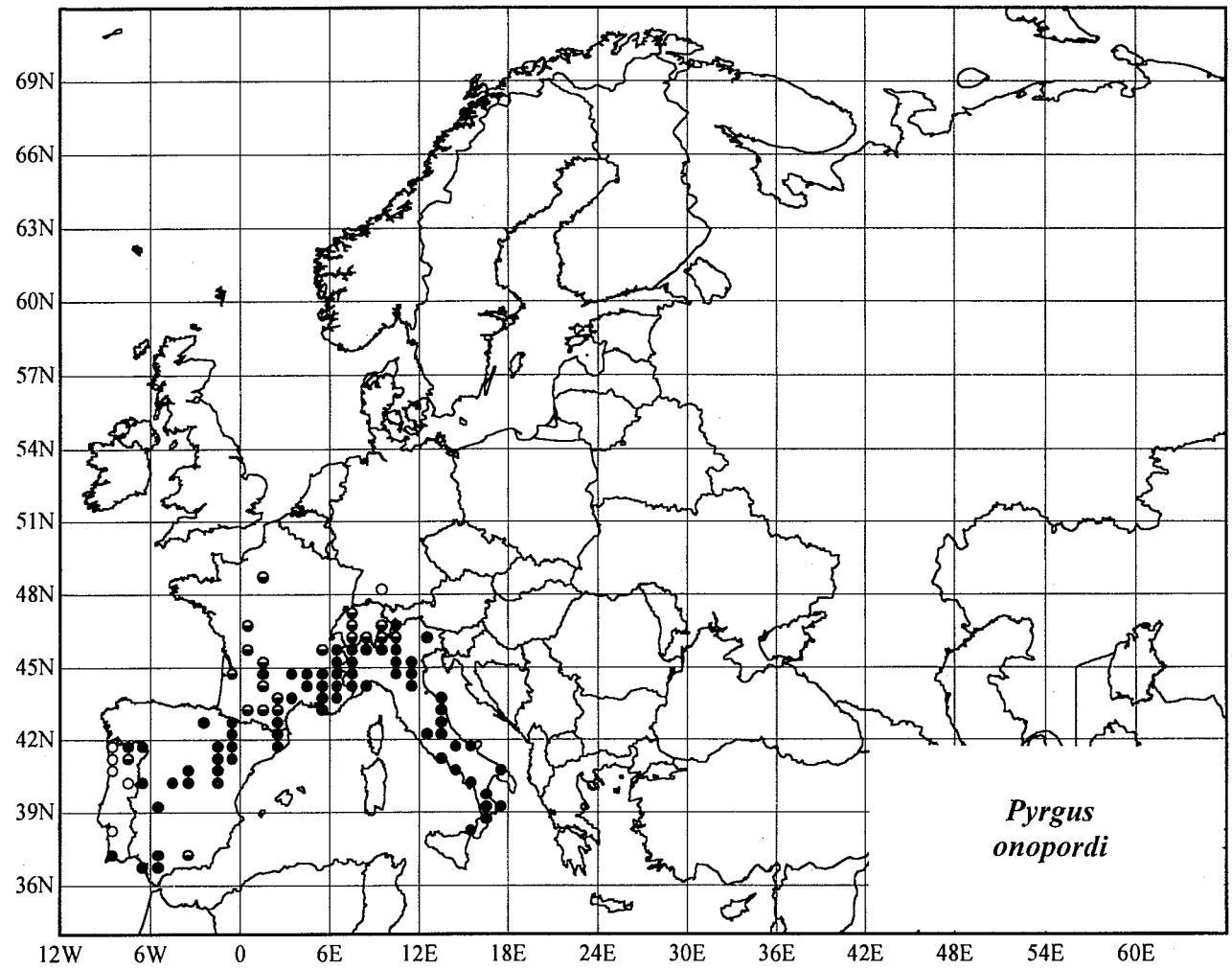
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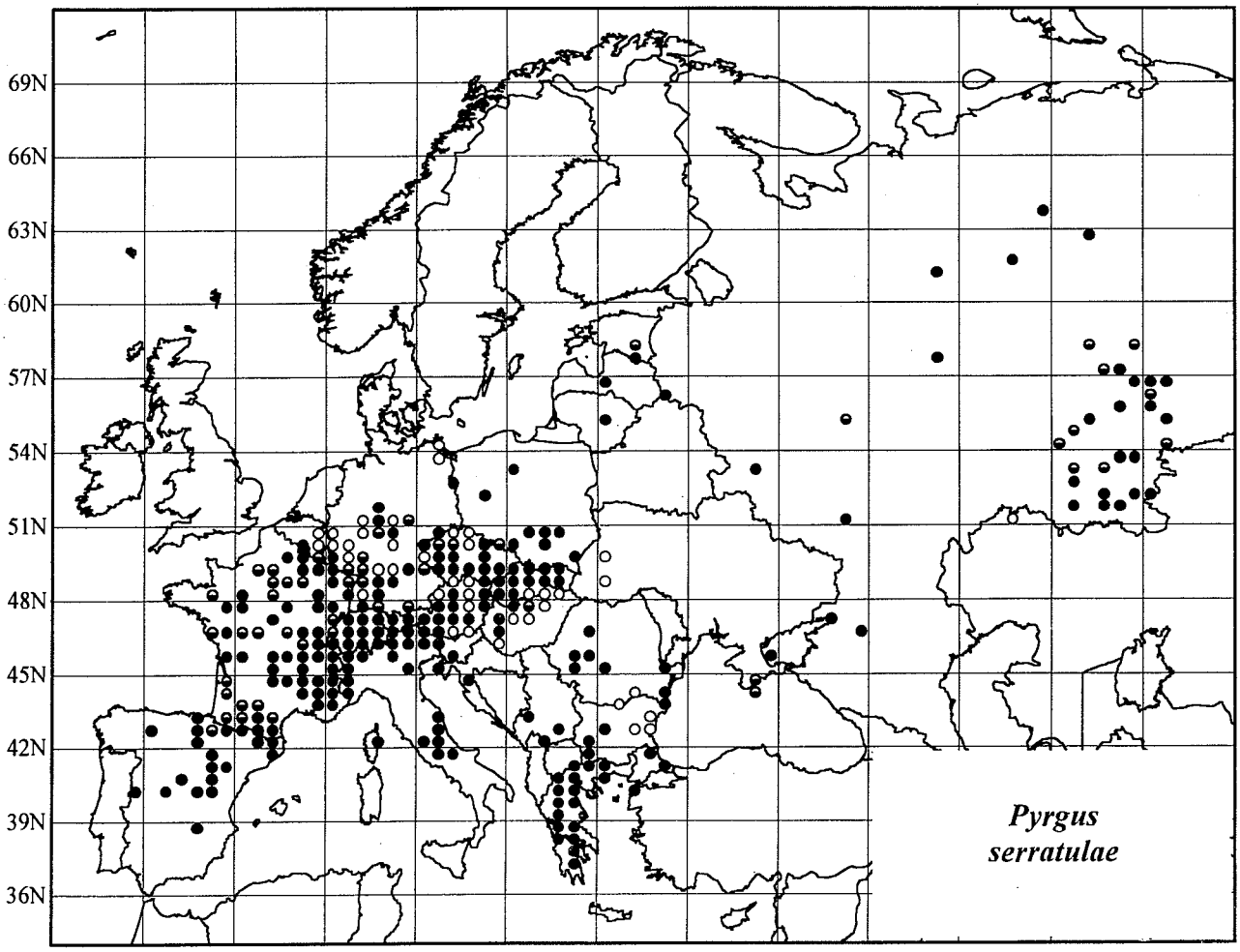
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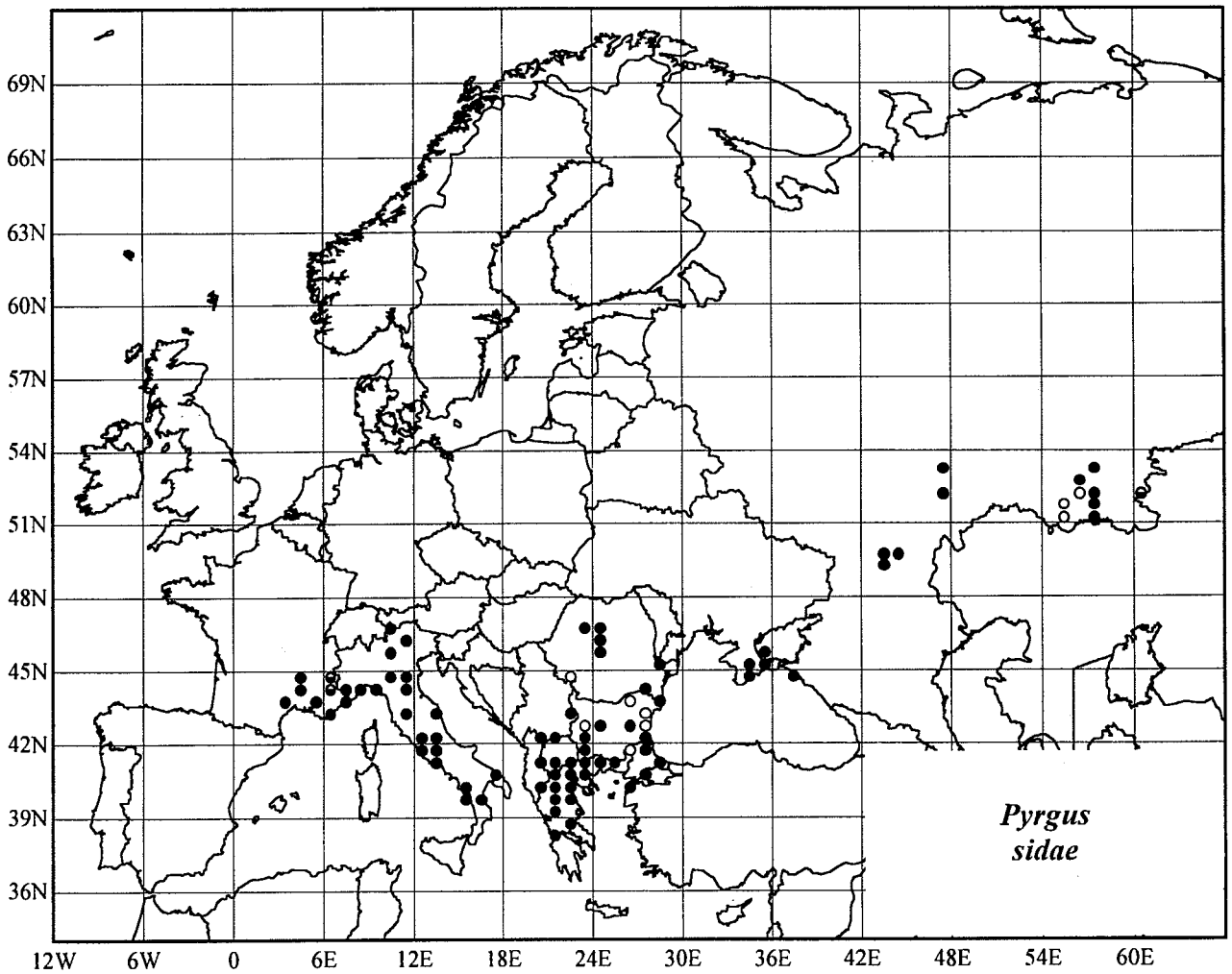
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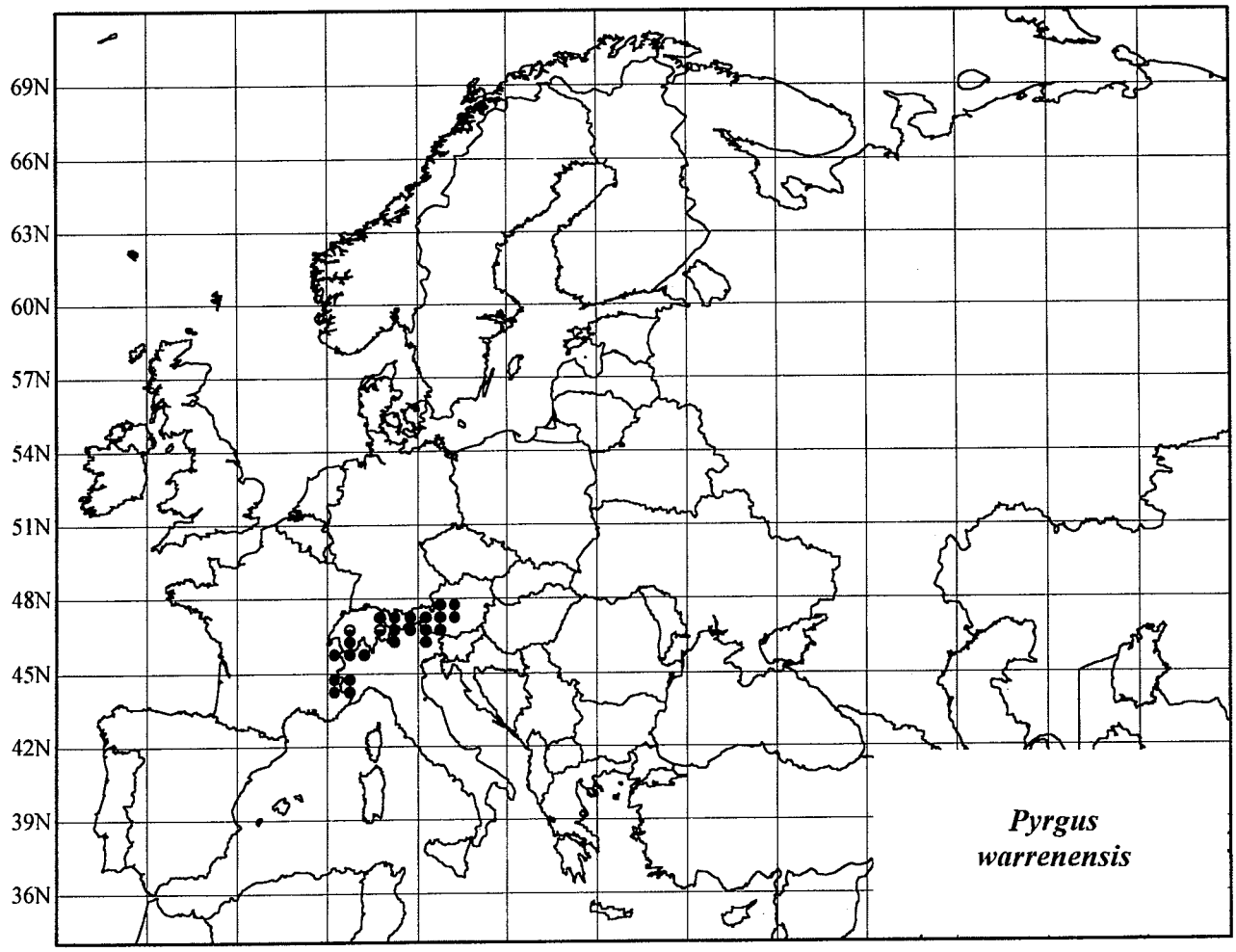
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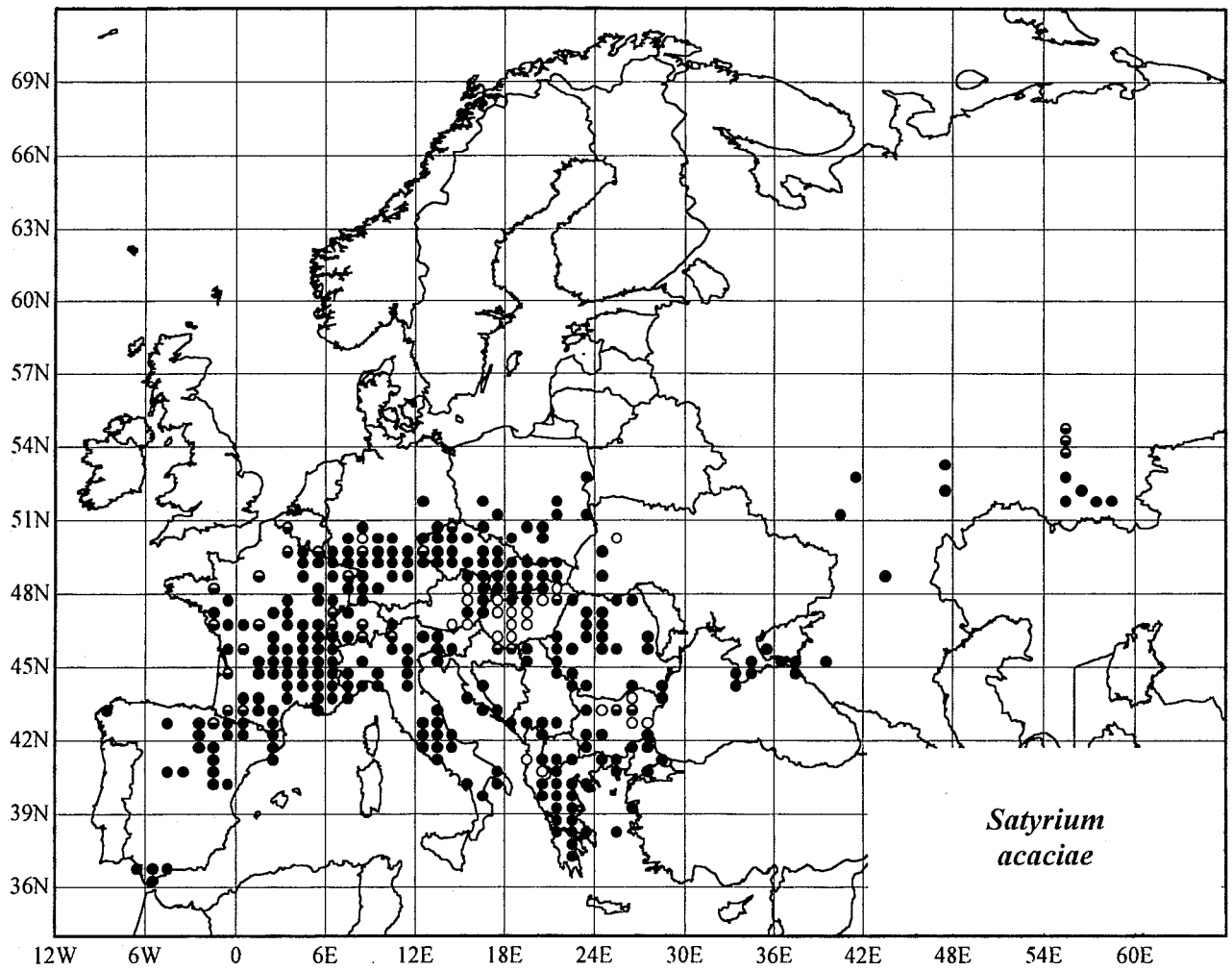
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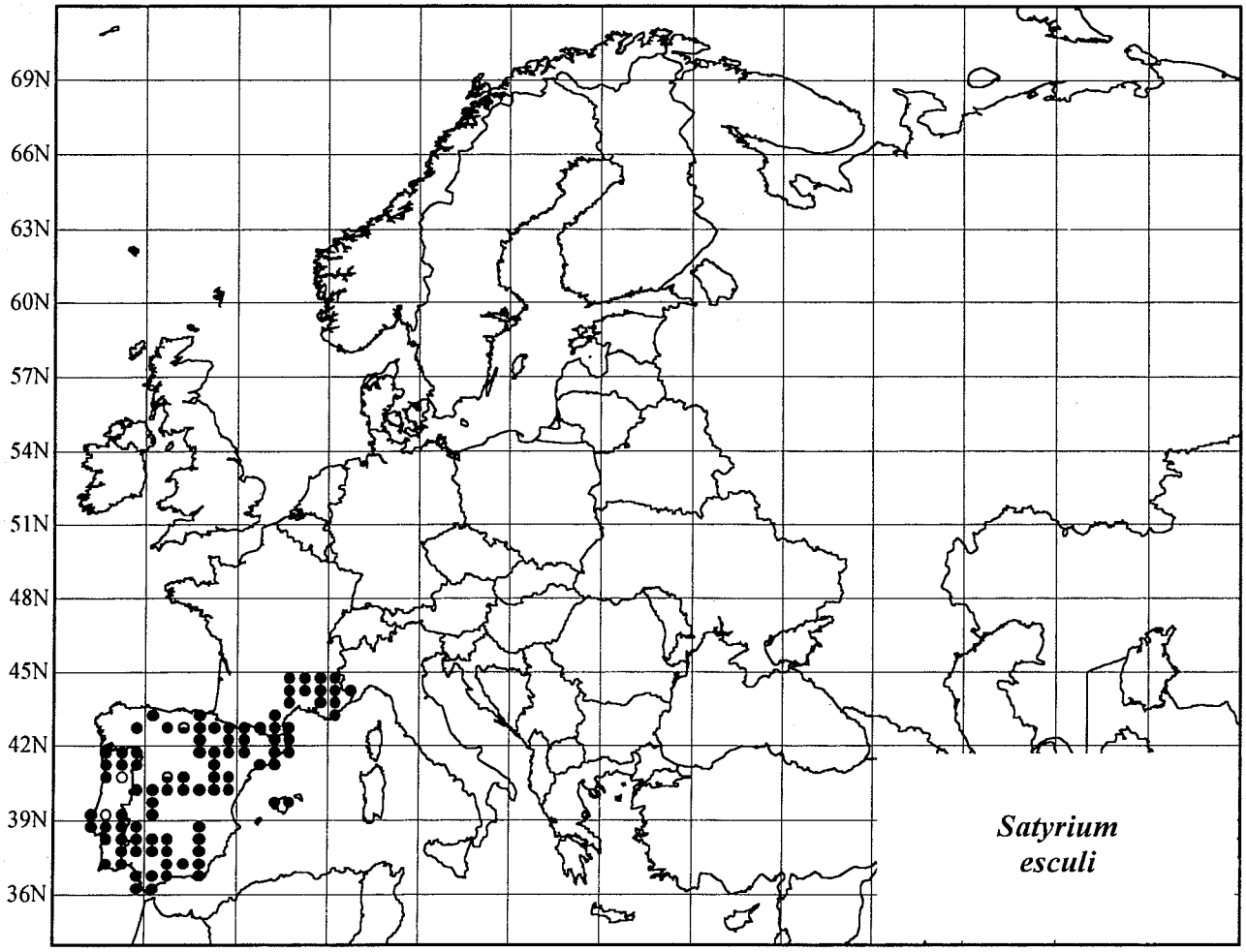
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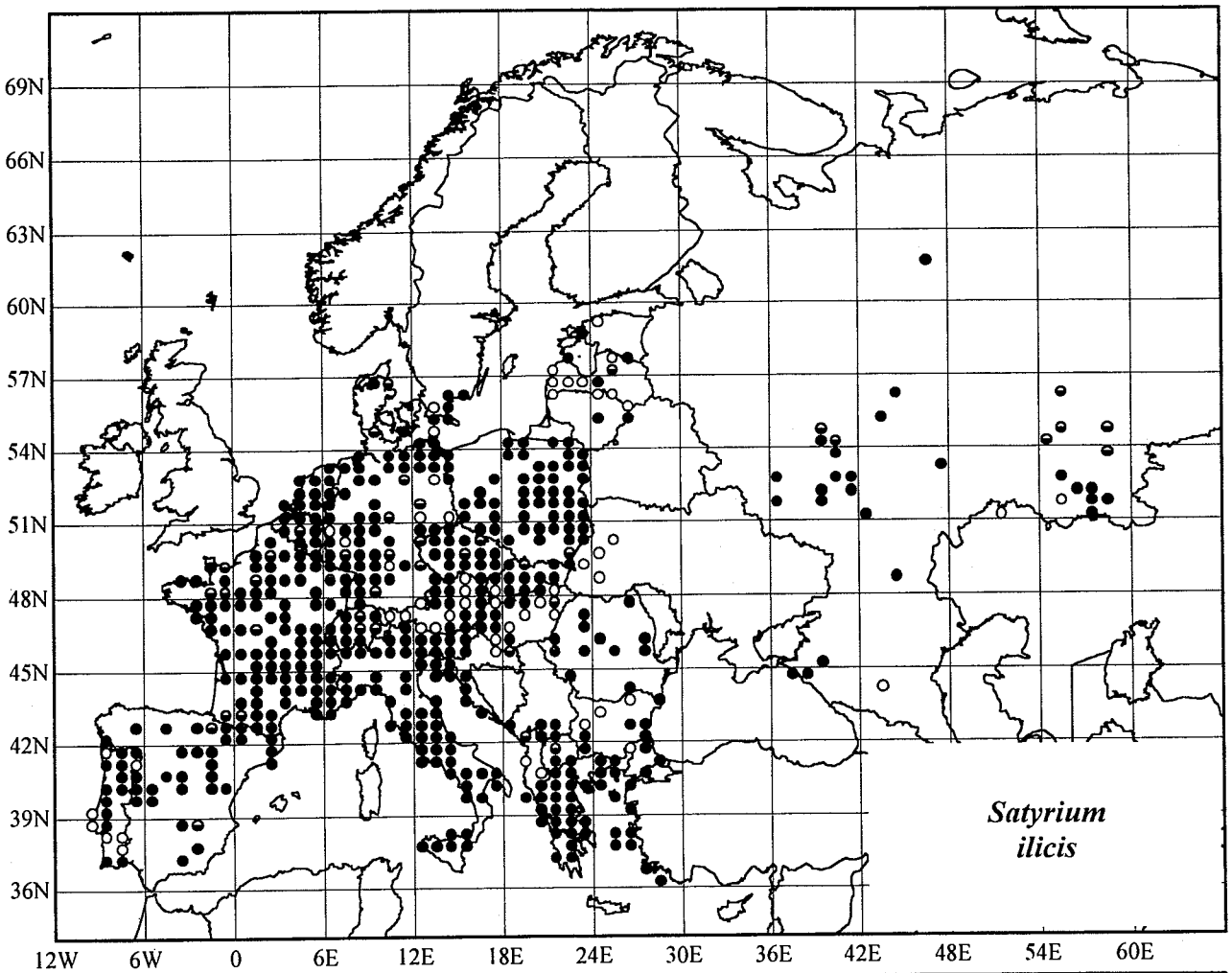
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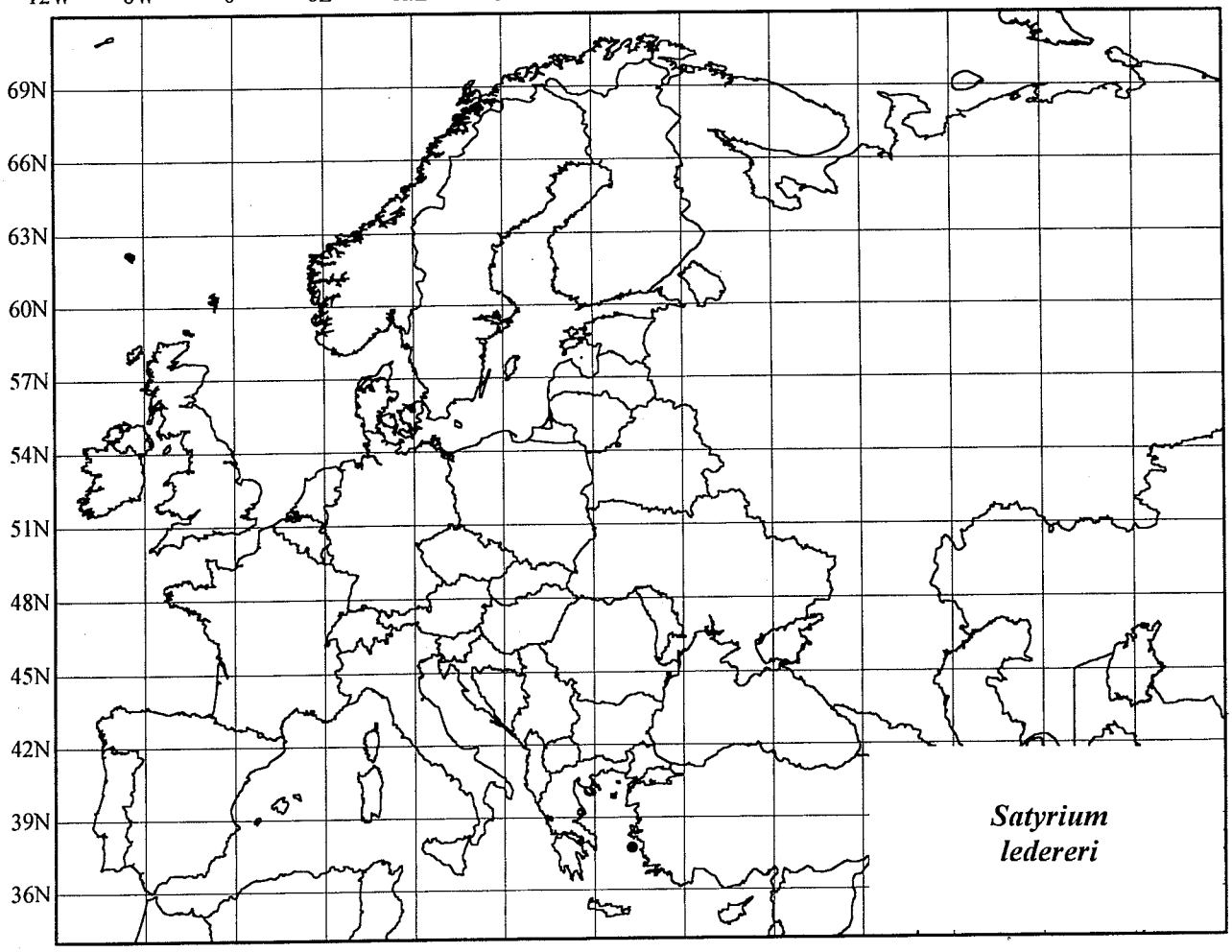
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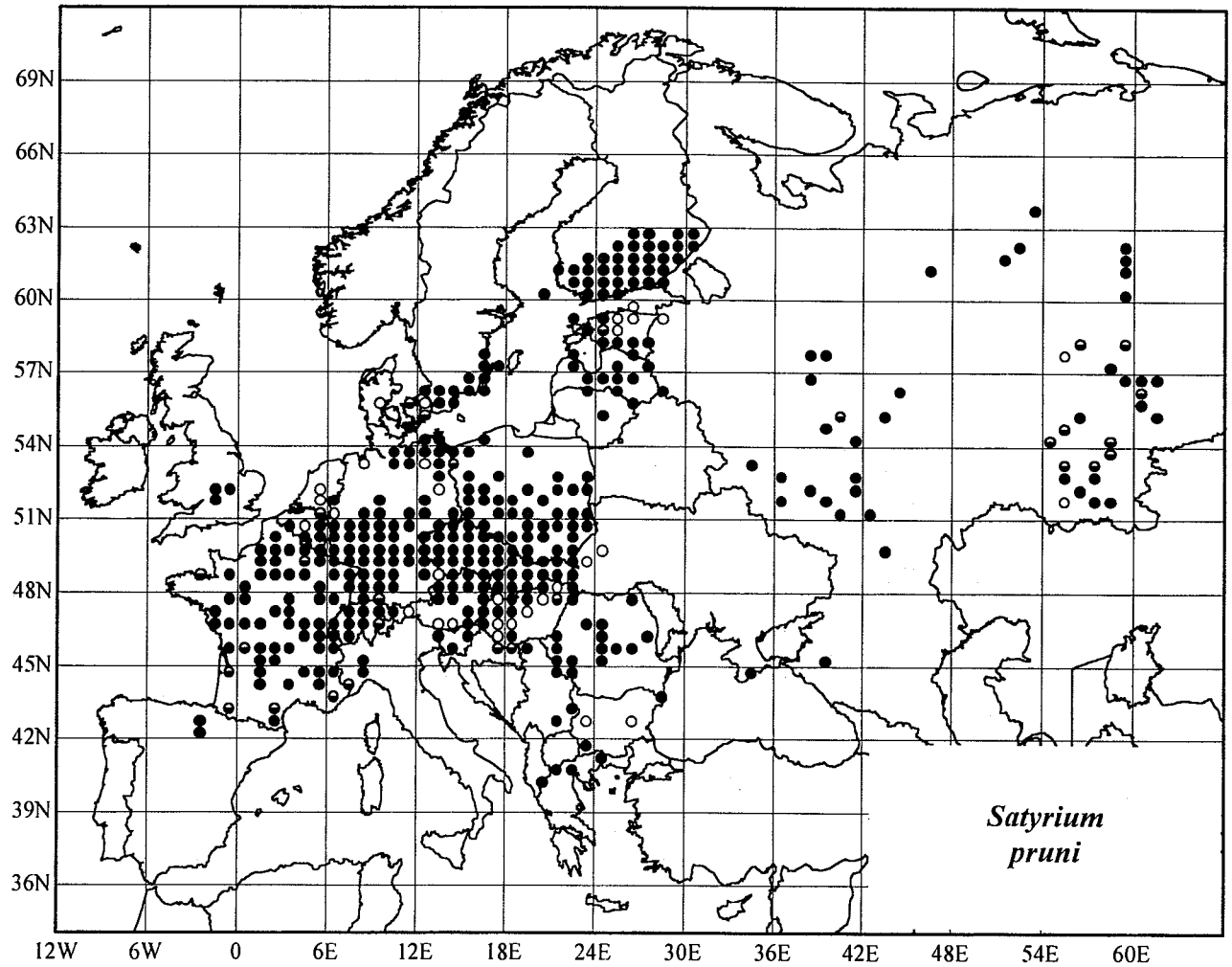
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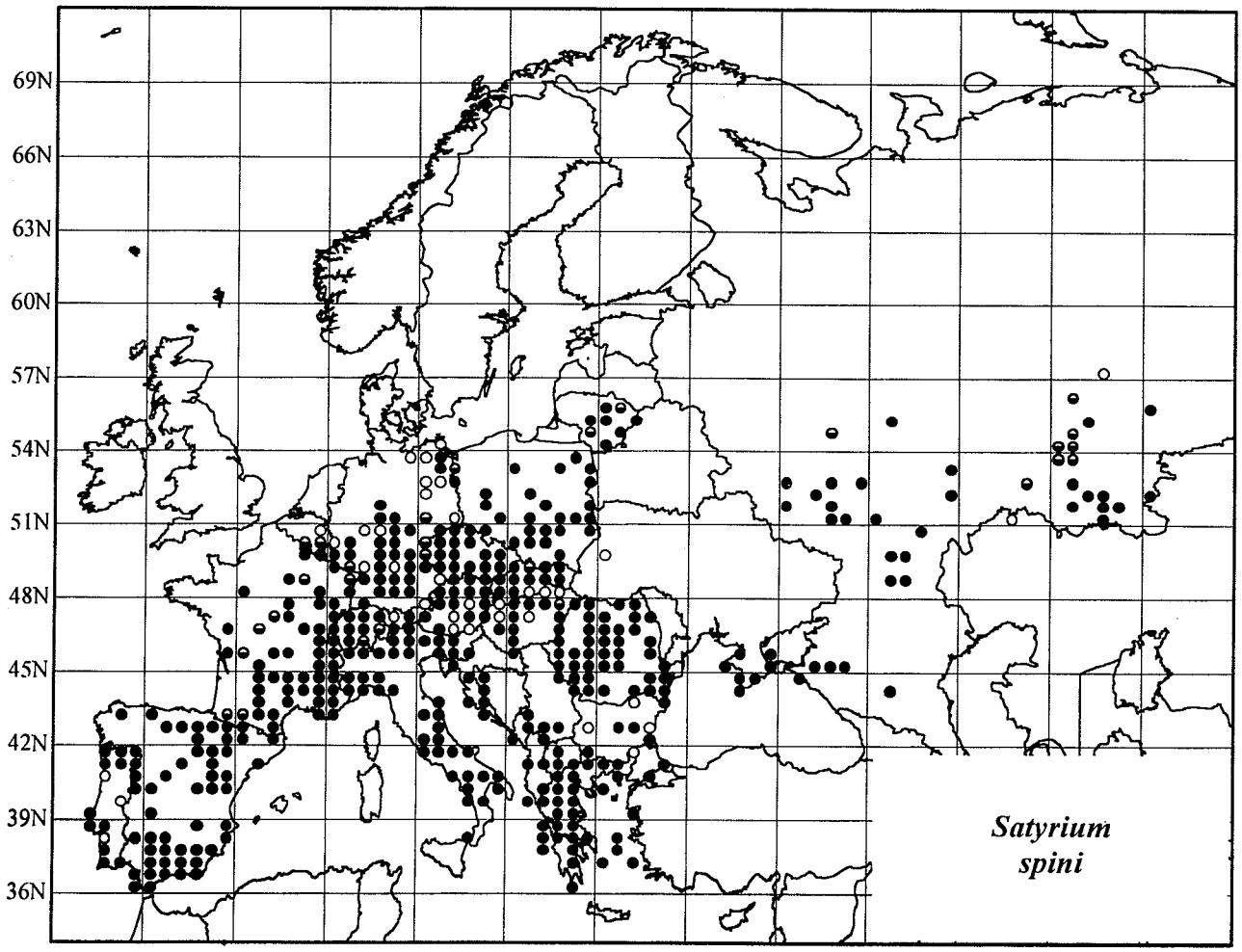
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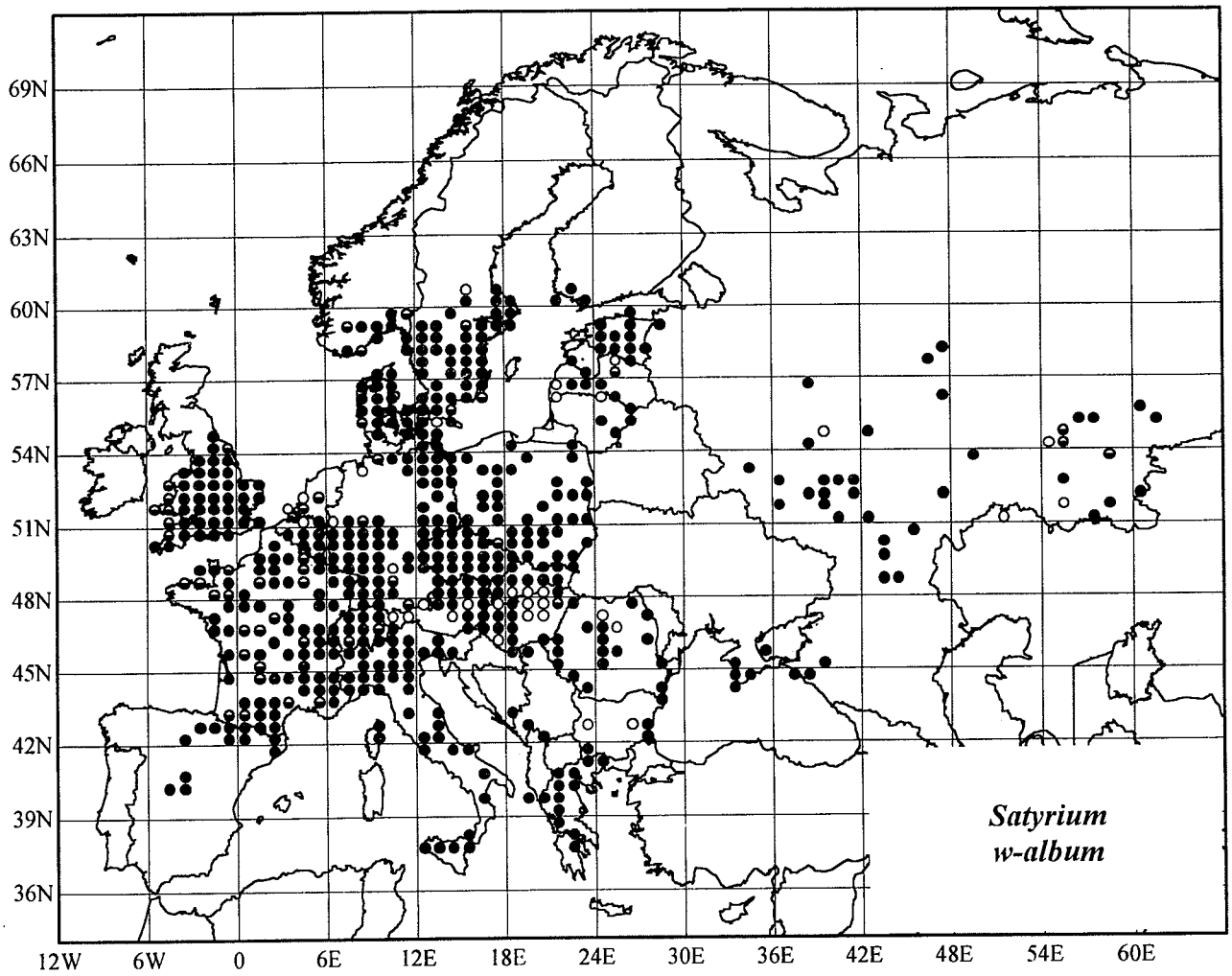
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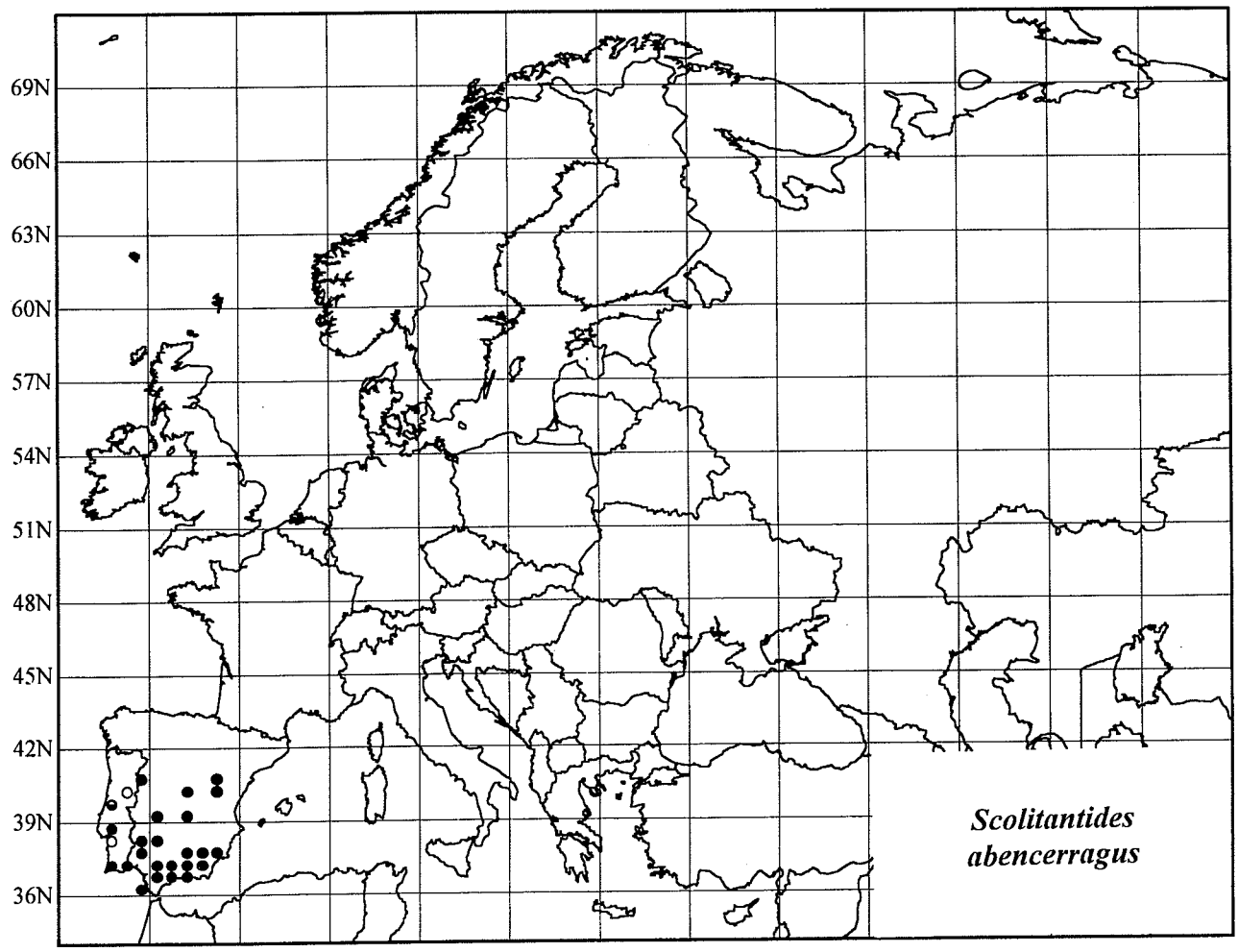
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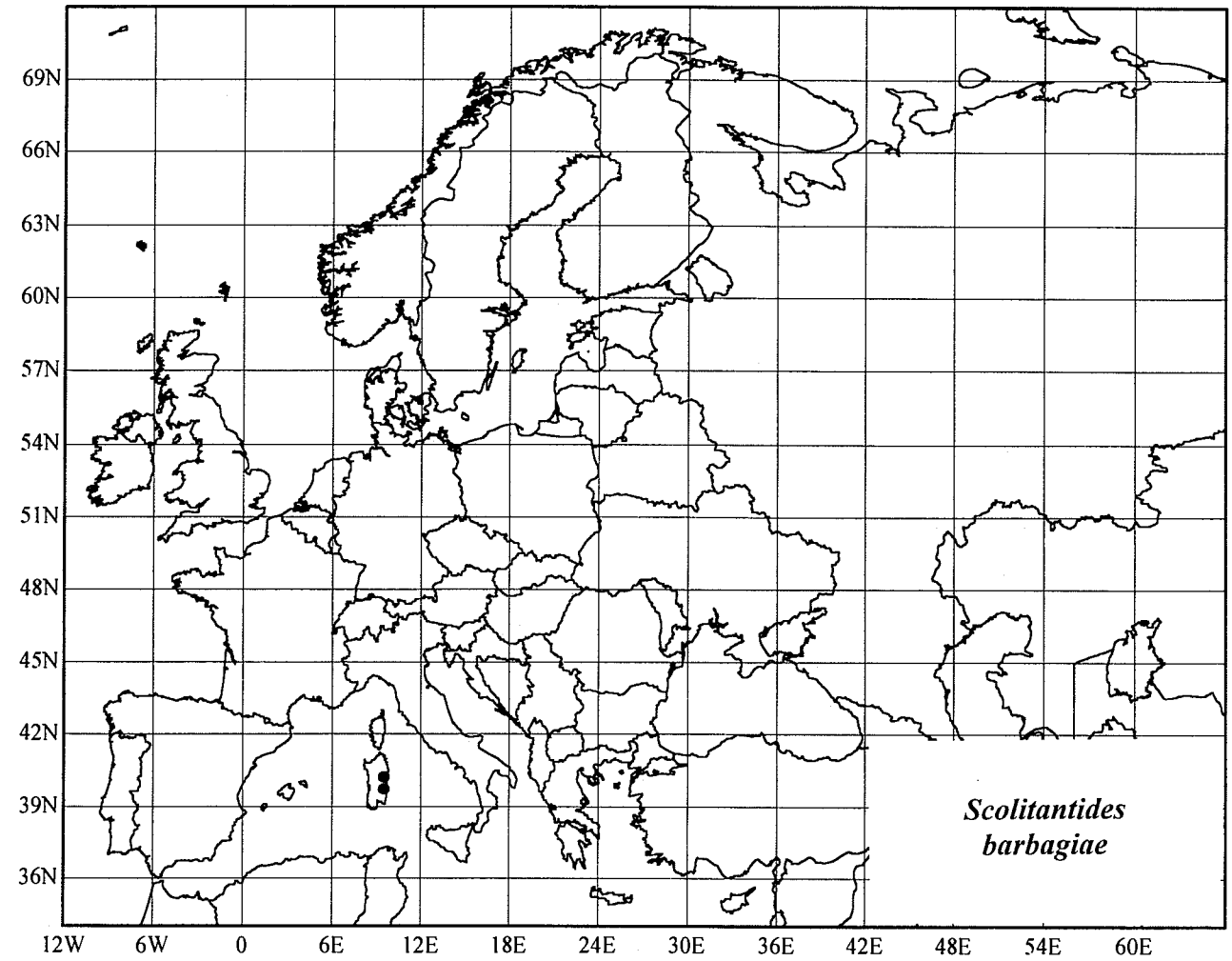
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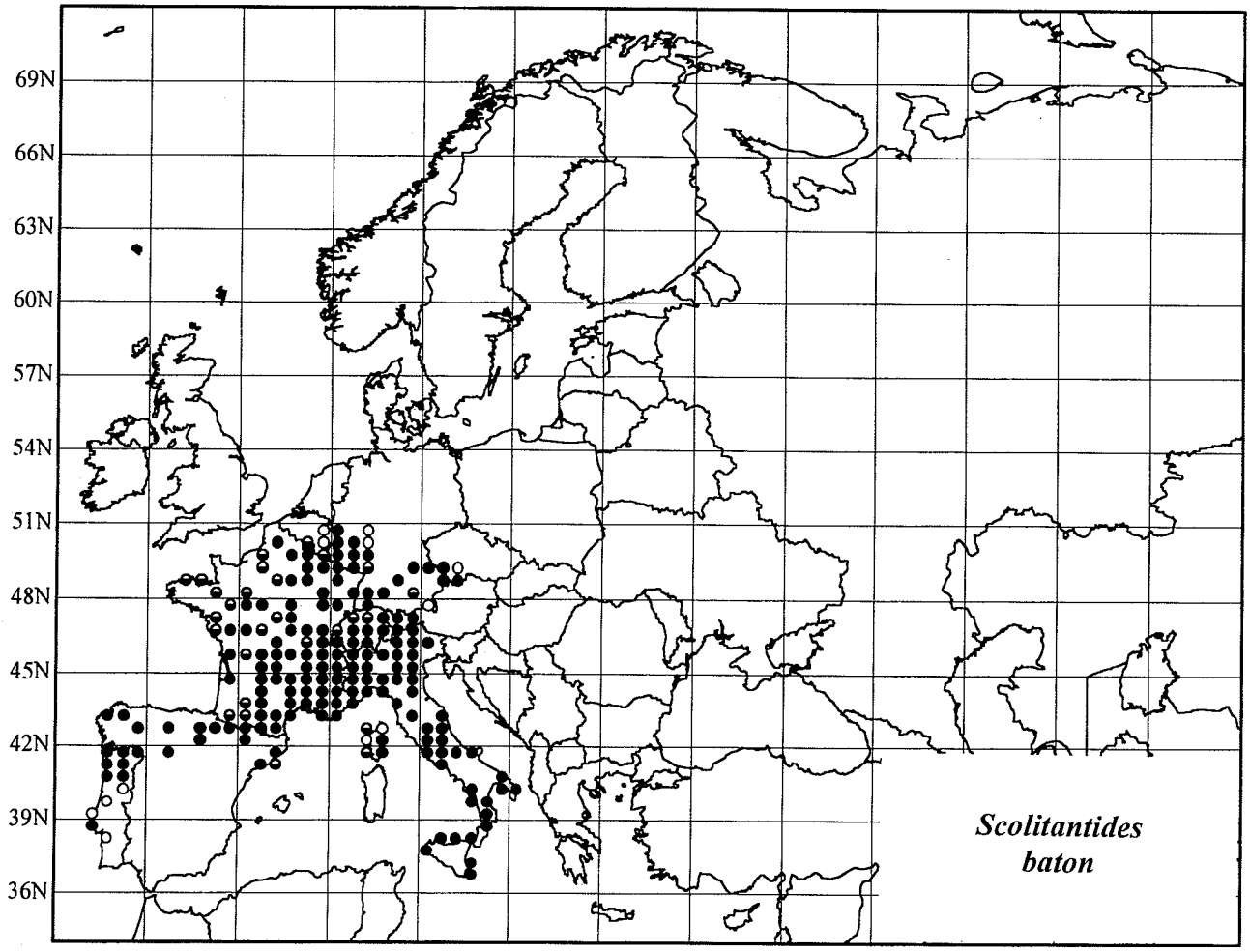
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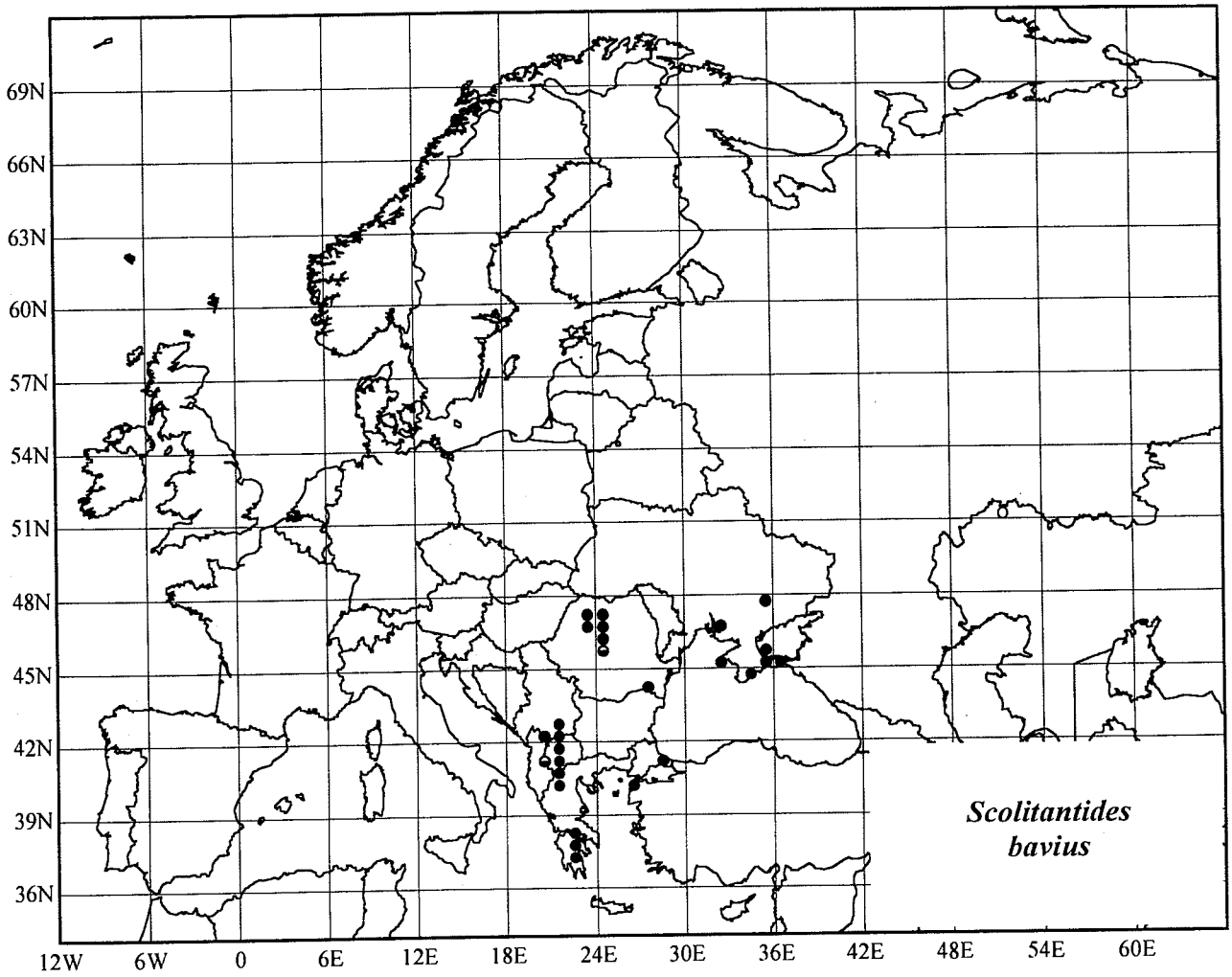
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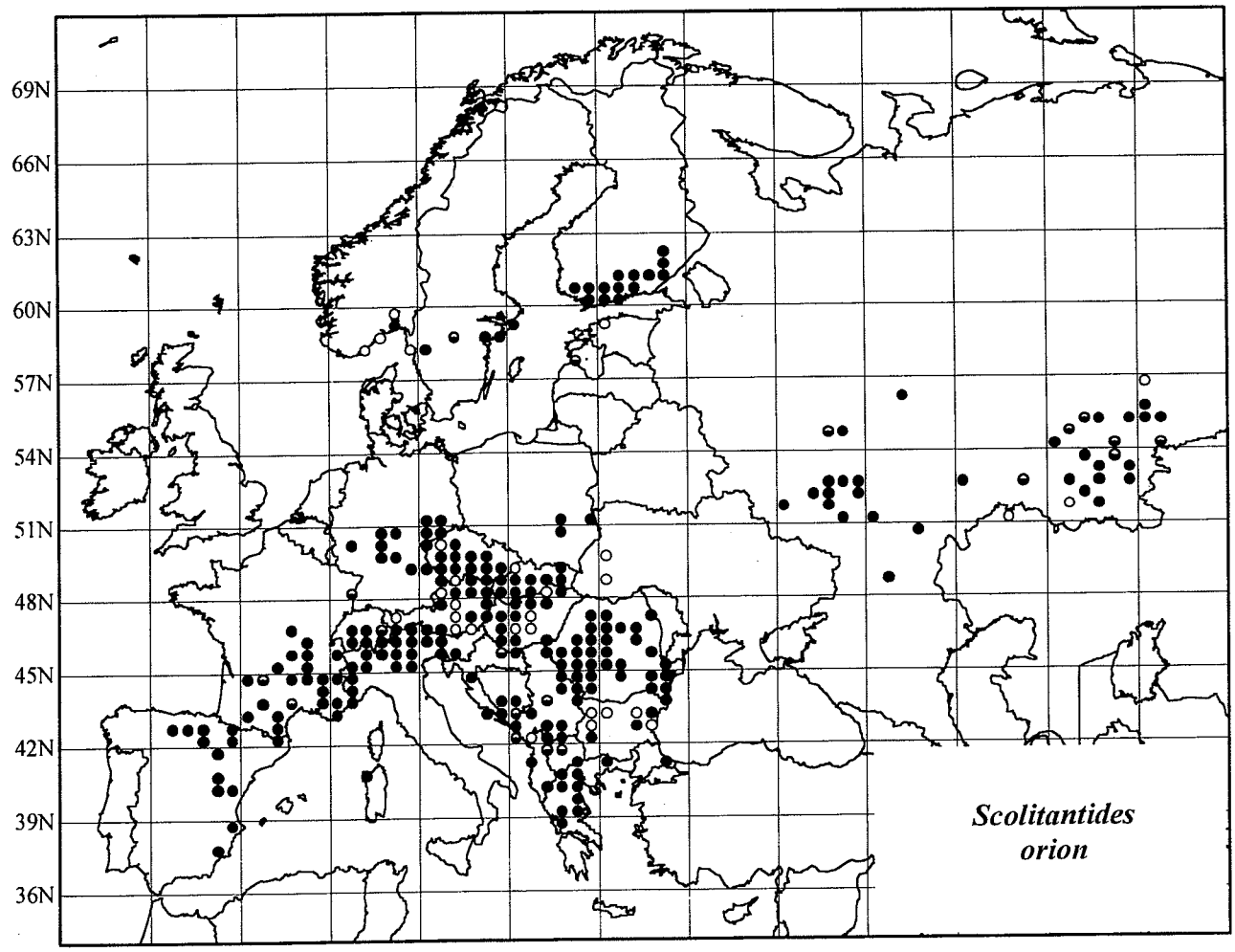
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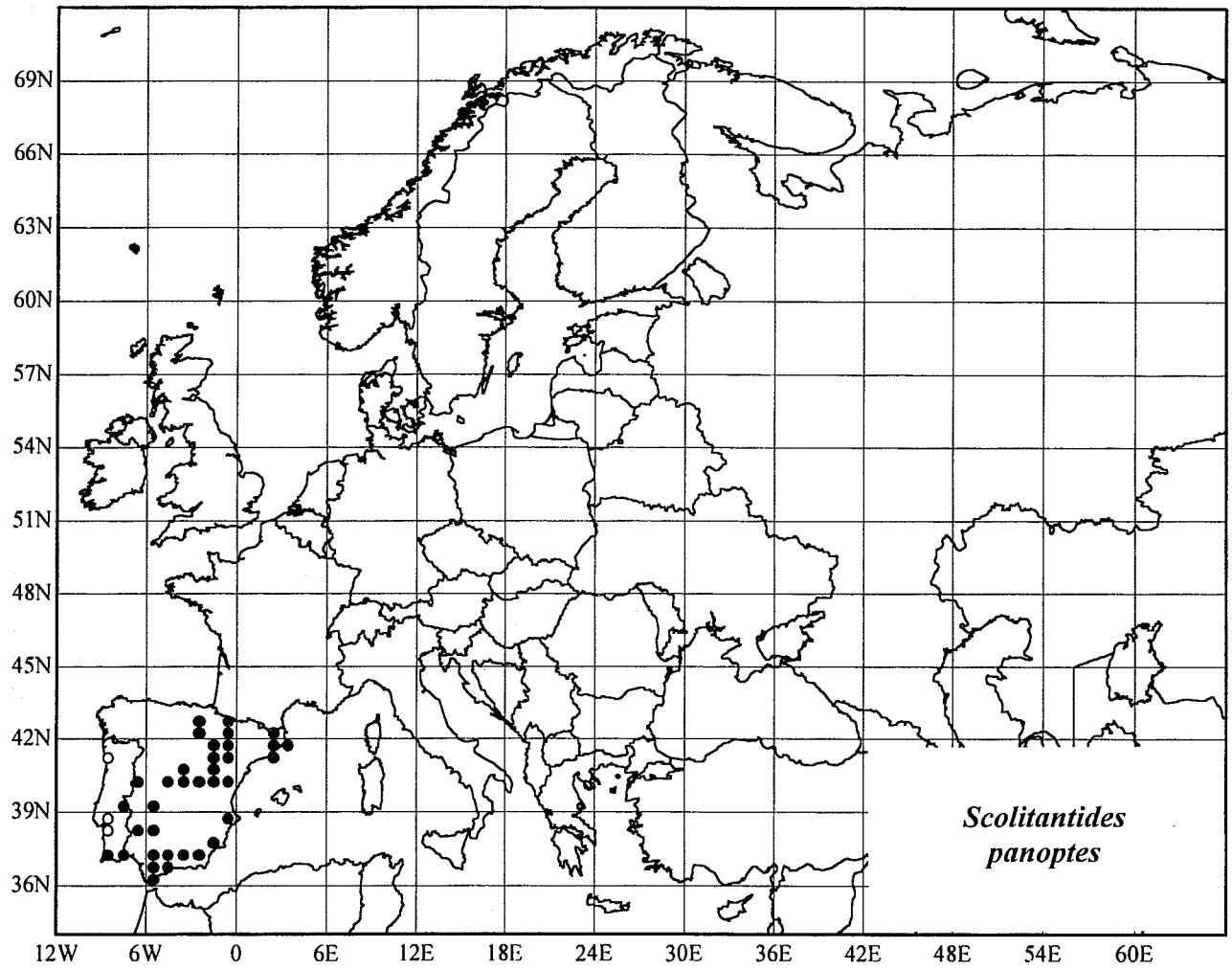
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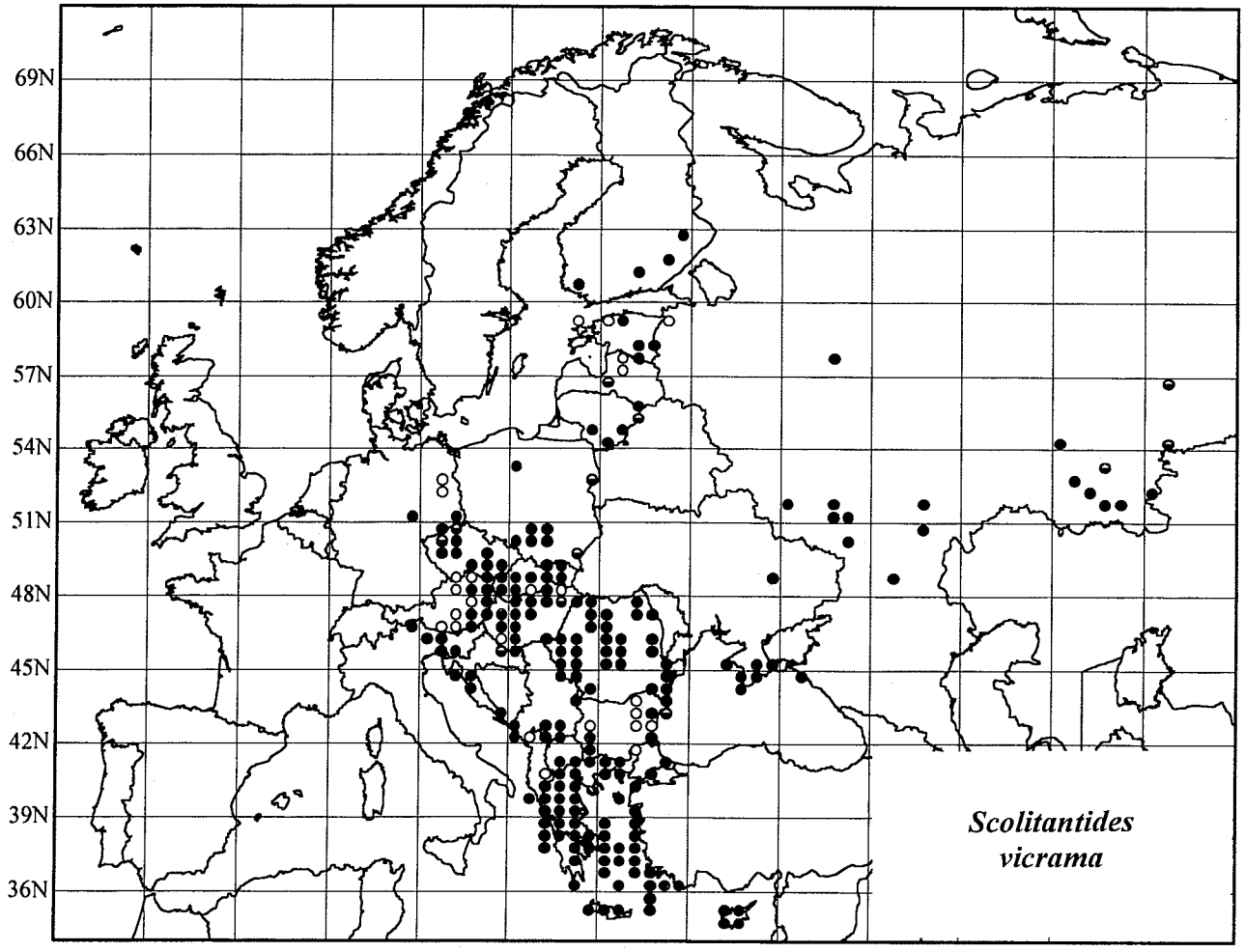
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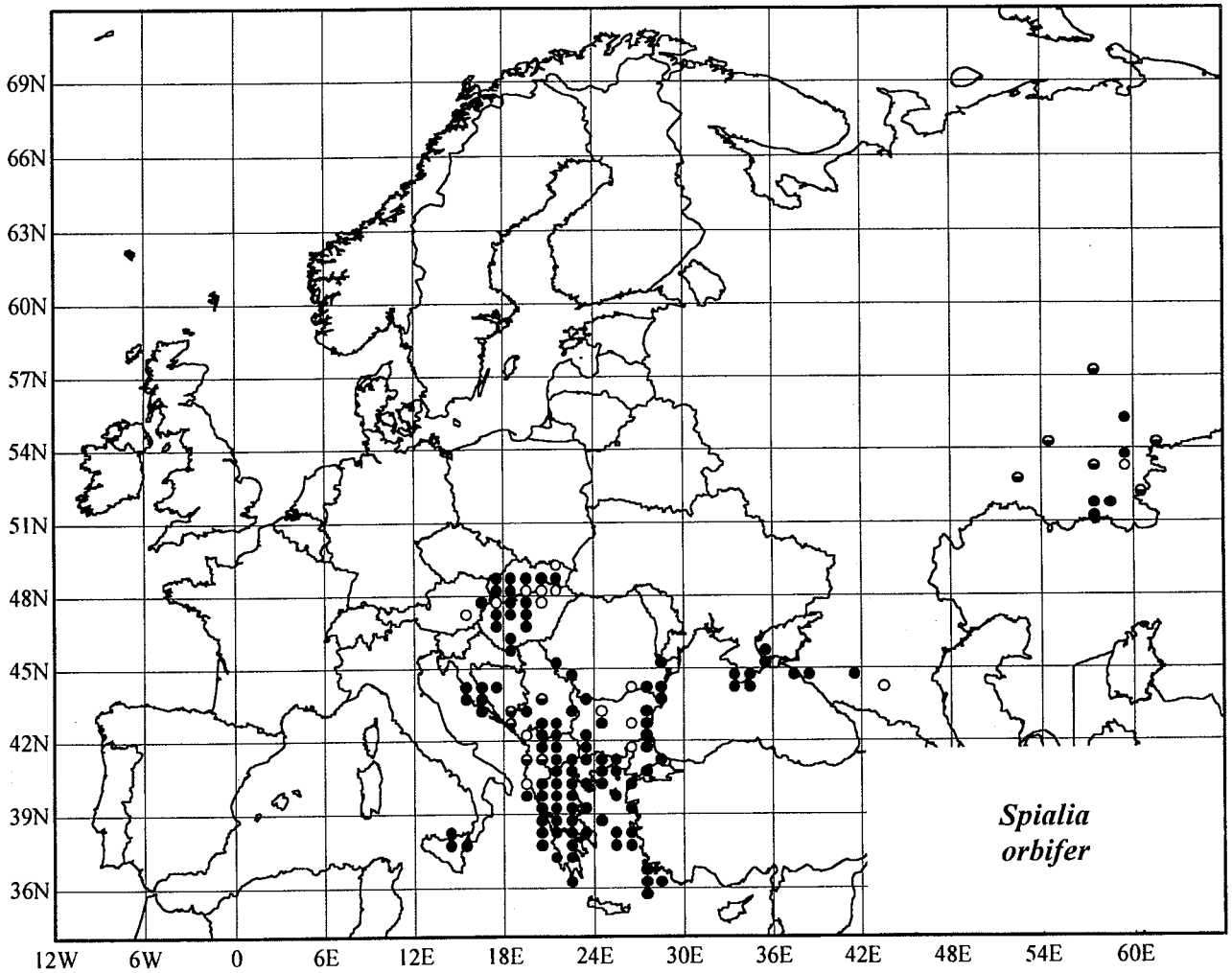
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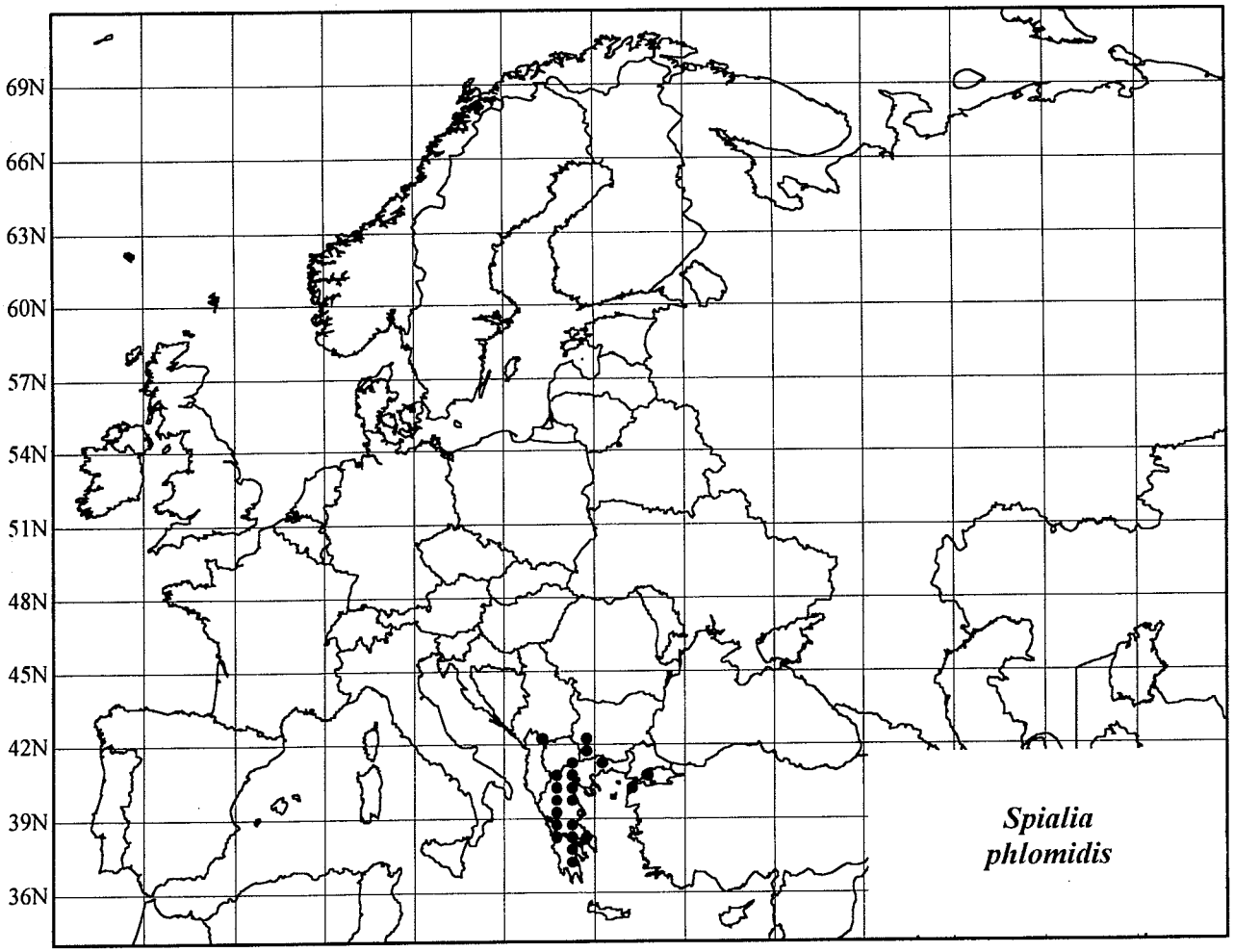
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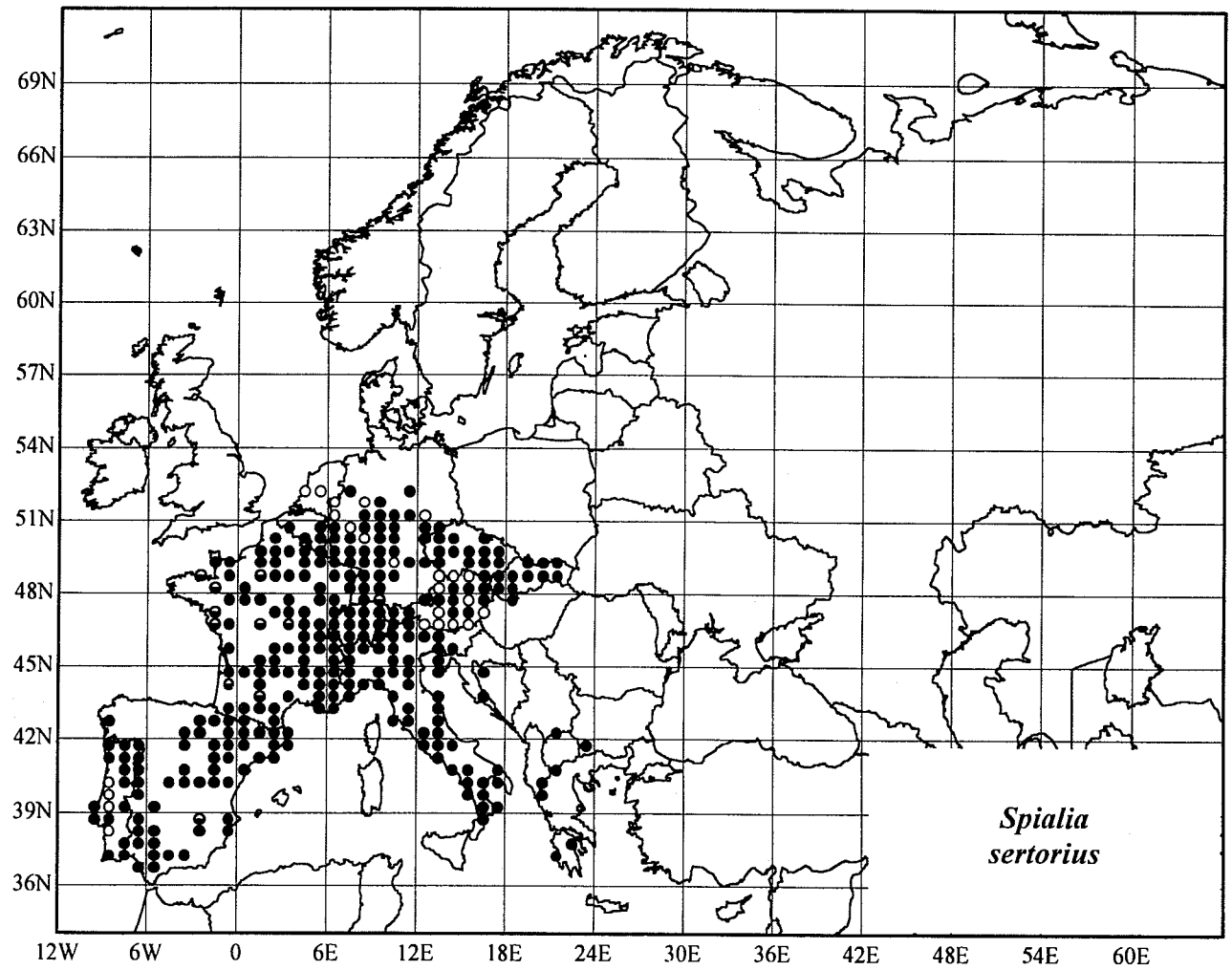
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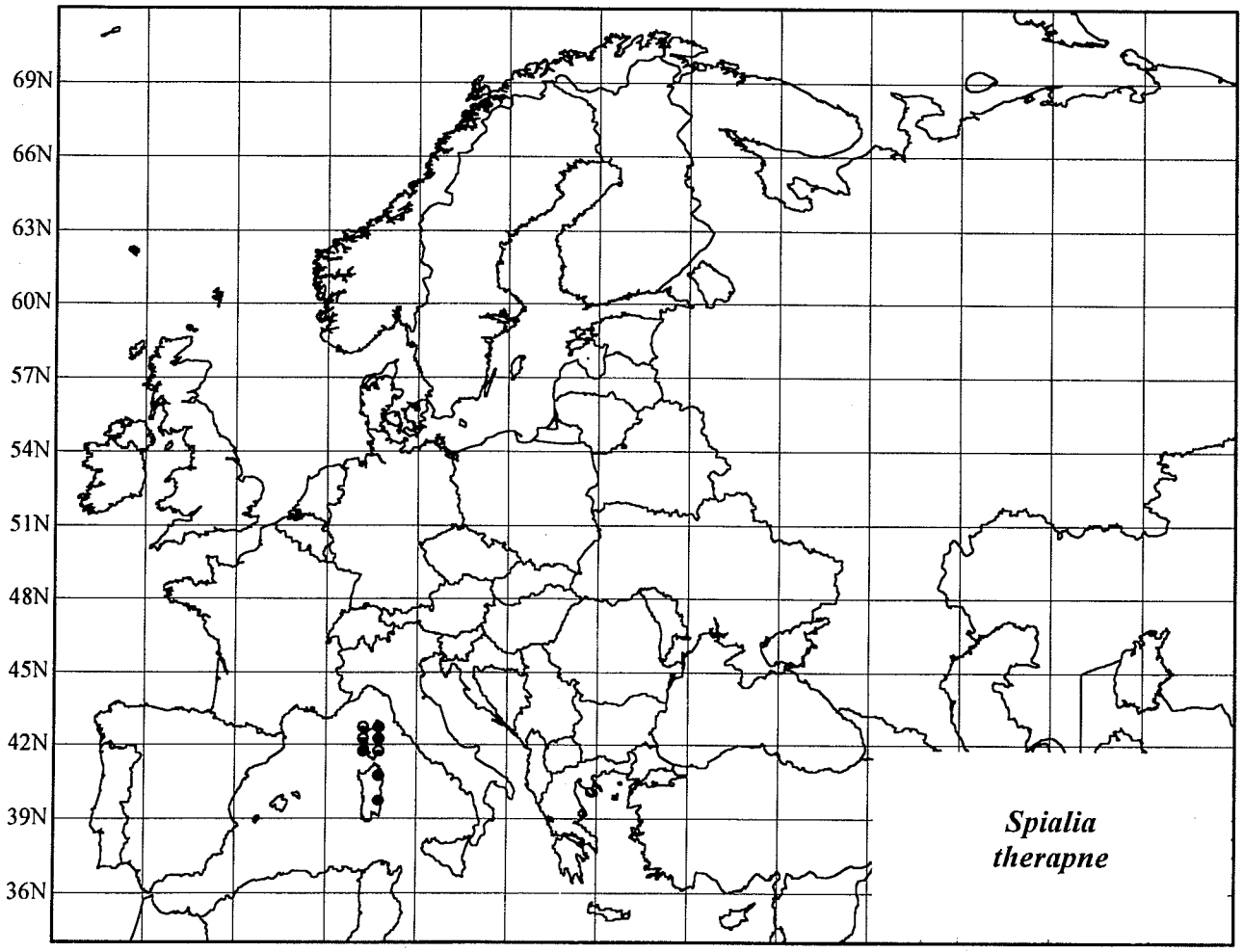
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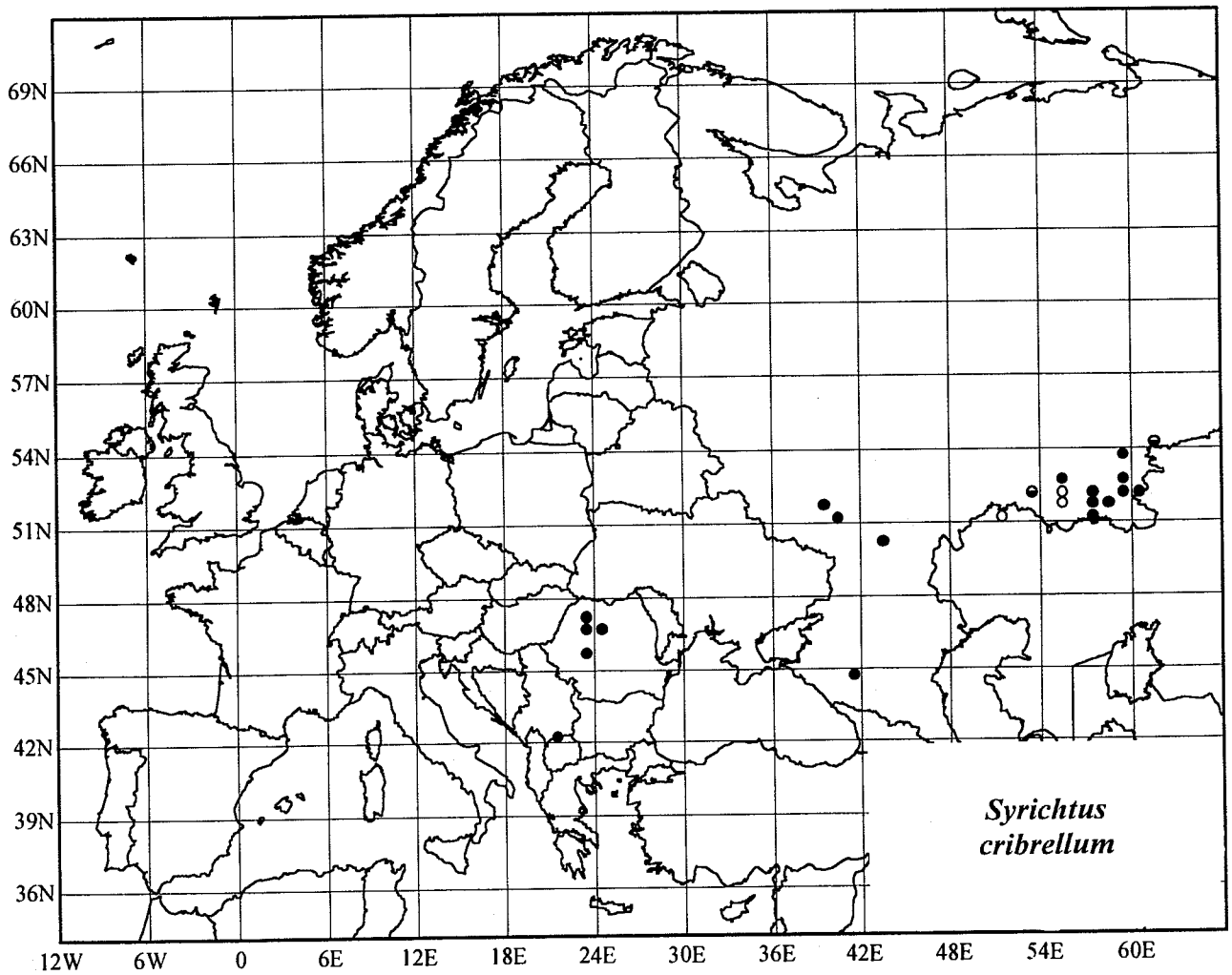
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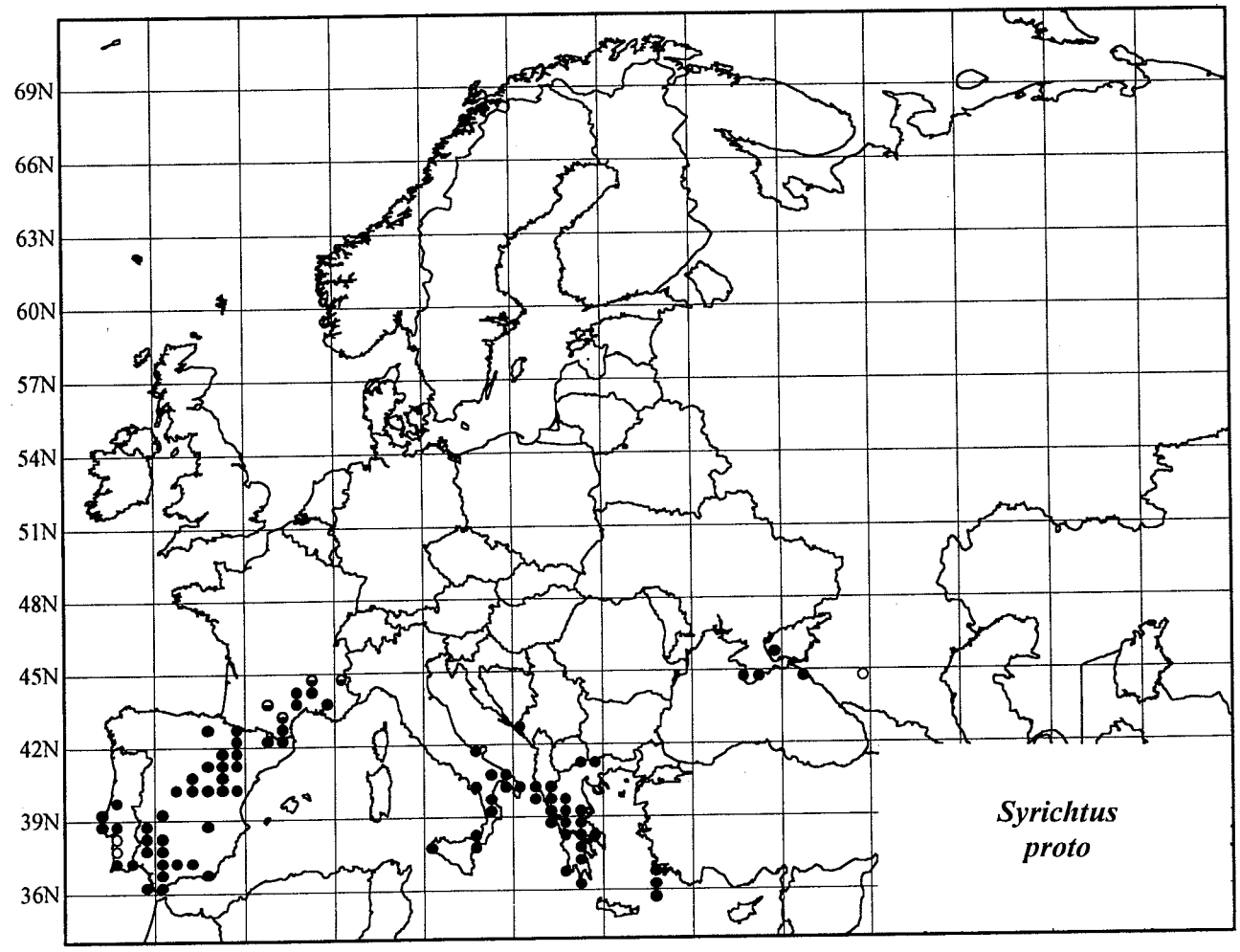
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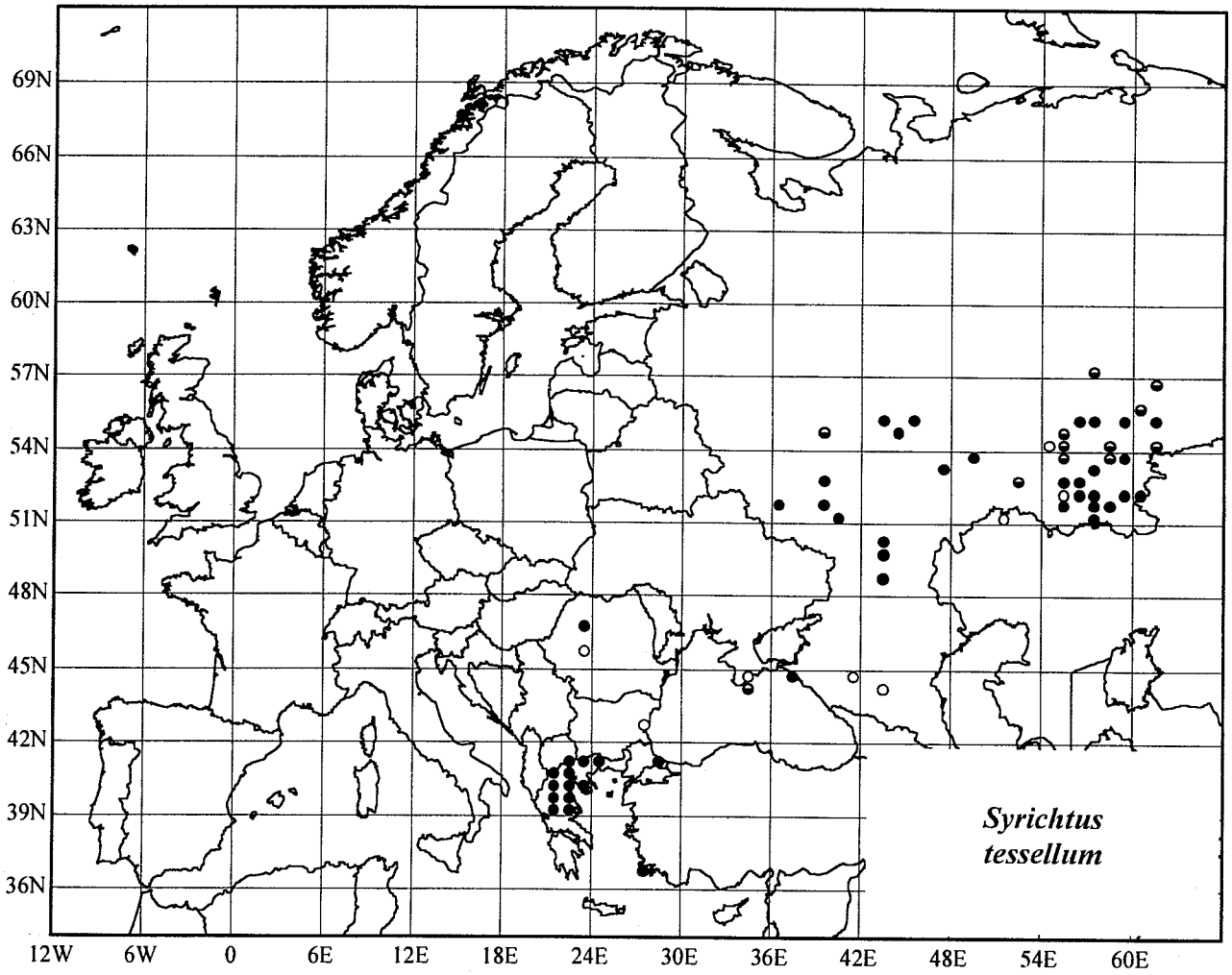
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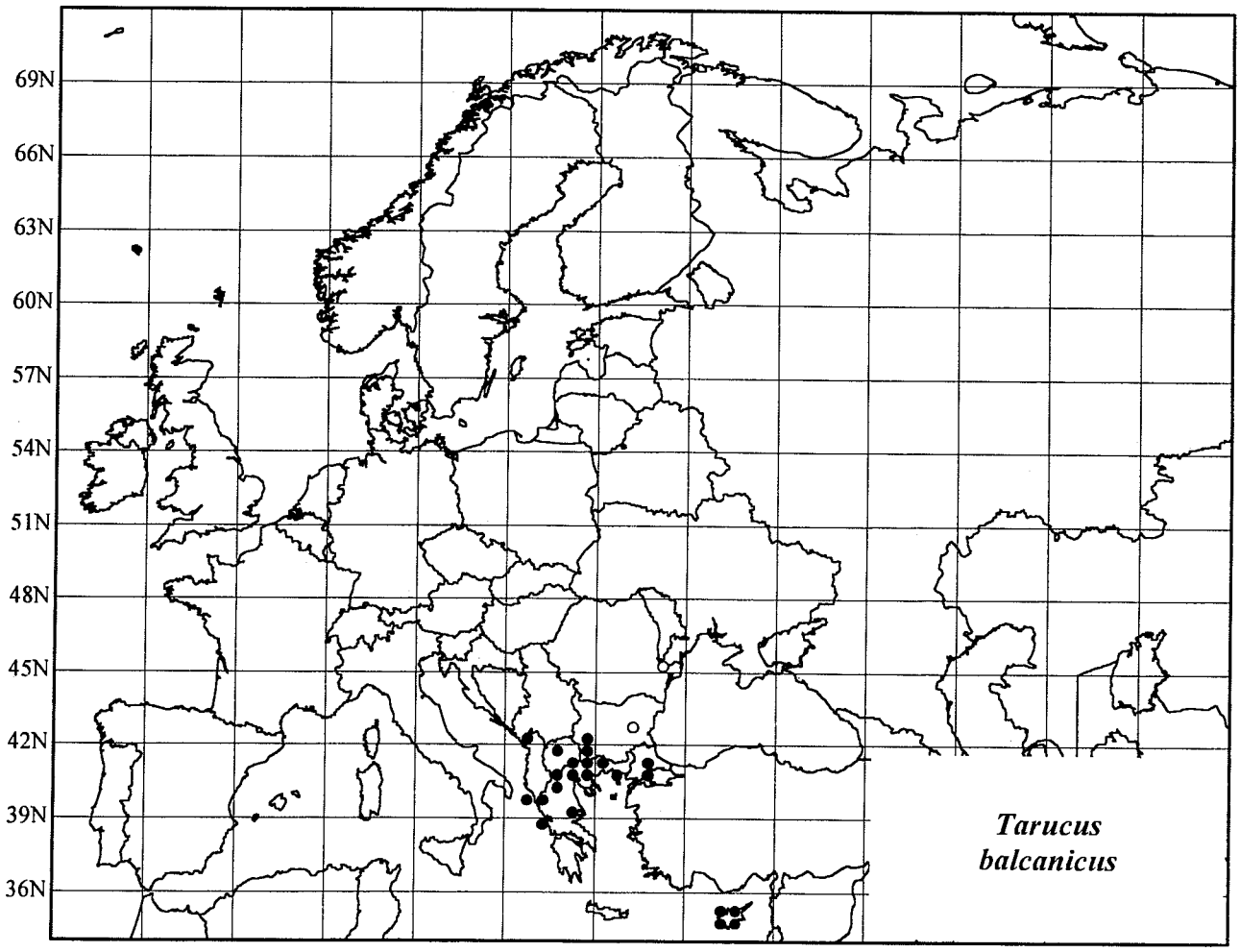
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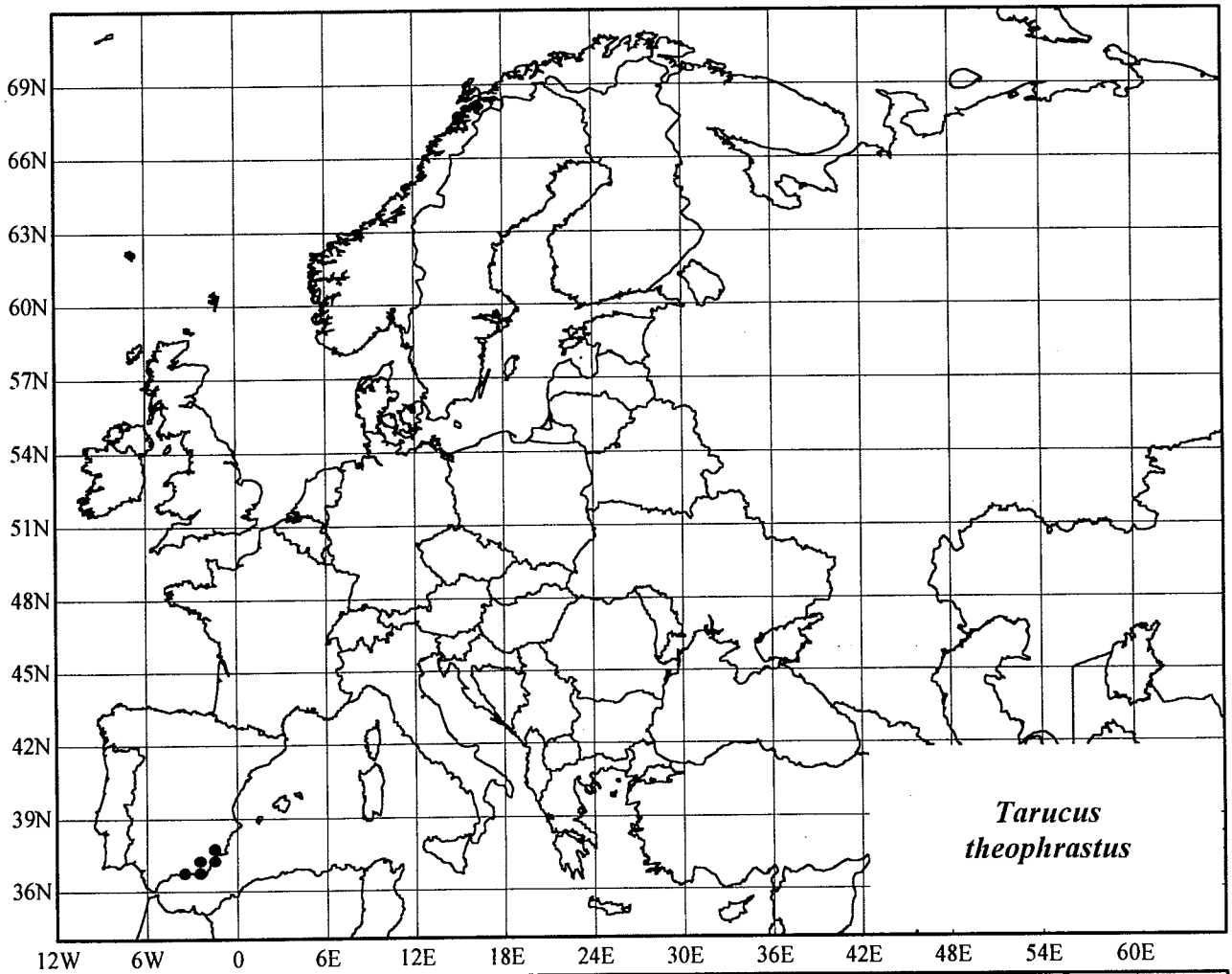
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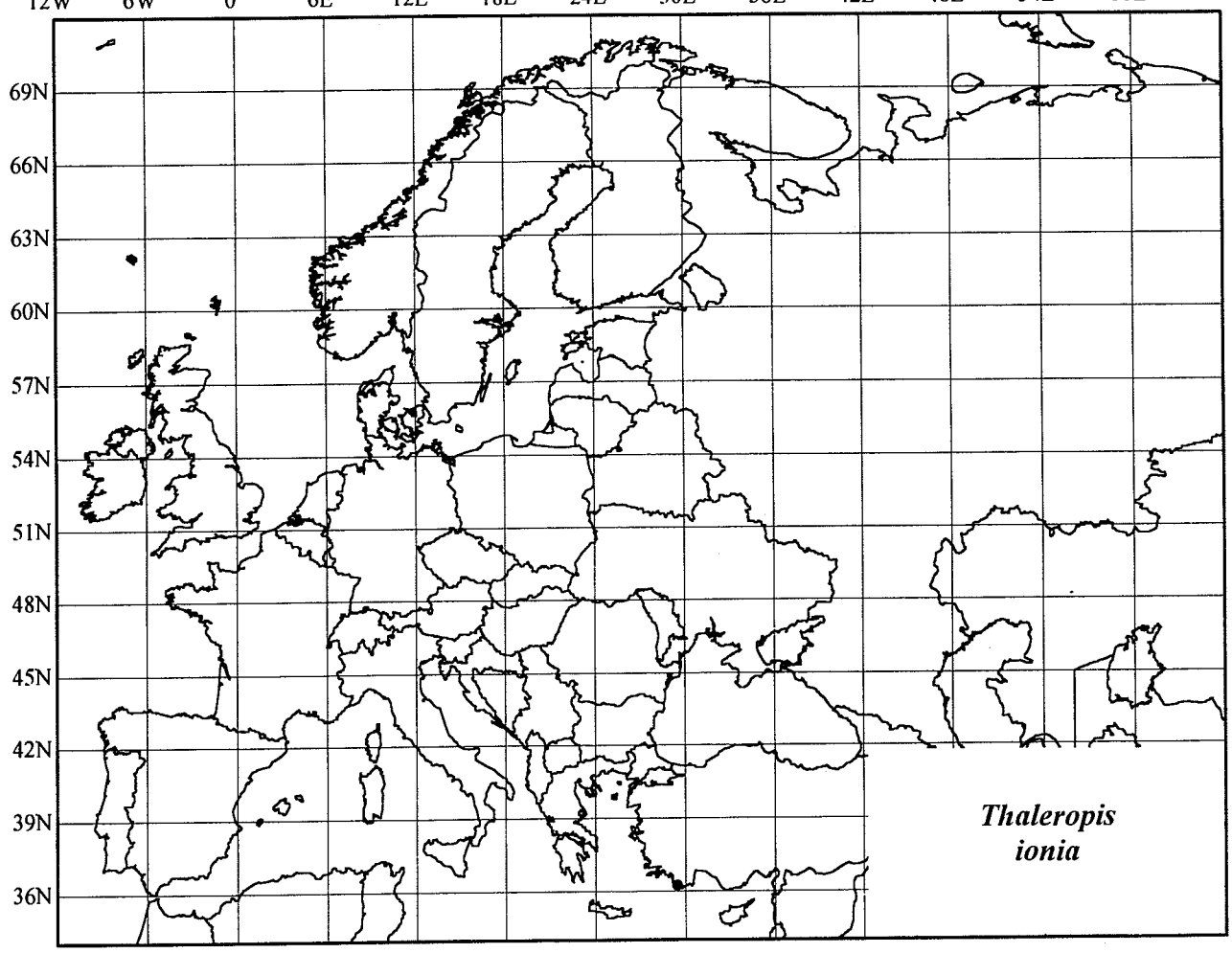
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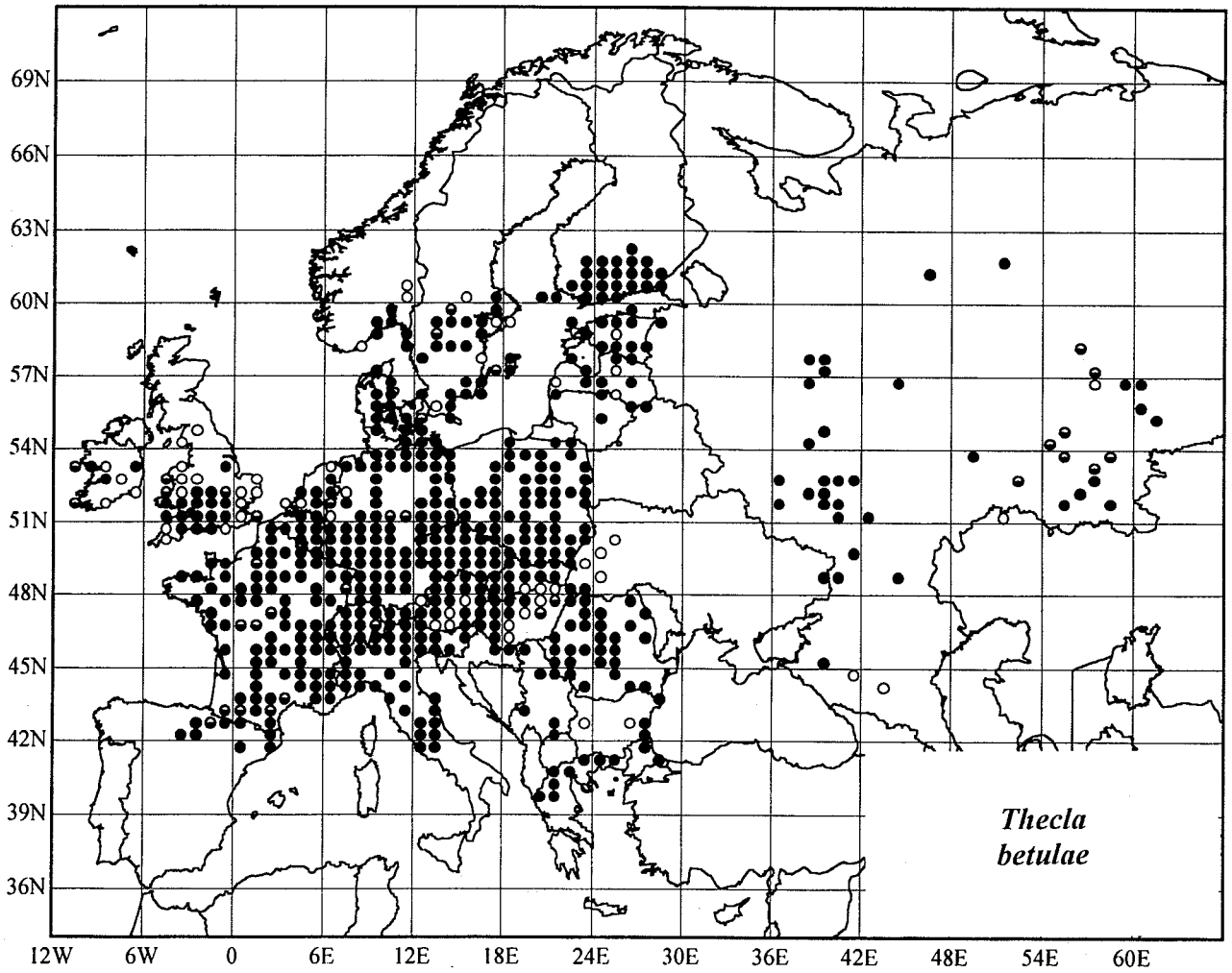
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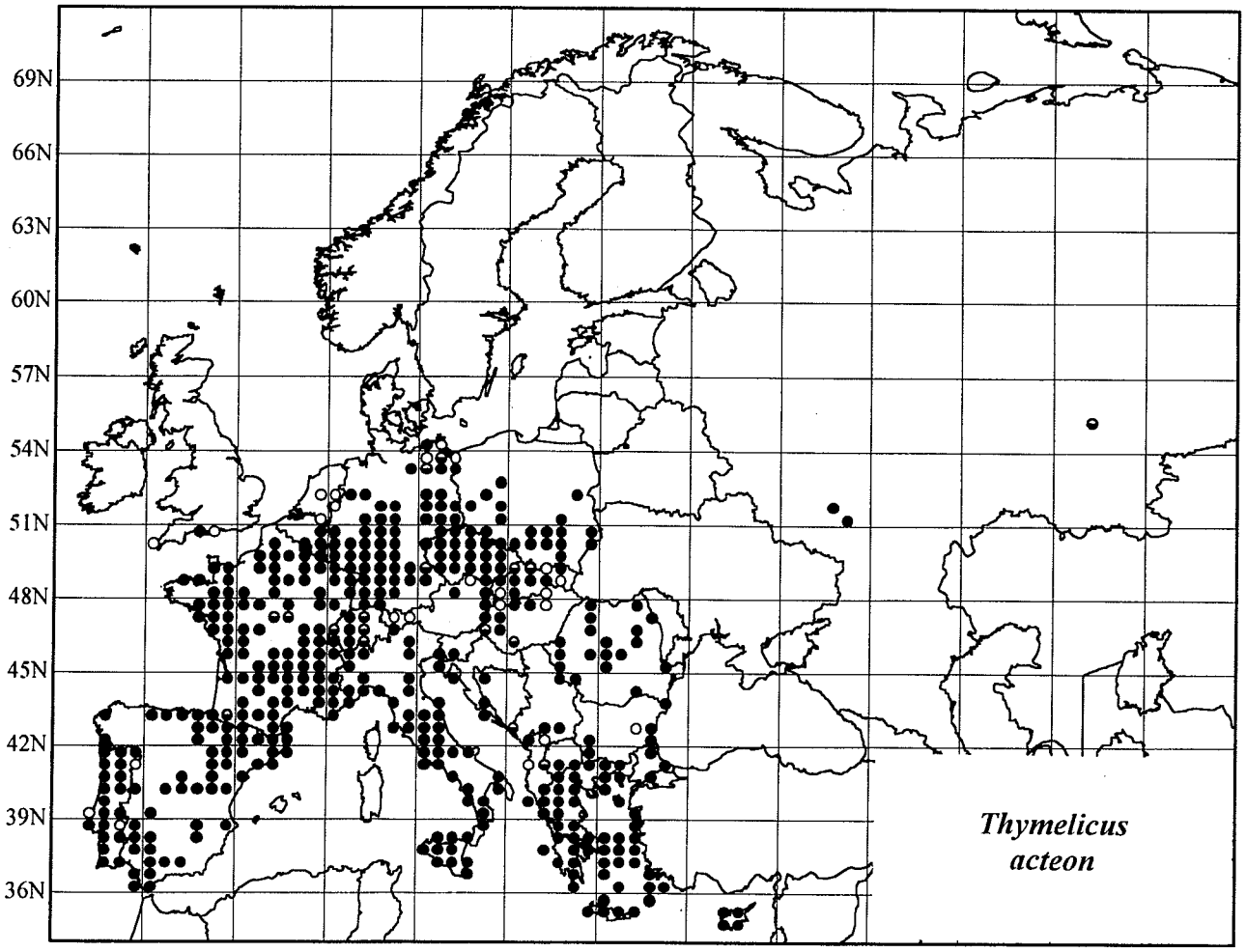
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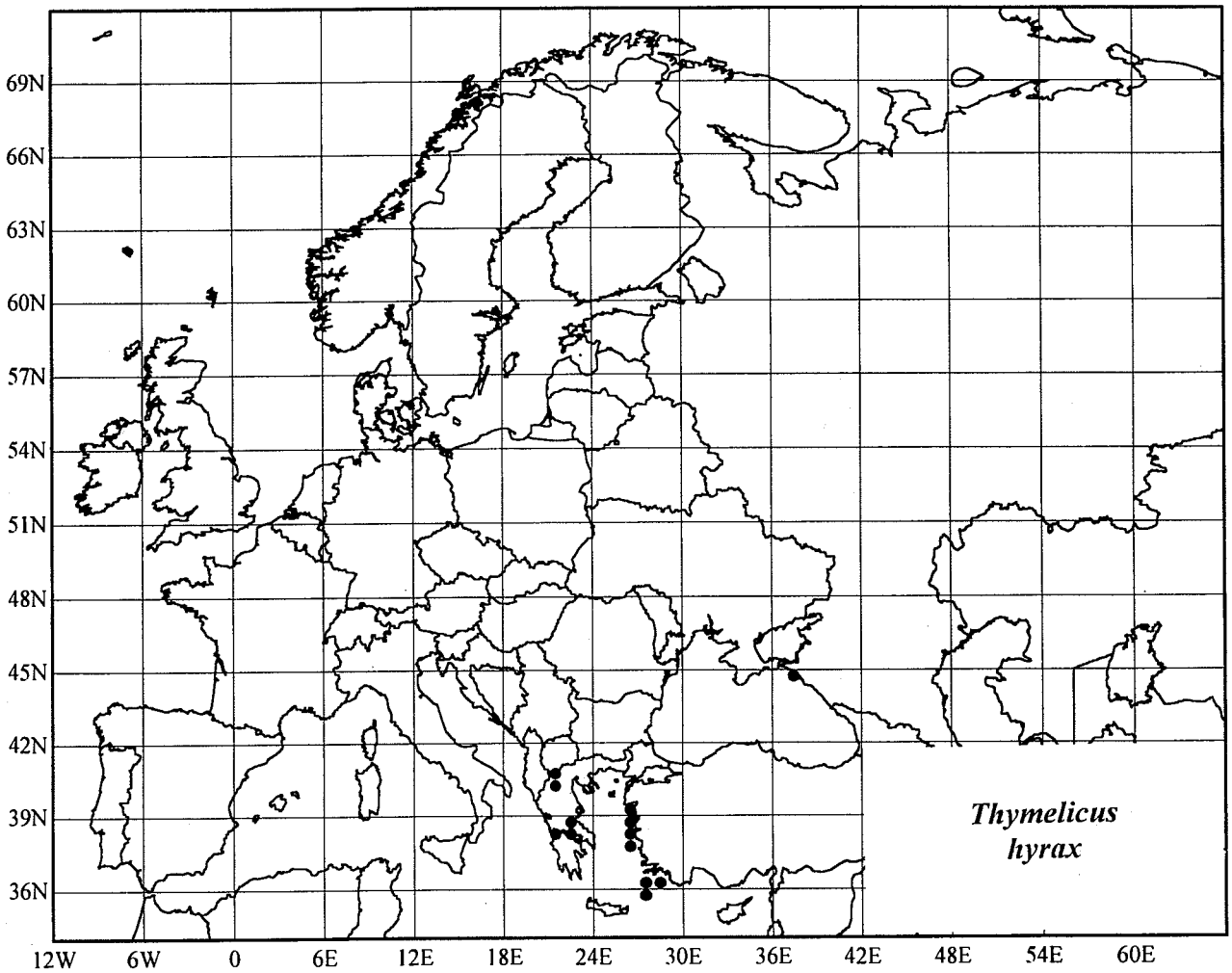
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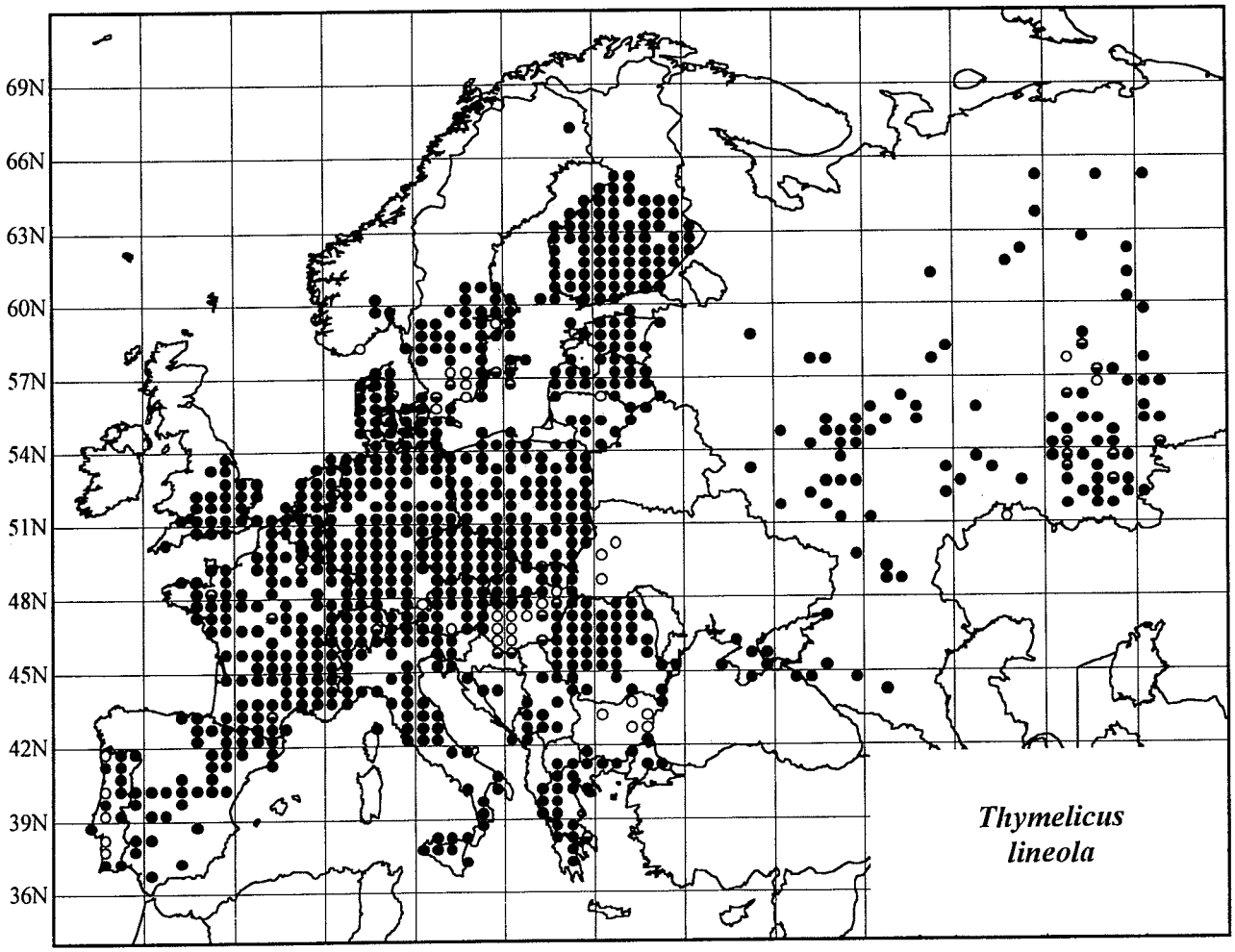
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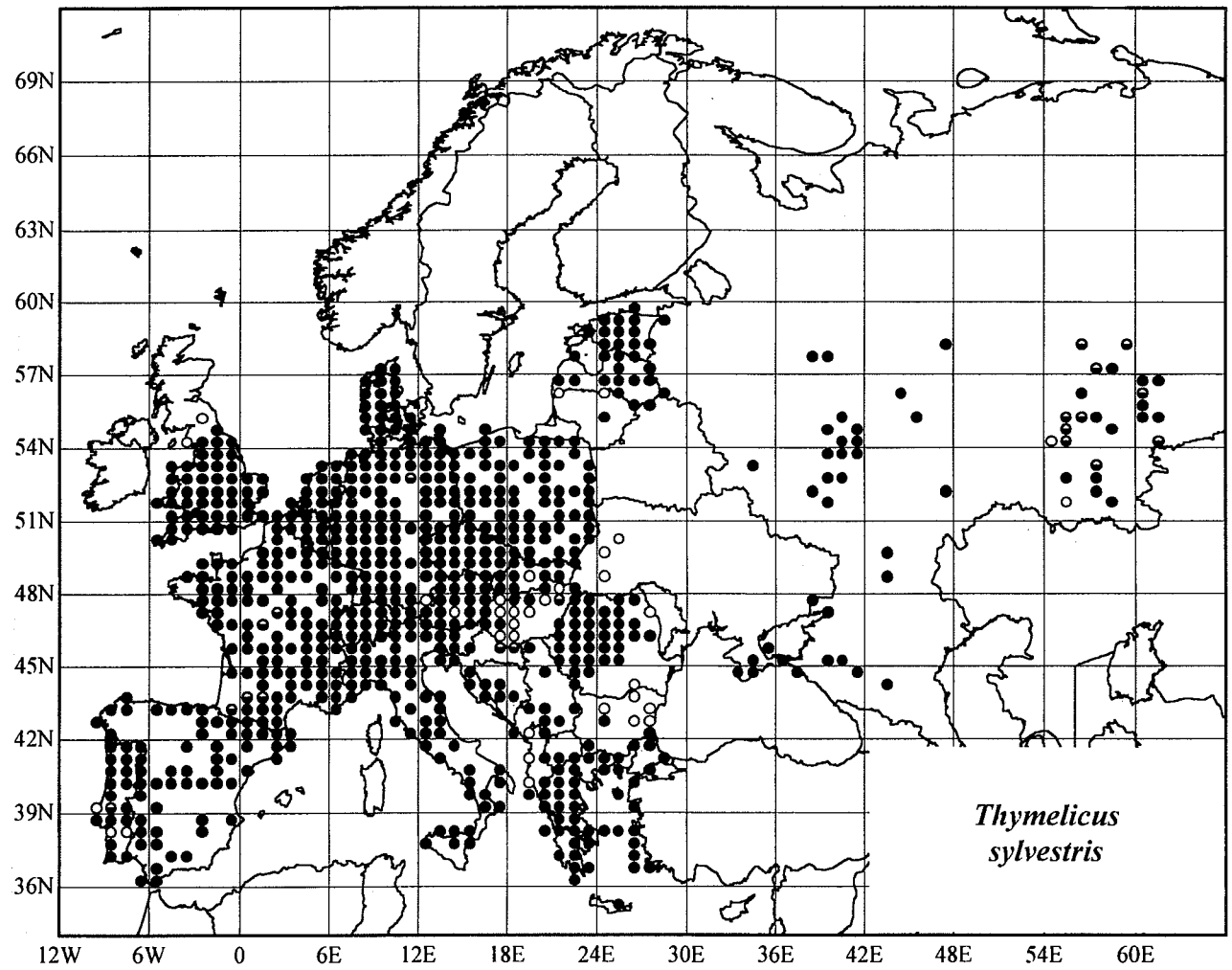
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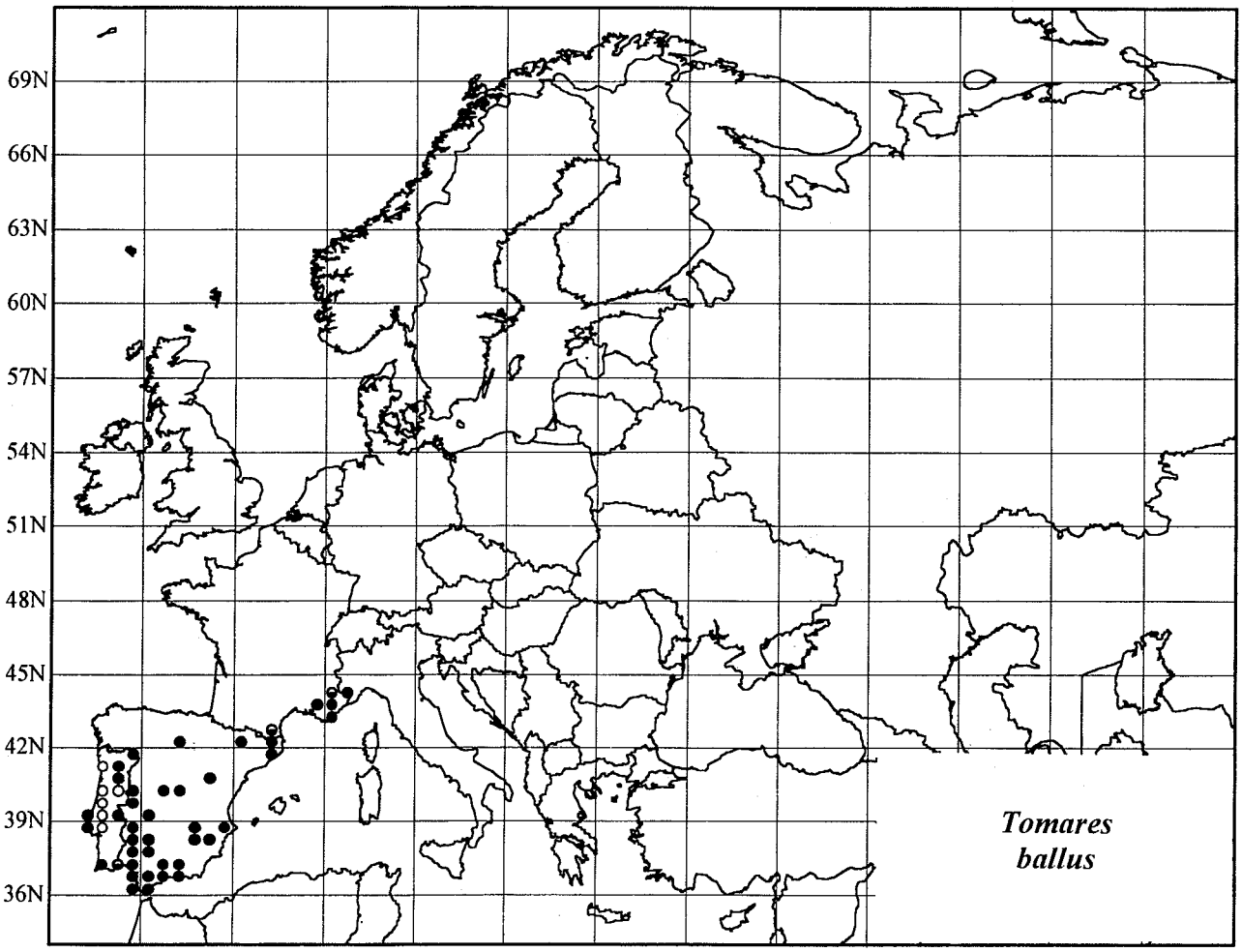
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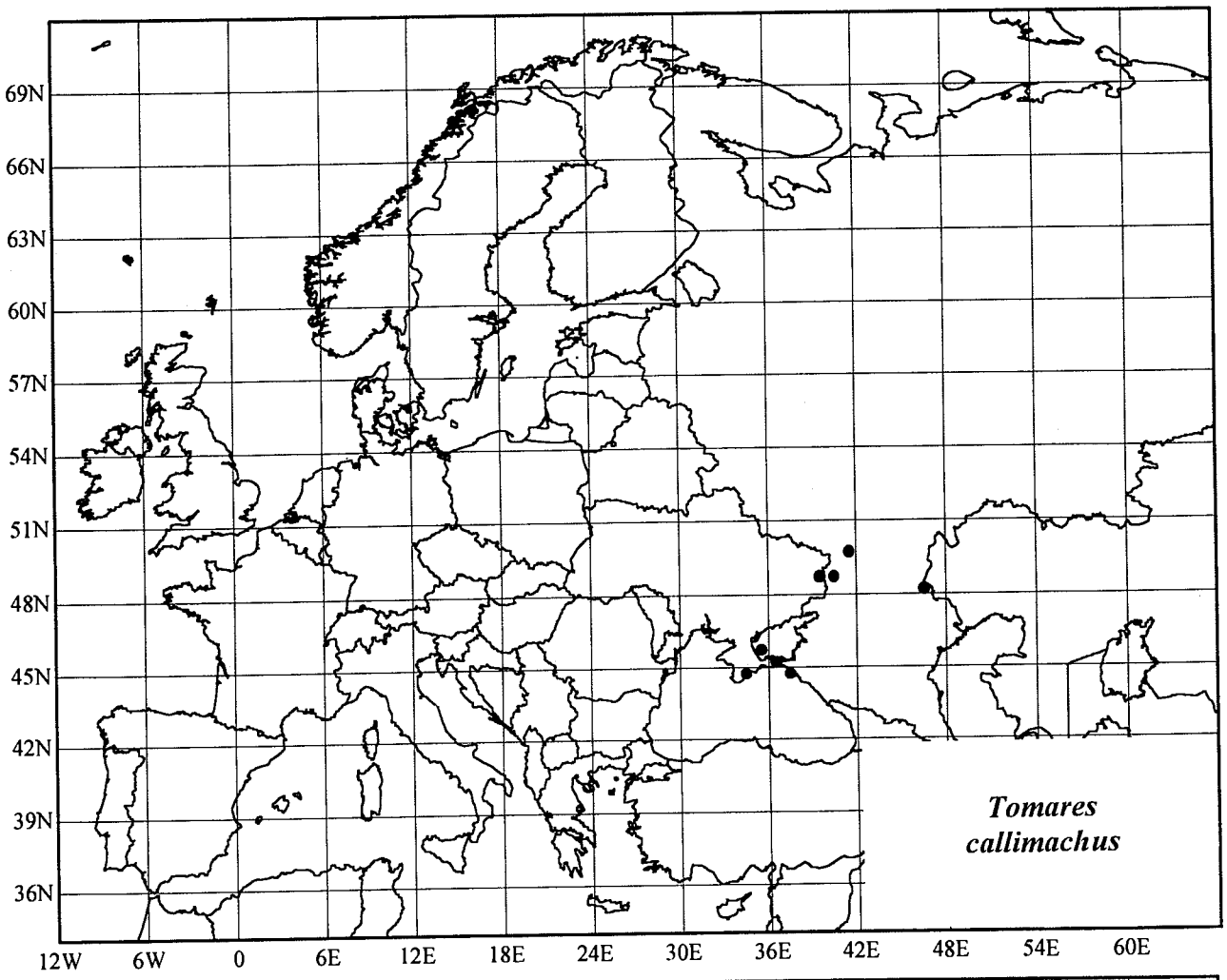
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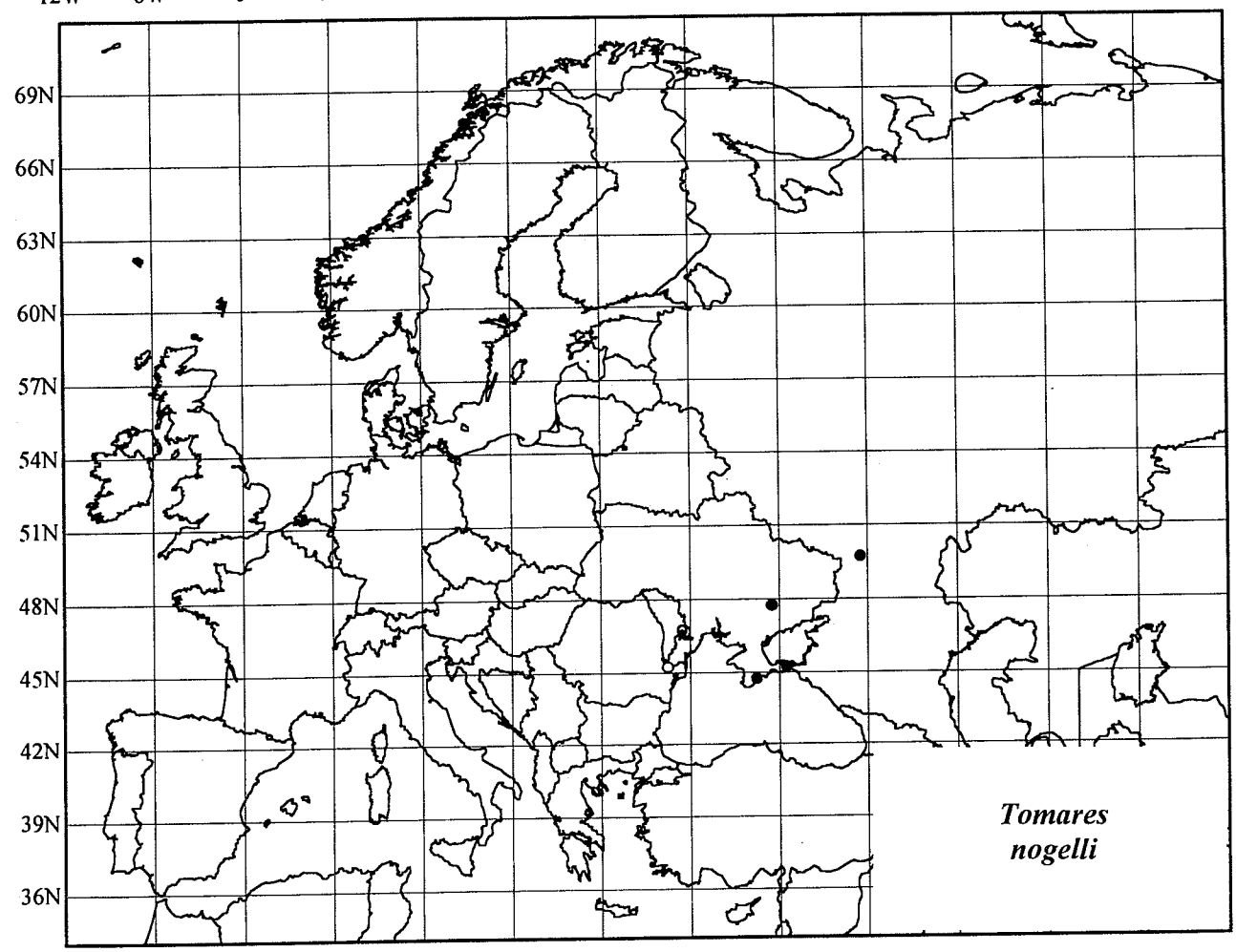
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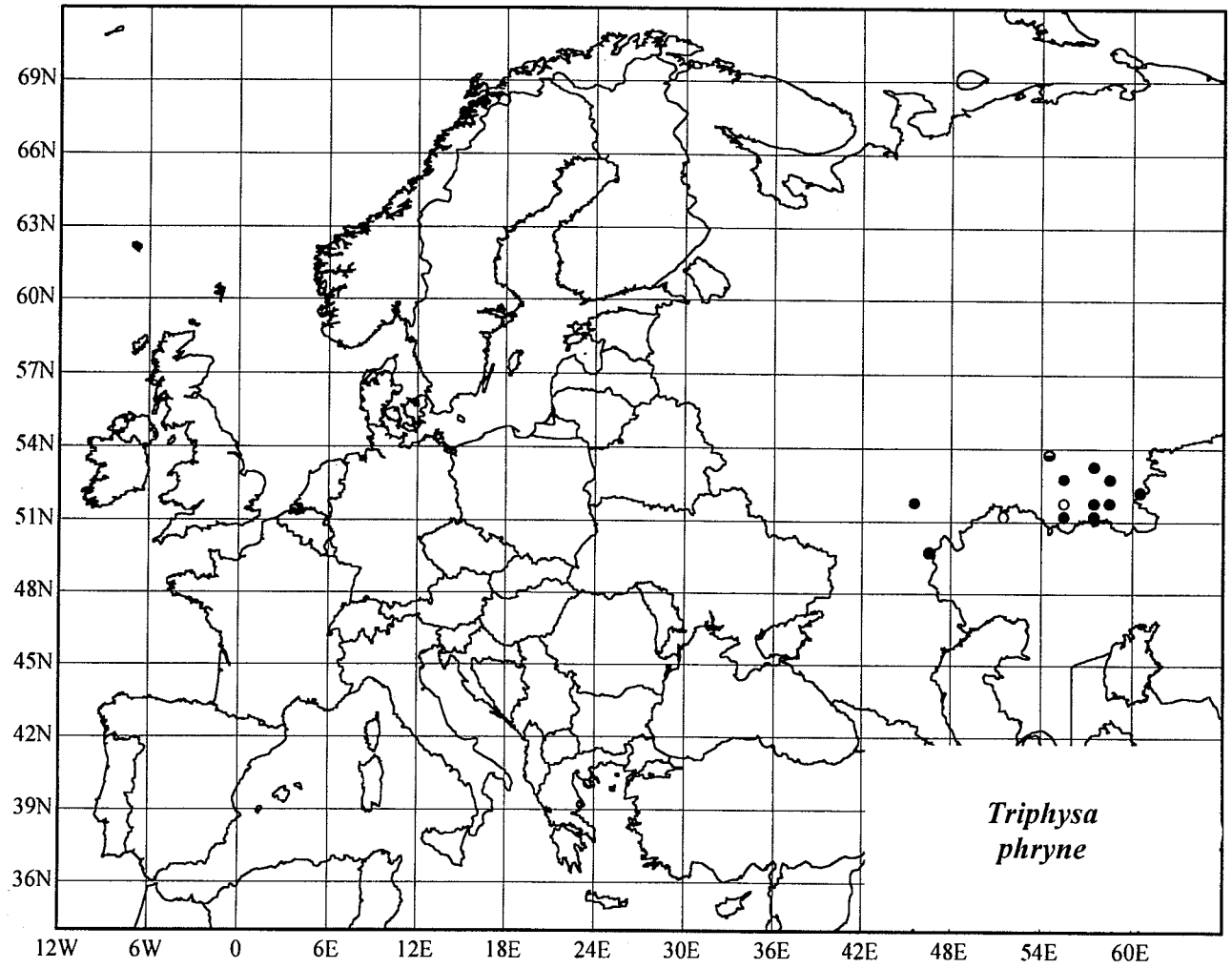
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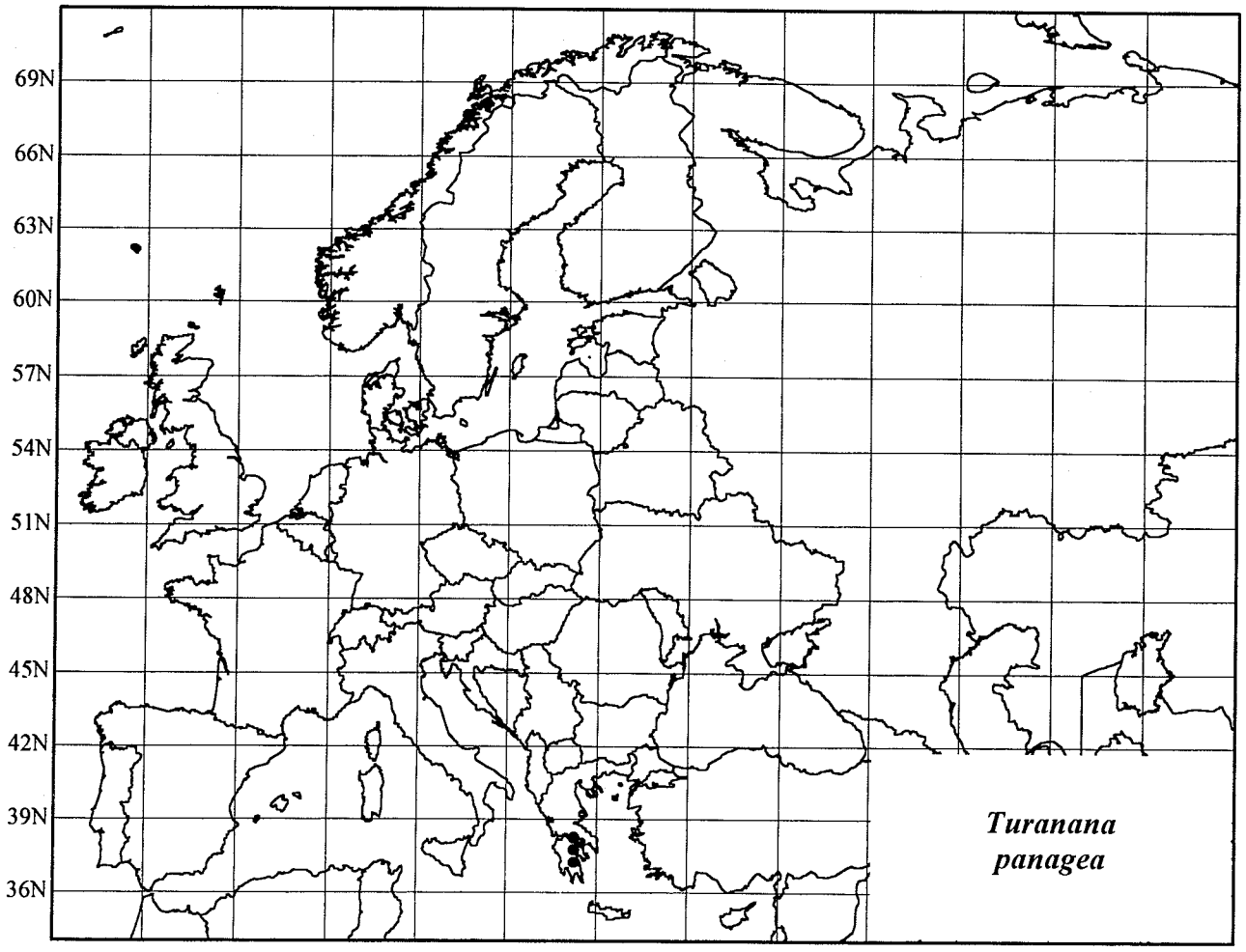
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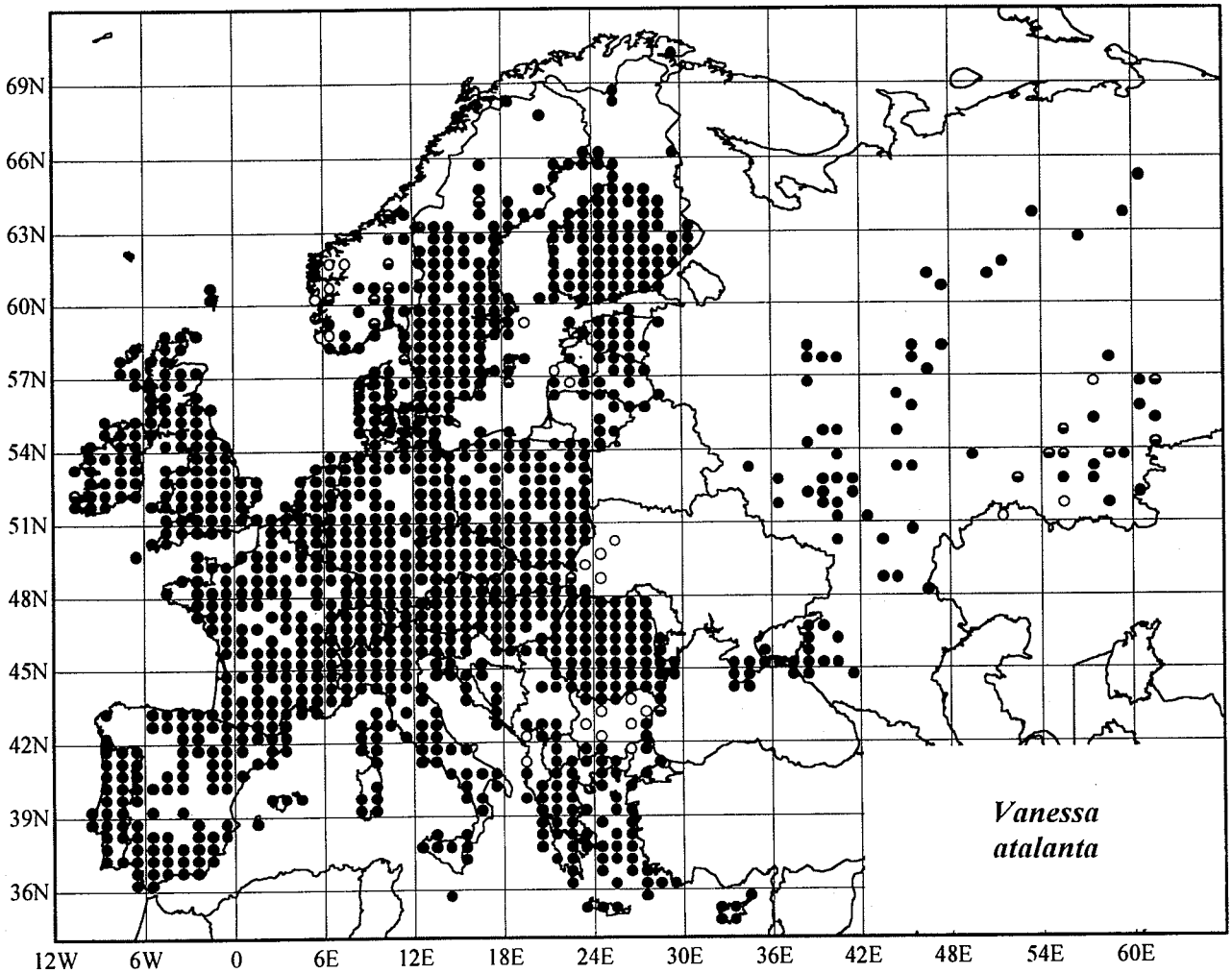
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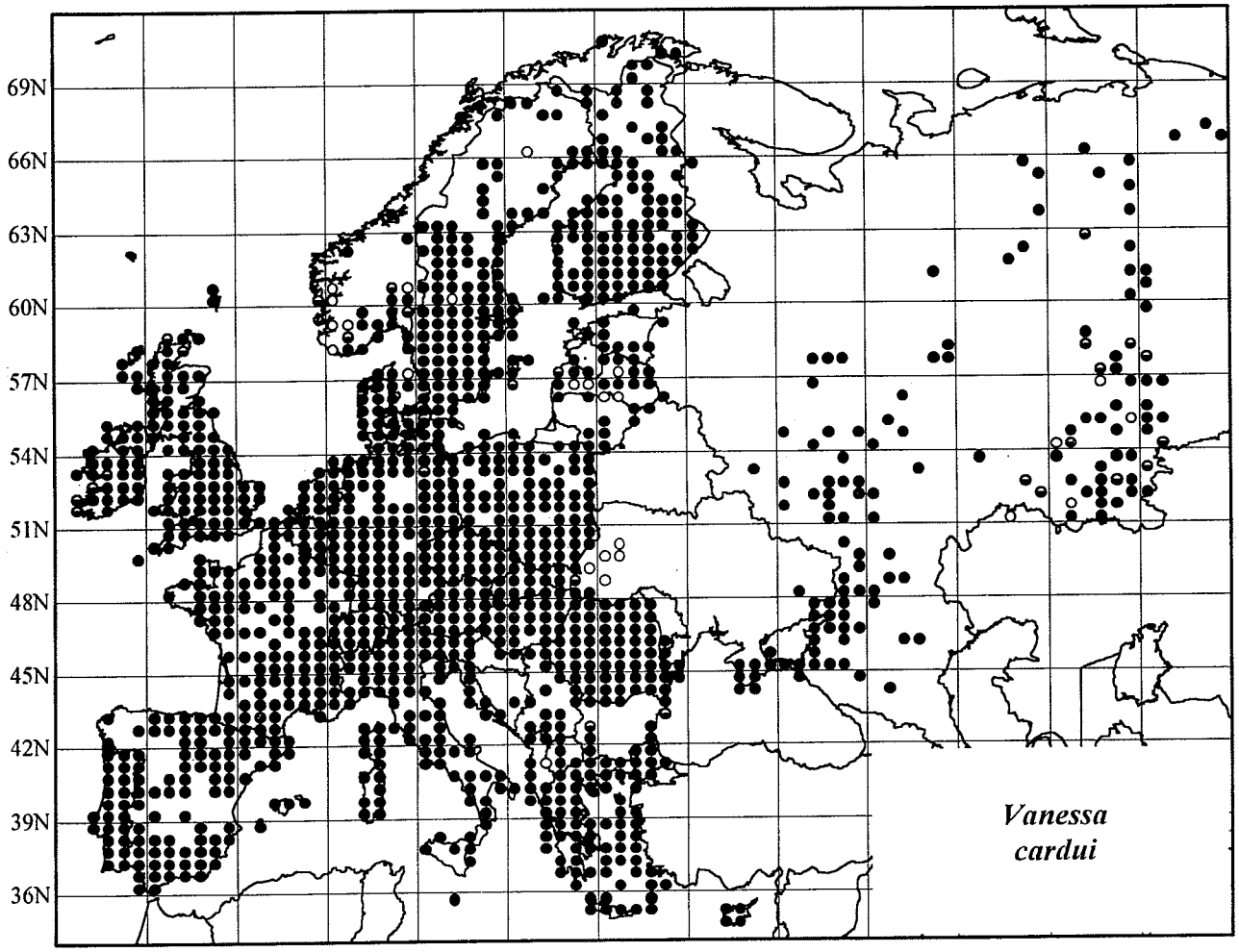
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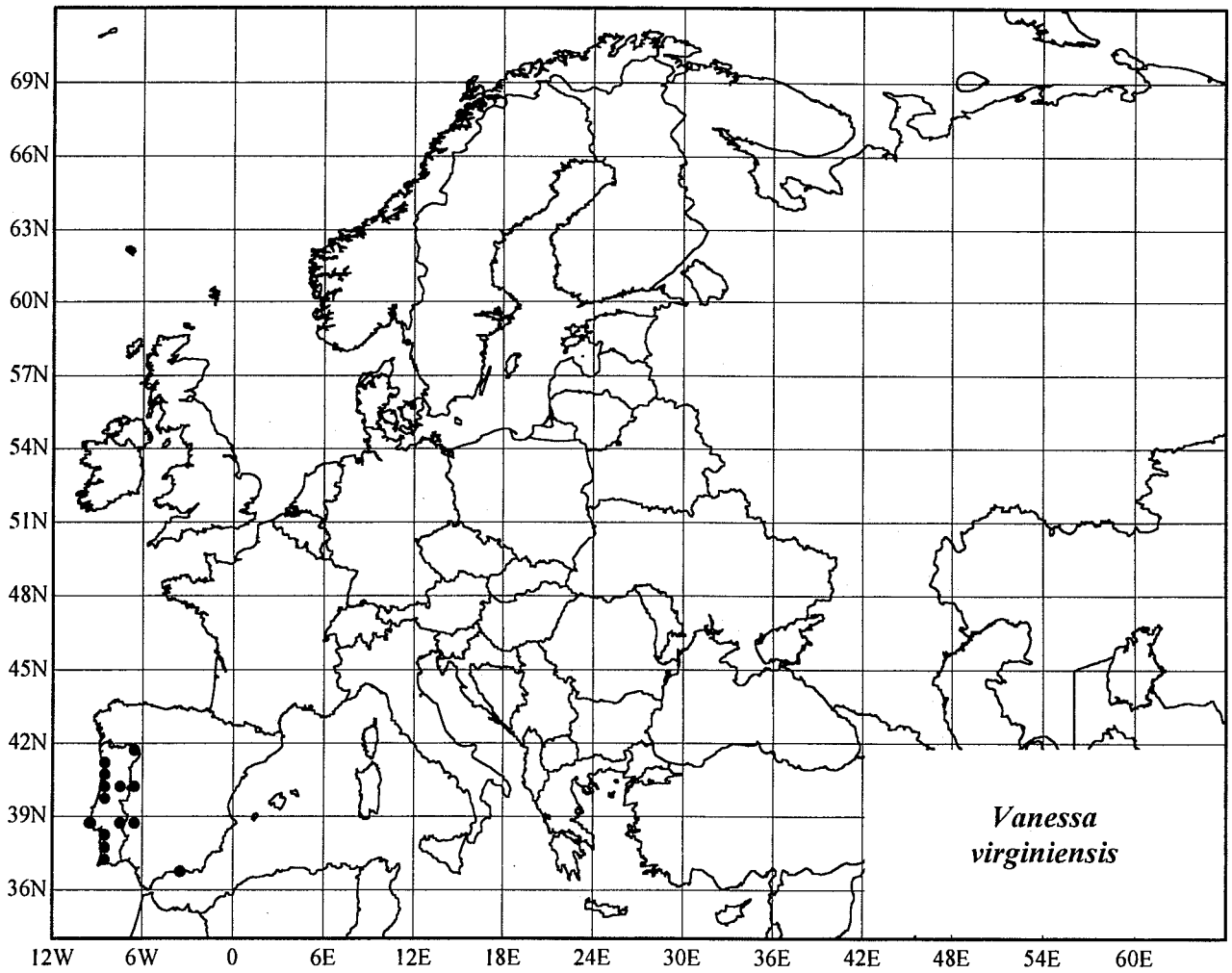
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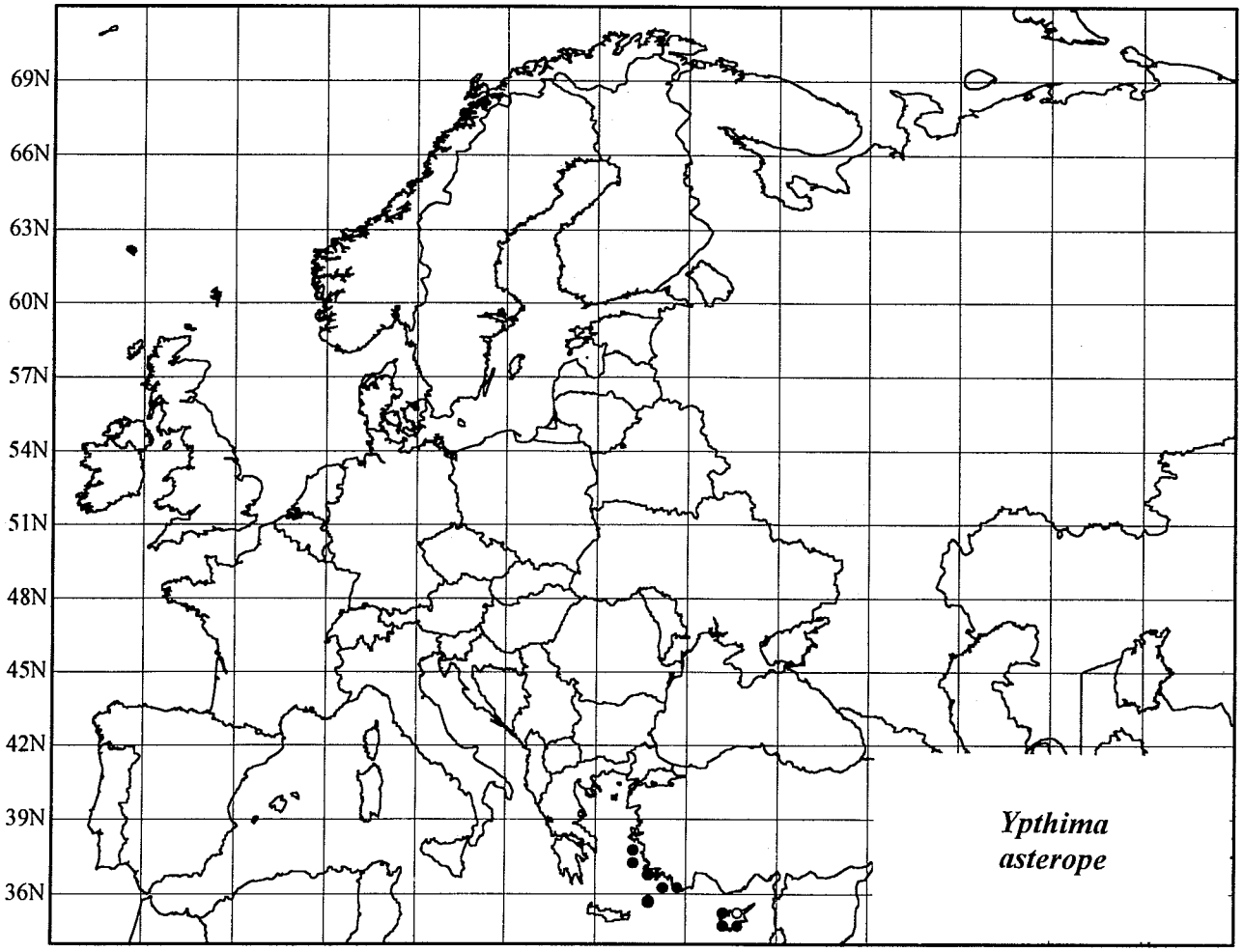
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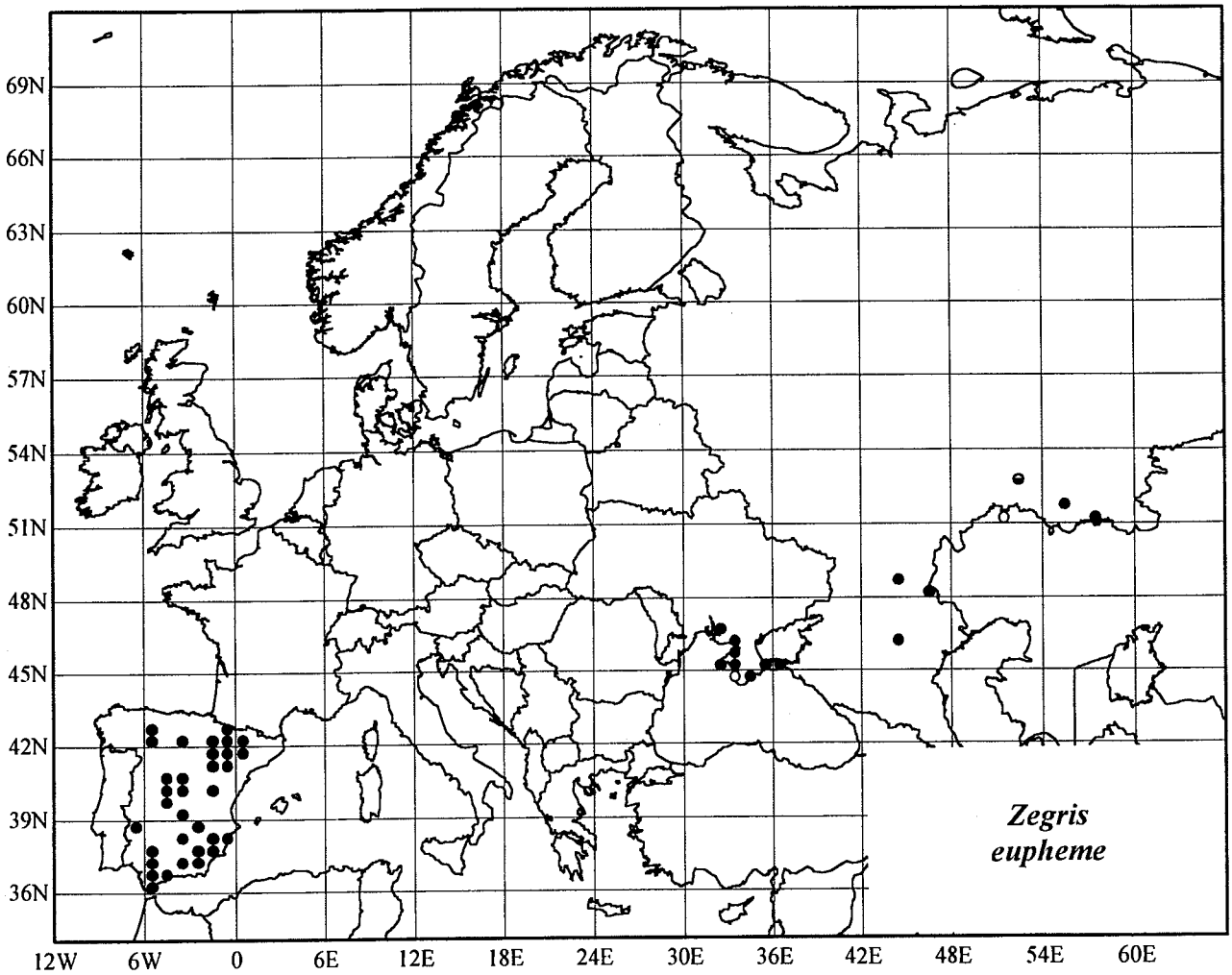
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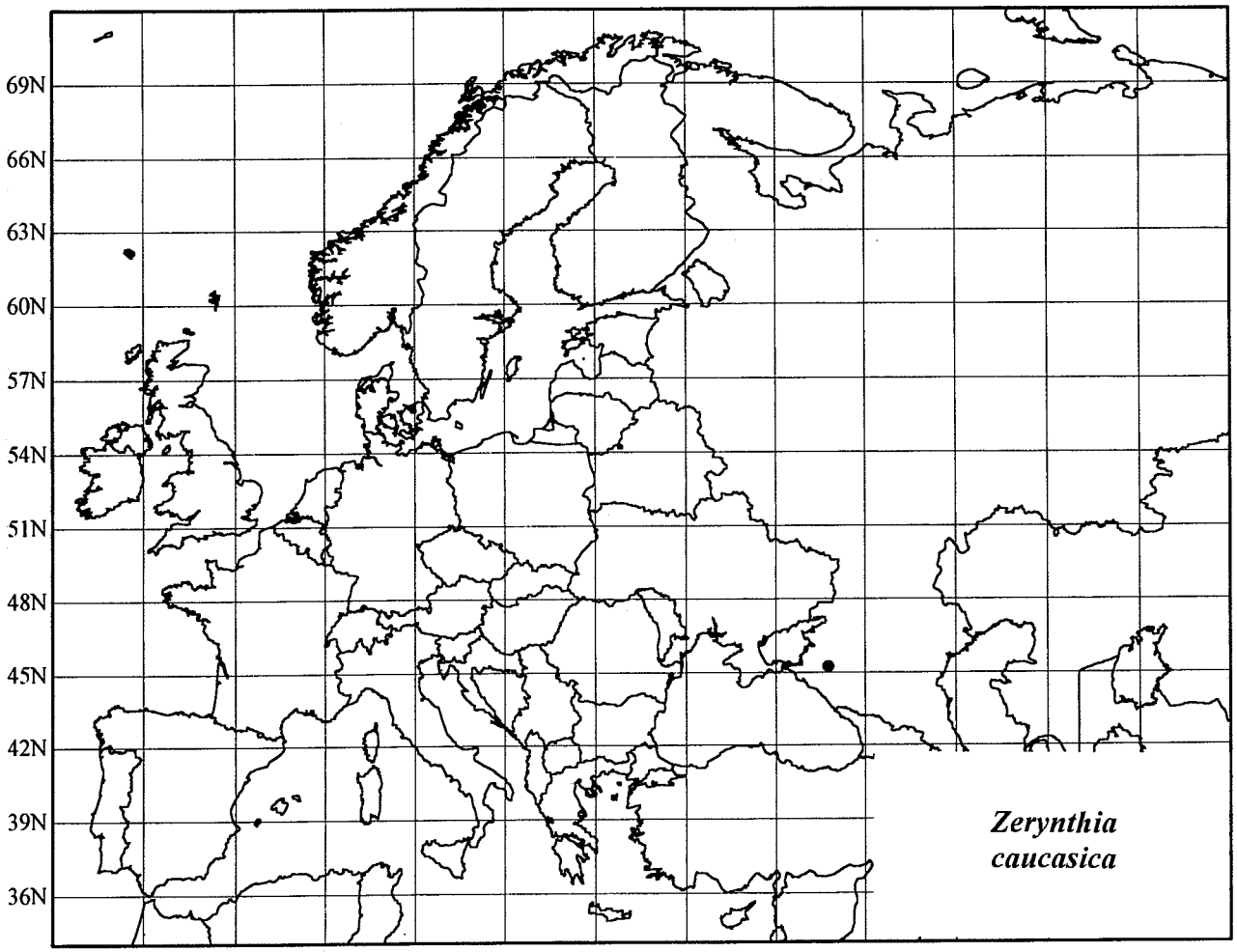
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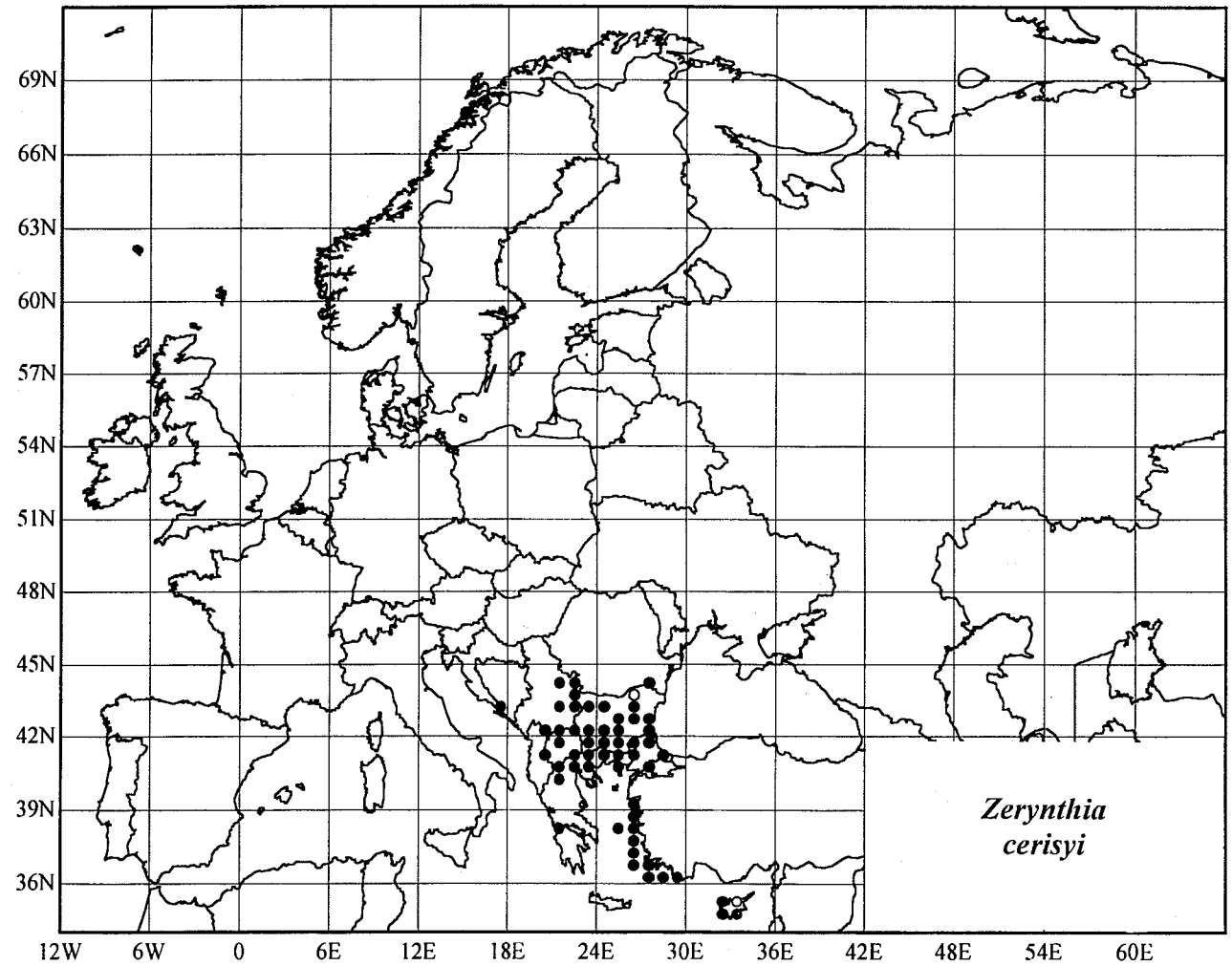
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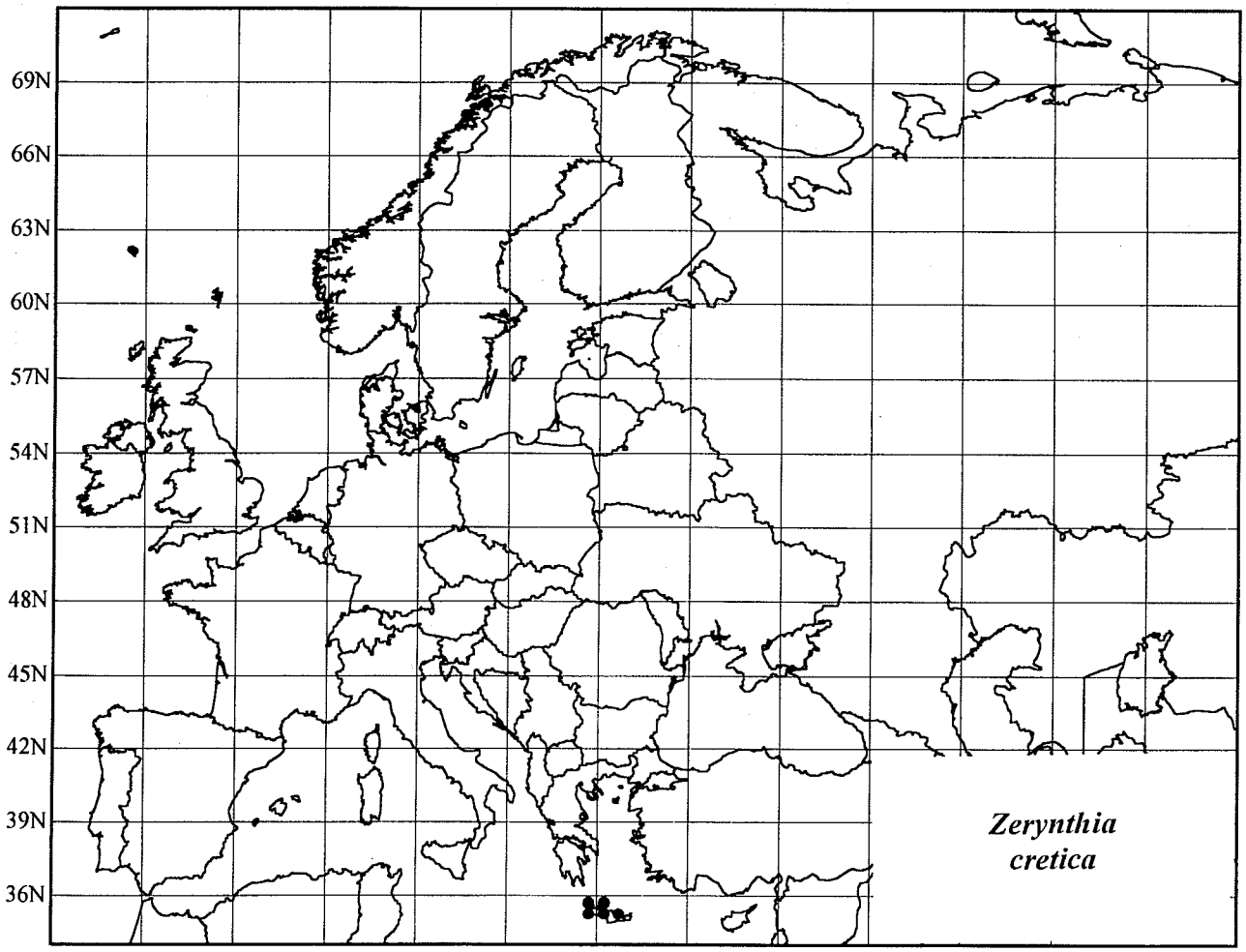
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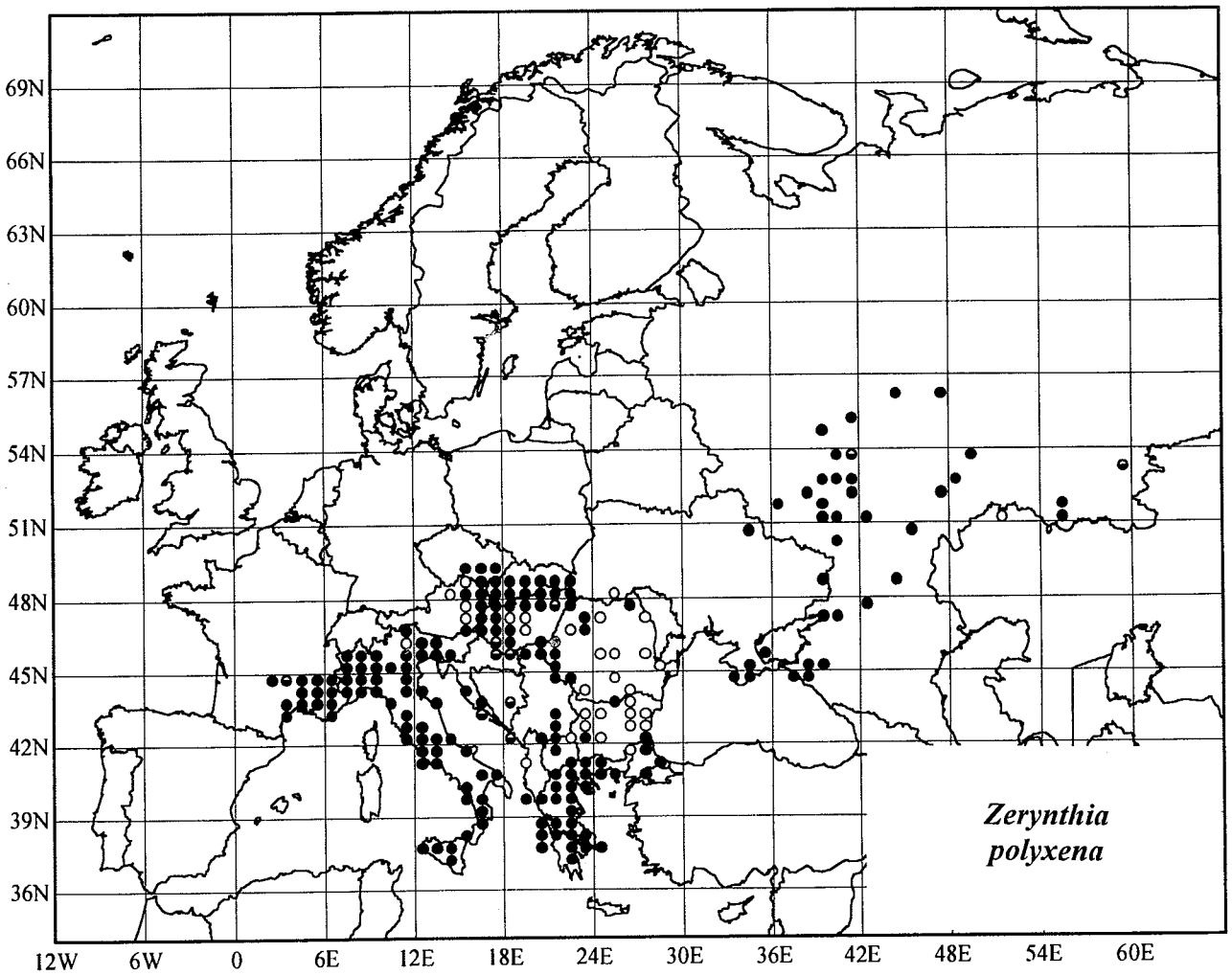
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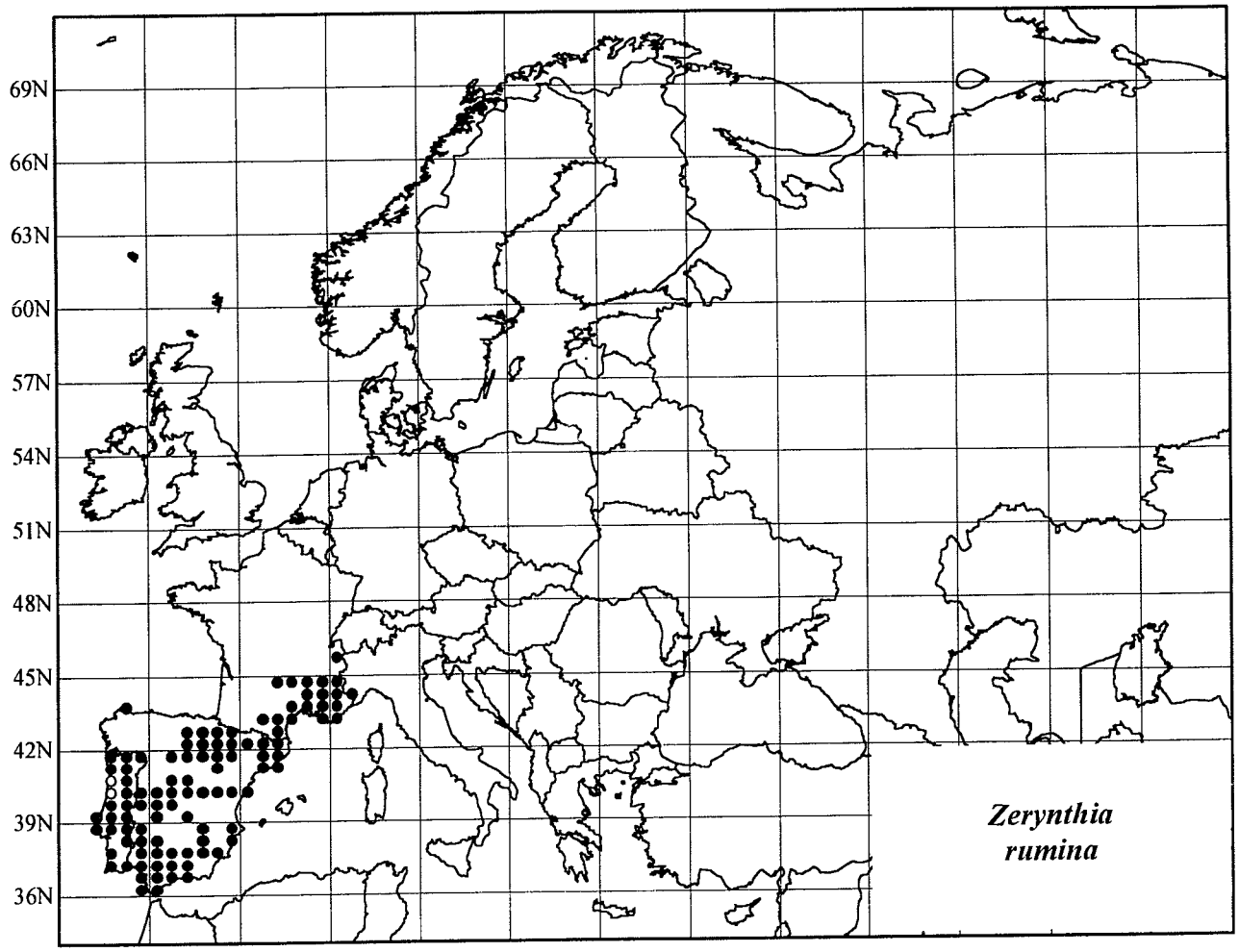
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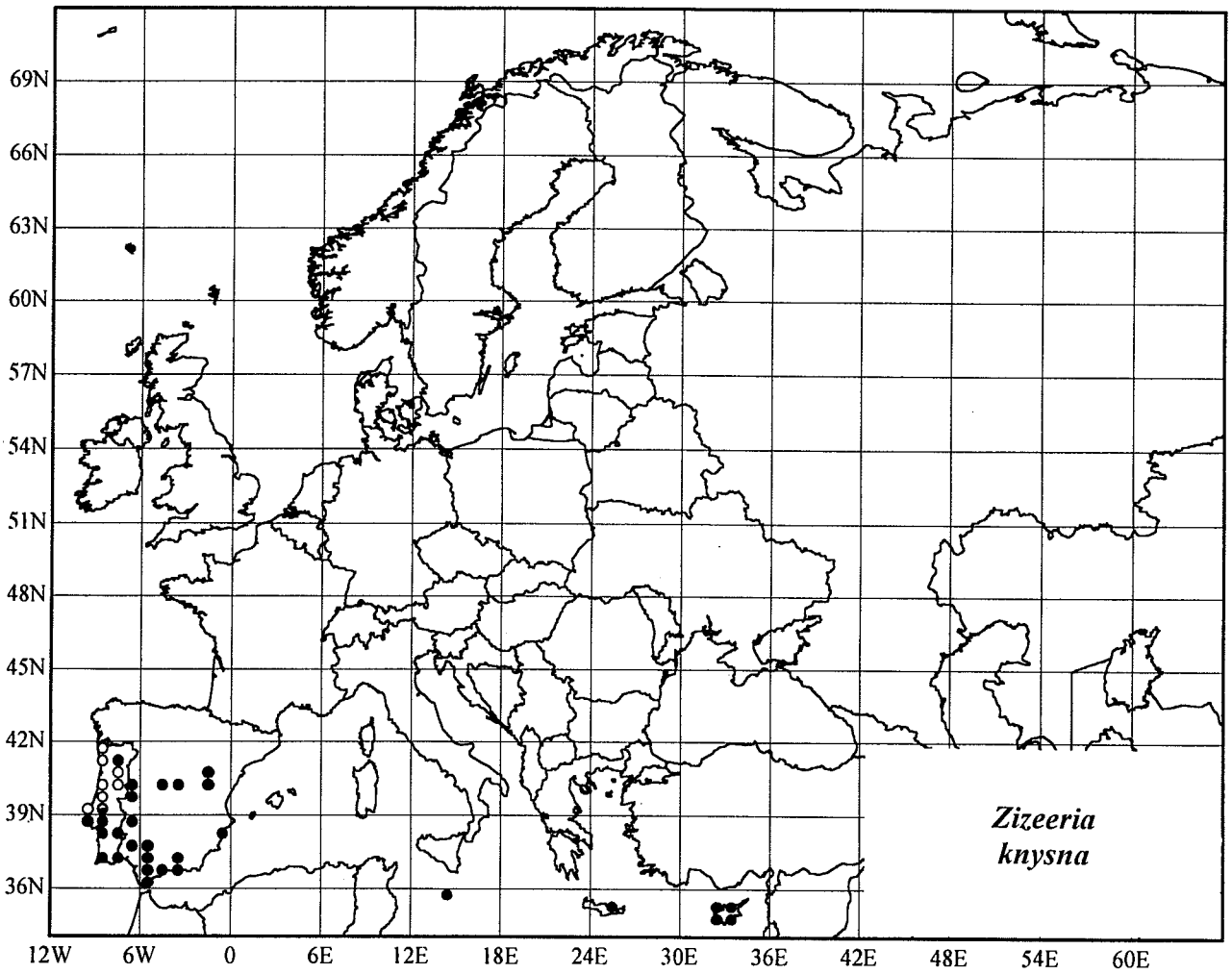
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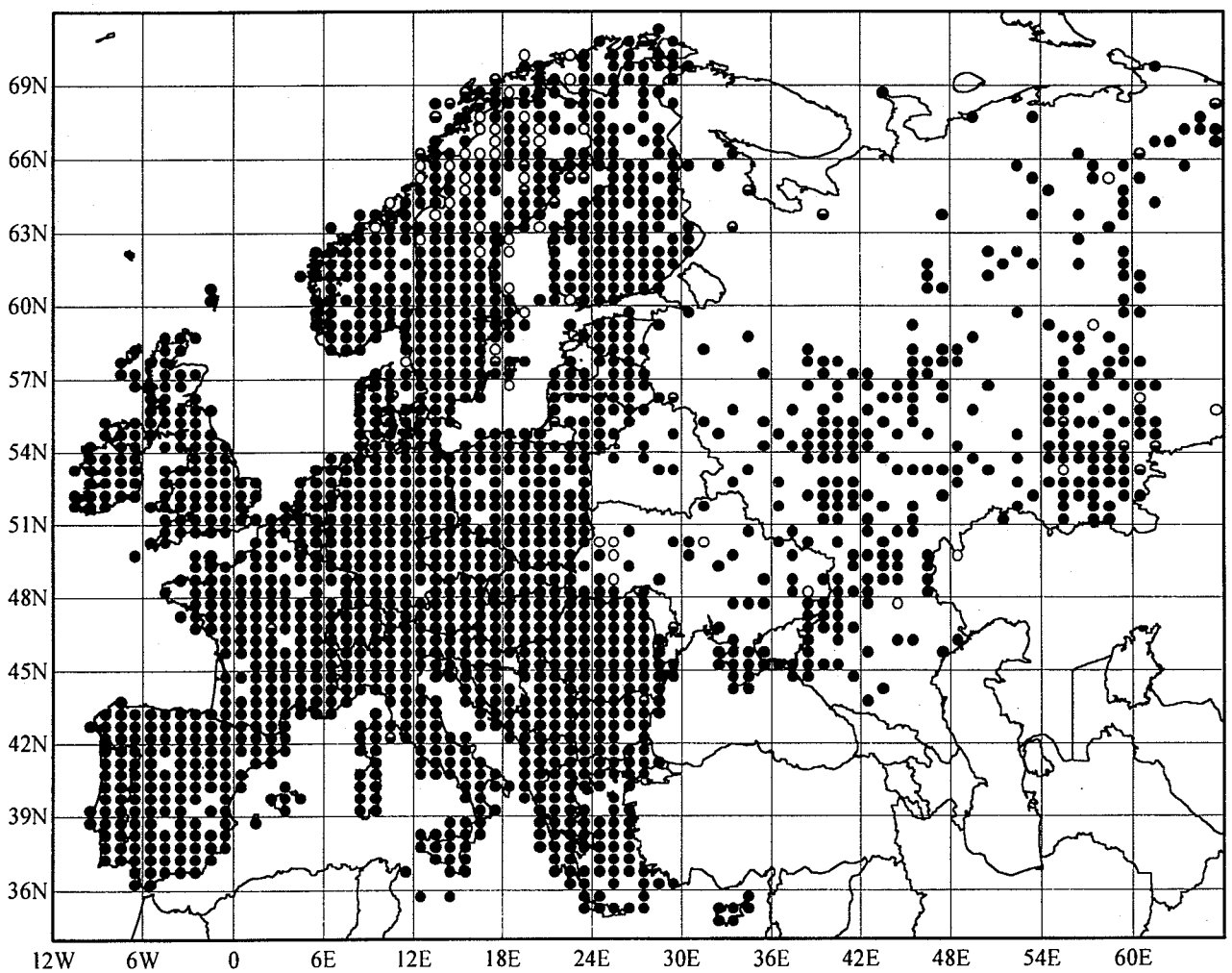
6 Discussion

6.1 Evaluation of country relevant data

The MEB data bank contains at present 228931 data records from 1879 of the total of approximately 3100 basic recording fields (BRF) of Europe; the 1879 BRF cover 60.61 % of European territory. This overall coverage is more than satisfactory at this stage. Nonetheless, it may be argued, that the number of data records could be more suggestive of the amount of work involved with data processing than of the quality of coverage of the territory. Data efficiently extracted from extensive national data banks can be converted in a compact way, thus saving both the work involved with the input of data and the size of the MEB data bank. The following map shows all records plotted on the standard MEB map of Europe using the standard 30' × 60' grid.



It is apparent at first glance that Europe consists of two very distinct worlds: the West and the East. The north-south boundary dividing the West from the East is the border line running from Norway's eastern border southwards following the eastern border of the European Union and the EU accession countries and including Rumania, all the Balkan countries and European Turkey. The Russian enclave of Königsberg (now called Kaliningrad) – an old German territory annexed after WWII by the Soviet Union and now forming a part of Russia – wedged in the West, is biogeographically insignificant. Although the data availability within the West differs a great deal in detail from country to country, the western territory is with 88.49 % very well covered on the whole, in view of the map grid used and in spite of the thin coverage of some areas. The East is with a coverage of only 27.37 %, very under-represented, practically no data being available from vast stretches of land or even almost whole countries (e.g. Belarus, Moldova, most of the Ukraine). The exception is the Crimea, which, thanks to the contribution made by K. EFETOV (E01) and in view of the map

grid, bears comparison with western standards. In the above three countries and Russia, reliable comprehensive checklists of butterflies are not available even for some major university cities and their surroundings, these being often the best surveyed places in Europe.

The quality of available data is closely related to their quantity. Data from a good national or regional data bank can usually be accepted for MEB with only a few minor adjustments or corrections. It must be remembered, that national and regional data banks prefer to include singular records of rare vagrants to make the national or regional species spectrum more attractive (the more impoverished the country, the greater attention is paid to questionable single records of rare or attractive vagrant butterflies). The input of single records provided directly by recorders is always more time consuming, and in many cases, more susceptible to errors such as misidentification of species or localities. Generally speaking, the "second-hand observations" of species not caught or observed by the recorder himself contained many errors and were therefore often left out. The input of Western data stringently followed at all times a slogan coined at an early stage of MEB:

"If in doubt, leave it out"!

This slogan was applied time and time again because it is much better to leave out an uncertain record in the first place than to search for an error hundreds of other records later. However, it had to be applied less stringently when scrutinising the Eastern data, particularly those of common and widespread species; otherwise the East would contain even fewer data than it does at present. It is probably safe to assume that the reliability of Western data is better than the coverage density, i.e. that it could be well over 90 %. It is hoped that also the average reliability of the Eastern data clearly exceeds the coverage density: perhaps up to about 70 %. In spite of the relatively limited reliability of Eastern data, it would have been wrong to eliminate the East from the project.

The quality and quantity of data country by country, with special reference to data bank records, is outlined in the following general, alphabetically arranged survey:

Albania (AL). No data bank of any kind, no data from any native recorder; mostly observation provided by individual recorders, older data extracted and summarised mainly by the late D.E. GASKIN (G03). Albania is very poorly surveyed.

Andorra (AND). No proper data bank, two comprehensive distribution lists provided by recorders J. CROZIER (C14) and M. SAVAGE-DUBOURG (S50).

Austria (A). A comprehensive national data bank (ZOODAT) converted (after adjustment of recording periods where necessary) and (owing to numerous erroneous records) thoroughly revised by G. EMBACHER (E04). Numerous additional records were provided by individual recorders. Austria is very well surveyed.

Belarus (BY). No data bank, no native recorders, practically no data available. Belarus is from a lepidopterological point of view a very poorly known country.

Belgium (B). There are two national data banks in Belgium; the data were extracted and converted for MEB by P. GOFFART (P21) and D. MAES (D01). Belgium is well surveyed.

Bosnia-Herzegovina (BIH). No data bank but P. JAKSIC (J01) made records from his private survey and his distribution atlas of butterflies of the former Yugoslavia (JAKSIC 1988) available to MEB. Single supplementary observations were provided by many recorders. The country is insufficiently surveyed.

Bulgaria (BG). No data bank available before closing date and no contributing native recorder. Newer data were supplied by individual recorders (mostly from Czechia); where possible published data were extracted and converted. Bulgaria is not sufficiently surveyed and, owing to the disinterest of native lepidopterists, poorly represented.

Croatia (HR). No data bank and no native contributing recorders but P. JAKSIC (J01) made records from his private survey and his distribution atlas of butterflies of the former Yugoslavia (JAKSIC 1988) available to MEB. Numerous supplementary observations were provided by recorders visiting the country. Croatia is not adequately represented.

Cyprus (CY). No national data bank, no national contributing recorder. E. JOHN (J10) maintains a private data bank including comprehensive data from other students of Cyprus butterflies such as R. PARKER (P02).

Czechia (CZ). A butterfly recording scheme is being run and a national data bank maintained by the Czech Butterfly Conservation Society (SOM); this data bank also includes all data from the provisional distribution atlas (KUDRNA 1994). Czech data for MEB were converted by A. PAVLICKO (P01).

Denmark (DK). There is an extensive national data bank and a distribution atlas. Converted data from the Danish national data bank were promised for MEB but not delivered. Data from the national distribution atlas were extracted for MEB by T.N. KRISTENSEN (K06). The distribution of butterflies in Denmark is well known.

Estonia (EST). There is no national recording scheme or data bank. The available national data were summarised for MEB by J. VIIDALEPP (V05).

Finland (FIN). There is an extensive national data bank, a national butterfly recording scheme and a detailed distribution atlas. Data from the distribution atlas were converted for MEB by M.K. JANTUNEN (J06).

France (F). There is no national data bank, but a simple, very low resolution distribution atlas (DELMAS, MAECHLER & SIBERT 1999); the majority of French distribution data for MEB were extracted from this atlas. LAFRANCHIS' (2001) book containing somewhat better and probably more reliable distribution maps was published too late to be utilised for MEB. Comprehensive data from Corsica were made available by H. GUYOT (G23). The butterfly fauna of France is exceptionally rich but as yet insufficiently surveyed.

Germany (D). There is no national data bank and no national recording scheme in this country of great lepidopterological history and rich tradition. Official and private data banks (varying much in their standard and reliability) are being maintained for some German Länder or their parts; converted data from or published distribution maps based upon these banks have been utilised for MEB. Major contributions were made by K. DÖRBANDT (D14), H. KINKLER, (K05), J. KLEINEKUHLE (K39), W. KRAUS (K20), O. KUDRNA (K01), A.C. LANGE (L21), H. SBIESCHNE (S52) and V. WACHLIN (W02). The distribution of butterflies in Germany is well researched, but very inadequately mapped.

Great Britain (GB). A national butterfly recording scheme was launched more than 30 years ago; there is a comprehensive national data bank and up-dated editions of the distribution atlas are being published at irregular intervals every several years. Data from the latest edition of the distribution atlas (ASHER et al. 2001) were converted for MEB by L. WINOKUR (W04). The distribution of butterflies in Great Britain is extremely well known.

Greece (GR). There is no national data bank, no distribution atlas and no national recording scheme. Private data banks are being maintained by J.G. COUTSIS (C11), who contributed very simple distribution maps, and the Flemish Entomological Society of Antwerpen – namely A. OLIVIER (O10), W. DE PRINS (P03) and D. VAN DEN POORTEN (P28) – who summarised their data for MEB. The hand-drawn distribution maps provided by J.G. COUTSIS (C11) were converted for MEB by K. KONECNY (K11). Distribution data published by PAMPERIS (1997) were not utilised. Greece is very rich in butterflies including several endemic species, but at present insufficiently surveyed.

Hungary (H). There is no official national recording scheme or data bank at present, but Z. BALINT (B03) compiled all available data for MEB and is currently making efforts to set-up a butterfly recording scheme in Hungary.

Ireland (IRL). There is a recording scheme and a national data bank. Irish distribution data were extracted and converted by L. WINOKUR (W99) from ASHER et al. (2001).

Italy (I). There is no national recording scheme, no national data bank and no proper distribution atlas of butterflies. E. BALLETTO (B22) maintains an extensive private data bank of Italian butterflies and his unpublished distribution maps were extracted and converted for MEB. The butterfly fauna of Italy is one of the richest in Europe, containing several endemic species, but the country is not sufficiently surveyed at present.

Kazakhstan (KAZ). This is a large Asiatic country a western-most tip of which – the area between the rivers Volga and Ural – forms arbitrarily a part of the MEB territory. Only two records of butterflies from Kazakhstan have been reported to MEB.

Latvia (LV). There is no national butterfly recording scheme or data bank, but N. SAVENKOV (S51) summarised the available Latvian distribution data for MEB.

Liechtenstein (FL). There is no national butterfly recording scheme or data bank. The distribution data were converted for MEB from AISTLEITNER & AISTLEITNER (1997) by myself.

Lithuania (LT). There is no national butterfly recording scheme or data bank but D. DAPKUS (D09) summarised the available Lithuanian distribution data for MEB.

Luxembourg (L). The MEB data converted from a list of species supplied by M. MEYER (M30) and from the distribution atlas by MEYER & PELLES (1981).

Macedonia (MK). No data bank and no native contributing recorders but P. JAKSIC (J01) made records from his private survey of butterflies of the former Yugoslavia (JAKSIC 1988) available for MEB. Numerous supplementary observations were provided by recorders visiting the country. Macedonia is poorly surveyed.

Malta (M). Distribution data for MEB were compiled by P.M. SAMMUT (S30).

Moldova (MD). There is no national data bank, no recording scheme and no native contributing recorder, not even a checklist of species. Thus, the distribution of butterflies in Moldova is practically unknown.

Monaco (MC). No national data bank, no recording scheme, no checklist of species and no native recorder. There are probably hardly any resident butterflies in Monaco!

Netherlands (NL). An advanced national recording scheme, irregularly up-dated distribution atlas and a comprehensive data bank are being maintained by the Dutch Butterfly Conservation (De Vlinderstichting). Dutch data for MEB were converted by K. VELING (V09).

Norway (N). A national recording scheme is being run by the Lepidoptera Working Group of the Norwegian Entomological Society and the Natural History Museum of Oslo. The data were extracted and converted for MEB by J. ENGDAL (E06).

Poland (PL). Since 1986 there is a Polish national butterfly recording scheme; data based upon the distribution atlas (BUSZKO 1997) were converted for MEB by J. BUSZKO (B01). The distribution of butterflies in Poland is moderately known.

Portugal (P). E. MARAVALHAS (M38) and P. GARCIA-PEREIRA (G25) contributed comprehensive distribution data from their data bank and unpublished book on the butterflies of Portugal; S. OEHMIG (O02) summarised distribution data on the butterflies of the Azores and Madeira.

Rumania (RO). There is no national recording scheme or national data bank, but L. RAKOSY (R21), who is working on a book on the butterflies of Rumania, which will include distribution maps, contributed a comprehensive summary of his data including numerous hitherto unpublished records to MEB.

Russia (RUS). Russia is an underdeveloped country from a lepidopterological point of view. There are too few lepidopterists, no national data bank or recording scheme and, generally speaking, reliable distribution data are few and far between. Under these circumstances any record was accepted unless clearly wrong. A major contribution was made by P. GORBUNOV (G06).

San Marino (RSM). There is no national recording scheme or data bank and no native recorder. However, the miniature state of San Marino is included in the data bank maintained for Italy by E. BALLETTO (B22).

Slovakia (SK). Since about 1988 there are as yet unrealised plans of setting-up a national data bank. A. REIPRICH (R15) keeps a private recording scheme and summarised his comprehensive data for MEB.

Slovenia (SLO). A national butterfly distribution data bank is being set-up by the Centre for the Cartography of Flora and Fauna, but data were not available in time for MEB. Thus, MEB data from Slovenia relies on the contributions of individual recorders, particularly of R. STANTA (S15) and D. WITHRINGTON (W16).

Spain (E). There is no national recording scheme or national data bank at present, but great efforts are being made in this respect. Major contributions to the MEB data from Spain were made by O. KUDRNA (K01), J.M. MOLINA (M03), J. PIBERNAT-VINIETS (P10), M.R. TARRIER (T04) and M. WIEMERS (W11). Spain is a very rich country from a lepidopterological point of view, but it is very much under-represented in the present MEB data bank.

Sweden (S). There is – most surprisingly! – no Swedish national recording scheme or national data bank at present, but N. RYRHOLM (R20) has been maintaining a private data bank for several years and made his distribution data available for MEB.

Switzerland (CH). There is an extensive national data bank maintained by CSCF; data from this data bank were promised for MEB but the promise has never been realised. Under these circumstances, the existing distribution maps (GONSETH 1987) were converted for MEB.

Turkey (TR). Only a very small part of Turkey lies in Europe and there is no Turkish national data bank. Most MEB data from European Turkey were extracted and converted from HASSELBARTH, OORSCHOT & WAGENER (1995).

Ukraine (UKR). There is no national recording scheme or national data bank and only a few recorders in this, from a lepidopterological point of view, 'under-developed' country. Under these circumstances any record was accepted unless clearly wrong. An exceptional contribution of western standards was made by K. EFETOV (E01) for the Crimea.

Vatican (V). There is no data bank or a checklist of butterfly species. Vatican is treated as a part of Rome (v. Italy) for MEB.

Yugoslavia (YU). There is no national data bank but P. JAKSIC (J01) runs a private recording scheme and summarised his and other distribution data from Serbia and Montenegro (JAKSIC 1988) for MEB. The distribution of butterflies in Yugoslavia is moderately known.

No special effort has been made to extract records from all the innumerable faunistic papers on European butterflies (e.g. BRETHERTON 1966, KUDRNA 1985 etc.). It would take years to go through the thousands of publications and many thousands of records. It would be very difficult to check most of the data and impossible to interpret many of them, particularly statements like "widespread", "everywhere", "common at moderate altitudes" and the like, usually used to describe the distribution of common species by the old school of students of butterflies. Nevertheless, national and regional data banks usually contain revised distribution records extracted from literature sources.

Although the number of records for a country is often suggestive of the state of our present knowledge of the butterflies of that country, it is not always a reliable indicator. The following table shows the number of records country by country (alphabetical arrangement):

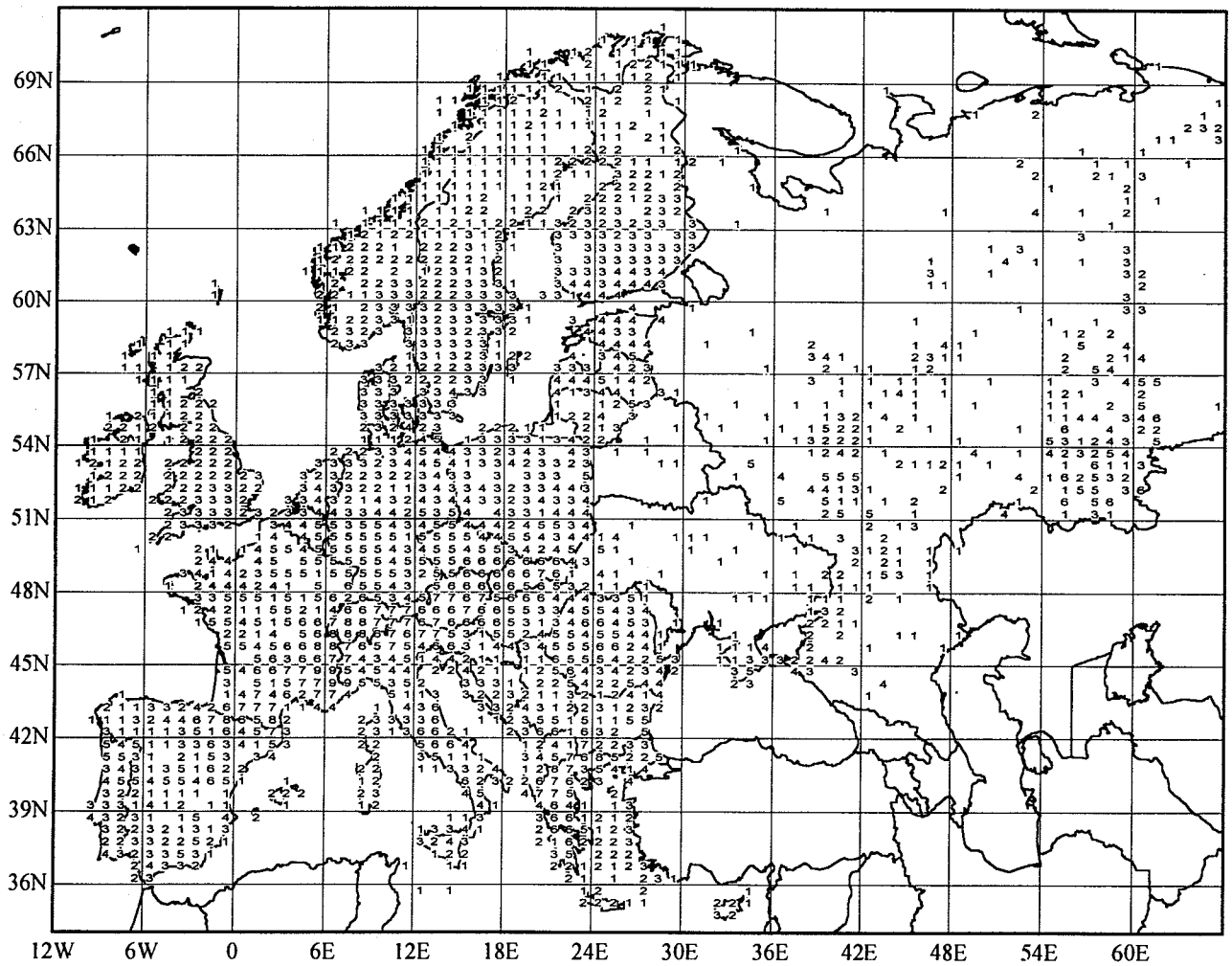
Albania (AL)	441	Great Britain (GB)	4310	Norway (N)	3204
Andorra (AND)	368	Greece (GR)	14227	Poland (PL)	8836
Austria (A)	9185	Hungary (H)	5331	Portugal (P)	5809
Belarus (BY)	12	Ireland (IRL)	933	Rumania (RO)	11761
Belgium (B)	2708	Italy (I)	11836	Russia (RUS)	13321
Bosnia-H. (BIH)	362	Kazakhstan (KAZ)	2	Slovakia (SK)	5314
Bulgaria (BG)	2456	Latvia (LV)	2038	Slovenia (SLO)	2079
Croatia (HR)	1340	Liechtenstein (FL)	121	Spain (E)	13502
Cyprus (CY)	617	Lithuania (LT)	548	Sweden (S)	23300
Czechia (CZ)	6202	Luxembourg (L)	187	Switzerland (CH)	6241
Denmark (DK)	1745	Macedonia (MK)	716	Turkey (TR)	496
Estonia (EST)	1840	Malta (M)	20	Ukraine (UKR)	1514
Finland (FIN)	6815	Moldova (MD)	2	Yugoslavia (YU)	1541
France (F)	20709	Monaco (MC)	5		
Germany (D)	33816	Netherlands (NL)	3110		

Species diversity varies greatly from country to country. Nonetheless, it must be remembered that the figures concerning the poorly known countries of the East do not express their true diversity and that many Russian species are quasi extra-European. Belarus, Kazakhstan and Moldova are presumably inhabited by many more butterfly species than reported to MEB. In the following table numbers of butterfly species recorded for MEB are shown country by country:

Albania (AL)	129	Great Britain (GB)	63	Norway (N)	97
Andorra (AND)	147	Greece (GR)	234	Poland (PL)	154
Austria (A)	207	Hungary (H)	158	Portugal (P)	139
Belarus (BY)	9	Ireland (IRL)	31	Rumania (RO)	186
Belgium (B)	116	Italy (I)	270	Russia (RUS)	241
Bosnia-H. (BIH)	127	Kazakhstan (KAZ)	2	Slovakia (SK)	164
Bulgaria (BG)	200	Latvia (LV)	114	Slovenia (SLO)	169
Croatia (HR)	161	Liechtenstein (FL)	121	Spain (E)	239
Cyprus (CY)	50	Lithuania (LT)	112	Sweden (S)	117
Czechia (CZ)	154	Luxembourg (L)	103	Switzerland (CH)	199
Denmark (DK)	79	Macedonia (MK)	168	Turkey (TR)	127
Estonia (EST)	115	Malta (M)	19	Ukraine (UKR)	174
Finland (FIN)	112	Moldova (MD)	2	Yugoslavia (YU)	191
France (F)	259	Monaco (MC)	5		
Germany (D)	162	Netherlands (NL)	101		

All European countries richest in butterflies are situated in the south of Europe and in the Alps. The richest countries are: Italy 270. France 259, Spain 239, Greece 234, Austria 207 and Switzerland 199. These countries are also inhabited by a relatively high number of endemic species. A surprisingly high number of species has been reported from relatively poorly surveyed Bulgaria. Amongst the 241 species reported from Russia are many quasi extra-European species widespread in Asia.

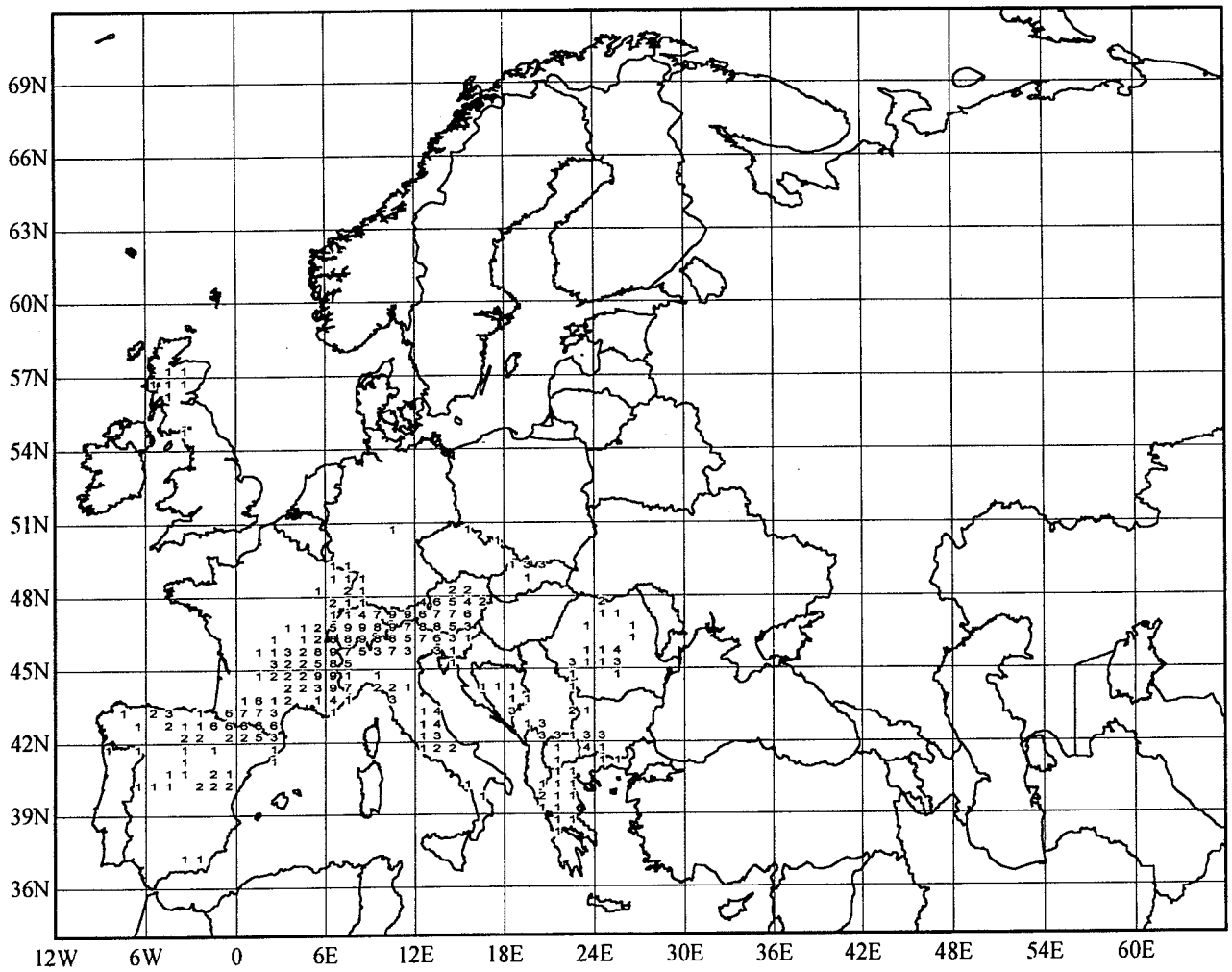
The following coincidence map of all European butterflies (N = 486) shows the species diversity from a European point of view, the class interval being 25 where 1 = 1-25 species, 2 = 26-50, 3 = 51-75, 4 = 76-100, 5 = 101-125, 6 = 126-150, 7 = 151-175, 8 = 176-200, 9 = 200-225 species.



The above coincidence map shows, that 'hot spots' of butterfly diversity – the areas richest in butterfly species – are mostly situated in the Mediterranean and in the Alps. The European scale of the MEB maps and their grid facilitates the selection of 'hot spots' as regions or districts; the pinpointing of sites must be the task of national surveys. At this stage, and in view of the planned second edition of this Atlas, only the most important, large, coherent 'hot spots' are to be identified. On the above map, the European districts of particularly high butterfly diversity – more than 150 species – are marked by symbols 7, 8 and 9 in the Alps and in the Mediterranean. North of the Alps, e.g. in Central Europe, basic recording fields containing more than 100 species – marked by symbols 5 and higher on the above map – constitute high diversity districts of the region.

Many of the above 'hot spots' coincide by-and-large also with the occurrence of endemic species. In future, the areas of high butterfly diversity must play an essential role in the planning of European butterfly conservation policy – as against politically motivated national priorities – if this is to be successful in the long term. The high species diversity in the Mediterranean is due to both extremely diverse ecological conditions attractive for butterflies and to the former glacial refugia. It must, however, be remembered that the Mediterranean generally and the countries particularly rich in butterflies especially – e.g. France, Greece, Italy and Spain – are at present not as well surveyed from a lepidopterological point of view, as is desirable. Central Europe north of the Alps is dominated by species referable to the Palaearctic or Euro-Siberian faunal elements. North-western Europe (e.g. Belgium, Great Britain, Ireland, Netherlands) is impoverished; of little significance from a European point of view.

The genus *Erebia* DALMAN, 1816, is represented in Europe by 55 species of which 38 are endemic (69 %!). The following coincidence map of endemic *Erebia* shows the great importance of the Alps and a other major mountain ranges for (not only) their preservation (class interval 2: 1 = 1-2 species, 2 = 3-4, 3 = 5-6, 4 = 7-8, 5 = 9-10, 6 = 11-12, 7 = 13-14, 8 = 15-16, 9 = 17-18 species):



6.2 Evaluation of species relevant data

Europe is at present inhabited by 486 butterfly species recognised for inclusion in MEB. These species are arranged in alphabetical order in the following annotated table. The annotations in the columns following the name of the species are as follows:

BRF The number of basic recording fields (BRF) inhabited by the species in any one or all three recording periods corresponding to the "dots" on the map. The number of BRF is a value substituting for this purpose the 'range size' in the chorological index of the biogeographical disposition (KUDRNA 1986).

DI The distribution index indicates in percentages (%) the relative size of the European distribution or range of the species; theoretically possible maximum is 3100 BRF.

BS The Biogeographical status expressed by the range affinity of the species (KUDRNA 1986): 0 = extra European species (vagrant specimens occasionally found in Europe), 1 = quasi extra European (headquarters outside Europe, not relevant for specifically European conservation efforts), 2 = European-alicontinental (or "neutral" species with headquarters both within and outside Europe), 3 = quasi European species (concentrated in Europe, recorded also outside Europe), 4 = European endemic species. An asterisk (*) indicates Asiatic species treated as European-endemic by SWAAY & WARREN (1999) for political reasons – Turkey is a member of the Council of Europe – which are not confined to Europe.

ECC Species of European conservation concern (SPEC) according to SWAAY & WARREN (1999): 1 = species restricted to Europe and globally threatened; 2 = species concentrated and threatened in Europe; 3 = species threatened in Europe, but with headquarters both within and outside Europe; 4a = global distribution restricted to Europe, but not threatened; 4b = global distribution concentrated in Europe, but not threatened. Parentheses () indicate that the status concerns only a subdivision (e.g. a form or a subspecies) of the taxon listed in the table. A combination of two figures (e.g. 2, 3) indicates that different subdivisions of the taxon listed in the table are attributed to different SPEC classes.

RDB Status according to the Red Data Book (SWAAY & WARREN 1999): C = critically endangered, E = endangered, V = vulnerable, L = lower risk (i.e. not threatened). No European butterfly species is considered extinct (= X). Parentheses () indicate that the status concerns only a subdivision (e.g. a form or a subspecies) of the taxon listed in the table. A combination of two letters (e.g. V, E) indicates that different subdivisions of the taxon listed in the table are subject to different degrees of threat.

FFH Species protected by the EU Habitat Directive 92/43; 2 indicates that the species is listed in Annex II, 4 indicates that the species is listed in Annex IV. Note: *Euphydryas glaciegenita* is not listed by name, but is presumably considered conspecific with *E. aurinia*. *Hesperia comma* is not protected as a species, but only in its cold season form *catena* STAUDINGER, 1861, which is found occasionally among normal looking specimens in N. Scandinavia and, very rarely, at high altitudes in the Alps.

BC A cross (+) indicates that the species is listed in Appendix II (strictly protected species) of the Bern Convention. Note: *Euphydryas glaciegenita* is not specifically listed by name in the Bern Convention, but it is presumably considered conspecific with *E. aurinia*. An asterisk (*) indicates candidate species proposed by SWAAY & WARREN (1999) for the inclusion in the above Appendix. Parentheses () indicate that the recommendation concerns only a subdivision (e.g. a subspecies or a form) of the taxon listed in the table (cf. taxonomic note on the taxon concerned).

The abbreviation 'cpx.' following the name of the taxon indicates a complex of two or more similar and closely related species that could not be distinguished for the purpose of Mapping European Butterflies (cf. taxonomic notes in the alphabetical checklist of species).

Species	BRF	DI	BS	ECC	FFH	RDB	BC
Anthocharis cardamines	1213	39.12	2				
Anthocharis damone	17	0.55	2	3		V	
Anthocharis euphenoides	100	3.23	4	4a			
Anthocharis gruneri	27	0.87	2				
Apatura ilia	483	15.58	2				
Apatura iris	513	16.55	2				
Apatura metis	48	1.55	2		4	L	+
Aphantopus hyperantus	967	31.19	2				
Aporia crataegi	911	29.39	2				
Araschnia levana	623	20.10	2				
Archon apollinus	15	0.48	2	3		E	*
Argynnis adippe	882	28.45	2				
Argynnis aglaja	1080	34.83	2				
Argynnis elisa	8	0.26	4	4a	4		+
Argynnis niobe	632	20.39	2				
Argynnis pandora	310	10.00	2				
Argynnis paphia	982	31.67	2				
Argyronome laodice	124	4.00	2				
Aricia agestis	622	20.06	2				
Aricia anteros	39	1.26	4	4a			
Aricia artaxerxes	481	15.52	4				
Aricia cramera	110	3.55	3				
Aricia eumedon	509	16.42	2				
Aricia montensis	30	0.97	4				
Aricia morronensis	14	0.45	4	4a			
Aricia nicias	112	3.61	4	4a			
Azanus ubaldus	1	0.03	1				
Boloria alaskensis	2	0.06	1				
Boloria angarensis	21	0.68	2				
Boloria aquilonaris	483	15.58	2				
Boloria chariclea	28	0.90	2			L	
Boloria dia	568	18.32	2				
Boloria eugenia	10	0.32	1				
Boloria eunomia	357	11.52	2				
Boloria euphrosyne	963	31.06	2				
Boloria freija	177	5.71	2				
Boloria frigga	183	5.90	2	3		V	
Boloria graeca	30	0.97	4	4a			
Boloria improba	11	0.35	2		2	L	
Boloria napaea	106	3.42	2				
Boloria pales	73	2.35	2				
Boloria polaris	27	0.87	2				
Boloria selene	999	32.22	2				
Boloria selenis	9	0.29	1				
Boloria thore	101	3.26	2	3		V	
Boloria titania	163	5.26	2	3		V	
Boloria tritonia	2	0.06	1				
Borbo borbonica	1	0.03	1				
Brenthis daphne	313	10.10	2				
Brenthis hecate	189	6.10	2				

Species	BRF	DI	BS	ECC	FFH	RDB	BC
Brenthis ino	738	23.81	2				
Cacyreus marshalli	33	1.06	2				
Callophrys avis	36	1.16	3	4b			
Callophrys rubi	1157	37.32	2				
Callophrys suaveola	2	0.06	1				
Carcharodus alceae	600	19.35	2				
Carcharodus baeticus	60	1.94	4	4a			
Carcharodus flocciferus	286	9.23	*3				
Carcharodus lavatherae	151	4.87	2	4b			
Carcharodus orientalis	56	1.81	2				
Carcharodus stauderi	6	0.19	1				
Carterocephalus palaemon	580	18.71	2				
Carterocephalus silvicolus	280	9.03	2				
Catopsilia florella	8	0.26	1				
Celastrina argiolus	1159	37.38	2				
Charaxes jasius	127	4.10	2				
Chilades galba	3	0.10	1				
Chilades trochylus	23	0.74	2				
Cigaritis acamas	4	0.13	1				
Coenonympha amaryllis	7	0.23	1				
Coenonympha arcania	675	21.77	2				
Coenonympha corinna	20	0.65	4	4a			
Coenonympha dorus	83	2.68	3	4b			
Coenonympha gardetta	45	1.45	4	4a			
Coenonympha glycerion	520	16.77	2				
Coenonympha hero	194	6.26	2	3	4	V	+
Coenonympha iphioides	34	1.10	4				
Coenonympha leander	48	1.55	2				
Coenonympha oedippus	53	1.71	2	3	2, 4	C	+
Coenonympha pamphilus	1263	40.74	2				
Coenonympha rhodopensis	33	1.06	4	4a			
Coenonympha thyrsis	5	0.16	4	4a			
Coenonympha tullia	564	18.19	2	3		V	
Colias alfacariensis	402	12.97	*3	4b			
Colias aurorina	12	0.39	2				
Colias balcanica	12	0.39	4				
Colias chrysotheme	74	2.39	2	3		V	
Colias crocea	935	30.16	2				
Colias erate	175	5.85	2				
Colias hecla	31	1.00	2	3		V	
Colias hyale	697	22.48	2				
Colias myrmidone	148	4.77	2	2		V	
Colias palaeno	460	14.84	2			L	
Colias phicomone	58	1.87	4	4a			
Colias werdandi	14	0.45	3	3		V	
Colotis evagore	8	0.26	1				
Cupido alcetas	174	5.61	4				
Cupido argiades	499	16.10	2				
Cupido carswelli	3	0.10	4				
Cupido decoloratus	66	2.13	4	4a			

Species	BRF	DI	BS	ECC	FFH	RDB	BC
Cupido fischeri	11	0.35	2				
Cupido lorquinii	15	0.48	3			L	
Cupido minimus	733	23.65	2				
Cupido osiris	143	4.61	3				
Cyclyrius webbianus	7	0.23	4	4a			
Danaus chrysippus	65	2.10	2				
Danaus plexippus	19	0.61	2				
Erebia aethiopella	5	0.16	4	4a			
Erebia aethiops	303	9.77	2			L	
Erebia alberganus	48	1.55	4	4a			
Erebia arvenensis	21	0.68	4				
Erebia calcaria	8	0.26	4	4a	2, 4		+
Erebia cassioides	48	1.55	4	4a			
Erebia christi	1	0.03	4	1	2, 4	V	+
Erebia claudina	5	0.16	4	4a			
Erebia cyclopius	9	0.29	2				
Erebia dabanensis	5	0.16	1				
Erebia disa	48	1.55	2				
Erebia discoidalis	5	0.16	1				
Erebia edda	1	0.03	1				
Erebia embla	165	5.32	2	3		V	
Erebia epiphron	102	3.29	4	4a			
Erebia epistygne	19	0.61	4	1		V	*
Erebia eriphyle	24	0.77	4	4a			
Erebia euryale	199	6.42	2				
Erebia fasciata	7	0.23	1				
Erebia flavofasciata	6	0.19	4	4a			
Erebia gorge	66	2.13	4	4a			
Erebia gorgone	10	0.32	4	4a			
Erebia hispania	14	0.45	4	4a			
Erebia jeniseiensis	3	0.10	1				
Erebia lefebvrei	11	0.35	4	4a			
Erebia ligea	577	18.61	2				
Erebia manto	63	2.03	4	4a			
Erebia medusa	298	9.61	2	3		V	
Erebia melampus	37	1.19	4	4a			
Erebia melas	26	0.84	4	4a		L	
Erebia meolans	110	3.55	4	4a			
Erebia mnestra	20	0.65	4	4a			
Erebia montana	28	0.90	4	4a			
Erebia neoridas	42	1.35	4	4a			
Erebia nivalis	9	0.29	4	4a			
Erebia oeme	71	2.29	4	4a			
Erebia orientalis	4	0.13	4	4a			
Erebia ottomana	37	1.19	2			L	
Erebia palarica	4	0.13	4	4a			
Erebia pandrose	180	5.81	2				
Erebia pharte	46	1.48	4	4a			
Erebia pluto	37	1.19	4	4a			
Erebia polaris	19	0.61	2		2	L	

Species	BRF	DI	BS	ECC	FFH	RDB	BC
Erebia pronoe	61	1.97	4	4a			
Erebia rhodopensis	8	0.26	4	4a			
Erebia rossii	13	0.42	2				
Erebia scipio	6	0.19	4	4a			
Erebia serotina	1	0.03	4				
Erebia sthennyo	7	0.23	4	4a			
Erebia stiria	14	0.45	4	4a			
Erebia styx	20	0.65	4	4a			
Erebia sudetica	12	0.39	4	1	4	V	+
Erebia triaria	56	1.81	4	4a			
Erebia tyndarus	18	0.58	4	4a			
Erebia zapateri	4	0.13	4	4a			
Erynnis marloyi	27	0.87	2			L	
Erynnis tages	764	24.64	2	4b			
Euchloe ausonia cpx.	342	11.03	*2/4	(3)		(E)	(*)
Euchloe belemia	56	1.81	3			L	
Euchloe charlonia	5	0.16	2			L	
Euchloe insularis	13	0.42	4	4a			
Euchloe penia	13	0.42	2			L	
Euchloe tagis	45	1.45	2				
Euphydryas aurinia	539	17.39	2	3	2	C, V	+
Euphydryas cynthia	40	1.29	4	4a			
Euphydryas desfontainii	33	1.06	3	4b			
Euphydryas glaciegenita	29	0.94	4		2		+
Euphydryas iduna	26	0.84	2				
Euphydryas intermedia	29	0.94	2	3		E	*
Euphydryas maturna	261	8.42	2	3	2, 4		+
Favonius quercus	731	23.58	2				
Gegenes nostrodamus	60	1.94	2				
Gegenes pumilio	76	2.46	2			L	
Glaucopsyche alexis	601	19.39	2	3			
Glaucopsyche melanops	86	2.77	2	4b			
Glaucopsyche paphos	4	0.13	4	4a			
Gonepteryx cleobule	4	0.13	4	4a			
Gonepteryx cleopatra	268	8.65	2				
Gonepteryx farinosa	39	1.26	2				
Gonepteryx maderensis	1	0.03	4	1		E	*
Gonepteryx rhamni	1124	36.25	2				
Hamearis lucina	427	13.77	2			L	
Hesperia comma	752	24.26	2		2		
Heteropterus morpheus	308	9.94	2				
Hipparchia actaea	61	1.97	3	4a			
Hipparchia amalthea	24	0.77	4				
Hipparchia amymone	1	0.03	4	4a			
Hipparchia anthelea	17	0.55	2	4a			
Hipparchia arethusa	240	7.74	2				
Hipparchia aristaeus	13	0.42	4	4a			
Hipparchia autonoe	29	0.94	2				
Hipparchia azorina	6	0.19	4	1		V/E	*
Hipparchia bacchus	2	0.06	4	4a			

Species	BRF	DI	BS	ECC	FFH	RDB	BC
Hipparchia blachieri	10	0.32	4				
Hipparchia briseis	361	11.65	2				
Hipparchia christenseni	1	0.03	4	4a			
Hipparchia cingovskii	2	0.06	4	4a			
Hipparchia circe	372	12.00	3	4b			
Hipparchia cretica	6	0.19	4	4a			
Hipparchia cypriensis	4	0.13	4				
Hipparchia dryas	345	11.13	2				
Hipparchia euxina	1	0.03	4	1		V	*
Hipparchia fagi	278	8.97	4	4a			
Hipparchia fatua	48	1.55	2				
Hipparchia ferula	156	5.03	2				
Hipparchia fidia	83	2.68	3	4b			
Hipparchia geyeri	6	0.19	2			L	
Hipparchia gomera	1	0.03	4	4a			
Hipparchia graeca	16	0.52	4	4a			
Hipparchia hermione	211	6.81	4				
Hipparchia hippolyte	18	0.58	2				
Hipparchia leighebi	2	0.06	4				
Hipparchia maderensis	1	0.03	4	1		V	*
Hipparchia mersina	4	0.13	1	4a		L	
Hipparchia neomiris	9	0.29	4	4a			
Hipparchia orestes	1	0.03	4	4a			
Hipparchia pellucida	12	0.39	2			L	
Hipparchia persephone	15	0.48	2				
Hipparchia prieuri	7	0.23	3	4b			
Hipparchia sbordonii	1	0.03	4				
Hipparchia semele	702	22.64	4	4a			
Hipparchia senthes	46	1.48	2				
Hipparchia statilinus	324	10.45	3	4b			
Hipparchia syriaca	57	1.84	2				
Hipparchia tilosi	1	0.03	4	4a			
Hipparchia tisiphone	6	0.19	4				
Hipparchia volgensis	42	1.35	*4	4a			
Hipparchia williamsi	4	0.13	4				
Hipparchia wyssii	3	0.10	4	4a			
Hypolimnas misippus	4	0.13	1				
Iolana iolas	99	3.19	3	4b			
Iphiclides podalirius	705	22.74	2				
Issoria lathonia	920	29.68	2				
Laeosopis roboris	137	4.42	3	4b			
Lampides boeticus	349	11.26	2				
Leptidea duponcheli	62	2.00	2				
Leptidea morsei	81	2.61	2	3		C	*
Leptidea sinapis cpx.	1055	34.03	*2/4				
Leptotes pirithous	258	8.32	2				
Libythea celtis	173	5.58	2				
Limenitis camilla	491	15.84	2				
Limenitis populi	549	17.71	2				
Limenitis reducta	370	11.94	2				

Species	BRF	DI	BS	ECC	FFH	RDB	BC
Lycaena alciphron	486	15.68	2				
Lycaena candens	40	1.29	2			L	
Lycaena dispar	429	13.84	2		2, 4		+
Lycaena helle	210	6.77	2	3		V	
Lycaena hippothoe	658	21.23	2			L	
Lycaena ottomana	35	1.13	3	(1)		V	*
Lycaena phlaeas	1258	40.58	2				
Lycaena thersamon	211	6.81	2				
Lycaena thetis	5	0.16	2				
Lycaena tityrus	586	18.90	2				
Lycaena virgaureae	734	23.68	2			L	
Maculinea alcon	346	11.16	2	1, 3		V	(*)
Maculinea arion	513	16.55	2	3	4	E	+
Maculinea nausithous	199	6.42	2	3	2, 4	V	+
Maculinea teleius	242	7.81	2	3	2, 4	V	+
Maniola bathseba	93	3.00	3				
Maniola cecilia	193	6.23	3				
Maniola chia	3	0.10	4	4a			
Maniola cypricola	4	0.13	4	4a			
Maniola halicarnassus	1	0.03	1	4a			
Maniola jurtina	1138	36.70	2				
Maniola lupina	172	5.55	2				
Maniola lycaon	398	12.84	2				
Maniola megala	1	0.03	1	4a			
Maniola nurag	5	0.16	4	4a			
Maniola telmessia	14	0.45	3				
Maniola tithonus	449	14.48	2				
Melanargia arge	26	0.84	4	4a	2, 4		+
Melanargia galathea	677	21.84	3	4b			
Melanargia ines	68	2.19	3				
Melanargia lachesis	86	2.77	4				
Melanargia larissa	59	1.90	3	4a			
Melanargia occitanica	78	2.52	3				
Melanargia pherusa	4	0.13	4	4a			
Melanargia russiae	147	4.74	3				
Melitaea aetherie	23	0.74	2	3		E	*
Melitaea arduinna	25	0.80	2				
Melitaea asteria	9	0.29	4	4a			
Melitaea athalia	929	29.97	2				
Melitaea aurelia	286	9.23	2	3		V	
Melitaea britomartis	138	4.45	2	3		V	
Melitaea cinxia	651	21.00	2				
Melitaea deione	92	2.97	3	4b			
Melitaea diamina	449	14.48	2				
Melitaea didyma	600	19.35	2				
Melitaea nevadensis	2	0.06	4				
Melitaea parthenoides	153	4.94	4	4a			
Melitaea phoebe	497	16.03	2				
Melitaea trivia	233	7.52	2				
Melitaea varia	30	0.97	2	4a			

Species	BRF	DI	BS	ECC	FFH	RDB	BC
Neolycaena rhymnus	29	0.94	2	3		E	*
Neptis rivularis	192	6.19	2				
Neptis sappho	135	4.35	2			L	
Nymphalis antiopa	856	27.61	2				
Nymphalis c-album	1062	34.25	2				
Nymphalis egea	147	4.74	3				
Nymphalis ichnusa	12	0.39	4				
Nymphalis io	1071	34.54	2				
Nymphalis l-album	109	3.52	2	3		E	*
Nymphalis polychloros	773	24.94	2				
Nymphalis urticae	1216	39.22	2				
Nymphalis xanthomelas	169	5.45	2	3		V	
Ochlodes sylvanus	999	32.22	*3				
Oeneis bore	30	0.97	2			L	
Oeneis glacialis	32	1.03	4	4a			
Oeneis jutta	203	6.55	3			L	
Oeneis magna	2	0.06	1				
Oeneis melissa	11	0.35	1				
Oeneis norna	72	2.32	2				
Oeneis oeno	2	0.06	1				
Oeneis polixenes	4	0.13	1				
Oeneis tarpeia	24	0.77	2				
Papilio alexanor	40	1.29	2		4		+
Papilio hospiton	12	0.39	4	4a	2, 4		+
Papilio machaon	1190	38.38	2				
Pararge achine	331	10.68	2	3	4	V	+
Pararge aegeria	1031	33.25	2				
Pararge climene	19	0.61	2				
Pararge deidamia	8	0.26	1				
Pararge maera	867	27.97	2				
Pararge megera	882	28.45	2				
Pararge paramegaera	14	0.45	4				
Pararge petropolitana	376	12.13	2				
Pararge roxelana	80	2.58	2				
Pararge xiphia	1	0.03	4	4a		L	
Pararge xiphioides	6	0.19	4	4a			
Parnassius apollo	344	11.10	2	3	4	V	+
Parnassius mnemosyne	384	12.39	2		4		+
Parnassius phoebus	44	1.42	2	3		V	
Pelopidas thrax	6	0.19	1			L	
Pieris brassicae	1282	41.35	2	(1)			(*)
Pieris bryoniae	85	2.74	3				
Pieris callidice	58	1.87	2				
Pieris cheiranthi	4	0.13	4	1		V	*
Pieris chloridice	57	1.84	2				
Pieris daplidice cpx.	907	29.26	2/2				
Pieris ergane	104	3.35	2				
Pieris krueperi	40	1.29	2			L	
Pieris mannii	181	5.84	2				
Pieris napi	1348	43.48	2	(4a)			

Species	BRF	DI	BS	ECC	FFH	RDB	BC
Pieris rapae	1304	42.06	2				
Plebejus aquilo	25	0.80	2		2		
Plebejus argus	966	31.16	2				
Plebejus argyrognomon	336	10.84	2			L	
Plebejus bellieri	11	0.35	4				
Plebejus dardanus	3	0.10	*3				
Plebejus eurypilus	2	0.06	1				
Plebejus glandon	34	1.10	4	4a			
Plebejus hespericus	6	0.19	4	1		V	*
Plebejus idas	767	24.74	2				
Plebejus loewi	5	0.16	1				
Plebejus optilete	509	16.42	2				
Plebejus orbitulus	48	1.55	2				
Plebejus psyloritus	3	0.10	4	4a			
Plebejus pylaon	28	0.90	2				
Plebejus pyrenaicus	5	0.16	4	4a			
Plebejus sephirus	41	1.32	4				
Plebejus trappi	8	0.26	4	1		V	*
Plebejus zuellichi	2	0.06	4				
Polyommatus admetus	48	1.55	3	4b			
Polyommatus ainsae	7	0.23	4				
Polyommatus albicans	32	1.03	4	4a			
Polyommatus amandus	565	18.22	3				
Polyommatus aroaniensis	12	0.39	4	4a			
Polyommatus bellargus	536	17.29	2				
Polyommatus caelestissimus	3	0.10	4	4a			
Polyommatus caucasicus	2	0.06	1				
Polyommatus coelestinus	21	0.68	2				
Polyommatus coridon	512	16.52	4	4a			
Polyommatus cyane	3	0.10	1	4a			
Polyommatus damocles	8	0.26	1	4b			
Polyommatus damon	172	5.55	2			L	
Polyommatus damone	15	0.48	2	3		V	
Polyommatus daphnis	299	9.65	3	4b			
Polyommatus dolus	25	0.80	4	4a			
Polyommatus dorylas	285	9.19	3	4b			
Polyommatus eroides	48	1.55	3	3		C	*
Polyommatus eros	47	1.52	3	4b		L	
Polyommatus escheri	143	4.61	3	4b			
Polyommatus exuberans	2	0.06	4				
Polyommatus fabressei	9	0.29	4	4a			
Polyommatus galloi	3	0.10	4	4a			
Polyommatus gennargenti	1	0.03	4				
Polyommatus golgus	2	0.06	4	4a	2, 4		+
Polyommatus hispanus	44	1.42	4	4a			
Polyommatus humedasae	1	0.03	4	1		E	
Polyommatus icarus	1409	45.45	2	(4a)			
Polyommatus iphigenius	2	0.06	1				
Polyommatus menalcas	1	0.03	1	4a			
Polyommatus nephohiptamenos	3	0.10	4	4a			

Species	BRF	DI	BS	ECC	FFH	RDB	BC
Polyommatus nivescens	24	0.77	4	4a			
Polyommatus poseidon	1	0.03	1				
Polyommatus ripartii	73	2.35	3				
Polyommatus semiargus	916	29.55	2				
Polyommatus thersites	343	11.06	2				
Polyommatus violetae	3	0.10	4				
Proterebia afra	30	0.97	2				
Pyrgus alveus cx.	485	15.65	2/4				
Pyrgus andromedae	67	2.16	4	4a			
Pyrgus armoricanus	300	9.68	3				
Pyrgus bellieri	20	0.65	4	4a			
Pyrgus cacaliae	45	1.45	4	4a			
Pyrgus carlinae	22	0.71	2	4a			
Pyrgus carthami	261	8.42	2				
Pyrgus centaureae	169	5.45	2	3		V	
Pyrgus cinarae	27	0.87	3	4a		L	
Pyrgus cirsii	86	2.77	4	1		V	*
Pyrgus malvae cpx.	913	29.45	2/4	(4a)			
Pyrgus onopordi	94	3.03	3			L	
Pyrgus serratulae	308	9.94	2				
Pyrgus sidae	89	2.87	2				
Pyrgus warrenensis	24	0.77	4	4a			
Satyrium acaciae	322	10.39	3	4b			
Satyrium esculi	93	3.00	3	4b			
Satyrium ilicis	545	17.58	2				
Satyrium ledereri	1	0.03	1			L	
Satyrium pruni	413	13.32	2				
Satyrium spini	462	14.90	2				
Satyrium w-album	558	18.00	2				
Scolitantides abencerragus	26	0.84	3			L	
Scolitantides barbagiae	2	0.06	4	4a			
Scolitantides baton	197	6.35	4	4a			
Scolitantides bavius	28	0.90	2	3		E	*
Scolitantides orion	275	8.87	2	3		V	
Scolitantides panoptes	38	1.23	4				
Scolitantides vicrama	229	7.39	2	3		V	
Spialia orbifer	137	4.42	2				
Spialia phlomidis	21	0.68	2			L	
Spialia sertorius	309	9.97	3				
Spialia therapne	8	0.26	4	4a			
Syrichtus cribrellum	23	0.74	2			L	
Syrichtus proto	89	2.87	3				
Syrichtus tessellum	64	2.06	2				
Tarucus balcanicus	24	0.77	2			L	
Tarucus theophrastus	5	0.16	2			L	
Thaleropis ionia	1	0.03	1	4b			
Thecla betulae	593	19.13	2				
Thymelicus acteon	455	14.68	2	2		V	
Thymelicus hyrax	13	0.42	2				
Thymelicus lineola	885	28.54	2				

Species	BRF	DI	BS	ECC	FFH	RDB	BC
Thymelicus sylvestris	752	24.26	2	4b			
Tomares ballus	48	1.55	3	2		V	
Tomares callimachus	8	0.26	3	2		E	*
Tomares nogelli	6	0.19	3	2		E	*
Triphysa phryne	13	0.42	2	3		C	*
Turanana panagea	3	0.10	2				
Vanessa atalanta	1246	40.19	2				
Vanessa cardui	1328	42.83	2				
Vanessa virginiensis	18	0.58	2				
Vanessa vulcania	9	0.29	4				
Ypthima asterope	10	0.32	1				
Zegris eupheme	49	1.58	3				
Zerynthia caucasica	1	0.03	1	1		V	*
Zerynthia cerisyi	56	1.81	2			L	
Zerynthia cretica	5	0.16	4	4a			
Zerynthia polyxena	224	7.23	2		4		+
Zerynthia rumina	101	3.26	2				
Zizeeria knysna	45	1.45	2			L	

The above table of 486 European butterflies rearranged according to the size of the European distribution of each species (i.e. according to the number of BRF inhabited by each species) in descending sequence:

Species	BRF	DI	BS	ECC	FFH	RDB	BC
Polyommatus icarus	1409	45.45	2	(4a)			
Pieris napi	1348	43.48	2	(4a)			
Vanessa cardui	1328	42.83	2				
Pieris rapae	1304	42.06	2				
Pieris brassicae	1282	41.35	2	(1)			(*)
Coenonympha pamphilus	1263	40.74	2				
Lycaena phlaeas	1258	40.58	2				
Vanessa atalanta	1246	40.19	2				
Nymphalis urticae	1216	39.22	2				
Anthocharis cardamines	1213	39.12	2				
Papilio machaon	1190	38.38	2				
Celastrina argiolus	1159	37.38	2				
Callophrys rubi	1157	37.32	2				
Maniola jurtina	1138	36.70	2				
Gonepteryx rhamni	1124	36.25	2				
Argynnis aglaja	1080	34.83	2				
Nymphalis io	1071	34.54	2				
Nymphalis c-album	1062	34.25	2				
Leptidea sinapis cpx.	1055	34.03	*2/4				
Pararge aegeria	1031	33.25	2				
Boloria selene	999	32.22	2				
Ochlodes sylvanus	999	32.22	*3				
Argynnis paphia	982	31.67	2				
Aphantopus hyperantus	967	31.19	2				
Plebejus argus	966	31.16	2				

Species	BRF	DI	BS	ECC	FFH	RDB	BC
Boloria euphrosyne	963	31.06	2				
Colias crocea	935	30.16	2				
Melitaea athalia	929	29.97	2				
Issoria lathonia	920	29.68	2				
Polyommatus semiargus	916	29.55	2				
Pyrgus malvae cpx.	913	29.45	2/4	(4a)			
Aporia crataegi	911	29.39	2				
Pieris daplidice cpx.	907	29.26	2/2				
Thymelicus lineola	885	28.54	2				
Argynnis adippe	882	28.45	2				
Pararge megera	882	28.45	2				
Pararge maera	867	27.97	2				
Nymphalis antiopa	856	27.61	2				
Nymphalis polychloros	773	24.94	2				
Plebejus idas	767	24.74	2				
Erynnis tages	764	24.64	2	4b			
Hesperia comma	752	24.26	2		2		
Thymelicus sylvestris	752	24.26	2	4b			
Brenthis ino	738	23.81	2				
Lycaena virgaureae	734	23.68	2			L	
Cupido minimus	733	23.65	2				
Favonius quercus	731	23.58	2				
Iphiclides podalirius	705	22.74	2				
Hipparchia semele	702	22.64	4	4a			
Colias hyale	697	22.48	2				
Melanargia galathea	677	21.84	3	4b			
Coenonympha arcania	675	21.77	2				
Lycaena hippothoe	658	21.23	2			L	
Melitaea cinxia	651	21.00	2				
Argynnis niobe	632	20.39	2				
Araschnia levana	623	20.10	2				
Aricia agestis	622	20.06	2				
Glaucopsyche alexis	601	19.39	2	3			
Carcharodus alceae	600	19.35	2				
Melitaea didyma	600	19.35	2				
Thecla betulae	593	19.13	2				
Lycaena tityrus	586	18.90	2				
Carterocephalus palaemon	580	18.71	2				
Erebia ligea	577	18.61	2				
Boloria dia	568	18.32	2				
Polyommatus amandus	565	18.22	3				
Coenonympha tullia	564	18.19	2	3		V	
Satyrium w-album	558	18.00	2				
Limenitis populi	549	17.71	2				
Satyrium ilicis	545	17.58	2				
Euphydryas aurinia	539	17.39	2	3	2	C, V	+
Polyommatus bellargus	536	17.29	2				
Coenonympha glycerion	520	16.77	2				
Apatura iris	513	16.55	2				
Maculinea arion	513	16.55	2	3	4	E	+

Species	BRF	DI	BS	ECC	FFH	RDB	BC
Polyommatus coridon	512	16.52	4	4a			
Aricia eumedon	509	16.42	2				
Plebejus optilete	509	16.42	2				
Cupido argiades	499	16.10	2				
Melitaea phoebe	497	16.03	2				
Limenitis camilla	491	15.84	2				
Lycaena alciphron	486	15.68	2				
Pyrgus alveus cx.	485	15.65	2/4				
Apatura ilia	483	15.58	2				
Boloria aquilonaris	483	15.58	2				
Aricia artaxerxes	481	15.52	4				
Satyrium spini	462	14.90	2				
Colias palaeno	460	14.84	2			L	
Thymelicus acteon	455	14.68	2	2		V	
Maniola tithonus	449	14.48	2				
Melitaea diamina	449	14.48	2				
Lycaena dispar	429	13.84	2		2, 4		+
Hamearis lucina	427	13.77	2			L	
Satyrium pruni	413	13.32	2				
Colias alfacariensis	402	12.97	*3	4b			
Maniola lycaon	398	12.84	2				
Parnassius mnemosyne	384	12.39	2		4		+
Pararge petropolitana	376	12.13	2				
Hipparchia circe	372	12.00	3	4b			
Limenitis reducta	370	11.94	2				
Hipparchia briseis	361	11.65	2				
Boloria eunomia	357	11.52	2				
Lampides boeticus	349	11.26	2				
Maculinea alcon	346	11.16	2	1, 3		V	(*)
Hipparchia dryas	345	11.13	2				
Parnassius apollo	344	11.10	2	3	4	V	+
Polyommatus thersites	343	11.06	2				
Euchloe ausonia cpx.	342	11.03	*2/4	(3)		(E)	(*)
Plebejus argyrognomon	336	10.84	2			L	
Pararge achine	331	10.68	2	3	4	V	+
Hipparchia statilinus	324	10.45	3	4b			
Satyrium acaciae	322	10.39	3	4b			
Brenthis daphne	313	10.10	2				
Argynnis pandora	310	10.00	2				
Spialia sertorius	309	9.97	3				
Heteropterus morpheus	308	9.94	2				
Pyrgus serratulae	308	9.94	2				
Erebia aethiops	303	9.77	2			L	
Pyrgus armoricanus	300	9.68	3				
Polyommatus daphnis	299	9.65	3	4b			
Erebia medusa	298	9.61	2	3		V	
Carcharodus flocciferus	286	9.23	*3				
Melitaea aurelia	286	9.23	2	3		V	
Polyommatus dorylas	285	9.19	3	4b			
Carterocephalus silvicolus	280	9.03	2				

Species	BRF	DI	BS	ECC	FFH	RDB	BC
Hipparchia fagi	278	8.97	4	4a			
Scolitantides orion	275	8.87	2	3		V	
Gonepteryx cleopatra	268	8.65	2				
Euphydryas maturna	261	8.42	2	3	2, 4		+
Pyrgus carthami	261	8.42	2				
Leptotes pirithous	258	8.32	2				
Maculinea teleius	242	7.81	2	3	2, 4	V	+
Hipparchia arethusa	240	7.74	2				
Melitaea trivia	233	7.52	2				
Scolitantides vicrama	229	7.39	2	3		V	
Zerynthia polyxena	224	7.23	2		4		+
Hipparchia hermione	211	6.81	4				
Lycaena thersamon	211	6.81	2				
Lycaena helle	210	6.77	2	3		V	
Oeneis jutta	203	6.55	3			L	
Erebia euryale	199	6.42	2				
Maculinea nausithous	199	6.42	2	3	2, 4	V	+
Scolitantides baton	197	6.35	4	4a			
Coenonympha hero	194	6.26	2	3	4	V	+
Maniola cecilia	193	6.23	3				
Neptis rivularis	192	6.19	2				
Brenthis hecate	189	6.10	2				
Boloria frigga	183	5.90	2	3		V	
Pieris mannii	181	5.84	2				
Erebia pandrose	180	5.81	2				
Boloria freija	177	5.71	2				
Colias erate	175	5.85	2				
Cupido alcetas	174	5.61	4				
Libythea celtis	173	5.58	2				
Maniola lupina	172	5.55	2				
Polyommatus damon	172	5.55	2			L	
Nymphalis xanthomelas	169	5.45	2	3		V	
Pyrgus centaureae	169	5.45	2	3		V	
Erebia embla	165	5.32	2	3		V	
Boloria titania	163	5.26	2	3		V	
Hipparchia ferula	156	5.03	2				
Melitaea parthenoides	153	4.94	4	4a			
Carcharodus lavatherae	151	4.87	2	4b			
Colias myrmidone	148	4.77	2	2		V	
Melanargia russiae	147	4.74	3				
Nymphalis egea	147	4.74	3				
Cupido osiris	143	4.61	3				
Polyommatus escheri	143	4.61	3	4b			
Melitaea britomartis	138	4.45	2	3		V	
Laeosopis roboris	137	4.42	3	4b			
Spialia orbifer	137	4.42	2				
Neptis sappho	135	4.35	2			L	
Charaxes jasius	127	4.10	2				
Argyronome laodice	124	4.00	2				
Aricia nicias	112	3.61	4	4a			

Species	BRF	DI	BS	ECC	FFH	RDB	BC
Aricia cramera	110	3.55	3				
Erebia meolans	110	3.55	4	4a			
Nymphalis l-album	109	3.52	2	3		E	*
Boloria napaea	106	3.42	2				
Pieris ergane	104	3.35	2				
Erebia epiphron	102	3.29	4	4a			
Boloria thore	101	3.26	2	3		V	
Zerynthia rumina	101	3.26	2				
Anthocharis euphenoides	100	3.23	4	4a			
Iolana iolas	99	3.19	3	4b			
Pyrgus onopordi	94	3.03	3			L	
Maniola bathseba	93	3.00	3				
Satyrium esculi	93	3.00	3	4b			
Melitaea deione	92	2.97	3	4b			
Pyrgus sidae	89	2.87	2				
Syrichtus proto	89	2.87	3				
Glaucopsyche melanops	86	2.77	2	4b			
Melanargia lachesis	86	2.77	4				
Pyrgus cirsii	86	2.77	4	1		V	*
Pieris bryoniae	85	2.74	3				
Coenonympha dorus	83	2.68	3	4b			
Hipparchia fidia	83	2.68	3	4b			
Leptidea morsei	81	2.61	2	3		C	*
Pararge roxelana	80	2.58	2				
Melanargia occitanica	78	2.52	3				
Gegenes pumilio	76	2.46	2			L	
Colias chrysotheme	74	2.39	2	3		V	
Boloria pales	73	2.35	2				
Polyommatus ripartii	73	2.35	3				
Oeneis norna	72	2.32	2				
Erebia oeme	71	2.29	4	4a			
Melanargia ines	68	2.19	3				
Pyrgus andromedae	67	2.16	4	4a			
Cupido decoloratus	66	2.13	4	4a			
Erebia gorge	66	2.13	4	4a			
Danaus chrysippus	65	2.10	2				
Syrichtus tessellum	64	2.06	2				
Erebia manto	63	2.03	4	4a			
Leptidea duponcheli	62	2.00	2				
Erebia pronoe	61	1.97	4	4a			
Hipparchia actaea	61	1.97	3	4a			
Carcharodus baeticus	60	1.94	4	4a			
Gegenes nostrodamus	60	1.94	2				
Melanargia larissa	59	1.90	3	4a			
Colias phicomone	58	1.87	4	4a			
Pieris callidice	58	1.87	2				
Hipparchia syriaca	57	1.84	2				
Pieris chloridice	57	1.84	2				
Carcharodus orientalis	56	1.81	2				
Erebia triaria	56	1.81	4	4a			

Species	BRF	DI	BS	ECC	FFH	RDB	BC
Euchloe belemia	56	1.81	3			L	
Zerynthia cerisyi	56	1.81	2			L	
Coenonympha oedippus	53	1.71	2	3	2, 4	C	+
Zegris eupheme	49	1.58	3				
Apatura metis	48	1.55	2		4	L	+
Coenonympha leander	48	1.55	2				
Erebia alberganus	48	1.55	4	4a			
Erebia cassioides	48	1.55	4	4a			
Erebia disa	48	1.55	2				
Hipparchia fatua	48	1.55	2				
Plebejus orbitulus	48	1.55	2				
Polyommatus admetus	48	1.55	3	4b			
Polyommatus eroides	48	1.55	3	3		C	*
Tomares ballus	48	1.55	3	2		V	
Polyommatus eros	47	1.52	3	4b		L	
Erebia pharte	46	1.48	4	4a			
Hipparchia senthes	46	1.48	2				
Coenonympha gardetta	45	1.45	4	4a			
Euchloe tagis	45	1.45	2				
Pyrgus cacaliae	45	1.45	4	4a			
Zizeeria knysna	45	1.45	2			L	
Parnassius phoebus	44	1.42	2	3		V	
Polyommatus hispanus	44	1.42	4	4a			
Erebia neoridas	42	1.35	4	4a			
Hipparchia volgensis	42	1.35	4	4a			
Plebejus sephirus	41	1.32	4				
Euphydryas cynthia	40	1.29	4	4a			
Lycaena candens	40	1.29	2			L	
Papilio alexanor	40	1.29	2		4		+
Pieris krueperi	40	1.29	2			L	
Aricia anteros	39	1.26	4	4a			
Gonepteryx farinosa	39	1.26	2				
Scolitantides panoptes	38	1.23	4				
Erebia melampus	37	1.19	4	4a			
Erebia ottomana	37	1.19	2			L	
Erebia pluto	37	1.19	4	4a			
Callophrys avis	36	1.16	3	4b			
Lycaena ottomana	35	1.13	3	(1)		V	*
Coenonympha iphioides	34	1.10	4				
Plebejus glandon	34	1.10	4	4a			
Cacyreus marshalli	33	1.06	2				
Coenonympha rhodopensis	33	1.06	4	4a			
Euphydryas desfontainii	33	1.06	3	4b			
Oeneis glacialis	32	1.03	4	4a			
Polyommatus albicans	32	1.03	4	4a			
Colias hecla	31	1.00	2	3		V	
Aricia montensis	30	0.97	4				
Boloria graeca	30	0.97	4	4a			
Melitaea varia	30	0.97	2	4a			
Oeneis bore	30	0.97	2			L	

Species	BRF	DI	BS	ECC	FFH	RDB	BC
Proterebia afra	30	0.97	2				
Euphydryas glaciegenita	29	0.94	4		2		+
Euphydryas intermedia	29	0.94	2	3		E	*
Hipparchia autonoe	29	0.94	2				
Neolycaena rhymnus	29	0.94	2	3		E	*
Boloria chariclea	28	0.90	2			L	
Erebia montana	28	0.90	4	4a			
Plebejus pylaon	28	0.90	2				
Scolitantides bavius	28	0.90	2	3		E	*
Anthocharis gruneri	27	0.87	2				
Boloria polaris	27	0.87	2				
Erynnis marloyi	27	0.87	2			L	
Pyrgus cinarae	27	0.87	3	4a		L	
Erebia melas	26	0.84	4	4a		L	
Euphydryas iduna	26	0.84	2				
Melanargia arge	26	0.84	4	4a	2, 4		+
Scolitantides abencerragus	26	0.84	3			L	
Melitaea arduinna	25	0.80	2				
Plebejus aquilo	25	0.80	2		2		
Polyommatus dolus	25	0.80	4	4a			
Erebia eriphyle	24	0.77	4	4a			
Hipparchia amalthea	24	0.77	4				
Oeneis tarpeia	24	0.77	2				
Polyommatus nivescens	24	0.77	4	4a			
Pyrgus warrenensis	24	0.77	4	4a			
Tarucus balcanicus	24	0.77	2			L	
Chilades trochylus	23	0.74	2				
Melitaea aetherie	23	0.74	2	3		E	*
Syrichtus cribrellum	23	0.74	2			L	
Pyrgus carlinae	22	0.71	2	4a			
Boloria angarensis	21	0.68	2				
Erebia arvenensis	21	0.68	4				
Polyommatus coelestinus	21	0.68	2				
Spialia phlomidis	21	0.68	2			L	
Coenonympha corinna	20	0.65	4	4a			
Erebia mnestra	20	0.65	4	4a			
Erebia styx	20	0.65	4	4a			
Pyrgus bellieri	20	0.65	4	4a			
Danaus plexippus	19	0.61	2				
Erebia epistygne	19	0.61	4	1		V	*
Erebia polaris	19	0.61	2		2	L	
Pararge climene	19	0.61	2				
Erebia tyndarus	18	0.58	4	4a			
Hipparchia hippolyte	18	0.58	2				
Vanessa virginiensis	18	0.58	2				
Anthocharis damone	17	0.55	2	3		V	
Hipparchia anthelea	17	0.55	2	4a			
Hipparchia graeca	16	0.52	4	4a			
Archon apollinus	15	0.48	2	3		E	*
Cupido lorquinii	15	0.48	3			L	

Species	BRF	DI	BS	ECC	FFH	RDB	BC
Hipparchia persephone	15	0.48	2				
Polyommatus damone	15	0.48	2	3		V	
Aricia morronensis	14	0.45	4	4a			
Colias werdandi	14	0.45	3	3		V	
Erebia hispania	14	0.45	4	4a			
Erebia stiria	14	0.45	4	4a			
Maniola telmessia	14	0.45	3				
Pararge paramegaera	14	0.45	4				
Erebia rossii	13	0.42	2				
Euchloe insularis	13	0.42	4	4a			
Euchloe penia	13	0.42	2			L	
Hipparchia aristaeus	13	0.42	4	4a			
Thymelicus hyrax	13	0.42	2				
Triphysa phryne	13	0.42	2	3		C	*
Colias aurorina	12	0.39	2				
Colias balcanica	12	0.39	4				
Erebia sudetica	12	0.39	4	1	4	V	+
Hipparchia pellucida	12	0.39	2			L	
Nymphalis ichnusa	12	0.39	4				
Papilio hospiton	12	0.39	4	4a	2, 4		+
Polyommatus aroaniensis	12	0.39	4	4a			
Boloria improba	11	0.35	2		2	L	
Cupido fischeri	11	0.35	2				
Erebia lefebvrei	11	0.35	4	4a			
Oeneis melissa	11	0.35	1				
Plebejus bellieri	11	0.35	4				
Boloria eugenia	10	0.32	1				
Erebia gorgone	10	0.32	4	4a			
Hipparchia blachieri	10	0.32	4				
Ypthima asterope	10	0.32	1				
Boloria selenis	9	0.29	1				
Erebia cyclopius	9	0.29	2				
Erebia nivalis	9	0.29	4	4a			
Hipparchia neomiris	9	0.29	4	4a			
Melitaea asteria	9	0.29	4	4a			
Polyommatus fabressei	9	0.29	4	4a			
Vanessa vulcania	9	0.29	4				
Argynnis elisa	8	0.26	4	4a	4		+
Catopsilia florella	8	0.26	1				
Colotis evagore	8	0.26	1				
Erebia calcaria	8	0.26	4	4a	2, 4		+
Erebia rhodopensis	8	0.26	4	4a			
Pararge deidamia	8	0.26	1				
Plebejus trappi	8	0.26	4	1		V	*
Polyommatus damocles	8	0.26	1	4b			
Spialia therapne	8	0.26	4	4a			
Tomares callimachus	8	0.26	3	2		E	*
Coenonympha amaryllis	7	0.23	1				
Cyclyrius webbianus	7	0.23	4	4a			
Erebia fasciata	7	0.23	1				

Species	BRF	DI	BS	ECC	FFH	RDB	BC
Erebia sthennyo	7	0.23	4	4a			
Hipparchia prieuri	7	0.23	3	4b			
Polyommatus ainsae	7	0.23	4				
Carcharodus stauderi	6	0.19	1				
Erebia flavofasciata	6	0.19	4	4a			
Erebia scipio	6	0.19	4	4a			
Hipparchia azorina	6	0.19	4	1		V/E	*
Hipparchia cretica	6	0.19	4	4a			
Hipparchia geyeri	6	0.19	2			L	
Hipparchia tisiphone	6	0.19	4				
Pararge xiphioides	6	0.19	4	4a			
Pelopidas thrax	6	0.19	1			L	
Plebejus hespericus	6	0.19	4	1		V	*
Tomares nogelli	6	0.19	3	2		E	*
Coenonympha thyrsis	5	0.16	4	4a			
Erebia aethiopella	5	0.16	4	4a			
Erebia claudina	5	0.16	4	4a			
Erebia dabanensis	5	0.16	1				
Erebia discoidalis	5	0.16	1				
Euchloe charlonia	5	0.16	2			L	
Lycaena thetis	5	0.16	2				
Maniola nurag	5	0.16	4	4a			
Plebejus loewi	5	0.16	1				
Plebejus pyrenaicus	5	0.16	4	4a			
Tarucus theophrastus	5	0.16	2			L	
Zerynthia cretica	5	0.16	4	4a			
Cigaritis acamas	4	0.13	1				
Erebia orientalis	4	0.13	4	4a			
Erebia palarica	4	0.13	4	4a			
Erebia zapateri	4	0.13	4	4a			
Glaucopsyche paphos	4	0.13	4	4a			
Gonepteryx cleobule	4	0.13	4	4a			
Hipparchia cypriensis	4	0.13	4				
Hipparchia mersina	4	0.13	1	4a		L	
Hipparchia williamsi	4	0.13	4				
Hypolimnas misippus	4	0.13	1				
Maniola cypricola	4	0.13	4	4a			
Melanargia pherusa	4	0.13	4	4a			
Oeneis polixenes	4	0.13	1				
Pieris cheiranthi	4	0.13	4	1		V	*
Chilades galba	3	0.10	1				
Cupido carswelli	3	0.10	4				
Erebia jeniseiensis	3	0.10	1				
Hipparchia wyssii	3	0.10	4	4a			
Maniola chia	3	0.10	4	4a			
Plebejus dardanus	3	0.10	*3				
Plebejus psyloritus	3	0.10	4	4a			
Polyommatus caelestissimus	3	0.10	4	4a			
Polyommatus cyane	3	0.10	1	4a			
Polyommatus galloi	3	0.10	4	4a			

Species	BRF	DI	BS	ECC	FFH	RDB	BC
Polyommatus nephohiptamenos	3	0.10	4	4a			
Polyommatus violetae	3	0.10	4				
Turanana panagea	3	0.10	2				
Boloria alaskensis	2	0.06	1				
Boloria tritonia	2	0.06	1				
Callophrys suaveola	2	0.06	1				
Hipparchia bacchus	2	0.06	4	4a			
Hipparchia cingovskii	2	0.06	4	4a			
Hipparchia leighebi	2	0.06	4				
Melitaea nevadensis	2	0.06	4				
Oeneis magna	2	0.06	1				
Oeneis oeno	2	0.06	1				
Plebejus eurypilus	2	0.06	1				
Plebejus zuellichi	2	0.06	4				
Polyommatus caucasicus	2	0.06	1				
Polyommatus exuberans	2	0.06	4				
Polyommatus golgus	2	0.06	4	4a	2, 4		+
Polyommatus iphigenius	2	0.06	1				
Scolitantides barbagiae	2	0.06	4	4a			
Azanus ubaldus	1	0.03	1				
Borbo borbonica	1	0.03	1				
Erebia christi	1	0.03	4	1	2, 4	V	+
Erebia edda	1	0.03	1				
Erebia serotina	1	0.03	4				
Gonepteryx maderensis	1	0.03	4	1		E	*
Hipparchia amymone	1	0.03	4	4a			
Hipparchia christenseni	1	0.03	4	4a			
Hipparchia euxina	1	0.03	4	1		V	*
Hipparchia gomera	1	0.03	4	4a			
Hipparchia maderensis	1	0.03	4	1		V	*
Hipparchia orestes	1	0.03	4	4a			
Hipparchia sbordonii	1	0.03	4				
Hipparchia tilosi	1	0.03	4	4a			
Maniola halicarnassus	1	0.03	1	4a			
Maniola megala	1	0.03	1	4a			
Pararge xiphia	1	0.03	4	4a		L	
Polyommatus gennargenti	1	0.03	4				
Polyommatus humedasae	1	0.03	4	1		E	
Polyommatus menalcas	1	0.03	1	4a			
Polyommatus poseidon	1	0.03	1				
Satyrium ledereri	1	0.03	1			L	
Thaleropis ionia	1	0.03	1	4b			
Zerynthia caucasica	1	0.03	1	1		V	*

It is interesting to observe that as many as 198 species (about 41 %) of the total of 486 species are at present known to inhabit not more than 1 % of European territory (i.e. 31 of 3100 BRF) whereas only 20 species (about 4.1 %) have been recorded from more than 1000 BRF, i.e. they inhabit about one third or more of the territory of Europe.

6.3 Implications for conservation

Contrary to claims made occasionally both by conservation biologists and politicians, practically all efforts aimed at the conservation and protection of European butterflies up to now have been determined by nationally orientated preferences, and in many cases influenced politically by uninformed civil servants. The spectrum of species protected by the Bern Convention and/or by the Habitat Directive 92/43 of the EU confirms this beyond any doubt (KUDRNA 2000). The implementation of national priorities on a European scale lacks a logical background. National conservation efforts must conform with pan-European priorities to make any sense. National conservation priorities aim without exception at the European-wide protection of 'national rarities' believed nationally or regionally threatened.

The best example demonstrating this out-dated approach is the re-establishment at all costs of *Maculinea arion* in the United Kingdom. The result – Great Britain has received back an attractive nationally lost species from foreign stock – but the original stock (i.e. the indigenous unit of evolution) was already lost for ever and the re-establishment has not affected the European or global conservation status of this widespread species. Leaving aside the spin-offs from the project – promoting butterfly conservation amongst the general public and advancing enormously our knowledge of the ecology and population biology of the species concerned – it surely may be argued, that the re-establishment comes close to wasting valuable resources. The lesson learned from this project is that national and regional conservation priorities can only be objectively determined from a European point of view, based upon the evaluation of the distribution of the species concerned. This can only be done by means of reliable, comprehensive up-to-date European distribution maps.

A distribution atlas is not a work directly concerned with butterfly conservation. Nevertheless, distribution maps provide indispensable information on the biogeographical status of the species, which cannot be substituted by any other means. Thus, this chapter attempts to interpret the distribution data by drawing conclusions for butterfly conservation. The east of Europe cannot be fully considered here; making proposals for the conservation of butterflies in countries like Russia, Belarus, the Ukraine or Moldova would probably be a waste of time at present due both to poor data availability and the anticipated disinterest of the conservation authorities concerned.

At present 25 butterfly species are protected by European legislation, i.e. by the EU Habitat Directive 92/43 and/or by the Bern Convention; in the EU they are protected by law as 'Species of Community Interest'. The official English definition extremely long-winded (and strictly speaking not identical with the German definition); it can be shortened as follows:

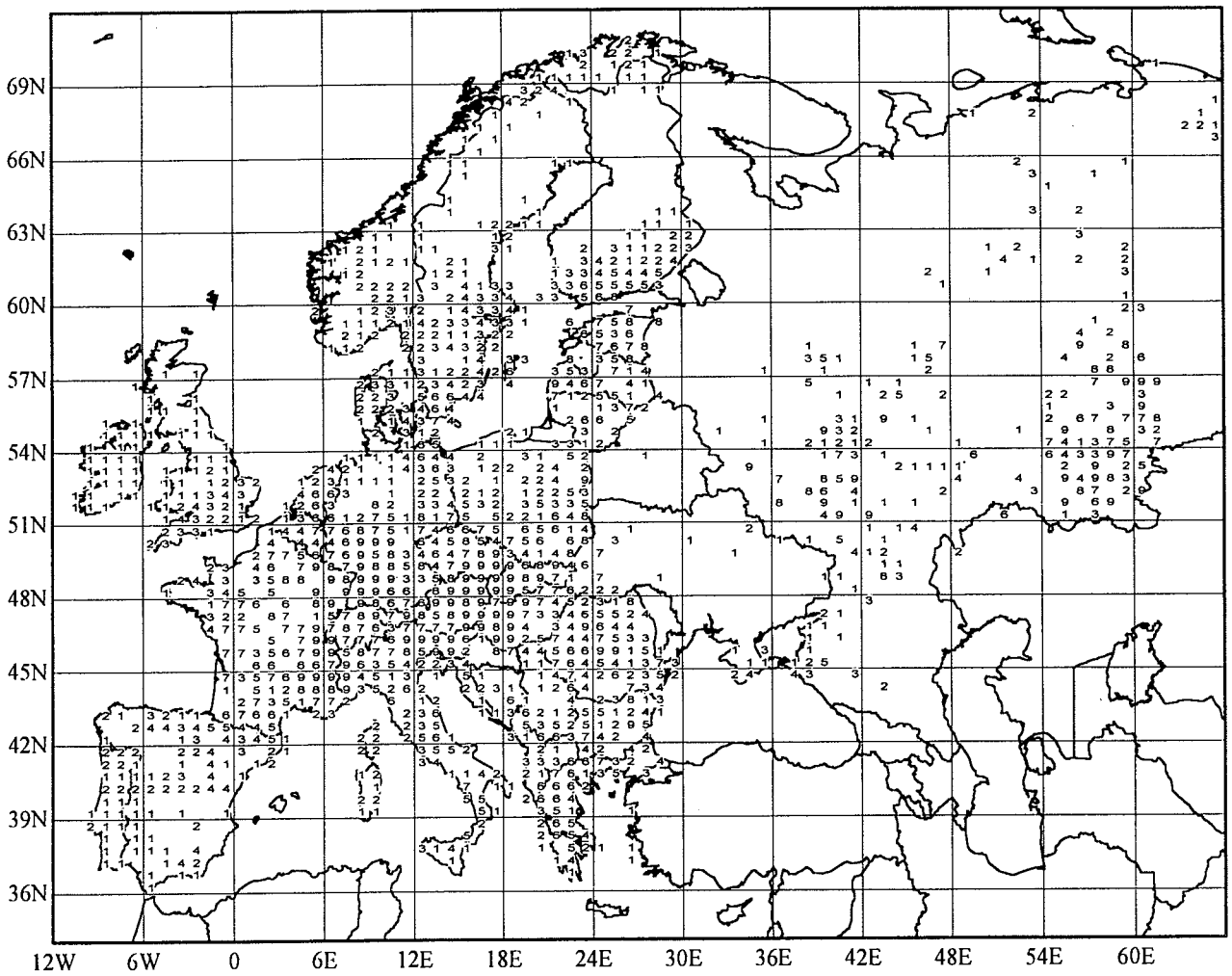
> Species of Community Interest (SCI) are species which within the territory of the European Union are endangered, vulnerable, rare or endemic. These species occur in restricted geographical regions of the Union's territory and require particular attention owing to their habitat requirements. Excluded are all those species which inhabit marginal zones of the Union's territory.

The three terms – endangered, vulnerable and endemic – require no special explanation. Rare species are those with small populations if they are not endangered or vulnerable, but potentially at risk due to their population size. The protected species are (cf. also evaluation of zoogeographical data for further information about these species):

Apatura metis
Argynnis elisa
Boloria improba
Coenonympha hero
Coenonympha oedippus
Erebia calcaria
Erebia christi
Erebia polaris
Erebia sudetica
Euphydryas aurinia
Euphydryas maturna
Hesperia comma catena
Lycaena dispar
Maculinea arion
Maculinea nausithous
Maculinea teleius
Melanargia arge
Papilio alexanor
Papilio hospiton
Pararge achine
Parnassius apollo
Parnassius mnemosyne
Plebejus aquilo
Polyommatus golgus
Zerynthia polyxena

These 25 species were selected according to national priorities and/or for political reasons; biogeographical affinities were by their selection apparently disregarded. As a matter of fact, only five of these 25 species fulfil (more or less) the definition of the species of community interest as laid down by the Habitat Directive 92/43 (KUDRNA 2000). They are *Coenonympha oedippus, Euphydryas maturna, Pararge achine, Parnassius apollo, Coenonympha hero* – in that order of preference. Nonetheless, this certainly does not mean, that all of these five species really need or deserve European protection.

The following coincidence map shows the areas of concentration of the above 25 species protected by the EU in Europe (class interval = 1).



Up to now, no butterfly species is known to have become extinct in Europe due to human activities. However, SWAAY & WARREN (1999) considered five species to be 'critically endangered' in Europe: *Coenonympha oedippus*, *Leptidea morsei*, *Polyommatus eroides*, *Pieris wollastoni* [sic] and *Triphysa phryne*. None of these species is endemic to Europe and *P. brassicae wollastoni* (BUTLER, 1866) is a subspecies confined to Madeira; it has not been observed in its headquarters for more than 10 years and is feared extinct (WAKEHAM-DAWSON, AGUIAR. & MARTIN 2002).

According to the valid Red Data Book of European butterflies (SWAAY & WARREN 1999), 71 butterfly species are threatened, but of these only the 58 species listed below really live in Europe; the remaining species live in Asia Minor, must be treated as extra-European or quasi extra-European or do not deserve recognition as distinct species. The Asiatic species were included by SWAAY & WARREN (1999) and labelled as 'European' for political reasons at the insistence of the Council of Europe. The 58 European species considered threatened by SWAAY & WARREN (1999) are:

Anthocharis damone	*Boloria frigga*	*Boloria titania*
Archon apolinus	*Boloria thore*	*Coenonympha hero*

Coenonympha oedippus
Coenonympha tullia
Colias chrysotheme
Colias hecla
Colias myrmidone
Colias werdandi
Erebia christi
Erebia embla
Erebia epistygne
Erebia medusa
Erebia sudetica
Euchlose simplonia
Euphydryas aurinia
Euphydryas intermedia
Euphydryas maturna
Glaucopsyche alexis
Gonepteryx maderensis
Hipparchia azorina
Hipparchia euxina
Hipprachia maderensis
Leptidea morsei
Lycaena helle
Lycaena ottomana
Maculinea alcon
Maculinea arion
Maculinea nausithous
Maculinea teleius
Melitaea aetherie
Melitaea aurelia
Melitaea britomartis
Neolycaena rhymnus
Nymphalis l-album
Nymphalis xanthomelas
Pararge achine
Parnassius apollo
Parnassius phoebus
Pieris cheiranthi
Plebejus hespericus
Plebejus trappi
Polyommatus damone
Polyommatus eroides
Polyommatus humedasae
Pyrgus centaureae
Pyrgus cirsii
Scolitantides bavius
Scolitantides orion
Scolitantides vicrama
Thymelicus acteon
Tomares ballus
Tomares callimachus
Tomares nogelii
Triphysa phryne

SWAAY & WARREN (1999) concluded that these species are threatened as a result of the evaluation of national data; they employed the following criteria to determine the conservation status of European butterfly species:

Abundance (i.e. present distribution):

< 1 %, 1-5 %, 5-15 %, > 15 % of the territory or
unknown.

Trend (i.e. distribution dynamics) over the last 25 years:

decrease (values recognised are extinct, 75 to100 %, 50 to 75 %, 25 to 50 %, 15 to 25 %.
more or less stable (i.e. –15 to +25 %)
increase (values recognised are 125 to 200 % and > 200 %.
strong fluctuations or unknown.

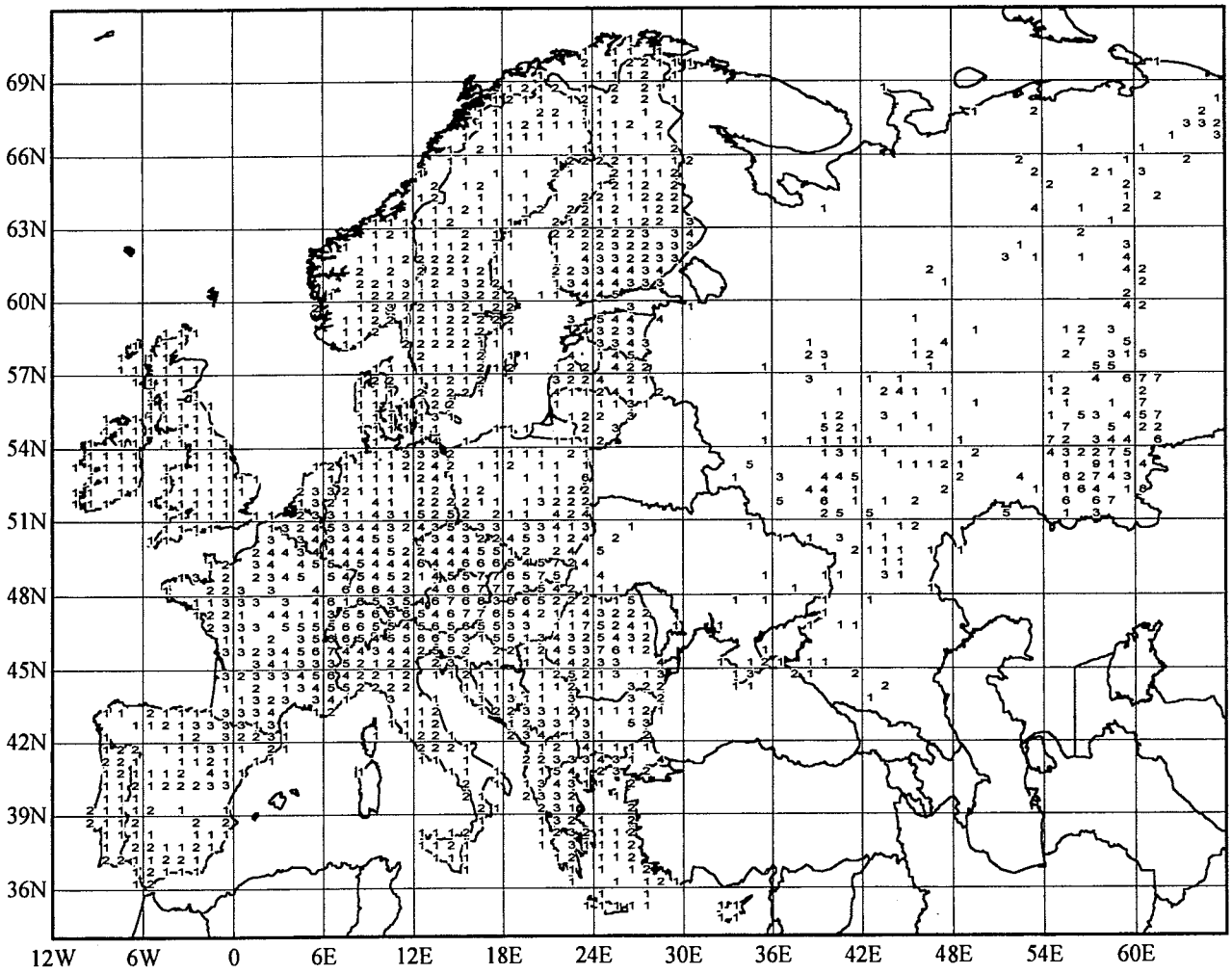
In principle, there is nothing wrong with this method, originally devised by MAES & SWAAY (1997); in fact it is the most exact method for the classification of butterflies for conservation purposes. The trouble is that the data necessary for the application of this method are available for two or three European countries only, these being Great Britain, the Netherlands and a part of Belgium (Flanders). In all other countries, the scoring of butterfly species in the above categories is pure guess work, which cannot be put right by a subjective qualifying note (poor, moderate, good, very good) on the state of our present knowledge of the butterfly distribution and trends in the country in question. This fact, combined with the very free interpretation of the adjectives 'moderate', 'good' and 'very good' by the national compilers, reduce the scientific significance of the conclusions made by SWAAY & WARREN (1999) quite considerably. This is multiplied by obvious errors made by some inexperienced national compilers and probably subsequently overlooked by the authors; these mistakes, however, need not be discussed here.

The following example should suffice to elucidate further this problem. At the time of preparation of the Red Data Book I was asked to provide distribution and trend data on butterflies in Czechia. The data bank of butterflies of Czechia (KUDRNA 1994) was at the time in my computer, but the data bank was structured in a different way than suitable to provide the information required for the Red Data Book. I offered to help but I declined to fill in the forms as requested because the structure of data available to me would not allow it. In the end Z. LASTUVKA and D. POVOLNY, as the national compilers for Czechia, provided the data required without any data bank and scored optimistically the 'quality of distribution data' as 'very good' and quality of trend data as 'moderate'. The situation in Eastern Europe is many times worse than in Czechia (situated in Central Europe), which is reasonably well surveyed: distribution data are available from 71 % of the country (KUDRNA 1994), trend-data are simply not available for butterflies in Czechia.

It is hard to imagine how widespread species such as *Erebia medusa* or *Thymelicus acteon* could be threatened on a European scale. *Boloria frigga* and *Erebia embla* are widespread in sparsely popu-

lated Scandinavia, *Colias hecla* and *C. werdandi* are restricted to the Arctic; how can these four species be threatened from a European point of view? Owing the nature of Scandinavia, high population dynamics is characteristic for most butterflies living in those regions and monitoring in the sense of MAES & SWAAY (1997) is in practical terms impossible (KUDRNA 1990).

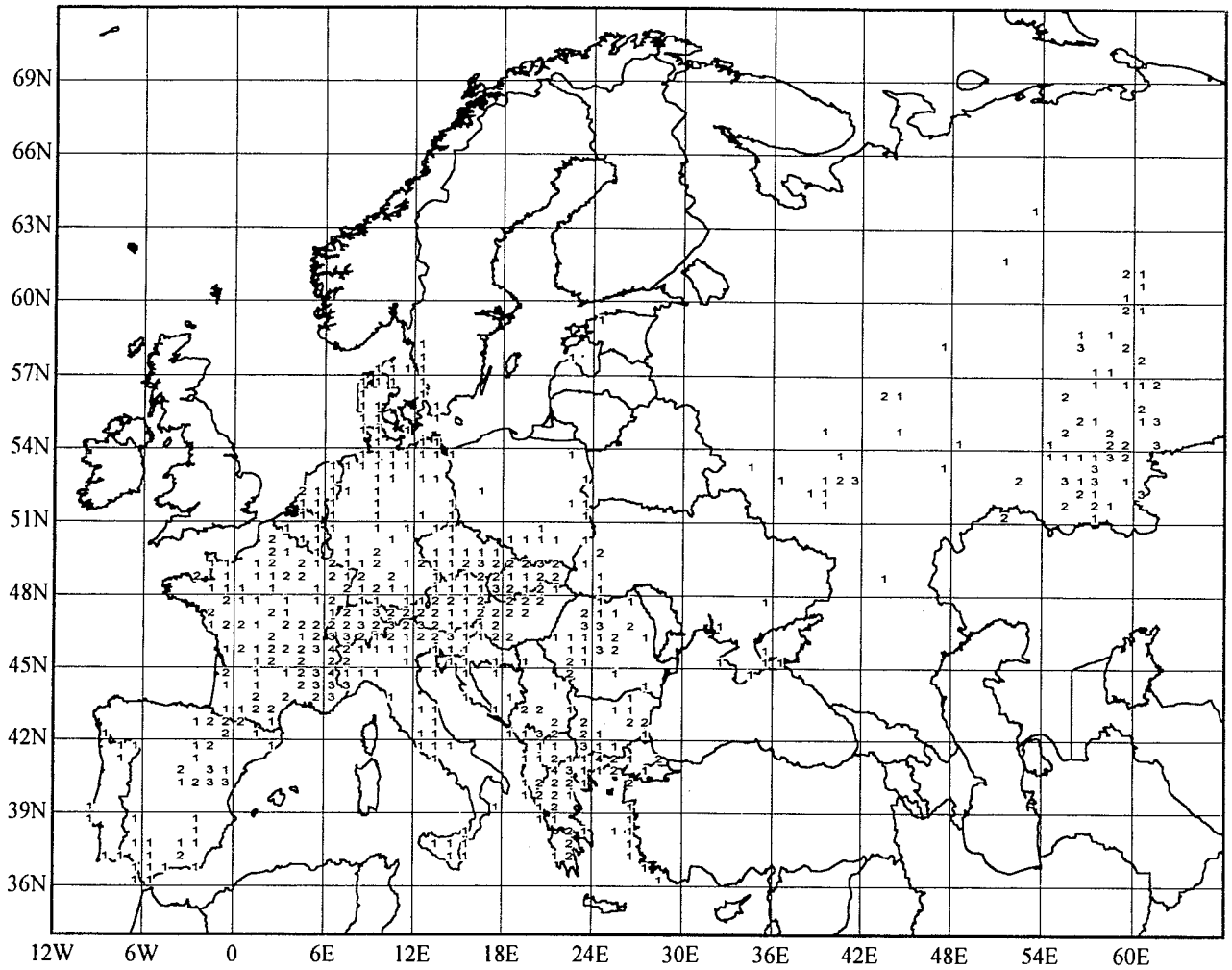
Although it is difficult to accept some judgements made by SWAAY & WARREN (1999) – they are little more than a summary of national views reflected on a European background – it is interesting to consider the distribution of the above species plotted on the following coincidence map (class interval = 3: 1 = 1-3 species, 2 = 4-6, 3 = 7-9, 4 = 10-12, 5 = 13-15, 5 = 16-18, 6 = 19-21, 7 = 22-24, 8 = 25-27 species).



Leaving aside Asiatic (Turkish) species SWAAY & WARREN (1999) recommended in their Red Data Book the inclusion of 20 European butterflies in Appendix II of the Bern Convention, based upon the evaluation of national data. Their list includes one misidentified taxon and a few infraspecific taxa (KUDRNA 2000). The corrected list contains the following 17 species:

Archon apollinus
Erebia epistygne
Euchloe simplonia
Euphydryas intermedia
Gonepteryx maderensis
Hipparchia azorina
Hipparchia maderensis
Leptidea morsei
Lycaena ottomana
Maculinea alcon
Melitaea aetherie
Pieris cheiranthi
Plebejus hespericus
Plebejus trappi
Polyommatus eroides
Pyrgus cirsii
Scolitantides bavius

The following coincidence map shows the mainland distribution of 13 of the above species (class interval =1):



Generally speaking, nearly all of these species inhabit only those European countries that have not been adequately surveyed and for which there are no adequately detailed data banks, or which have their European headquarters in those countries. The existence of detailed data banks is the precondition for the utilisation of the method generally used by SWAAY & WARREN (1999) for the assessment of the species' status for conservation purposes. Because distribution maps of these species were not available at the time, SWAAY & WARREN (1999) could not consider purely biogeographical aspects in their selection of these species.

This criticism must not be interpreted as a general condemnation of the work by SWAAY & WARREN (1999) or of a Red Data Book (RDB) concept as such. There is a great need for both the RDB and the distribution Atlas. No distribution atlas can be better or more reliable than the majority of data utilised; the same applies to any RDB. Generally, the best method is not the most advanced one, suited for the best known areas only, but the one suitable for the evaluation of average quality data as available for a decisive proportion of the territory studied. Whereas only a good distribution atlas provides indispensable biogeographical background, a good RDB delivers indispensable information and recommendations directly concerned with the conservation of individual species.

In view of the diversity of the butterfly fauna of Europe (486 species) and in view of the species already protected and of the recommendations already made by other authors, it is necessary to find the right priorities from the biogeographical point of view. If the list of species proposed becomes too long the conservation efforts become difficult to put into practice. There are two or three more or less objective criteria for the evaluation of European butterfly species according to their conservation eligibility from the biogeographical point of view: the zoogeographical affinity, the distribution size, and the human factor.

Zoogeographical criterion. The preservation of species of European conservation concern, in the first place of European endemic species, deserves the utmost priority. (Under some circumstances, also quasi-European species could be considered; these species have their headquarters in Europe but have also been found in one or two small places outside Europe). The immense direct responsibility of the EU and the remaining European countries for the preservation of European endemic species, an indispensable part of our European heritage, cannot be stressed enough!

Distribution criterion. The distribution size is the main eliminating factor; widespread endemic species are excluded at present because their "population reserves" are deemed adequate to survive several years of severe decline due to increased human pressures. Generally, endemic species inhabiting as little as 1 % of the European territory surely deserve the highest priority. The subjective limit of eligibility for the purpose of this work, however, could be a range restricted to not more than 0.16 % of European territory (i.e. 5 BRF or less of the total of approximately 3100 BRF).

Human factor: Species, the headquarters of which are situated in areas that are factually or potentially free of significant negative anthropogenic pressures at present, cannot be considered threatened. Nevertheless, they can be eligible for European protection as 'rare' or potentially threatened if they fulfil the first two criteria. Safe areas are considered to be for instance National Parks and major nature reserves, particularly if these are situated within the boundaries of extensive biosphere reserves or nature parks, managed and monitored.

The first two of these three criteria can easily be objectively identified according to the up-to-date distribution maps; the third criterion is more or less subjective, but the situation can usually be assessed by a small team of experts. Species fulfilling all three criteria can be considered 'vulnerable', 'endangered' or even 'critically endangered' according to the criteria currently recognised. Species which fulfil only the first two criteria correspond to the old IUCN category 'rare'; they are all potentially threatened due to their small range and population sizes. Species inhabiting extremely restricted ranges can become extinct 'at a stroke' if their sites are damaged or destroyed because they have no other safe refugia. Such species are usually confined to islands or isolated mountains.

The following 41 European endemic species confined to extremely restricted ranges are considered 'rare' according to the old IUCN criteria and deserve specific European protection:

Coenonympha thyrsis
Cupido carswelli
Erebia aethiopella
Erebia christi
Erebia claudina
Erebia orientalis
Erebia palarica
Erebia zapateri
Glaucopsyche paphos
Gonepteryx cleobule
Gonepteryx maderensis
Hipparchia bacchus
Hipparchia christenseni
Hipparchia cingovskii
Hipparchia euxina
Hipparchia gomera
Hipparchia leighebi
Hipparchia maderensis
Hipparchia orestes
Hipparchia sbordonii
Hipparchia tilosi
Hipparchia williamsi
Hipparchia wyssii
Maniola chia
Maniola cypricola
Maniola nurag
Melanargia pherusa
Melitaea nevadensis
Pararge xiphia
Plebejus psyloritus
Plebejus zuellichi
Polyommatus caelestissimus
Polyommatus exuberans
Polyommatus galloi
Polyommatus gennargenti
Polyommatus golgus
Polyommatus humedasae
Polyommatus nephohiptamenos
Polyommatus violetae
Scolitantides barbagiae
Zerynthia cretica

The following tasks will be necessary as the first conservation measures for the preservation of the above species, in the following order of priority:

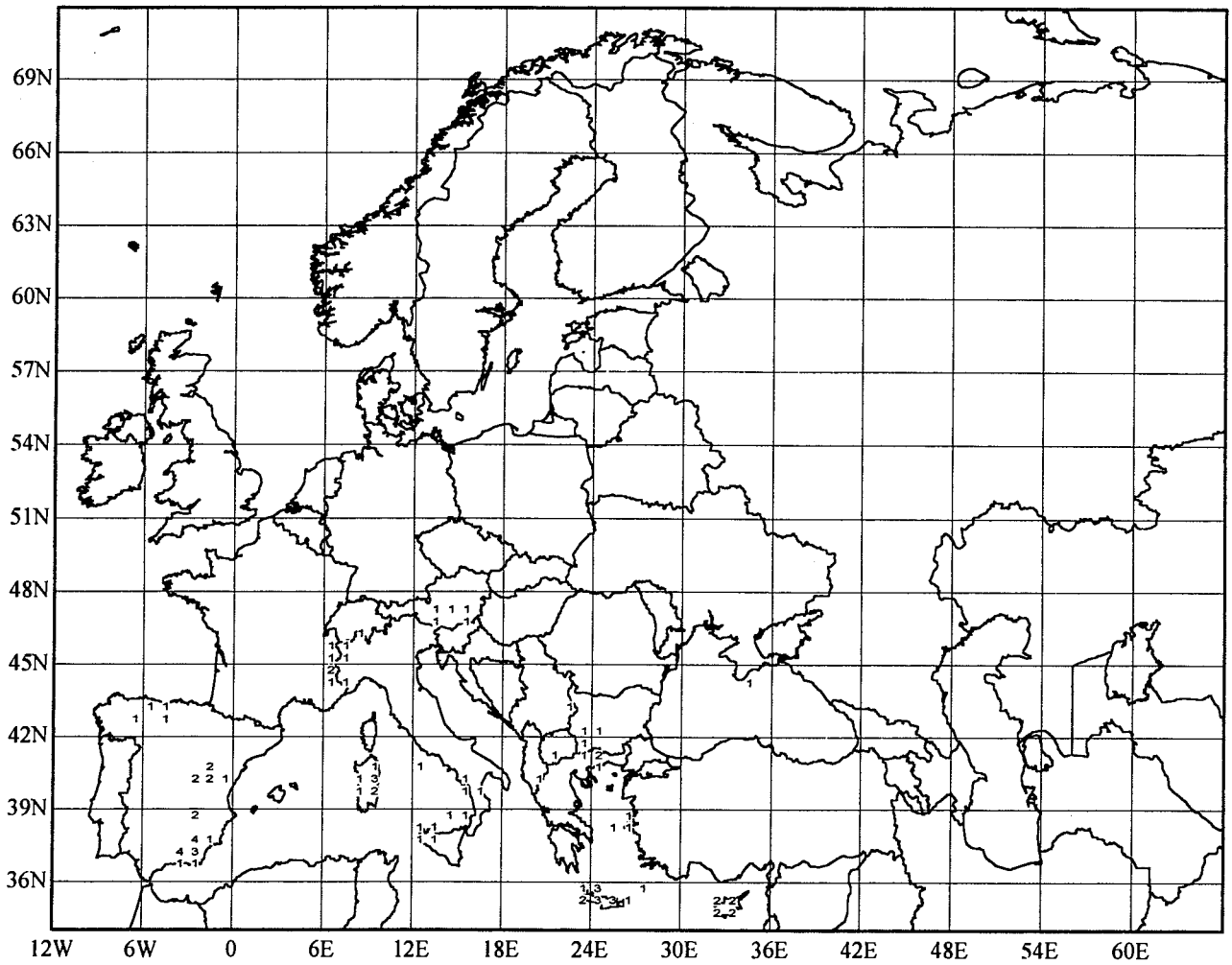
1. Identification or confirmation of the true taxonomic status by biological means of at least the following taxa listed above: *Hipparchia cingovskii, H. orestes, Melitaea nevadensis, Polyommatus exuberans, P. gennargenti, P. nephohiptamenos* and *P. violetae*. Nonetheless, all these taxa are units of evolutionary significance.
2. Detailed survey of the distribution of all species.
3. Autecological research to discover ecological requirement of all species.
4. Monitoring of all species, at least in their headquarters.

The following European endemic taxa listed above probably do not require any conservation measures at present for reasons given below:

1. *Hipparchia leighebi, H. maderensis, H. sbordonii, Maniola chia* and *Pararge xiphia* are so abundant in their natural habitats that they can be considered safe for the time being without any conservation measures.
2. *Gonepteryx maderensis, Hipparchia maderensis* and *Pieris cheiranthi* have already been recommended for European protection by SWAAY & WARREN (1999).
3. *Erebia christi* and *Polyommatus golgus* are already protected by European law.

Erebia serotina and *Hipparchia amymone* have not been included in the above list because they are most probably rare natural hybrids (as such they cannot be protected anyway!).

The following coincidence map shows the distribution (clusters) of the 'rare' European endemic species confined to extremely restricted ranges as listed in the above table; species confined to the Atlantic Islands are not mapped (class interval 1):



The following countries are responsible for the preservation of the rare European endemic species confined to extremely small ranges and listed in the above table:

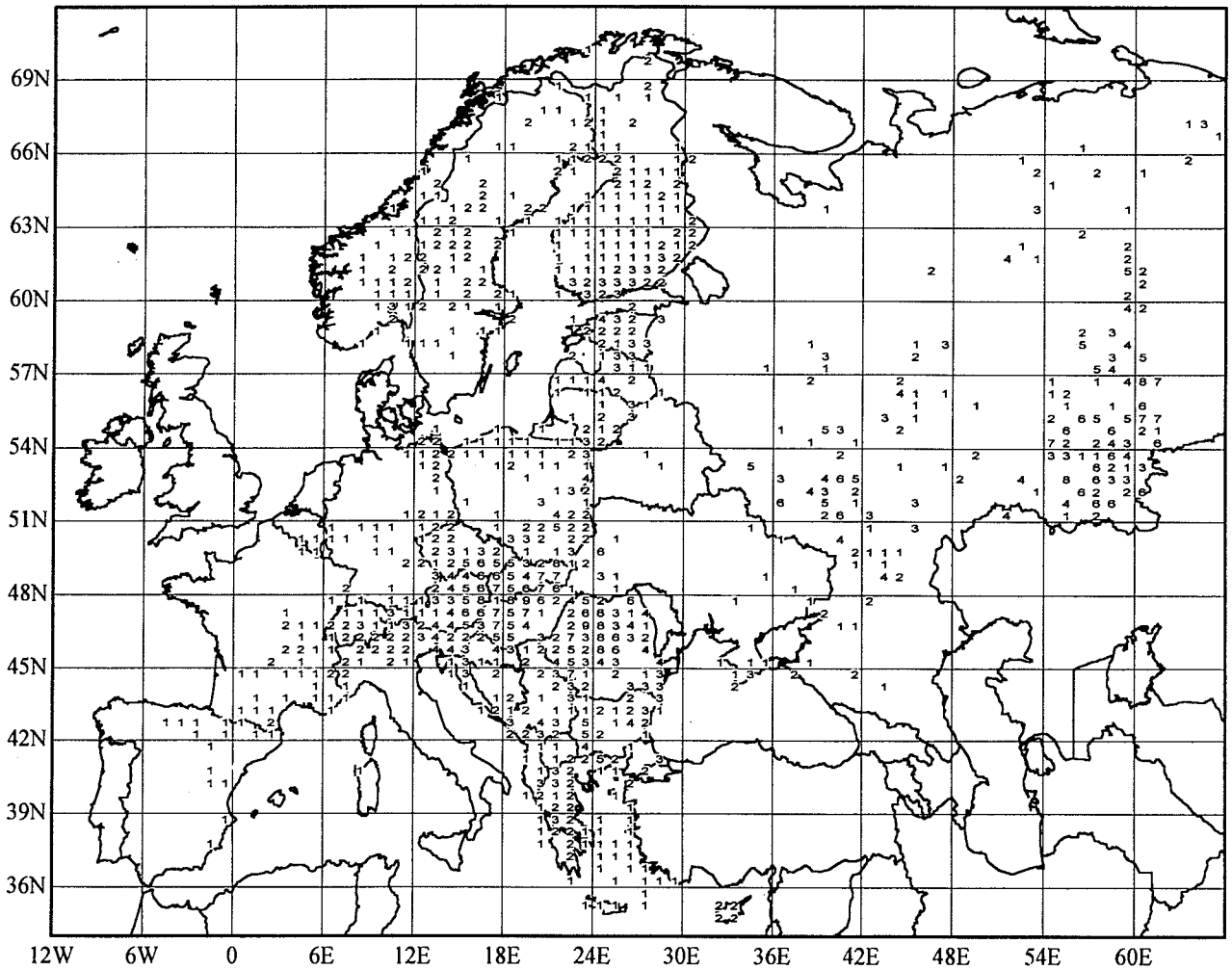
Austria (1 species): *Erebia claudina*
Bulgaria (1 species): *Erebia orientalis*
Cyprus (2 species): *Glaucopsyche paphos, Maniola cypricola*
France (species): *Erebia aethiopella*
Greece (6 species): *Coenonympha thyrsis, Hipparchia christenseni, Hipparchia cingovskii, Hipparchia orestes, Maniola chia, Plebejus psyloritus, Polyommatus nephohiptamenos*
Italy (8-9 speices): *Erebia christi, Erebia aethiopella, Hipparchia leighebi, Hipparchia sbordonii, Maniola nurag, Melanargia pherusa, Polyommatus exuberans, Polyommatus galloi, Polyommatus humedasae, Scolitantides barbagiae*
Macedonia (1 species): *Hipparchia cingovskii*
Portugal (3 speies): *Gonepteryx maderensis, Hipparchia maderensis, Pararge xiphia*
Spain (14 species): *Cupido carswelli, Erebia palarica, Erebia zapateri, Gonepteryx cleobule, Hipparchia bacchus, Hipparchia gomera, Hipparchia tilosi, Hipparchia wyssii, Hipparchia williamsi, Melitaea nevadensis, Plebejus zuellichi, Polyommatus caelestissimus, Polyommatus golgus, Polyommatus violetae*
Switzerland (1 species): *Erebia christi*
Ukraine (1 species): *Hipparchia euxina*

It is important to observe that all rare European endemic species live in the southern half of Europe, mostly inhabiting the Alps, the Mediterranean region including many Mediterranean islands and the Atlantic islands (cf. BALLETTO & KUDRNA 1985).
The enlargement of the European Union is imminent and the accession countries are obliged to comply with the 'Habitat Directive' 92/43/EEC (also called the 'FFH Directive') and 'Natura 2000'. The accession countries are divided into three groups according to their eligibility to become members of the EU. It is anticipated, that most or all six accession countries of the first wave will become members of the EU on 1st January 2002. These countries are: Cyprus, Czechia, Estonia, Hungary, Poland and Slovenia. The countries of the second wave are Latvia, Lithuania, Malta and Slovakia; it is not impossible that some of these countries could join the EU at the same time as the first wave countries. There is no 'third wave' as such, but a further enlargement of the EU is anticipated at an unspecified, much later, date and the accession states should include some of the Balkan countries such as Bulgaria and Rumania. There could well be several butterfly species of community interest in the Balkan countries (e.g. Bulgaria or Rumania), but as these countries are still very far away from being considered as EU accession states, no recommendation are made here.

In view of the imminent enlargement of the EU, the following twelve butterflies species are recommended for consideration as candidate species for inclusion in Annex II of the Habitat Directive 92/43/EEC, listed here according to their occurrence in the accession countries:

Candidate species	**Accession country**
Argyronome laodice	Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia
Colias chrysotheme	Czechia (?), Hungary, Slovakia (?)
Colias myrmidone	Czechia, Hungary, Poland, Slovakia
Glaucopsyche paphos	Cyprus
Leptidea morsei	Czechia (?), Hungary, Slovakia, Slovenia
Lycaena helle	Latvia, Poland
Neptis rivularis	Czechia, Hungary, Poland, Slovakia, Slovenia
Neptis sappho	Hungary, Slovakia, Slovenia
Oeneis jutta	Estonia, Latvia, Lithuania, Poland
Plebejus sephirus	Hungary
Scolitantides orion	Czechia, Hungary, Poland, Slovakia, Slovenia
Scolitantides vicrama	Czechia, Hungary, Poland, Slovakia, Slovenia

The following coincidence map shows the distribution 'clusters' of the above candidate species (class interval = 1):



All the above species fulfil (more or less) the definition of the species of community interest (SCI) and have their European headquarters in on or more of the accession countries. There is no potential butterfly species of community interest inhabiting Malta. *Glaucopsyche paphos* fulfils the definition of the SCI better than any other endemic butterfly species inhabiting Cyprus, but, strictly speaking, it does not fully satisfy the criteria.

6.4 Outlook

The publication of the present Atlas surely amounts to a major milestone in the study of European butterflies; it is probably of similar significance to BRETHERTON'S (1966) survey of the distribution of butterflies in western Europe or to the first edition of the Field Guide by HIGGINS & RILEY (1970). Like these two important works, the present Atlas is comprehensive, but not quite complete and, naturally, far from perfect. It has therefore been agreed by the MEB backers and the present author to work towards the production of a second, up-dated and enlarged edition of the Atlas, to be published within the next five years, but not before the first edition will have been sold out. Thus the publication of the present Atlas closes an important chapter of Mapping European Butterflies, but does not constitute the end of the road embarked upon in 1995/96.

Although much time has been devoted to checking the records, particularly those from the West, some errors must have entered the MEB data bank and, subsequently, the distribution maps. The author would greatly appreciate receiving written factual comments by experts on individual species and countries, pointing out exactly possible errors and suggesting corrections.

It is hoped that, within the next few years, new national data banks will be set-up and existing data banks expanded for those countries rich in butterflies, such as France, Italy and Spain, and that better data for the Balkan countries, especially for Bulgaria, will become available. Major improvements are possible also in the case of some essentially Central European countries, such as Germany, Hungary and Slovenia. It is also hoped that more and better data will become available for Russia, the Ukraine, Belarus and Moldova; it would, however, be unrealistic to expect that these countries could significantly close the enormous gap existing at present between those in the West and the East. Naturally, it is also hoped that quality of the team of contributing recorders from the East can be improved and, where possible, also enlarged.

To facilitate the continuation of MEB, the project backers have generously agreed to make the proceeds from the sale of the first edition available for the financing of the extension of the project. This decision provides a moderate, but secure, financial base for the next few years of work.

The MEB input program has been developed further by K. LUX and brought almost to perfection during the last few years. It is hoped that the latest version DMAP (not in use at present) will also be developed further by A. MORTON so as to enable direct labelling of distribution maps in a desired place and quality, preferably using a proportional type face such as Times New Roman including italics, bold and their combinations. A further important improvement would be the option of printing two especially formatted distribution maps on one A4 page.

It can be expected that the second edition of this Atlas will provide even more precise maps and thus enable more and better conclusions to be reached, particularly concerning the identification of butterfly areas of European significance. Recording butterflies chiefly for conservation purposes is, however, a lengthy task. In the long term, it will be necessary to set-up a European Butterfly Recording Centre producing up-dated editions of the Atlas every 10 years and providing up-to-data information on the status of butterflies and their habitats to students of European butterflies and agencies concerned with their conservation. This can only be achieved if the European Commission recognises this need and provides safe financial backing for the European Butterfly Recording Centre. At the present time, there is no major body of butterfly conservation that could attempt to run a complex, long term European butterfly recording scheme alone due to the lack of experts of European standing. It is relatively easy to become familiar with butterflies on a regional scale, especially so in lepidopterologically impoverished countries. It takes years, however, to become adequately acquainted with the butterflies of Europe: profound knowledge of the European species and an understanding of their systematics and biogeography are preconditions for the success of any European mapping project. It is not impossible to imagine a major, progressive and efficiently run natural history museum maintaining a comprehensive collection of European butterflies, with an equally comprehensive butterfly library as an ideal long-term partner of the European Commission. Is there such an institution? The present partner of the Commission – the 'Thematic Centre' at the Paris Natural History Museum certainly does not fulfil these requirements. Regrettably, no European museum has been paying special attention to European butterflies for some decades. Under these circumstances, some universities could also satisfy the European Commission in this respect.

One thing is certain: the way to a really comprehensive, detailed atlas of European butterflies produced by an official European institution is going to be long, expensive and difficult! Meanwhile, it is hoped to retain the support of the existing team of contributing recorders and backers and to win new ones on the way towards the compilation of the improved and enlarged second edition of this Atlas in a few years time.

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8 Zusammenfassung

Das vorliegende Buch ist das Hauptergebnis des Projektes „Mapping European Butterflies" (MEB), das gemeinsam vom Naturschutzbund Deutschland e.V. (NABU) und von der Gesellschaft für Schmetterlingsschutz e.V. (GfS) in den Jahren 1996 – 2001 durchgeführt wurde.
Zielsetzung des Vorhabens:

1. Erstellung einer Datenbank über die Verbreitung der Tagfalterarten Europas
2. Veröffentlichung eines kommentierten Verbreitungsatlasses der Tagfalterarten Europas
3. Wissenschaftliche Beurteilung des Schutzstatus einheimischer Tagfalterarten Europas
4. Herausstellen der wichtigsten Verbreitungsgebiete der Tagfalter Europas
5. Festlegen der Prioritäten beim Schutz europäischer Tagfalter

und zwar in allen Fällen basierend auf der Auswertung gegenwärtiger Verbreitungsmuster.

Die Tagfalter oder Rhopalocera umfassen zwei Superfamilien: Papilionoidea und Hesperioidaea. Europa (ohne Island) umfasst etwa 10 400 000 km²; die östliche Grenze Europas verläuft in nord-südlicher Richtung durch das Uralgebirge, entlang des Flusses Ural und dann in beinahe ost-westlicher Richtung durch die Manytschniederung. Zu Europa zählen alle zu den europäischen Staaten gehörenden Mittelmeerinseln sowie die Azoren, Kanaren und Madeira; Island wurde ausgeschlossen, da dort keine Tagfalter leben.

Insgesamt 465 Mitarbeiter (Recorders) hatten sich für Mapping European Butterflies angemeldet, aber nur 254 (54 %) lieferten tatsächlich Verbreitungsdaten für die MEB Datenbank. Darüber hinaus wurden auch Verbreitungsdaten aus allen wichtigen nationalen, regionalen und privaten Datenbanken konvertiert und eingegeben. Ein alphabetisches Verzeichnis der beitragenden Mitarbeiter befindet sich im Kapitel 2.

Die Dateneingabe erfolgte mittels eines für dieses Projekt von K. LUX geschriebenen Programms (Datenbank Paradox und Borland Delphi 3 Tool); das Programm wurde im Laufe des Projekts weiter entwickelt. Die Verbreitungskarten wurden mit Hilfe des kommerziell verfügbaren Programms DMAP von A. MORTON gezeichnet.

Die Datenerfassung erfolgte das über für dieses Projekt erfundene System von Referenzlokalitäten. Eine Referenzlokalität (RL) ist ein im „The Times Atlas of the World" (9. Auflage von 1994 oder spätere Auflage) unter Angabe von geographischen Koordinaten (Länge und Breite) enthaltener Ortsname. Eine Referenzlokalität vertritt alle in ihrer Nähe liegenden Fundorte. Die MEB Datenbank enthält 9145 vorgewählte Referenzlokalitäten. Weitere Informationen und das alphabetisch nach Ländern geordnete Register der Referenzlokalitäten sind dem Kapitel 4 zu entnehmen.

Die Darstellung der Verbreitung erfolgt über Raster von 30' × 60'. Die Fläche von 30' × 60' bildet einen Basic Recording Unit (BRF) oder ein Grundfeld der Erfassung. Die geographische Länge eines Grundfeldes misst 55 km (Meridian); die geographische Breite (Parallelkreis) ist aber unterschiedlich: Etwa 85 km in Südeuropa (Sizilien, Parallelkreis 40°), 72 km in Mitteleuropa (Parallelkreis 50°) und 55 km in Nordeuropa (Parallelkreis 60°). Die Gesamtfläche von Europa entspricht etwa 3100 Grundfeldern. Die Fläche eines Durchschnittsgrundfelds misst etwa 3387 km² und entspricht daher ungefähr einem Quadrat von etwa 58 × 58 km. Die Projektion der Grundkarte ist zylindrisch äquidistant mit einem Standardparallelkreis von 51°.

Die Erklärungen der allgemein verwendeten Abkürzungen befinden sich im Unterkapitel 1.2.4.

Die Tagfalterarten (insgesamt 486) sind im ganzen Werk computertechnisch bedingt grundsätzlich alphabetisch geordnet. Das kommentierte alphabetische Verzeichnis (Tabelle) der Arten befindet sich im Kapitel 3. Die Abkürzungen der einzelnen Spalten in der Tabelle bedeuten: FA = Familie; TS = Taxonomischer Status der Art (Hinweis auf nummerierte Anmerkung), EC = Hinweis auf Vorkommen auf dem Europäisches Festland; AI = Hinweis auf Vorkommen auf den atlantischen Inseln (Azoren, Kanaren, Madeira); MP = Hinweis auf die Seite mit der Karte der Art. Die Seiten 18-19 beinhalten die wichtigsten Erläuterungen (Synonyme, Untergattungen etc.) zu den verwendeten generischen Namen.

Der Verbreitungskartenteil (Kapitel 5) beinhaltet Verbreitungstabellen für die auf den atlantischen Inseln (Azoren, Kanaren, Madeira) vorkommenden Arten und 451 Verbreitungskarten für die auf dem Festland vorkommenden Arten. In einigen Fällen musste die Verbreitung von zwei oder mehreren ähnlich aussehenden und/oder sehr nahe verwandten Arten in eine Verbreitungskarte zusammengefasst und als „Komplex" bezeichnet werden:

Euchloe ausonia Komplex beinhaltet *E. ausonia, E. crameri* und *E. simplonia*
Leptidea sinapis Komplex beinhaltet *L. reali* und *L. sinapis*
Pieris daplidice Komplex beinhaltet *P. daplidice* und *P. edusa*
Polyommatus dolus Komplex beinhaltet *P. dolus* und *P. virgilius*
Pyrgus alveus Komplex beinhaltet *P. accretus*, *P. alveus* und *P. trebevicensis*
Pyrgus malvae Komplex beinhaltet *P. malvae* und *P. malvoides*

Die wissenschaftlichen Gründe für die Notwendigkeit dieser Lösungen sind im Kapitel 3 (s. Tabellenspalte TS) ausführlich erläutert.

Die Verbreitungsangaben gliedern sich in drei MEB Erfassungsepochen, die sich in den Verbreitungskarten durch die Verwendung der folgenden Symbole unterscheiden:

Epoche 1 = vor dem 01.01.1951	Symbol ○
Epoche 2 = zwischen 01.01.1951 und 31.12.1980	Symbol ◒
Epoche 3 = nach dem 31.12.1980	Symbol ●

Dabei hat die jüngste Angabe immer Priorität, d.h. eine Beobachtung der Epoche 2 „überschreibt" die entsprechende Beobachtung der Epoche 1 und eine Beobachtung aus der Epoche 3 „überschreibt" die entsprechende Beobachtung in einer oder beiden vorigen Epochen. Die aus einigen nationalen Datenbanken übernommenen, konvertierten Daten haben eine relativ geringfügige Anpassung verlangt.

Die MEB Datenbank beinhaltet 228931 Datensätze von 1879 aus insgesamt ungefähr 3100 Erfassungsgrundfeldern. Die 1879 erfassten Grundfelder entsprechen etwa 60,61 % der Fläche Europas, ein sicher mehr als zufriedenstellendes Ergebnis. Dennoch ist die Erfassung qualitativ und quantitativ sehr unterschiedlich. Die Trennlinie ist die Westgrenze von Russland, Weißrussland, Ukraine und Moldawien. Der „Westen" (d.h. das westlich dieser Grenze liegende Gebiet) ist trotz einigen schwächer bzw. dünner erfassten Gebieten mit 88,49 % generell gut abgedeckt, während der „Osten" (d.h. die östlich der o.a. Trennlinie liegenden Staaten) mit 27,37 % unzureichend erfasst ist; die große Ausnahme stellt nur die Halbinsel Krim dar. Ähnlich ist es auch mit der Qualität und Zuverlässigkeit der Daten. Die Beurteilung der westlichen Daten war sehr kritisch; die Eingabe richtete sich immer nach dem Sprichwort „If in doubt, leave it out!", und die Richtigkeit dieser Daten liegt bestimmt über 90 %. Hingegen musste die Bearbeitung der Verbreitungsdaten aus dem „Osten" wesentlich „großzügiger" sein, um nicht zu viele Daten aufgrund ihrer möglichen Unsicherheit auszuschließen. Die Richtigkeit der „östlichen" Daten könnte bei etwa 70 % liegen. Die Übernahme von konvertierten Daten aus Datenbanken hat eine große Rolle gespielt. Die Qualität und Quantität der Erfassung von Land zu Land ist auf den Seiten 302-304 dargestellt. Die Verbreitungskarte auf Seite 301 zeigt alle untersuchten Grundfelder.

Die Übersichtstabelle auf Seite 305 zeigt die Anzahl der eingegebenen Datensätze pro Land. Die Übersichtstabelle auf Seite 306 zeigt die Anzahl der pro Land computertechnisch festgestellten Arten. Die Übereinstimmungskarte der Artenkonzentration „coincindence map" auf Seite 306 zeigt die „hot spots" – die relative Artenkonzentration auf jedem erfassten Grundfeld, von 1 für 1-25 Arten in Stufen von 25 bis zu 9 für 200-225 Arten. Diese „hot spots" sind die „heißen Flecken" der hohen Artendiversität aus der Sicht der Lepidopterologie. Viele dieser „heißen Flecken" hoher Artendiversität stimmen mit dem Vorkommen zahlreicher endemischer Tagfalterarten überein; dies zeigt die „coincindence map" der endemischen Arten der Gattung *Erebia* auf der Seite 307 sehr deutlich.

Das tabellarische alphabetische Artenverzeichnis (Seiten 309-318) fasst die naturschutzrelevanten Daten über die erfassten Arten zusammen. Die Abkürzungen der einzelnen Spalten sind auf der Seite 308 erläutert. Angegeben werden u.a. die Anzahl der durch die entsprechende Art bewohnten Grundfelder (Spalte BRF), die relative Größe der bewohnten Fläche in % (3100 BRF = 100 %) und der biogeographische Status (Spalte BS); die Ziffer „4" in der Spalte „BS" bezeichnet endemische

Arten. Die übrigen Spalten nehmen Bezug auf die Berücksichtigung der entsprechenden Art im gegenwärtig gültigen europäischen *Red Data Book* (Spalten ECC und RDB) und der europäischen Gesetzgebung (Spalten FFH und BC). Genauere Erläuterung ist der Seite 308 zu entnehmen.

Die Größe der Verbreitung einer Tagfalterart ist das wichtigste Kriterium für die Beurteilung der potentiellen Gefährdung der Art. Grundsätzlich: Je kleiner die Verbreitung einer Art ist, desto höher ist die potentielle oder tatsächliche Gefährdung der Art. Daher sind in der Übersichtstabelle auf den Seiten 318-327 die Arten nach der Verbreitungsgröße absteigend geordnet. Für die Erhaltung der endemischen Arten tragen Europa bzw. die entsprechenden europäischen Staaten allein die volle Verantwortung weil sie nur in Europa leben (und sonst nirgendwo). Diese Arten sind mit der Ziffer „4" in der Spalte „BS" gezeichnet.

Es ist sehr interessant zu beachten, dass 198 (41 %) von den 486 europäischen Arten jeweils höchstens 1 % der Fläche Europas (bis zu 31 von 3100 BRF) bewohnen, während nur 20 Arten (4,1 %) über 1000 BRF verbreitet sind, und damit bewohnen sie ein Drittel oder mehr der Fläche Europas. Diese Feststellung ist für den Schutz der Tagfalterfauna Europas sehr wichtig.

Insgesamt 25 Tagfalterarten sind als „Arten von gemeinschaftlichem Interesse" durch die FFH-Richtlinie 92/43 der EU und/oder die Berner Konvention geschützt. Diese Arten sind auf der Seite 328 aufgelistet. Hierzu ist zu bemerken, dass nur etwa fünf dieser Arten die für die „Arten von gemeinschaftlichem Interesse" gesetzlich festgelegte Definition erfüllen. Die „coincindence map" der 25 FFH-Arten befindet sich auf der Seite 329.

Die 58 tatsächlich in Europa vorkommenden durch das „Red Data Book" als bedroht bezeichneten Arten sind auf den Seiten 229-230 aufgelistet. Die „coincindence map" dieser Arten ist auf der Seite 331 zu finden. Die im aktuellen „Red Data Book" verwendete wissenschaftliche Methode für die Beurteilung der Arten wird diskutiert und die Anwendung dieser Methode außerhalb Großbritanniens, der Niederlande und z.T. Belgiens wegen Datenmangel kritisiert.

Im aktuellen „Red Data Book" wird die Einbeziehung von 17 tatsächlich in Europa vorkommenden Tagfalterarten in das Appendix II der Bern-Konvention empfohlen. Diese Arten sind auf der Seite 331 aufgelistet; die „coincidence map" dieser Arten befindet sich auf Seite 332. Die allgemeine Berücksichtigung der Türkei als europäischer Staat im „Red Data Book" wird kritisiert; nur eine kleiner Zipfel der Türkei liegt in Europa, fast die gesamte Fläche der Türkei liegt in Kleinasien; die wohl politisch erzwungene Betrachtung der Türkei als europäisches Land verfälscht die Ergebnisse.

Insgesamt 41 seltene endemische europäische Tagfalteraten werden aus biogeographischer Sicht als besonders schutzwürdig ermittelt; keine dieser Arten bewohnt mehr als 5 BRF (5 BRF entsprechen 0,16 % der Fläche Europas). Diese 41 Arten entsprechen der alten IUCN Gefährdungskategorie „selten"; sie sind auf der Seite 333 aufgelistet; die „coincidence map" dieser Arten ist auf der Seite 334 zu finden.

Im Bezug auf die bevorstehende Erweiterung der EU werden zwölf Tagfalterarten als potentielle „Arten von gemeinschaftlichem Interesse" auf der Seite 335 der EU-Kommission zur weiteren Überlegung empfohlen; die „coincidence map" ist auf der Seite 336 zu finden.

Es wird beabsichtigt, das Projekt Mapping European Butterflies noch um einige Jahre fortzusetzen, um eine erweiterte zweite Auflage des Atlasses zu erarbeiten. Die Projektträger werden die Einnahmen aus dem Verkauf der ersten Auflage des Atlasses für die Weiterführung des Projektes verwenden. Zum Schluss wird die Notwendigkeit der Gründung einer langfristig geführten und stets aktualisierten europäischen Tagfalterdatenbank betont.