# Mikrosensoren am UFZ

Ausstattung

Möglichkeiten

Anwendungsbeispiele

# Mikrosensoren – Ausstattung am UFZ

- Mikroelektroden: $O_2$, pH, $H_2S$, Diffusionskoeffizient (UNISENSE)
- Mikrooptoden: $O_2$, Microx TX1, Microx TX3, Firesting
- 3 manuelle Mikromanipulatoren (Märzhäuser)
- 4 motorgetriebene Mikromanipulatoren (2xUNISENSE, 2x Newport), davon einer 3D
- Equipment zum Selbstbau von Mikroelektroden
- Stereolupen + Kaltlichtquellen
- *In-situ* Mikrosensor Profiler zur Messung im Gewässer
- Software zum Auswerten von Mikroprofilen

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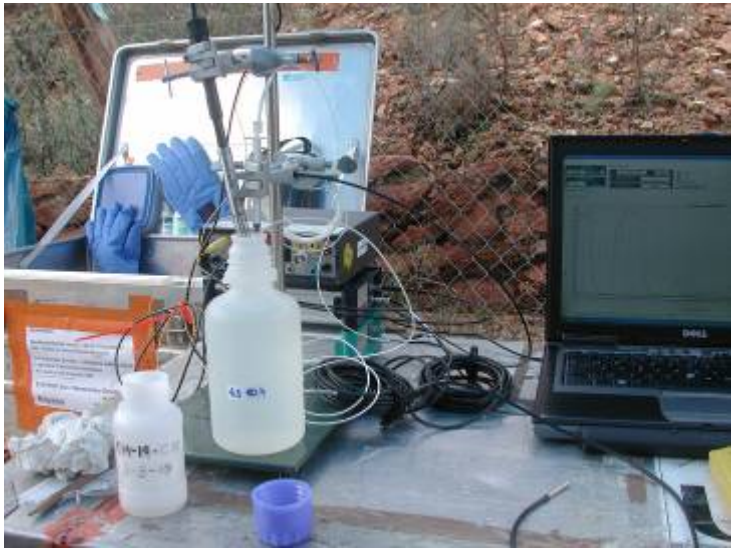
# Messung in Sedimentkernen – im Feld



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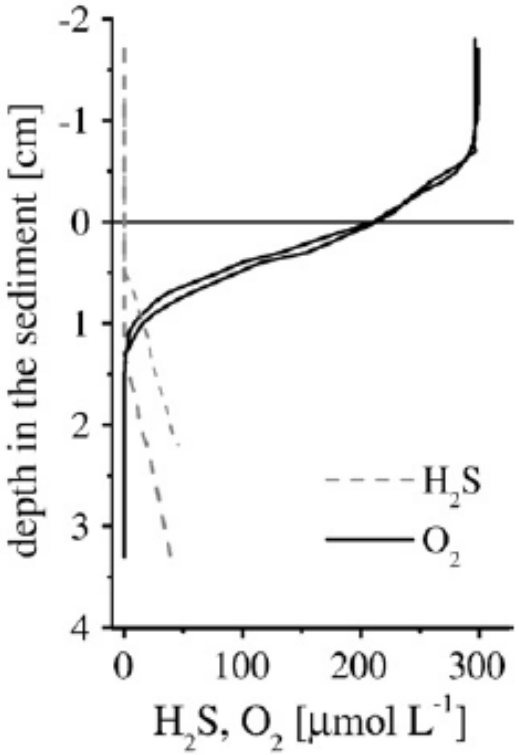


Koschorreck, M., Wendt-Potthoff, K., Scharf, B., Richnow, H.H. (2008): *Journal of Volcanology and Geothermal Research* **178** (2), 197 - 204

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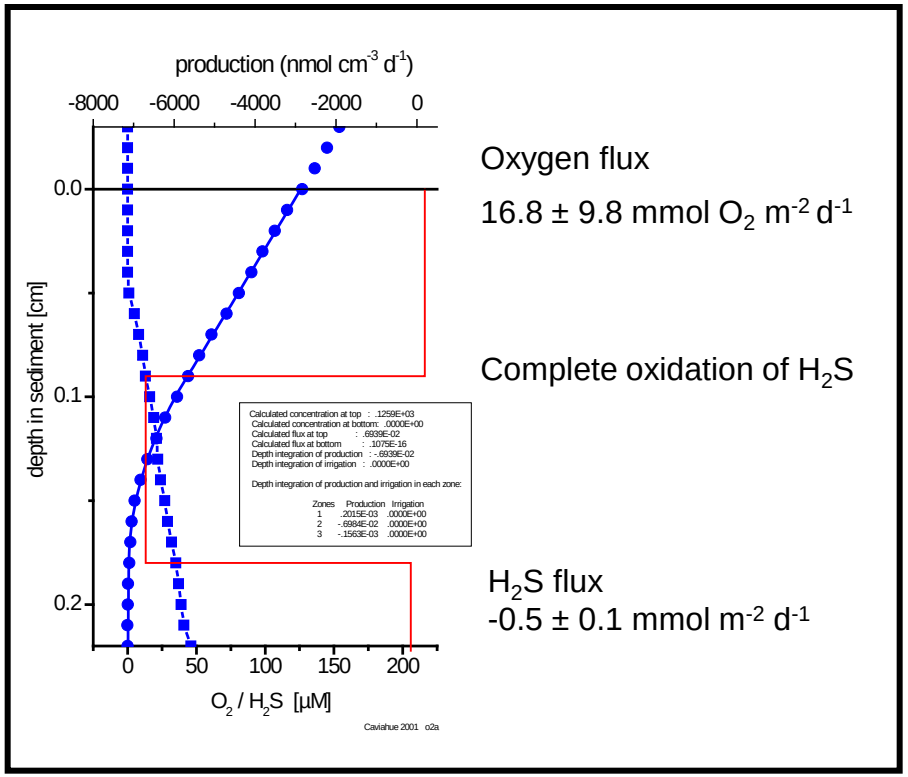
# Messung in Sedimentkernen – im Labor

# Berechnung von Umsatzraten



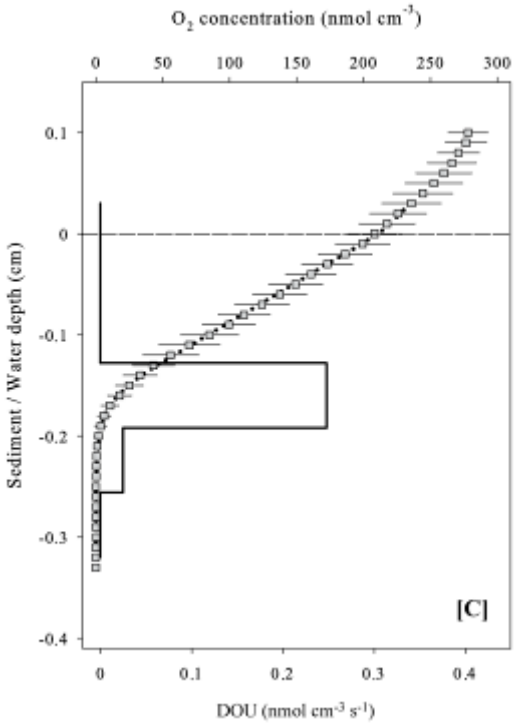

Oxygen flux

16.8 ± 9.8 mmol $O_2$ $m^{-2}$ $d^{-1}$

Complete oxidation of $H_2S$

$H_2S$ flux

-0.5 ± 0.1 mmol $m^{-2}$ $d^{-1}$




Lagauzère, S., Moreira, S., Koschorreck, M. (2011): *Biogeosciences* **8** (2), 339 - 352

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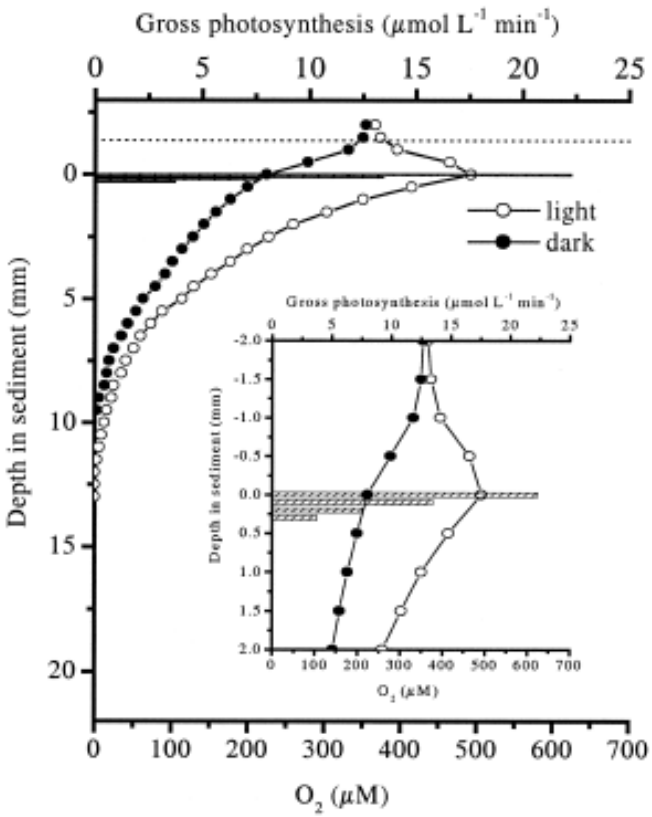
# Benthische Photosynthese




Koschorreck, M., Tittel, J. (2002)
*Limnol. Oceanogr.* **47**, 1197 - 1201

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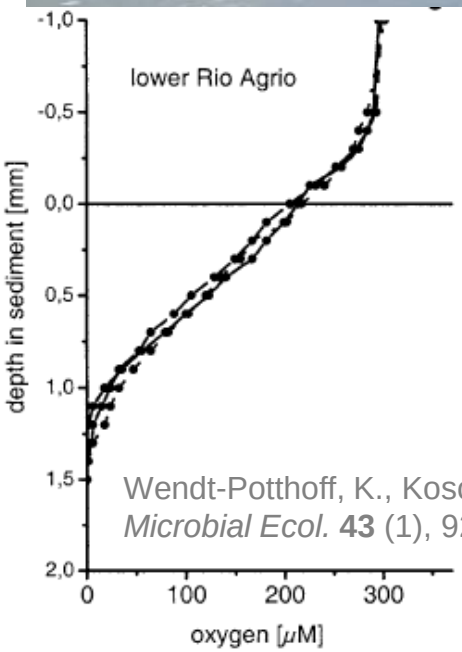
# Messung in Situ




Wendt-Potthoff, K., Koschorreck, M. (2002):
*Microbial Ecol.* **43** (1), 92 - 106

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# *In Situ* Messung am Gewässergrund

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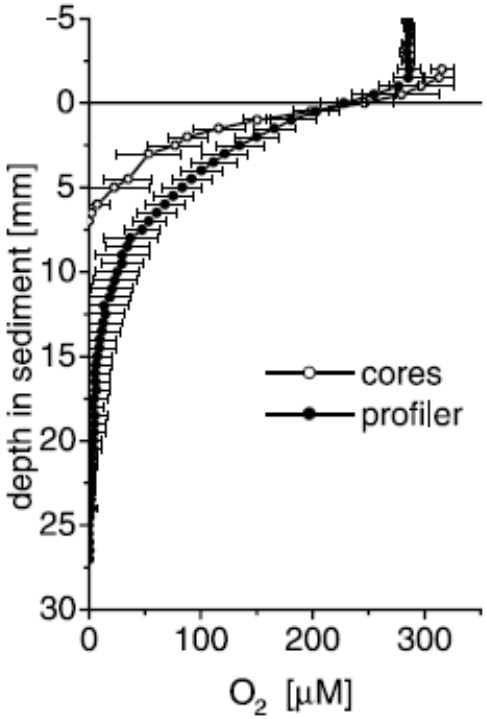
# *In Situ* Messung am Gewässergrund




Koschorreck, M., Brookland, I., Matthias, A. (2003)
*J.Exp.Mar.Biol.Ecol.* **285-286**, 71 - 84

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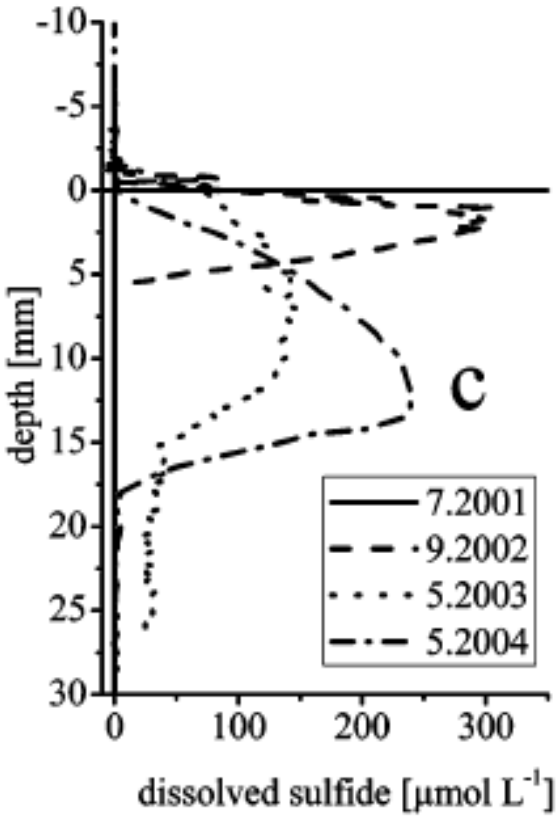
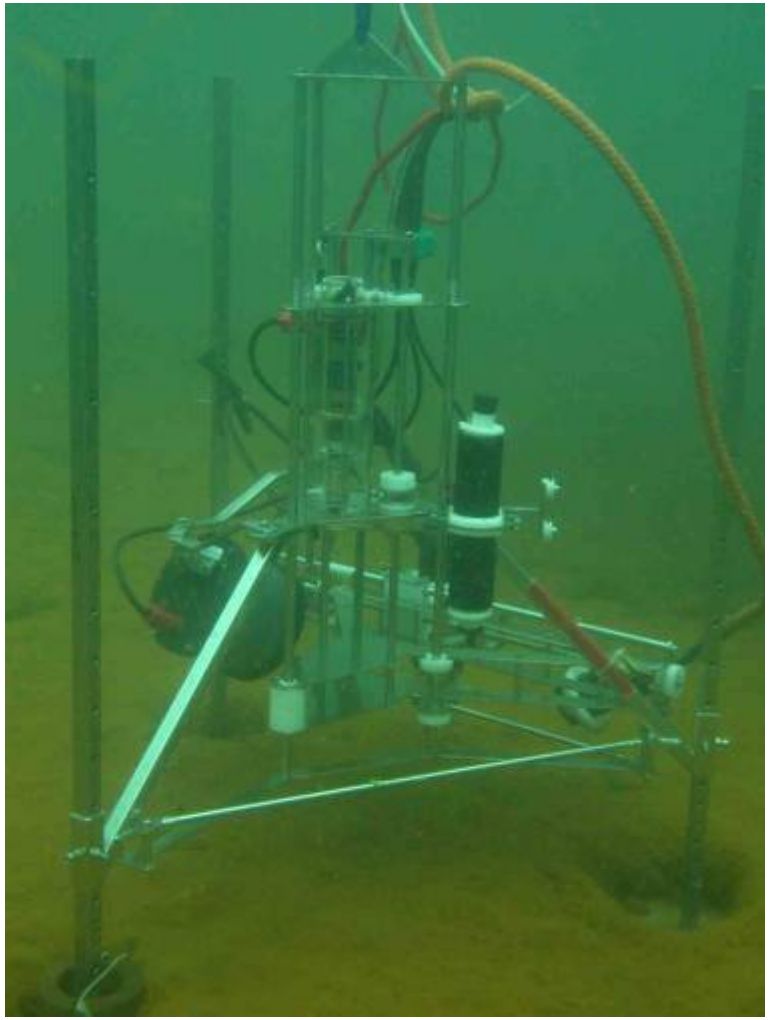
# *In Situ* Messung am Gewässergrund



Koschorreck, M., Bozau, E., Frömmichen, R., Geller, W., Herzsprung, P., Wendt-Potthoff, K. (2007) *Environ. Sci. Technol.* **41** (5), 1608 - 1614

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# *In situ* Messung im Wasser

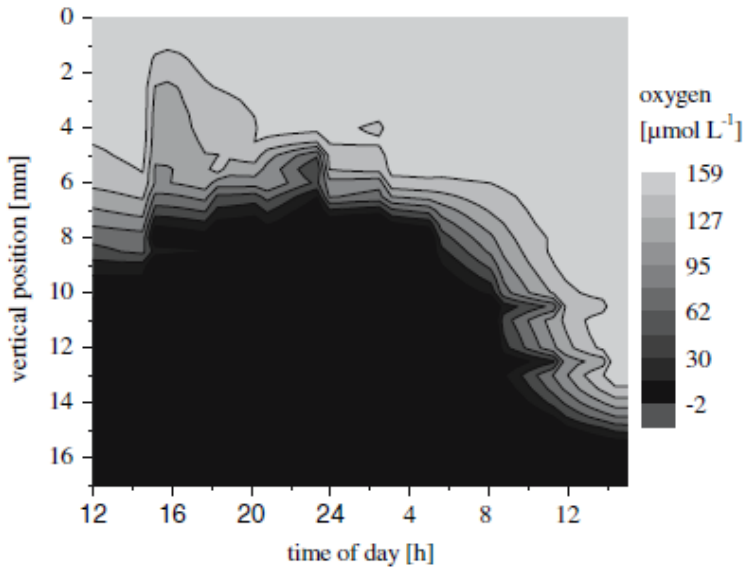


**Fig. 2** Diurnal change of oxygen concentration in the periphyton layer measured by multiple micro sensor measurements at the same location with an in situ profiler

Koschorreck, M., Kleeberg, A., Herzsprung, P., Wendt-Potthoff, K. (2007)
*Hydrobiologia* **592** (1), 387 - 397

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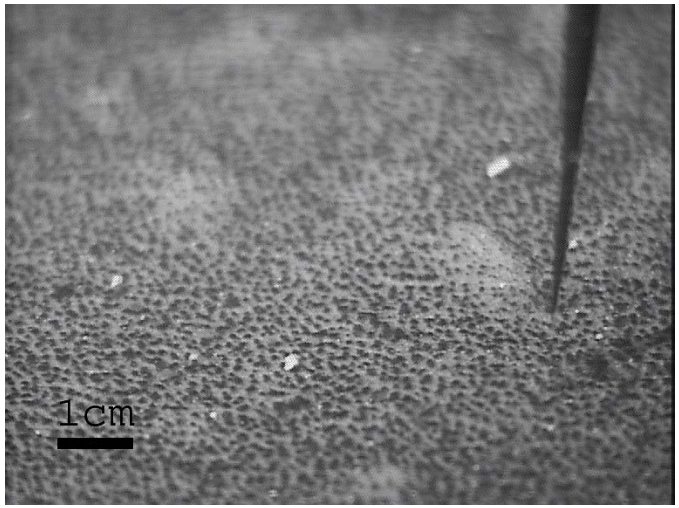
# Sedimentoberfläche *in situ*

3.7.2001 NB

10.5.2004 Littoral




4.12.2001 NB

18.9.2001 NB

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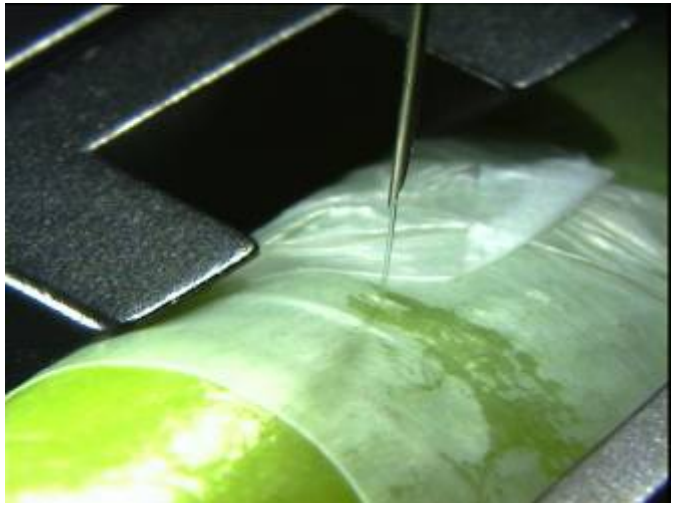
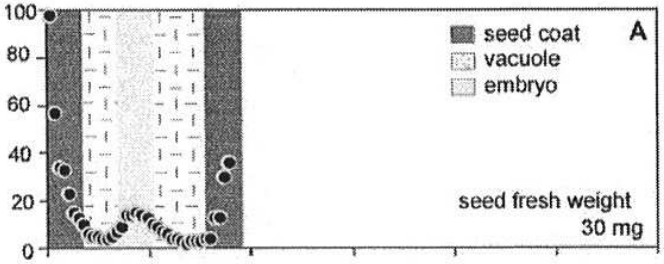
# Messung in Pflanzen






Rolletschek, H., Borisjuk, L., Koschorreck, M., Wobus, U., Weber, H. (2002):
*J.Exp.Bot.* **53** (371), 1099 - 1107

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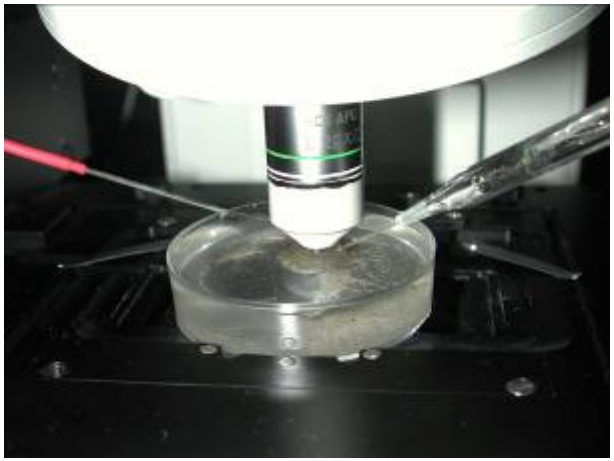
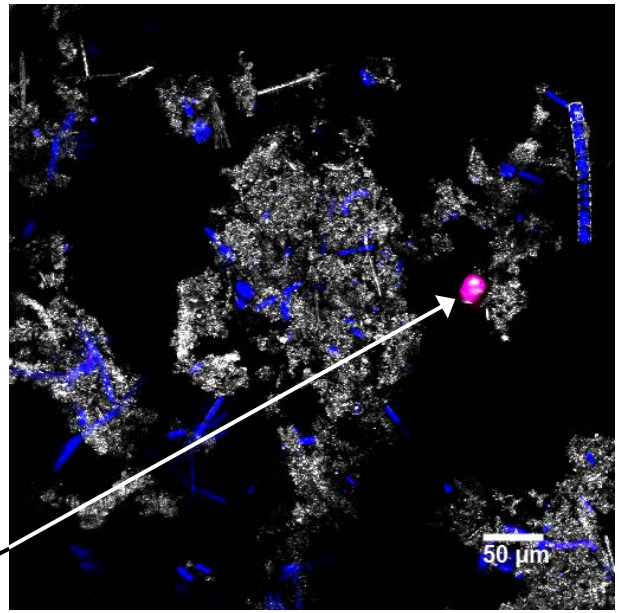
# Messung unter dem CLSM






$O_2$-Optode

Kooperation mit
Dr. Thomas Neu

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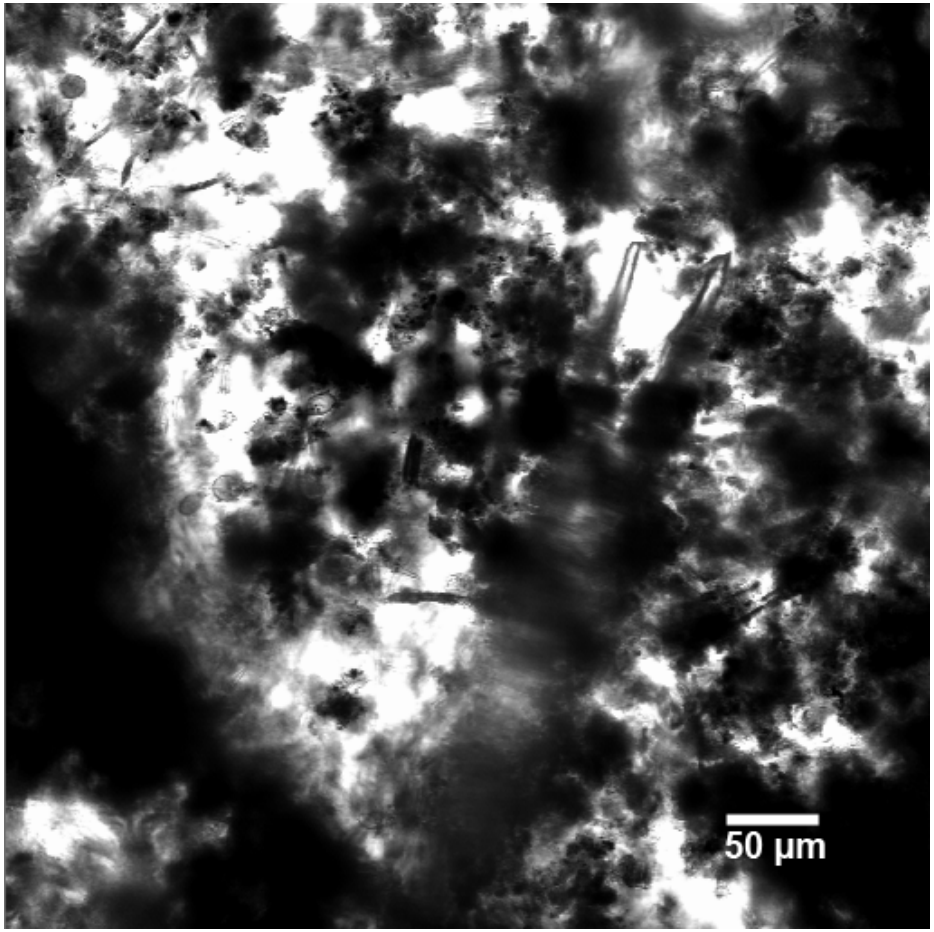
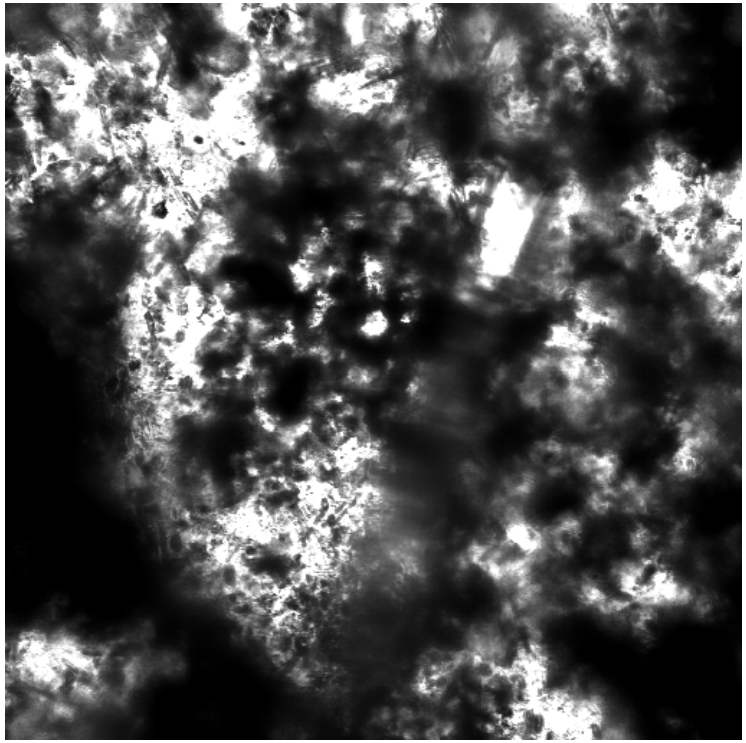
# $O_2$ Elektrode unter dem CLSM



River biofilm with
$O_2$ electrode

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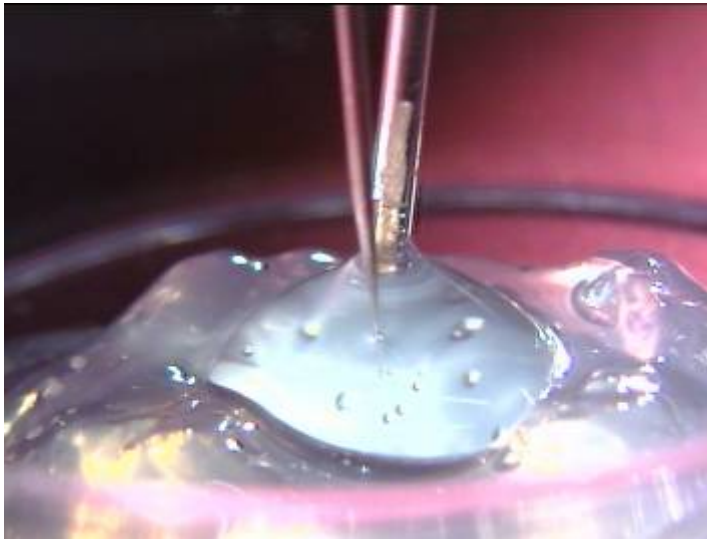
# Weitere Anwendungen

- Gradientenkulturen
- Mikrobielle Aggregate
- Inkubierte Proben
- Biofilme auf Steinen



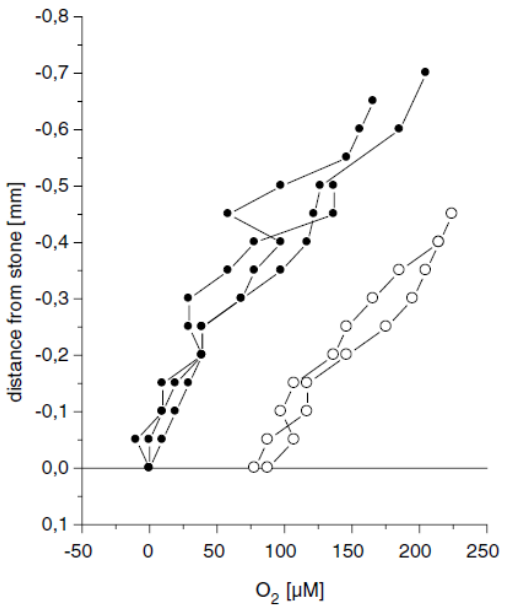



**Fig. 6** Concentration of oxygen at different distances from the stone surface under light (*open circles*) and dark (*filled circles*) conditions

Baffico, G.D., Diaz, M.M., Wenzel, M.T., Koschorreck, M., Schimmele, M., Neu, T.R., Pedrozo, F. (2004): *Extremophiles* **8** (6), 463 - 473

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