

CHEMO- AND PHOTOTACTIC BEHAVIOR OF PHOTOTROPHIC SULFUR BACTERIA UNDER NATURAL CONDITIONS IN LAGO DI CADAGNO, A MEROMICTIC ALPINE LAKE.

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During the summer season in the photic zone of the redoxcline of Lago die Cadagno large planktonic populations of phototrophic sulfur bacteria rich in carotenoids accumulate. These zones are still reached by mainly green light, oxygen concentration is very low and H<sub>2</sub>S is supplied continuously by sulfate-reducing bacteria. The phototrophic bacteria show diurnal migration over vertical distances of up to 100 cm, regulated by radiation, H<sub>2</sub>S and O<sub>2</sub>.

Four regulatory patterns for this migration behavior can be deduced: 1. After sunrise, the bacteria photooxidize H<sub>2</sub>S to elemental sulfur; the bacterial layer migrates to deeper zones. 2. This continues under high irradiation during sunny days until the cells reach radiation limited depths. 3. Towards evening, the bacteria often swim upwards, probably now photo-oxidizing internal sulfur reserves. 4. H<sub>2</sub>S-production in the bacterial zone during the night is an indication of heterotrophic dark metabolism.

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EFFECT OF DISSOLVED HEAVY METALS ON GROWTH OF GREEN PHOTOTROPHIC SULPHUR BACTERIA

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The effect of several heavy metals on the growth of *Chlorobium limicola* and *Chlorobium phaeobacteroides* has been investigated. Cr, Co, Ni, Cu, Zn, Ag, Cd and Pb at high concentrations (100 µM) were tested, comparing the photosynthetic activity and cell growth of both species. The results obtained indicate that only Zn, Ag and Pb showed toxic effects on cell activity measured as sulphide oxidation capacity and protein increase. Unlike the control, metal containing cultures stopped growth once sulphide was depleted and free metals were released into the medium. By chemical combination with metal ions, sulphide seems to act as a detoxifier.

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