

PI-127:

## Physiological and phylogenetic characterization of bacteriochlorophyll-containing oligotrophs isolated from river biofilm

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Oligotrophs prefer to grow under low nutrient conditions. Oligotrophic bacteria have been found in aquatic and terrestrial environments. Aerobic anoxygenic photosynthetic bacteria are obligate heterotrophs but they contain bacteriochlorophyll-based photosystems. They were reported to be widely spread in oligotrophic environments, but less is known in freshwater environments. Recently, we have isolated diverse species of aerobic anoxygenic photosynthetic bacteria from epilithic river biofilm. In this study, we examined the oligotrophic nature of some of the isolates and their phylogenetic positions.

Thirteen strains of aerobic anoxygenic photosynthetic bacteria were isolated from biofilms on submerged stones of a river. Growth of the isolates was tested in low and high nutrient liquid media containing organic and amino acids, yeast extract and Casamino acids at 30\_C in the dark under aerobic conditions. Total organic nutrients was 0.5 g and 2.5 g per liter in low and high nutrient media, respectively. Three strains showed growth in low nutrient medium but not in high nutrient medium. Based on 16S rRNA gene sequence analyses, two of them were similar in the sequence (99.6 % identity), belonged to the alpha-3 subclass of Alphaproteobacteria and were related to *Tabrizicola aquatica* (98.8-99.2 % identity). One strain belonged to the alpha-4 subclass and was related to *Sphingomonas jaspi* (98.6 % identity). Both of the closest relatives did not contain bacteriochlorophyll and was not reported to be oligotrophs.

The results showed that oligotrophic aerobic anoxygenic photosynthetic bacteria are present in river biofilms. Availability of light energy may allow them to survive in the oligotrophic environments. We have previously reported that aerobic anoxygenic photosynthetic bacteria have non-photosynthetic close relatives. Likewise, the oligotrophic bacteria were shown to have copiotrophic relatives in this study.

keywords:Aerobic photosynthetic bacteria,Aerobic anoxygenic phototrophs,Epilithic biofilm,Upper region of a river,Oligotroph

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