



## Dynamics of community structure and phosphate status of picocyanobacterial populations in the Gulf of Aqaba, Red Sea

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Limnol. Oceanogr., 50(1), 2005, 363-375 | DOI: 10.4319/lo.2005.50.1.0363

**ABSTRACT:** We monitored the genetic diversity and phosphate (P) status of *Prochlorococcus* and *Synechococcus* populations during an annual cycle (1999-2000) in the Gulf of Aqaba, Red Sea, using DNA probes and antibodies against the protein PstS, a molecular marker of P stress. The usual spring *Synechococcus* bloom was not observed in this year, and the picophytoplankton was dominated by *Prochlorococcus* from April to December. A single high light (HL)- adapted ecotype of *Prochlorococcus*, HLII, dominated, and this dominance extended even to the base of the euphotic zone for much of the year. Low light (LL)-adapted ecotypes only appeared between July and October and were confined to waters deeper than 50 m. The *Synechococcus* population was also dominated by a single clade (clade II), with the exception of a peak of clade III genotypes in June. Highest PstS expression from the collective *Synechococcus* and *Prochlorococcus* populations, indicative of P stress, was observed during the acutely oligotrophic summer, whereas low expression occurred during the winter and spring. *Prochlorococcus* abundance appeared unaffected by P stress and only decreased with the beginning of winter mixing, whereas P stress might have caused the decline of the *Synechococcus* population in May 1999.

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