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Solar energy and life: the diversity of phototrophic processes in the environments

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The evolution and recruitment of phototrophic processes that convert solar radiation into biochemical energy are among the most critical issues for the life on Earth. Recent works has revealed mechanisms of the phototrophy that contribute to ecosystem and geochemical cycles are rather diverse beyond the well-known oxygenic photosynthesis is. In addition, recent works also revealed diversity and quantitative significance of pico-phytoplanktons in the aquatic environment, hence the microbial energy/material flow founding on them. Understanding of microbial ecology is now refreshing a basis for biogeochemical processes in the ocean.

Keywords: phototrophy, photosynthesis, chlorophyll, aquatic ecosystem, biogeochemical cycles