Photoregulation in a Kleptochloroplastidic Dinoflagellate, Dinophysis acuta - DTU Orbit (08/11/2017)

Photoregulation in a Kleptochloroplastidic Dinoflagellate, Dinophysis acuta

Some phagotrophic organisms can retain chloroplasts of their photosynthetic prey as so-called kleptochloroplasts and maintain their function for shorter or longer periods of time. Here we show for the first time that the dinoflagellate Dinophysis acute takes control over "third-hand" chloroplasts obtained from its ciliate prey Mesodinium spp. that originally ingested the cryptophyte chloroplasts. With its kleptochloroplasts, D. acuta can synthesize photosynthetic as well as photoprotective pigments under long-term starvation in the light. Variable chlorophyll fluorescence measurements showed that the kleptochloroplasts were fully functional during 1 month of prey starvation, while the chlorophyll a-specific inorganic carbon uptake decreased within days of prey starvation under an irradiance of 100 mu mol photons m(-2) s(-1). While a acute cells can regulate their pigmentation and function of kleptochloroplasts they apparently lose the ability to maintain high inorganic carbon fixation rates.

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