

Putative functions of kleptoplast in *Planoglabratella opercularis* (foraminifera)

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A rocky-shore benthic foraminifera, *Planoglabratella opercularis*, constructs specific host-symbiont relationships that has chloroplast as kleptoplast. Host organisms may have some benefit from kleptoplast, such as organic matters, or amino acids. To understand the functions of kleptoplast, we conducted culture experiment, ultrastructural observations, oxygen micro-sensor observations and nitrogen stable isotope of amino acid analyses. The trophic position of individuals with or without kleptoplast, we measured stable isotopic composition of amino acid to understand whether their nutritional requirements come from kleptoplast or not. As a result, trophic position (TP) of the individual with kleptoplast shows 1.2. In contrast, TP of cultured individual specimens that digested kleptoplast shows 2.0. It is possible that *P. opercularis* behave as a primary producer, phyto-benthos, in nature.

Keywords: Kleptoplast, benthic foraminifera, nitrogen isotope of amino acid, oxygen micro-sensor, transmission electron microscope