

64

Taxonomy and phylogeny of *Ochromonas smithii* and *O. itoi*, the dominant algae inhabiting yellow snow in Japan.

¹Tomofumi Shitara, ¹Hanae Takahira, ²Minoru Hasei and ³Yoshiaki Hara

¹Graduate School of Science and Engineering, Yamagata University, Yamagata 990-8560, Japan

²Hasei Ltd. Ota 373-0802, Japan

³Department of Biology, Faculty of Science, Yamagata University, Yamagata 990-8560, Japan

str84x@yahoo.co.jp

In mountainous areas affected heavy snow facing the Japan Sea, we can frequently encounter the colored snows, as green, red and yellow patches, from late May to beginning July, even though the areas are lower than 1000m above sea level. A representative yellow snow algae, *Ochromonas smithii* and *O. itoi* established as unialgal cultures in a cold room at 4°C were provided for investigation the morphological feature, physiological properties and phylogenetic analysis to understand their taxonomy and phylogeny.

The cells of these two species are globular shaped with tiny protrudings like as thorns immediately after collected from the snow and under the unialgal condition. One or two days after, they are changeable into tetrapod shape which is maintained when they are placed in the cold room condition. Using the culture strains, nuclear SSU rDNA sequences are determined and constricted phylogenetic trees together with the related algae from GenBank. The following results were obtained. 1) *Ochromonas* was polyphyly. 2) *O. smithii* and *O. itoi* made a clade. 3) This clade was independent from many other species of *Ochromonas*. 4) the reconstructed the trees including the multicellular chrysophytes, *Hydrurus foetidus* and *Chrysonobula holmesii* whose zoospores were commonly tetrapod shaped, showed the sister relationship of *O. smithii* and *O. itoi*.