Strain TKB-055: A Novel Typical Excavate Flagellate in the "Discoba" Clade

Akinori YABUKI[1], Takeshi NAKAYAMA[1], Naoji YUBUKI[2], Tetsuo HASHIMOTO[1], Yuji INAGAKI[1] and Ken-ichiro ISHIDA[1] ([1]Graduate School of Life and Environmental Sciences, University of Tsukuba, [2] Departments of Botany and Zoology the University of British Columbia)

SUMMARY

We report the ultrastructure and phylogenetic position of a free-living heterotrophic flagellate strain TKB-055. This flagellate was isolated from a pond on the campus of University of Tsukuba. The cell is spherical and its diameter is approximately 15 μm. Light microscopic observations revealed that the cell is naked and highly vacuolated, and that the vegetative cells are always swimming with a rotating motion. Although light microscopy revealed no clear affinity to any taxonomic group, our electron microscopic observations revealed that strain TKB-055 possessed a shallow but typical ventral feeding groove, which is one hallmark characteristic of the supergroup Excavata (Simpson and Patterson 1999). The multigene phylogeny using α-tubulin, β-tubulin, Actin, 90 kDa heat shock protein, and translation elongation factor 2 also showed that strain TKB-055 belongs to a subgroup of Excavata, "Discoba," which is proposed, based on results of several recent studies, as a phylum or super phylum level. Three major groups exist in "Discoba" (euglenozoans, heteroloboseans, and jakobids). Although the detailed position of strain TKB-055 in the "Discoba" clade could not be resolved using the present analyses, some ultrastructural similarities to other members in "Discoba" were recognized. Results show that taxonomically and phylogenetically strain TKB-055 is a novel and missing-link protist within "Discoba".