Choice after co-symbioses: A hypothetical process for diversification of symbiotic algae of *Paramecium bursaria*

Ryo HOSHINA[1] and Yuko FUJIWARA[2]

([1]Dept. Biomed. Sci., Coll. Life Sci., Ritsumeikan Univ., [2]Dept. Bio-Sci., Nagahama Inst. Bio-Sci. Technol.)

SUMMARY

Paramecium bursaria is a single-celled protozoan that maintains several hundred green algal cells within its cytoplasm, lending it a green color. The symbiotic algae are usually cloned, single species within each *Paramecium*, and the species depends, in part, on where the *P. bursaria* was collected. Piecing together collection reports, *P. bursaria* collected from countries along the Pacific Rim contain *Chlorella variabilis*, whereas many of the *P. bursaria* collected in western to northern Europe contain *Micractinium reisseri*. Both algae have already lost the ability to live in natural water resources, and seem to be "old" natural symbionts. *Chlorella vulgaris* and *Scenedesmus* sp. have also been found as other symbionts of *P. bursaria*. The genetic discrepancies among these symbionts indicate multiple origins of the symbioses. So, how were the various symbionts obtained? Since *P. bursaria* has lost none of its ability to take in algae to be new symbionts, the following two modes of algal switching are conceivable: loss of the natural symbiont and subsequent ingestion of another suitable alga, or, more than one symbiont lives in a *P. bursaria* cell sympatrically, and one is "chosen." Some studies suggest the latter scenario.