Thermal tolerance in *Paramecium bursaria* does not depend on the presence of symbiotic algae

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SUMMARY

The ciliate *Paramecium bursaria* has several hundred endosymbiotic algae. It is known to be highly tolerant against oxidative stress (Kawano *et al.,* 2004). This tolerance might be important for the ciliate to have many symbiotic algae in the cytoplasm. To elucidate the symbiotic mechanism of *P. bursaria* with symbiotic algae, we investigated the tolerance against environmental stress of other kinds, such as high temperature, in *P. bursaria* and other *Paramecium* species (*P. caudatum, P. tetraurelia, P. trichium, P. multinucleatum,* and *P. jenningsi*). Our data obtained here revealed that *P. bursaria* is strongly tolerant against high temperature compared with other *Paramecium* species and that the tolerance is not dependent on the symbiotic algae. These results suggest that high tolerance against environmental stress is important for *P. bursaria* but not other *Paramecium* species to keep many symbiotic algae in the cytoplasm.