

Effects of the symbiosis *Chlorella* on the hydrogen peroxide tolerance in *Paramecium bursaria*

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SUMMARY

Cells of *Paramecium bursaria* contain several hundred symbiotic *Chlorella* in the cytoplasm. *Chlorella*-free white cells are obtainable easily from natural green cells by rapid growth in constant darkness (DD). White cells can also be restored quickly to green ones by the infection of *Chlorella* isolated from green cells. In this study, to confirm the role of symbiotic *Chlorella* in enhancing tolerance to hydrogen peroxide using *Chlorella*-free and *Chlorella*-containing cells. More than 70% of white cells died within 12 hr in 100 μ M hydrogen peroxide. Most green cells lived in the darkness after hydrogen peroxide treatment, although they showed as low a survival rate as the white ones in constant light (LL) did. Furthermore, the degree of tolerance to hydrogen peroxide in white cells became as high as that of the green cells after maltose added. When the survival rate of white cells was measured in hydrogen peroxide after infection with *Chlorella*, many cells died for one day after re-infection even though cells contained many *Chlorella*. However, the survival rate increased to high as same as the green cells five days after re-infection. We clarified that symbiotic *Chlorella* of *P. bursaria* enhanced the tolerance to hydrogen peroxide in host cells.