

The symbiotic environment of symbiotic *Chlorella* from Japanese *Paramecium bursaria*

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SUMMARY

The endosymbiotic *Chlorella* cells in *Paramecium bursaria* are reported to provide photosynthate as maltose to the host. In an acid condition, the cultured endosymbiotic *Chlorella* released maltose although its carbon dioxide fixation was decreased and the *Chlorella* were unable to grow. The inconsistency of conditions for the growth and the maltose release of cultured endosymbiotic *Chlorella* F36-ZK led to study the endosymbiotic milieu in *P. bursaria* F36. First, the pH change in F36-ZK cells were measured using fluorescence dye and the intracellular pH were varied depending on the external pH. To estimate the growth stage of endosymbionts in *P. bursaria* F36, the cell diameters of freshly isolated endosymbionts were measured and compared to those of various stage of cultured F36-ZK. The average cell diameter of freshly isolated endosymbionts was almost equal to that of cultured F36-ZK cells in middle stage of the stationary phase. The cell in this stage is larger than those in exponential growth phase or in the early stage of the stationary phase because cells store photosynthate, carbohydrate, and/or lipid. Consequently, the symbiotic milieu in *P. bursaria* F36 is apparently almost neutral and good for endosymbiont growth.