

A Green *Paramecium* Strain with Abnormal Growth of Symbiotic Algae

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Some hundred cells of *Chlorella*-like green algae are naturally enclosed within the cytoplasm of a single cell of green paramecia (*Paramecium bursaria*). Therefore, *P. bursaria* serves as an experimental model for studying the nature of endo-symbiosis made up through chemical communication between the symbiotic partners. For studying the mechanism of symbiotic regulations, the materials showing successful symbiosis are widely used. Apart from such successful model materials, some models for symbiotic distortion would be of great interest in order to understand the nature of successful symbiosis. Here, we describe a case of unsuccessful symbiosis causing unregulated growth of algae inside the hosting ciliates. Recently, we have screened some cell lines, from the mass of *P. bursaria* cells survived after paraquat treatment. The resultant cell lines (designated as KMZ series) show novel and unusual morphological features with heavily darker green colour distinguishable from the original pale green-coloured paramecia. In this type of isolates, endo-symbiotic algae are restricted within one or two dense spherical structures located at the center of the host cells' cytoplasm. Interestingly, this isolate maintains the host cells' circadian mating response which is known as an alga-dependent behaviour in the host cells. In contrast, we discuss that KMZ lacks the host-dependent regulation of algal growth, thus the algal complex often over-grows obviously exceeding the original size of the normal hosting ciliates. Additionally, possible use of this isolate as a novel model for symbiotic cell-to-cell communication is discussed.

Key words: Algae, Ciliate, Symbiosis