

5PO.5**HORIZONTAL GENE TRANSFER FROM BACTERIA TO THE CHLOROPLAST GENOMES OF SIPHONOUS GREEN ALGAE (BRYOPSIDALES, CHLOROPHYTA)**

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Species of Bryopsidales are characterized by macroscopic plants consisting of a single giant tubular cell containing millions of nuclei and chloroplasts. These siphonous cells are also known to harbor diverse bacterial communities. Little is known about the diversity of chloroplast genomes (cpDNAs) in this

group, and about the possible consequences of intracellular bacteria on genome composition of the host. We present the complete cpDNAs of *Bryopsis plumosa* and *Tydemania expeditiones*. The two cpDNAs are amongst the smallest and most gene dense genomes in the core Chlorophyta. The cpDNA of *B. plumosa* contains a 13 kb region with several free-standing open reading frames (ORFs) of bacterial origin, including a large ORF (> 8 kb) closely related to bacterial *rhs*-family genes. The cpDNA of *T. expeditiones* also contains several regions with ORFs of bacterial origin, including genes involved in mobile functions (transposases, integrases, phage/plasmid DNA primases), and ORFs showing close similarity with bacterial DNA methyltransferases. The presence of bacterial genes, including genes typically found in mobile elements, suggest that these have been acquired through horizontal gene transfer, which may have been facilitated by the occurrence of obligate intracellular bacteria in these siphonous algae.