

THE DEVELOPMENT OF *BUDDENBROCKIA* SP. IN BRYOZOA WITH COMPARISON TO *TETRACAPSULOIDES BRYOSALMONAE*, THE CAUSE OF SALMONID PROLIFERATIVE KIDNEY DISEASE.

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Buddenbrockia plumatellae was previously classified as *Tetracapsula bryozoides* (Canning *et al.*, 2002), comprising the genus *Tetracapsula* along with *T. bryosalmonae* - the causative agent of salmonid proliferative kidney disease (PKD) (Canning *et al.*, 1999). Subsequent analysis of 18S rDNA sequences suggested that *Tetracapsula* and *Buddenbrockia* were congeneric (Monteiro *et al.*, 2002), the latter taking taxonomic precedence, resulting in the establishment of the genus *Tetracapsuloides* to accommodate *T. bryosalmonae*.

In the current study, Bryozoa were collected from inlet water to PKD-affected fish farms in Southern England. Specimens of *Plumatella repens* were removed from sections of submerged wood and plastic sheeting, while samples of *Fredericella sultana* were obtained adhered to submerged tree roots. The bryozoans were cultured in eight litre aquaria containing Chalkey's medium, and fed with a mixture of artificially reared protozoa and algae. The bryozoan colonies were attached to petri dishes and the development of malacosporean parasites was visualised using an inverted microscope. The specimens of *P. repens* were found to contain characteristic vermiform spore sacs of *Buddenbrockia* sp. (Morris *et al.*, 2002), while samples of *F. sultana* included spherical sacs consistent with descriptions of *T. bryosalmonae*. In contrast to previous reports of bryozoans containing *Buddenbrockia plumatellae*, statoblast production was recorded during infection, although at a subnormal level. The bryozoan colonies were reared *in vitro* for over 90 days, allowing monitoring of the development cycle of *Buddenbrockia* within *P. repens* by electron and light microscopy, including extensive video capture.

Infection with both malacosporean parasites resulted in the formation of spores, released upon maturity of spore sacs into the coelom of the host. Video footage allowed visualisation of the swirling motion of diverse parasitic stages within bryozoans. Unlike *T. bryosalmonae*, the development of *Buddenbrockia* included immature stages budding from the bryozoan wall. Electron microscopical analysis of these stages revealed developmental similarities with previous studies on *T. bryosalmonae*. Whereas exposure of rainbow trout (*Oncorhynchus mykiss*) to *Buddenbrockia* material did not produce clinical disease, exposure to *T. bryosalmonae* material led to the development of PKD. However, failure to transmit *Buddenbrockia* to other bryozoan colonies suggests that an alternative host is needed in its life cycle.

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