LS-2-P-2318 ULTRASTRUCTURE OF THE SPERMATOCYTES OF Spondylus calcifer (Carpenter, 1857) AND S. princeps (Gray, 1825) (MOLLUSCA: PELECIPODA: SPONDYLIDAE)

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ABSTRACT
Spondylus calcifer (Carpenter, 1857) and S. princeps (Gray, 1825) are bivalve gonochoric and free spawning with fertilization occurring in seawater, both species are distributed on coastal rock of American Pacific Ocean. We describe for the first time the ultrastructural development of the cells during spermatogenesis, and the morphology of the mature spermatozoa were characterized by transmission electronic microscopy. The testes in both species are tubular. The development of the spermatogonia and spermatocytes of 1st and 2nd order are concentrically arranged inside the tubules with the less developed cells closer to the wall, and the spermatids and spermatozoa closer to the lumen. The tubules are surrounded by a matrix of connective tissue with accessory cells which function is equivalent to the Sertoli cells in mammals. Four stages were distinguished in gametes development of both species: Spermatogonia (4-8 μm), Spermatocytes (3-4 μm) (primary and secondary), Spermatids (4-8 μm) and Spermatozoa (~2 μm head length). In both species, the spermatozoid shows similar morphology, which supports the close phylogenetical relationship between them. Both species also have four mitochondria arranged circularly in the midpiece, typical of external fertilization species and ancestral spermatozoids. The evolutionary implications and relevance of these results for the taxonomy of the Spondylus species and sustainable use of their populations are discussed.

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Fig. 1: Transmission electron micrographs of spermatogenesis in Spondylus princeps. Spermatogonia (spg); nucleus (n); mitochondria (m); primary spermatocyte (spt1); secondary spermatocyte (spt2); spermatid (spm); support cells (sc).

Fig. 2: Transmission electron micrographs of mature spermatozoa of Spondylus calcifer. Nucleus (n); flagella (fl); pseudopodia-like projections (pp).

Fig. 3: Transmission electron micrographs of mature spermatozoa of Spondylus princeps. mitochondria (m); acrosome (ac).