

**A NEW PHOTOSYMBIOTIC MARINE BIVALVE WITH WINDOW SHELL  
MICROSTRUCTURE (CARDIIDAE: FRAGINAE)**

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**ABSTRACT:** Species of *Fragum* were collected from shallow waters in the Funafuti Atoll in Tuvalu in 2004, with one species being new. We describe *Fragum funafutiense* n. sp., which in addition to its occurrence at Funafuti, has now been found in five additional countries in the Indo-West Pacific. It can be differentiated from closely similar species only by consideration of a suite of characters that include shell shape, nature of the umbonal keel, rib number, rib sculpture, constitution of the hinge and nature of the shell window formation. Previously published molecular sequence data, including COI and 16S mtDNA, support this species as distinct from other tested fragines as well. Like all species in the genera *Fragum*, *Corculum*, and *Lunulicardia*, this new species is also photosymbiotic. In contrast to many other cardiiids, however, *Fragum funafutiense* n. sp. exhibits deep penetration of fibrous prismatic microstructure on the posterior shell surface, consistent with window shell microstructure. Window shell microstructure is an adaptation that enhances light penetration through the shell to photosymbionts housed in soft tissue such as mantle, foot, and siphonal tentacles. A lectotype of its congener *F. mundum* (Reeve, 1845) is herein designated.

**Keywords:** cardiiids, *Fragum*, new species, tropical reefs, biodiversity, photosymbiosis, window shell microstructure

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