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Two new *Horaiclavus* (Horaiclavidae, Conoidea) species from the Indo-Pacific region

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The genus *Horaiclavus* includes eight Holocene Indo-Pacific species (Appeltans *et al.* 2012). Herein, we describe two new species that resemble members of this genus in some aspects of shell morphology, but otherwise show features that suggest that they differ from "typical" *Horaiclavus* species. Descriptions and measurements were based on shells oriented spire up with the aperture facing the viewer and made using a Leica MS 5 Stereomicroscope for incident light and a 10× ocular micrometer. Scanning electron microscope (SEM) micrographs were taken using a Hitachi S-2400. The classification adopted here follows Bouchet *et al.* (2011). The following abbreviations are used in the text: MZB = Museo di Zoologia dell'Università di Bologna; MNHN = Muséum National d'Histoire Naturelle, Paris, France; NHMUK = The Natural History Museum of United Kingdom [formerly British Museum (Natural History)], London, United Kingdom; ZMA = Naturalis Biodiversity Center, Leiden, the Netherlands; ZRC = Zoological Reference Collection, Raffles Museum of Biodiversity Research, Singapore; a = aperture length; b = shell width; l = length; a/l = ratio of aperture length to total shell length; b/l = ratio of shell breadth to total length; dd= dead collected specimen(s); stn. = station.

Systematic description

Conoidea Fleming, 1822

Horaiclavidae Bouchet, Kantor, Sysoev & Puillandre, 2011

Genus *Horaiclavus* Oyama, 1954

Type species: *Mangilia splendida* A. Adams, 1867 (by original designation).

Remarks. The taxonomic position of the genus *Horaiclavus* Oyama, 1954 has been controversial. Powell (1966) assigned it to the Turridae but considered the possibility of placement in Buccinidae. Subsequent authors (Sysoev, 1993; 1996; Higo, Callomon & Goto, 1999) assigned *Horaiclavus* to Drilliidae Olsson, 1964, while Fedosov & Kantor (2008) placed it in the Crassispirinae (= Pseudomelatomidae Morrison, 1965). More recently, Bouchet *et al*. (2011) designated *Horaiclavus* as the type genus of the new family Horaiclavidae which differs from Pseudomelatomidae mainly on molecular grounds. Species assigned to *Horaiclavus* are characterized by a claviform shell sculptured with axial folds with a very shallow to virtually absent anal sinus.

Sysoev *in* Fedosov & Kantor (2008) noted that there are likely to be numerous additional undescribed *Horaiclavus* species and that the genus, as presently construed, is most probably polyphyletic and includes species that actually belong to distinct genera. *Horaiclavus phaeocercus* and *H. anaimus* (both described by Sysoev *in* Fedosov & Kantor, 2008) differ from *H. splendidus* (A. Adams, 1867), the type species of *Horaiclavus*, in lacking a radula and in foregut anatomy. These species also differ from typical members of *Horaiclavus* in their smaller dimensions and proportions ("lower spire and larger aperture and a somewhat longer siphonal canal"). The two new species described below resemble the relatively small-sized species described by Sysoev (*in* Fedosov & Kantor, 2008) but otherwise differ in having peculiar morphological characters. It is thus possible that they may actually belong to one, or possibly two, still undescribed genera. This consideration is particularly pertinent in the case of *Horaiclavus ordinei* **sp. nov.** which differs

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examination would show the presence of this feature in other *Horaiclavus* or *Horaiclavus*-like species. *H. adenensis* **sp. nov.** superficially resembles in shape, axial sculpture and presence of a carinate protoconch the shallow water *Clavus costatus* Hedley, 1922 (= *Gracicliclava mackayensis* Shuto, 1983), from Queensland (Australia), type species of *Graciliclava* Shuto, 1983, a genus currently regarded as closely related to and possibly a subgenus of *Anacithara* Hedley, 1922 (Kilburn, 1994), also included in the Horaiclavidae (Bouchet *et al.*, 2011). However, according to Shuto (1983:11–12) the shell surface of *Graciliclava costata* (Hedley, 1922) is sculptured by "dense and minute spiral lines" of different order of strength as in members of the genus *Anacithara* and the protoconch keel is stronger than in *H. adenensis.*

***Horaiclavus ordinei* sp. nov.**

Figures 1M–T

Type material. Holotype (MZB60081) and paratype (MZB60082).

Type locality. Balicasag Island, Philippines trawled by local fishermen at about 200 m.

Material examined. 2 dd from the type locality.

Description. Shell broadly claviform (b/l 0.53–0.57; a/l 0.41–0.44) (Fig. 1.M–P) with a moderately high orthoconoid spire and a short, contracted and quite strongly tapering base. Protoconch papilliform of about 1½ smooth whorls (Fig. 1S–T). Maximum protoconch diameter 0.57 mm. Teleoconch of up to about five whorls with deeply impressed, strongly wavy suture. Whorls strongly convex with an angled periphery just below mid-whorl height on earlier whorls, at middle on last two whorls. Subsutural ramp narrow, shallowly concave. Axial sculpture of strong, slightly arcuate and weakly opisthocline folds, extending from suture to suture, slightly weakening on subsutural ramp and extending on base but not on rostrum. Axial ribs of rounded triangular cross-section, interspaces concave, slightly broader to about the same width as ribs. There are nine axial folds on last two teleoconch whorls. Spiral sculpture commencing with a peripheral cord forming shoulder angle, joined on second whorl by a closely-spaced weaker cord below periphery, and a third cord near abapical suture on last two whorls (Fig. 1Q); in the paratype of fourth rather weak spiral cord in the interspace between the two adapical cords and cord bordering abapical suture. Last whorl has three spiral threads on base and five threads on rostrum. Aperture oval, with a distinct, narrow, proportionally long (for genus) siphonal canal. Inner lip has a relatively thick callus forming a weak parietal tubercle. Fasciole is strong; a shallow but distinct false umbilicus is present. Outer lip has with heavy varicoid-rib behind thin lip edge. Anal sinus shallow but distinct. Shell pale buff colored. Dimensions: Holotype: 5.8 x 3.1 mm, aperture height 2.4 mm. Paratype: 4.9 x 2.8 mm, aperture height 2.2 mm.

Etymology. Named after Professor Nuccio Ordine of the University of Calabria, Italy.

Remarks. *Horaiclavus ordinei* **sp. nov.** is a rather peculiar species morphologically and is characterized by its small dimensions, relatively low spire, strong fasciole, relatively long siphonal canal and presence of few but distinct spiral cords. The southwestern Pacific species *Horaiclavus phaeocercus* Sysoev *in* Fedosov & Kantor, 2008 and *H. anaimus* Sysoev *in* Fedosov & Kantor, 2008 are superficially similar to the new species in proportions but attain a larger size (up to about 6 mm in length vs ca. 12 mm) and lack spiral sculpture on spire whorls. Among *Horaiclavus* species, *H. multicostatus* (Schepman, 1913) from Indonesia has a distinct spiral cord forming a peripheral angulation on spire whorls, but otherwise spiral sculpture in restricted to base and rostrum. Shuto proposed the monotypic subgenus *Anguloclavus* Shuto, 1983 for *H. multicostatus* (Schepman, 1913) but the status of this latter taxon, as well as of the two species here described, will remain uncertain until anatomical and/or molecular features become known.

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