

A new species of *Amphidromus* (Pulmonata: Camaenidae) from Palawan Island, Philippines

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KEYWORDS. Gastropoda, Camaenidae, Philippines, *Amphidromus* n. sp.

ABSTRACT. A new species of *Amphidromus* s.s. was collected from high altitude at Mount Mantalingajan in the southern part of Palawan Island, Philippines. It has a different shell outline and differs in several shell characters compared with other *Amphidromus* s.s. This new species is especially compared with *Amphidromus entobaptus* (Dohrn 1889) that also lives in Palawan and its satellite islands in the Calamianes Archipelago in the North East of Palawan.

INTRODUCTION

Laidlaw & Solem (1961) studied and classified the species, subspecies, and varieties of *Amphidromus* Albers 1850. According to them, the subgenus *Amphidromus* s.s. is represented by three species in the Philippines: *Amphidromus entobaptus* (Dohrn 1889), *A. maculiferus* (Sowerby 1838), and *A. chloris* (Reeve 1848), which had previously been dealt with Pilsbry (1900) and Bartsch (1917).

The shell characters of *Amphidromus entobaptus* and its varieties are: sinistral shell, obese shape, straight or slightly convex whorls, small to medium shell height (36.4-55.2 mm), monochrome orange-yellow or yellow shell color, sometimes with some vague hydrophanous streaks, varices not developed, deep yellow color inside aperture, and closed umbilicus. *Amphidromus entobaptus* is distributed on Palawan Island and its satellite islands in the Calamianes Archipelago. *A. entobaptus entobaptus* (shell size medium, height 46.2-55.2 mm) was recorded from several places in Central Palawan Island: Puerto Princesa, Aborlan, Tay-Tay, Poncal, and Ulugan. All described varieties are from several satellite islands of Palawan, and have been united by Laidlaw & Solem (1961) into one subspecies, *Amphidromus entobaptus contractus* Kobelt 1916, with a slightly smaller average shell height (36.4-49.9 mm). They are known from the following islands in the Calamianes Archipelago: Malubutglubut (*viridoflavus* Bartsch 1917), Linapacan (*gracilis* Kobelt 1916 = *linapacensis* Bartsch 1917), Culion (*culionensis* Bartsch 1917), Coron (*contractus* Kobelt 1916 = *coronensis* Bartsch 1917), and Busuanga (*busuangensis* Bartsch 1917). *Amphidromus mindoroensis* Bartsch 1917 was described based on a single shell specimen of 53.2 mm height and canary-yellow color labeled "Mindoro Island". This nominal taxon was also placed under *Amphidromus entobaptus contractus* Kobelt 1916 by Laidlaw & Solem (1961); the occurrence of *A. entobaptus* in Mindoro Island needs further confirmation. Laidlaw & Solem (1961) grouped the remaining multitude of nominal taxa from

the Philippines belonging to *Amphidromus* s.s. into two species: *Amphidromus maculiferus* (Sowerby 1838) and *Amphidromus chloris* (Reeve 1848). They are usually sinistral, but in some varieties dextral shells have been found.

Amphidromus maculiferus is characterized by shell heights varying from medium to very large (45.8-72 mm), high conical shape, rather robust and thick shell wall, usually the presence of distinct brown streaks or clear hydrophanous markings, moderately open umbilicus, expanded and reflected outer lip. The distribution area of *A. maculiferus* includes Mindanao, Bohol, Leyte, the Camotes Islands, and Samar. The status of several nominal taxa from Basilan and some islands in the Sulu Archipelago needs further study. Laidlaw & Solem (1961) associated eighteen species-group names with *Amphidromus maculiferus* (Sowerby 1838) which they grouped into three subspecies: *Amphidromus maculiferus maculiferus*, *A. maculiferus buluanensis* Bartsch 1917 and *A. maculiferus multicolor* von Möllendorff 1894.

In *A. chloris* the shell is small (34-49.8 mm in height), rather thin-walled; of yellow, white or light brown ground color, sometimes with brown markings or streaks; with or without a white subsutural band; moderately open or closed umbilicus; little expanded, reflected or recurved outer lip. *A. chloris* is distributed on some islands of the Sulu Archipelago, Basilan, and the Zamboanga Peninsula in the southern part of Mindanao; the occurrence in Mindoro and Sibuyan needs confirmation. Laidlaw & Solem (1961) placed ten nominal taxa referable to *A. chloris* in two subspecies, *A. chloris chloris* (Reeve 1848) and *A. chloris roeseleri* von Möllendorff 1894. In addition, Schileyko (2011) reported *A. chloris* from South Vietnam and "W Australia (Eastern Islands)." The latter locality seems to refer to the Easter Group in the Houtman Abrolhos off Western Australia and is certainly erroneous. The type locality of *A. chloris*, as given by Reeve (1848), is "Eastern Islands," without further specification. That Reeve meant "Eastern Islands" in a generic way similar to "East Indies" is obvious from the same term being used as the type

locality of other non-Australian species, such as *Bulimus contusus* (= *Amphidromus inversus* (O. F. Müller 1774), cf. Laidlaw & Solem 1961: 612) published on the same plate (Reeve, 1848: pl. 38).

Laidlaw & Solem (1961) separated doubtful forms of *A. maculiferus* and *A. chloris* by the brown or clear hydrophanous streaks in *A. maculiferus* and the lack of such in *A. chloris*. The fact that some specimens of *A. chloris* with brown streaks have been found makes these separation criteria seem problematic.

Twenty two specimens of *Amphidromus* n. sp. were collected by members of a native tribe from Mount Mantalingajan in the southern part of Palawan Island. The color of this new species is monochrome; only sinistral specimens have been found in, in comparison with other sinistral shell that has relatively monochrome color *Amphidromus entobaptus* (Dohrn 1889).

Type materials of the new species are deposited in: Museum Zoologicum Bogoriense, Bogor, Indonesia (MZB); United States National Museum of Natural History, Smithsonian Institution, Washington D. C. (USNM); Field Museum of Natural History, Chicago (FMNH); Rijksmuseum Natuurlijke Historie, Leiden, the Netherlands (RMNH); Haus der Natur-Cismar, Germany (HNC); Bunjamin Dharma coll. (BD); Antonio dela Cruz coll. (AC).

Family **CAMAENIDAE** Albers, 1850

Genus ***Amphidromus*** Albers, 1850

Type species: *Helix perversus* Linnaeus, 1758 (by subsequent designation of von Martens, 1860)

***Amphidromus toncruzi* n. sp.**

Figs 2-4, 7, Table 1

Type material. Barangay Tau Bato, Mt. Mantalingajan, South Palawan, 1,500 m.: holotype MZB Gst. 13823, 2 paratypes MZB Gst. 13824, 2 paratypes USNM 1180555-1180556, 2 paratypes FMNH 328326, 2 paratypes RMNH. Mol. 209718-

209719, 2 paratypes HNC 79441-79442, 7 paratypes BD, 4 paratypes AC.

Distribution. Only known from the type locality at Barangay Tau Bato, Mt. Mantalingajan, South Palawan, Philippines.

Type locality. Barangay Tau Bato, Mt. Mantalingajan, South Palawan, Philippines, about 1,500 m.

Habitat. All specimens were taken dead under big trees by members of a native tribe.

Description. Shell moderately large, height up to 61.5 mm; all specimens seen sinistral; high conical with rather inflated last whorl. Shell rather thick or medium thick-walled, little transparent, shining. Whorls 5-5½, convex, regularly increasing in size, last whorl comprising about three-quarters of shell height, aperture height about half of shell height; perch angle small (29°-33°). Apex smooth and shining. Radial striae fine, spiral striae weak. Shell color monochrome, pale orange, yellow or white, sometimes with a pale orange or yellow spire fading into a white last whorl, varices absent. Suture of apical whorls impressed, suture of lower whorls shallow, with a comparatively broad white subsutural band. Suture of last whorl broadly appressed to penultimate whorl for about 1.5 mm. Aperture oblique, ovate; yellowish or white inside. Parietal wall overlaid by rather thick translucent callus. Peristome white, with a white commarginal zone behind it; outer lip thickened, little expanded, recurved and adnate behind. Columella vertical, with a somewhat sharp proximal edge, extending distally and forming a rather thick columellar plate. Umbilicus closed, concealed by the columellar plate. Dimensions: height 51.4-61.5 mm, width 27.6-33.6 mm, height of aperture 25.3-31.6 mm, height of last whorl 38.0-45.3 mm.

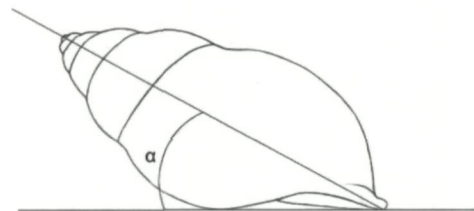
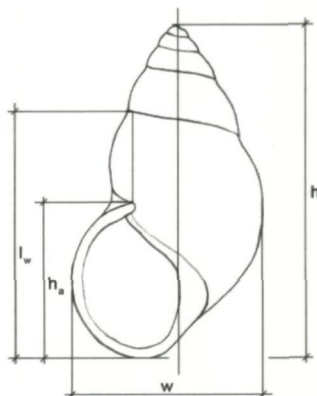


Fig. 1. Measurements. h: height of shell, w: wide of shell, h_a : height of aperture, l_w : height of last whorl, α : perch angle.

		h (mm)	b (mm)	h _a (mm)	l _w (mm)	α (°)	h/b	h _a /h	l _w /h
1	Holotype MZB Gst. 13823	59.2	32.1	29.2	43.0	30	1.84	0.49	0.73
2	Paratype MZB Gst. 13824	54.7	28.3	27.6	40.7	30	1.93	0.50	0.74
3	Paratype MZB Gst. 13824	52.7	28.3	27.2	39.7	29	1.86	0.52	0.75
4	Paratype USNM 1180555	55.9	29.2	26.8	40.8	33	1.91	0.48	0.73
5	Paratype USNM 1180556	54.2	29.6	27.1	39.5	32	1.83	0.50	0.73
6	Paratype FMNH 328326	51.4	27.6	25.3	38.0	30	1.86	0.49	0.74
7	Paratype FMNH 328326	54.1	28.8	27.2	39.6	32	1.88	0.50	0.73
8	Paratype RMNH 209718	55.7	29.0	28.0	40.6	29	1.92	0.50	0.73
9	Paratype RMNH 209719	55.4	30.8	28.0	41.0	29	1.80	0.51	0.74
10	Paratype HNC 79441	58.6	31.6	29.0	42.4	32	1.85	0.49	0.72
11	Paratype HNC 79442	54.5	31.5	28.5	40.6	30	1.73	0.52	0.74
12	Paratype BD	56.7	33.0	29.1	41.8	33	1.72	0.51	0.74
13	Paratype BD	58.5	32.7	29.0	42.3	32	1.79	0.50	0.72
14	Paratype BD	55.8	30.7	27.6	41.3	32	1.82	0.49	0.74
15	Paratype BD	61.5	33.6	31.6	45.3	33	1.83	0.51	0.74
16	Paratype BD	55.3	32.0	29.3	42.7	31	1.73	0.53	0.77
17	Paratype BD	58.2	30.0	28.7	42.3	31	1.94	0.49	0.73
18	Paratype BD	54.9	30.2	29.4	42.2	29	1.82	0.54	0.77
19	Paratype AC	56.2	31.0	28.0	41.9	32	1.81	0.50	0.75
20	Paratype AC	57.0	30.0	28.0	42.5	33	1.90	0.49	0.75
21	Paratype AC	57.3	30.6	28.4	41.9	32	1.87	0.50	0.73
22	Paratype AC	56.2	29.7	28.1	42.0	30	1.89	0.50	0.75
	minimum	51.4	27.6	25.3	38.0	29.0	1.72	0.48	0.72
	maximum	61.5	33.6	31.6	45.3	33.0	1.94	0.54	0.77
	mean	56.1	30.5	28.2	41.5	31.1	1.84	0.50	0.74
	standard deviation	1.68	1.31	0.90	1.16	1.27	0.05	0.01	0.01

Table 1: Measurements of the *Amphidromus toncruzi* n. sp. type series.

Remarks. The unique character state of the suture of the last whorl being broadly appressed for about 1.5 mm to the penultimate whorl is consistent in all specimens of *A. toncruzi* n. sp. studied. The new species' shell is monochrome yellow or pale orange, without dark color markings or hydrophanous streaks, except for white around the aperture and below the suture. The white subsutural band is rather broad. The color inside the aperture is relatively pale.

Amphidromus entobaptus entobaptus and *A. entobaptus contractus*, which are also sinistral and have a monochrome coloration, differ from *A. toncruzi* n. sp. in their on average smaller shell, (height up to 55.2 mm), a simple suture that is not broadly appressed to the penultimate whorl, a narrower white subsutural band, and a deeply colored inside of the aperture.

Amphidromus maculiferus and *A. chloris* are differ from *A. toncruzi* n. sp. in their simple suture that is not broadly appressed to the penultimate whorl, their even less convex whorls, their sometimes moderately open

umbilicus (which, however, can also be completely closed), their more broadly expanded peristome with a reflected outer lip. In addition, *A. maculiferus* shells are not monochrome but usually display brown streaks or clear hydrophanous markings, plain-colored shells have black subsutural bands on some earlier whorls. Shells of *Amphidromus chloris* are on average smaller (height up to 49.8 mm) and more slender.

Amphidromus toncruzi n. sp. has similarities with some monochrome *Amphidromus* species from outside the Philippines, such as *A. ameliae* Dharma 2007 from Sumatera, Indonesia, and *A. atricallosus perakensis* Fulton 1901 from Peninsular Malaysia and southern Thailand with their high conical shells lacking dark varices. They are different from *A. toncruzi* n. sp. in having less convex whorls, a less globose last whorl, a higher whorl count of 5½-7, in being not transparent, thicker-shelled, in a simple, not broadly appressed suture, a sometimes open umbilicus, (Solem 1965; Sutcharit & Panha 2005; Dharma 2007). *Amphidromus perversus perversus*

(Linnaeus 1758) from Sumatera, Jawa, Bali, Lombok, Kalimantan, Sulawesi and their satellite islands in Indonesia has a yellow ground color with very variable dark markings, a smaller average shell height (43-54 mm), an outer lip which is adnate behind and has a black brown edge (Pilsbry 1900; Laidlaw & Solem 1961; Dharma 2007).

Etymology. Named after Antonio dela Cruz, from the Philippines.

ACKNOWLEDGEMENTS

I am very thankful to Dr. Jochen Gerber, Field Museum of Natural History, Chicago, for corrections and helpful comments and for improving the English of the manuscript. I am very grateful to Dr. Robert Hershler and Ms. Yolanda Villacampa, the Department of Invertebrate Zoology, United States National Museum of Natural History, Smithsonian Institution, for sending photographs of *Amphidromus entobaptus* from Ulugan Bay, Palawan, Philippines.

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Figures 2-8

2-4. *Amphidromus toncruzi* n. sp., Barangay Tau Bato, Mt. Mantalingajan, south of Palawan 2. Holotype MZB Gst. 13823, height 59.2 mm. 3. Paratype FMNH 328326, height 51.4 mm. 4. Paratype HNC 79441, height 58.6 mm. Fig. 5. *Amphidromus entobaptus* USNM 254917, Ulugan, Palawan, height 48 mm. Fig. 6. *A. entobaptus* var., Culion Island, North East Palawan, height 40.5 mm. Fig. 7. Suture detail of last whorl *A. toncruzi* n. sp., holotype, scale bar 2 mm. Fig. 8. Suture detail of last whorl *A. entobaptus* var., Culion Island, specimen of fig. 6, scale bar 2 mm.

