

**Three new species of *Amphidromus* Albers, 1850
(Gastropoda: Camaenidae) from Vietnam, and
Presentation of *Conus (Rhizoconus) paulkersteni*, nom. nov.
pro *Conus kersteni* Thach, 2017 non Tenorio, Afonso & Rolán, 2008**

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ABSTRACT Three new species of genus *Amphidromus* Albers, 1850 are described from Bảo Lộc, Lâm Đồng Province, Nha Trang, Khánh Hòa Province, Krong Pak, Daklak Province, Vietnam and compared to three other species of this genus: *Amphidromus noriokowasoei* Thach & Huber, 2017, *Amphidromus mouhoti* (Pfeiffer, 1861) and *Amphidromus hongdaoae* Thach, 2017. *Conus (Rhizoconus) paulkersteni* nom. nov. is also presented to replace *Conus kersteni* to avoid hynonymy.

KEYWORDS Gastropoda, Helicoidea, Camaenidae, *Amphidromus*, *Conus*, *Rhizoconus*, Bảo Lộc, Lâm Đồng Nha Trang, Khánh Hòa, Krong Pak, Daklak, Vietnam, new taxon.

INTRODUCTION

The genus *Amphidromus* Albers, 1850 belongs to the family Camaenidae and has many species collected in Vietnam. At the beginning of 2017, three new camaenid species were found. They were not listed in the works by Pilsbry (1900), Laidlaw & Solem (1961), Zilch (1964), Solem (1965), Parkinson, Hemmen & Groh (1987), Abbott (1989), Dharma (2005), Severns (2006), Stanistic, Shea, Potter & Griffiths (2010), Chan & Tan (2010), Schileyko (2011), Raheem *et al.*, 2014, Thach (2005, 2007, 2012, 2016, 2017) and Stark, 2017, and are described as new to science.

Abbreviations.

MNHB	Museum of Natural History, Berne, Switzerland
MNHN	National Museum of Natural History, Paris, France
NHMUK	National Museum of Natural History, United Kingdom
NNT	Collection Dr. Nguyen Ngoc Thach
AH	Aperture height
BH	Body whorl height
SH	Shell height
SW	Shell width
TB	Ted Baer Collection

SYSTEMATICS

Class Gastropoda Cuvier, 1797

Superfamily Helicoidea Rafinesque, 1815

Family Camaenidae Pilsbry, 1895

Genus *Amphidromus* Albers, 1850

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

Amphidromus christabaerae sp. nov.
(Figures 1-4)

Description. Shell large for the genus (with height range 35.9-45.3 mm) and rather slender with sinistral coiling (5/5 collected specimens are sinistral). Shell width 43% of shell height (*see* Table 1). Spire very tall, sutures constricted. Body whorl slightly inflated and occupying 63% of shell height, periphery rounded. Apex red or greenish, umbilicus closed. Sculpture weak with axial riblets, strongest below sutures. Outer surface adorned with axial lines at last and penultimate whorls and widely-spaced blackish-brown axial stripes at spire whorls that are often bisected. Aperture elongate, greenish white and

occupying 45% of shell height, outer lip black with purple inner margins, reflected and moderately thick. Parietal wall yellow, columella purple. Color green at last and penultimate whorls and yellowish at remaining whorls.

Type material. Holotype 44.3 mm high x 18.4 mm wide (Figures 1, 3) in MNHB; Paratype 1: 35.9 mm (Figures 2, 4 at top) in TB, Paratype 2: 41.9 mm (not illustrated), Paratype 3: 42.2 mm (Figure 4 at bottom) in TB [All Paratypes from type locality].

Type locality. Bảo Lộc area, Lâm Đồng Province, Central Vietnam.

Habitat. Found on coffee trees.

No.	1	2	3	4	5
SH (mm)	44.3	35.9	41.9	42.2	45.3
SW (mm)	18.4	17.2	18.3	18.3	18.2
SW/SH	0.42	0.48	0.44	0.43	0.40
Mean SW/SH	0.43				
AH (mm)	19.8	16.9	18.7	18.9	19.9
AH/SH	0.45	0.47	0.45	0.45	0.44
Mean AH/SH	0.45				
BH (mm)	27.8	24.1	25.5	27.0	27.5
BH/SH	0.63	0.67	0.61	0.64	0.61
Mean BH/SH	0.63				

Table 1. *Amphidromus christabaerae* sp. nov.

Comparison. *Amphidromus christabaerae* sp. nov. is close to *Amphidromus noriokowasoei* Thach & Huber, 2017 (Figure 5) in black outer lip but differs mainly in more slender shape, more rounded anterior end of aperture, green (not yellow) background color of last and penultimate whorls.

Etymology. This new species is named in honor of Christa Baer of Switzerland for her interest in Vietnamese terrestrial snails.

Amphidromus baerorum sp. nov.
(Figures 6-9)

Description. Shell large for the genus (with height range 38.3-46.2 mm) and elongate tapering in outline with sinistral coiling (5/5 collected specimens are sinistral). Shell width 45% of shell height (*see* Table 2). Spire tall and straight-sided, sutures distinct. Body whorl inflated and occupying 64% of shell height, periphery rounded. Apex red, umbilicus closed. Sculpture weak with axial riblets, extending from suture to suture. Outer surface adorned with turmeric yellow subsutural bands along sutures, closely-spaced axial lines at last whorl and widely-spaced red-brown axial stripes at spire whorls. Aperture elongate, whitish or greenish white and occupying 44% of shell height, outer lip calloused reversed and moderately thick. Parietal wall orange, columella purple and bordered by a yellow stripe. Color green at body whorl and whitish at spire whorls.

Type material. Holotype 41.3 mm high x 18.5 mm wide (Figures 6, 8) in MNHB; Paratype 1: 43.3mm (Figures 7, 9) in TB; Paratype 2: 46.2mm, Paratype 3: 43.8 mm and Paratype 4: 38.3 mm not illustrated [All Paratypes from type locality].

Type locality. Nha Trang area, Khánh Hòa Province, Central Vietnam.

Habitat. Found around trees.

Comparison. *Amphidromus baerorum* sp. nov. is close to *Amphidromus mouhoti* (Pfeiffer, 1861) (Figure 10) in shape but differs mainly in more rapidly tapering spire, presence of yellow stripe bordering columella and dark green color of body whorl.

No.	1	2	3	4	5
SH (mm)	41.3	43.3	46.2	43.8	38.3
SW (mm)	18.5	20.1	20.1	20.0	17.1
SW/SH	0.45	0.46	0.44	0.46	0.45
Mean SW/SH	0.45				
AH (mm)	18.6	19.7	20.4	19.3	16.9
AH/SH	0.45	0.45	0.44	0.44	0.44
Mean AH/SH	0.44				
BH (mm)	26.7	27.6	29.0	27.7	24.8
BH/SH	0.65	0.64	0.63	0.63	0.65
Mean BH/SH	0.64				

Table 2. *Amphidromus baerorum* sp. nov.

Etymology. The new species is named in honor of Dr. & Mrs. Ted Baer of Switzerland for providing the type material.

Amphidromus nicoi sp. nov.
(Figures 11-14)

Description. Shell small for the genus (with height range 29.1-30.8 mm) and elongate tapering in outline with dextral coiling (3/3 collected specimens are dextral). Shell width 52% of shell height (*see* Table 3). Spire broad and moderately tall, sutures distinct. Body whorl inflated and occupying 66% of shell height, periphery rounded. Apex red, umbilicus closed. Columella white, bordered by black stripe and tumeric yellow band at outside. Sculpture weak with axial riblets. Outer surface adorned with turmeric yellow subsutural bands along sutures and blackish brown spiral bands that are intermittent at spire. Aperture wide and brown with external pattern visible within, occupying 47% of shell height, outer lip reflected and moderately thin. Color white at early whorls and chocolate brown at last and penultimate whorls.

Type material. Holotype 29.1 mm high x 15.5 mm wide (Figures 11, 13, and 14 at bottom) in MNHN; Paratype 1: 29.8 mm (Figure 12, 14 at

top) and Paratype 2: 30.8 mm not illustrated All Paratypes from type locality.

Type locality. Krong Pak District, Daklak Province, Central Vietnam.

Habitat. Found on coffee trees.

No	1	2	3
SH (mm)	29.1	29.8	30.8
SW (mm)	15.5	15.7	15.4
SW/SH	0.53	0.53	0.50
Mean SW/SH	0.52		
AH (mm)	14.1	14.6	14.2
AH/SH	0.48	0.49	0.46
Mean AH/SH	0.47		
BH (mm)	19.5	19.7	20.0
BH/SH	0.67	0.66	0.65
Mean BH/SH	0.66		

Table 3. *Amphidromus nicoi* sp. nov.

Comparison. *Amphidromus nicoi* sp. nov. is close to *Amphidromus hongdaoae* Thach, 2017 (Figure 15) in white outer lip and columella but differs mainly in stouter shape, much smaller adult size, wider aperture, and the presence of spiral bands at last and penultimate whorls.

Etymology. This new species is named in honor of Nico Arling of Poland for providing the type material.

Conus (Rhizoconus) paulkersteni nom. nov.
(Figures 16,18, and 20)

Conus kersteni Thach, 2017 (Figures 16, 18, 20) was recently described in the author's book "New Shells of Southeast Asia" published by 48HourBooks in the United States (at pages 27-28, Figures 287 to 293). With this article, it is renamed as *Conus (Rhizoconus) paulkersteni* nom. nov. in order to avoid hynonymy. The

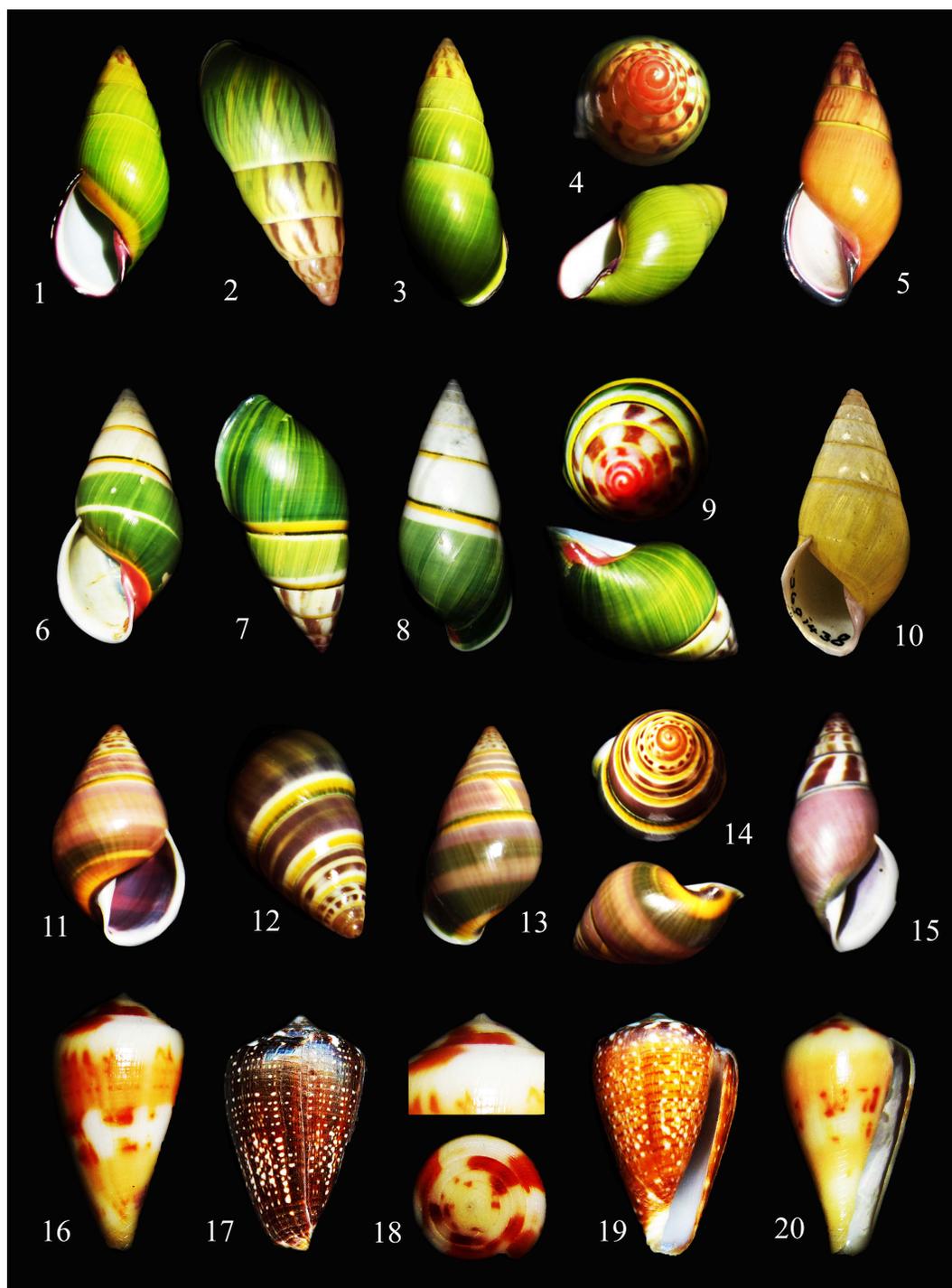
reason for renaming this new cone species is that *Conus (Africonus) kersteni* (shown at Figures 17, 19 herein) was previously described by Tenorio, Afonso & Rolán in 2008 in *Vita Malacologica Magazine*, No. 6, pp. 2-5.

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Figures 1-4: *Amphidromus christabaerae* sp. nov. Báo Lộc, Vietnam. **1, 3:** Holotype (44.3 mm). **2:** Paratype 1 (35.9 mm) with spire view. **4:** Paratype 1 with apex (top) and Paratype 3 (42.2 mm) with umbilicus (bottom). **Figure 5:** *Amphidromus noriokawasoei* Thach & Huber, 2017, 35.6 mm for comparison. **Figures 6-9:** *Amphidromus baerorum* sp. nov. Nha Trang, Vietnam. **6, 8:** Holotype (41.3 mm). **7:** Paratype 1 (43.3 mm) with spire view. **9:** Paratype 1 with apex (top) and umbilicus (bottom). **Figure 10:** *Amphidromus mouhoti* (Pfeiffer, 1861) for comparison, photo used with permission from NHMUK. **Figures 11-14:** *Amphidromus nicoi* sp. nov. Krong Pak, Vietnam. **11, 13:** Holotype (29.1 mm). **12:** Paratype 1 (29.8 mm) with spire view. **14:** Paratype 1 with apex (top) and Holotype with umbilicus (bottom). **Figure 15:** *Amphidromus hongdaoae* Thach, 2017, 38.9 mm for comparison. **Figures 16, 18, 20:** *Conus (Rhizoconus) paulkersteni* Thach, 2017, 32.5 mm and 33.6 mm. **Figures 17, 19:** *Conus (Africonus) kersteni* Tenorio, Afonso & Rolán, 2008, 20.8 mm for comparison, photos used with permission from Cone Collector's Guide.