

Two new subspecies of *Amphidromus* from Indonesia (Mollusca: Gastropoda: Camaenidae)

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ABSTRACT Two new subspecies of the genus *Amphidromus* Albers, 1850 are described from Indonesia and compared to five other species and subspecies of this genus: *Amphidromus berschaueri* Thach, 2018, *Amphidromus reflexilabris* Schepman, 1892, *Amphidromus laevus Janettabasae* Parsons, 2014, *Amphidromus laevus kissuensis* Rolle, 1903 and *Amphidromus laevus nusteli* Parsons, 2014.

KEYWORDS Gastropoda, Helicoidea, Camaenidae, *Amphidromus*, Ayu Topas, Sei, Kolbano, Lakor, Leti, Moa, Kisar, West Timor, Indonesia, new taxa

INTRODUCTION

Amphidromus is a genus of the family Camaenidae with many species collected in Indonesia. In summer 2018, two other subspecies of this genus were collected. They were not listed in the works by Parkinson, Hemmen & Groh (1987), Abbott (1989), Dharma (2005), Severns (2006), Stanistic, Shea, Potter & Griffiths (2010, 2017), Van der Bijl *et al.* (2010), Schileyko (2011), Tan *et al.* (2011), Parsons (2014), Raheem *et al.*, 2014, Inkhavilay, Sutcharit & Panha (2017), Lok & Tan (2018), Thach (2005, 2007, 2012, 2016, 2017, 2018). In this article, they are described as new to science.

Abbreviations.

FMNH Field Museum of Natural History, Chicago, USA

RMNH Naturalis Center of Biodiversity, Leiden, The Netherlands

NNT Collection Dr Thach

JA Collection John Abbas

SH Shell height

SW Shell width

AH Aperture height

BH Body whorl height

SYSTEMATICS

Class Gastropoda Cuvier, 1797

Superfamily Helicoidea Rafinesque, 1815

Family Camaenidae Pilsbry, 1895

Subfamily Camaeninae Pilsbry & Olsson, 1954

Genus *Amphidromus* Albers, 1850

Type species of genus: *Helix perversus* Linnaeus, 1758 (subsequent designation by Martens, 1896)

Amphidromus berschaueri mingmini

Thach, 2019, new subspecies

(Figures 1-8)

Type material. Holotype 38.7 mm in FMNH (Figures 1, 2, 3, 4, 8a, 8b) with Registration No FMNH 386363. Paratypes: All from type locality, Paratype 1: 42.7 mm (Figures 5, 6) and Paratype 2: 40.9 mm (Figure 7) in NNT; Paratype 3: 39.7 mm, Paratype 4: 36.4 mm and Paratype 5: 43.3 mm (not illustrated) in JA.

Type locality. Ayu Topas, West Timor.

Habitat. Around trees.

Diagnosis: The new species is characterized by slender shape, purplish-red subsutural bands, black apex, regularly-spaced axial stripes and columella elevated at anterior end

Description: Shell large for the genus (measuring in height between 34.4mm and 43.3 mm), sinistral, elongate tapering in outline with width 46.7% of height (see Table 1). Spire tall and straight-sided, sutures constricted. Body whorl slightly inflated and measuring 64.2% of shell height, periphery rounded. Outer surface ornamented with widely-spaced axial stripes, extending from suture to suture. Sculpture consists of oblique axial striae and purplish-red subsutural bands. Aperture elongate and occupying 45.3% of shell height, outer lip moderately thick and reflected. Umbilicus open, columella calloused and elevated at anterior part. Color brown with black apex, white outer lip and columella. Type material was provided by John Abbas from Hawaii, USA.

No.	1	2	3	4	5	6
SH (mm)	38.7	42.7	40.9	39.7	36.4	43.3
SW (mm)	17.8	20.1	18.6	18.5	18.0	20.1
SW/SH	0.46	0.47	0.45	0.47	0.49	0.46
Mean SW/SH	0.47					
AH (mm)	17.3	19.7	18.2	17.5	17.2	19.0
AH/SH	0.45	0.46	0.46	0.44	0.47	0.44
Mean AH/SH	0.45					
BH (mm)	24.1	27.6	26.1	25.0	24.6	27.4
BH/SH	0.62	0.65	0.64	0.63	0.68	0.63
Mean BH/SH	0.64					

Table 1. *Amphidromus berschaueri mingmini* Thach, 2019, new subspecies

Etymology. This new subspecies is named in honor of Ming Min from China for his interest at malacological study.

Discussion. The new subspecies is close to *Amphidromus berschaueri* Thach, 2018 (Figures 9, 12) but differs mainly in different localities (Ayu Topas versus Sei, Kolbano), slenderer shape, narrower aperture, longer and more tapering spire, presence of purple-red subsutural bands, widely-spaced (not coalescent) axial stripes at last whorl and columella is angulate (elevated at anterior part). *Amphidromus reflexilabris* Schepman, 1892 (Figures 10, 11) is distinguished mainly from the new subspecies by obese shape, broader and not tapering spire, white (not purple-red) subsutural bands, not regularly-spaced (or lacking) axial stripes at body whorl, more oblique columella and outer lip is purplish (not white), rolled up and forming a tube at dorsal side.

Amphidromus laevus lakorensis Thach, 2019
new subspecies
(Figures 13-18, 20a, 20b)

Type material. Holotype 34.6mm in FMNH (Figures 1, 2, 3, 4, 8a, 8b) with Registration No FMNH 386364.

Other Material Examined. Paratypes: All from type locality, Paratype 1: 38.3 mm (Figures 5, 6) and Paratype 2: 31.8 mm (not illustrated) in NNT; Paratype 3: 49.0 mm, Paratype 4: 37.8 mm and Paratype 5: 35.1 mm (not illustrated) in JA.

Type locality. Lakor Island, West Timor, Indonesia.

Habitat. Around trees.

Diagnosis. The new subspecies is readily recognized by robust shell, lack of axial stripes, constricted sutures, not angulate columella, obsolete (or very few) black lines at body whorl and penultimate whorl is much narrower than last whorl.

Description. Shell large for the genus (measuring in height between 31.8 mm and 49.0 mm), solid, sinistral, elongate tapering in outline with width 51.2% of height (see table 2). Spire tall, sutures constricted. Body whorl inflated and measuring about 69.2% of shell height, periphery rounded. Outer surface ornamented with orange spiral bands at body whorl and blackish (or brownish) spiral lines at spire whorls, axial lines lacking. Whorl diameters decrease abruptly from body whorl to penultimate whorl. Sculpture consists of weak axial striae and growth lines. Aperture elongate, flared anteriorly and occupying 45.5% of shell height, outer lip moderately thick and slightly reflected. Umbilicus widely open, columella slightly curved and highly calloused. Color yellowish at body whorl and whitish at spire

No.	1	2	3	4	5	6
SH (mm)	34.6	38.3	31.8	49.0	37.8	35.1
SW (mm)	17.8	19.6	18.2	21.3	20.0	17.9
SW/SH	0.51	0.51	0.57	0.44	0.53	0.51
Mean SW/SH	0.51					
AH (mm)	15.5	18.2	15.1	19.8	17.3	16.5
AH/SH	0.45	0.48	0.47	0.40	0.46	0.47
Mean AH/SH	0.46					
BH (mm)	22.5	25.5	21.5	39.9	25.3	23.5
BH/SH	0.65	0.67	0.68	0.81	0.67	0.67
Mean BH/SH	0.69					

Table 2. *Amphidromus laevis lakorensis* Thach, 2019, new subspecies

whorls with pink early whorls, white aperture, outer lip and columella, pinkish white apex. Type material was provided by John Abbas from Hawaii, USA.

Etymology. This new subspecies is named after the Lakor Island of Indonesia.

Discussion. The new subspecies is close to *Amphidromus laevis janetabbasae* Parsons, 2014 (Figures 19, 21b, 22) but differs mainly in different localities (Lakor Island versus Moa Island), larger adult size, more robust shell, more inflated body whorl, elongate and more tapering spire, more constricted sutures, obsolete (or less numerous) black spiral lines at body whorl, not wavy columella, lack of red spiral band below suture of body whorl, abrupt decrease of diameters from last to penultimate whorl, background color less yellow at body whorl and whiter at spire whorls. *Amphidromus laevis kissiuisensis* Rolle, 1903 (Figure 23) is distinguished mainly from the new subspecies by different localities (Kisar Island versus Lakor Island), smaller in adult size, presence of broad, dark-colored and widely-spaced spiral bands at body whorl, black (not pinkish white) apex, shorter spire, less elongate aperture with external pattern visible within. *Amphidromus laevis musteli* Parsons, 2014 (Figure 24) differs mainly from the new subspecies by different localities (Leti Island versus Lakor Island), smaller in adult size, shorter body whorl, black apex, coalescent spiral bands, yellower background color (especially at spire whorls).

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- Website of Malacology-Asia of Andy Tan**

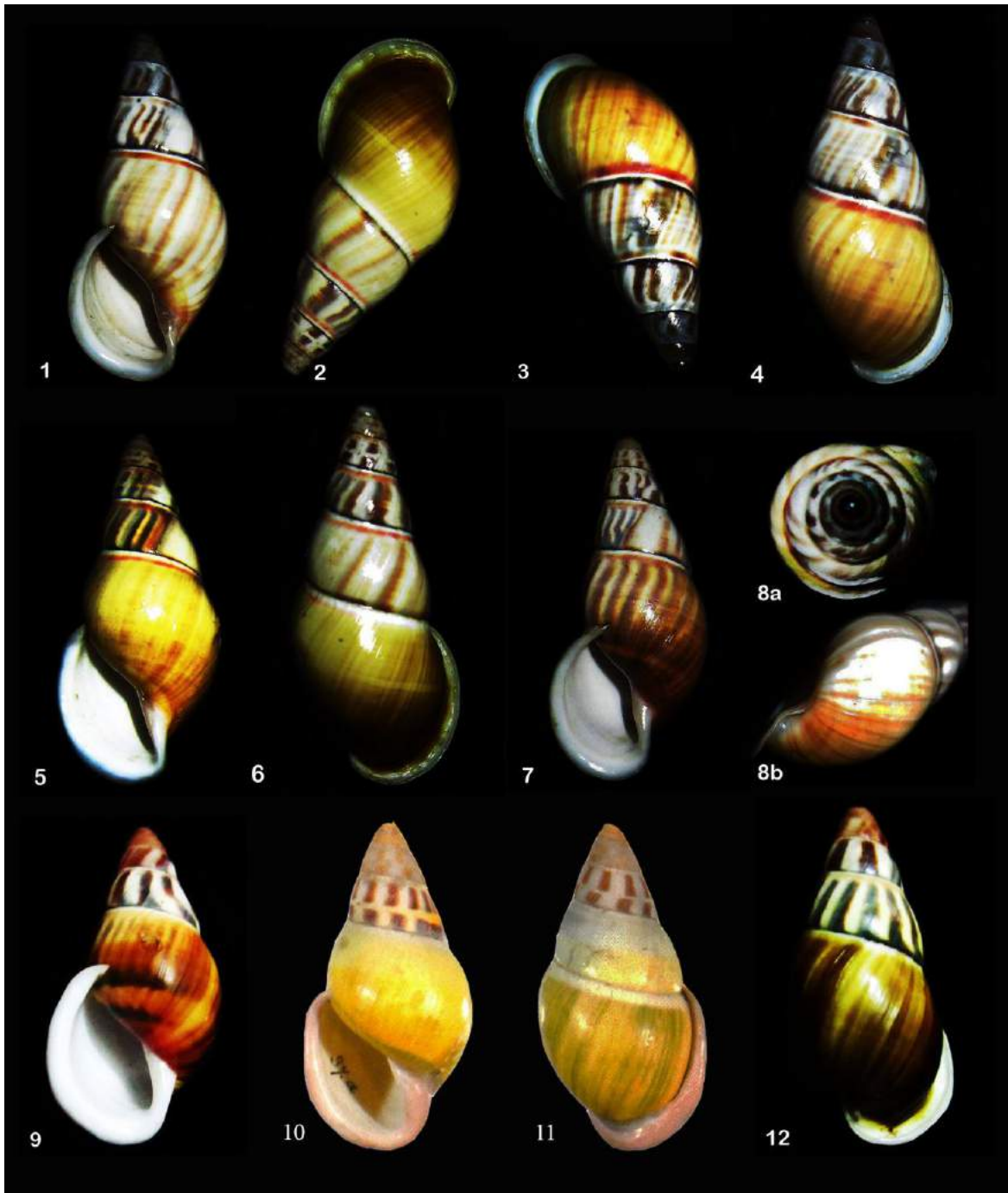


Plate 1. *Amphidromus berschaueri mingmini*, *A. berschaueri*, and *A. reflexilabris*.

1-8a, 8b: *Amphidromus berschaueri mingmini* new subspecies, Ayu Topas, West Timor, Indonesia

1, 2: Holotype 44.5 mm with ventral side and reflected outer lip in FMNH

3, 4: Holotype with spire view and dorsal view

5, 6: Paratype 1, 42.7 mm with ventral and dorsal sides in NNT

7: Paratype 2, 40.9 mm with ventral side in JA

8a: Holotype with enlarged apex

8b: Holotype with enlarged umbilicus

9, 12: *Amphidromus berschaueri* Thach, 2018 for comparison

10, 11: *Amphidromus reflexilabris* Schepman, 1892 for comparison, photo of Bijl *et al.*, 2010

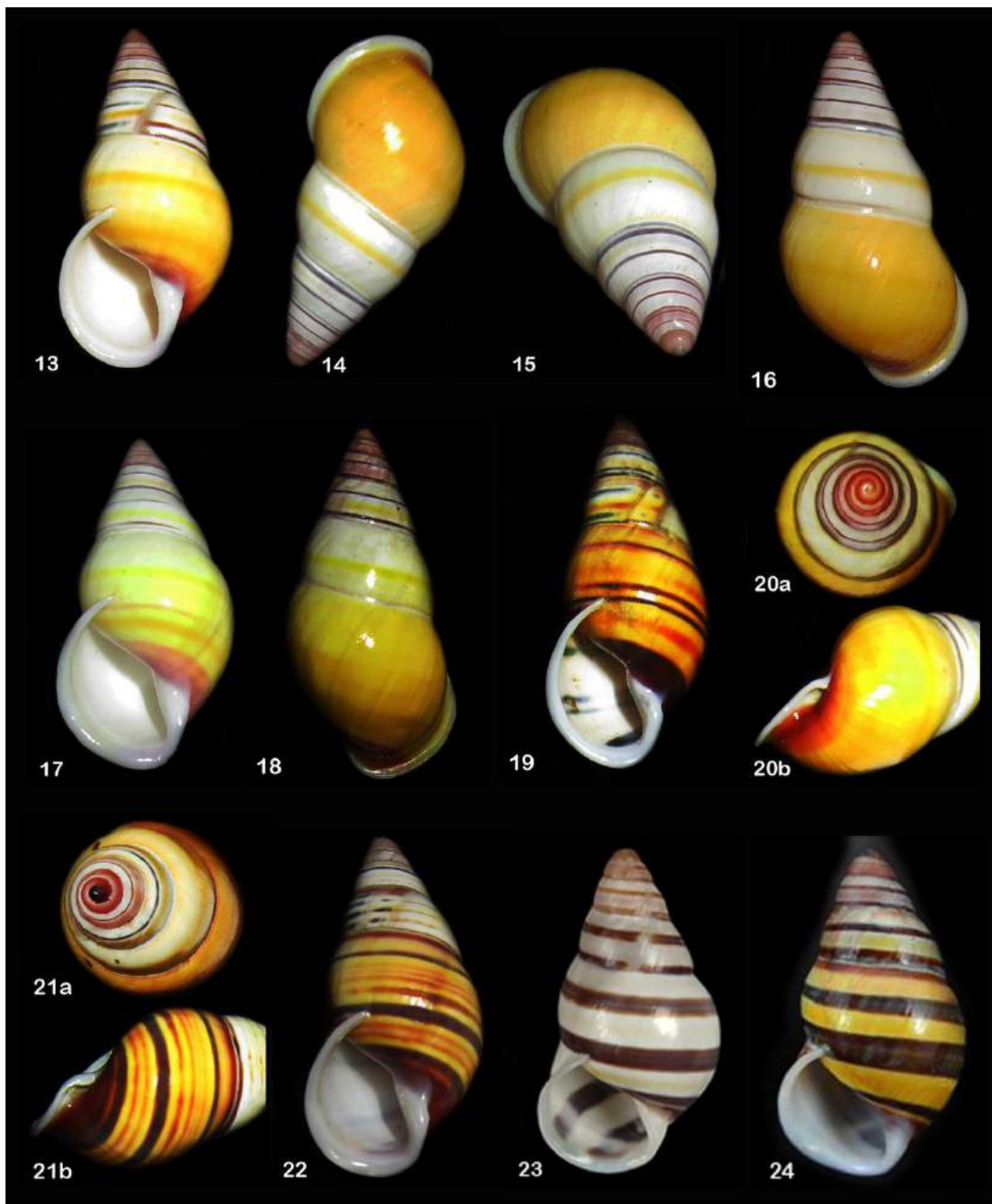


Plate 2. *Amphidromus laevis lakorensis*, *A. Janetabbasae*, *A. laevis nusteli*, *A. laevis Janetabbasae*, and *A. laevis kissiensis*.

13-18, 20a, 20b: *Amphidromus laevis lakorensis* new subspecies, Lakor Island, West Timor, Indonesia

13, 14: Holotype 34.6 mm with ventral side and reflected outer lip in FMNH

15, 16: Holotype with spire view and dorsal view

17, 18: Paratype 1, 38.3 mm with ventral and dorsal sides in NNT

20a: Holotype with enlarged apex

20b: Holotype with enlarged umbilicus

19: *Amphidromus Janetabbasae* 36.8 mm with ventral side for comparison

21a: Enlarged apex of *Amphidromus laevis nusteli* Parsons, 2014, 33.2 mm for comparison

21b: Enlarged umbilicus of *Amphidromus laevis Janetabbasae* Parsons, 2014, 33.4 mm for comparison

22: *Amphidromus laevis Janetabbasae* Parsons, 2014, 33.4 mm for comparison

23: *Amphidromus laevis kissiensis* Rolle, 1903, 28.6 mm for comparison, photo of Guido and Philippe Poppe, 2018

24: *Amphidromus laevis nusteli* Parsons, 2014, 29.1 mm for comparison, photo of Malacologia-Asia