
The land snail family Streptaxidae J. Gray, 1860 from Thua Thien Hue, Vietnam, with description of two new species (Gastropoda: Pulmonata)

BUI Thi Chinh^{1*}, DO Van Nhung², NGO Dac Chung¹, DO Duc Sang^{3,4}

¹Faculty of Biology, Hue University of Education, Hue University, 34 Le Loi, Hue, VIETNAM.

*Corresponding author. E-mail: buithichinhdhsphue@gmail.com

²Faculty of Biology, Hanoi National University of Education, 136 Xuan Thuy, Dich Vong, Cau Giay, Ha Noi, VIETNAM. E-mail: dvnhuong@hotmail.com

³Department of Zoology, Faculty of Biology, Tay Bac University, Chu Van An Street, Quyet Tam, Son La, VIETNAM. E-mail: doducsangdhtb@gmail.com

⁴Department of Applied Zoology, Faculty of Biology, Hanoi University of Science (Vietnam National University, Hanoi), 334 Nguyen Trai, Thanh Xuan, Hanoi, VIETNAM.

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ABSTRACT. The predatory family Streptaxidae is comprised of five species occurring in Thua Thien Hue Province, central Vietnam. The present paper provides an assessment of the literature data relevant to these species and the description of two new species. *Haploptychius bachmaensis* sp. nov. has an oblique-heliciform shell with elevated spire. The aperture is subcircular, peristome discontinuous, thick and slightly expanded, apertural dentition with one strong parietal lamella. *Perrottetia namdongensis* sp. nov. has a rounded and protruded shell periphery. The aperture is subcircular, peristome is discontinuous, thick and expanded, apertural dentition with one large, strong parietal lamella, one small upper palatal lamella, one large palatal lamella, one large basal lamella, and one large strong columellar lamella.

Introduction

The species-rich carnivorous family of the Streptaxidae is widely distributed in the tropical regions of Asia and Africa [Schileyko, 2000, 2011; Siriboon *et al.*, 2013, 2014; Bentham Jutting, 1961]. In Vietnam, streptaxid diversity was thought to comprise only ten genera and about 48 species and subspecies [Jaeckel, 1950; Schileyko, 2011; Varga, 2012; Thach, 2016, 2017; Do, 2017]. The streptaxid fauna of central Vietnam is as rich as that of northern Vietnam, but is relatively little-known. Only six species were discovered from Central Vietnam in the last decades: *Discartemon discus* (Pfeiffer, 1853), *Perrottetia aberrata* (Souleyet, 1852), *Haploptychius deflexus* (Souleyet, 1852), *Oophana diplodon* (Möllendorff, 1900), *Oophana pachyglottis* (Möllendorff, 1900), *Indoenna irregularis* (Möllendorff, 1900), and a species added in recent years

(*Discartemon pallgergelyi* Thach, 2017) [Schileyko, 2011; Do, 2017; Thach, 2017].

Thua Thien Hue Province is situated in the center of Vietnam, which was formed in the Pliocene. It covers a 5,033.2 km² area, with mountains, covering more than a half of the surface of Thua Thien Hue along the western and south-western border; they belong to the Northern of Truong Son mountainous range. Mountains' height is 500–1,480 m. In the south-east of province, limestone areas are mainly in Nam Dong District, close to the Bach Ma National Park (natural conservation zone). In addition, the topography is divided into three different zones: mountainous hills, plains and lagoons.

The aim of this paper is to provide a comprehensive and updated checklist of land snail family Streptaxidae by consolidating data from literature and collected specimens, including photographs of all species, in order to present a baseline species inventory for future land snail studies.

Material and methods

Streptaxids were surveyed throughout Thua Thien Hue Province, central Vietnam from different habitats (primary forest, depleted primary forest, densely vegetated limestone hill, riparian fringe, cave).

Identification of streptaxid species were based on descriptions in Pfeiffer [1853, 1854], Eydoux, Souleyet [1852], Kobelt [1906], Siriboon *et al.* [2014] and comparison with type specimens from several museums. Shell width (D), shell height (H), whorl counts, shell angle (SA) and H/D ratio were measured and calculated.

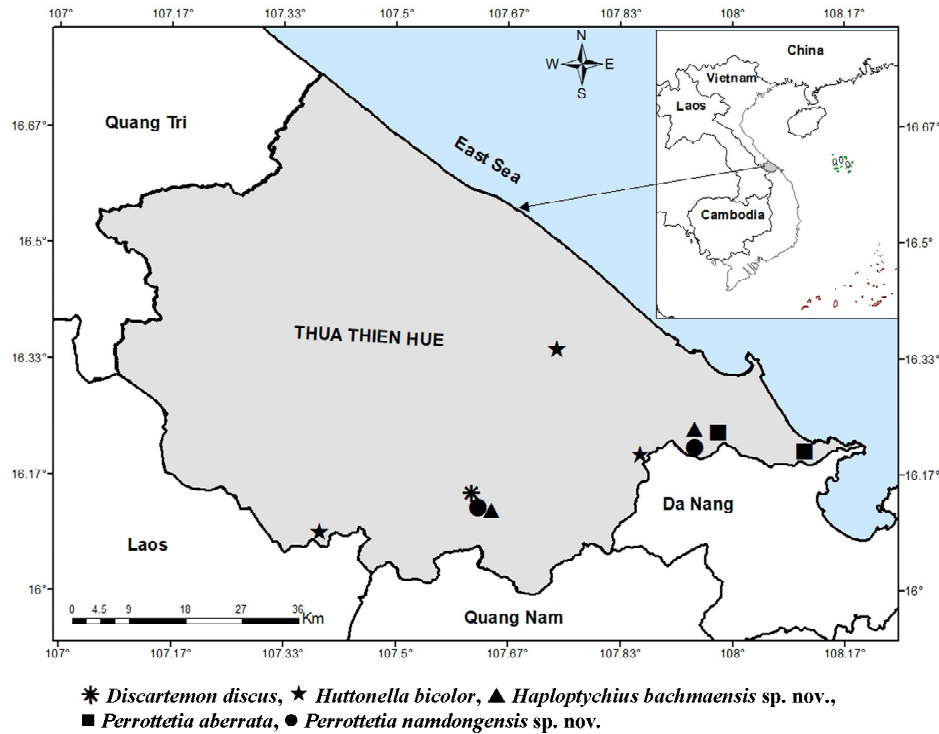


FIG. 1. Approximate geographic localities of streptaxid species in Thua Thien Hue, central Vietnam.

РИС. 1. Приблизительные географические находения видов Streptaxidae в Туа Тьен Хуэ, центральный Вьетнам.

Collected material has been deposited in the Vietnam National Museum of Nature, Laboratory of Zoology – Hue University of Education, Thua Thien Hue, Vietnam and private collections.

Abbreviations

BTC – Private collection Bui Thi Chinh (Thua Thien Hue, Vietnam);
 DDS – Private collection Do Duc Sang (Son La, Vietnam);
 LZ–HUE – Laboratory of Zoology, Hue University of Education, Vietnam;
 NHMUK – The Natural History Museum, London, UK;
 RMNH – Naturalis Biodiversity Center, Leiden, Netherlands;
 SMF – Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main, Germany;
 VNMN_IZ – National Museum of Nature, Hanoi, Vietnam;
 D – shell width;
 H – shell height;
 SA – shell angle.

Systematic part

Family Streptaxidae J. Gray, 1860
 Genus *Discartemon* Pfeiffer, 1856

Pfeiffer, 1856: 173.

Type species – *Streptaxis discus* Pfeiffer, 1851 (by subsequent designation by Ancy [1884]).

Diagnosis. Shell medium sized, flattened to globose-heliciform, white and translucent. Shell surface is smooth and glossy, transverse ridges

may be present. Whorls 4–7, with spire flattened to conical. Last whorl rounded to angular, regularly expanded. Aperture regularly semi-ovate or triangular. Peristome discontinuous, thick and expanded. Apertural dentition always have one parietal lamella, other lamellae (upper palatal, palatal, basal, columellar and supracolumellar lamellae) may be present or absent. Umbilicus very widely open.

Discartemon discus (Pfeiffer, 1853)

(Figs 1, 2A–B)

Streptaxis discus Pfeiffer, 1851: 252; Pfeiffer, 1853: 289; Pfeiffer, 1854: 394, 395, Taf. 145, Figs 15–17; Ancy, 1884: 399; Tryon, 1885: 66, Taf. 16, Figs 77–79; Gude, 1902: 226.

Discartemon discus. – Bourguignat, 1899: 46; Schileyko, 2000: 784, fig. 1022; Siriboon *et al.*, 2014: 53, figs 4A–C, 11A–C, 22A, 23; Inkhavilay *et al.*, 2016: 26.

Streptaxis (Discartemon) paradiscus Möllendorff, 1900: 117; Ancy, 1904: 289, 290; Fischer, Dautzenberg, 1904: 2.

Odontartemon (Discartemon) discus. – Kobelt, 1906: 97, Taf. 55, Figs 5–7.

Odontartemon (Discartemon) paradiscus. – Kobelt, 1906: 97, 98, Taf. 55, Figs 8, 9.

Discartemon paradiscus. – Benthem Jutting, 1954: 79; Zilch, 1961: 82, Taf. 5, Fig. 3; Schileyko, 2011: 22, 23.

Type locality: Phucson, Da Nang, Vietnam

Type material: Holotype NHMUK 20130684, [Siriboon *et al.*, 2014: fig. 4A].

Material examined. LZ–HUE 3101, BTC/03, DDS/01, Vietnam, Thua Thien Hue Province, Nam Dong District,



FIG. 2. Shells of streptaxid species, **A, B.** *Discartemon discus*, LZ-HUE 3101, Thua Thien Hue, Nam Dong. **C–E.** *Perrottetia aberrata*, LZ-HUE 3201, Thua Thien Hue, Phu Loc. **F.** *Huttonella bicolor*, LZ-HUE 3401, Thua Thien Hue, Nam Dong.

РИС. 2. Раковины Streptaxidae, **A, B.** *Discartemon discus*, LZ-HUE 3101, Туа Тьен Хуэ, Нам Донг. **C–E.** *Perrottetia aberrata*, LZ-HUE 3201, Туа Тьен Хуэ, Фу Лок. **F.** *Huttonella bicolor*, LZ-HUE 3401, Туа Тьен Хуэ, Нам Донг.

Thuong Quang Commune, Limestone mountain, 16°08.06'N, 107°36.47'E, 351 m, leg. T.C. Bui, 01 October 2017.

Diagnosis. Shell medium sized, flattened, white and translucent. Shell surface glossy with thin transverse ridges. Whorls 6–6½, spire flattened with distinct suture. Last whorl angular, regularly expanded. Umbilicus very wide but shallow. Aperture semi-ovate, peristome discontinuous, thickened and expanded; apertural dentition with only one parietal lamella.

Measurements (mm): D 12.5–16.2, H 4.4–5.8 (n = 20).

Distribution. In Vietnam, known from Da Nang,

Thua Thien Hue Provinces. Elsewhere, in Laos ? [Schileyko, 2000, 2011; Inkhavilay *et al.*, 2016].

Remarks. The species is a variable in terms of shell size. This appears to be the first record of the species from Thua Thien Hue Province. *Discartemon discus* has previously been recorded from Laos, but uncertainly [Schileyko, 2000, 2011].

Genus *Huttonella* Pfeiffer, 1856

Pfeiffer, 1856: 174.

Type species – *Pupa bicolor* Hutton, 1834: 93 (by subsequent designation by Stoliczka, [1871]).

Diagnosis. Shell small, elongated cylindrical, white or pale yellow, translucent to opaque. Whorls 7–8, convex, weakly rounded, with relatively deep suture. Aperture rectangular, peristome discontinuous and expanded. Apertural dentition with one parietal lamella, one supraparietal, one columellar lamella, and one basal lamella. Umbilicus very narrow.

Huttonella bicolor (Hutton, 1834)
(Figs 1, 2F)

Pupa bicolor Hutton, 1834: 86, 93; Pfeiffer, 1854: 115, Taf. 32, Figs 15–17.

Ennea bicolor. – Mörch, 1872: 315; Tryon, 1885: 104; Fischer, 1891: 18; Fischer, Dautzenberg, 1904: 2.

Gulella (Huttonella) bicolor. – Jaeckel, 1950: 18.

Huttonella bicolor. – Benthem Jutting, 1961: 8; Schileyko, 2000: 822, fig. 1075A; Schileyko, 2011: 27; Simone, 2013: 47–58, figs 1–6; Do, Do, 2015: 42, fig. 3H.

Gulella bicolor. – Vermeulen, Maassen, 2003: 23.

Type locality: Mirzapure and Agra, India.

Type material: Not seen.

Material examined: LZ–HUE 3401 (14 shells), Vietnam, Thua Thien Hue Province, Nam Dong District, Huong Giang Commune, Limestone mountain, 16°06.56'N, 107°38.304'E, 98 m, 01 October 2017; LZ–HUE 3402 (5 shells), Vietnam, Thua Thien Hue Province, Phu Loc District, Loc Son Commune, Bach Ma National Park, Primary forest, 16°20.517'N, 107°44.21'E, 13 m, 22 October 2017; LZ–HUE 3402 (7 shells), Vietnam, Thua Thien Hue Province, Phu Loc District, Bach Ma National Park, Primary forest, 16°13.146'N, 107°51.307'E, 29 April 2017.

Diagnosis. Shell small, elongated cylindrical, white, fragile and translucent. Whorls 7–8, convex, weakly rounded, with relatively deep suture. Umbilicus very narrow. Aperture rectangular, peristome discontinuous, thickened and expanded. Apertural dentition with one large and strong parietal lamella, one strong supraparietal, one small columellar lamella, and one blunt basal lamella.

Measurements (mm): D 1.7–2.2, H 5.8–7.4 (n = 26)

Distribution. In Vietnam, known from Quang Ninh, Ha Nam, Son La, Thanh Hoa, Thua Thien Hue Provinces and Southern Vietnam [Vermeulen, Maassen, 2003; Schileyko, 2011; Do, Do, 2015]. Elsewhere, in the tropics and subtropics worldwide [Schileyko, 2011; Simone, 2013].

Remarks. Specimens of this introduced species from Thua Thien Hue have a shell height of up to 7.4 mm. New distribution records from Thua Thien Hue Province.

Genus *Haploptychius* Möllendorff, 1906

Möllendorff in Kobelt, 1906: 127.

Type species – *Streptaxis sinensis* Gould, 1858; OD.

Diagnosis. Shell medium sized, depressed to distorted, white and translucent. Shell surface is

smooth, glossy or with radial ridges. Whorls 5–7, spire conical with distinct suture. Aperture regularly subcircular or semioval. Peristome discontinuous, expanded, and reflected. Apertural dentition usually have one strong parietal lamella. Umbilicus open and deep.

Haploptychius bachmaensis

Bui et Do D.S. sp. nov.

(Figs 1, 3D–F, Table 1)

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Type material. Holotype VNMN_IJ 000.000.157, Vietnam, Thua Thien Hue Province, Bach Ma National Park, Primary forest, 16°11.39'N, 107°56.33'E, 1433 m, leg. T.C. Bui, 29 April 2017. Paratypes LZ–HUE 3501 (5 shells), Vietnam, Thua Thien Hue Province, Nam Dong District, Limestone mountain, 16°06.56'N, 107°38.32'E, 217 m, leg. T.C. Bui, 01 October 2017, LZ–HUE 3502 (7 shells), DDS/01, same data as holotype.

Diagnosis. Shell medium sized, oblique-heliciform with elevated spire; aperture oblique, wide, and subcircular; peristome discontinuous, thickened, and slightly expanded; apertural dentition with one strong parietal lamella.

Description. Shell medium in size, thick, oblique-heliciform, white and translucent. Whorls 7, spire conical with suture distinct. Shell surface glossy, with thin transverse ridges that diminish below periphery. Embryonic shell large, about 2½ whorls, smooth; following whorls regularly expanded. Penultimate whorl rounded; last whorls slightly rounded and axially deflected. Aperture subcircular; peristome discontinuous, parietal callus thin; lip thickened and slightly expanded. Apertural dentition with one slightly strong parietal lamella. Umbilicus narrowly open and shallow (Figs 3D–F).

Measurements (mm). Holotype: D 13.1, H 11.3. Paratypes (n = 12): D 12.5–13.1, H 9.7–11.3.

Distribution. This species is known from several primary forest areas in Thua Thien Hue Province, central Vietnam.

Etymology. The specific epithet is derived from the type locality of this new species, the Bach Ma National Park, Thua Thien Hue Province, Vietnam.

Remark. This new species is similar to *Haploptychius fischeri* (Morlet, 1886) (from Quang Ninh Province, Northern Vietnam), however it differs in its larger shell, subcircular aperture, weak parietal lamella, and the left periphery of penultimate whorl not extended beyond the diameter of the last whorl. *Haploptychius bachmaensis* sp. nov. can be distinguished from *H. anceyi* (Mabille, 1887), *H. blaisei* (Dautzenberg et Fischer, 1905), *H. costulatus* (Möllendorff, 1881), *H. diespiter* (Mabille, 1887), and *H. dorri* (Dautzenberg, 1893) in having a larger shell and less deviated last whorl. Compared with

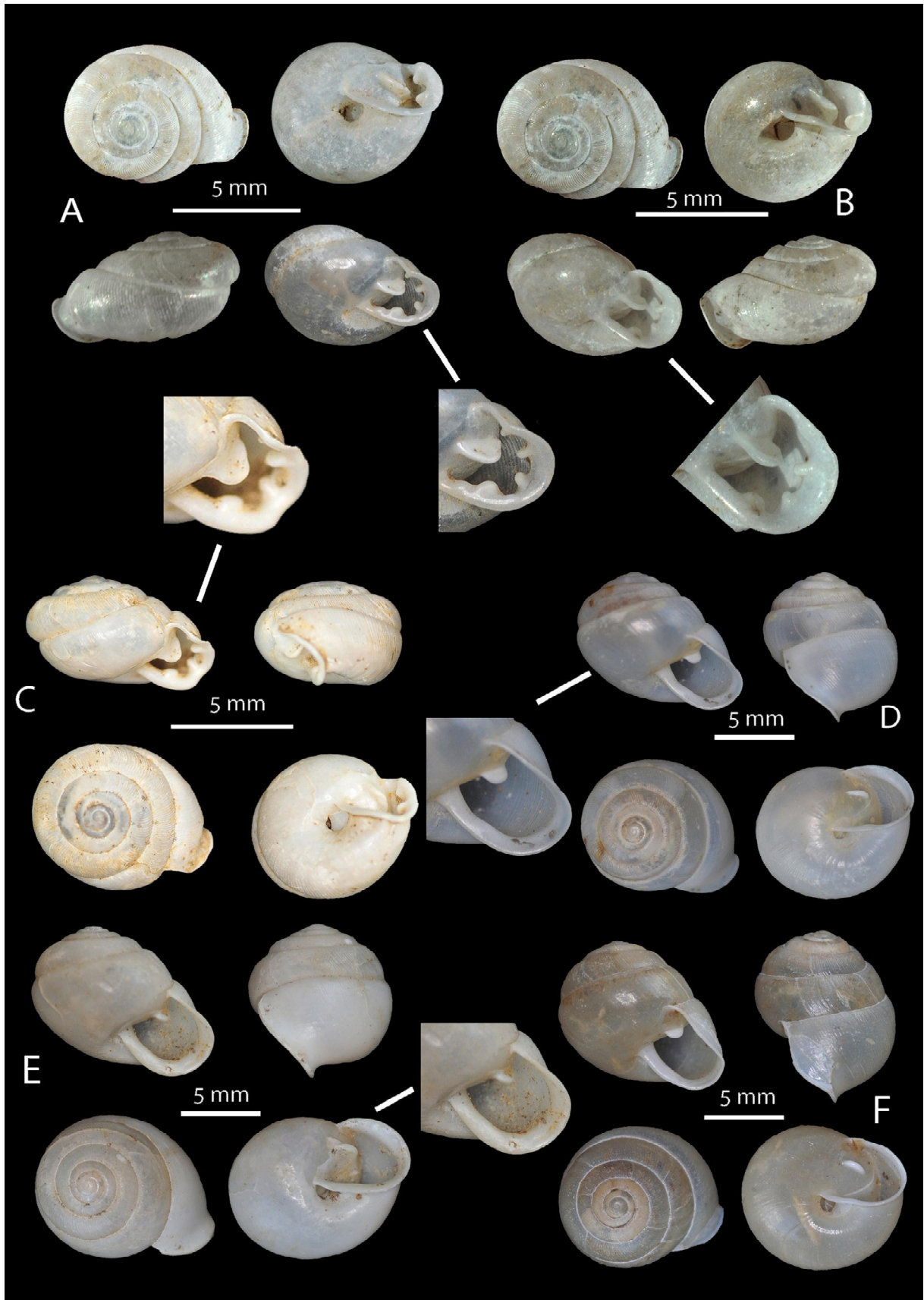


FIG. 3. A–C. *Perrottetia namdongensis* sp. nov., A. Holotype VNMN_IZ 000.000.158, B, C. Paratype LZ–HUE 3301; D–F. *Haploptychius bachmaensis* sp. nov., D. Holotype VNMN_IZ 000.000.157, E, F. Paratype LZ–HUE 3501.

РИС. 3. А–С. *Perrottetia namdongensis* sp. nov., А. Голотип VNMN_IZ 000.000.158, В, С. Паратип LZ–HUE 3301; D–F. *Haploptychius bachmaensis* sp. nov., D. Голотип VNMN_IZ 000.000.157, E, F. Паратип LZ–HUE 3501.

Table 1. Shell measurements of the Streptaxidae species from Thua Thien Hue, Vietnam.

Табл. 1. Промеры раковины видов Streptaxidae из Туа Тьен Хуэ, Вьетнам.

Species and locality	No. of specimens	Ranges of:				Number of whorls
		Shell height (mm)	Shell width (mm)	H/D ratio	Shell angle (°)	
<i>Discartemon discus</i>						
Nam Dong	20	4.4–5.8	12.5–16.2	0.35–0.37	42–46	6–6½
<i>Perrottetia aberrata</i>						
Bach Ma	3	6.1–6.8	8.6–9.3	0.71–0.73	33–35	7
Hai Van	6	6.3–7.7	9.0–9.7	0.67–0.83	30–35	7
<i>Perrottetia namdongensis</i> sp. nov.						
Nam Dong	26	3.8–4.9	6.8–7.8	0.60–0.63	31–37	6–6½
Bach Ma	7	4.1–4.5	5.8–6.5	0.69–0.71	33–37	6–6½
<i>Haploptychius bachmaensis</i> sp. nov.						
Nam Dong	6	9.9–10.7	12.5–12.9	0.79–0.83	14–17	7
Bach Ma	7	9.7–11.3	12.5–13.1	0.77–0.86	14–16	7
<i>Huttonella bicolor</i>						
Nam Dong	14	6.1–7.3	1.8–2.2	3.32–3.39	–	7–8
Bach Ma	5	6.6–7.4	1.9–2.2	3.36–3.47	–	7–8
Phu Loc	7	5.8–7.2	1.7–2.2	3.27–3.41	–	7–8

H. porrectus (Pfeiffer, 1863) (from northeastern and central Laos), this species differs in its larger and thicker shell, depressed spire, stronger parietal lamella, and opener umbilicus [see Inkhavilay *et al.*, 2016]. To date no living specimens have been found.

Genus *Perrottetia* Kobelt, 1905

Kobelt, 1905: 91 (*Odontartemon* subgenus)

Type species – *Helix peroteti* Petit, 1841, by subsequent designation of Forcart [1946].

Diagnosis. Shell small, oblique-heliciform, white and translucent. Shell surface smooth and glossy or with transverse ridges. Whorls 5–7, spire conical with suture distinct. Shell periphery is usually rounded and last whorl axially deflected. Aperture regularly semi-ovate, peristome expanded with reflected lip. Apertural dentition usually have one or two parietal lamellae; palatal, upper palatal, basal, supracolumellar, and columellar lamellae are usually present. Umbilicus open and deep.

Perrottetia aberrata (Souleyet, 1852)

Figs 1, 2C–E

Helix aberrata Eydoux, Souleyet, 1852: 505, Taf. 28, Figs 32–34.

Streptaxis aberrata. – Pfeiffer, 1854: 24, Taf. 102, Figs 27–30; Crosse, Fischer, 1863: 355; Tryon, 1885: 77, Taf. 15, Figs 65–67; Fischer, 1891: 17; Möllendorff, 1898: 66; Gude, 1902: 221; Fischer, Dautzenberg, 1904: 1.

Odontartemon (Oophana) aberratus. – Kobelt, 1906: 104, Taf. 55, Figs 20–22.

Perrottetia aberrata. – Schileyko, 2011: 23; Do, 2017: 96.

Type locality: Touranne (Da Nang), Vietnam

Type material: Not seen.

Material examined. LZ–HUE 3201 (3 shells), Vietnam, Thua Thien Hue Province, Phu Loc District, Bach Ma National Park, Primary forest, 16°11.385'N, 107°51.11'E, 1255 m, 06 May 2017; LZ–HUE 3202 (6 shells), BTC/02, Vietnam, Thua Thien Hue Province, Phu Loc District, Hai Van Pass, Steep limestone slope with disturbed forest, 16°11.147'N, 108°07.515'E, 122 m, 22 July 2018.

Diagnosis. Shell suboblique-heliciform, white and translucent; whorls 6½, spire conical, with distinct suture. Shell surface dull, with fine transverse ridges that diminish below periphery. Last whorl shouldered, axially deflected, and expanded. Embryonic shell large, about 2½ whorls, with smooth surface; following whorls regularly expanding. Aperture subcircular, peristome discontinuous, thick and slightly expanded. Apertural dentition with one large, strong parietal lamella, one small upper palatal lamella, one strong palatal lamella, one basal lamella, one strong columellar lamella, and one small supracolumellar lamella. Umbilicus widely open and shallow.

Measurements (mm): D 8.6–9.7, H 6.1–7.7 (n = 9)

Distribution. In Vietnam, known from Da Nang, Thua Thien Hue Provinces.

Remarks. This species was known only from Central Vietnam. New distribution records from Thua Thien Hue Province.

Perrottetia namdongensis Bui et Do V.N.

sp. nov.

(Figs 1, 3A–C, Table 1)

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Type material. Holotype VNMN_IZ 000.000.158, Vietnam, Thua Thien Hue Province, Nam Dong District, Thuong Quang commune, Depleted primary forest, 16°06.56'N, 107°38.32'E, 217 m, leg. T.C. Bui, 16 September 2017. Paratypes LZ–HUE 3301 (8 shells), Vietnam, Thua Thien Hue Province, Bach Ma National Park, Primary forest, 16°11.459'N, 107°51.457'E, 1380 m, leg. T.C. Bui, 06 May 2017, LZ–HUE 3302 (15 shells), BTC/03, DDS/03, same data as holotype.

Diagnosis. Shell small, oblique-heliciform with slightly convex spire; aperture subcircular, peristome discontinuous, thickened and expanded; apertural dentition with one large, strong parietal lamella, one small upper palatal lamella (sometimes absent), one large palatal lamella, one large basal lamella, one large strong columellar lamella, absent supracolumellar lamella.

Description. Shell small, slightly thickened, oblique-heliciform, white and translucent. Whorls 6–6½, spire slightly convex with distinct suture. Shell surface glossy, with reduced transverse ridge. Embryonic shell large consisting of about 2½ whorls, with smooth surface; following whorls regularly expanding. Shell periphery shouldered, last whorl axially deflected. Aperture subcircular, peristome discontinuous, thickened and expanded; parietal callus thin. Apertural dentition with one large, strong parietal lamella, absent second parietal lamella, one small upper palatal lamella (sometimes absent), one large palatal lamella, one large basal lamella, one large strong columellar lamella, absent (or one very small) supracolumellar lamella. Umbilicus widely open and shallow (Figs 3 A–C).

Measurements (mm). Holotype: D 4.5, H 7.3. Paratypes (n = 22): D 6.8–7.8, H 3.8–4.9.

Distribution. This species is known from several primary forest areas in Thua Thien Hue Province (Nam Dong and Phu Loc Districts), central Vietnam.

Etymology. The specific epithet is derived from the type locality of this new species, Nam Dong District, Thua Thien Hue Province, Vietnam.

Remark. This new species differs from *P. cristatella* (Mölldendorff, 1881), *P. daedalea* (Bavay et Dautzenberg, 1908), *P. dugasti* (Morlet, 1892), *P. gudei* (Fulton, 1915), *P. mabiliei* (Bavay et Dautzenberg, 1908), *P. oppidulum* (Bavay et Dautzenberg, 1908) from north Vietnam in its larger shell and larger, strong parietal lamella. *P. aberrata* (Sou-

leyet, 1852) differs from the new species in its fine transverse ridge at the suture, the larger palatal lamella, and one supracolumellar lamella. *Perrottetia namdongensis* sp. nov. is superficially similar to *P. unidentata* Inkhavilay et Panha, 2016 (from Houaphanh Province, eastern Laos), however it differs in its smaller shell, subcircular aperture, and weak parietal lamella.

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- Наземные моллюски семейства Streptaxidae J. Gray, 1860 из Туа Тьен Хуэ, Вьетнам, с описанием двух новых видов (Gastropoda: Pulmonata)
- БУЙ Ти Чинх^{1*}, ДО Ван Нхуонг², НГО Дак Чунг¹, ДО Дук Санг^{3,4}
- ¹Faculty of Biology, University of Education, Hue University, 34 Le Loi, Hue, VIETNAM. *Corresponding author. E-mail: buithichinhhdspue@gmail.com
- ²Faculty of Biology, Hanoi National University of Education, 136 Xuan Thuy, Dich Vong, Cau Giay, Ha Noi, VIETNAM. E-mail: dvnhuong@hotmail.com
- ³Department of Zoology, Faculty of Biology, Tay Bac University, Chu Van An Street, Quyet Tam, Son La, VIETNAM. E-mail: doducsangdhtb@gmail.com
- ⁴Department of Applied Zoology, Faculty of Biology, Hanoi University of Science (Vietnam National University, Hanoi), 334 Nguyen Trai, Thanh Xuan, Hanoi, VIETNAM.
- РЕЗЮМЕ.** Семейство хищных брюхоногих Streptaxidae в провинции Туа Тьен Хуэ, центральный Вьетнам, представлено пятью видами. В настоящей работе приведен обзор, основанный на опубликованных и оригинальных данных, а также описание двух новых видов. *Haploptychius bachmaensis* sp. nov. имеет скошенно-хелициформную раковину с приподнятым завитком. Устье округлое, перистом прерывистый, утолщенный и слегка отвернутый. Устьевая арматура с одной сильной париетальной складкой. У *Perrotetia namdongensis* sp. nov. периферия раковины закругленная и выдающаяся. Устье округлое, перистом прерывистый, утолщенный и отвернутый. Устьевая арматура с одной сильной париетальной складкой, одной небольшой верхней палатальной складкой, одной крупной палатальной складкой и крупной колумеллярной складкой.