

TAXONOMIC POSITION OF THE LAND SNAIL *BULIMUS DEMERARENSIS* L. PFEIFFER 1861 (GASTROPODA, PULMONATA, BULIMULIDAE)

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Abstract *Bulimus demerarensis* was described by Pfeiffer (1861: 24) from Demerara (now part of Guyana). *Drymaeus* (*Leiostracus*) *ruthveni* was described by H.B. Baker (1926: 48) from the same region (Dunoon) and later was synonymised with *Leiostracus* (*Leiostracus*) *demerarensis* (Pfeiffer 1861) by Breure (1978: 1, 227). Troschel (1849) probably dissected this species under the name *Bulimus cinnamomeolineatus*, but illustrated only the jaw and the radula. The anatomy of this species remained unknown until 1997 when one snail has been collected alive in French Guiana. Unfortunately, this specimen dried out and had to be re-hydrated in a solution of tri-sodium phosphate. Surprisingly, the re-hydration worked quite well and we are able to illustrate the genital apparatus of this species for the first time. As the result, we are transferring *demerarensis* Pfeiffer 1861 (syn. *ruthveni* Baker 1926) from *Leiostracus* Albers 1850 to *Bostryx* Troschel 1847.

Key words *Bostryx*, *demerarensis*, *ruthveni*, taxonomic position, French Guiana.

INTRODUCTION

Bulimus demerarensis was described by Pfeiffer (1861: 24) based on the material from Cuming's collection from Demerara shortly after this former Dutch colony in South America became a part of British Guiana (now Guyana) in 1831. The species probably was first collected by Richard Schomburgk in French Guiana, but its presence in that country was not clearly established until recently. Baker (1926: 49) situated the type locality of his *Drymaeus* (*Leiostracus*) *ruthveni* (synonymised with *demerarensis* Pfeiffer by Breure in 1978) "on trees in forest on sand ridge near Dunoon, British Guiana". He mentioned that the species listed by Troschel (1849) and Drouët (1859) (both referred to the Schomburgk's material) as *Bulimus cinnamomeolineatus* Moricand 1838 (type species of genus *Leiostracus*) might be his new species. Indeed, the description evokes *ruthveni*: «Schomburgk a trouvé dans la Guyane une jolie variété d'un blond pâle, vergetée de stries obliques cornées, et à péristome réfléchi (Muséum de Berlin)» (Drouët, 1859: 61). True *Leiostracus cinnamomeolineatus* (Moricand 1838) is known from the Bahia Province in Brazil and examination of the probable syntypes at the MNHN Paris clearly shows that material from French Guiana belongs to a different species. Subsequently Breure (1976) recorded *ruthveni* from Surinam and mentioned a record from

"Cayenne, French Guyana", apparently again referring to the Schomburgk's material. Breure (1978: 1, 227) considered *ruthveni* "a junior subjective synonym of *Bulimus demerarensis* Pfeiffer, 1861", but later listed both species separately (Breure 1979: 127). Tillier (1980) did not mention this species. Finally, the presence of *ruthveni* in French Guiana was definitely confirmed by Massemin *et al.* (2009). Here we transfer *demerarensis* to *Bostryx* and confirm synonymy of *demerarensis* and *ruthveni*.

MATERIAL AND METHODS

The anatomical description is based on single dried individual collected alive from a tree by Th.E.J. Ripken & O. Gargominy on October 23, 1997 at Route de Cacao, Roura (4.56548°N, 52.41922°W) in French Guiana. The dried parts were soaked in tri-sodium phosphate for two days prior to dissection and then placed into 70 percent ethanol.

Additional material (empty shells) from Nouragues field station was examined as well: Saül, July 08, 1999, Th.E.J. Ripken & O. Gargominy; Piste Paul Isnard, crique Tatou, Saint-Laurent-du-Maroni, April 16, 2008, D. Massemin (see distribution map in Fig. 1). The illustration of a living animal from Nouragues field station (ca. 4°05'N, 52°41'W) was provided by Massemin *et al.* (2009: 406).

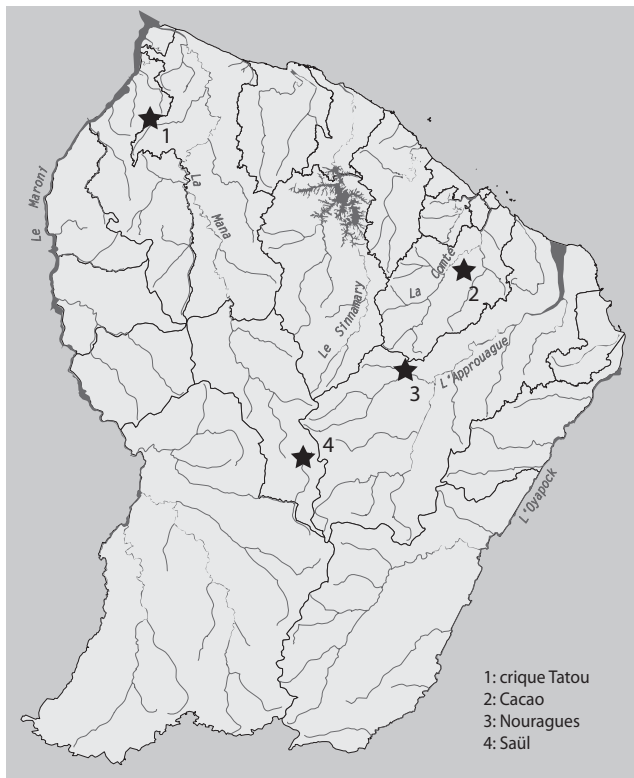


Figure 1 Distribution map for *Bostryx demerarensis* in French Guiana.

All the measurements are given using the following template (height × greater diameter) measured in standard apertural view.

SYSTEMATICS

Clade Stylommatophora
 Super-family ORTHALICOIDEA Albers 1860
 Family BULIMULIDAE Tryon 1867
 Subfamily BULIMULINAE Tryon 1867
 Genus *Bostryx* Troschel 1847

Bostryx demerarensis (L. Pfeiffer 1861) n. comb.
 (Figs 2–4)

? *Bulimus cinnamomeolineatus* non Moricand;
 F.H. Troschel, 1849: 231; pl. IV; fig. 4a–d.

? *Bulimus cinnamomeolineatus* non Moricand;
 H. Drouët, 1859: 61, French Guiana.

Bulimus demerarensis Pfeiffer, 1861 (April): 14,
 Demerara (Guyana).

Bulimus demerarensis Pfeiffer, 1861a (May): 24,
 Demerara (Guyana).

Bulimus demerarensis Pfeiffer, 1868: 51.

Drymaeus demerarensis; H.A. Pilsbry, 1898: 306.

Drymaeus (Leiostracus) ruthveni H.B. Baker, 1926:
 48, near Dunoon, British Guiana.

Drymaeus (Leiostracus) ruthveni H.B. Baker, 1927:
 pl. XXVI; figs C–D (holotype).

Leiostracus ruthveni; A.S.H. Breure, 1976: 115, near
 the Lucie River, Surinam.

Leiostracus (Leiostracus) demerarensis: A.S.H.
 Breure, 1978: 1, 227, Demerara (Guyana).

Leiostracus (Leiostracus) ruthveni; A.S.H. Breure,
 1979: 127 (reference to the type material only).

Leiostracus ruthveni; Masseurin *et al.*, 2009: 406; pl.
 6; fig. G (Guyana, Surinam and Guyane).

Description Shell medium size (height 17.95–
 20.64 mm, greater diameter 10.66–11.82 mm),
 perforated, dextral, broadly conical with almost
 straight outline, rather thin, whitish-yellowish
 with translucent radial corneous stripes and spots.
 Whorls 6.1 with straight suture line all the way
 to the aperture. Protoconch entirely corneous,
 translucent, about 1.5 whorls, finely striated with
 numerous spiral threads. Transition protoconch/
 teleoconch obvious because of change in micro-
 sculpture and discontinuity of growth. Surface
 of teleoconch with delicate, radial, oblique,
 crowded, regularly spaced growth lines and much
 finer spiral striation. Whorls slightly convex with
 most convexity below the middle. Penultimate
 whorl slightly angulated at the continuation of
 sutural line. Aperture oblique, strongly antecline,
 with well (ca. 90°) reflexed margins. Umbilicus
 tiny, partially covered by the reflected columellar
 margin.

Jaw stegognathous (fig. 3), consisting of 24
 thin converging plates with longitudinal stria-
 tion, horseshoe-shaped. Radula with monocus-
 pid central, bicuspid lateral and weakly tricuspid
 marginal teeth (see also Troschel, 1849: pl. IV,
 fig. 4b).

Free oviduct and vagina very short. Spermatheca
 with small reservoir and long duct. Proximal
 part of spermathecal duct thin, passing along-
 side spermooviduct and connected to diaphragm
 near reservoir. Distal part of spermathecal duct
 somewhat swollen, almost as large as penis. Vas
 deferens long, thin, entering penis short distance
 from apex. Penis therefore with short caecum.
 Penial retractor attached to caecum apically and
 connected to diaphragm.

Remarks The jaw illustrated by Troschel (1849:
 pl. IV, fig. 4a) consists of 26 plates and is not

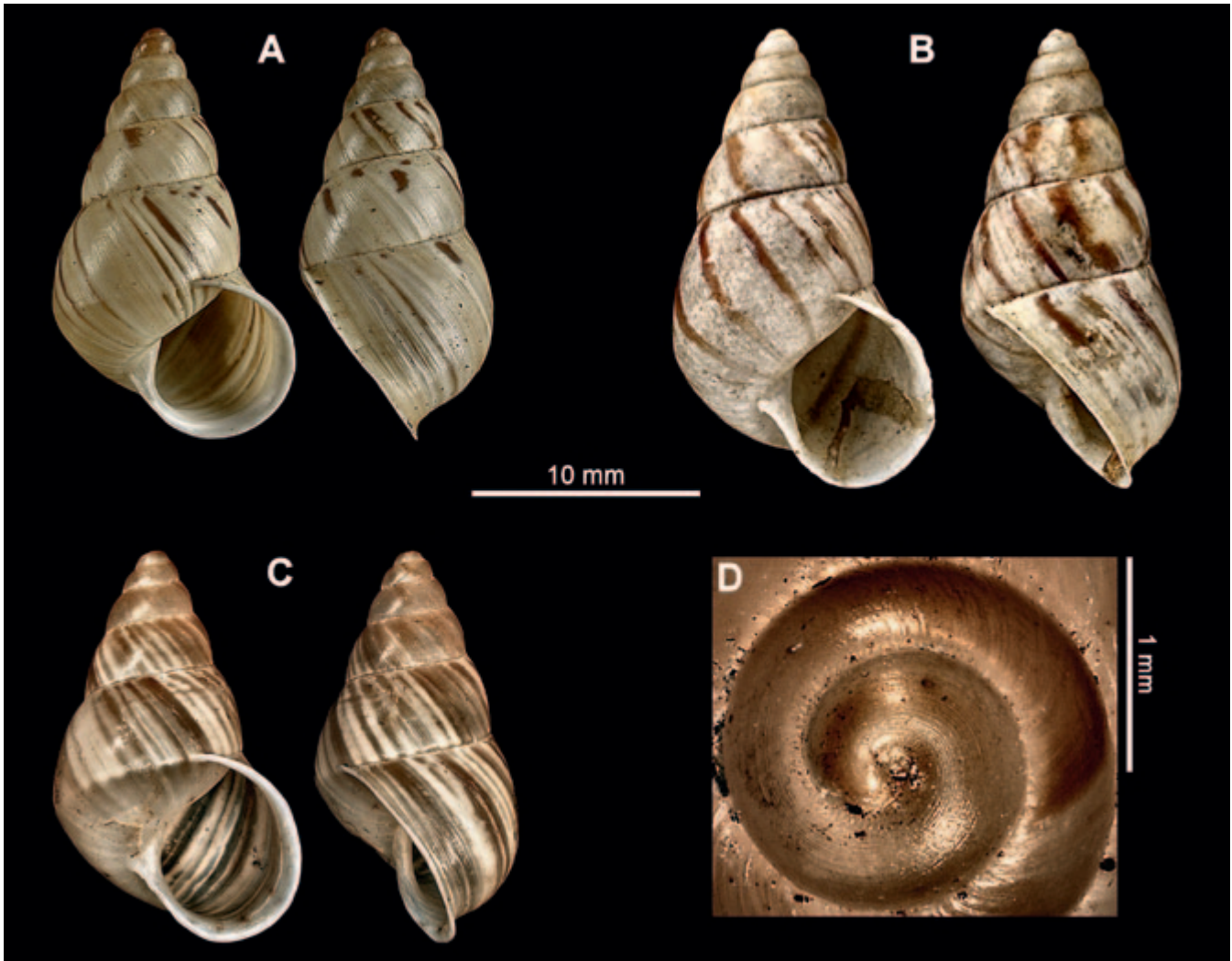


Figure 2 *Bostryx demerarensis*. **A** Shell from Nouragues, French Guiana. **B** Lectotype of *Bulimus demerarensis* from Demerara, Guyana (NHMUK 1975501). **C–D** Paratype of *Drymaeus (Liostracus) ruthveni* from Dunoon, Guyana (ANSP 140889).

horseshoe-shaped. It probably bent in our specimen when the snail dried out. Penial sheath is not clearly visible in our re-hydrated specimen but is very likely present at the base of the penis.

DISCUSSION

The shell from French Guiana is quite similar to the holotype of *ruthveni* illustrated by Baker (1927: pl. XXVI; figs C–D) and its size (17.95×10.66 mm) is near the mean (18.2×10.9 mm, holotype 19.2×11.3 mm) given by Baker (1926: 49). In addition, we did not find any essential differences between our shell from French Guiana and the lectotype of *Bulimus demerarensis* Pfeiffer 1861

(NHMUK 1975501: 20.64×11.82 mm). Thus, we do not have doubts concerning its identification.

The proximal part of the duct of spermatheca of *demerarensis* is connected to the diaphragm near the reservoir of the spermatheca as in *Rabdotus* and *Laeiorthalicus*. However, this character is not often mentioned in the descriptions and we suspect that it could be present in some other genera of Bulimulidae as well. Numerous spiral lines on the protoconch place *demerarensis* in a group of three genera: *Discoleus* Breure 1978, *Liostracus* Albers 1850 and *Bostryx* Troschel 1847. All species of genus *Discoleus* have a thin and simple peristome, a long penis that passes without external differentiation into the epiphallus, and are known only from Argentina (Breure, 1978: 195, 1979: 90). The shell of *demerarensis* does not



Figure 3 *Bostryx demerarensis*. Jaw of the dissected specimen from Route de Cacao, Roura in French Guiana.

resemble any known species of *Bostryx* and quite similar to some species of *Leiostracus* in having a peripheral angle on the body whorl. Not surprisingly *ruthveni* was described under *Drymaeus* (*Leiostracus*) Baker 1926. However, *demerarensis* lacks the very characteristic, for *Leiostracus*, division of the spermathecal duct into an enlarged distal part and a slender proximal part that connects to the distal part sub-apically (Breure, 1978: fig. 386, 1979: fig. 164), which is essentially the only character that separates *Leiostracus* from *Bostryx*. The genital apparatus of *demerarensis* positions it well within the general characters of *Bostryx*. Unfortunately we were unable to observe the penial sheath clearly on our rehydrated specimen but we strongly suspect its presence since it was quite difficult to trace the vas deferens on the surface of the distal part of the penis. Formally *demerarensis* could be reclassified in a new monotypical subgenus of *Bostryx*. However, we agree with Breure (1978: 46) and Schileyko (1999: 286) that sub-generic separation in *Bostryx* does not produce clearly defined groups, and therefore refrain from describing another subgenus.

According to Breure (1979: 48, 50) *Bostryx* has a mainly Andean distribution with a questionable occurrence (*Bostryx kugleri*) in north-western Venezuela. The changed generic position of *dem-*

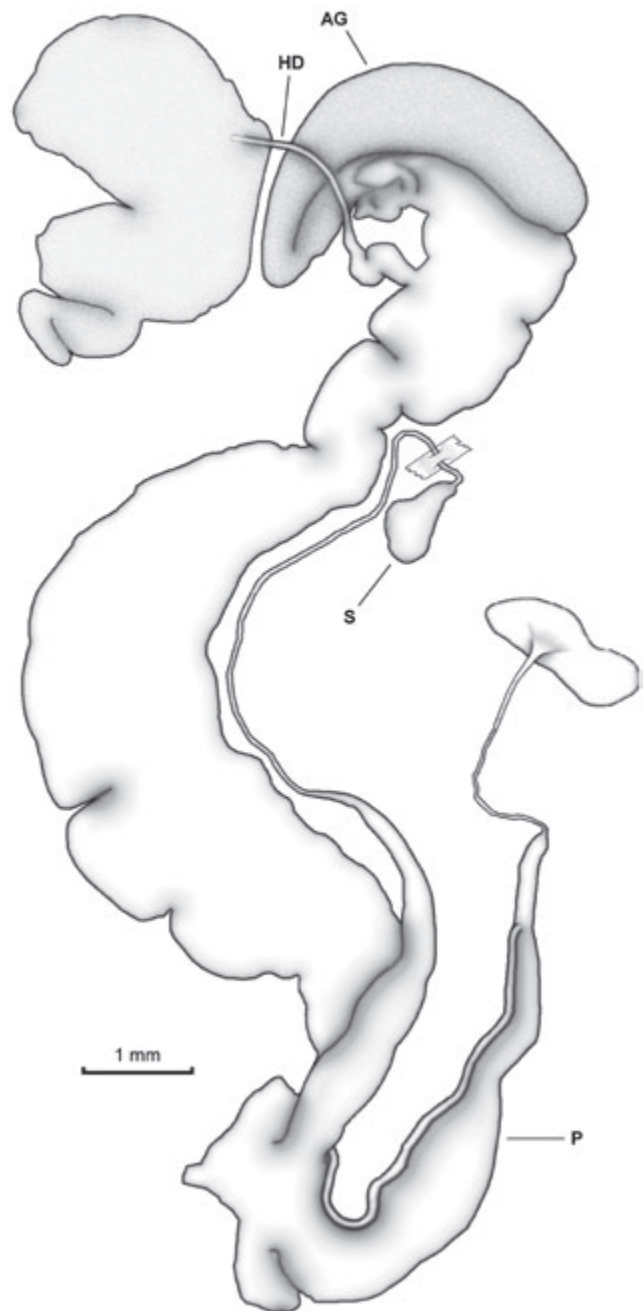


Figure 4 *Bostryx demerarensis*. Genital system of the specimen from Route de Cacao, Roura in French Guiana; HD – hermaphrodite duct, AG – albumen gland, S – spermatheca, P – penis.

erarensis supported here produces a significant re-evaluation of the geographical distribution of the genus *Bostryx*. Confirmed occurrences of this species in Guyana, Surinam and French Guiana extends the range of *Bostryx* approximately 1300–2000 km ESE from *kugleri* localities in north-western Venezuela and approximately 2000–2500 km NE of its core distribution area in Peru.

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