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Taxonomic revision of the species of *Limnebius* LEACH from Mauritius and Réunion (Mascarene Islands, Indian Ocean) (Coleoptera: Hydraenidae)

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Abstract

Three new species of *Limnebius* LEACH (Coleoptera: Hydraenidae) are described: *L. apolloniae* (Réunion), *L. oweni* (Mauritius), *L. pollex* (Mauritius). *Limnebius curidius* ORCHYMONT, 1941 and *L. vinsoni* ORCHYMONT, 1941 are redescribed. Specimens recorded from Réunion under the name *L. curidius* by BAMEUL (1986) were found to represent a new species (*L. apolloniae*). *Limnebius curidius* is regarded as extinct.

Key words: Coleoptera, Hydraenidae, *Limnebius*, taxonomy, new species, Mauritius, Réunion, Mascarene Islands, Indian Ocean.

Introduction

Two species of *Limnebius* LEACH have been described from Mauritius so far: *L. curidius* ORCHYMONT, 1941 and *L. vinsoni* ORCHYMONT, 1941. The types of these species were collected in 1935 (*L. curidius*) and 1937 (*L. vinsoni*) by Jean Vinson (1906–1966), a famous entomologist from Mauritius, who disappeared on May 8, 1966 under mysterious circumstances during an excursion on Île aux Aigrettes (a small island off Mauritius).

In November/December 2012 the senior author visited Mauritius, where he was able to find one male of *L. vinsoni* at the type locality, and two other species of the genus *Limnebius* being new to science. *Limnebius curidius* could not be found and remains missing since 1935.

BAMEUL (1986) recorded *L. curidius* from Réunion, being the only species of this genus ever recorded from that island. However, in the course of this revision, the specimens from Réunion turned out to represent in fact another new species, which is described herein, together with the two new species from Mauritius.

The specimens examined are deposited in the following collections:

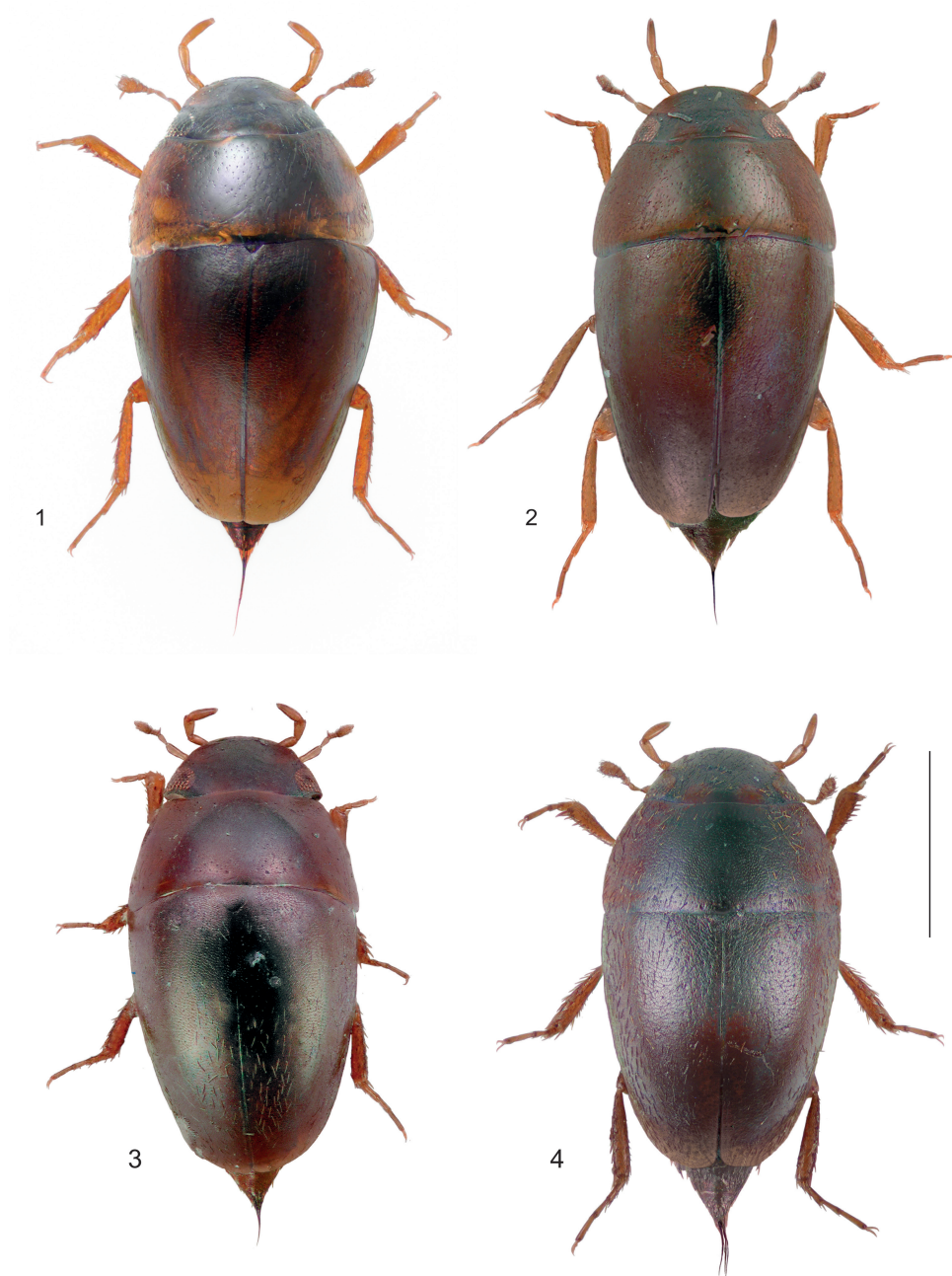
CDM	Coll. Delgado, Murcia, Spain
CTP	Coll. Turner, Plymouth, UK
IBE	Institut de Biologia Evolutiva, Barcelona, Spain
ISNB	Institut royal des Sciences naturelles de Belgique, Brussels, Belgium
MHNG	Muséum d'Histoire naturelle, Geneva, Switzerland
NHML	The Natural History Museum, London [formerly: British Museum (Natural History)], UK
NMW	Naturhistorisches Museum Wien, Vienna, Austria

Limnebius curidius ORCHYMONT, 1941

Limnebius (*Bilimnebius* [= error for *Bilimneus*]) *curidius* ORCHYMONT 1941: 5 (orig. descr.).

Limnebius curidius ORCHYMONT, 1941: VINSON 1958: 78 (biol., distr.), 1967: 315 (cat.); HANSEN 1998: 66 (cat.); GOMY 2000: 41 (cat., partim).

Limnebius (*Bilimneus*) *curidius* ORCHYMONT, 1941: BAMEUL 1986: 880 (partim).



Figs. 1–4: Habitus of 1) *Limnebius curidius*, holotype, male, 2) *L. oweni*, paratype male, 3) *L. pollex*, paratype, female, 4) *L. vinsoni*, holotype, male. Scale: 0.5 mm. All specimens have been modified digitally; some appendages and all abdomina were added.



Fig. 5: *Limnebius apolloniae*, habitus, holotype, male. Scale: 0.5 mm. Some appendages and the abdomen were added digitally.

TYPE LOCALITY: Grand Bassin [crater lake], 20°25'05"S 57°29'31"E, ca. 670 m a.s.l., southern Mauritius.

TYPE MATERIAL: **Holotype** ♂ (ISNB): "♂", "Mauritius Grand Bassin 24. XI. 1935 J. Vinson" (partially handwritten), "A d'Orchymont det. *Limnebius* (*Bilimneus*) *curidius* m." (partially handwritten), "TYPE" (red), "cf. Bull. Mus. Hist.Nat.Belg. XVII, 1941, n°1. p. 5" (partially handwritten). Right protarsus glued separately. **Paratype** ♂ (ISNB), same locality data as holotype.

DIAGNOSIS: Habitus as in Fig. 1. Length (from tip of labrum to elytral apex): 1.15 mm. Body form distinctly drop-shaped, apically distinctly acuminate. Pronotal disc glabrous, rather sparsely punctate; punctures small, becoming denser toward lateral side; without any microreticulation. Elytra completely covered with small polygonal meshes; adpressed setae emerging from hardly noticeable punctures.

First three pro- and mesotarsal segments of male enlarged, with adhesive setae.

Aedeagus (Fig. 6 a–b): 370 µm long, slightly arched in lateral view, almost straight in ventral view; apex slightly furcate, left branch distinctly smaller than right branch; apex of right branch evenly rounded in lateral view; one pair of moderately long, subapical setae on dorsal face.

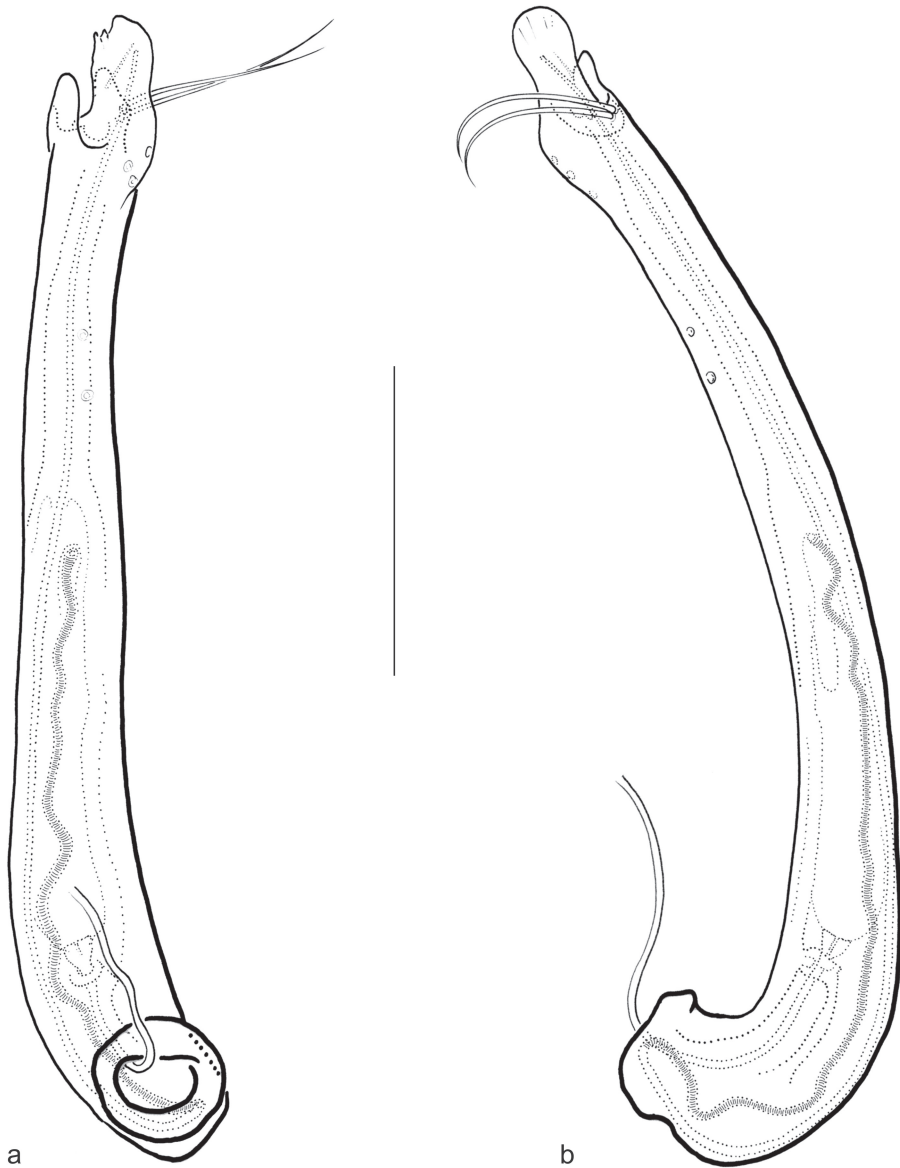


Fig. 6: *Limnebius curidius*, aedeagus, a) ventral view, b) lateral view. Scale bar: 0.1 mm.

Limnebius curidius is the only Mascarene species with only two aedeagal setae.

The female of *Limnebius curidius* is still unknown.

HABITAT: "Collected in a small swamp" (VINSON 1958: 78) at Grand Bassin, a crater lake in the Mauritian Highland. It is also known as Ganga Talao, which is the most sacred Hindu place in Mauritius.

DISTRIBUTION: Endemic to Mauritius. Only the type specimens are known. Numerous small swamps in the Mauritian Highland have been examined by the senior author and by Clive Turner between 2005 and 2012. But this species was not found again. It is currently regarded as extinct.

***Limnebius vinsoni* ORCHYMONT, 1941**

Limnebius (Bilimneus) vinsoni ORCHYMONT 1941: 5 (orig. descr.); BAMEUL 1986: 896 (cat.).

Limnebius vinsoni ORCHYMONT, 1941: VINSON 1958: 77 (biol., distr.), 1967: 315 (cat.); HANSEN 1998: 75 (cat.); GOMY 2000: 41 (cat., partim).

TYPE LOCALITY: Shallow stream on the plateau of Le Pouce [mountain], northern Mauritius (see also VINSON 1958).

TYPE MATERIAL: **Holotype** ♂ (ISNB): “♂”, “Mauritius Le POUCE II. VIII. 1937 J. Vinson” (partially handwritten), “A d’Orchymont det. *Limnebius* (Bilimneus) *Vinsoni* m.” (partially handwritten), “TYPE” (red), “cf. Bull. Mus. Hist.Nat.Belg. XVII 1941 n°1. pp. 5 - 6” (partially handwritten). **Paratypes:** 1 ♂, 2 ♀ (ISNB), same locality data as holotype.

ADDITIONAL MATERIAL EXAMINED:

MAURITIUS: 1 ♂ (NMW): “MAURITIUS Le Pouce, S Port Louis 20°12'02.0"S/57°31'28.0"E 608 m a.s.l., 29.XI.2012, leg. M.A. Jäch (MAU 8)”, “small rock pools in intermittent stream partly shaded between bushes”.

DIAGNOSIS: Habitus as in Fig. 4. Length (from tip of labrum to elytral apex): 1.15–1.30 mm. Body form suboval. Pronotum mat, densely microreticulate (in some specimens microreticulation in middle of anterior margin effaced); meshes small, round to polygonal, deeply impressed; punctures scattered and small. Elytra completely covered with polygonal meshes, larger than on pronotum; adpressed setae emerging from scattered punctures.

Females are slightly larger than males, elytra more acuminate apically. First three pro- and mesotarsal segments of male enlarged, with adhesive setae.

Externally, this species is well characterized by the very strongly microreticulate upper surface of pronotum and elytra.

Aedeagus (Fig. 7a–b): 290 µm long, almost straight in lateral view, arched only at its base, in ventral view slightly bisinuous; in lateral view gradually tapering from base to apex; apex subacuate in lateral view, somewhat rounded in ventral view; with three groups of moderately long setae: one row of eight setae on ventral face in apical half near right margin, two subapical setae on left margin, and a group of about seven densely set setae at the apex.

The aedeagus differs from all other Mascarene species by its straight form and by the large number of setae.

Genocoxite (Fig. 7d) strongly transverse, trapezoidal; basal apophyses small; inner plate not projecting; cavea indistinct; posterior margin trisinuous, medially slightly produced; basal area without setae, remaining parts moderately densely setose.

Tergite X (Fig. 7e) subtriangular, more or less as wide as long; basal margin divided into a dorsal (outer) part, and a ventral (inner) part – base of dorsal part more or less straight, ventral part projecting, completely visible in dorsal view, its base concave; basal half of disc without setae or spines; apical half with very strong spines becoming longer and denser towards margins and apex, and with six setae of moderate length; apex with a tuft of six very long setae, being distinctly longer than the tergite.

Unfortunately, the spermatheca could not be examined. Obviously it had been removed by Orchymont, when dissecting the two female paratypes.

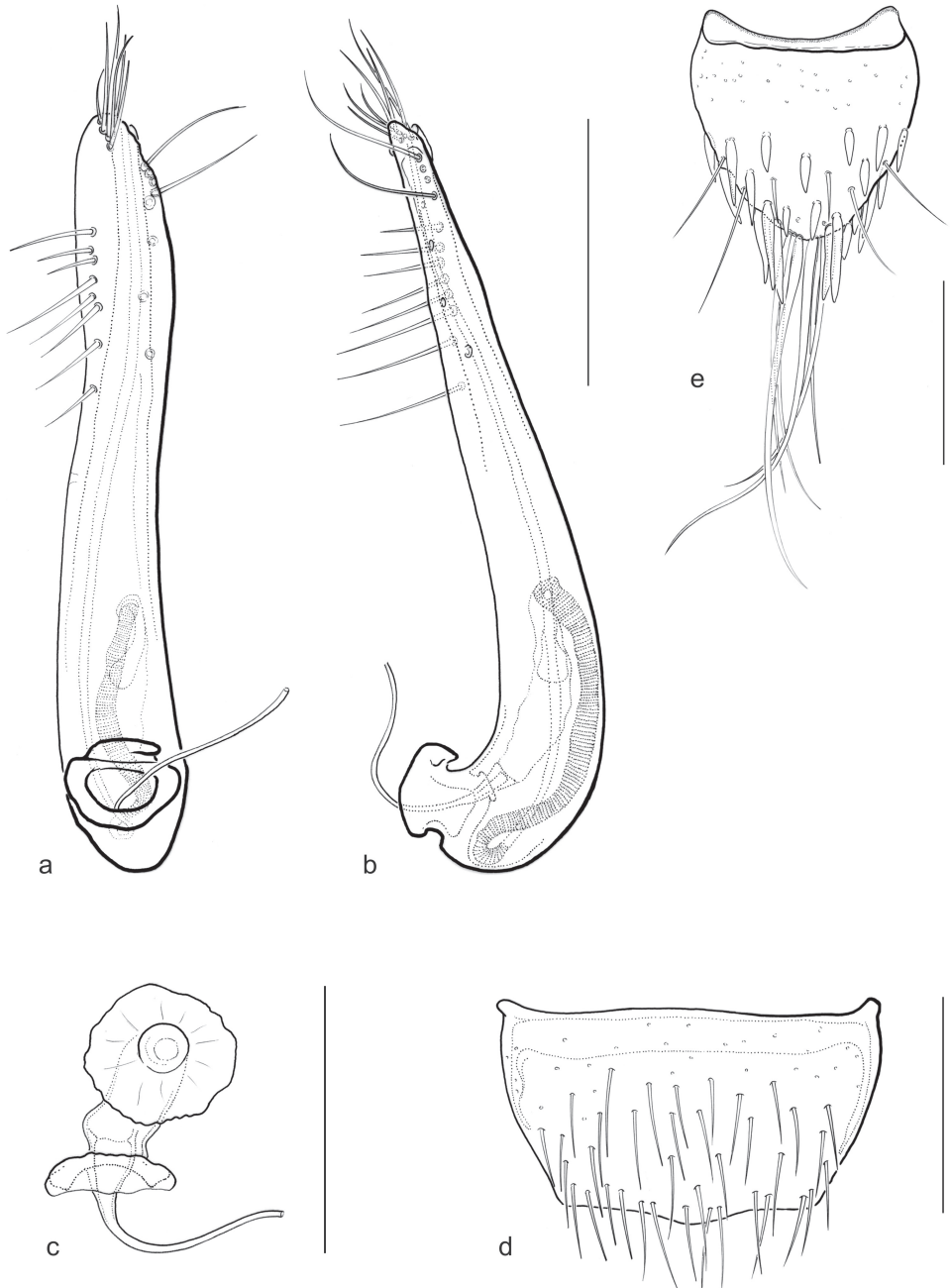


Fig. 7: *Limnebius vinsoni*, a) aedeagus, in ventral view, b) same, in lateral view, c) sperm pump, d) gonocoxite, e) female tergite X. Scale bars: 0.1 mm.

HABITAT: The single specimen collected by the first author was found in a small rock pool of a very small intermittent stream at about 608 m a.s.l. (Fig. 17), which is probably identical with the type locality.

DISTRIBUTION: Endemic to Mauritius. This species was first collected in 1937 on Le Pouce Mountain in northern Mauritius, where it still occurs.

Eventually, VINSON (1958: 77) recorded *Limnebius vinsoni* from Cabinet Nature Reserve (southern slopes of Trois Mamelles Mountain, between Tamarin and Vacoas, western Mauritius). Unfortunately, these six specimens (4 exs. collected in September 1957 “at the base of rocky cliffs”, and 2 exs. collected in February 1958 “in the algal growth developing on the seepage water of vertical cliffs”) could not be located and therefore their true identity remains unclear.

Limnebius oweni sp.n.

TYPE LOCALITY: River (Rivière Canal, left tributary of Rivière Baie du Cap), ca. 5 m wide, flowing through degraded forest, 20°27'23"S 57°24'19"E, 220 m a.s.l., ca. 3.5 km SE Charamel, southeastern Mauritius (see Fig. 14).

TYPE MATERIAL: **Holotype** ♂ (NMW): “MAURITIUS Choisy Estate 20°27'23"S/57°24'19"E 220 m a.s.l., 01.XII.2012, leg. M.A. Jäch (MAU 12)”, “ca. 3.5 km SE Charamel river, ca. 5 m wide large boulders through degraded forest”. **Paratypes:** 2 ♂♂, 7 ♀♀ (NMW), same data as holotype; 1 ♂, 1 ♀ (NMW): “MAURITIUS, Bamboo Mountains Vallée de l'Est 20°19'56"S/57°43'40"E 300 m a.s.l., 03.XII.2012, leg. M.A. Jäch (MAU 16)”, “ca. 2.7 km NNW Anse Jonchée stream, ca. 1-2 m wide, with larger pools flowing through forest and smaller tributaries (springs)”; 1 ♂ (CTP), 1 ♀ (NHML): “MAURITIUS leg. Clive R. Turner 7 Dec 2005 20°05'31"S 57°31'17"E 7m Artesian pool next to track nr. Hotel Maritim, Grande Baie, fine silty margins and water body”.

DIAGNOSIS: Habitus as in Fig. 2. Length (from tip of labrum to elytral apex): 1.15–1.30 mm.

Externally, this species agrees quite well with *Limnebius curidius*. In the two males of *L. curidius* examined, the elytral apices are slightly less acuminate, therefore the new species appears slightly less drop-shaped. The pronotal punctation in *L. oweni* is somewhat variable, sometimes as faint as in *L. curidius*, but sometimes slightly more distinct and denser.

Sexual dimorphism as described for *L. vinsoni*.

Aedeagus (Fig. 8a–d): 375 µm long, in lateral view curved, gently sinuous in basal half, apex somewhat flexible, more or less recurved; in ventral view trisinuous; apex tube-like, slender, more or less strongly curved to left side, base of apex with conspicuous bulge (ventral view); with two pairs of moderately long, subapical setae, one pair on dorsal side near right margin, second pair on ventral face of subapical bulge.

The aedeagus of this species differs from all other Mascarene species by its remarkable shape, especially by the flexible curved apex.

Gonocoxite (Fig. 9a) much less transverse than in *L. vinsoni*, subtrapezoidal; basal apophyses small, but distinct; inner plate projecting sublaterally; cavea indistinct; posterior margin slightly convex; basal area without setae, remaining parts moderately densely setose. A large vaginal sclerite (Fig. 9a–b), inversely Y-shaped with disc-like base, is connected to the base of the gonocoxite.

Tergite X (Fig. 9c) subtriangular, more or less as wide as long; similar to that of *L. vinsoni*, but base of dorsal part slightly concave and base of ventral part more strongly concave; spines and setae more or less as in *L. vinsoni*.

Spermatheca as in Fig. 9d–e.

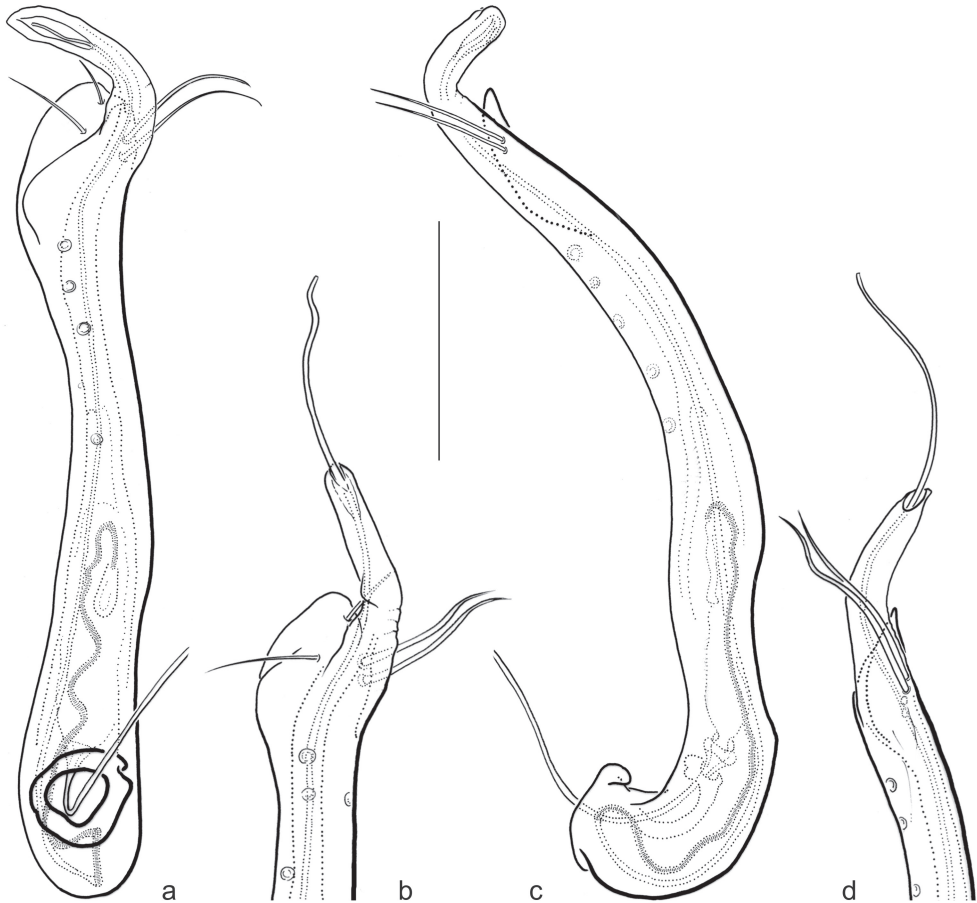


Fig. 8: *Limnebius oweni*, aedeagus, a) ventral view, b) detail of apical third of a different specimen in ventral view, showing an everted filament, c) lateral view, d) same as b, lateral view. Scale bar: 0.1 mm.

HABITAT: This species was collected in the gravelly/silty margins of a small river (220 m a.s.l.), a small stream (300 m a.s.l.) and a springfed pool (7 m a.s.l.) (see Figs. 14–16).

DISTRIBUTION: Endemic to Mauritius. So far known from three locations (in northern, southwestern and southeastern Mauritius), being obviously the only wide-spread species on this island.

ETYMOLOGY: We take pleasure in naming this species for Owen Griffiths (Mauritius), dedicated conservationist and excellent specialist of Mauritian snails. The first author warmly thanks him for his generous support during his visit to Mauritius and especially for the permission to collect water beetles on his premises in southeastern Mauritius (Vallée de l'Est), where this new species was also found.

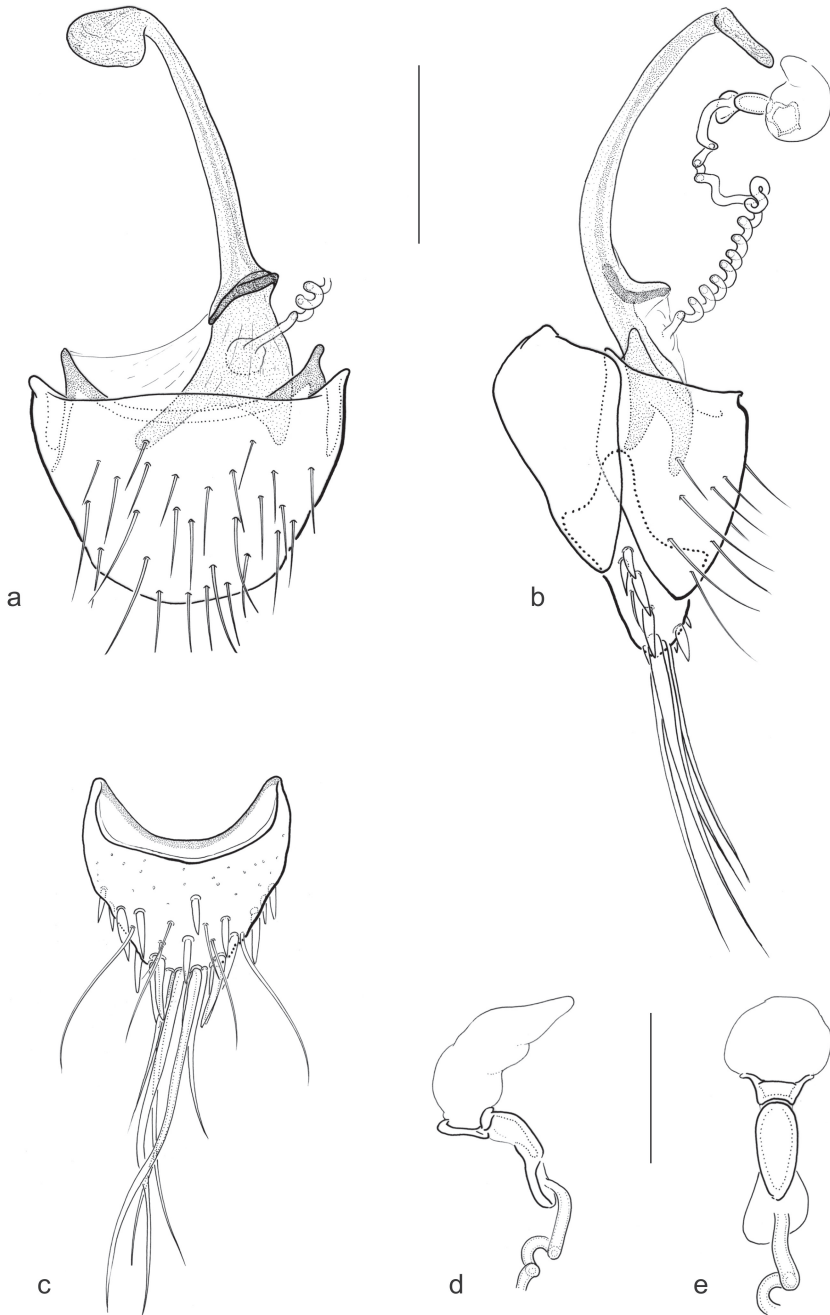


Fig. 9: *Limnebius oweni*, a) gonocoxite and vaginal sclerite, ventral view, b) gonocoxite, tergites IX, X and vaginal sclerite with attached spermatheca, lateral view, c) female tergite X, d–e) spermatheca. Scale bars: 0.1 mm (a–c), 0.05 mm (d–e).

Limnebius pollex sp.n.

TYPE LOCALITY: Small, intermittent stream on Le Pouce [mountain], 20°12'02"S 57°31'28"E, 608 m a.s.l., northern Mauritius (see Fig. 17). Very probably, this is also the type locality of *L. vinsoni* (see above).

TYPE MATERIAL: **Holotype** ♂ (NMW): "MAURITIUS Le Pouce, S Port Louis 20°12'02.0"/57°31'28.0"E 608 m a.s.l., 29.XI.2012, leg. M.A. Jäch (MAU 8)", "small rock pools in intermittent stream partly shaded between bushes". **Paratypes:** 2 ♂♂, 1 ♀ (IBE: 1 ♂, NMW: 1 ♂, 1 ♀), same locality data as holotype; 2 ♂♂, 1 ♀ (NMW): "MAURITIUS track to top of Le Pouce 20°12'07.5"/57°31'29.6"E 522 m a.s.l., 29.XI.2012, leg. M.A. Jäch (MAU 7)", "S Port Louis seepage on rock and very small rock pool in forest"; 1 ♂ (NMW), same data, but "leg. M. Madl".

The DNA of the paratype deposited in IBE was sequenced.

DIAGNOSIS: Habitus as in Fig. 3. Length (from tip of labrum to elytral apex): 1.05–1.15 mm.

Externally, this species resembles *Limnebius vinsoni*. It can be distinguished from the latter by the smaller size, and by the microreticulation – meshes on pronotum less strongly impressed and elytral meshes smaller.

Sexual dimorphism as described for *L. vinsoni*.

Aedeagus (Fig. 10a–b): 430 µm long, in lateral view strongly sinuous, strongly curved in basal half, apical half more or less straight; in ventral view almost straight, but with distinct emargination on left side near middle and with a distinct hump on left side near apical 0.3; apex with two lobes, a shorter one, widely rounded in ventral view, and a slightly longer, tube-like one; with one pair of moderately long, subapical setae on dorsal side near right margin, and with a short single seta near apex of shorter apical lobe.

The aedeagus of this species differs from all other Mascarene species significantly in its remarkable shape.

Gonocoxite (Fig. 11a) strongly transverse, trapezoidal; basal apophyses distinct; inner plate asymmetrical, projecting sublaterally, projection of left side much larger, with small bulge; cavea indistinct; posterior margin feebly trisinuous, medially very slightly produced; setation as in the other Mauritian species.

Tergite X (Fig. 11b) subtriangular, distinctly wider than long; dorsal base almost straight with small median emargination, ventral base projecting, especially sublaterally, middle distinctly concave; spines and setae as in the other Mauritian species.

Spermatheca as in Fig. 11c–e.

HABITAT: All specimens were collected from tiny rock pools and from seepage water at about 522 and 608 m a.s.l. (see Figs. 17–18).

DISTRIBUTION: Endemic to Mauritius. So far known only from two locations on Le Pouce Mountain, northern Mauritius.

ETYMOLOGY: Pollex (Latin): thumb. Named in reference to the type locality, Le Pouce (the thumb), the third highest mountain of Mauritius (812 m). The remarkable peak of this mountain, which can be seen from afar, resembles a raised thumb. Charles Darwin ascended the mountain on May 2, 1836.

Limnebius apolloniae sp.n.

Limnebius (*Bilimneus*) *curidius* ORCHYMONT, 1941: BAMEUL 1986: 880 (partim); GOMY 2000: 41 (cat., partim).

TYPE LOCALITY: Pool in stream, 1800 m a.s.l., Piton Maïdo, SE Petit France, SE St. Paul, western La Réunion (French Overseas Department).

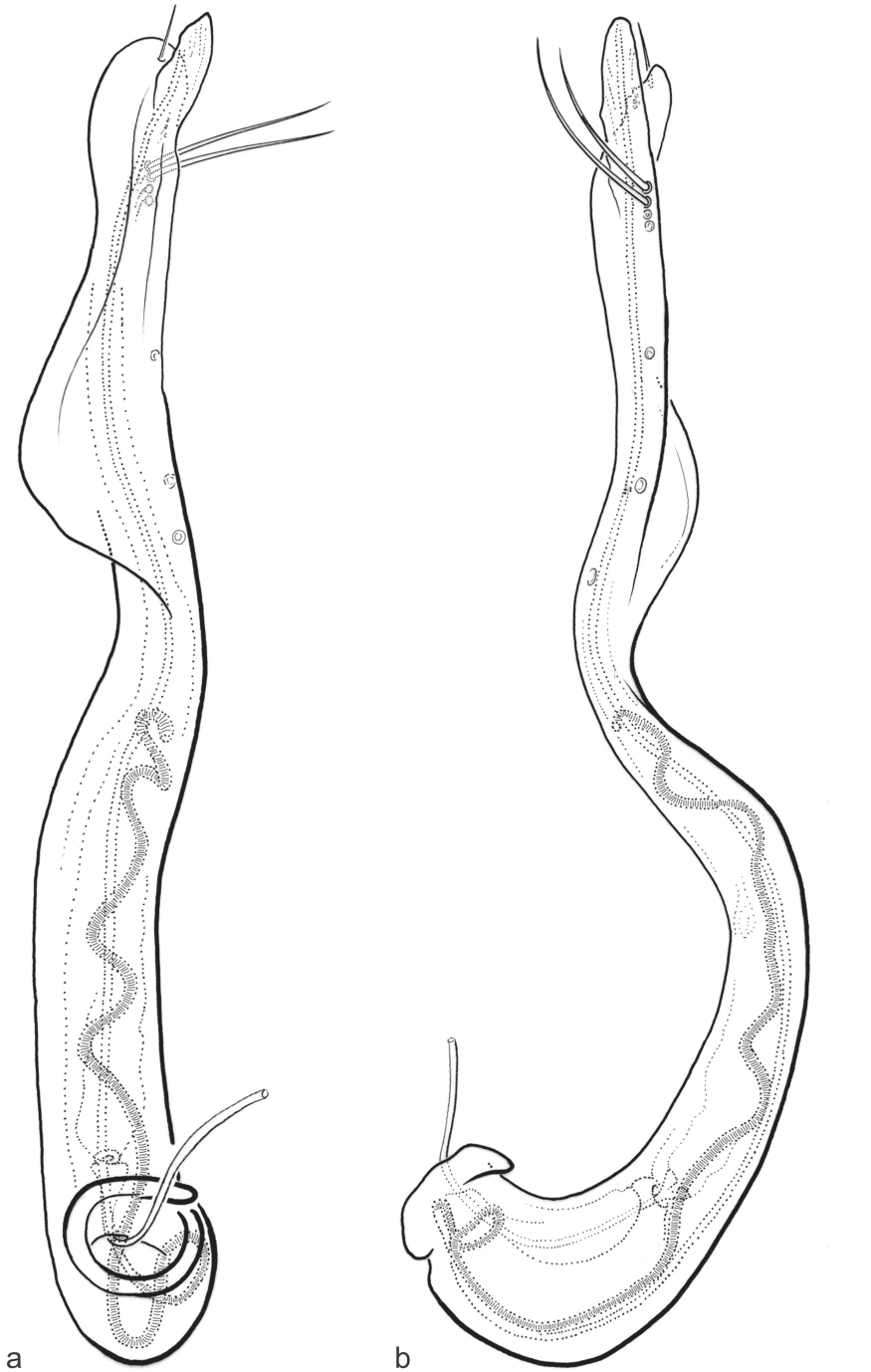


Fig. 10: *Limnebius pollex*, aedeagus, a) ventral view, b) lateral view. Scale bar: 0.1 mm.

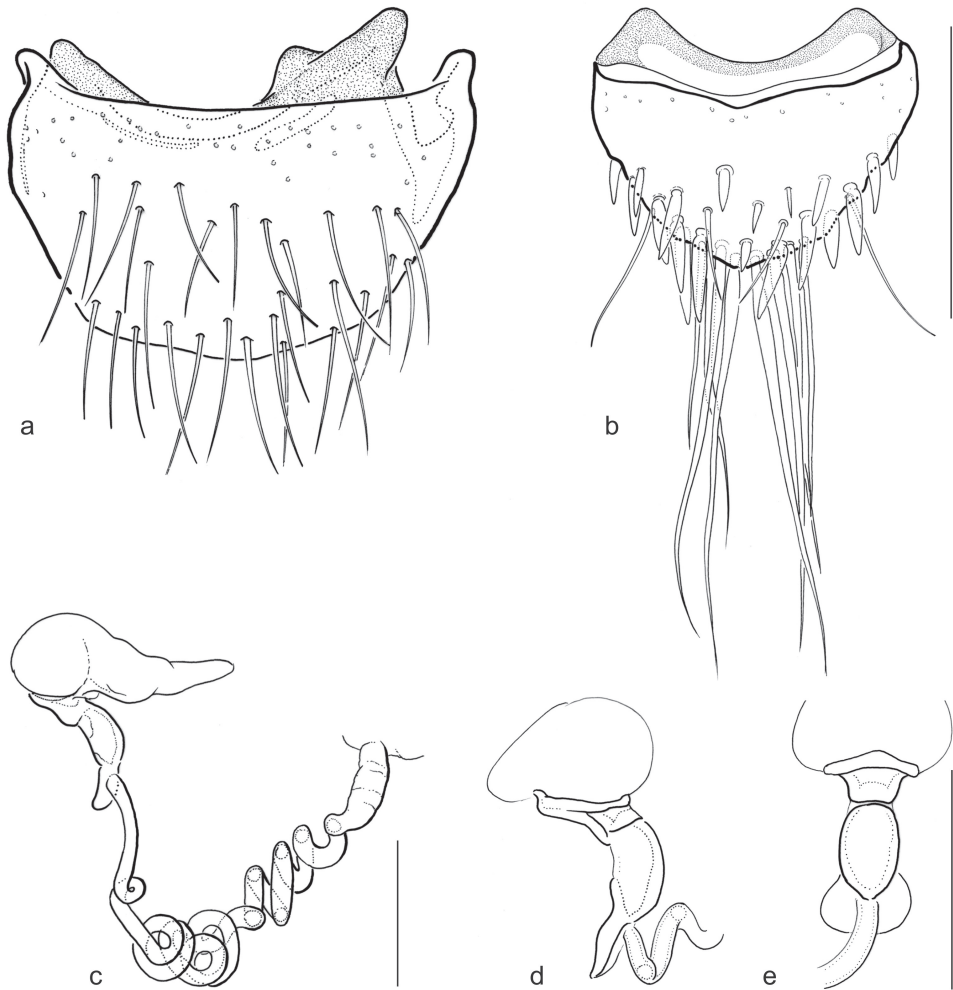


Fig. 11: *Limnebius pollex*, a) gonocoxite, b) female tergite X, c–e) spermatheca. Scale bars: 0.1 mm (a–b), 0.05 mm (c–e).

TYPE MATERIAL: **Holotype** ♂ (NMW): “LA REUNION: 22.-25.12.1998 SE St Paul SE Petit France 1800 m leg. Wewalka (2)”. **Paratypes**: 10 exs. (NMW: 8, CDM: 2), same locality data as holotype; 1 ♂, 2 ♀ (NMW): “LA REUNION: 2.-3.1.1999 S St. Benoit NW Cambourg, 250 m leg. Wewalka (12)”; 8 exs. (MHNG: 2 ♂♂, 4 ♀♀, NMW: 1 ♂, 1 ♀): “LA REUNION Bois de Nèfles [village] St Paul; petite mare [small swamp]; 12.VI.66 Y. Gomy”; 1 ex. (MHNG): “La Réunion Plaine de Makes 15-XI-70 petite mare Y. Gomy”; 3 exs. (MHNG): “La Réunion Plaine des Affouches 1400 m. 19-10-69 tamisage [sifting] Y. Gomy”.

DIAGNOSIS: Habitus as in Fig. 5. Length (from tip of labrum to elytral apex): 1.15–1.30 mm.

Externally, this species is very similar to *L. curidius* and *L. oweni*. Elytral apices less acuminate than in these species, punctures on head and pronotum more distinctly impressed.

Sexual dimorphism as in the Mauritian species.



Fig. 12: *Limnebius apolloniae*, aedeagus, a) ventral view, b) lateral view. Scale bar: 0.1 mm.

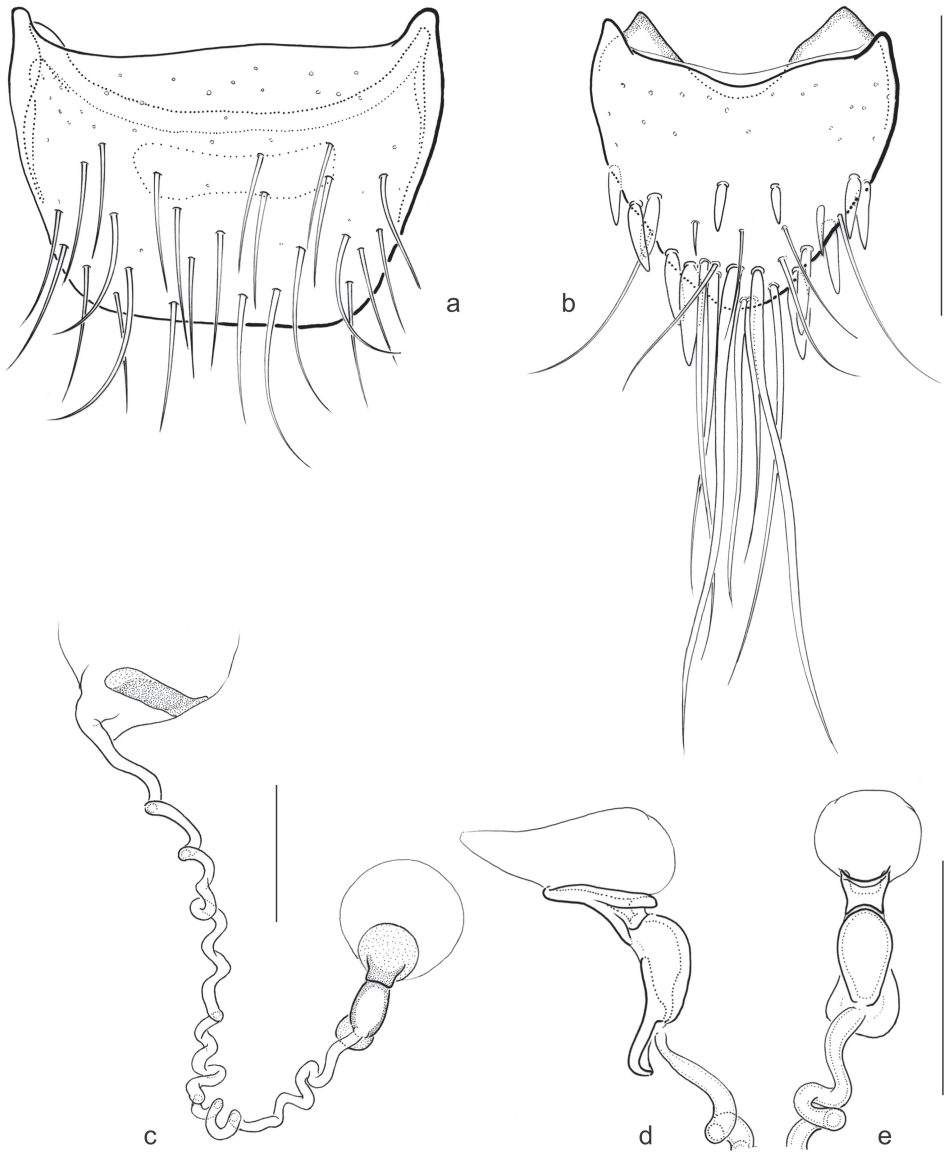


Fig. 13: *Limnebius apolloniae*, a) gonocoxite, b) female tergite X, c–e) spermatheca. Scale bars: 0.1 mm (a–b), 0.05 mm (c–e).

Aedeagus (Fig. 12a–b): 320 µm long; shape similar to that of *L. curidius*, but in lateral view more strongly curved in basal half; apex not distinctly bilobed, just with a tiny subapical excision (lateral view); apex subtruncate in lateral view, subacute in ventral view, with four instead of two setae.

From *L. vinsoni* the aedeagus is distinguished by the curvature (lateral view) and by the number of setae; from the two remaining Mascarene species it can be distinguished by the less sinuous shape.

Gonocoxite (Fig. 13a) strongly transverse, subrectangular, slightly asymmetrical, on left side longer than on right side; basal apophyses small, but distinct; inner plate slightly asymmetrical, hardly noticeably projecting near left apophysis; cavea small, transverse; posterior margin more or less straight, posterior corners rounded; setation as in the other Mascarene species.

Tergite X (Fig. 13b) subtriangular, approximately as wide as long; dorsal base with distinct apophyses, between apophyses trisinuous, medially concave, ventral base distinctly projecting sublaterally; spines and setae as in the other Mascarene species.

Spermatheca as in Fig. 13c–e.

HABITAT: Specimens were collected from “pools in streams” (Petit France, St. Benoit), “petite mare” (small swamp) (Le Bois de Nèfles, Plaine des Makes), and by sifting (Plaine d’Affouches), at elevations between 250 and 1800 m a.s.l.

DISTRIBUTION: Endemic to Réunion. Widely distributed, so far known from five localities in western, southwestern, northwestern and eastern Réunion.

ETYMOLOGY: On old Portuguese maps the island of Réunion was named “Santa Apolónia”, after a saint, which suggests that the date of the Portuguese discovery may have been February 9, her saint day.

Saint Apollonia was a virgin martyr who suffered in Alexandria during a local uprising against the Christians. According to legend, her torture included having all of her teeth violently pulled out or shattered. For this reason, she is popularly regarded as the patroness of dentistry and those suffering from toothache.

Discussion

All five Mascarene species of *Limnebius* can be easily distinguished from each other, especially by the aedeagi. Even females differ from each other significantly in the morphology of tergite X and the gonocoxite. However, despite these considerable differences, all species seem to be closely related, belonging to the same species group. All aedeagi are long and slender and they share at least one good synapomorphy, i.e. one pair of moderately long, subapical setae inserted on the dorsal face or at the right margin. These two setae are always directed ventrad. Another synapomorphy of the Mascarene species might be the strongly coiled spermathecal duct. No other species is so far known to have such a strongly coiled duct. We should, however, point out here, that the spermathecae of *L. curidius* and *L. vinsoni* are unknown. In the European *Limnebius aluta* BEDEL, which is not related with the Mascarene species, this duct has a few widely separated coils.

The presence of four species of *Limnebius* on Mauritius, being a comparatively small island (2.040 km²) of oceanic origin is remarkable. There is only one species known from Réunion, and one is known from Socotra. No species have hitherto been recorded from Rodriguez and the Seychelles. And no species has ever been recorded from the Comoros or Madagascar (although there are several undescribed species from Madagascar deposited in the NMW). From the African continent south of the Sahara only six species have been recorded until today!

14



15



Figs. 14–15: Habitats of *Limnebius oweni*: 14) Rivière Canal near Chamarel, Mauritius. Type locality. Owen Griffiths (at middle, standing) and Michael Madl (at left, looking for *Limnebius*); 15) Pool in small stream, Bamboo Mountains, Mauritius. Although the first author searched for *Limnebius* for hours in this stream and its tributaries, only two specimens were found in the silt between stones, exactly where the first author's fingers are placed.

16



17



Figs. 16–17: Habitats of *Limnebius oweni*, *L. pollex* and *L. vinsoni*: 16) Artesian pool near Grande Baie, Mauritius. Habitat of *Limnebius oweni*; 17) Small stream on Le Pouce, Mauritius. Type locality of *Limnebius pollex*, and probably also of *L. vinsoni*.



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Fig. 18: Habitat of *Limnebius pollex*. Wet rock and small water-filled rock pool at track to top of Le Pouce, Mauritius. Michael Madl.

All Mauritian species of *Limnebius* are endemic to this island. Three of these species, *L. pollex*, *L. vinsoni* and *L. curidius* seem to be confined to higher elevations, living above 500 m a.s.l. The fourth species, *L. oweni* occurs at lower elevations, from the coast up to 300 m a.s.l.

All Mauritian species seem to be rare and at risk. Clive Turner (2005, 2006) and the senior author (2012) were searching for water beetles in about one hundred sites in Mauritius, but specimens of the genus *Limnebius* were found only in five of these sites. Only one of the Mauritian species, *Limnebius oweni*, can be regarded as wide-spread on the island, but it is obviously also quite rare (IUCN risk assessment: Near Threatened, NT). *Limnebius pollex* seems to be confined to Le Pouce Mountain, where its population presently can be regarded as quite strong (IUCN risk assessment: Vulnerable, VU). In recent years, *L. vinsoni* was also found only on Le Pouce Mountain, where a single specimen could be traced in 2012 (IUCN risk assessment: Critically Endangered, CR). Finally, *L. curidius* has not been found at all since 77 years. Therefore, it is one of the few species of water beetles that should be regarded as extinct world-wide.

Acknowledgements

Thanks are due to Clive Turner for sending specimens, for various valuable information and literature, for the photograph of the artesian pool near Grande Baie (Fig. 16), and for his comments on the manuscript.

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Pol Limbourg (ISNB) and Giulio Cuccodoro (MNHG) are thanked for the loan of type specimens under their care.

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Last not least the senior author thanks Michael Madl (NMW) for his companionship, organization and guidance during the excursion to Mauritius, and for one of the habitat photographs (Fig. 15).

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Buchbesprechung

DUFF, A.G. 2012: Beetles of Britain and Ireland, Volume 1: Sphaeriusidae to Silphidae. – West Runton: A.G. Duff, 496 pp.

Dies ist sozusagen der erste Band der britisch-irischen Version des "FHL". Geografisch umfasst dieses Bestimmungswerk die Republik Irland, das Vereinigte Königreich von Großbritannien und Nordirland sowie die Isle of Man. Die Käfer der Kanal-Inseln sind nicht berücksichtigt. Insgesamt vier Bände sind geplant. Die Larven werden nicht behandelt.

Es ist das erste zusammenfassende Bestimmungswerk über die Käfer der Britischen Inseln seit 1932 (Joy, N.H.: A Practical Handbook of British Beetles).

887 Arten und 18 Familien sind in diesem Band inkludiert: Sphaeriusidae, Gyrinidae, Haliplidae, Noteridae, Hygrobiidae (erfreulicherweise wurde im Sinne der nomenklatorischen Stabilität nicht der in den letzten Jahren wiederholt auftauchende Name Paelobiidae verwendet), Dytiscidae, Carabidae, Helophoridae, Georissidae, Hydrochidae, Spercheidae, Hydrophilidae, Sphaeritidae, Histeridae, Hydraenidae, Ptiliidae, Leiodidae, Silphidae. 17 dieser Familien wurden von A.G. Duff bearbeitet, das Kapitel über die Ptiliidae stammt von M. Darby.

Die Seiten 9–15 umfassen die einleitenden Kapitel, mit vielen Abbildungen und Erklärungen morphologischer Details. Unverständlich ist allerdings, warum anstelle der Begriffe Mesoventrit und Metaventrit die Begriffe Mesosternum und Metasternum in diesem Werk verwendet werden. Bei adulten Käfern gibt es kein äußerlich sichtbares Meso- bzw. Metasternum.

Der Familienschlüssel reicht von Seite 51–72. Die Abbildungen (größtenteils Habitus-Zeichnungen) finden sich zumeist am linken Seitenrand.

Die einzelnen Familienkapitel (pp. 73–419) sind sehr übersichtlich gestaltet, mit Einleitung, Gattungs- und Artschlüsseln und zahlreichen Zeichnungen (auch Aedeagi) und kleinen S/W Habitus-Fotos. Im Art-schlüssel finden sich bei jeder Spezies Angaben zur Körperlänge, Lebensraum und Verbreitung in Großbritannien und Irland.

Die Liste der Zitate reicht von Seite 420–432. Der Vollständigkeit halber sei hier erwähnt, dass die Arbeiten von Jäch 1991a und 1991b im Jahr 1992 erschienen sind.

Auf den Seiten 434–480 befinden sich Farbtafeln mit größtenteils sehr guten Farbfotos (von Udo Schmidt) von 241 Käfer-Arten.

Ohne Zweifel sind die Britischen Inseln allgemein wesentlich artenärmer als Mitteleuropa. Es gibt jedoch Käfer-Familien, in denen ein relativ hoher Prozentsatz der britischen Arten in Mitteleuropa nicht vorkommt, so zum Beispiel bei den Hydraenidae. Zwar gibt es in Mitteleuropa ca. doppelt so viele Hydraeniden-Arten (ca. 60 spp.) als auf den Britischen Inseln, doch sieben Arten, also beinahe ein Viertel der britischen Arten kommt in Mitteleuropa nicht vor: *Ochthebius aeneus*, *O. exaratus*, *O. lejolisii*, *O. lenensis*, *O. nilssoni*, *O. poweri*, *O. punctatus*.

Das Kapitel über die Hydraenidae ist leider nicht ganz auf dem neuesten Stand, vor allem was die Untergattungseinteilung betrifft. *Hymenodes* und *Homalochthebius* wurden schon vor langer Zeit synonymisiert. Außerdem steht *Hydraena minutissima* unter dem Namen *H. flavipes*. Letztere ist jedoch ein Synonym von *H. pulchella* (siehe Jäch, M.A. 2004: Hydraenidae, pp. 102–122. – In Löbl & Smetana (eds.): Catalogue of Palaearctic Coleoptera, Vol. 2. – Stenstrup: Apollo Books, 942 pp.). Hydraeniden-Weibchen besitzen nicht mehr sichtbare Sternite als die Männchen, sondern weniger (der Gonocoxit ist kein Sternit).

Insgesamt gefällt mir das Buch jedoch sehr gut. Ich kann es jedem empfehlen, der seine Bibliothek mit einem wertvollen Werk bereichern oder auf den Britischen Inseln sammeln möchte.

M.A. JÄCH

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