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Studies on neotropical Phasmatodea VII. Descriptions of a new genus and four new species of Diapheromerinae from Peru and Bolivia

(Phasmatodea: "Anareolatae": Diapheromeridae)

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Abstract

The new genus *Lobolibethra* **gen. n.** is established in the tribe Diapheromerini, with *Lobolibethra panguana* **sp. n.** designated as the type-species. Three new species are described: *L. boliviana* **sp. n.** from the Chapare Province of Bolivia and *L. mutica* **sp. n.** from North Peru from the females only, the type-species *L. panguana* **sp. n.** from East Peru from is described from both sexes and the eggs. *Libethra peruana* CAUDELL, 1918 is a junior synonym of *Ocnophila mainerii* GIGLIO-TOS, 1910 (**syn. n.**). *Ocnophila ignava* (WESTWOOD, 1859) from Brazil and *Rugosolibethra ramale* (GIGLIO-TOS, 1898) from South Ecuador are transferred to *Lobolibethra* **gen. n.** (**comb. n.**).

A new species on the genus *Ocnophiloidea* ZOMPRO, 2001 (tribe Ocnophilini), *O. dillerorum* **sp. n.**, is described from the Huanuco Province of East Peru. This new species is known from both sexes and the egg.

Holotypes of new taxa are deposited in MUSM and ZSMC, paratypes in the two mentioned institutions and the author's collections. All type-specimens are dried and pinned.

Introduction

This paper is the seventh part of an on-going study of the New World Phasmatodea by the authors and describes a new genus and three new species of the tribe Diapheromerini from Peru and Bolivia, as well as a new species of *Ocnophiloidea* ZOMPRO, 2001 (tribe Ocnophilini) from Peru.

The extensive material at hand for the present study originates from the collection of the State Zoological Collections Munich (ZSMC) and the author's collections, as well as numerous specimens collected by the authors on a entomological expedition to the scientific research station "Panguana" in 2004, organized by the ZSMC with support of the Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima (MUSM) and Instituto Nacional de Recursos Naturales (INRENA). "Panguana" is located the tropical Oriente of the Huanuco Province, some 140 kilometres south of Pucallpa on the Rio Yuyapichis (= Llullapichis) a western affluent of the Rio Pachitea. In addition type-specimens in various other European museums have been examined which received support by all corresponding curators.

Abbreviations

BMNH:	Natural History Museum, London / England.
MCSN:	Museo Civico di Storia Naturale "Giacomo Doria", Genova / Italy.
MIZT:	Museo Regionale de Scienze Naturali, Torino / Italy.
MNUH:	Museum für Naturkunde der Humboldt-Universität, Berlin / Germany.
MUSM:	Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima / Peru
USNM:	United States National Museum of Natural History, Washington D.C. / USA.
ZSMC:	Zoologische Staatssammlung, Munich / Germany.
FH:	Private collection of Frank H. HENNEMANN, Kaiserslautern / Germany.
OC:	Private collection of Oskar V. CONLE, Bolsterlang / Germany.

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HT: Holotype
PT: Paratype
LT: Lectotype
PLT: Paralectotype

Tribe Diapheromerini

Lobolibethra gen. n.

Type-species: *Lobolibethra panguana* **sp. n.**, by present designation.

Ceroys, WESTWOOD, 1859: 61, pl. 4: 7.
Libethra, GIGLIO-TOS, 1898: 27.
CAUDELL, 1918: 6.
OTTE & BROCK, 2005: 175 (in part).
Ocnophila, BRUNNER v. WATTENWYL, 1907: 309 (in part).
GIGLIO-TOS, 1910: 30.
OTTE & BROCK, 2005: 228 (in part).

Etymology
A combination of "*Lobo*", referring to the often prominent lobes of the legs and abdominal tergites III and VIII of ♀♀, and the generic name "Libethra" to emphasize the close relation to this genus. It means as much as "lobed *Libethra*" and is meant to indicate the generally more decidedly developed body and leg armature, if compared with *Libethra*. Feminine.

Description
♂, ♀**:** Medium-sized to large if compared with related genera (body lengths ♂♂ 44.3-67.0 mm, ♀♀ 45.0-72.0 mm), moderately slender to rather robust; general colouration usually brown often with paler markings. Head and body surface in ♀♀ strongly sculptured, ± granulose or rugulose and covered with ± distinct longitudinal carinae particularly on the dorsal surface of the abdomen. In ♂♂ sparingly granulose and occasionally covered with single small tubercles to almost smooth; sometimes with fine longitudinal carinae on the abdominal terga. Head elongate, sub-cylindrical, slightly narrowed towards the posterior and 1.2-1.5x longer than wide; widest at eyes. Vertex unarmed, between the eyes with a pair of ± distinct spines. Eyes rather small, circular and projecting hemispherically. Antennae long and filiform, projecting over base of metanotum (♀♀) or abdominal segment II (♂♂). Scapus at best 1.5x longer than wide, dorsoventrally flattened with the apex club-like and the outer lateral margin ± rounded. Pedicellus circular in cross-section and distinctly shorter than scapus. Third antennomere elongate, almost as long as combined length of the two basal segments. Following antennomeres first gently then rapidly decreasing in length towards apex of antennae; all densely setose. Pronotum rectangular, about as long and wide as head (♀♀) or slightly narrower (♂♂). Mesothorax elongate, cylindrical, in ♀♀ 3.5-4.5x, in ♂♂ > 6x longer than pronotum. Metanotum less than 2/3 the length of mesonotum. Abdomen including median segment slightly shorter than complete thorax and head combined. Median segment short, quadrate to slightly transverse, less than 1/3 the length of metanotum. Tergite III, and VIII, of ♀♀ often with a ± transverse foliaceous und crenulated lobe. Segments II-VII slightly increasing in length, in ♂♂ all parallel-sided and longer than wide, in ♀♀ II-IV may be wider than long and gently broadened with IV being the widest segment. Sternites unarmed. Praeopercular organ very indistinct. Tergite VIII of ♂♂ 2/3 the length of VII and trapezoidal, being strongly widened towards the posterior margin which is broader than IX-X. IX about as long as wide, constricted medially. Anal segment flat with a slight longitudinal median carina and a shallow posteromedian notch; lateral surfaces somewhat deflexed. In ♀♀ tergites VIII-X almost of equal width, VIII slightly longer than following, IX quadrate to slightly wider than long. Anal segment with a slight median carina and lateral angles ± strongly deflexed. Supraanal plate very small, in great parts hidden underneath anal segment, notched apically. Cerci very small, dorsoventrally compressed, straight and tapered towards the apex in ♀♀, rather elongate, slender, cylindrical and very gently incurving in ♂♂; slightly projecting over anal segment. Vomer of ♂♂ well

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developed, flat, broad, roughly triangular and with a single terminal hook. Poculum of ♂♂ strongly convex, cup-like with a laterally compressed keel-like projection at the angle and with posterior margin indented posteromedially. Subgenital plate of ♀♀ slightly keeled, boat-shaped, with a distinct longitudinal lateral carina, ± strongly tuberlose in posterior half and reaching at best half way along anal segment. Profemora compressed and curved basally, almostr triangular in cross-section with dorsal carinae distinctly nearing, remaining femora and tibiae trapezoidal in cross-section; all decidedly carinate. Medioventral carina of femora indistinct, unarmed. Profemora about as long as mesothorax, mesofemora about as long as metanotum and median segment combined, hind legs projecting over apex of abdomen. Front legs unarmed, or in ♀♀ anteroventral and dorsal carinae of femora and dorsal carinae of tibiae with lobes of variable size; in ♂♂ the anteroventral carina may bear single teeth. Mid legs of ♀♀ lobed, although indistinct in some species. Mesofemora with ± prominent lobes on anteroventral and dorsal carinae; these may be very indistinct to very prominent and ± foliaceous. Mesotibiae with ± distinct lobes dorsally, and occasionally with medioventral carina elevated sub-basally. Mesofemora of ♂♂ with single lobes ventrally, tibiae may have single lobes dorsally and the medioventral carina elevated sub-basally. Hind legs unarmed or similar in structure to mid legs. Basitarsus as long as following three tarsomeres combined, or longer.

Eggs

Of average size (capsule length 2.8 mm in the type-species) if compared with related genera, capsule globose, about 1.5x longer than wide, slightly laterally flattened and oval in cross-section; dorsal surface strongly convex. Capsule surface strongly shiny and very minutely granulose. Micropylar plate elongate, parallel-sided, more than ¾ the length of capsule. Outer margin weakly raised and broadly whitish. Micropylar cup small and positioned close to posterior end of plate. Median line very faint. Internal micropylar plate open with a short median line. Operculum elliptical, in centre supplied with an irregularly raised, hollow net-like structure. Opercular angle almost 90˚.

Differentiation

This new genus is closely related to *Libethra* STÅL, 1875 (Type-species: *Libethra nisseri* STÅL, 1875: 74, by subsequent designation of KIRBY, 1904: 345) and *Rugosolibethra* ZOMPRO, 2001 (Type-species: *Ceroys rabdota* WESTWOOD, 1859: 61, pl. 22: 6a-e, by original designation), which is seen in the ♂ genitalia, shape of the head and antennae, structure and armature of the abdomen and legs of ♀♀, as well as in the generally similar egg-morphology. A table to distinguish between these three genera is presented below (table 1).

The laterally deflexed or node-like lateral surfaces of the anal segment of ♂♂ and transverse lobe of the abdominal tergite III of ♀♀ are found throughout all three genera. However, *Lobolibethra* **gen. n.** is frequently separated from the two mentioned genera by e.g. the convex, more or less decidedly keeled, rugulose and posteriorly rounded or truncate subgenital plate of ♀♀, and much longer micropylar plate of the eggs. The less strikingly furnished species like *L. mutica* **sp. n.** or *L. ramale* (GIGLIO-TOS) strongly resemble moderately armed species of *Libethra*, but the shape of the subgenital plate clearly distinguish these from members of that genus. The prominent armature of the legs, including the anterior pair, and large transverse lobe of tergite III of ♀♀ of e.g. *L. boliviana* **sp. n.** and *L. panguana* **sp. n.** show striking convergence to these structures in certain species of *Rugosolibethra*, but again and in addition to the lack of prominent spines on the vertex, the shape of the subgenital plate of ♀♀ clearly separates these from *Rugosolibethra*.

In addition to the features mentioned in table 1 below, ♀♀ of *Lobolibethra* **gen. n.** may be distinguished from those of *Libethra* by the strongly rounded, deflexed posterolateral angles of the anal segment, more prominently sculptured body surface and generally more prominent lobes of the legs. Furthermore, the basitarsi of both sexes are relatively shorter than in *Libethra*. From *Rugosolibethra* ♀♀ may additionally be distinguished by the more strongly deflexed posterolateral angles of the anal segment and lack of distinct spines on the mesonotum.

Comments

Due the close relation with *Libethra* STÅL and *Rugosolibethra* ZOMPRO, *Lobolibethra* **gen. n.** belongs in the generic complex of Diapheromerini, which ZOMPRO (2001: 219) in his generic review of Diapheromerinae, termed the "*Clonistria*-group". In addition to the type-genus *Clonistria* STÅL, 1875 as well as the two genera mentioned above ZOMPRO (2001: 219) included seven further genera. However, several taxa clearly violate most of the features that ZOMPRO stated to be typical for the "*Clonistria*-group", shortcomings which were caused by only a few species being covered within the genera. For instance, members of *Libethra*, and *Lobolibethra* **gen. n.** lack a praeopercular organ, and in most representatives of these two genera, the

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	Lobolibethra **gen. n.**	*Libethra*	*Rugosolibethra*
Body surface (♂♂)	Strongly granulose / tuberculose	Smooth to sparsely and minutely granulose	Smooth to granulose
Head (♀♀)	With a pair of inter-ocular tubercles or spines	Unarmed	With a pair of conical spines on the vertex
Subgenital plate (♀♀)	Longitudinally keeled, ± boat-shaped and granulose or rugulose; apex rounded	Scoop-like and smooth; apex narrowed and with a deep median incision	Slightly keeled, smooth; apex narrowed and with a deep median incision
Cerci (♂♂)	Slender and weakly incurving	Obtuse and strongly incurving to hook-like	Obtuse and strongly incurving
Meso- and metafemora (♂♂)	Lobed	Unarmed	Unarmed or lobed
Mesofemora (♀♀)	± lobed	At best with small lobules	Unarmed or lobed
Metafemora (♀♀)	± lobed	At best with small lobules	Unarmed or lobed
Egg (opercular angle)	about 90˚	± 70˚	-*
Egg (micropylar plate)	Elongate & parallel-sided; > ¾ the length of capsule	Oval; < than half the length of capsule	-* * eggs of *Rugosolibethra* ZOMPRO are not known

Table 1: Distinction of *Lobolibethra* **gen. n.**, *Libethra* STÅL and *Rugosolibethra* ZOMPRO

basitarsus is shorter than the remaining tarsomeres combined. Furthermore, ZOMPRO (2001: 220) stated "body surface of ♂ smooth" which is not true for at least four genera, and "Eggs bullet-like", but the eggs of e.g. *Clonistria*, *Libethra* and *Lobolibethra* **gen. n.** are obviously ovoid. Although the distinctive shape and structure of the ♀ subgenital plate of *Libethra* and *Rugosolibethra* is of high generic value and serves very well to separate these two genera from the remaining genera in the group, it is noted that ZOMPRO did not mention it at all, not in the keys neither in the diagnoses and complementary descriptions.

ZOMPRO (2001: 224) re-diagnosed the genus *Libethra* STÅL, 1875 and described the egg of the type-species. The author however only included three species in *Libethra* why the further work now being undertaken is identifying shortcomings in the generic diagnosis provided by ZOMPRO. In the complementary description of *Libethra* ZOMPRO mentioned the unarmed meso- and metafemora to be a characteristic generic feature and in a brief discussion of the genus stated "The armation of the femora does not vary. *Libethra* always has unarmed femora". These comments are misleading, since small lobes are present in several species of the genus and even in the ♀ paralectotype of the type-species *L. nisseri* STÅL. Furthermore, STÅL (1875: 74) in his original description of *L. nisseri* explicitly stated the ♀ to have the mesofemora supplied with lobes. The egg of *L. nisseri* described and sketched by ZOMPRO (2001, Figs 104-105) differs considerably from the eggs of four Ecuadorian species in the author's collections, all of which undoubtedly represent members of *Libethra*, and may be based on misidentified specimens. ZOMPRO (2001: 225) described the egg capsule to be covered with rough, bulgy structures, but those of the four Ecuadorian species all have smooth to very minutely granulose and slightly shiny capsules, similar to those seen in *Lobolibethra* **gen. n.**.

The following combination of characters distinguishes *Libethra* from related genera: head unarmed; subgenital plate of ♀♀ elongate, slender, scoop-like, tapering from the median portion to a narrow, deeply posteromedially incised apex to form two ± elongate, parallel points; cerci of ♂♂ prominent, strongly incurving and often with specific shapes in different species; legs of ♂♂ unarmed (see table 1).

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Distribution
Moist tropical rain forests below 2000 m in southeast Ecuador, eastern and central Peru, E-Brazil and central Bolivia. According to MORRONE (2006: 472, 473) the known distribution defines to the Amazonian subregion of the Neotropical region (Province Yungas) and to the eastern sections of the South American Transition Zone (Province Puna).

Species included

1. *Lobolibethra boliviana* **sp. n.**	[Bolivia: Chapare Prov.]
2. *Lobolibethra ignava* (WESTWOOD, 1859: 61, pl. 4: 7) [*Ceroys*]. **comb. n.**	[Brazil]
3. *Lobolibethra mainerii* (GIGLIO-TOS, 1910: 30) [*Ocnophila*]. **comb. n.**	[Peru: Huanuco Prov.]
= *Libethra peruana* CAUDELL, 1918: 6. **syn. n.**	
4. *Lobolibethra mutica* **sp. n.**	[N-Peru]
5. *Lobolibethra panguana* **sp. n.**	[Peru: Huanuco Prov.]
6. *Lobolibethra ramale* (GIGLIO-TOS, 1898: 27) [*Libethra*]. **comb. n.**	[SE-Ecuador: San José]

Key to ♀♀ of *Lobolibethra* gen. n.

1. Hind legs unarmed 2
– All three pairs of legs with various lobes of variable size 3

2. Body rugose, longitudinal carinae indistinct; tergite III with a transverse posterior lobe; mesofemora with three prominent, rounded lobes on anteroventral carina; Brazil . . . . . *L. ignava*
– Body with prominent longitudinal dorsal carinae; tergite III without a lobe; mesofemora with minute lobules dorsally; Peru . . . . . *L. mutica* **n.sp**.

3. Anteroventral carina of metafemora at best with minute, rounded lobes; metatibiae without a sub-basal ventral lobe 4
– Metafemora with large foliaceous lobes on anteroventral carina; metatibiae with a distinct sub-basal ventral lobe 5

4. Body length > 50 mm; slender; mesonotum > 4x longer than pronotum; abdominal segments III-V longer than wide; mesofemora with three small, rounded lobes on anteroventral carina; S-Ecuador . . . . . *L. ramale*
– Body length < 50 mm; more robust; mesonotum at best 4x longer than pronotum; mesofemora with two prominent lobes on anteroventral carina abdominal segments III-V wider than long; E-Peru . . . . . *L. mainerii*

5. Robust; mesonotum about 4x longer than pronotum; median segment about 1/3 the length of metanotum; profemora longer than mesothorax; Bolivia . . . . . *L. boliviana* **sp. n.**
– Rather elongate; mesonotum almost 5x longer than pronotum; median segment less than ¼ the length of metanotum; profemora about as long as mesothorax; E-Peru . . . . . *L. panguana* **sp. n.**

Lobolibethra boliviana sp. n.
(Figs 1, 3-6)

HT, ♀: Bolivien, Chapare, Villa Tunari, 320 m, 6.-20. Nov. 2002, leg. B. Bembé (ZSMC).

Etymology
This striking new species is named after Bolivia, in reference to the type-locality Villa Tunari at the Rio Chapare.

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Fig. 1. *Lobolibethra boliviana* **sp. n.**, habitus of ♀, HT (ZSMC).

Differentiation

Very similar to the type-species *L. panguana* **sp. n.** from Peru but ♀♀ differ by: the somewhat broader body and relatively shorter body segments; shorter mesonotum which is about 4.4x longer than the pronotum (almost 5x longer in *panguana* **sp. n.**); presence of minute (1.1 mm), scale-like tegmina; decidedly longer median segment; slightly smaller cerci; more prominent and decidedly more dentate lobes of the front legs, and relatively longer legs, the profemora being longer than the mesothorax and the metafemora reaching to posterior margin of tergite VI.

Description

♀♀ (Fig. 1, measurements in table 2). Size large for the genus (body length 65.1 mm), form moderately stout (maximum width at tergite IV 3.7 mm), body cylindrical and almost of uniform width. Body surface heavily rugulose, granulose and lobate; abdominal tergites distinctly multi-carinate. Legs heavily furnished with foliaceous lobes of variable size and shape, those on the anteroventral carina of the meso- and metafemora largest. General colouration brown with irregular darker brown mottling. Lobes of the abdominal tergites and legs dull ochracheous with darker brown markings. Bases of meso- and metafemora straw. Head with a very faint blackish postocular stripe. Posterolateral angles of abdominal tergite VII each with a small straw-coloured spot. Antennae mid brown and slightly paler at the apex, segments black apically.

Head: 1.3x longer than wide. Between the eyes with two composite tubercles and various granules. Vertex flat with complete surface, except very posterolateral sections, supplied with numerous granules of variable size and single enlarged nodes; single well decided nodules along the cheeks. Eyes comparatively small, length contained 4.5x in that of cheek. Antennae reaching to anterior margin of median segment; consisting of about 35 segments. Scapus club-like towards the apex, slightly elevated laterally and with the outer margin considerably rounded; about 1.2x longer than wide. Pedicellus slightly club-like, about 1.5x longer than wide and 2/3 the length of scapus. Third antennomere elongate, more slender than previous and about 2x longer than pedicellus.

Thorax: Pronotum slightly shorter than head and about 1.3x longer than wide; lateral margins with a shallow median indention. Surface irregularly but prominently granulose, the granules becoming increasingly distinct towards the lateral margins and there being four rather well defined, small, oval areas destitute of granules and of a somewhat paler colour than rest of pronotum. Transverse median depression indistinct, curved and almost reaching to lateral margins of segment. Median line indistinct. Mesothorax about 4.4x longer than pronotum, slightly widened posteriad. Dorsal surface of mesonotum with a very faint longitudinal median carina, otherwise densely covered with irregularly longitudinally directed rugulae and granules. Four prominent nodules along lateral margins. Posterior margin possessing very minute (1.1 mm), scale-like traces of tegmina. Mesopleurae sparingly granulose and set with a longitudinal row of about ten rather distinct, rounded nodules. Metanotum about as broad but less than half the length of mesonotum, very gently constricted medially; structured like mesonotum. Metapleurae heavily rugulose and furnished with single prominent, composite tubercles. Meso- and metasternum very minutely rugulose and irregularly set with granules of variable size.

Abdomen: Median segment short and contained more than 3x in length of metanotum, slightly wider than long, anterior margin rounded; surface granulose and with four irregular carinae. Abdominal segments II indistinctly wider than long, III-VI slightly longer, about of equal length and roughly quadrate; VII slightly

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narrower than previous. Tergites II-VIII irregularly but acutely multi-carinae. Sternites II-VII prominently granulose and tuberculose, some of these indicating two longitudinal carinae. Posterior margin of tergite II with four small, slightly composite spine-like projections. III with posterior margin developed into a very large, transverse, foliaceous, bi-lobate, irregularly angulato-arcuate and horizontally extended plate, which extends over lateral margins of the segment and overhangs the anterior half of the fourth tergite. The two median longitudinal carinae just in front of this plate developed into a dentate lobe. Tergites IV-VII with the two median longitudinal carinae posteriorly terminating in small crenulated lobe (IV), composite spine-like process (V), or tubercle (VI and VII). Tergite VIII ¾ the length of VII, slightly narrower, roughly quadrate. Two median longitudinal carinae forming two large, apically diverging and crenulated lobes (Fig. 3). On IX these carinae supplied with spine-like projections, which are most distinct and composite posteriad, this segment rectangular and of slightly smaller dimensions than VIII. Anal segment slightly longer than IX, tri-carinate dorsally, the lateral angles rounded and decidedly deflexed (Fig. 4), the posterior margin dentate and with a minute median indention (Fig. 3). Supraanal plate very small and completely hidden underneath anal segment. Cerci very small, conical and hardly projecting over posterior margin of anal segment. Subgenital plate rather short, strongly convex and rounded boat-like, reaching about 1/3 the way along anal segment; apex truncate (Fig. 5). Apical half prominently rugose and granulose, lateral surfaces with a fine but irregular longitudinal carina. Lower gonapophyses covered by subgenital plate, paraproct granulose.

Legs: Profemora very slightly longer than mesothorax, mesofemora reaching to posterior margin of abdominal tergite II, metafemora reaching about two thirds the way along abdominal tergite VI. All three pairs of legs with all lateral surfaces sparingly set with small nodules. Profemora with anteroventral carina strongly raised, gently lamellate and wave like. Posterodorsal carina with a few small, rounded elevations, posteroventral carina supplied with four very irregular and strongly denticulate lobe-like appendages of moderate size. Medioventral carina distinct and slightly displaced towards anteroventral carina; the latter unarmed. Protibiae with two prominent, rounded and distinctly denticulate lobes in basal half, the basal one being decidedly larger. Posterior half with three small triangular teeth. Mesofemora with anteroventral carina furnished with two large, foliaceous and irregularly dentate lobes, the basal one slightly rounded, the apical one more decidedly triangulate; posteroventral carina with two small, denticulate elevations (Fig. 6). Anterodorsal carina with three, posterodorsal carina with two heavily denate lobes; the median one largest and with an elongate median point. Medioventral carina faint and unarmed. Both dorsal carinae of mesotibiae supplied with a small triangular tooth sub-basally and a distinct, dentate lobe about 1/3 off the base; two further roughly triangular teeth in apical two thirds, the apical one smaller. Medioventral carina elevated triangularly, about ¼ off the base and just between the lobes of the anterodorsal carina. Hind legs generally as median pair of legs, but armature slightly less prominent. Tarsi moderately elongate, about ¼ the length of corresponding tibia. Basitarsus about as long as following three tarsomeres combined.

Comments

In view of the considerable intra-specific variation concerning to the lobes of the abdominal tergites, lobes of the legs and colouration seen in the closely related type-species *L. panguana* **sp. n.**, similar polymorphy can be presumed for *L. boliviana* **sp. n.** in a similar degree with quite some certainty. This should be kept in mind when using the description presented above, which is based on the unique HT. ♂♂ and eggs unknown.

Distribution

So far only known from the type-locality in Central Bolivia (Chapare Province, Rio Chapare, Villa Tunari, 320 m).

Lobolibethra mainerii (GIGLIO-TOS, 1910) comb. n.

Ocnophila mainerii GIGLIO-TOS, 1910: 30. **HT**, ♀: Rio Chanchamayo, Peru, 1896 - 1898, Pesce Maineri; Holotype ♀ *Ocnophila mainerii* GIGLIO-TOS, 1910; *Ocnophila mainerii* GIGLIO-TOS ♀ tipo (MCSN). OTTE & BROCK, 2005: 229.

Libethra peruana CAUDELL, 1918: 6. **HT**, ♀: 1800 m, 11˚3' S, 75˚17' W Greenw., N. Iconnicoff 4.12. 06; *Libethra peruana* CAUD. ♀ Type (USNM). **syn. n.**
OTTE & BROCK, 2005: 176.

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Comments
Examination and comparison of the holotypes of *Ocnophila mainerii* GIGLIO-TOS, 1910 and *Libethra peruana* CAUDELL, 1918 leave no doubt they are the same species and consequently, the latter falls as a junior synonym. This is for instance seen in the small size (body length < 50.0 mm), leg armature and shape of the anal segment and subgenital plate. Furthermore, the type-localities are not in far distance to another and both define to mountainous habitats in altitudes between 1000 and 2000 metres. "Rio Chanchamayo" presumably refers to the present Rio Carhuamayo an affluent of Rio Perené which joins this near San Ramon. The coordinates given for *Libethra peruana* CAUDELL (11˚3' S, 75˚17' W) define to a place some 20 kilometres northwest of Satipo. The average distance between these two localities is less than 100 kilometres.

Close relation to *L. boliviana* **sp. n.** and *L. panguana* **sp. n.** is obvious. ♂♂ and eggs unknown.

Lobolibethra mutica sp. n.
(Figs 2, 7-10)

HT, ♀: N-Peru, Rodriguez de Mendoza, 12.V.1996 (ZSMC, ex coll. FH 0219-1).

Etymology
The name (lat. = unarmed / smooth) refers to the lack of foliaceous lobes on the abdominal tergites III and VIII and just indistinct lobules of the legs.

Differentiation
Namely well characterized and distinguished from other members of the genus by the body lacking lobes on abdominal tergites III and VIII, the mesofemora and tibiae only bearing very minute, rounded lobes dorsally, and the smooth anteroventral carina of the mesofemora.

Description

♀♀ (Fig. 2, measurements in table 2). Size medium for the genus (body length 54.8 mm), form moderately slender (maximum width at tergite IV 3.8 mm) with the basal six segments of the abdomen very gently swollen. General colouration brown with faint, irregular darker brown markings and speckles. Head with a very faint blackish postocular stripe. Basal seven segments of abdomen dull brown to blackish (due to preservation). Entire dorsal body surface granulose, rugose and distinctly multi-carinate (abdomen in particular). Legs only with minute lobes. Antennae mid brown and becoming pale brown towards the apex, sub-apically with three indistinct brown annulations.

Head: Almost parallel-sided and 1.4x longer than wide. Vertex flat and dorsally densely granulose, and furnished with a very fine, slightly impressed coronal line. Dorso-laterally behind the eyes with a large, roughly oval and smooth area; this of paler colour than rest of head. A few small tubercles close to posterior margin. Eyes of moderate size, length contained 3.5x in that of cheek, sub-circular. Antennae rather strong, projecting over posterior margin of abdominal tergite IV; consisting of about 47 segments. Scapus club-like towards the apex, slightly elevated laterally and with the outer margin gently rounded; about 1.3x longer than wide. Pedicellus cylindrical, tapered apically, almost 2x longer than wide and about half the length of scapus. Third antennomere more slender than previous and about as long as two basal segments combined.

Thorax: Pronotum slightly shorter and narrower than the head, rectangular and about 1.3x longer than wide. Surface granulose, the granules becoming increasingly distinct towards the lateral margins. Transverse median depression gently curved and almost reaching to lateral margins of segment. Median line distinct, impressed. Mesothorax about 4.7x longer than pronotum; mesonotum very indistinctly gradually widened towards the posterior. Dorsal surface of mesonotum with a prominent and blunt longitudinal median keel, laterally with irregularly longitudinally directed rugulae roughly indicating a longitudinal keel, and a fine carina along lateral margins. Surface otherwise sparingly supplied with single blunt nodes and granules, especially along median keel and lateral margins. Mesopleurae rugulose and sparingly set with granules of variable size; these positioned in a longitudinal row in anterior two thirds of segment. Metanotum parallel-sided as broad but only a little less than half the length of mesonotum; structured like mesonotum but lateral carinae more decided. Metapleurae minutely rugulose and roughly placed in two longitudinal, sub-parallel lines. Meso- and metasternum very minutely rugulose and sparingly set with minute granules; surface more decidedly structured on metasternum.

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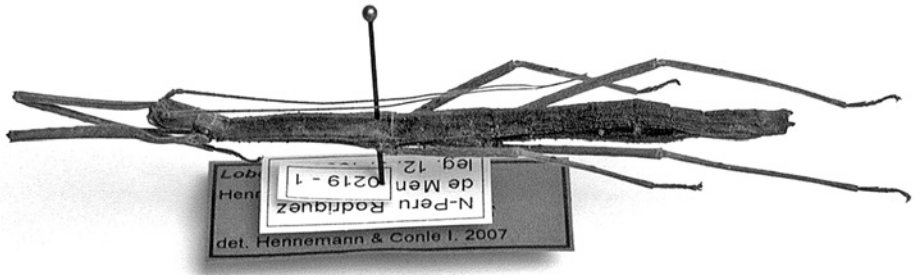

Fig. 2. *Lobolibethra mutica* **sp. n.**, habitus of ♀, HT (ZSMC)

Abdomen: Median segment almost contained 4x in length of metanotum, about 1.3x wider than long, rectangular; surface with five longitudinal carinae. All tergites irregularely multi-carinae, the median keel divided to form two parallel carinae. Otherwise surface minutely rugulose and sparingly supplied with small, rounded granules. Abdominal segments II-V roughly quadrate, very indistinctly increasing in length and about equal in width; VI and VII gradually narrowed towards the posterior. Sternites II-VII set with numerous distinct granules and nodes which roughly form two parallel, longitudinal carinae; lateral margins raised. Sternite VII with posterior margin slightly swollen and armed with two short and blunt, spine-like tubercles. Tergite VIII somewhat shorter than VII, very gently widened towards the posterior and about 1.2x longer than wide; longitudinal median carinae fused posteriorly and terminating in a blunt, scale-like tubercle. IX slightly shorter than VIII, quadrate; the two longitudinal median carinae each terminating in a small rounded node. Anal segment slightly longer than IX, gently widened towards the apex, the posterior margin rounded, minutely quadri-dentate and with a small posteromedian indention; surface tri-carinate, the lateral carina decidedly converging in anterior half of segment (Fig. 7); lateral margins truncate posteriorly. Supraanal plate very small and almost completely hidden underneath anal segment. Cerci small, cylindrical and projecting over posterior margin of anal segment, by about ¼ the length of that segment. Subgenital plate rather short, scoop-shaped and reaching about 1/3 the way along anal segment; apex triangular (Fig. 8). Towards the apex increasingly convex and with an acute median keel; keeled ventral surface sharply defined from lateral sides by a distinct but irregular longitudinal carina (Fig. 9). Lateral surfaces and apex minutely rugulose and granulose. Lower gonapophyses hidden underneath subgenital plate, paraproct granulose.

Legs: Profemora slightly longer than mesothorax, mesofemora almost reaching to posterior margin of abdominal tergite III, metafemora reaching about two thirds the way along abdominal tergite VI. Profemora with the anteroventral carina strongly raised and gently laminate. Protibiae with several very minute, rounded lobules which decrease in size towards the apex. Mesofemora with four small, rounded lobes on anterodorsal carina, and two lobes of similar size on posterodorsal carina; otherwise unarmed (Fig. 10). Anteroventral carinae very indistinctly lamellate. Posteroventral carina unarmed. Mesotibiae with one or two small,rounded lobules about 1/3 off the base on dorsal carinae. Metafemora with a few small lobules in basal half of dorsal carinae; ventral carinae smooth. Metatibiae entirely unarmed. Tarsi of moderate length, a little more than ¼ the length of corresponding tibia. Basitarsus about as long as following three tarsomeres combined.

Comments

Although this sombre and plain stick-insect appears rather unlike other species of the genus due to lacking lobes on the abdominal tergites III and VIII, and having the anteroventral carina of the mesofemora unarmed, genital features however, such as the keeled and apically rounded subgenital plate, clearly place it in *Lobolibethra* **gen. n.**. In aspect of the body and leg armature it therefore represents the opposite extreme to the strikingly furnished *L. boliviana* **sp. n.** and *L. panguana* **sp. n.**, and well shows the considerable polymorphy of *Lobolibethra* **gen. n.** concerning to these features. Unfortunately, the type-locality "N-Peru" is regrettably insufficient.

♂♂ and eggs unknown.

Distribution

So far only known from the rather undefined type-locality "Northern Peru".

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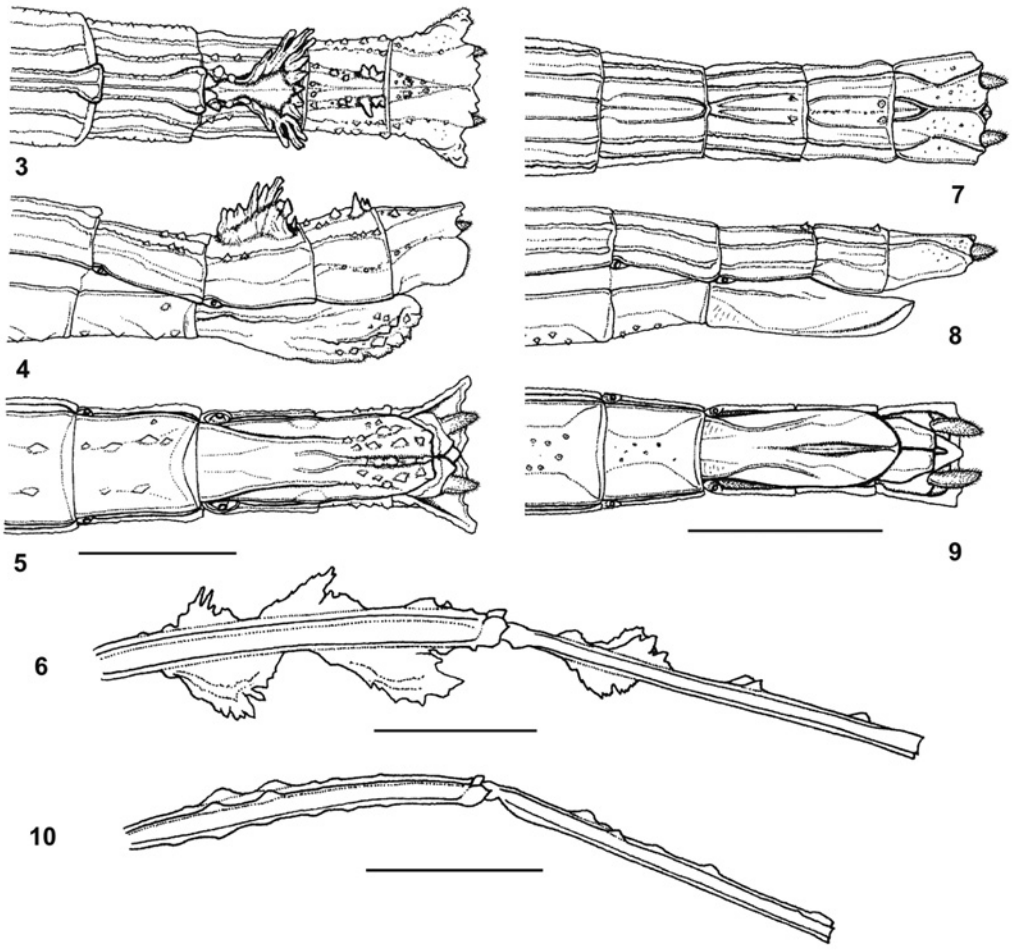

Figs 3-10: *Lobolibethra boliviana* **sp. n.** & *L. mutica* **sp. n.** [scale = 5 mm]: **3.** *Lobolibethra boliviana* **sp. n.**, dorsal view of apex of abdomen, ♀ HT; **4.** *Lobolibethra boliviana* **sp. n.**, lateral view of apex of abdomen, ♀ HT; **5.** *Lobolibethra boliviana* **sp. n.**, ventral view of apex of abdomen, ♀ HT; **6.** *Lobolibethra boliviana* **sp. n.**, lateral view of left mid leg, ♀ HT; **7.** *Lobolibethra mutica* **sp. n.**, dorsal view of apex of abdomen, ♀ HT; **8.** *Lobolibethra mutica* **sp. n.**, lateral view of apex of abdomen, ♀ HT; **9.** *Lobolibethra mutica* **sp. n.**, ventral view of apex of abdomen, ♀ HT; **10.** *Lobolibethra mutica* **sp. n.**, sinistral lateral view of left mid leg ♀ HT.

Lobolibethra panguana **sp. n.**
(Figs 11-23, 32-33, 38-40)

HT, ♀: Peru, Dep. Huanuco, Rio Yuyapichis, Nebenfluß d. Rio Pachitea, ZSM-Forschungsstation Panguana, 9˚73'S, 74˚56'W, 260m, 22.09.-03.10.2004, leg. O. CONLE & F. HENNEMANN (MUSM).

PT (113 ♂♂, 82 ♀♀, 21 nymphs, eggs): 49 ♂♂, 22 ♀♀, 20 nymphs: Peru, Dep. Huanuco, Rio Yuyapichis, Nebenfluß d. Rio Pachitea, ZSM-Forschungsstation Panguana, 9˚73'S, 74˚56'W, 260m, 22.09.-03.10.2004, leg. O. CONLE & F. HENNEMANN (ZSMC); 1 ♂: Peru, Huánuco, Yuyapichis, Panguana, 9˚73'S, 74˚56'W, 260m, 6-IV-2003, leg. T. KOTHE (ZSMC); 20 ♂♂, 21 ♀♀, eggs: Peru, Dep. Huanuco, Rio Yuyapichis,

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Nebenfluß d. Rio Pachitea, ZSM-Forschungsstation Panguana, 9˚73'S, 74˚56'W, 260m, 22.09.-03.10.2004, leg. F. HENNEMANN & O. CONLE (coll. FH 0552-1 to 41 & E1); 3 ♂♂, 1 ♀, 1 ♀ (penultimate instar nymph), eggs: ex Zucht F. HENNEMANN 2005, Herkunft: Peru, Panguana, F1-Generation (coll. FH 0552-42 to 46 & E2); 2 ♂♂, 1 ♀: ex Zucht F. HENNEMANN 2006, Herkunft: Peru, Panguana, F2-Generation (coll. FH 0552-47 to 49); 5 ♂♂, 5 ♀♀: ex Zucht F. HENNEMANN 2007-2008, Herkunft: Peru, Panguana (coll. FH 0552-50 to 60); 25 ♂♂, 25 ♀♀, eggs: Peru, Dep. Huanuco, Rio Yuyapichis, Nebenfluß d. Rio Pachitea, ZSM-Forschungsstation Panguana, 9˚73'S, 74˚56'W, 260m, 22.09.-03.10.2004, leg. O. CONLE & F. HENNEMANN (coll. OC); 5 ♂♂, 5 ♀♀: ex Zucht O. CONLE 2006, Zuchtstamm aus Peru, Panguana (coll. OC); 1 ♂, 1 ♀: Peru, Dep. Huanuco, Rio Yuyapichis, Nebenfluß d. Rio Pachitea, ZSM-Forschungsstation Panguana, 9˚73'S, 74˚56'W, 260m, 22.09.-03.10.2004, leg. O. CONLE & F. HENNEMANN (MNHU); 1 ♂, 1 ♀, 3 eggs: ex Zucht F. HENNEMANN 2006, Herkunft: Peru, Dep. Huanuco "Panguana" (BMNH, ex coll. FH).

Etymology

This handsome and apparently variable new species is named after its type-locality, the scientific research station "Panguana" at the Rio Yuyapichis in the Huanuco Province of Peru, where it is very abundant and the most frequently found stick-insect.

Differentiation

Very similar to *L. boliviana* **sp. n.** from Bolivia but ♀♀ differ by: the slightly more slender body and relatively longer body segments; comparatively longer mesonotum which is almost 5x longer than the pronotum (4.4x longer in *boliviana* **sp. n.**); lack of minute, scale-like tegmina; much shorter median segment; slightly more prominent cerci; less distinct lobes of the front legs, and relatively shorter legs, the profemora being only about as long as the mesothorax (longer in *boliviana* **sp. n.**) and the metafemora reaching at best half way along tergite VI.

Description

The intra-specific variation of certain features are summarized and discussed in more detail in a separate section. The description of the colouration is based on live captive-reared specimens and photos of live wild specimens. Measurements in table 2.

♀♀ (Fig. 11 & 38-39). Size medium to large for the genus (body length 55.7-72.0 mm), form moderately slender (maximum width at tergite IV 3.2-3.4 mm), body cylindrical and almost of uniform width, abdominal tergites III-V very gently swollen. Body surface heavily rugulose, granulose and often lobate; abdominal tergites distinctly multi-carinate. Legs furnished with foliaceous lobes of variable size and shape, those on the anteroventral carina of the meso- and metafemora largest. Colouration variable (➜ see comments on variation below), general colour usually mid to dark brown, more rarely greenish, usually with irregular paler and darker brown mottling, sometimes with conspicuous white markings. Lobes of the abdominal tergites usually somewhat darker than rest of body. Antennae pale to mid brown and slightly paler at the apex, which bears a few fine blackish annulations.

Head: 1.3x longer than wide. Between the eyes with two ± decided horn-like spines, directed cephalad, and a few larger tubercles in between. Vertex flat with complete surface supplied with numerous granules of variable size and single enlarged nodes; less numerous dorsolaterally; cheeks with single well decided nodules. Eyes comparatively small, length contained almost 4.5x in that of cheek. Antennae reaching to median segment and in average consisting of about 37 segments. Scapus slightly club-like towards the apex, gently elevated laterally and with the outer margin considerably rounded; about 1.2x longer than wide. Pedicellus club-like, about 1.3x longer than wide and 2/3 the length of scapus. Third antennomere elongate, more slender than previous and almost as long as two basal antennomeres combined.

Thorax: Pronotum about as long but slightly narrower than head, about 1.3x longer than wide; very weakly constricted medially. Surface irregularly and ± prominently granulose, the granules becoming increasingly decided towards the lateral margins and there being two ± distinct composite tubercles close to posterior margin. Transverse median depression indistinct, curved but not reaching to lateral margins of segment. Median line faint, slightly impressed. Mesothorax almost 5x longer than pronotum, slightly widened posteriad. Dorsal surface of mesonotum with an indicated longitudinal median keel, otherwise densely covered with irregularly longitudinally directed rugulae, granules and nodules of variable size. Several

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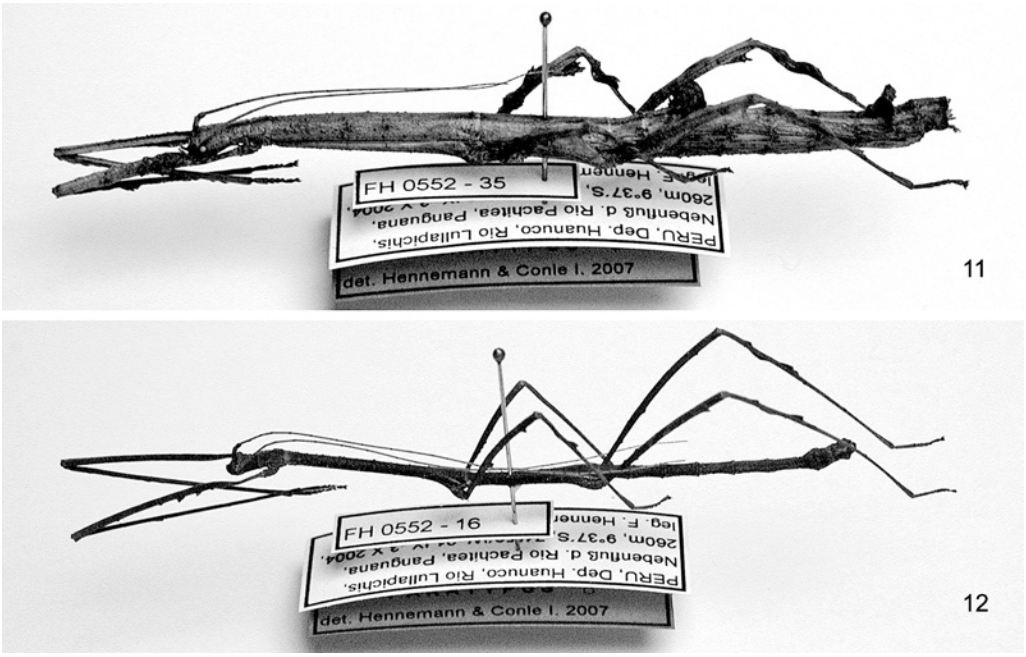

Figs 11-12: *Lobolibethra panguana* **sp. n.**: **11.** habitus of ♀, PT (coll. FH); **12.** habitus of ♂, PT (coll. FH).

much more decided nodes along the lateral margins. Mesopleurae granulose and to a various degree set with rounded nodules. Metanotum about as broad but only about half the length of mesonotum, parallel-sided; structured like mesonotum but longitudinal median keel more decided and becoming more distinct in posterior half of segment; posteriorly terminating in a small scale-like tubercle. Metapleurae granulose and irregularly set with single nodules. Meso- and metasternum granulose and tuberculose to a variable degree; the first with a fine longitudinal carina along lateral margins.

Abdomen: Median segment contained almost 4.4x in length of metanotum, wider than long, anterior margin very gently rounded; surface granulose and with four faint, irregular carinae. Abdominal segments II quadrate, III-VI slightly longer, of equal length and slightly longer than wide; VII somewhat narrower than previous. Tergites II-IX irregularly but acutely multi-carinae, X tri-carinate; all sparingly granulose. Sternites II-VII granulose and tuberculose, on II the tubercles roughly arranged in two converging longitudinal rows; II-V with a pair of nodules close to posterior margin. Praeopercular organ indistinct, formed by two rough humps close to posterior margin of sternite VII. Posterior margin of tergite II with two median longitudinal carinae each posteriorly terminating in a ± decided tubercle or composite spine-like projection. III with similar structure or posterior margin furnished with a ± developed transverse, foliaceously extended plate or lobe which shows strong polymorphy concerny to the size and shape (➜ see comments on variation below). If such a lobe or plate present then the two median longitudinal carinae each developed into a ± decided dentate lobe just in front. Tergites IV-VII with the two median longitudinal carinae distinct and posteriorly terminating in small rounded or dentate lobe; indistinct on VII. VIII slightly more than ¾ the length of VII, as broad as posterior margin of VII, rectangular and just slightly longer than wide. Dorsal surface with the two median longitudinal carinae each terminating in a blunted tubercle or forming two lobes of extremely variable size, shape and structure (➜ see comments on variation below). IX slightly shorter than VIII, quadrate, the two median longitudinal carinae supplied with tubercles and spine-like projections, which are most distinct and often composite to form small crenulated lobes posteriad. Anal segment slightly longer than IX, tri-carinate, the lateral angles rounded and strongly deflexed (Fig. 14), the posterior margin excavated at the lateral angles and with a minute median indention (Fig. 13). Supraanal plate very small and very indistinctly projecting over anal segment. Cerci small, conical and slightly projecting over posterior margin

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of anal segment. Subgenital plate rather short, strongly convex and rounded boat-like, reaching about ¼ the way along anal segment; apex broad and rounded truncate (Fig. 15). Basal half of ventral surface granulose, apical half prominently strumose and rugose, lateral surfaces supplied with an irregularly ledge-like longitudinal carina. Lower gonapophyses covered by subgenital plate. Paraproct granulose and in the centre with two short, parallel keels, each supplied with a few minute tubercles.

Legs: All moderately long and slender; profemora about as long as mesothorax, mesofemora in average reaching half way along median segment, metafemora reaching to posterior margin of abdominal tergite V. All lateral surfaces sparingly set with small granules and nodules. Profemora with the anteroventral carina strongly raised, gently lamellate and wave-like. Posteroventral carina supplied with a ± distinct, dentate lobe about 1/3 off the apex and 1-3 decidedly smaller, spine- or lobe-like teeth irregularly positioned throughout basal two thirds. Medioventral carina distinct, gently elevated and rounded just in front of basal constriction, directed towards the interior and slightly displaced towards anteroventral carina; both unarmed. Protibiae at least with one enlarged, rounded and denticulate lobe 1/3 off the base on posterodorsal carina; following portions with a variable number of variably sized and shaped lobe-like teeth; occasionally a somewhat larger one 1/3 away from the apex. Anterodorsal carina with a few small lobules. Mesofemora with anteroventral carina furnished with two large, foliaceous and irregularly dentate lobes, the basal one rather rounded, the apical one more triangulate; these of variable size and shape (➜ see comments on variation below, Fig. 16). Posteroventral carina with two rounded elevations, the basal one larger. Anterodorsal carina with two prominent lobes of variable size and shape, the apical one larger and rather triangulate; posterodorsal carina with two lobes of moderate size. Medioventral carina very faint and unarmed. Anterodorsal carina of mesotibiae supplied with a rounded lobe sub-basally and a distinct, rounded or dentate lobe about 1/3 off the base; one or two further roughly triangular teeth in apical two thirds, the apical one smaller. Posterodorsal carina with a small lobe 1/3 off the base. Medioventral carina strongly elevated and rounded some ¼ off the base and just between the two lobes of the anterodorsal carina. Hind legs generally as median pair of legs, but armature slightly less prominent. Tarsi of moderately elongate, slightly more than ¼ the length of corresponding tibia. Basitarsus about as long as following three tarsomeres combined.

♂♂ (Fig. 12 & 40). Size medium (body length 44.3-67.0 mm), form very slender, elongate and stick-like (body width 1.3 mm); the legs long and slender with single leaf-like teeth. Body surface sparingly granulose and tuberculose. General colouration greyish mid to dark brown. Granules and nodules of the thorax of a slightly paler colour. Posterolaterally the mesonotum bears a short, longitudinal pale cream stripe close to each lateral margin; lateral skins of median segment of similar colour. Head occasionally with a faint but broad blackish postocular stripe. Antennae pale to mid brown and slightly paler at the apex, which bears a few fine blackish annulations.

Head: Generally as in ♀♀, but more decidedly narrowed from the eyes towards the base. Region between the eyes raised, spine-like processes more distinct than in ♀♀; ± elongate and acute. Vertex flat and supplied with a few small granules. Lateral surfaces with a slightly impressed postocular line. Eyes rather large, length contained slightly more than 3x in that of cheek. Antennae generally structured as in ♀♀ and consisting of about 37 segments, but reaching to posterior margin of abdominal tergite IV; antennomeres in basal half of antennae comparatively longer than in ♀♀.

Thorax: Pronotum slightly shorter and narrower than head and about 1.3x longer than wide; weakly constricted medially. Surface minutely granulose. Transverse median depression distinct, decidedly curved but not reaching to lateral margins of segment. Median line faint, slightly impressed. Mesothorax cylindrical and widened posteriad; almost 7x longer than pronotum. Mesonotum parallel-sided; posterolaterally with very minute (0.5 mm) spatulate traces of tegmina. Metathorax a little more than half the length of metanotum, very slightly constricted medially. All segments to a variable degree set with numerous granules of various sizes, the meso- and metanotum with single additional nodules and a very weakly indicated longitudinal median carina; granulation of pleurae and sterna slightly less decided.

Abdomen: Median segment contained more than 7x in length of metanotum, form slightly trapezoidal, longer than wide; surface sparingly granulose and with three very weakly indicated carinae. Segments II-VI all gently constricted medially with the posterolateral angles weakly deflexed and slightly increasing in length; II 2.3, VI 2.6x longer than wide. II almost twice the length of median segment, VI longest, VII ¾ the length of VI. All irregularly supplied with granules of variable size and single small nodules, all with faint longitudinal carinae which become increasingly more distinct towards the more apical tergites. Posterior

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margin of III and IV occasionally with a rather well decided, scale-like median tubercle. Sternites II-VII granulose and nodulose with a faint longitudinal median carina. Tergite VIII about 2/3 the length of VII, trapezoidal with the posterior margin almost 2x wider than anterior margin; multi-carinate dorsally. The two median longitudinal carinae each terminating in a ± decided tubercle at posterior margin of segment. IX almost as long as VII gradually but decidedly narrowed towards the posterior, slightly constricted medially, dorsal surface distinctly carinate. Anal segment 2/3 the length of IX, constricted at the base with the lateral margins slightly deflexed and the lateral surfaces gently convex, posterior margin with a wide median indention. Dorsal surface with a distionct longitudinal median carina (Fig. 20). Supraanal plate very small and hidden completely under anal segment. Cerci of moderate size, elongate, cylindrical in cross-section and weakly incurving with the apex gently club-like. Vomer well developed, elongated triangular with a well defined, straight acute terminal hook (Fig. 21). Poculum strongly convex and cup-like, posterior margin deflexed, angulate and with a wide, rounded median excavation, ventral surface at the angle with a short but prominent, laterally compressed keel; hardly projecting over posterior margin of tergite IX (Fig. 21).

Legs: Profemora slightly longer than pro- and mesonotum combined, mesofemora reaching half way along tergite II, metafemora reaching to posterior margin of VII. Profemora with the anterodorsal carina pronounced. Posteroventral carina of profemora with 1-4 ± distinct triangular teeth in the median portion; other carinae unarmed. Medioventral carina distinct and displaced towards anteroventral carina. Protibiae dorsally with a rather distinct rounded or triangular lobe 1/3 off the base and occasionally with a further small lobule 1/3 off the apex. Both ventral carinae of mesofemora in basal half first with a small, slender tooth followed by a prominent, rounded to slightly triangular lobe; each carina often with 1-2 further minute teeth. All other carinae unarmed, the medioventral carina moderately distinct. Mesotibiae dorsally with a minute tooth sub-baselly, one or two decidedly more distinct teeth or lobes some 1/3 off the base and ususlla with one or two small teeth in apical half. Medioventral carina protruded into a broad triangular teeth about ¼ off the base and between the dorsal armature. Armature of hind legs similar but that of the femora much less prominent than on mesofemora. Tarsi slender and elongate, about ¼ the length of corresponding tibia. Basitarsus almost as long as remaining tarsomeres except claw.

Variation

♀♀ in particular show strong intra-specific variation concerning to the size, colouration as well as to the size, shape and structure of the leg armature and lobes of the abdominal tergites III and VIII.

The general colouration ranges from pale to very dark brown and almost black, more rarely greenish brown or dull green. A great majority of specimens are of a plain colouration (Fig. 39), often exhibiting irregular darker or paler speckles, but quite frequently specimens occur which have the dorsal body surface with two more or less distinct parallel, longitudinal median lines or stripes. More rarely specimens may even have the dorsal body surface and legs furnished with several bold, often triangular or trapezoidal white markings, providing a rather good lichen-mimic for brown and moss-like appearance in green specimens (Fig. 38).

The posterior lobes of abdominal tergites III and VIII underlie strong variability, all either being rounded and foliaceous (Fig. 14) or with the outer margin more or less decidedly crenulated or dentate (Fig. 17). The paired lobes of VIII show even higher polymorphy then the lobe of tergite III (figs 16-18) and may be completely lacking (Fig. 16) or just represented by a pair of tubercles in about 30% of the wild specimens at hand for examination. Occasionally a further pair of enlarged tubercles or lobe-like spines is present on tergite IX (figs 17 & 18). Specimens with a well developed transverse lobe on tergite III usually possess a small pair of parallel, longitudinal, dentate lobes directly in front.

The leg armature in particular shoes striking variability which is by far too wide to be summarized in whole below. Almost every lobe or appendage is variable to a varying degree, but the most considerable variation concerns to the shape of the large foliaceous lobes of the anteroventral carina of the meso- and metafemora. In a vast majority of specimens these are separated from another to a variable degree but may in some specimens be united to form a single, ledge- or lamella-like extension, which covers the complete length of the femur.

♂♂ show variation concerning to the size and number of the teeth of the legs and armature of abdominal tergites III and IV. The number of teeth on the posteroventral carina of the profemora in particular shows to be variable, ranging from 1-4.

Eggs (Figs 32 & 33)

Medium-sized, capsule globose, about 1.5x longer than wide, slightly laterally flattened and oval in cross-section; dorsal portion strongly convex. Capsule surface strongly shiny and very minutely granulose.

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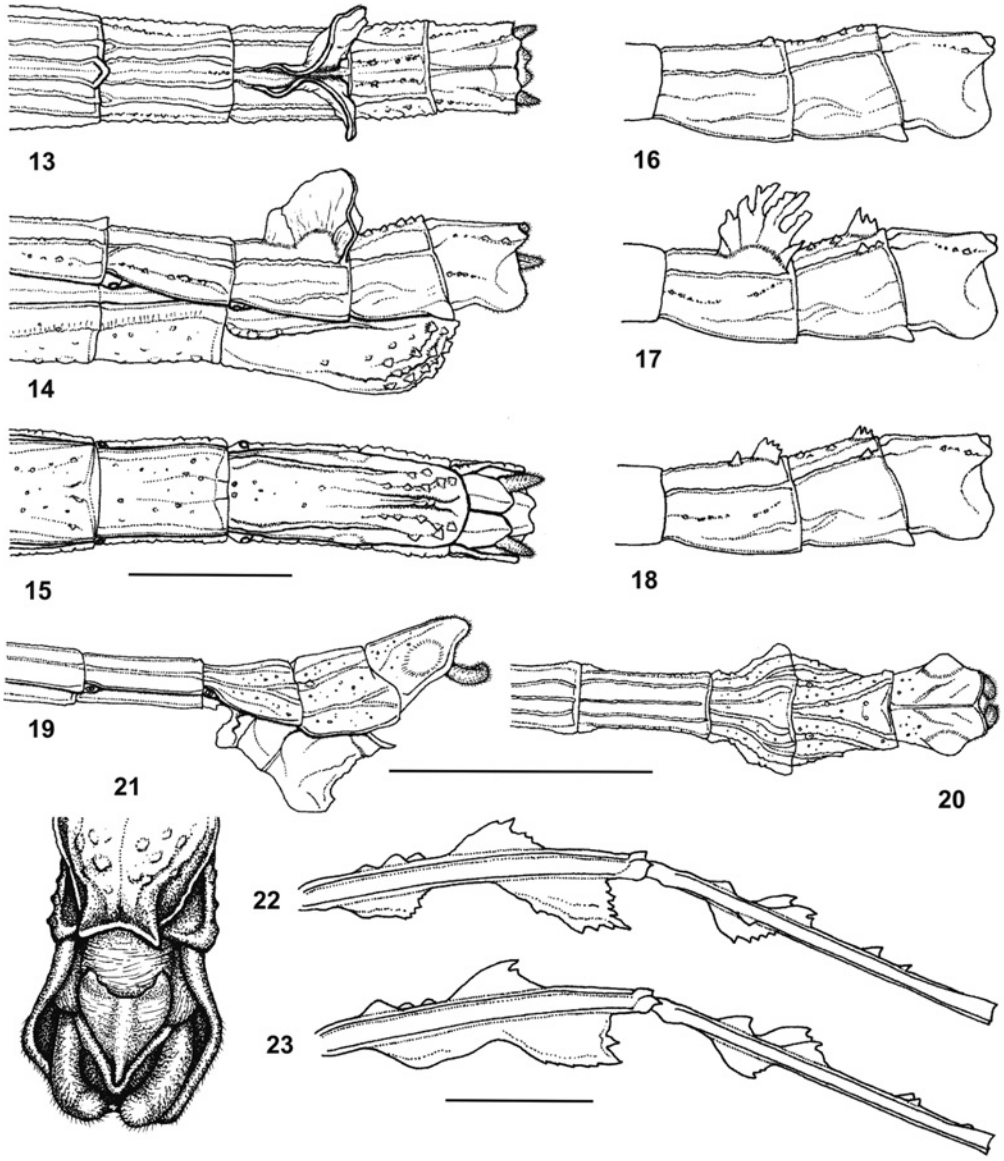

Figs 13-22: *Lobolibethra panguana* **sp. n.** [scale = 5 mm]: **13.** Dorsal view of apex of abdomen, ♀ (PT); **14.** Lateral view of apex of abdomen, ♀ (PT); **15.** Ventral view of apex of abdomen, ♀ (PT); **16.** Abdominal tergites VIII-X in lateral aspect, ♀ (PT); **17.** Abdominal tergites VIII-X in lateral aspect, ♀ (PT); **18.** Abdominal tergites VIII-X in lateral aspect, ♀ (PT); **19.** Lateral view of apex of abdomen, ♂ (PT); **20.** Dorsal view of apex of abdomen, ♂ (PT); **21.** Ventral view of anal segment, ♂ (PT) [enlarged]; **22.** Lateral view of left mid leg, ♀ (PT); **23.** Lateral view of left mid leg, ♀ (PT).

Micropylar plate elongate, parallel-sided, almost 4/5 the length of capsule. Outer margin broadly but very weakly raised. Posteromedially with a small, but decided and well defined, oval excavation. Micropylar cup small and positioned close to posterior margin of plate. Internal micropylar plate open with a broad oval notch posteromedially and a short median line, positioned somewhat towards the polar-area. Median line very faint and reaching about half way to polar-area. Operculum elliptical, gently elevated towards the dorsal

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surface, outer section flat, interior portion with a gently, irregularly raised, hollow-net-like structure. Opercular angle almost 90˚. General colouration of capsule creamish ochracheous, the region around the micropylar plate widely sepia. Lateral surfaces each with a large, ± decided oval marking; this of a creamish mid brown colour with the outer margin sepia. Interior portion of micropylar plate pale sepia, the outer margin broadly whitish to ivory. Flat outer portion of operculum pale grey, central structure gold-brown to amber.

As the innumerable eggs at hand do not show any considerable size-variation average measurements are given (in mm): overall length 3.0, capsule length 2.8, width 1.8, height 2.5, length of micropylar plate 2.3.

Comments

L. panguana **sp. n.** is apparently abundant around the guest house of Panguana and was commonly encountered in primary rain forest close to the Rio Yuyapichis in autumn 2004. It is hydrophilic and in particular restricted to the more moist sections of the research station, being found on low growing vegetation along the paths. Most specimens were found between 30 cm and 3 metres off the ground and all stages of development, from newly hatched nymphs to adults, occured at the same time. In its natural habitat *L. panguana* **sp. n.** is rather polyphagous and accepted various plants, including ferns (Polypodiaceae) and different Araceae in captivity in Peru.

Almost 150 eggs were obtained from live ♀♀ and brought back to Germany for breeding purposes. In humid conditions and temperatures of 22-28˚C this species has proven quite easy to rear in captivity in Europe. Alternative food plants accepted include bramble (*Rubus fruticosus*, Rosaceae), rose (*Rosa* spp., Rosaceae), oak (*Quercus robur* & *Q. petraea*, Fagaceae) and *Scindapsus aureus* (Araceae). Eggs of the F1 and F2-generations were distributed to various breeders throughout Europe and currently *L. panguana* **sp. n.** is being quite commonly and successfully reared.

Distribution

East Peru (Huanuco Province, Rio Yuyapichis, "Panguana" 260 m).

	boliviana **sp. n.** ♀ HT (ZSMC)	*mutica* **sp. n.** ♀ HT (ZSMC)	*panguana* **sp. n.** ♀ HT (MUSM)	*panguana* **sp. n.** ♂♂ PT	*panguana* **sp. n.** ♀♀ PT
Body	65.1	54.8	60.4	44.3-67.0	55.7-72.0
Pronotum	4.0	2.9	4.3	2.0-2.3	3.0-4.3
Mesonotum	17.5	13.8	15.8	12.9-17.0	14.9-16.9
Metanotum	7.3	6.7	7.6	6.9-10.9	7.4-9.0
Median segment	2.3	1.7	2.2	1.2-1.5	2.0-2.2
Profemora	18.2	15.8	17.5	15.3-22.5	14.4-17.0
Mesofemora	14.0	11.2	11.1	10.6-13.7	9.9-11.7
Metafemora	17.7	14.7	14.7	14.3-18.0	12.6-14.8
Protibiae	19.2	17.9	17.7	18.9-22.3	16.1-20.0
Mesotibiae	15.0	12.1	13.7	13.0-15.8	11.3-13.1
Metatibiae	21.0	17.5	17.8	17.2-22.2	16.0-18.7
Antennae	33.4	36.8	34.0	34.5-42.0	29.5-36.0

Table 2: Measurements [mm] of Lobolibethra **n. spp.**

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Tribe Ocnophilini

Ocnophiloidea ZOMPRO, 2001

Type-species: *Libethra regularis* BRUNNER v. WATTENWYL, 1907: 308, by original designation.

Ocnophiloidea ZOMPRO, 2001: 236, Figs 61-62, 114-115 & 137-138.
ZOMPRO, 2004: 315.
OTTE & BROCK, 2005: 231.
Libethra, BRUNNER v. WATTENWYL, 1907: 303 (in part - **not** Stål, 1875).

Comments
ZOMPRO (2001: 236) established *Ocnophiloidea* solely for the type-species *Libethra regularis* BRUNNER v. WATTENWYL, 1907 and placed it in close relation to *Ocnophila* BRUNNER v. WATTENWYL, 1907 (Type-species: *Ocnophila integra* BRUNNER v. WATTENWYL, 1907). Furthermore, ZOMPRO (2001: 235) described *Exocnophila* (Type-species: *Exocnophila exintegra* ZOMPRO, 2001) which he stated to resemble at first view *Ocnophiloidea*. Obviously these two genera are very closely related, but the differential diagnosis for *Ocnophiloidea* only mentions features which distinguish it from *Ocnophila*. The key to the ♀♀ of Ocnophilini presented by ZOMPRO (2001: 233) distinguishes *Ocnophiloidea* and *Exocnophila* solely by whether abdominal tergite VIII is longer (*Ocnophiloidea*) or "similar in length" to tergites IX and X (*Exocnophila*). Obviously this distinction is rather insufficient and weak as a key feature. In addition to not differentiating *Ocnophiloidea* from the closely related *Exocnophila*, ZOMPRO did not define the additional features that separate these two genera, e.g. the shape of the subgenital plate and head.

As generic characters ZOMPRO stated the meso- and metafemora to be unarmed and the head to bear two spines between the eyes, but these features are only true for the genotype *O. regularis* (BRUNNER v. WATTENWYL). ♀♀ of the here newly described Peruvian species exhibit small, rounded dorsal and ventral lobes on both the meso- and metafemora, and both sexes lack spines between the eyes.

Features which distinguish *Ocnophiloidea* from the other three genera of Ocnophilini are: the decidedly reduced subgenital plate of ♀♀, which is strongly tapered towards a notched apex and never extends as far as to the posterior margin of the anal segment, as well as the slender and straight to gently incurving cerci of ♂♂.

Distribution
The type-species is endemic to Trinidad. *O. dillerorum* **sp. n.** occurs in the Huanuco Province of eastern Peru. The large distance between these two species, shows the distributional range of *Ocnophiloidea* to include great parts of the Amazon basin and emphasizes our still very limited knowledge of the various genera and species of Ocnophilini.

Species included
1. *Ocnophiloidea dillerorum* **sp. n.** [E-Peru: Huanuco Province]
2. *Libethra regularis* BRUNNER v. WATTENWYL, 1907: 308. [Trinidad]

Ocnophiloidea dillerorum **sp. n.**
(Figs 24-31, 34-37)

HT, ♂: Peru, Panguana, Rio Llullapichis, rechter Nebenfluß des Rio Pachitea, 9˚73'S, 74˚56'W, 28.09.-06.10.2000; leg. 28.09.-06.10.2000, E.-G. BURMEISTER, E. DILLER, T. KOTHE & W. SCHLANG (MUSM, ex coll. ZSMC).

PT (23 ♂♂, 52 ♀♀, 21 nymphs, eggs): 1 ♀: Peru / Amazonia, Prov. Huanuco, Rio Yuyapichis, "Panguana", VII.1982, leg. BURMEISTER (ZSMC ➜ evtl. MUSM); 1 nymph: Peru, Huánuco, Yuyapichis, Panguana, 9˚73'S, 74˚56'W, 260m, 6-IV-2003, leg. T. KOTHE (ZSMC); 1 ♂: Peru, Huánuco, Yuyapichis, Panguana, 9˚73'S, 74˚56'W, 260m, 6.4.-17.4-2003, leg. BURMEISTER (ZSMC); 2 ♂♂, 5 ♀♀, 20 nymphs: Peru, Dep. Huanuco, Rio Yuyapichis, Nebenfluß d. Rio Pachitea, ZSM-Forschungsstation Panguana, 9˚73'S, 74˚56'W, 260m, 22.09.-03.10.2004, leg. O. CONLE & F. HENNEMANN (ZSMC); 1 ♀: Peru, Dep. Huanuco, nr. Pucallpa

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- Tingo Maria km11, Divina Montana, 19.-20.IX.2004, leg. F. HENNEMANN & O. CONLE (coll. FH 0553-1); 9 ♂♂, 9 ♀♀, 8 eggs: Peru, Dep. Huanoco, Rio Lullapichis, Nebenfluß d. Rio Pachitea, Panguana, 260 m, 9°73'S, 74°56'W, 21.IX.-3.X.2004, leg. F. HENNEMANN & O. CONLE (coll. FH 0553-2 to 19 & E); 5 ♀♀: ex Zucht O. CONLE,2006, Herkunft: Peru, Panguana (coll. FH 0553-20 to 26); 1 ♀: ex Zucht: F. HENNEMANN 2006, Herkunft: Peru, Panguana, F3-Generation (coll. FH 0553- 20); 11 ♂♂, 15 ♀♀, eggs: Peru, Dep. Huanuco, Rio Yuyapichis, Nebenfluß d. Rio Pachitea, ZSM-Forschungsstation Panguana, 9°73'S, 74°56'W, 260m, 22.09.-03.10.2004, leg. O. CONLE & F. HENNEMANN (coll. OC); 15 ♀♀: ex Zucht 2006, Zuchtstamm aus Peru, Panguana, (coll. OC).

Etymology

This pretty new species is dedicated to Dr. Juliane DILLER and Erich DILLER (both ZSMC), owners of the well-known scientific research station "Panguana" in eastern Peru, for the generous allowance to visit the station and arranging an entomological expedition of the State Zoological Collections Munich (ZSMC) to "Panguana" in autumn 2004.

Differentiation

Distinguished from the type-species by: the lack of a pair of spines between the eyes and interobasally not deflexed meso- and metafemora of both sexes; distinctly lobed anteroventral carina of the mesofemora, differently shaped anal segment, comparatively smaller cerci, shorter subgenital plate and occasional presence of a transverse posterior lobe on abdominal tergites III and IV of ♀♀, as well as the lack of a longitudinal lateral black line along the meso- and metathorax, more decidedly carinate abdominal tergites, differently shaped anal segment and poculum of ♂♂. The eggs differ by the much more elongate and slender micropylar plate, which lacks a broad whitish outer margin, and the distinct net-like structure of the capsule.

Description

♀♀ (Figs 24 & 36). Of average size for the genus (body length 48.6-57.0 mm), form moderately robust (maximum width at tergite IV 4.0-5.0 mm) with the basal half of the abdomen gently swollen (almost parallel-sided in very young specimens not in egg-production). General colouration variable, ranging from plain pale to very dark brown, more rarely dark green. Entire dorsal body surface rugose, the meso- metathorax and complete abdomen with a blunt longitudinal median keel. A dorso-lateral carina indicated on meso- and metanotum and the median segment, the abdominal tergites irregularly multi-carinate. Tergite III with or without a transverse lobe at posterior margin.

Head: Elongate, sub-cylindrical in cross-section, parallel-sided. Vertex flat and sparingly covered with granules; usually two slightly enlarged granules near posterior margin. Lateral surfaces with a slightly impressed longitudinal postocular line. Eyes of moderate size, length contained three times in that of cheek, circular and projecting hemispherically. Antennae filiform, extending half way along metanotum; occasionally as far as to the posterior margin of median segment. Scapus dorsoventrally compressed, conspicuously elevated laterally with the outer margin gently rounded; about 1.3x longer than wide. Pedicellus cylindrical, almost 2x longer than wide and about 2/3 the length of scapus. Third antennomere very elongate, almost as long as two basal segments combined. Following decreasing in length towards apex of antennae; all densely covered with pale setae.

Thorax: Pronotum about as long and broad as head, about 1.3x longer than wide, anterior half very faintly constricted. Surface granulose, the transverse median depression very strongly curved with the ends terminating almost parallel to lateral margins. Mesothorax elongate, somewhat more than 4x the length of pronotum; mesonotum parallel-sided. Surface very sparingly set with single blunt nodes. Mesopleurae with a very fine, irregular, longitudinal carina set with a longitudinal row of 6-8 ± distinct granules. Mesosternum very slightly rugulose. Metanotum parallel-sided as broad but only a little more than 1/3 the length of mesonotum; structured like mesonotum. Metapleurae slightly rugulose; metasternum like mesosternum. The mediodorsal keel of both the meso- and metanotum with a fine central impressed line.

Abdomen: Median segment very short and almost contained 5x in length of metanotum, wider than long; anterior margin ± rounded. Depending on age of specimen, abdominal segments II-VII are roughly quadrate to slightly wider than long; II and II gently widened, IV broadest, V-VII slightly tapering. II shorter than following segments, III-VII of similar length. Tergite III unarmed, or with a ± large, scale like to foliaceous, transverse lobe at posterior margin; this of variable size and shape (➜ see comments on variation below). Occasionally a much smaller, scale-like lobe is present on IV, and the two inner longitudinal carinae may terminate in ± distinct nodes on V. Tergites II-IV often supplied with irregularly scattered nodules and tubercles. Sternites II-VII furnished with four longitudinal carinae; VII with two slightly raised oval regions, which are densely

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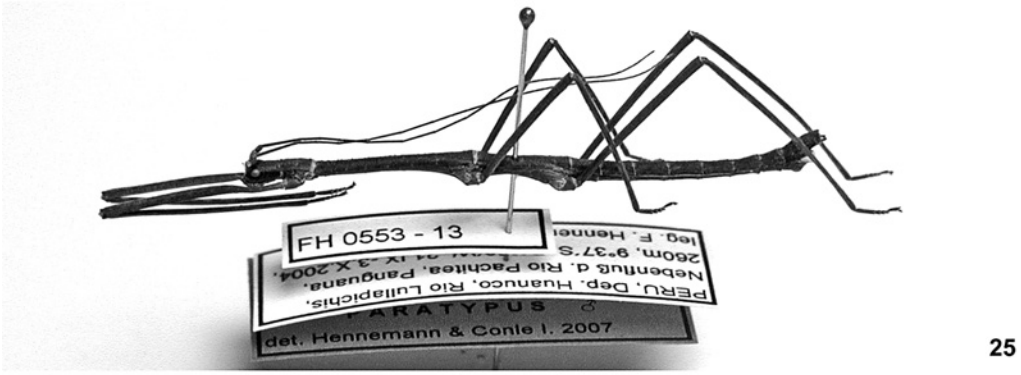

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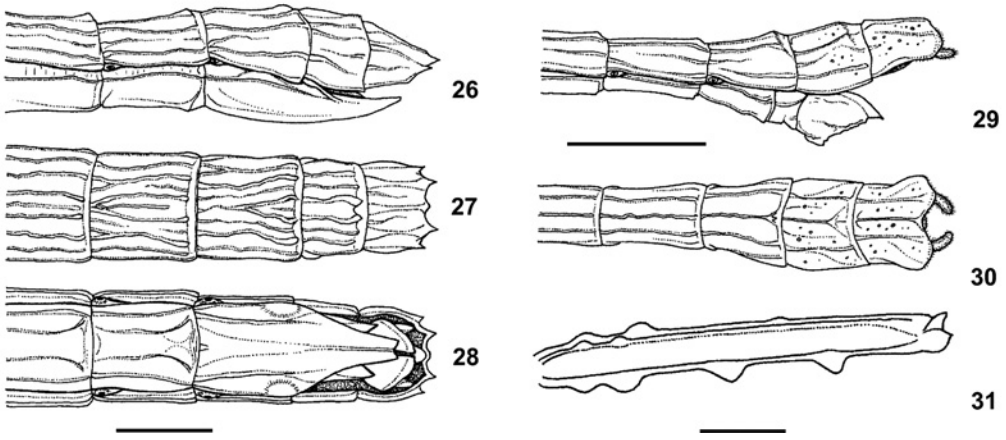

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Figs 24-31: *Ocnophiloidea dillerorum* **sp. n.** [scale = 5 mm]: **24.** Habitus of ♀, PT (coll. FH); **25**. Habitus of ♂, PT (coll. FH); **26.** Lateral view of apex of abdomen, ♀ (PT); **27.** Dorsal view of apex of abdomen, ♀ (PT); **28.** Ventral view of apex of abdomen, ♀ (PT); **29.** Dorsal view of apex of abdomen, ♂ (PT); **30.** Lateral view of apex of abdomen, ♂ (PT); **31.** Lateral view of left mesofemur, ♀ (PT).

covered with very minute spine-like processes. Tergite VIII somewhat shorter than VII and very gently broadened in posterior half, the posterior margin being slightly broader than the anterior margin; about 1.3x longer than wide. IX less than 2/3 the length of VIII, wider than long; the two inner longitudinal carinae each terminating in a ± distinct tubercle. Anal segment slightly narrower than IX, tapered in posterior half, the

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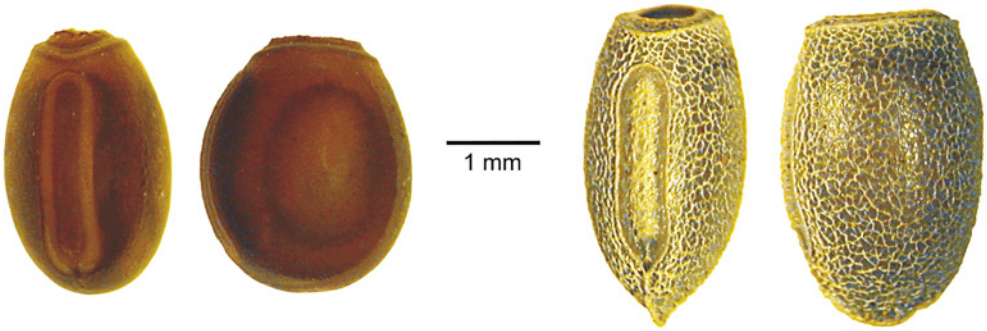

Figs 32-34: Eggs [scale = 1 mm]: **32.** *Lobolibethra panguana* **sp. n.**, PT, dorsal view (coll. FH); **33.** *Lobolibethra panguana* **sp. n.**, PT, lateral view (coll. FH); **34.** *Ocnophiloidea dillerorum* **sp. n.**, PT, dorsal view (coll. FH); **35.** *Ocnophiloidea dillerorum* **sp. n.**, PT, lateral view (coll. FH).

	♂ HT (MUSM)	♂♂ PT	♀♀ PT
Head	49.1	38.5-47.6	48.6-57.0
Pronotum	3.5	2.1-2.6	3.2-3.9
Mesonotum	14.8	9.8-13.7	12.0-13.1
Metanotum	6.6	4.7-6.1	4.9-5.2
Median segment	1.3	1.1-1.2	1.2-1.4
Profemora	17.1	12.7-14.8	12.6-12.9
Mesofemora	12.8	10.0-12.1	10.2-11.1
Metafemora	15.9	12.8-15.3	13.2-13.3
Protibiae	16.8	14.8-16.9	12.8-14.7
Mesotibiae	14.7	11.9-13.4	10.5-10.8
Metatibiae	21.4	16.8-19.3	15.2-16.9
Antennae	33.0	31.5-33.0	21.5-27.5

Table 3: Measurements [mm] of *Ocnophiloidea dillerorum* **sp. n.**

posterior margin straight with a small spine-like projection at each lateral angle; surface tri-carinate (Fig. 27). Supraanal plate very small and hidden underneath anal segment. Cerci very small, cylindrical and hardly projecting over posterior margin of anal segment. Subgenital plate rather small, slender, gently convex and strongly tapered in posterior half towards a slender, truncate and ± decidedly notched apex; reaching about half way along anal segment (Fig. 28).

Lower gonapophyses short, conical and projecting laterally over subgenital plate.

Legs: All of moderate length and strength; profemora about as long as mesothorax, mesofemora almost as long as metathorax and three basal abdominal segments combined, metafemora reaching at least half way along abdominal tergite VI (depending on age of specimen). All three pairs of legs decidedly carinate, all femora and tibiae slightly trapezoidal in cross-section. Profemora strongly compressed and curved basally, the anteroventral carina gently raised. Protibiae with 3-8 small, rounded lobules which decrease in size towards the apex on both dorsal carinae. Mesofemora with single, minute lobules particularly in basal half of dorsal carinae; at least one slightly more distinct rounded lobule about one fifth of the base on posterodorsal carina. Anteroventral carinae with three distinct, rounded lobes, the basal one largest and the terminal one occasionally slightly triangular (Fig. 31). Posteroventral carina unarmed except for a ± decided minute lobule ¼ of the base.

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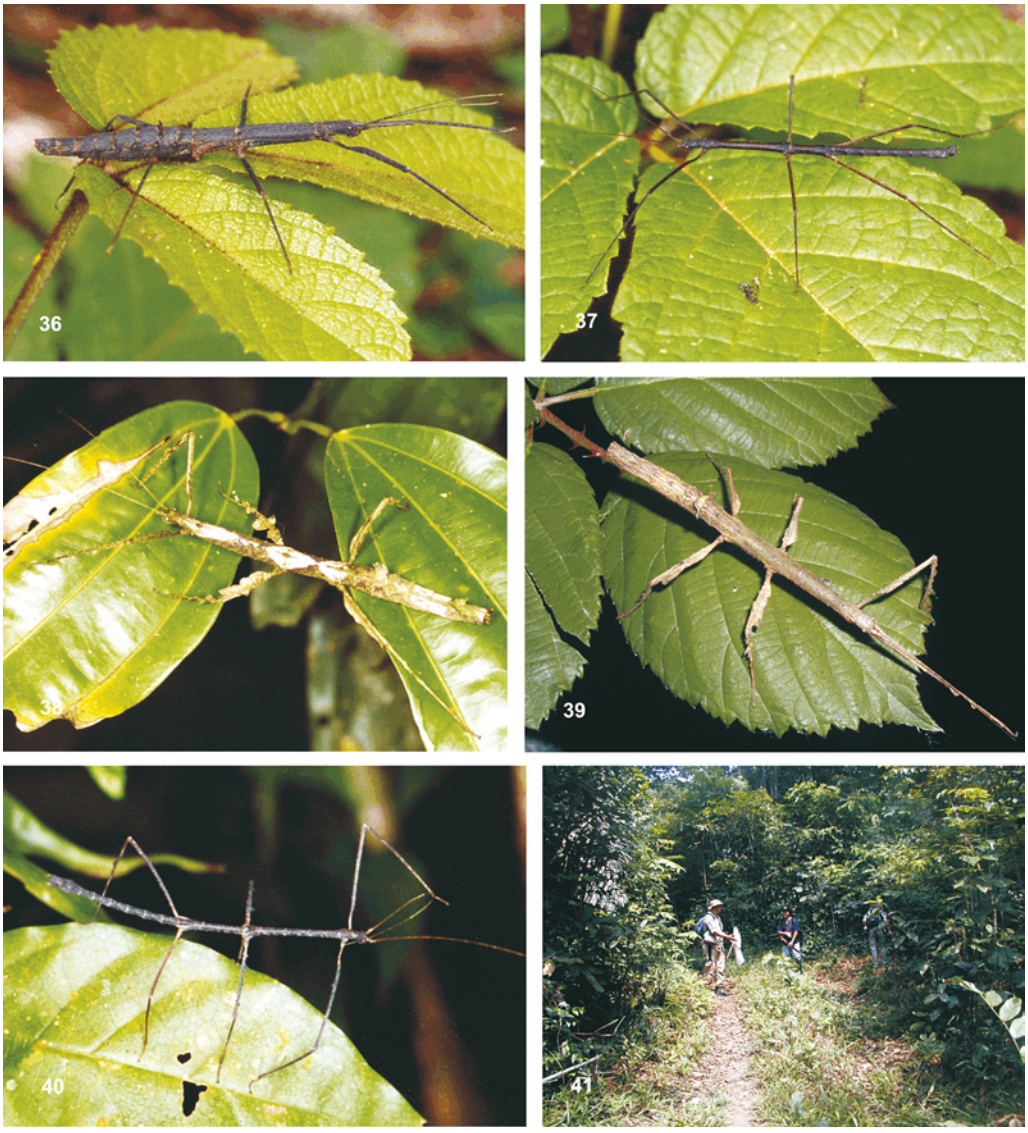

Figs 36-41 Live Insects; **36.** *Ocnophiloidea dillerorum* **sp. n.**, ♀ PT; **37.** *Ocnophiloidea dillerorum* **sp. n.**, ♂ PT; **38.** *Lobolibethra panguana* **sp. n.**, ♀ PT ("moss-like" variety with white markings); **39.** *Lobolibethra panguana* **sp. n.**, ♀ PT (plain brown variety); **40.** *Lobolibethra panguana* **sp. n.**, ♂ PT cleaning its left antenna; **41.** Tropical primary rain forest at "Panguana" (Peru), the type locality of *Lobolibethra panguana* **sp. n.** and *Ocnophiloidea dillerorum* **sp. n.**.

Mesotibiae and metafemora with a few very faint lobules dorsally. Metatibiae entirely unarmed. Medioventral carina of femora indistinct and unarmed. Tarsi delicate, less than 1/5 the length of corresponding tibia. Basitarsus about as long as combined length of following three tarsomeres.

♂♂ (Figs 25 & 37). Of average size for the genus (body length 38.5-49.1 mm), form slender and stick-like (average body width 1.3 mm), body almost of uniform width. Body all over but sparingly supplied with granules of variable size, the all abdominal tergites irregularly tri-carinate. General colouration plain mid to dark brown, head with an oval blackish area between the eyes. Larger granules of thorax may be pale greyishor straw. Antennae mid to dark brown but becoming ochracheous to straw at the apex.

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Head: Generally as in ♀♀ but less distinctly granulose and lacking two enlarged granules at posterior margin. Eyes relatively larger and sub-circular, strongly projecting hemispherically. Between the eyes with a gently convex oval area which is densely covered with very minute granules. Antennae generally as in ♀♀ but longer; projecting over abdominal tergite III.

Thorax: Pronotum generally as in ♀♀ but parallel-sided, granulation less distinct and transverse median depression faint. Mesothorax very elongate, slender and cylindrical except for being slightly widened at anterior and posterior margins, about 5.5x longer than pronotum. Granules laterally indicating a very indistinct and irregular longitudinal carina on each lateral surface of mesonotum. Metanotum about half as long as mesonotum gently constricted medially and with a faint longitudinal median carina; indistinctly tri-carinate. Meso- and metapleurae with a few minute granules placed in a longitudinal row. Meso- and metasternum without specializations.

Abdomen: Median segment about as long as wide, slightly trapezoidal with anterior margin narrower than posterior margin, its length contained almost 6x in that of metanotum; slightly tri-carinate. Segment II almost 2x longer than median segment, following roughly of equal length and about 1.6x longer than wide; all constricted medially. Tergites II-VI occasionally with a posteromedian node or tubercle. Base of the lateral carinae each with a ± decided granule close to anterior margin of tergites II-VI. Sternites II-VIII with two sub-parallel, longitudinal median carinae, and a fine carina along lateral margins. Sternite IX with two faint lateral nodes. Tergite VIII trapezoidal, gradually widened towards the posterior and about ¾ the length of VII. IX widest segment, roughly quadrate and about as long as VIII. Anal segment gently convex, narrowed anteriorly, the lateral margins slightly deflexed and rounded posteriorly and the posterior margin with a wide concave median excavation (Fig. 30). Ventral surface of posterior margin swollen on both sides the median excavation and covered with minute teeth. Supraanal plate very small, rounded triangular and very indistinctly projecting over posteromedian excavation of anal segment. Cerci small, cylindrical, almost straight and about ¾ the length of anal segment; distinctly bristled. Vomer well developed, flat and generally heart-shaped with the terminal hook short but acute; lateral margins very minutely denticulate. Poculum convex, cup-like rugulose and with the posterior margin acutely truncate; reaching about 1/3 the way along anal segment (Fig. 29).

Legs: All slender, of moderate length and relatively more slender and longer than in ♀♀. All distinctly carinate but unarmed; mesofemora may be very weakly laminate dorsally; the HT has a minute triangular teeth shortly before mid of anterodorsal carina. Cross-section of all femora and tibiae very slightly trapezoidal. Profemora somewhat longer than mesothorax, metafemora almost reaching to anal segment. Tarsi as in ♀♀ but comparatively more delicate.

Variation

In addition to the colouration, ♀♀ exhibit polymorphy in particular concerning to the armature of the abdominal tergites III and IV. A majority of wild specimens have tergite III furnished with a more or less prominent transverse lobe at posterior margin. This is of variable shape being more or less decided tri-lobate with the two outer lobes smaller than the interior lobe. About 30% of the ♀♀ at hand entirely lack this lobe. Tergite IV may be unarmed or bear a small scale-like posteromedian lobe; this is present in specimens with and without a lobe on tergite III. Furthermore, the lobes of the anteroventral carina of the mesofemora exhibit some variation concerning to the size and shape. Single ♀♀ may have the dorsal body surface with a faint dark longitudinal median stripe, or an indistinct blackish lateral stripe on the metanotum and basal half of the abdomen. ♂♂ do not show any considerable variation other than the number and size of granules on the thorax and degree of the carinae of the abdominal tergites.

Eggs (Figs 34 & 35)

Of average size for the genus (length 3.0-3.6 mm), capsule bullet-shaped, narrowed towards polar end, 1.8-1.9x longer than wide, decidedly laterally flattened and elliptical in cross-section; highest slightly below anterior end of micropylar plate. Capsule surface very minutely granulose and all over covered with a finely raised net-like structure. Over polar-area with a prominent and bulgy longitudinal keel, which dorsally starts at the polar apex of the micropylar plate and rather abruptly terminates in the lower portion of the ventral surface. In lateral aspect there is a faint, rounded indention shortly before where the polar keel terminates. Micropylar plate elongate, about 4.5x longer than wide, covering slightly more than half of dorsal egg surface. Anterior end broadly rounded, polar end acute, lateral margins-sub-parallel. Outer margin raised, the central portion convex with similar net-like structure as capsule, remaining portions flat and very minutely granulose. Micropylar plate position in very polar point of micropylar plate; distinct, oval and decidedly

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raised. Median line indistinct and externally melted with polar keel of capsule. Operculum oval, flat and smooth; outer margin strongly elevated and directed inwards; laterally structured like capsule, anterior margin obtuse and very minutely but densely granulose. General colouration of capsule and elevated outer margin of the operculum dark grey, the raised net-like structure and polar keel pale grey to ivory. Micropylar plate mid grey, the outer margin and central raised structures pale grey. Lower interior surface of operculum blackish brown to black.

Due to the eggs show considerable size-variation, measurements for the extremes are given (in mm): length 3.0- 3.6, width 1.7-1.9, height 2.3-2.5, length of micropylar plate 1.7-2.4.

Comments

Ocnophiloidea dillerorum **sp. n.** is quite frequently found around the guest house of Panguana and was commonly encountered in moist primary rain forest close to the Rio Yuyapichis. It is hydrophilic and in particular restricted to the more moist sections of the research station, being found on low growing vegetation along the paths. Most specimens were found between 30 cm and 2 metres off the ground and all stages of development, from newly hatched nymphs to adults, occured at the same time. In its natural habitat *O. dillerorum* **sp. n.** is rather polyphagous and accepted various plants, including different Araceae in captivity in Peru.

About 50 eggs were obtained from live ♀♀ and brought back to Germany for breeding purposes. In humid conditions and temperatures of 22-28˚C this species has proven quite easy to rear in captivity, although already the F1-generation became parthenogenetic. Alternative food plants accepted in Europe include bramble (*Rubus fruticosus*, Rosaceae), oak (*Quercus robur* & *Q. petraea*, Fagaceae) and *Scindapsus aureus* (Araceae).

Distribution

East Peru (Huanuco Province, Rio Yuyapichis, "Panguana" 260 m & Pucallpa, Divina Montana).

Acknowledgements

Thanks are due to Dr. Gerardo LAMAS (MUSM) for help in obtaining necessary permits and access to the collection of the Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima. Mrs. Rosario ACERO of INRENA (Instituto Nacional de Recursos Naturales) is thanked for support in obtaining the collecting and export permits. Dr. Mauro DACCORDI (MIZT) and Dr. Roberto POGGI (MCSN) are acknowledged for access to the corresponding collections.

Furthermore, we want to express our thanks to Prof. Klaus SCHÖNITZER (ZSMC), Dr. Andreas SEGERER (ZSMC), Tanja KOTHE (ZSMC) and Magdalena BREITSAMETER (Munich) for the nice and exciting time in Peru. Moro and Ibrahim MODENA (Panguana, Peru) and their family are thanked for the sincere hospitality and catering during our stay in the station.

Daniel PÉREZ-GELABERT (Washington D.C., USA) took photographs and measurements of the holotype of *Libethra peruana* CAUDELL in USNM and Paul D. BROCK (Slough, England) kindly provided a photo of the type specimens of *Libethra nisseri* STÅL in NHRS.

Finally, many thanks are due to Dr. Juliane DILLER and Erich DILLER (ZSMC) for allowance to visit "Panguana" and immense support in arranging the expedition and holding correspondence with INRENA.

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