

***Lautereropsis* gen.nov., a new psyllid genus from Nepal (Hemiptera, Psylloidea)**

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BURCKHARDT D. & MALENOVSKÝ I. 2003: *Lautereropsis* gen.nov., a new psyllid genus from Nepal (Hemiptera, Psylloidea). *Acta Musei Moraviae, Scientiae biologicae* (Brno) 88: 21–29. – The new genus *Lautereropsis* is described for *L. unifasciata* sp.nov. (type species), *L. pallidicornis* sp.nov., and *L. shiwapuriensis* (Miyatake, 1981) comb.nov. (from *Pauropsylla* Rübsaamen, 1899). The known distribution of *Lautereropsis* gen.nov. is so far restricted to Central and Eastern Nepal. The new genus is referred to the Psyllidae (Diaphorininae) based on characters of the hind legs and male terminalia. It is unique within the subfamily for having rhinaria on antennal segments IV to IX and long setae on the forewing membrane.

Key words. Psylloidea, Psyllidae, Diaphorininae, taxonomy, new taxa, Oriental region

Introduction

Jumping plant-lice or psylloids are a small group of highly host-specific phytophages with some 3000 described species world-wide. In the last 30 years, the higher classification has undergone drastic changes and many suprageneric taxa are now reasonably well-defined. There are, however, taxa that are difficult to define or to associate with existing groups. Such a taxon is the enigmatic *Pauropsylla shiwapuriensis* which was described by MIYATAKE (1981) on the basis of a single male from Nepal. HOLLIS (1984) showed in his revision of *Pauropsylla* Rübsaamen, 1899 that *P. shiwapuriensis* is assigned to the wrong genus and suggested that it may belong in the Aphalaridae near the *Haplaphalara-Diclidophlebia* group.

On a recent field trip to Nepal some specimens of two species apparently closely related to *P. shiwapuriensis* were collected by the senior author. On the basis of this material, a relationship to the *Haplaphalara-Diclidophlebia* group can be excluded. The presence of metabasitarsal spurs places the species outside the subfamily Paurocephalinae as defined by BURCKHARDT & MIFSUD (2003). Here we erect the new genus *Lautereropsis* gen.nov. to accommodate *P. shiwapuriensis* as well as the two new Nepalese species, and place it in the subfamily Diaphorininae (Psyllidae).

Material and Methods

The type material is deposited in the Naturhistorisches Museum Basel, Switzerland (NHMB). Specimens are dry or slide-mounted.

Morphological terminology follows mostly HOLLIS (1976, 1984) and OSSIANNILSSON (1992). Drawings and measurements were made of specimens permanently mounted in Canada balsam. Measurements are given in millimetres.

The following abbreviations are used in the descriptions:

AEL	length of distal segment of aedeagus
AL	antenna length (including scape and pedicel)
ALHW	ratio of antenna length to head width
FP	female proctiger length
FPC	ratio of female proctiger to circumanal ring length
FPHW	ratio of female proctiger length to head width
FPS	ratio of female proctiger to subgenital plate length
HW	head width
LAS	length of antennal segments I to X
MP	male proctiger length
MPHW	ratio of male proctiger length to head width
PL	paramere length
TLHW	ratio of metatibia length to head width
WL	forewing length
WLHW	ratio of forewing length to head width
WLW	ratio of forewing length to width.

Taxonomy

Lautereropsis gen.nov.

Type species: *Lautereropsis unifasciata* sp.nov., by present designation.

Description. Adult (Fig. 1). Entire body, including antennae, head, thorax, legs, forewings and abdomen, covered in long and relatively dense whitish or yellowish pubescence.

Head (Figs 2–3) distinctly narrower than mesoscutum, adpressed to thorax, deflexed at about 45° from longitudinal axis of body. Vertex transverse, half as long as wide; posterior margin slightly concave; with well-developed coronal suture. Discal fovea on vertex medially on either side of coronal suture deeply and largely depressed. Lateral ocelli in the posterolateral corners of vertex. Preocular sclerite developed, flat. Genal processes developed, about one third as long as vertex, hairy, conical, pointed apically, separated medially, diverging, situated below plane of vertex. Frons small, slightly larger than the median ocellus, posteriorly limited by genal processes. Clypeus small, pyriform and flattened. Rostrum short. Toruli placed anterodorsally on the genae. Antenna 10-segmented, relatively short and robust, about 1.2–1.3 times as long as head width, segment III the longest, slightly longer than the segments IV–VI together. Hairs on antenna about twice as long as diameter of segments. Apical setae subequal, longer than segment X. A single rhinarium and a bifid seta present subapically on each of segments IV–IX (Fig. 6).

Thorax robust, wide and flat. Pronotum short, about 1/3 to 1/4 of vertex length along the mid-line, deflexed, relatively flat laterally. Episternum larger than epimerum,

propleural suture forked dorsally. Hind margin of metacoxa irregularly curved; trochanteral cavity with small membranous tubercle. Meracanthus long, slender, projected ventro-caudad, blunt or acute (in *L. shiwapuriensis*) at apex. Metatibia lacking genual spine, bearing an open crown of 9–13 tightly packed black apical spurs, anteriorly larger than posteriorly. Metabasitarsus bearing two black spurs, slightly smaller than tibial spurs, according to the description of Miyatake lacking in *L. shiwapuriensis*. Forewing (Figs 4–5) large and broad, almost twice as long as wide, narrowly or broadly rounded apically with apex lying in the middle of cell *rs*; with species-specific brown pattern. Costal break present adjacent to pterostigma. Anal break lying at the apex of vein Cu1b. Pterostigma narrow. Membrane covered in surface spinules. Radular spinules present in all cells along outer and posterior wing margin, forming wide fields. Long setae present on veins, dense along foremargin, sparser on remaining veins and on membrane in all cells (Fig. 7), about 4 times as long as diameter of veins. Hind wing large, broad, about 4/5 as long as forewing, 2.5 times as long as wide; costal setae ungrouped; vein Cu branching off first, hence with R+M vein.

Abdomen shiny, hairs sparser than on head and thorax. Male terminalia (Figs 8, 11) with subglobular or slightly elongate subgenital plate, sparsely setose. Proctiger unipartite, sparsely covered in long setae, with tubular apical portion and large angular or rounded posterior lobe; lobes bearing groups of peg setae on internal face (Fig. 9). Paramere as long as or slightly shorter than proctiger, lamellar, covered in long setae, lacking peg setae in inner face (Fig. 10); with ridge along posteroanterior margin and flattened posteriorly, with posteroapical tooth (not examined in *L. shiwapuriensis*). Aedeagus two-segmented; basal portion U-shaped, slightly inflated in the middle, inner margin furrowed; apical segment straight with globular apical dilatation; sclerotised end tube of ductus ejaculatorius short. Female terminalia (Fig. 14) cuneate.

Biology. Larva and host plant unknown.

Distribution. Known only from Central and Eastern Nepal, at altitudes between 2700 and 3100 m.

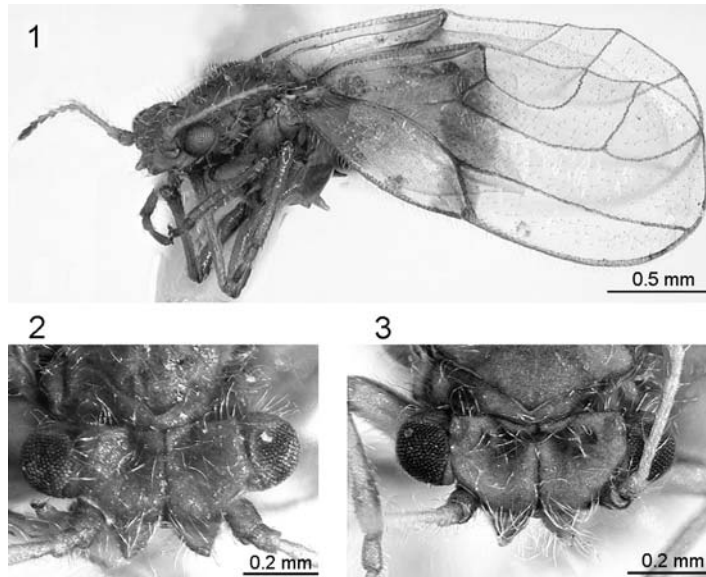
Name derivation. Named in honour of our friend, colleague and teacher, the Czech hemipterist Pavel Lauterer, on the occasion of his 70th birthday.

Differential diagnosis. Head bearing genal processes. Antenna 10-segmented, each with a rhinarium and an associated bifid seta on segments IV to IX. Forewing with costal break and anal break near apex of vein Cu1b; wing membrane covered in long setae. Metatibia with an open crown of apical spurs; metabasitarsus with spurs. Male proctiger with large posterior lobes.

Lautereropsis pallidicornis sp.nov. (Figs 2, 4, 6–10, 12)

Material examined. Holotype ♂: Nepal: Kosi, Phokde N of Bhalukhop, 27°24'N/87°25'E, 3100 m, 15–17.vi.2001, *Rhododendron*/Ericaceae forest, swept from vegetation in forest and cleared areas, D. Burckhardt (slide mounted, NHMB).

Description. Adult. Body coloration red to reddish brown. Antenna yellowish, basal segments ochreous, apical two segments light. Genal processes, genae and occiput



Figs 1–3. 1, *Lautereropsis unifasciata* sp.nov.: male habitus; 2, *Lautereropsis pallidicornis* sp.nov.: head, dorsal view; 3, *Lautereropsis unifasciata* sp.nov.: head, dorsal view.

ochreous. Forewing (Fig. 4) with ochreous veins, transparent; two well-delimited brown bands with irregular margins present in the basal part and proximally of the line pterostigma–Cul1b respectively; distal part of forewing membrane bearing a weak brown maculation across veins M1+2 and M3+4, infuscation extending into the adjacent cells. Hind wing transparent. Legs ochreous. Abdominal sclerites dark brown. Male subgenital plate dark brown, paramere and distal half of proctiger lighter.

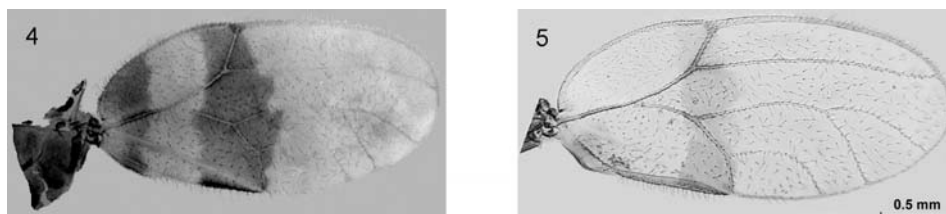
Structure. Genal processes with strongly diverging apices, inner margin evenly curved outwards (Fig. 2). Forewing (Fig. 4) oval. Meracanthus relatively short and robust, blunt apically. Male terminalia (Figs 8–10) with subglobular subgenital plate. Posterior lobes on proctiger angular posteriorly. Paramere relatively slender, almost as long as proctiger; in profile weakly narrowed in the middle, with small posteroapical tooth; bearing distinct flat tubercle in the basal third of foremargin; in caudal view (Fig. 12) weakly sinuous in apical third, thus inner outline strongly widened in apical third. Apical dilatation of distal segment of aedeagus subglobular. Female unknown.

Measurements and ratios (1♂): HW 0.73; AL 0.87; LAS 0.09:0.08:0.29:0.08:0.07:0.07:0.06:0.06:0.06:0.04; WL 2.23; MP 0.32; PL 0.28; AEL 0.26; ALHW 1.19; TLHW 0.44; WLHW 3.05; WLW 2.00; MPHWH 0.44.

Biology. Larva and host plant unknown.

Distribution. East Nepal.

Name derivation. The name refers to the two light apical antennal segments.



Figs 4–5. Forewing: 4, *Lautereropsis pallidicornis* sp.nov.; 5, *Lautereropsis unifasciata* sp.nov.

Differential diagnosis. *L. pallidicornis* sp.nov. differs from *L. unifasciata* sp.nov. and *L. shiwapuriensis* in the reddish brown body coloration, the light antennal segments IX–X, the forewing pattern consisting of two basal transverse bands and the strongly diverging genal processes. From *L. unifasciata* sp.nov. it differs in the relatively shorter (compared to head width) and broader (compared to length) forewing, the slightly shorter meracanthus and the male terminalia. The proctiger lobes of *L. pallidicornis* sp.nov. are angular posteriorly rather than irregularly rounded as in *L. unifasciata* sp.nov.; the paramere is more slender in profile with a smaller posteroapical tooth, the tubercle on the foremargin in basal third is well-developed and, in posterior view, the inner outline more sinuous than in *L. unifasciata* sp.nov. In *L. pallidicornis* sp.nov. the apical dilatation of the distal portion of the aedeagus is more globular than in *L. unifasciata* sp.nov.

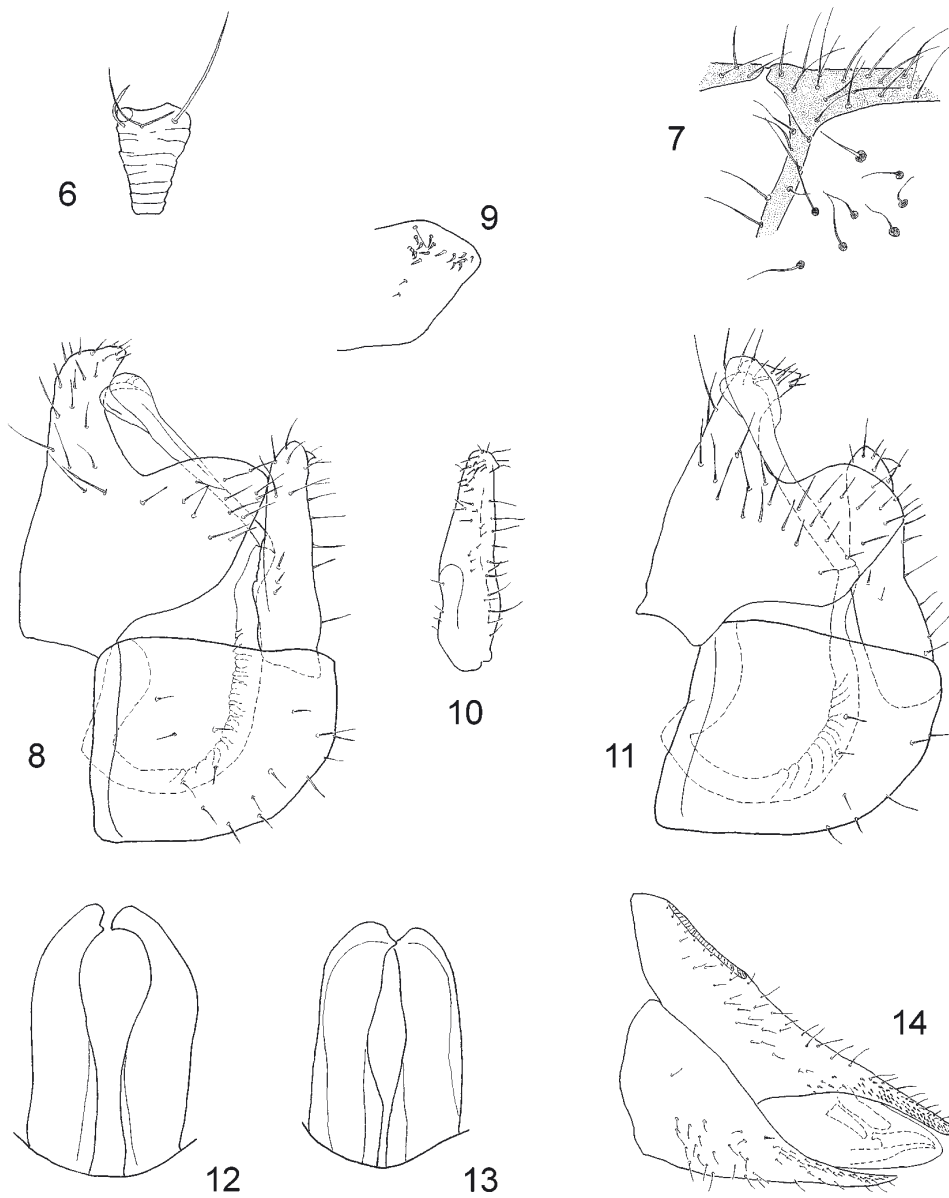
***Lautereropsis unifasciata* sp.nov.** (Figs 1, 3, 5, 11, 13–14)

Material examined. Holotype ♂, Nepal: Kosi, Lamo Pokhari, 27°20'N/87°29'E, to Jhor Pokhari, 27°19'N/87°30'E, 2900–3000 m, 19.vi.2001, swept from vegetation in *Rhododendron*, deciduous or sclerophyll forests mixed with cleared areas, D. Burckhardt (dry mounted, NHMB).

Paratypes. Nepal: 1♂, 2♀, same as holotype; 1♂, Kosi, Jhor Pokhari, 27°19'N/87°30'E, 3000 m, 20–21.vi.2001, swept from *?Nex sikkimensis* in pure or mixed wet *Rhododendron* forests and cleared areas, D. Burckhardt (dry and slide mounted, NHMB).

Description. Adult. Body coloration brown to dark brown. Antenna yellowish, with segments I, II, VII and VIII ochreous to brown and segments IX and X dark brown to black. Mesoscutellum and metapseudonotum ochreous. Discal fovea on vertex, thoracic venter and abdominal sclerites dark brown to black. Forewing (Fig. 5) with ochreous veins, membrane clear and transparent apart from a brown transverse band proximally to the line pterostigma–Cu1b and a weak, small basal infuscation. Hind wing transparent. Legs ochreous, femora dorsally and tibia apically darker. Male terminalia dark brown to black, apex of parameres lighter. Female terminalia brown to ochreous, basis and apex of proctiger and lateral valvulae dark brown to black.

Structure. Genal processes with apices slightly diverging, inner margin almost straight (Fig. 3). Forewing (Fig. 5) oblong-oval. Meracanthus relatively long and slender, subacute apically. Male terminalia (Fig. 11) with elongate subgenital plate. Posterior lobes on proctiger irregularly rounded posteriorly. Paramere robust, distinctly shorter



Figs 6–14. 6–10, 12, *Lautereropsis pallidicornis* sp.nov.; 11, 13–14, *Lautereropsis unifasciata* sp.nov.: 6, antennal segment 5 with rhinarium and associated bifid seta; 7, forewing, area around costal break and base of pterostigma showing setae on wing membrane; 8, 11, male terminalia in profile; 9, inner face of posterior lobe of proctiger; 10, inner face of paramere; 12, 13, Paramere in rear view; 14, female terminalia in profile.

than proctiger; in profile with almost subparallel margins, with relatively large posteroapical tooth; lacking distinct tubercle in basal third of foremargin; in caudal view (Fig. 13) almost straight, curved to the middle apically, thus inner outline lens-shaped. Apical dilatation of distal segment of aedeagus elongate. Female terminalia (Fig. 14) long, cuneate. Dorsal margin of proctiger straight, apex subacute, ventral margin evenly concave. Circumanal ring oval, consisting of two rows of unequal pores. Subgenital plate long, sharply pointed apically. Lateral valvulae narrowly rounded apically.

Measurements and ratios (1♂, 1♀): HW 0.75–0.85; AL 0.92–1.02; LAS 0.10:0.07:0.30:0.10:0.09:0.08:0.08:0.07:0.05; WL 2.50–3.26; MP 0.34; PL 0.33; AEL 0.29; FP 1.01; ALHW 1.20–1.23; TLHW 0.87–0.99; WLHW 3.33–3.84; WLW 2.12–2.14; MPH 0.45; FPHW 1.18; FPC 5.91; FPS 1.33.

Biology. Larva and host plant unknown.

Distribution. East Nepal.

Name derivation. The name refers to the forewing pattern.

Differential diagnosis. According to the description of MIYATAKE (1981) *L. unifasciata* sp.nov. differs from *L. shiwapuriensis* in the more elongate forewing with a more reduced pattern and the posterior lobes of the male proctiger, which are irregularly rounded rather than angular. *L. unifasciata* sp.nov. differs from *L. pallidicornis* sp.nov. in the brown to dark brown body coloration, the dark brown or black antennal segments IX–X, the less diverging axes of the genal processes, the longer and more elongate forewing with a pattern consisting of one (rather than two) well-delimited brown band, and the slightly longer meracanthus and the male terminalia. The proctiger lobes of *L. unifasciata* sp.nov. are irregularly rounded posteriorly rather than angular as in *L. pallidicornis* sp.nov.; the paramere is more robust in profile with a larger posteroapical tooth, the tubercle on the foremargin in basal third is almost absent and, in posterior view, the inner outline more lens-shaped than in *L. pallidicornis* sp.nov.. In *L. unifasciata* sp.nov. the apical dilatation of the distal portion of the aedeagus is more elongate than in *L. pallidicornis* sp.nov.

***Lautereropsis shiwapuriensis* (Miyatake, 1981) comb.nov.**

Pauropsylla shiwapuriensis: MIYATAKE (1981): 53. [Holotype ♂: Nepal, Shiwapuri Hills, Kathmandu Valley, Top, 2732 m, 3.v.1979, Y. Miyatake leg.; Osaka Museum of Natural History, Japan, not examined.]

Discussion

Prior to the revision of HOLLIS (1984), the concept and definition of *Pauropsylla* and its relationships within the Psylloidea were vague and controversial. In particular, relating *Pauropsylla* to *Paurocephala* Crawford, 1914 added much to the confusion (LOGINOVA 1972, BURCKHARDT & MIFSUD 2003). The reasons for including *P. shiwapuriensis* in *Pauropsylla* were not stated by MIYATAKE (1981). The presence of a costal break and of the anal break situated near apex of vein Cu1b, the presence of a crown of apical metatibial spurs and the presence of metabasitarsal spurs clearly place *P. shiwapuriensis*

outside the Triozidae, confirming HOLLIS (1984) who concluded that the species was wrongly assigned. Based on Miyatake's illustrations and descriptions, HOLLIS (1984) suggested a possible relationship of *P. shiwapuriensis* to the Aphalaridae near the *Haplaphalara-Diclidophlebia* group. In both new species described here, the spurs on metabasitarsi are distinctly developed, whereas they are always absent in *Diclidophlebia* CRAWFORD, 1920 and other Paurocephalinae (BURCKHARDT & MIFSUD 2003). A combination of the following characters places *Lautereropsis* gen.nov. in the Diaphorininae: presence of an open crown of apical metatibial spurs; metabasitarsal spurs present; genal processes developed; male proctiger with posterior lobes. According to WHITE & HODKINSON (1985), HOLLIS (1985) and BURCKHARDT (1987) the Diaphorininae comprise the genera *Diaphorina* Löw, 1879, *Psyllopsis* Löw, 1879, *Parapsylla* Heslop-Harrison, 1961 and *Notophorina* Burckhardt, 1987. From these genera *Lautereropsis* gen.nov. can be distinguished by the very long setae on the head, the antennae and the thorax; the presence of a rhinarium on each of antennal segments IV to IX; the short antenna with apically strongly expanded flagellar segments bearing long setae; the presence of bifid setae associated with the rhinaria on the antenna; and the presence of setae on the forewing membrane.

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