

## Notes on some Oriental Derbidae (Hemiptera: Fulgoroidea) with description of new species

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### Abstract

The species described in the genera *Losbanosia* Muir and *Nomuraida* Matsumura are discussed, as well as the priority of these generic names. Two new species *Losbanosia tamdaoensis* sp. nov. from Tam Dao National Park in Viet Nam and *Losbanosia taivaniae* sp. nov. from Taiwan are described. The distribution of species ascribed to the genus *Losbanosia* Muir is discussed.

**Key words:** *Losbanosia* Muir, *Nomuraida* Matsumura, *Losbanosia bakeri* Muir, *Losbanosia vuilleti* (Distant), *Losbanosia hibarensis* (Matsumura), *Losbanosia tamdaoensis* sp. nov., *Losbanosia taivaniae* sp. nov., Derbidae, Hemiptera, new species, Viet Nam, Taiwan, Oriental region, distribution, synonymy

### Introduction

The genus *Losbanosia* was erected by Muir in 1917 for a single species from Luzon Island, named *Losbanosia bakeri* Muir, 1917. The genus and species were described on the basis of a single female specimen. Another species placed in this genus by Muir (1918) is *Losbanosia vuilleti* (Distant, 1914) from Indo-China, originally described in the genus *Zoraida* Kirkaldy, 1900 by Distant (1914). In 1935 Matsumura described another genus, *Nomuraida*, with a single species, *Nomuraida hibarensis* Matsumura, 1935, from Honshu (Japan). Metcalf, in his General Catalogue of the Hemiptera (Metcalf 1945), listed both genera as separate taxa: *Losbanosia* Muir with two species and monotypic *Nomuraida* Mats. The latter genus was not mentioned in Fennah's key to Zoraidini genera or in the text of this paper (Fennah 1952). *Nomuraida hibarensis* Mats. was mentioned and figured in "Iconographia Insectorum Japonicorum" (Esaki et al. 1952). Fennah (1956) gave another locality for *Losbanosia bakeri* Muir in Guangdong Province, South-East China. Later, the species described by Matsumura was mentioned and figured in Chou et al.

(1985), under the name *Losbanosia hibarensis* (Matsumura, 1935), but no reason for this synonymy was given. Anufriev (1968) and Anufriev & Emeljanov (1988) listed and illustrated this species under the original generic name, as *Nomuraida hibarensis* Matsumura. It was also listed in Nast's (1972) catalogue in the same genus. Yang & Wu (1993) mentioned Matsumura's species again in the genus *Losbanosia* Muir, listing *Nomuraida* Matsumura as a synonym of *Losbanosia* Muir, but with the following note: "The authors don't know who and when suppressed *Nomuraida* Matsumura as synonym of *Losbanosia* Muir." However, it was Chou et al. (1985) who synonymized *Nomuraida* Matsumura, 1935 under *Losbanosia* Muir, 1917. Later, Yang & Yeh (1994) also confirmed this synonymy.

The original descriptions of both genera were based on female specimens and, according to external characters given in the original descriptions and drawings, as well as venation and male genital block characters, *Nomuraida* Matsumura, 1935, seems to be a synonym of *Losbanosia* Muir, 1917. Thus, Chou et al.'s (1985) decision would appear well grounded. However, the male genital block features of *Losbanosia hibarensis* (Mats.), as drawn in Anufriev (1968) and Anufriev & Emeljanov (1988), differ from the drawings of the specimen from Taiwan given the same name and presented by Yang & Wu (1993). Examination of the specimens of *Losbanosia hibarensis* (Mats.) from the Korean Peninsula (Figs. 31–38) has shown that the specimen from Taiwan represents a separate species, described below. Another species was found in Tam Dao National Park, Viet Nam, and also described as new.

## Systematics

### *Losbanosia* Muir, 1917

TYPE SPECIES: *Losbanosia bakeri* Muir, 1917: Muir 1917: 86; by monotypy; Luzon, Mount Maquiling.

*Nomuraida* Matsumura, 1935

TYPE SPECIES: *Nomuraida hibarensis* Matsumura, 1935: Matsumura 1935: 79; by original designation; Lake Hibara, Fukushima Prefecture, Honshu.

### *Losbanosia taivaniae* sp. nov.

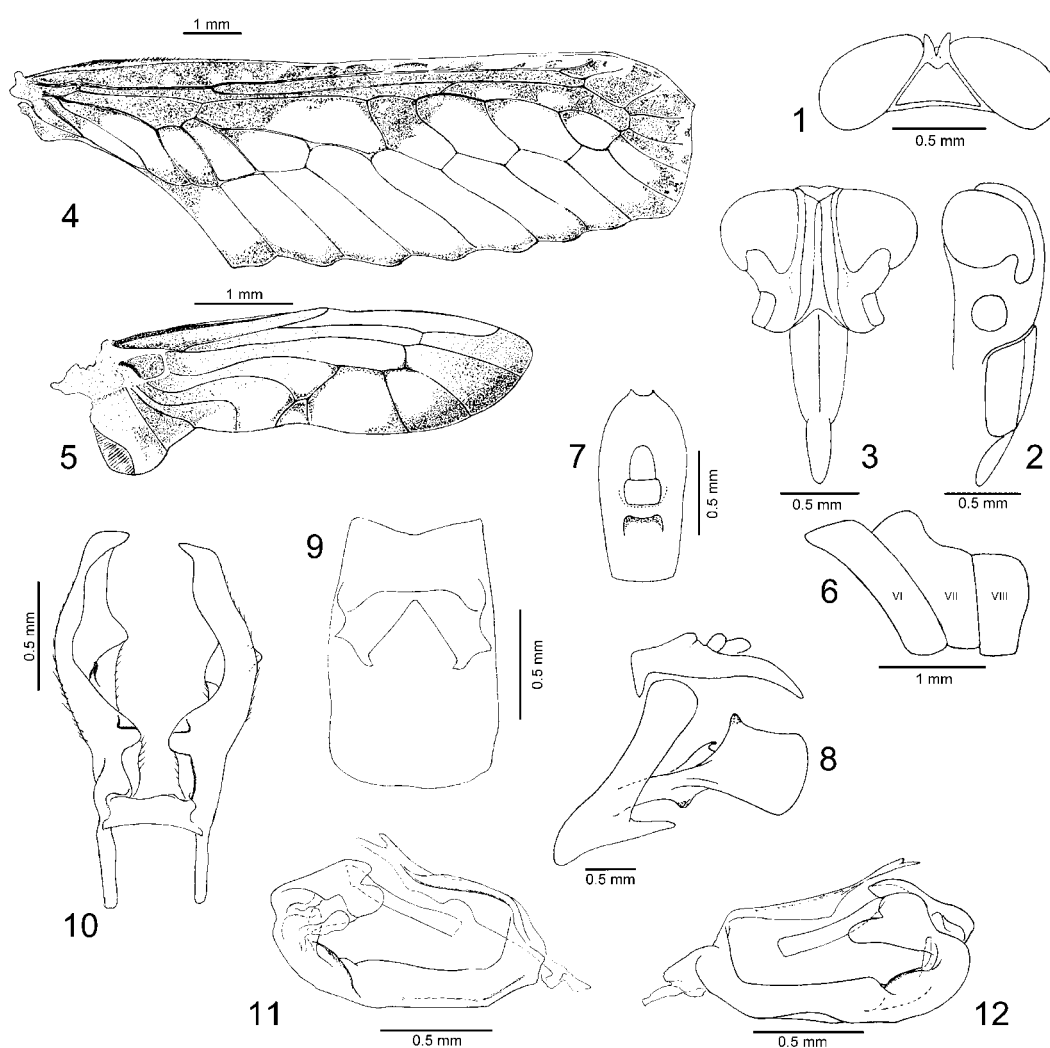
(Figs. 1–12)

*Losbanosia hiberensis* [sic!] (Matsumura, 1935): Yang & Wu 1993: 37, Fig. 14A–J.

*Losbanosia hiberensis* [sic!] (Muir) [sic!]: Yang & Chang 2000: 545, 546, Fig. 444A–F.

DIAGNOSIS: It differs from *Losbanosia hibarensis* (Mats.) by the almost subtriangular, only slightly diamond-like shape of the ventral median process of the pygofer (distinctly diamond-shaped in *L. hibarensis*); the posterolateral margin of pygofer lacking a process,

angulately rounded (angulate process in *L. hibarensis*); the anal tube about three times as long as wide at the base, and not widened at the base (shorter and widened at base in *L. hibarensis*); the apical portion of the anal tube with two short teeth (lack of such teeth in *L. hibarensis*, apical portion rounded); curved ventrad (straight in *L. hibarensis*); the aedeagus with the endosomal process blunt at apex (acute in *L. hibarensis*); VIII<sup>th</sup> abdominal segment without distinct dorsal crest (small crest in *L. hibarensis*).



**FIGURES 1–12.** *Losbanosia taivaniae* sp. nov. Fig. 1. Head in dorsal view; (After Yang & Wu 1993); Fig. 2. Head in right lateral view; (After Yang & Wu 1993); Fig. 3. Head in frontal view; (After Yang & Wu 1993); Fig. 4. Tegmen; Fig. 5. Wing; Fig. 6. Abdomen segments VI–VIII in lateral view; (After Yang & Wu 1993); Fig. 7. Anal tube in dorsal view; (After Yang & Wu 1993); Fig. 8. Pygofer, anal tube, and style in right lateral view; Fig. 9. Pygofer in ventral view; Fig. 10. Styles in ventral view; Fig. 11. Aedeagus in right lateral view; Fig. 12. Aedeagus in left lateral view.

DESCRIPTION (Based also on data provided by Yang & Wu 1993): Length of body (including tegmina) 12.8 mm. General colour brown; rostrum and legs pale yellowish; tegmina white with brown to black markings as in Fig. 4, veins on markings red.

Vertex (Fig. 1) triangular with bifurcate apex, disc shallowly excavate; lateral carinae of frons distinctly separated throughout; compound eyes deeply incised ventrally; ocelli absent (Figs. 2 & 3).

Tegmina (Fig. 4) longer than widest part about 3.5:1, longer than wings about 1:0.35, with anterior and posterior margins nearly parallel; vein RA with two terminals, RP with three terminals, M with 5 terminals, CuA + CuP with 4 terminals; second transverse veinlet *m-cu* short.

Wings (Fig. 5) with anterior margin arched anteriorly in median portion, ScRA reaching margin in about half of wing length, M simple, CuA with three terminals, CuP distinctly curved and deflected basad in terminal portion, at the level of oblique veinlet uniting CuA<sub>2</sub> with CuP, PCu distinctly curved, stridulatory area on anal field distinct.

Tibio-metatarsal formula 5:(5-6):(5-6).

Abdominal tergite VII (Fig. 6) in profile distinctly longer than ventrally, dorsal margin with basal half produced dorsad, in form of rounded crest.

Anal segment (Fig. 7) slender, apical third slightly curved, in dorsal view evenly widened at apical third, then narrowed, apical margin distinctly incised medially, each side with a small process; pygofer (Figs. 8 & 9) with ventral margin sharply oblique, dorsal margin rounded, in ventral view medioventral process subtriangular (diamond-shaped), lateral incisions very small; aedeagus (Figs. 11 & 12) in left lateral view with membranous flagellar lobe, in right lateral view small process arising from phallosome and directed dorsomedially, endosomal process rod-like, blunt at apex; genital styles with basal portion rather narrow, apical portion quadrate, with dorsobasal angle produced dorsad roundly, dorsal margin at middle with lower portion hooked at apex, same position at ventral margin produced ventrad roundly.

ETYMOLOGY: Species named after Latin form of the name of Taiwan—Taivania.

REMARKS: The description and figures in Yang & Wu (1993) are based on a single male, collected in Chihshingshan, Taipei Hsien, 7I-X-1985, by S.C. Tsaur. Yang & Yeh (1994) described a nymph identified as *Losbanosia hiberensis* [sic!] (Matsumura, 1935), collected in Hualien Hsien, Tailuko, 14-II-1990, by W.-B. Yeh, under rotten wood, and identified by Yeh on the basis of two males. These data should probably also be referred to the species described above.

MATERIAL EXAMINED: Holotype, male, dissected specimen. Labelled: [*Losbanosia taivaniae* Szw. et Ada. ♂]; red label [HOLOTYPE]; [TAIWAN: Taipei / Chihshingshan / 7I-X-1985 / col. S.C. Tsaur]; [*Losbanosia hiber-* / *ensis* (Mats.)]; [1]; tegmina and wings on separate microscopic slides with the same labels and annotations: [2]—tegmina and [3]—wings.

***Losbanosia tamdaoensis* sp. nov.**

(Figs. 13–30)

**DIAGNOSIS:** It differs from other *Losbanosia* species by this combination of characters: diamond-shaped medioventral process of pygofer (almost subtriangular in *L. taivaniae*, diamond-shaped but shorter and wider in *L. hibarensis*), posterolateral margin of pygofer with distinct lateral process, tapered posteriad (no process in *L. taivaniae*, process in *L. hibarensis* shorter and rounded at apex); anal tube about three times as long as wide at base, distinctly widened at base with lateral margins subparallel and without apical processes (anal tube not widened at base and with convex lateral margins and two apical processes in *L. taivaniae*; anal tube shorter, about 2.5 times as long as wide at base, with lateral margins concave in *L. hibarensis*); aedeagus with acute endosomal process (blunt in *L. taivaniae*); flagellar lobe with distinct apical concavity (lack of such concavity in *L. hibarensis*), phallosome with additional process on caudad margin directed dorsolaterally right (no such process in *L. hibarensis* and *L. taivaniae*); VIII<sup>th</sup> abdominal segment with distinct crest (lack of such crest in *L. taivaniae* and small crest in *L. hibarensis*); posterior margin of tegmen less undulate than in *L. hibarensis*, wing with veins CuA<sub>2</sub> and CuP fused near margin in common point (transverse veinlet uniting these veins in *L. taivaniae* and *L. hibarensis*); postclypeus with distinct lateral carinae (lack of such carinae in *L. hibarensis*).

**DESCRIPTION:** Length of body 4.06 mm, length of tegmen 10.1 mm. General colour brownish, face darker brown, rostrum yellowish, antennae reddish-brown, femora brownish, tibiae and tarsi yellowish; tegmen hyaline with blackish markings, costal margin red, subcostal area of apical portion of tegmen with whitish markings, basal portions of veins red, apical portion brownish; wings hyaline, with smoky background and blackish markings in apical portion, venation red.

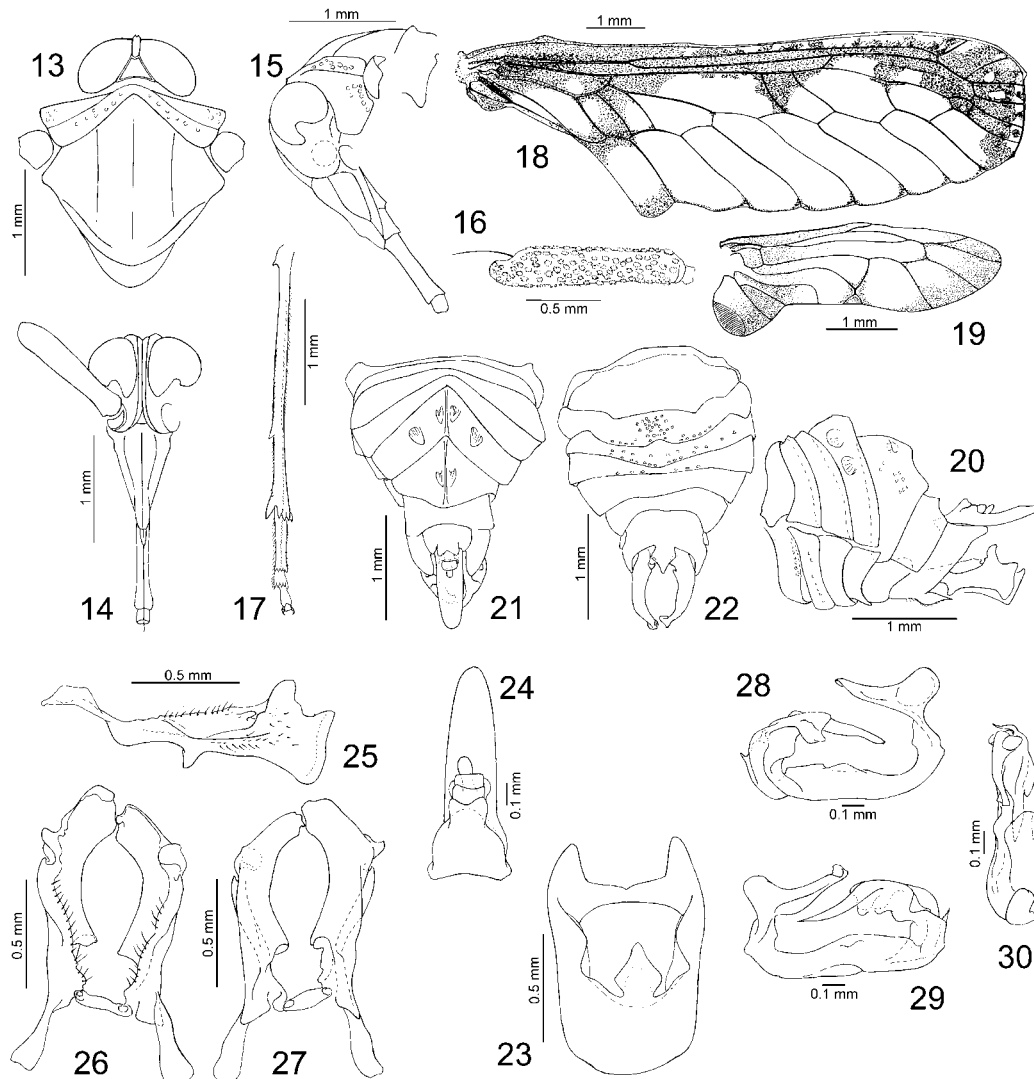
Vertex (Fig. 13) triangular, twice as wide at base as long in mid line (0.16 mm), with bifurcate apex and concave posterior margin, disc distinctly excavate; frons 0.78 mm long, with lateral carinae close to each other; postclypeus 0.61 mm long, convex, with distinct median and lateral carinae; anteclypeus 0.48 mm long with distinct median carina; rostrum 0.92 mm long, subapical segment 4.5 times longer than apical one, apical segment as long (0.17 mm) as wide; compound eyes with distinct ventral incision (Figs. 14 & 15), ocelli lacking; 2<sup>nd</sup> antennal segment (Fig. 16) 1.31 mm long, cylindrical with apical concavity, covered with numerous sensillae.

Pronotum (Fig. 13) distinctly wider than head with compound eyes, 1.53 mm wide, 0.14 mm long in mid line, with median carinae and distinct postocular carinae reaching posterolateral margin; posterior margin distinctly incised; disc of pronotum in anterior lower portion and posterior portion covered with whitish tubercles.

Mesonotum 1.63 mm long in mid line, 1.7 mm wide, with distinct median carina and lateral carinae, disc distinctly convex, posterior margin carinate.

Metanotum with anterior margin carinate, 0.49 mm long in midline, with median carina, anterior margin distinctly incised, posterior margin roundly triangular.

Tegmina (Fig. 18) longer than widest part about 3.4:1, longer than wings about 1:0.34, with anterior margins almost straight, posterior margin subparallel, slightly concave, with rather indistinct undulation; vein RA with two terminals, RP with three terminals, M with 5 terminals, CuA + CuP with 4 terminals; second transverse veinlet *m-cu* short.



**FIGURES 13–30.** *Losbanosia tamdaoensis* sp. nov. Fig. 13. Anterior part in dorsal view; Fig. 14. Head in frontal view; Fig. 15. Anterior part in left lateral view; Fig. 16. Antenna; Fig. 17. Hind tibia and tarsus; Fig. 18. Tegmen; Fig. 19. Wing; Fig. 20. Abdomen in left lateral view; Fig. 21. Abdomen in dorsal view; Fig. 22. Abdomen in ventral view; Fig. 23. Pygofer in ventral view; Fig. 24. Anal tube in dorsal view; Fig. 25. Left style in lateral view; Fig. 26. Styles in dorsal view; Fig. 27. Styles in ventral view; Fig. 28. Aedeagus in right lateral view; Fig. 29. Aedeagus in left lateral view; Fig. 30. Aedeagus in dorsal view.

Wings (Fig. 19) with anterior margin arched anteriorly in median portion, ScRA reaching margin about half of wing length, RP and M fused in subapical portion, at the level of *m-cu* veinlet, M with single terminal, CuA with three terminals, CuP distinctly curved, and deflected basad in terminal portion, at the level junction of CuA<sub>2</sub> with CuP, PCu distinctly curved, stridulatory area on anal field distinct.

Fore and mid tibiae slender, subequal in length (2.35 mm), hind femur 1.14 mm long, hind tibia (Fig. 17) 2.69 mm long, slender, with distinct subapical lateral spine and second lateral spine distinctly apical of half of hind tibia length; tarsus 0.95 mm long, basitarsomere 0.64 mm long, longer than combined length of mid and hind tarsomeres, mid and hind tarsomeres subequal in length (0.34 mm), tarsal claws delicate; tibio-metatarsal formula 5:5:5.

Abdomen (Figs. 20–22) with genital segment about as long as anterior part of body, III<sup>rd</sup> abdominal sternite with distinct (sensory?) pits in median portion and at caudal margin; IV<sup>th</sup> and V<sup>th</sup> abdominal sternites pitted, VI<sup>th</sup> abdominal tergite with distinct crest and with two impressions, VII<sup>th</sup> tergite with distinct crest and single impression, VIII<sup>th</sup> tergite with small crest.

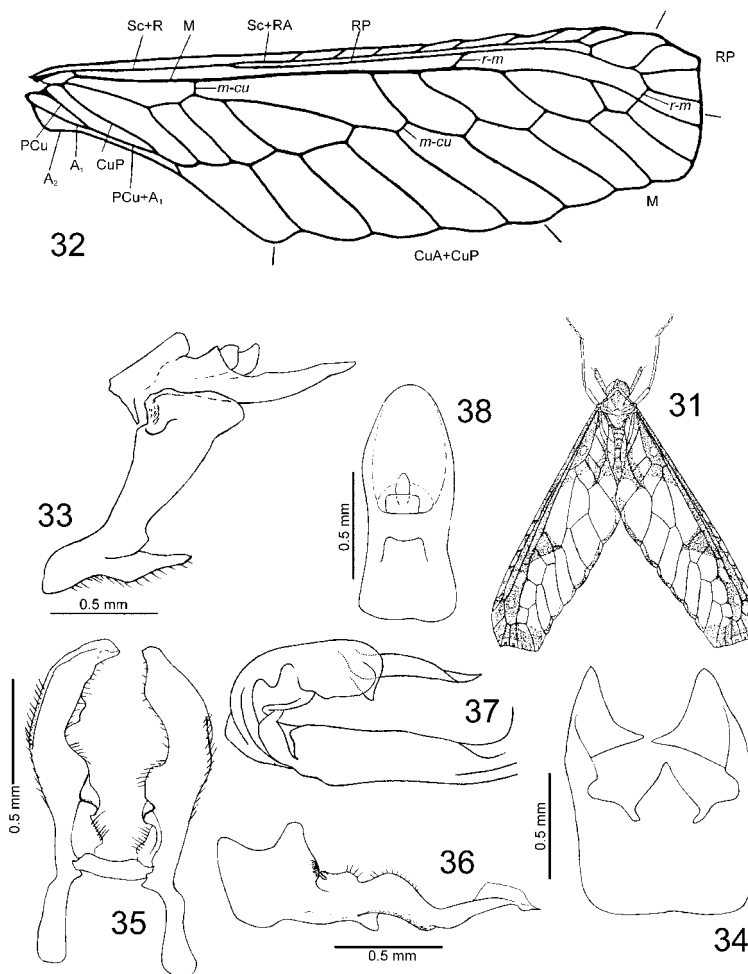
Pygofer (Figs. 20, 22 & 23) 0.64 mm long in mid line, with distinct, diamond-shaped, distinctly convex medioventral process; posterolateral margin of pygofer oblique, with distinct, acutely rounded process; anal tube (Fig. 24) 0.98 mm long, slender, about 3 times as long as wide at base, distinctly wider at base, basal portion narrowing apically, with lateral margins subparallel, apex rounded, without median incision and processes, dorsal portion with bilobed apical margin, anal style quite long; aedeagus (Figs. 28–30) with acute endosomal process; in right lateral view flagellar lobe with distinct apical concavity, phallosome with additional process on caudal margin directed dorsolaterally right; genital style (Figs. 25–27) with narrow basal portion, apical portion subquadrate, with distinct posterior margin curved medially, distinct subapical dorsal process present, dorsal margin at middle with distinct, hooked posterolateral process, ventral margin with distinct ventrolateral, subtriangular protrusion.

ETYMOLOGY: Species named after locality Tam Dao in Viet Nam.

MATERIAL EXAMINED: Holotype, male. Labelled: [*Losbanosia / tamdaoensis* Szw. et Ada. ♂]; red label [HOLOTYPE]; [TONKIN: Vinh Phu / Tam Dao, 1000 m. / road above village / 24.X.1996 / coll. R. Hołyński]; [MZPW 14/2003].

ADDITIONAL MATERIAL EXAMINED: specimens of *Losbanosia hibarensis* (Matsumura, 1935): Museum and Institute of Zoology, Polish Academy of Sciences, Warsaw: 1 female [*Nomuraida / hibarensis* (Mats.) ♀ / det. J. Szwedo 2003], [Korea, Thomak-tong / 20 km N Čongdžin / (7867) 8.9.1970 / R. Bielawski & / M. Mroczkowski], [Inst. Zool. P.A.N. / Warszawa / 69/70]; 1 male [*Nomuraida / hibarensis* (Mats.) ♂ / det. J. Szwedo 2003], [Korea / Onpha ad Chongjin / 16.8.1959 / leg. B. Pisarski / & J. Prószyński / right lateral margin (5838)], [Inst. Zool. P.A.N. / Warszawa / 58/59]. Museum National d'Histoire Naturelle, Paris: [Corée / Posoksa / Keumsan / 17/21-VIII-1998], [Museum

Paris / P. Tripotin réc.], [*Nomuraida / hibarensis* (Mats.) ♂/ det. J. Szvedo 2003]; 6 males [Corée / Sanan 2 Li / Keumsan / 20/30-VII-1998], [Museum Paris / P. Tripotin réc.], [*Nomuraida / hibarensis* (Mats.) ♂/ det. J. Szvedo 2003]; 1 female [Corée / Posoksa / Keumsan / 17/21-VIII-1998], [Museum Paris / P. Tripotin réc.], [*Nomuraida / hibarensis* (Mats.) ♀/ det. J. Szvedo 2003]; 1 male [Museum Paris / COREE DU SUD / Changdong 2 ku], [TAEJON / 14-17.VIII.1996 / P. Tripotin rec.], [*Nomuraida / hibarensis* (Mats.) ♂/ det. J. Szvedo 2003]; 1 female [Museum Paris / COREE DU SUD / Changdong 2 ku], [TAEJON / 14-17.VIII.1996 / P. Tripotin rec.], [*Nomuraida / hibarensis* (Mats.) ♀/ det. J. Szvedo 2003].

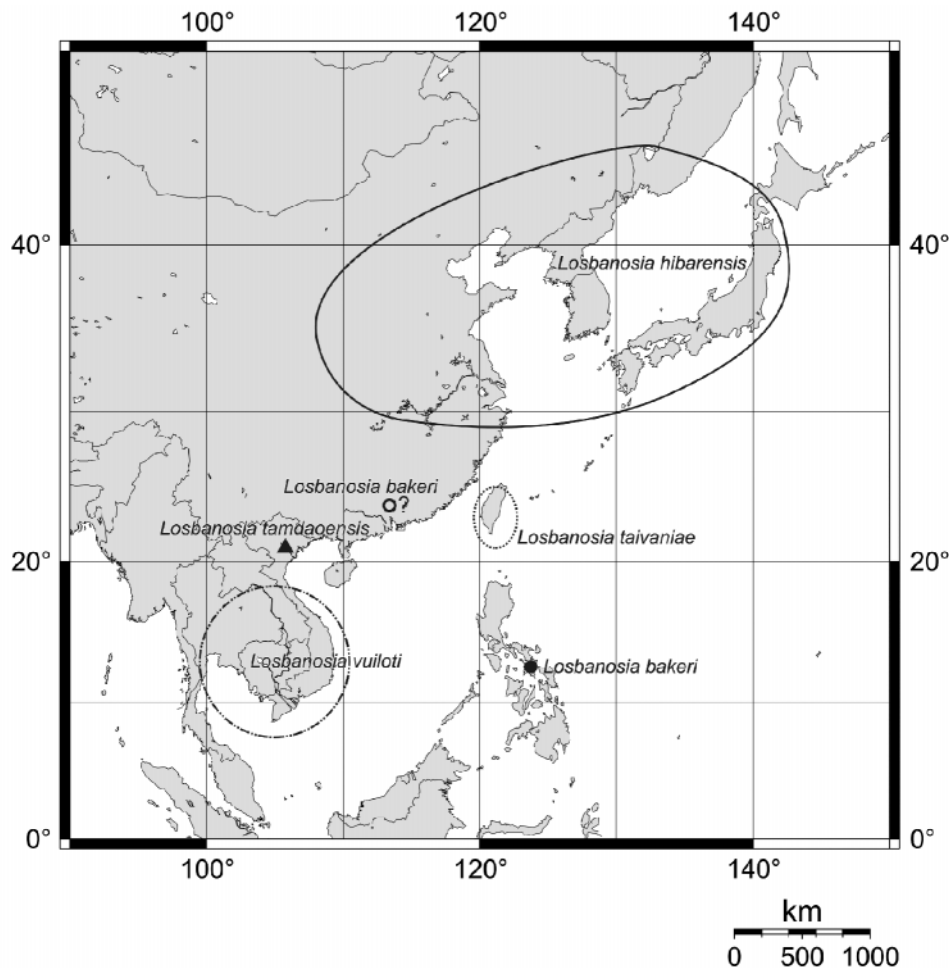


**FIGURES 31–38.** *Losbanosia hibarensis* (Matsumura, 1935). Fig. 31. General habitus (After Anufriev 1968); Fig. 32. Tegmen (After Anufriev & Emeljanov 1988); Fig. 33. Pygofer and anal tube in lateral view; Fig. 34. Pygofer in ventral view; Fig. 35. Styles in ventral view; Fig. 36. Right style in lateral view; Fig. 37. Aedeagus in right lateral view (After Anufriev & Emeljanov 1988); Fig. 38. Anal tube in dorsal view.



**Remarks**

The genus *Losbanosia* Muir, 1917 comprises three formerly known species: *L. bakeri* Muir, *L. vuilleti* (Dist.), and *L. hibarensis* (Mats.), and two species described above: *L. taivaniae* Szw. et Ada. and *L. tamdaoensis* Szw. et Ada. (Fig. 39). *L. bakeri* Muir is known from the Philippines, from Mt. Maquiling in Luzon; data about the presence of this species in mainland China, collected in “Lung-Tau Shan, N. Kwantung, China” (Guangdong Province, South-East China), are doubtful, as based on a female specimen, with no characters serving to identify it given in Fennah’s (1956) paper. The exact locality of *L. vuilloti* (Dist.) remains unknown, after the original description it is given as “Indo-China” (Distant 1914). *L. hibarensis* (Mats.) seems to be known from Japan, the Russian Far East, and the Korean Peninsula (Anufriev & Emeljanov 1988, Yang & Wu 1993). *L. taivaniae* Szw. et Ada. is recorded from Formosa Island (Taiwan) while *L. tamdaoensis* Szw. et Ada. is known from northern Viet Nam (Fig. 39).



**FIGURE 39.** Distribution of *Losbanosia* Muir, 1917 species.

Unfortunately, males of *L. bakeri* Muir and *L. vuilloti* (Dist.) are unknown, the same is true of genital characters of male specimens from South-East China. *L. hibarensis* (Mats.) and *L. tamdaoensis* Szw. et Ada. seem to be similar with respect to morphological characters, and both differ distinctly from *L. taivaniae* Szw. et Ada regarding the structure of pygofer. It is clear that further research on Derbidae in East Asia is very important and necessary.

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