

Notes on the tribe Tongini, with description of a new species of the genus *Orthophana* from northern Vietnam (Hemiptera: Fulgoroidea: Nogodinidae)

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Abstract. A new species of the genus *Orthophana* Melichar, 1923, *O. tamdaoina* sp. nov., representing a new subgenus, *Eupharos* subgen. nov., is described from the Tam Dao National Park in northern Vietnam. Diagnostic characters are provided in a form of a key to differentiate the new species and the new subgenus from the type species, *O. spinata* Melichar, 1923. The following nomenclatural changes are proposed: *Lollius graciosus* Melichar, 1906 is transferred to the genus *Epitonga* Fennah, 1954 to become *Epitonga graciosus* (Melichar, 1906) comb. nov. and *Issus lineolatus* Walker, 1862 to the genus *Cotylana* Fennah, 1954 to become *Cotylana lineolata* (Walker, 1862) comb. nov.

Key words. Auchenorrhyncha, Fulgoromorpha, *Cotylana*, *Epitonga*, *Lollius*, *Tylana*, planthoppers, taxonomy, nomenclature, new subgenus, new species, new combination, Australasian Region, Oriental Region

Introduction

The tribe Tongini Kirkaldy, 1907 has recently been moved from the family Issidae Spinola, 1839 to the family Nogodinidae Melichar, 1898 based on the structure of male and female genitalia (GNEZDILOV 2007, 2013). The tribe is widely distributed in the Oriental, Australasian, and Oceanic Regions and has been recorded also from Madagascar, the Mascarenes and Seychelles in the Afrotropical Region (FENNAH 1954; METCALF 1958; WILLIAMS 1982; HOLZINGER et al. 2008; GNEZDILOV 2009, 2013). It currently comprises 21 genera with more than 130 species and subspecies (BARTLETT 2014, BOURGOIN 2014). Some species-rich genera of Tongini like *Tylana* Stål, 1861 and *Lollius* Stål, 1866 are in need of revision.

The genus *Orthophana* Melichar, 1923, erected for a single species from Perak in Malaysia, has been known only after original description (MELICHAR 1923) until recently. Below we

describe a new species of the genus from the Tam Dao National Park in northern Vietnam and provide new records of the type species, *Orthophana spinata* Melichar, 1923 from Malaysia.

Two additional nomenclatural changes are proposed within Tongini: *Lollius gratiosus* Melichar, 1906 is moved to the genus *Epitonga* Fennah, 1954 and *Issus lineolatus* Walker, 1862 to the genus *Cotylana* Fennah, 1954.

Material and methods

Morphological terminology follows ANUFRIEV & EMELJANOV (1988) for the head, EMELJANOV (2001) for the pronotum, and BOURGOIN (1993) for the ovipositor. Drawings were made using compound light microscopes Leica M165C and Leica MZ95. Photographs were taken with a Canon EOS 300D camera equipped with a Tamron DI SP 90 mm Macro lens, and processed in Adobe Photoshop CS3 software.

The holotype of the new species described below is deposited in the Royal Belgian Institute of Natural Sciences, Brussels, Belgium (IRSNB). The examined specimens of *Orthophana spinata* and *Issus lineolatus* are from the Moravian Museum, Brno, Czech Republic (MMBC), the Natural History Museum, London, United Kingdom (BMNH), and the Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia (ZIN).

Taxonomy

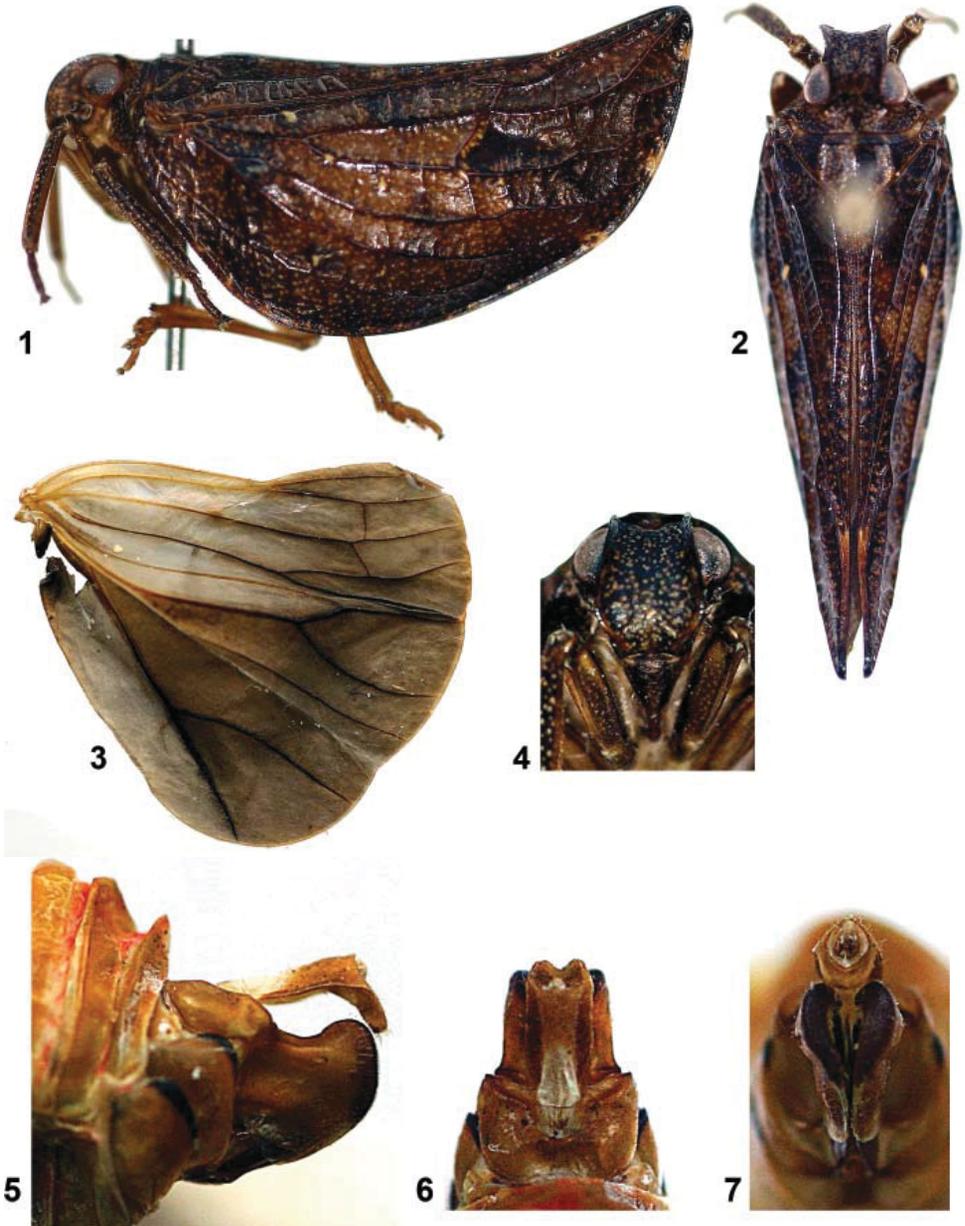
Orthophana Melichar, 1923

Orthophana Melichar, 1923: 11. Type species: *Orthophana spinata* Melichar, 1923 (by original designation).

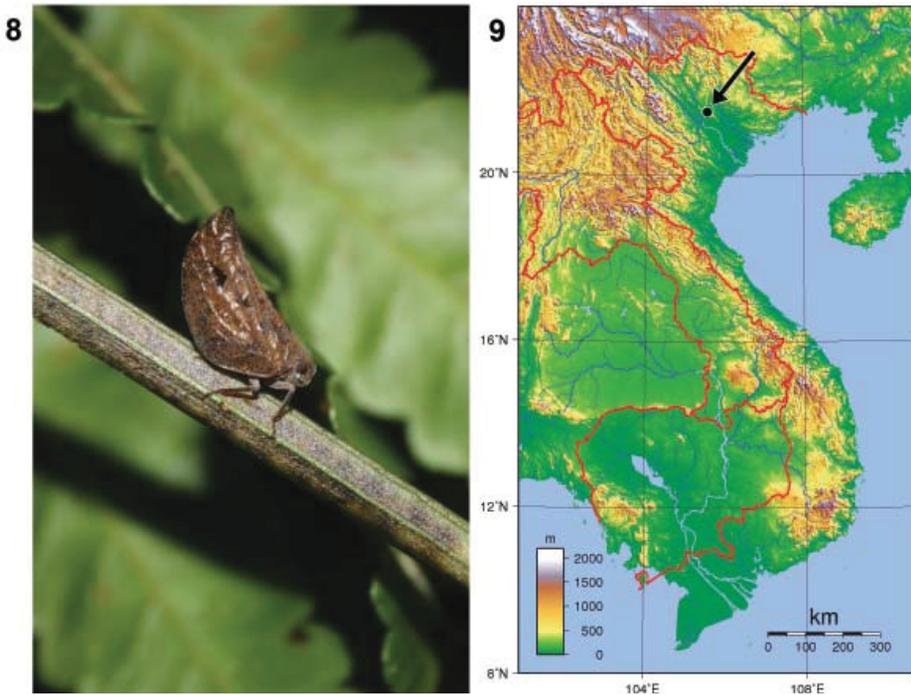
Diagnosis. Border between coryphe and metope smooth, without carina (Figs 1–2, 12–13). Metope quite wide, with no intermediate carinae (Figs 4, 13), lateral margins (keels) slightly leaf-like flattened. Fore wing wide, sail-shaped (Figs 1, 8, 12), without hypocostal plate, precostal area with many transverse veins (Figs 16–17). Fore wing venation: costa separate, Sc+R 2, M 2, CuA 2. Hind wing well-developed, tri-lobed (Figs 3, 18). Hind tibia with 1–2 lateral spines distally.

Key to subgenera and species

1. General coloration green or green brownish (illustrated in MELICHAR 1923: Pl. 2, Fig. 15; also Fig. 12 here). Metope narrower, lateral keels curved above the clypeus forming an obtuse angle (Fig. 13). Fore wing with costal vein furcating apically and Sc and R running separately from the basal cell (Figs 12, 16). Apex of fore wing with distinct claw-shaped tooth formed by fusion of apices of posterior branch of M (M_2) and both branches of CuA (CuA_{1-2}). Hind tibia with one lateral spine distally. Smaller, total length of females 11–12.5 mm. *Orthophana* Melichar, 1923 (*O. spinata* Melichar, 1923)
- General coloration brown or dark brown, with small yellow dots and patches (Figs 1–2, 4, 8). Metope wider, lateral keels convex above the clypeus (Fig. 4). Fore wing with costal



Figs 1–7. *Orthophana (Eupharos) tamdaoinea* sp. nov., holotype. 1 – lateral view; 2 – dorsal view; 3 – hind wing; 4 – frontal view. 5–7 – apex of female abdomen (5 – lateral view; 6 – dorsal view; 7 – caudal view).



Figs 8–9. *Orthophana (Eupharos) tamdaoina* sp. nov. 8 – live specimen; 9 – map of distribution (black circle with arrow indicating the Tam Dao forest – the type locality).

vein simple apically and Sc and R with a common stem basally (Fig. 17). Apex of fore wings without claw-shaped tooth. Hind tibia with two lateral spines distally. Larger, total length of females 14 mm. *Eupharos* subgen. nov. (*O. tamdaoina* sp. nov.)

Orthophana (Orthophana) spinata Melichar, 1923

(Figs 10–13, 16)

Type material examined. SYNTYPE: ♀, “Malacca / Perak // spinata [handwritten] det. Melichar // *Orthophana / spinata* [handwritten] // dessin  Wytsm [handwritten on pink label] // Collectio / Dr. L. Melichar / Moravsk  museum Brno // Syn- / typus [red label] // Transcriptio / *Orthophana / spinata* sp. nov. [handwritten] L. Melichar det. // Type no. / 6848 / Moravian Mus. Brno” (MMBC; Figs 10, 11).

Additional material examined. MALAYSIA: PAHANG: Cameron highlands: 1 ♀, Orange Asli village env., Gunung [Mt.] Perdah, 1575 m, 4°29.2'N, 101°22.1'E, 1–16.v.2009, sweeping/beatng, P. Ba ar, P. Pachol tko & M. Tr zna leg.; 1 ♂ 1 ♀, Tanah Rata env., Gunung [Mt.] Jasar, 1600 m, 4°28'36.65"N, 101°21'26.11"E, 5–6.iv.2013, L. Dembick  leg. (all MMBC).

Note. MELICHAR (1923) did not mention any lateral spines on hind tibia of *Orthophana spinata* at all. Igor Malenovsk  (Brno, Czech Republic) examined the type of the species and kindly let us know that it has one lateral spine (see the key above). The species is recorded for the first time from the state of Pahang in Malaysia.

***Eupharos* subgen. nov.**

Type species. *Orthophana tamdaoina* sp. nov. (here designated).

Diagnosis. Distinguished from the nominotypical subgenus by the coloration, structure of the head, fore wing shape and venation, and the presence of two lateral spines on hind tibia (see the key above).

Etymology. From the Greek noun “φάρος” (lighthouse) from which Russian equivalent of “sail” is derived (MOKIENKO 2007). The fore wing shape of *Orthophana* reminds a sail.

***Orthophana (Eupharos) tamdaoina* sp. nov.**

(Figs 1–8, 17–18)

Type material. HOLOTYPE: ♀, VIETNAM: Tam Dao National Park, 21°31'N, 105°33'E, 27.vii.2011, “I.G.31.933”, J. Constant & J. Bresseel leg. (IRSNB).

Description. Coloration. General coloration brown or dark brown, with small light dots (Figs 1, 2, 4, 8). Each fore wing (tegmen) with several yellow dots (patches) on veins, three yellow patches on marginal vein, and three black spots (patches) each on R furcation, between branches of M vein distally, and between M and CuA near to wing middle. Caudo-dorsal angles of wings almost black. Hind wings not transparent, with veins light yellow proximally and brown or black distally (Fig. 3).

Structure. Metope relatively wide, weakly enlarged above clypeus, without intermediate carinae (Fig. 4). Lateral margins of metope slightly leaf-like flattened (Fig. 2). Metopo-clypeal suture horizontal, deep. Postclypeus convex, without carinae. Ocelli present. Second (first visible) segment of rostrum 1.5 times as long as third (second visible) segment. Border between coryphe and metope smooth, without carina (Figs 1, 2). Coryphe transverse, almost four times as wide as long medially, without carinae, anterior margin weakly convex, posterior margin weakly concave. Pronotum without carinae, anterior margin strongly convex, posterior margin almost straight. Paradiscal fields of pronotum wide behind eyes. Paranotal lobes of pronotum wide, long, without carinae. Mesonotum nearly 1.3 times as long as pronotum medially, with median and lateral carinae. Fore wings crescentic (Figs 1, 8, 17), with distinct caudo-dorsal angles, without hypocoastal plate. Basal cell very narrow, oval. Fore wing (tegmen) venation (Fig. 17) as follows: many transverse veins present in precostal area, costal area and between longitudinal veins; costa separate, simple; Sc+R running as a common stem from the basal cell and furcating in proximal half of wing; M furcating in proximal half of wing after R; CuA furcating in distal half of wing (Sc+R 2 M 2 CuA 2); second branch of cubitus anterior running as marginal vein as well; clavus as long as 3/4 of wing length, open (Pcu+A₁ running to apex of clavus), Pcu and A₁ joined at middle of clavus. Hind wings well-developed, trilobed, with a coupling lobe and two weak lateral clefts (Figs 3, 18). Costal margin distinctly concave, with setae proximally. Hind wing venation: Sc+R, CuA, Pcu, A₁, and A₂ each with two branches; M and CuP simple; A₁ furcating near to wing middle, other veins furcating in distal half of wing; intermediate veins: single vein between second branch of R and M and between M and first branch of CuA distally and between A₁ and A₂ basally; second branch of CuA and first branch of Pcu closely situated apically but not joined; CuP joining anterior branch of Pcu distally and not reaching wing margin; second branch of A₁ weak. Hind tibia with two lateral spines distally and 9 apical spines. First and second metatarsomeres almost

equal in length, both with two latero-apical spines, ventral surface with long setae. First metatarsomere with 10 intermediate apical spines arranged in arc.

Female genitalia. Anal tube narrow, enlarged apically, with apical part turned down at right angle (Figs 5–6). Gonoplasts flat, nearly square (Fig. 5), with many marginal denticles (Fig. 7). Anterior connective laminae of gonapophyses VIII narrow, with teeth (Fig. 7).

Male genitalia. Male unknown.

Total length. 14 mm.

Etymology. Adjective derived from the name of the type locality – the Tam Dao forest in Vietnam (Fig. 9).

Ecological note. The species was collected during the night on fern (Fig. 8).

Epitonga Fennah, 1954

Epitonga Fennah, 1954: 462. Type species: *Epitonga ferox* Fennah, 1954 (by original designation).

The genus *Epitonga* was erected by FENNAH (1954) for a single species from the Solomon Islands (New Georgia Island) and distinguished by the peculiar convex “shoulders” (a strong bulge near to basal cell) of fore wings (in dorsal view), narrow metope, and leaf-shaped lateral margins of the narrow coryphe. According to Melichar’s illustration (MELICHAR 1906: Fig. 42) *Lollius gratiosus* Melichar, 1906 from New Guinea apparently belongs to *Epitonga* as well.

The genus *Lollius* Stål, 1866 (= *Okissus* Matsumura, 1916 = *Ecapelopterum* Chan & Yang, 1994; synonymy after GNEZDILOV 2009) is characterized by a quite wide metope with two sublateral carinae joined in the shape of an inverse letter ‘V’ (FENNAH 1954, GNEZDILOV 2009) and a quite wide coryphe without leaf-shaped lateral margins. The genus is widely distributed from Australia and New Guinea to Taiwan and the Ryukyus and currently includes 24 species (BOURGOIN 2014).

Epitonga gratiosa (Melichar, 1906) comb. nov.

Lollius gratiosus Melichar, 1906: 194.

Note. The current placement of the species is based on examination of the original description and drawing (MELICHAR 1906).

Genus *Cotylana* Fennah, 1954

Cotylana Fennah, 1954: 463. Type species: *Lollius acutipennis* Kirkaldy, 1906 (by original designation).

The genus *Tylana* Stål, 1861 was erected for species from the Mascarenes (Mauritius) (STÅL 1861, WILLIAMS 1982). The genus needs revision as already mentioned by WILLIAMS (1982). It is probably monotypical as its type species, *Tylana cristata* (Fabricius, 1803), is very peculiar and differs from other species assigned to *Tylana* by the metope narrow between eyes, with no intermediate carinae and the coryphe with leaf-shaped lateral margins (WILLIAMS 1982: Figs 1–3). Based on this feature of the coryphe *Tylana* may be closely related to *Epitonga*.

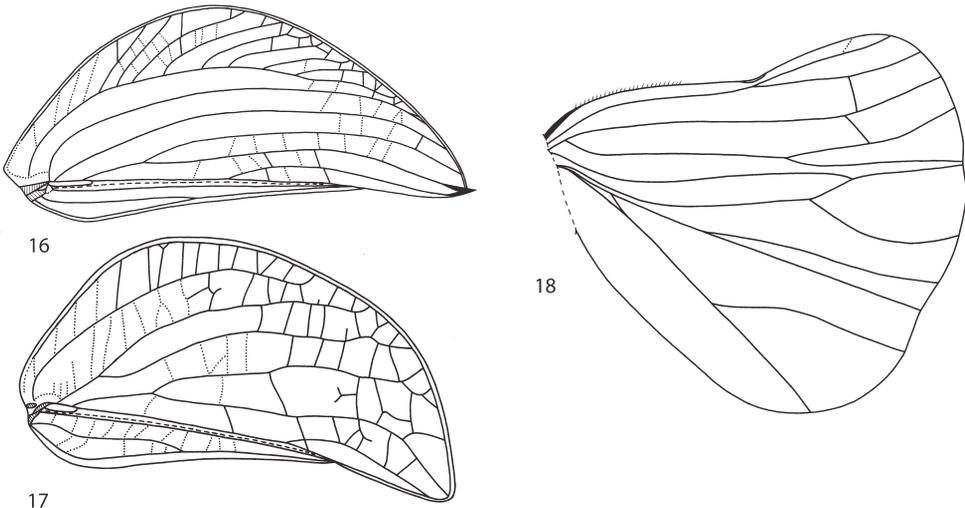
Our study of *Issus lineolatus* Walker, 1862 from Queensland in Australia, placed by DISTANT (1909) to the genus *Tylana*, shows that this species actually belongs to the genus *Cotylana*



Figs 10–13. *Orthophana (O.) spinata* Melichar, 1923. 10 – syntype, dorsal view; 11 – syntype, labels; 12 – female from Pahang, lateral view; 13 – same, frontal view.



Figs 14–15. *Cotylana lineolata* (Walker, 1862). 14 – lateral view, 15 – frontal view.



Figs 16–18. Wings. 16 – *Orthophana (O.) spinata* Melichar, 1923, fore wing; 17 – *Orthophana (Eupharos) tamdaoina* sp. nov., holotype, fore wing; 18 – same, hind wing.

which was erected by FENNAH (1954) for another Australian species, *Lollius acutipennis* Kirkaldy, 1906, and to which some species from New Caledonia were later added (FENNAH 1969). *Cotylana* is distinguished within the tribe Tongini by a tricarinate metope (Fig. 15) and wide fore wings with reticulate venation (Fig. 14).

***Cotylana lineolata* (Walker, 1862) comb. nov.**

(Figs 14–15)

Issus lineolatus Walker, 1862: 308.

Tylana lineolata: DISTANT (1909: 77).

Material examined. AUSTRALIA: QUEENSLAND: 1 ♂ 5 ♀♀, “Austr., Q., Bundaberg, 1904” (BMNH and ZIN).

Acknowledgements

Authors are grateful to Dr Igor Malenovský (Brno, Czech Republic) who provided a loan and information on material in the Moravian Museum collection and photographs of the type of *Orthophana spinata*, Mr Mick Webb (London, United Kingdom) who made the material of *Issus lineolatus* Walker available for study, and to Mr Viktor Hartung and Mrs Carla Pinho (Berlin, Germany) who helped with delivery of the holotype of *Orthophana tamdaoina* from Berlin to Brussels. The first author thanks Prof. Dr Hannelore Hoch (Berlin, Germany) for her help and hospitality during his stay in the Museum für Naturkunde, and Dr Jürgen Deckert and Mr Hans-Ulrich Raake (Berlin, Germany) for their help with literature. First

author was financially supported by the Royal Society London (United Kingdom) and the Alexander von Humboldt Stiftung (Bonn, Germany). The second authors' collecting trip was supported through a grant issued by the capacity building Programme of the Belgian Global Taxonomic Initiative National Focal Point that runs with financial support from the Belgian Directorate-General for Development Cooperation.

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