



A new species of the Oriental planthopper genus *Tenguna* Matsumura, 1910 (Hemiptera: Fulgoroidea: Dictyopharidae) from Xizang, China

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Abstract

The Oriental dictyopharid planthopper genus *Tenguna*, Matsumura, 1910 is redescribed, including its type species and a new species: *Tenguna medogensis* sp. nov. (S.W. China: Xizang). The discovery of the new species broadens our knowledge of the morphology and biogeography of the genus *Tenguna* and also represents the first record of the planthopper family Dictyopharidae in Xizang Autonomous Region, P. R. China.

Key words: *Tenguna*, Dictyopharidae, new species, China

Introduction

The Oriental dictyopharid planthopper genus *Tenguna* was established by Matsumura in 1910 based on a single species, *Tenguna watanabei* Matsumura, from Taiwan, China. Melichar (1912) in his dictyopharid monograph redescribed the genus and its species. Matsumura (1940) proposed that *Centromeria formosana* Kato, 1933 from the same location should be synonymised with *T. watanabei*. Since the genus and its type species were included in Metcalf's (1946) catalogue of world Dictyopharidae, they have not been mentioned until Yang & Yeh (1994) described and illustrated the fifth instar nymphs of *T. watanabei* and 27 other planthopper species. In addition, they provided the first description and illustration of the male genitalia of *T. watanabei*. Liang & Suwa (1998) designated a lectotype for *T. watanabei* after checking the type specimens of Matsumura's species of Fulgoroidea (excluding Delphacidae) in the Hokkaido University Insect Collection, Japan. Prior to this study, the genus *Tenguna* has been monotypic for nearly one hundred years.

While sorting and identifying planthopper material from the collection of the Insect Explorations of the Great Yarlung Zangbo Canyon, Xizang Autonomous Region, China, on Aug. 3–28, 2006, we found an undescribed species of the genus *Tenguna* Matsumura, 1910. The discovery of the new species not only broadens our knowledge of the morphology and biogeography of the genus, but also represents the first record of the planthopper family Dictyopharidae in Xizang, China. We herein describe and illustrate the new species, *Tenguna medogensis* sp. nov.

Material and methods

The specimens studied in the course of this work are deposited in the following institutions whose names are abbreviated in the text as follows:

BMNH The Natural History Museum (formerly British Museum (Natural History)), London, UK;
BPBM Bernice Pauahi Bishop Museum, Honolulu, Hawaii, USA;
HU Laboratory of Systematic Entomology, Hokkaido University, Sapporo, Japan;
IZCAS Zoological Museum, Institute of Zoology, Chinese Academy of Sciences, Beijing, P. R. China;
NU Department of Biology Insect Collection, Nankai University, Tianjin, P. R. China.

The morphological terminology and measurements used in this study follow Yang & Yeh (1994) and Liang & Song (2006).

The following abbreviations are used in the text, BL: body length (from apex of cephalic process to tip of fore wings); HL: head length (from apex of cephalic process to base of eyes); HW: head width (including eyes); FWL: fore wing length.

Taxonomy

Genus *Tenguna* Matsumura, 1910

Tenguna Matsumura, 1910: 104. Type species: *Tenguna watanabei* Matsumura, 1910: 105, by original designation.

Description

General color green or yellowish green; carinae on cephalic process, frons, pronotum and mesonotum, and parts of veins on fore wings, dark green; rostrum with extreme apex blackish; hind tibia with a black marking at extreme apex.

Head (Figs 1–9) relatively short, produced into a moderate cephalic process shorter than pronotum and mesonotum combined. Vertex (Figs 1–4, 7) with lateral margins carinate, sub-parallel at base, slightly sinuate in front of eyes, then gradually narrowing to arrowhead at apex; posterior margin angularly concave; median carina distinct and complete. Frons (Figs 6, 9) with lateral margins carinate and nearly parallel-sided, posterior margin somewhat concave; median carina distinct, lateral carinae nearly parallel, approaching frontoclypeal suture. Postclypeus and anteclypeus (Figs 6, 9) convex medially, with distinct median carina. Rostrum long, reaching beyond abdominal segment VI.

Pronotum (Figs 1–4, 7) distinctly shorter than mesonotum medially, narrow anteriorly, broad posteriorly; disc broad with anterior margin centrally angularly produced, posterior margin angularly concave; with distinct median carina and two obscure lateral discal carinae (elevated only anteriorly). Mesonotum (Figs 1–4, 7) tricarinate on disc, with median carina conspicuous, not reaching to apex, lateral carinae curving anteriorly towards median carina. Fore wings (Figs 1–3, 10, 11) with Sc+R, M and Cu all branched apically; stigma distinct, with 2–5 cells. Legs narrow and moderately long; fore femur with one minute, short, blunt spine near apex; hind tibia with 5–6 lateral black-tipped spines, spinal formula 8–(9–10)–(8–10).

Male genitalia: pygofer (Figs 12–14) narrow and high in lateral view (Fig. 13), ventrally distinctly wider than dorsally, anterior margin straight and posterior margin angularly produced posteriorly near apex. Anal tube (Figs 12, 13) oval and large in dorsal view. Parameres (Figs 13, 14) large, distinctly broadening towards apex in lateral view (Fig. 13), posterior margin straight, upper margin with dorsally directed, black-tipped process near middle, with ventrally directed, hooklike process near sub-middle on outer upper edge. Aedeagus (Figs 15–17) with pair of long, processes apically, processes with apex acute, sclerotized and pigmented; phallobase sclerotized and pigmented at base, with pairs of membranous lobes at apex.

Female genitalia: anal tube (Fig. 18) round and large in dorsal view. First valvula (Fig. 19) strongly sclerotized with 7 different sized teeth in lateral view; second valvulae (Fig. 20) triangular, symmetrical in ventral view, connected at base and separated from 1/4 base; third valvula (Fig. 21) with 2 sclerotized lobes, lateral lobe with 1–4 long spines at apex.

Remarks

Tenguna species can be distinguished from other dictyopharid planthoppers by the combination of the following diagnostic characters: general color green or yellowish green; vertex with median carina distinct and complete, lateral margins sub-parallel at base, slightly sinuate in front of eyes, then gradually narrowing to arrowhead at apex; pronotum with distinct median carina and two obscure lateral discal carinae, elevated only anteriorly; fore femur with one minute, short and blunt spine near apex; aedeagus with a pair of processes apically and phallobase with pairs of membranous lobes apically.

Species of *Tenguna* are externally similar to those of *Centromeria* Stål, 1870, but can be separated from the latter by the general color which is almost uniformly green or yellowish green (vertex, frons, genae and pronotum with orange red markings or stripes in *Centromeria* species); and vertex with median carina complete (median carina only present at base in *Centromeria* species).

The genus *Tenguna* also superficially resembles *Dictyopharina* Melichar, 1903, but differs from the latter in that the head is relatively elongate and narrower; vertex with lateral margins slightly sinuate in front of eyes and then gradually narrowing to arrowhead at apex and the fore wings having less reticulate venation.

Distribution

Southern China (Guizhou, Hubei, Sichuan, Taiwan, Xizang).

Tenguna watanabei Matsumura, 1910

(Figures 1, 4–6, 10)

Tenguna watanabei Matsumura, 1910: 105.

Centromeria formosana Kato, 1933: 461, synonymised by Matsumura, 1940: 15.

Description

Female, BL: 15.1–15.8 mm; HL: 2.0–2.2 mm; HW: 1.6–1.7 mm; FWL: 12.2–12.4 mm.

Vertex (Figs 1, 4) relatively wide, with ratio of length to width between eyes about 2.4:1; median carina in basal third sharper than in remainder part of vertex, with disc between eyes convex medially. Frons (Fig. 6) with median carina ridged sharply, lateral carinae approaching frontoclypeal suture. Pronotum (Figs 1, 4) with lower lateral carinae between eyes and tegulae conspicuous and visible in dorsal view (Fig. 4). Fore wings as in figures 1 and 10, stigma distinct, with 3–5 cells. Hind tibia with 6 lateral black-tipped spines, spinal formula 8-(9–10)-(9–10).

Male genitalia: pygofer with posterior margin slightly produced posteriorly near apex. Aedeagus with 3 pairs of membranous lobes at phallobasal apex.

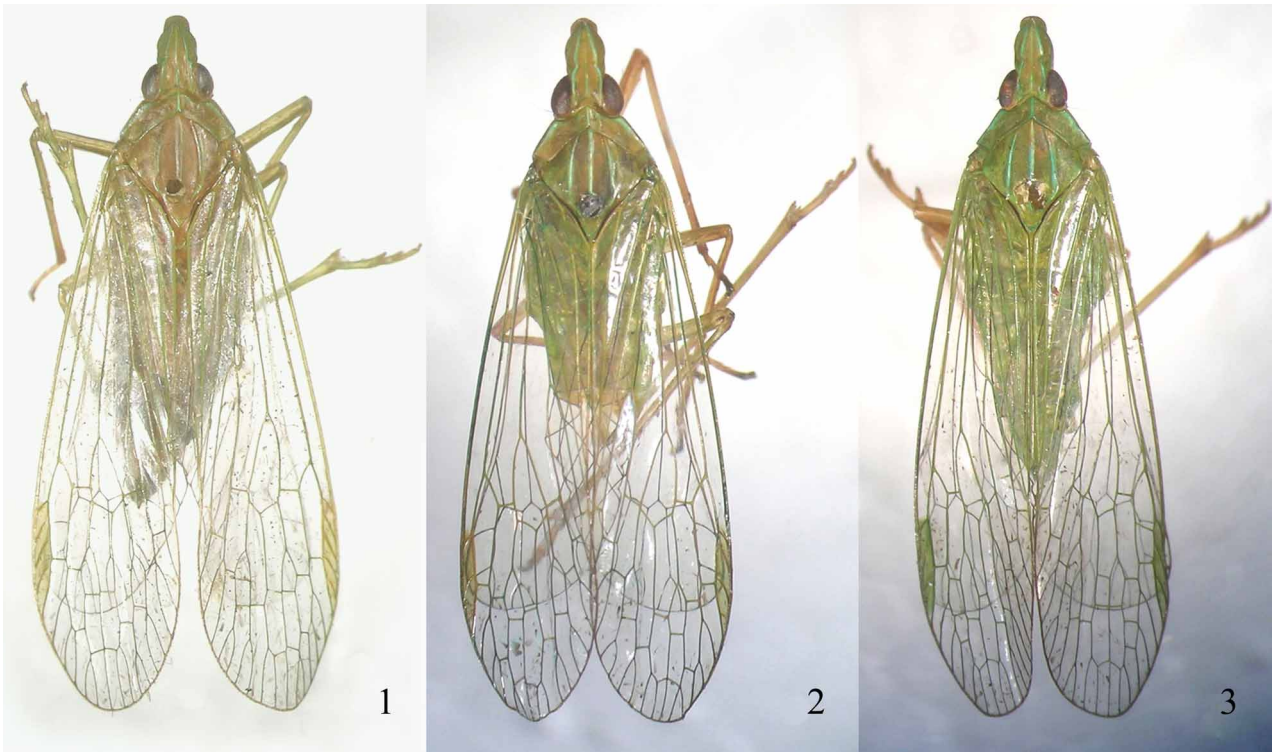
Notes: A further description and illustrations of male and female genitalia and fifth instar nymph are provided by Yang & Yeh (1994).

Type material examined

Lectotype. ♀, *Tenguna watanabei* Matsumura, 1910, designated by Liang & Suwa (1998), Taiwan, Hoppo, 8.VII; *Paralectotypes*. 1♀, Taiwan, Hoppo, 8.VIII.1906; 1♀, Taiwan, Shinsha, 23.VII.1906; 1♀, Taiwan, Koannai, 29.VII.1906 (HU).

Other material examined

China: 1♀, Taiwan, Yunlin, Tsaoling, 6.VII.1985 (C. T. Yang), *Tenguna watanabei* Matsumura, determined by C. T. Yang (BMNH); 1♀, Taiwan, Hori (Puli), 750 m, 22.VIII.1947 (J. L. Gressitt) (BPBM); 1♀, Sichuan, Mt. Qingcheng, 12.VIII.1957 (L. Y. Zheng) (NU); 3♀, Sichuan, Mt. Emei, Baoguosi, 550–750 m, 24–27.VII., 9.IX.1957 (F. X. Zhu); 1♀, Sichuan, Mt. Emei, Jiulaodong, 12.IX.1940, no collector; 1♀, Hubei, Hefeng, 900 m, 28.VII.1989 (N. N. Xiao); 1♀, Guizhou, Mt. Fanjing, 28.VII.2001 (X. C. Du) (all in IZCAS).



FIGURES 1–3. Dorsal habitus of *Tenguna* Matsumura, 1910. 1. *Tenguna watanabei* Matsumura, 1910; 2. *Tenguna medogensis* sp. nov., male, holotype; 3. same, female, paratype.

Distribution

Southern China (Guizhou, Hubei, Sichuan, Taiwan).

Tenguna medogensis sp. nov.

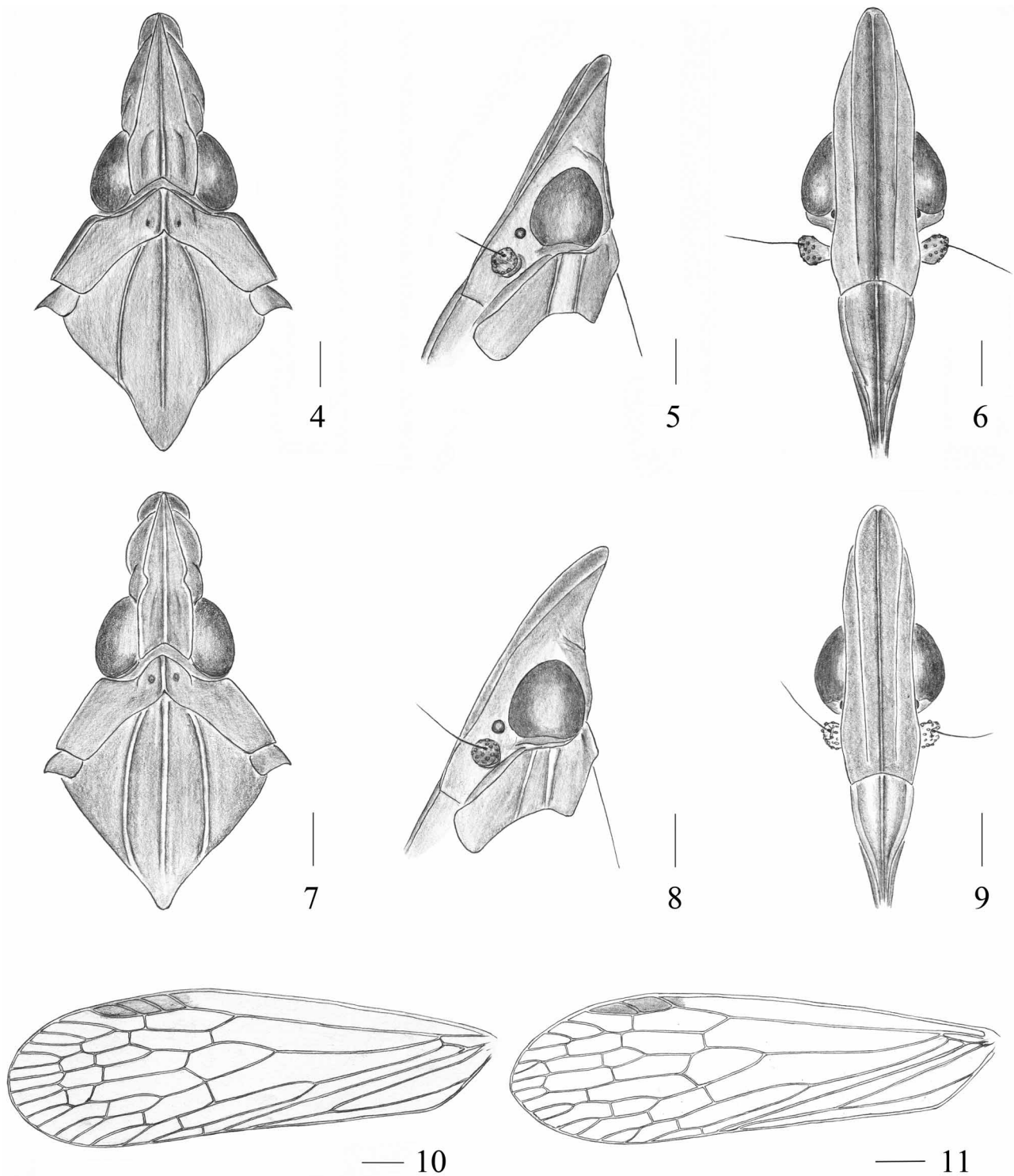
(Figures 2, 3, 7–9, 11–21)

Description

Male, BL: 13.8–14.7 mm; HL: 1.8–2.0 mm; HW: 1.4–1.5 mm; FWL: 10.8–11.4 mm. Female, BL: 12.0–12.6 mm; HL: 1.6–1.7 mm; HW: 1.2–1.3 mm; FWL: 9.3–9.8 mm.

General color and external characters as in generic description. Vertex (Figs 2, 3, 7) relatively narrow, with ratio of length to width between eyes about 3.0:1; disc between eyes convex medially and remainder part somewhat upturned. Pronotum (Figs 2, 3, 7) with lower lateral carinae between eyes and tegulae not observed in dorsal view (Fig. 7). Fore wings as in figures 2, 3 and 11, stigma distinct, with 2–3 cells. Hind tibia with 5 lateral black-tipped spines, spinal formula 8–9-(8–9).

Male genitalia: pygofer (Figs 12–14) ventrally distinctly wider than dorsally (about 3:1), posterior margin with distinct, posteriorly directed process near apex in lateral view (Fig. 13); dorsal margin deeply excavated to accommodate anal tube, dorsal-lateral margins angularly produced posteriorly in dorsal view (Fig. 12). Anal tube (Figs 12, 13) nearly long triangular in lateral view (Fig. 13), large and elongate in dorsal view (Fig. 12), with ratio of length to width at middle about 1.7:1. Anal style short and broad. Parameres (Figs 13, 14) large and broad in lateral view (Fig. 13), distinctly humped distinctly near apex in ventral view (Fig. 14). Aedeagus (Figs 15–17) short and stout, with pair of long, asymmetrical, phallic processes; processes turned anterodorsally and intercrossed at basal half, and directed anterolaterally in dorsal view (Fig. 15); phallobase with two pairs of membranous lobes at apex: dorsal pair above phallobase and other ventral pair below phallobase in lateral view (Fig. 16).

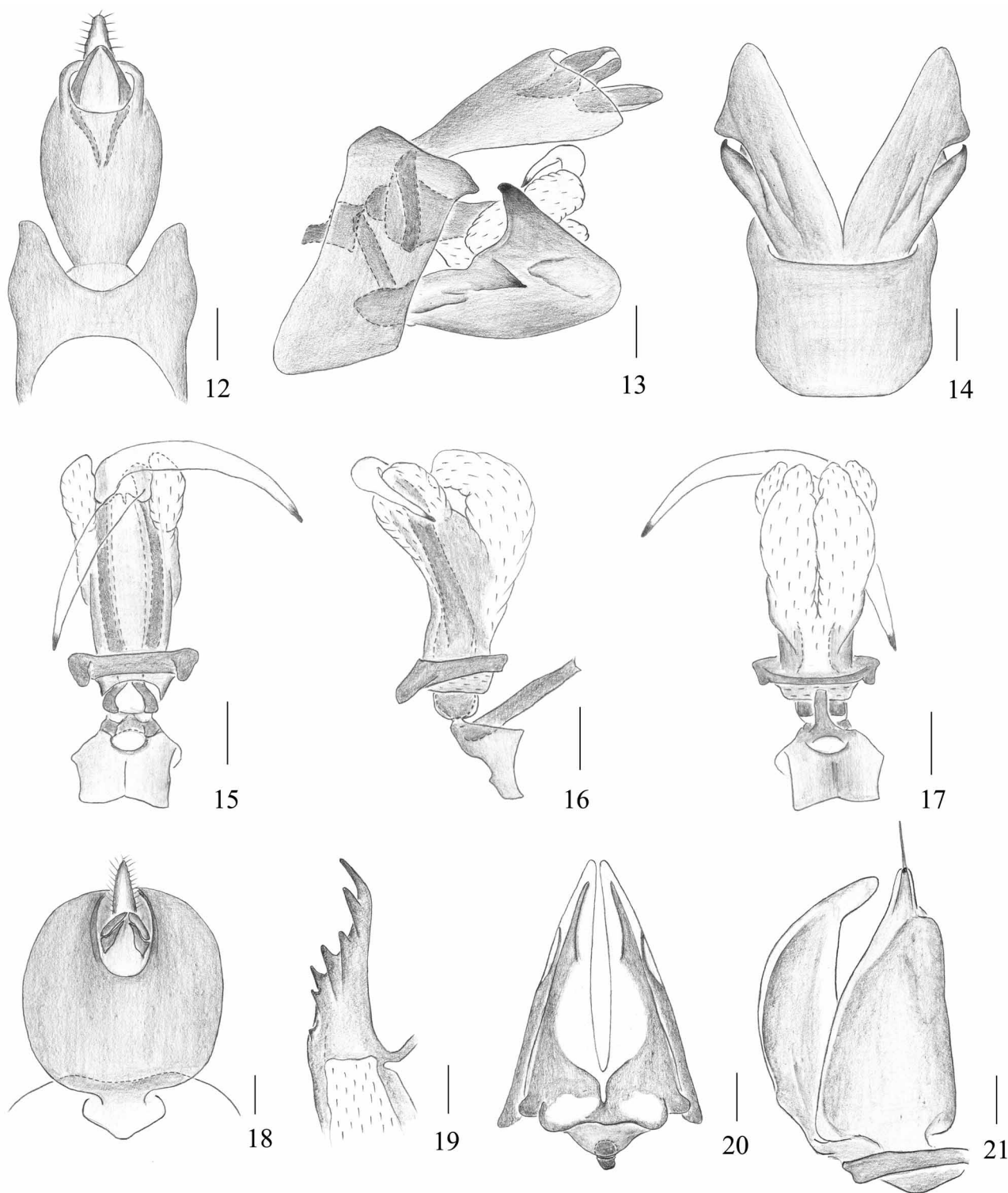


FIGURES 4–11. *Tenguna watanabei* Matsumura, 1910 (Figs 4–6, 10); *Tenguna medogensis* sp. nov., male, holotype (Figs 7–9, 11). 4, 7. head, pronotum and mesonotum (dorsal view); 5, 8. head and pronotum (lateral view); 6, 9. head (ventral view); 10, 11. left wing. Scale bars: Figs 4–9 = 0.5 mm, Figs 10, 11 = 1 mm.

Female genitalia: anal tube (Fig. 18) round and large in dorsal view, ratio of length to width at middle about 1:1. Valvulae (Fig. 19–21) as in generic description.

Etymology

The species is named for its occurrence in Medog County, Xizang Autonomous Region in southwestern China.



FIGURES 12–21. *Tenguna medogensis* sp. nov. 12. male, holotype, pygofer and anal tube (dorsal view); 13. genitalia (lateral view); 14. pygofer and parameres (ventral view); 15. aedeagus (dorsal view); 16. same (lateral view); 17. same (ventral view); 18. female, paratype, anal tube (dorsal view); 19. first valvula (lateral view); 20. second valvulae (ventral view); 21. third valvula (lateral view). Scale bars: Figs 12–21 = 0.2 mm.

Material examined

Holotype: ♂, Southwestern China: Xizang, Medog, Maniweng (29.27337°N, 96.16859°E), 895 m, 14.VIII.2006 (Z. S. Song), light trap. *Paratypes*. 3♂♂, 3♀♀, same data as holotype; 5♂♂, 5♀♀, Xizang, Medog, Aniqiao (29.32874°N, 95.14866°E), 1080 m, 12–13.VIII.2006 (Z. S. Song); 1♀, Xizang, Medog, Beibeng (29.24349°N, 95.17145°E), 786 m, 17.VIII.2006 (Z. S. Song) (all in IZCAS).

Distribution

Southwestern China (Xizang).

Remarks

The species can be distinguished from *T. watanabei* by the relatively narrow vertex, with ratio of length to width between eyes about 3.0:1 (about 2.4:1 in *T. watanabei*); pronotum with lower lateral carinae between eyes and tegulae not observed in dorsal view (Fig. 9); phallobase with two pairs of membranous lobes at apex (three pairs of lobes in *T. watanabei*).

The discovery of this species not only broadens our knowledge of the morphology and biogeography of the genus, but also represents the first record of the planthopper family Dictyopharidae in Xizang, China.

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