



RESEARCH PAPER

Taxonomic revision of family Tropicuchidae (Hemiptera: Fulgoromorpha) from Korea

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Abstract

The family Tropicuchidae is revised taxonomically comprising five genera and five species from Korea. *Catullia vittata* Matsumura is redescribed here on the basis of a series of males recently collected in Korea. *Cixiopsis punctatus* Matsumura and *Catullia vittata* Matsumura were transferred from Achilidae to Tropicuchidae and are redescribed here with male genitalia for the first time from Korea. *Ommatissus binotatus* Fieber previously reported was an incorrect identification of *Ommatissus lofouensis* Muir. Another species, *Trypetimorpha koreana* Kwon and Lee, is the macropterous form of *Trypetimorpha japonica* Ishihara. All Korean species of the Tropicuchidae are redescribed and illustrated, and an identification key to the genera of Tropicuchidae is provided.

Key words: Auchenorrhyncha, Fulgoroidea, taxonomy, tropiduchid plant hopper.

Introduction

The tropiduchid plant hoppers of Korea were last summarized by Kwon and Huh (2001), providing four species in three genera: *Trypetimorpha japonica* Ishihara, 1954, *Trypetimorpha koreana* Kwon and Lee, 1979, *Ommatissus binotatus* Fieber, 1875 and *Ossoides lineatus* Bierman, 1910. Considering the species richness in other plant hopper families, the number of tropiduchid plant hoppers known from Korea is low. In that regard, a detailed taxonomic study of this family is barely needed.

While studying tropiduchid fauna of Korea, we found that *Cixiopsis punctatus* Matsumura and *Catullia vittata* Matsumura were mistakenly classified into the family Achilidae without description although they were reported for the first time from Korea (Kwon & Huh 2001). Another species, *Ommatissus binotatus* Fieber previously recorded, is probably an incorrect identification of *Ommatissus lofouensis* Muir (Guglielmino 1997). *Trypetimorpha koreana* Kwon and Lee (1979) was synonymized with *T. japonica* Ishihara by Huang and Bourgoïn (1993). In our investigation, we found that *T. koreana* was the macropterous form of *T. japonica*.

In this paper, the Tropicuchidae of Korea is revised, providing some taxonomic changes of the following species: *Catullia vittata* Matsumura, 1914, *Cixiopsis punctatus* Matsumura, 1900, *Trypetimorpha japonica* Ishihara, 1954, *Ommatissus lofouensis* Muir, 1913 and *Ossoides lineatus* Bierman, 1910. All the above species are redescribed with illustrations of male genital structures.

Materials and methods

Terminology follows Anufriev and Emeljanov (1988). Dried specimens were used for description and illustration. External and internal morphology were observed under a stereoscopic microscope (Olympus SZH10) and characters were measured with an ocular micrometer. The length of the body was measured from the apex of the head to the posterior end of the tail. Photographs of morphological structures were taken by a Canon EOS 500D digital camera with an MPE 65 mm lens. Images were imported into Adobe Photoshop CS3 for labeling and plate composition. Specimens examined in the present study are deposited in the collection of

the School of Applied Bio-sciences, Kyungpook National University, Daegu, Republic of Korea.

Systematics

Family Tropiduchidae Stål, 1866

Key to genera of Tropiduchidae from Korea

- 1 Frons with single median carina 2
- Frons with two median carinae joined at the end *Catullia*
- 2 Vertex parabolic and comparatively elongated *Ossoides*

- Vertex pentagonal and comparatively short 3
- 3 Frons with one median, two lateral and two sub-lateral carinae *Cixiopsis*
- Frons with one median and only two lateral carinae . . . 4
- 4 Pronotum and frons with two distinct almost round black spot; median carina of vertex inconspicuous *Ommatissus*
- Pronotum and frons with several patches of dark spot; median carina of vertex prominent *Trypetimorpha*

Genus *Catullia* Stål, 1870

Catullia Stål, 1870: p. 748. Type species: *Catullia subtestacea* Stål 1870.

Catullia vittata Matsumura 1914 (Korean name: Maep-si-bang-pae-myeol-gu) (Fig. 1a–i)

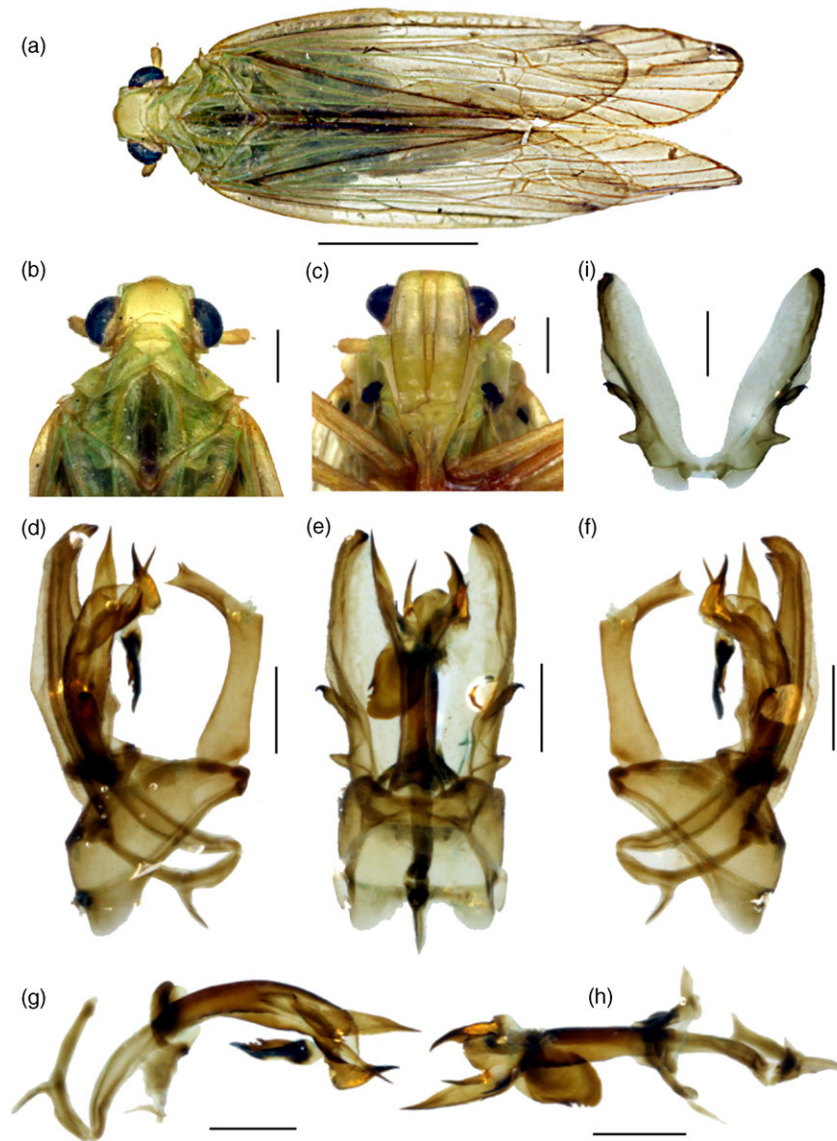


Figure 1 *Catullia vittata* Matsumura. (a) Dorsal habitus; (b) vertex, pronotum and mesonotum; (c) clypeus; (d) genital block with pygofer, penis, paramere and anal tube (right lateral view); (e) genital block with pygofer, penis, paramere and anal tube (dorsal view); (f) genital block with pygofer, penis, paramere and anal tube (left lateral view); (g) penis (right lateral view); (h) penis (dorsal view); (i) paramere (lateral view). Scale bars (a) 2.0 mm; (b–i) 0.5 mm.

Catullia vittata Matsumura 1914: pp. 266–267; Chou *et al.* 1985: p. 39; Kwon & Huh 2001: p. 320.

Redescription. Length male: 7.7–8.0 mm, female: 8.5–9.0 mm. Body yellowish green with four black strips on tegmina, tegmina much longer than abdomen (Fig. 1a). Head (Fig. 1b) slightly projected before eyes, vertex yellow green, wider than long, bounded by a ridged carina, middle area depressed, median carina inconspicuous or absent, anteriorly more or less convex-angled, posteriorly concave, lateral side strongly ridged; frons (Fig. 1c) also yellow green, two median carinae joined at apex near epistomal suture, lateral carinae ridged; post clypeus with median carina; second antennomere yellowish, bristles dark; eyes dark black.

Pronotum (Fig. 1b) slightly longer than peak with 5 carinae on both sides of ventral margin with rounded black spots; mesopleuron each with small rounded black spots; mesonotum with 3 carinae; tegmina (Fig. 1a) subhyaline, clouded yellowish green, yellowish at tip, much longer than abdomen, with about 4 longitudinal stripes, costa with about 15 cross veins; wings hyaline, nerves pale yellowish; underside and legs yellowish green, tips of front tarsi and claws dark.

Male genitalia. Male genital block (Fig. 1d–f) pale yellowish, pygofer symmetrical, dorsal margin narrower than ventral margin and strongly excavated to accommodate anal tube, anterior margin convex in lateral view and concave posteriorly; aedeagus (Fig. 1g,h) slightly curved, with four spinose apical processes dorsally, and with a remarkable wide dented process, downwardly directed; genital styles (Fig. 1i) symmetrical, with two spines laterally; anal tube (Fig. 1d,f) slender, sickle-shaped laterally.

Material examined. 1 female, Baegunsan, Jeollanam-do, 11.ix.1999, Y.J. Kwon; 11 males, Baegil-do, Jeollanam-do, 13.viii.2011; 14 females, same locality, same date; 2 males, Munsusan, Jeollanam-do, 30.viii.1997; 2 females, Suryeonsan, Jeollanam-do, same date; 1 male, Cheonhwangsan, Jeollabuk-do, 12.ix.1999, all same collector.

Distribution. Korea, Japan, China.

Remarks. This species was first known from a single female specimen by Matsumura. Later it was reported from China and Korea but none of these authors studied the male genitalia even though it provides a better character to identify taxa on the species level. This species is still incorrectly regarded as a member of the family Achilidae in the Korean fauna. New Korean name of this species is provided in this revision: Maep-si-bang-pae-myeol-gu.

Genus *Trypetimorpha* Costa, 1862

Trypetimorpha Costa, 1862: p. 60; Melichar 1914: p. 198; Metcalf 1954: p. 66; Ishihara 1954: p. 18; Fennah 1955: p. 125; Fennah 1982: p. 634; Chou *et al.* 1985: p. 34; Asche & Wilson 1989: p. 130. Type species: *Trypetimorpha fenestrata* Costa 1862.

Trichoduchus Bierman 1910: p. 28, synonymized by Horváth 1911: p. 338; Oshanin 1912: p. 121; Asche & Wilson 1989: p. 130.

Trypetimorpha japonica Ishihara 1954 (Korean name: Hwa-san-bang-pae-myeol-gu) (Brachypterous form: Fig. 2; Macropterous form: Fig. 3)

Trypetimorpha japonica Ishihara 1954: p. 48; Lee & Kwon 1977: p. 98; Lee & Kwon, 1979: p. 966; Chou *et al.* 1985: p. 35; Anufriev & Emeljanov 1988: p. 489; Morimoto 1989: p. 89; Huang & Bourgoïn 1993: p. 622; Kwon *et al.* 1994: p. 94; Kwon *et al.* 1996a: p. 123; Kwon & Huh 2001: p. 329.

Trichoduchus japonicus Fennah 1955: p. 125, synonymized by Asche & Wilson 1989: p. 130.

Trypetimorpha koreana Kwon & Lee 1979: p. 63, synonymized by Huang & Bourgoïn 1993: p. 622.

Redescription. Length male: 3.1–3.4 mm (brachypterous), 4.1–4.2 mm (macropterous); female: 3.5–3.9 mm. Body small, pale brown to black; tegmina hyaline in macropterous forms (Fig. 3a); several dark spots in head capsule and pronotum. Head angularly projected before eyes, slightly narrower than pronotum. Vertex (Figs 2c,3b) pentagonal, distinctly longer than wide, with ridged carinae, slightly concave at base, median carina well marked; frons (Figs 2d,3c) short, pale yellow, with two transverse dark brown band, lateral carinae slightly convex, median and lateral carinae strongly produced. Clypeus darker than frons, anteclypeal conical protrusion paler, labium surpassing prothorax; antennae with pedicel about 3 times as long as scape, produced anterodistally, with anterior transverse brown streak; flagellum long, brown.

Pronotum (Figs 2c,3b) pentacarinated, anterior margin slightly convex, posterior one concave-angled; lateral carina converging cephalad; median carina reaching hind margin, laterally often two darker patches on each side of latero-external carina. Mesonotum tricarinated, with distinct transverse suture separating mesoscutellum. In macropterous form (Fig. 3a), tegmina hyaline, rounded apices, with dark brown radial veinlets. RM and MCu longitudinal cells half at least as long as tegmina; clavus shorter than half of tegmina; no M and Cu fork vein posteriorly. In brachypterous form (Fig. 2a,b), tegmina opaque, broader in their distal part, radial cells possessing a wide dark brown band; wing hyaline and approximately half as long as tegmen in macropterous forms. Legs pale brown with blackish spines and claws. Abdomen usually dark brown with yellowish intersegmental fold.

Male genitalia. Pygofer (Figs 2e,3d,e) symmetrical, dorsal margin excavated to accommodate anal tube, ventral margin convex in lateral view; genital styles (Figs 2f,g,3f,g) symmetrical, trapezoidal, dorsally armed with hook-like process; aedeagus (Figs 2f,g,3f,g) slightly curved sclerotized tube connected to an apical membranous endosoma,

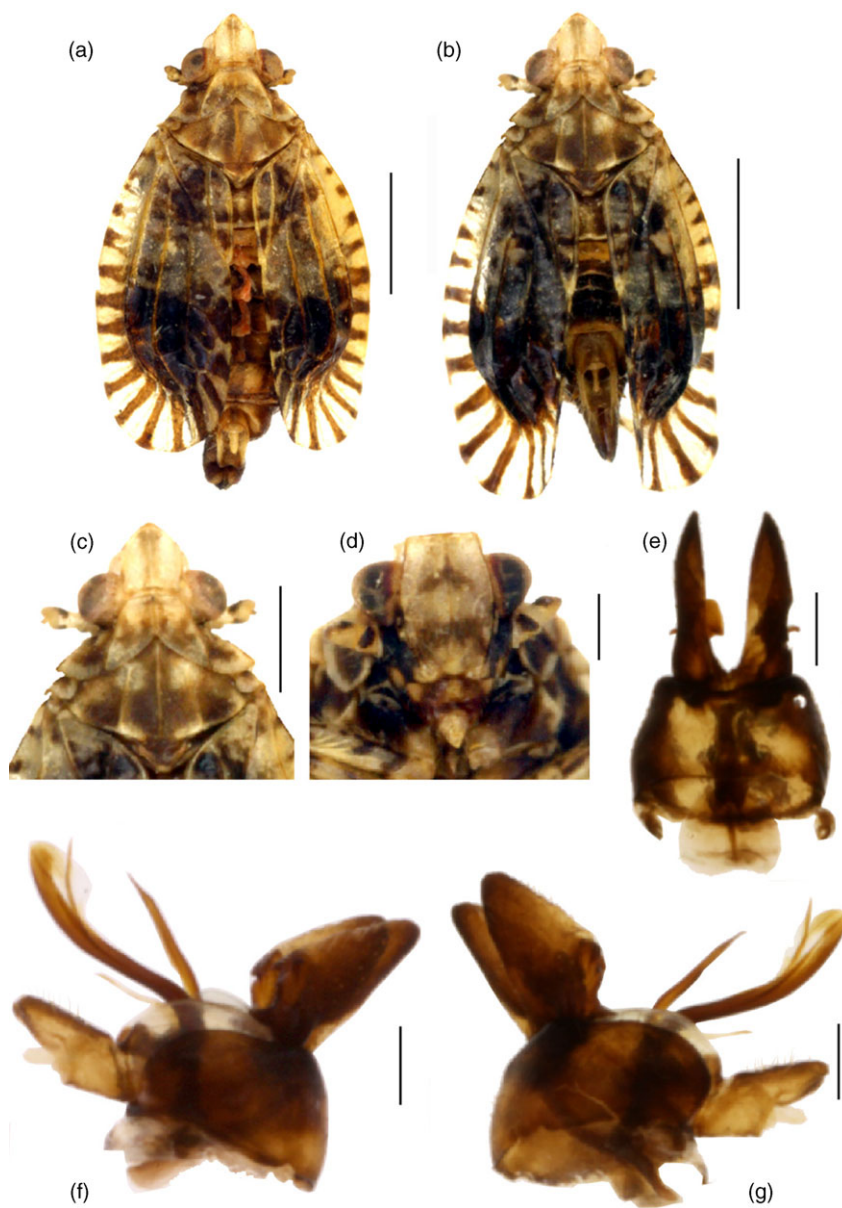


Figure 2 *Trypetimorpha japonica* Ishihara (brachypterous form). (a) Dorsal habitus (female); (b) dorsal habitus (male); (c) vertex, pronotum and mesonotum; (d) clypeus; (e) pygofer and paramere; (f) genital block with pygofer, penis, paramere and anal tube (left lateral view); (g) genital block with pygofer, penis, paramere and anal tube (right lateral view). Scale bars (a,b) 1.0 mm; (c) 0.5 mm; (d–g) 0.25 mm.

with endosomal processes; perianthium short with an asymmetrical left process; anal tube (Figs 2f,g,3f,g) small with hairs and projected ventrally.

Material examined. 1 male, Palgongsan, Gyeongsangbuk-do, 6.ix.1985, Y.J. Kwon; 1 female, Daegu city, Gyeongsangbuk-do, 5.viii.1981; 1 male (Macrop.), 1 female, Dansan-myeon, Gyeongsangbuk-do, 13.viii.1983; 2 females, Gamcheon-myeon, Gyeongsangbuk-do, 7.ix.1980; 1 male, Cheonhwangsan, Gyeongsangnam-do, 30.ix.1984; 1 male, Cheamsan, Jeollanam-do, 4.ix.1999, 1 male (Macrop.), Uido, Jeollanam-do, 15.ix.1998; all same collector.

Distribution. Korea, Japan, Russia.

Remarks. *Trypetimorpha koreana* Kwon and Lee (1979) from Korea was synonymized with *T. japonica* Ishihara by

Huang and Bourgoïn (1993). In the present investigation of *Trypetimorpha koreana* specimen, we found that *T. koreana* was the macropterous form (Fig. 3) of *T. japonica* with the same male genitalia.

Genus *Cixiopsis* Matsumura, 1900

Cixiopsis Matsumura 1900: p. 207. Type species: *Cixiopsis punctatus* Matsumura 1900.

Cixiopsis punctatus Matsumura 1900 (Korean name: Ddung-bo-bang-pae-myeol-gu) (Fig. 4)

Cixiopsis punctatus Matsumura 1900: p. 207; Matsumura 1910: pp. 101–102; Chou *et al.* 1985: p. 37; Anufriev & Emeljanov 1988: p. 489; Kwon & Huh 2001: p. 320.

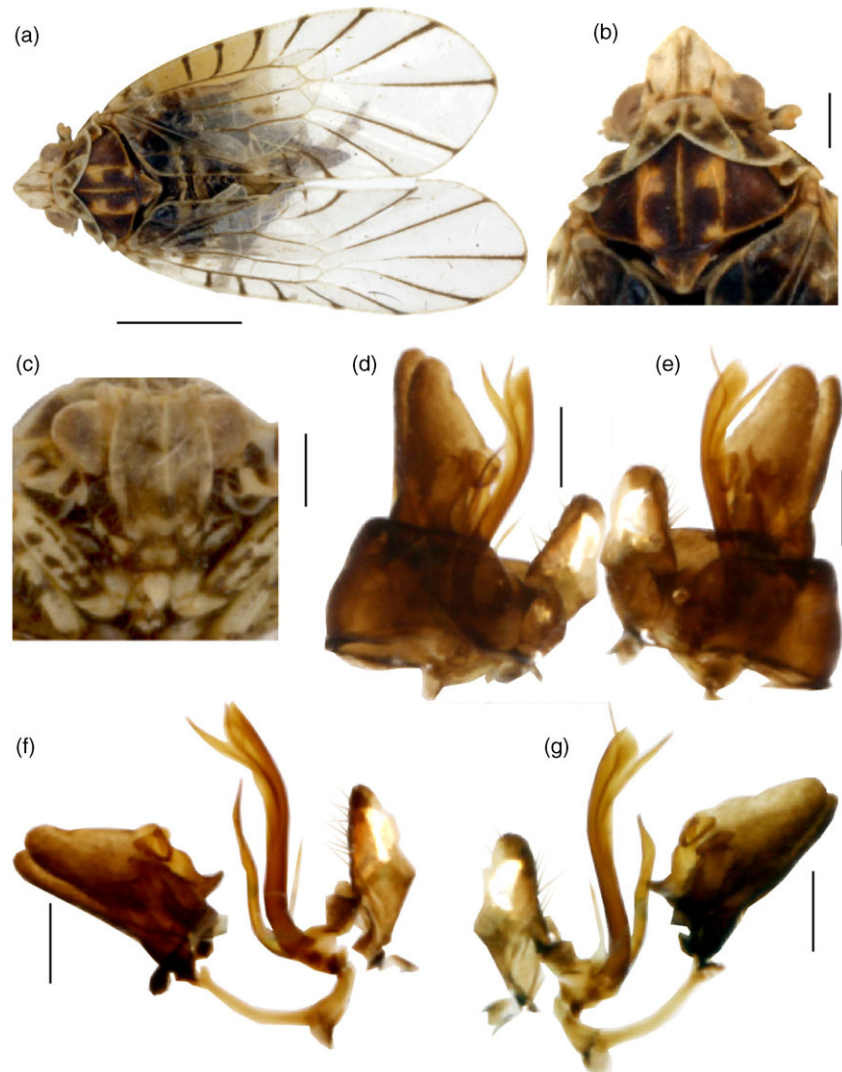


Figure 3 *Trypetimorpha japonica* Ishihara (macropterous form). (a) Dorsal habitus (male); (b) vertex, pronotum and mesonotum; (c) clypeus; (d) genital block with pygofer, penis, paramere and anal tube (right lateral view); (e) genital block with pygofer, penis, paramere and anal tube (left lateral view); (f) male genitalia with penis, paramere and anal tube (right lateral view); (g) male genitalia with penis, paramere and anal tube (left lateral view). Scale bars (a) 1.0 mm; (b–g) 0.25 mm.

Redescription. Length male: 7.4–7.7 mm including genitalia (brachypterous form), 6.3–6.5 mm (macropterous form); female: 6.5–6.8 mm. Body tegmen brown to dark brown, tegmina macropterous and brachypterous form (Fig. 4a–c). Head including eyes slightly narrower than pronotum, angularly projecting before eyes. Vertex (Fig. 4d) pentagonal, bounded by ridge carina, with distinct median carina, anteriorly more or less convex angled, posteriorly concave; frons (Fig. 4e) brown, with 5 carinae, intermediate carinae extended up to epistomal suture, post-clypeus with lateral and median carinae.

Disc of pronotum (Fig. 4d) semi circular, wide, noticeably elevated above less wide lateral parts; mesonotum with 3 longitudinal carinae approximated anteriorly; tegmina usually shortened up to apex of abdomen, convex, consolidated, bearing accessory veins; in macropterous form (Fig. 4a) tegmina surpass the abdominal apex; abdomen

brown to dark brown; hind tibia light brown, with lateral spines.

Male genitalia. Genital block (Fig. 4f) brown to dark brown, with symmetrical and hawk beak – shaped genital styli (lateral view) (Fig. 4g,h); anal tube noticeably smaller; aedeagus (Fig. 4g,h) slightly curved sclerotized with widened apex of thick endosoma, with endosomal process; lateral process of perianthrium unbranched, apex widened and cup-shaped; pygofer (Fig. 4f) longer than wide ventrally, ventromedian process short but widen.

Material examined. 1 male, Hakgasan, Gyeongsangbuk-do, 21.viii.1998, Y.J. Kwon; 1 female, Juwangsan, Gyeongsangbuk-do, 26.vii.1984; 1 female, Palgongsan, Gyeongsangbuk-do, 24.viii.1980; 1 male, Ullyeonsan, Gyeongsangbuk-do, 20.viii.2001; 2 males, Weolgyeongsan, Gyeongsangnam-do, 28.viii.1997; 1 male, Weolchulsan, Jeollanam-do, 17.vii.1999, all same collector.

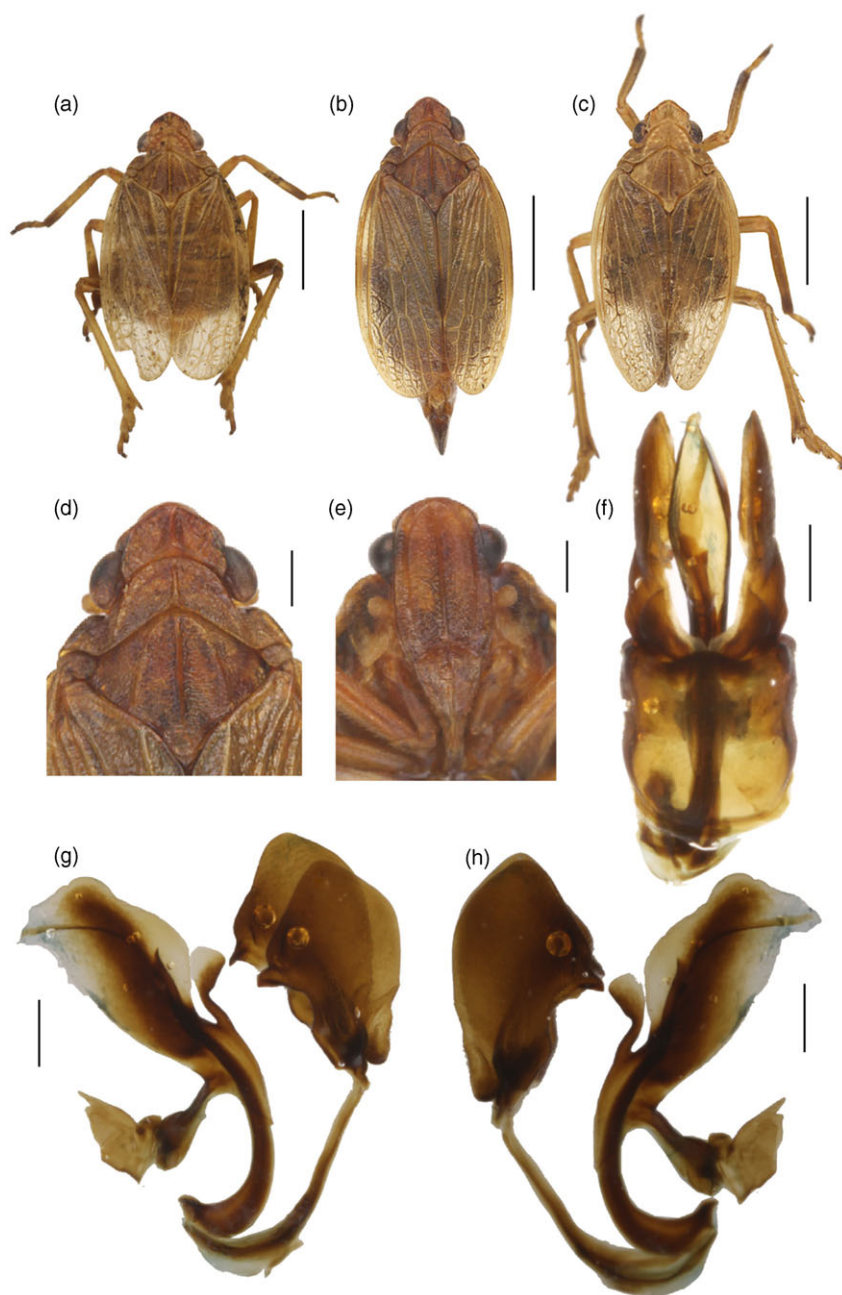


Figure 4 *Cixiopsis punctatus* Matsumura. (a) Dorsal habitus (female, macropterous form); (b) dorsal habitus (male, brachypterous); (c) dorsal habitus (male, macropterous); (d) vertex, pronotum and Mesonotum; (e) clypeus; (f) genital block with pygofer, penis, paramere and anal tube (ventral view); (g) male genitalia with penis, paramere and anal tube (left lateral view); (h) male genitalia with penis, paramere and anal tube (right lateral view). Scale bars (a–c) 2.0 mm; (d–h) 0.5 mm.

Distribution. Korea, Japan, China, Russia, Vietnam, India, Sri Lanka.

Remarks. This species was firstly identified from Japan by Matsumura (1900) on the basis of a female specimen and a male included in 1910. Later, it was reported from China, Russia and Korea but Anufriev and Emeljanov (1988) synonymized the two species *Padanda atkinsoni* Distant, 1906 and *Olontheus obscurus* Jacobi, 1944 with *Cixiopsis punctatus* by describing the male genitalia. Vilbaste (1968) described the male genitalia of *Olontheus obscurus* first.

However, this species was incorrectly classified as a member of the family Achilidae in the Korean fauna. The new Korean name of this species is provided in this revision: Ddung-bo-bang-pae-myeol-gu.

Genus *Ossoides* Bierman, 1910

Ossoides Bierman 1910: p. 26. Type species: *Ossoides lineatus* Bierman 1910.

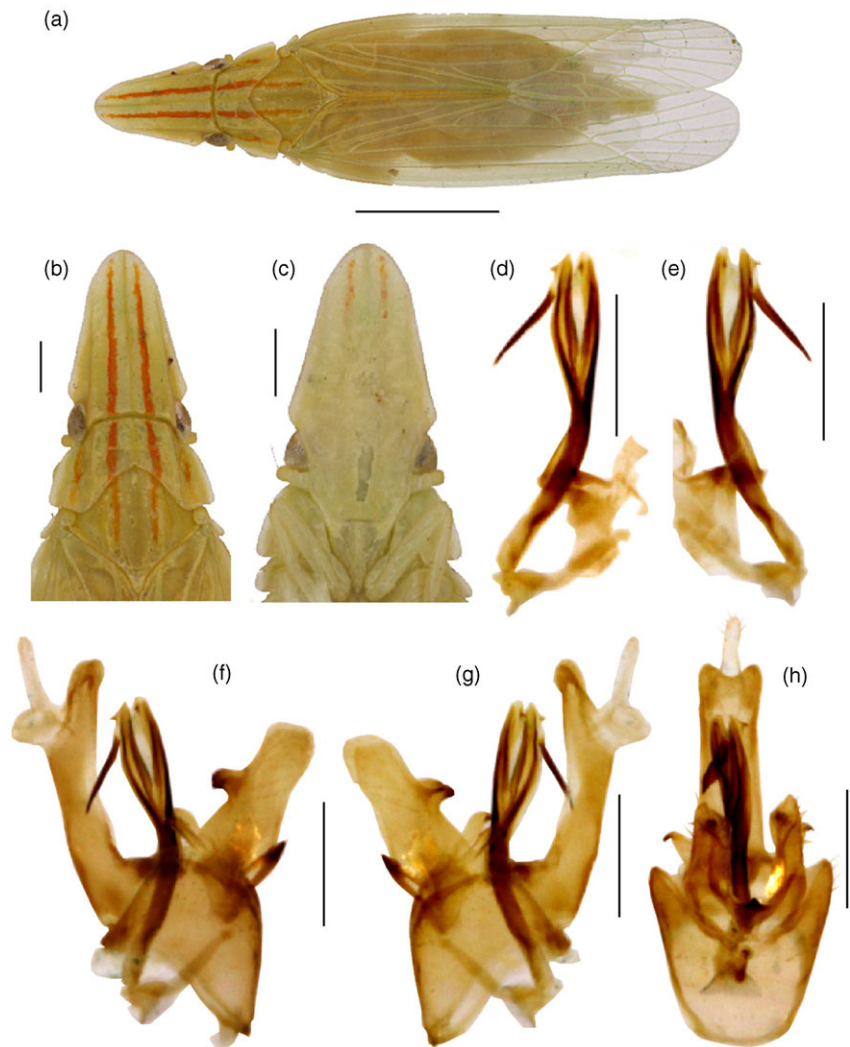


Figure 5 *Ossoides lineatus* Bierman. (a) Dorsal habitus (male); (b) vertex, pronotum and mesonotum; (c) clypeus; (d,e) male genitalia with penis (left lateral and right lateral view); (f–h) genital block with pygofer, penis, paramere and anal tube (right lateral, left lateral and ventral view). Scale bars (a) 2.0 mm; (b–h) 0.5 mm.

Platyepora Matsumura 1913: p. 59. Type species: *Platyepora quadrivittata* Matsumura 1913 (Japan).

Ossoides lineatus Bierman 1910 (Korean name: Wun-gye-bang-pae-myeol-gu) (Fig. 5)

Ossoides lineatus Bierman 1910: p. 27; Lee & Kwon 1977: p. 96; Lee & Kwon 1979: p. 967; Kim & Park 1981: p. 171; Kim 1984: p. 203; Kim 1989: pp. 105, 126; Chou *et al.* 1985: p. 37; Morimoto 1989: p. 89; Kim 1993: p. 301; Kwon *et al.* 1994: p. 94; Kwon & Huh 1995a: p. 42; Kwon & Huh 1995b: p. 258; Kwon *et al.* 1996b: p. 123; Kwon *et al.* 1996b: p. 235; An 1999: p. 41.

Platyepora quadrivittata Matsumura 1913: p. 59.

Redescription. Length male: 8.8–9.0 mm, female: 9.3–9.5 mm. Body (Fig. 5a) slender, straw color with greenish shade. Head (Fig. 5b) bears persimmon-red stripes; tegmen hyaline with greenish veins. Vertex noticeably elongated, flat, with 3 sharp ridge of carinae, with 2 persimmon-red stripes, parabolic apex, slightly concave posteriorly, lateral

margin surpass eyes near base; frons (Fig. 5c) also flat, a little depressed in middle, median carina present but not prominent, pale green, epistomal suture present, anteclypeus with median carina, rostrum short, apex ended with orange dot.

Pronotum (Fig. 5b) tricarinated, with 4 persimmon-red stripes, anterior margin slightly convex, posterior one concave angled; mesonotum also tricarinated, with distinct transverse suture separating the mesoscutellum; tegmen hyaline, longer than wide, with pale green veins, a series of cross veins form a chain from clavus end to pterostigma, other cross vein also connected longitudinal veins near the apex. Abdomen straw color or pale yellow, legs pale yellow with extremity of all spines blackish.

Male genitalia. Ventral side of genital block black, consists of pygofer, genital styles, aedeagus and anal segments; aedeagus (Fig. 5d,e) shaft slightly curved in the middle with bifurcated apex bearing a long spinose process laterally;

genital styles (Fig. 5f,g) symmetrical, each of which bears 2 hook-shaped spinose processes; pygofer with elongated ventro-median process; anal tube symmetrical, slender and elongated.

Material examined. 1 male, 1 female, Cheongnyongsan, Gyeongsangbuk-do, 20.ix.1997, Y.J. Kwon; 2 males, Dosolje, Gyeongsangbuk-do, 15.viii.1997; 1 female, Daegeumsan, Gyeongsangnam-do, 7.ix.1997; 1 male, 1 female, Geumsan, Gyeongsangnam-do, 17–18.viii.1994; 1 female, Mangsan, Gyeongsangnam-do, 6.ix.1997; 1 male, Nojasan, Gyeongsangnam-do, 7.ix.1997; 6 males, 5 females, Waryongsan, Gyeongsangnam-do, 11.viii. 1999; 7 males, 9 females, Yeohangsan, Gyeongsangnam-do, 11.viii.1999; 11 males, 9 females, Jeamsan, Gangwon-do, 4.ix.1999; 1 male, Geumjeongsan, Jeollabuk-do, 14.viii.1997; 1 female, same locality, 29.viii.1997; 1 male, Soyosan, 15.vii.1997; 3 males, 4 females, Donnaeko, Jeju-do, 26.viii.1994; 1 male, 5 females, same locality, 4.ix.1998; 3 males, 5 females, Hallasan, Jeju-do, 4.viii.1989; 12 males, 5 females Jungmun, Jeju-do, 11–12.viii.1984; 1 male, 1 female, San-gumburi, Jeju-do, 7.x. 1994; 3 males, Udo, Jeju-do, 26.viii.1994; 1 male, 3 females, same locality, 6.x.1994; 19 males, 46 females, Daap-myeon, Jeollanam-do, 26.viii.2005; 1 male, 2 females, Bogildo, Jeollanam-do, 7.viii.1996; 1 male, Duryunsan, Jeollanam-do, 2.x.1983; 1 female, Heuksando, Jeollanam-do, 13.viii.1981; 2 males, 3 females, Hongdo, Jeollanam-do, 10.viii.1981; 4 males, 7 females, same locality, 12.viii.1981; 2 males, 1 female, Jogyesan, Jeollanam-do, 10.ix.1998; 1 female, Munsusan, Jeollanam-do, 15.viii.1997; 1 male, Suryeonsan, Jeollanam-do, 30.viii.1997; 3 males, 4 females, Uido, Jeollanam-do, 17.viii.1998; 8 males, 9 females, Wando, Jeollanam-do, 11.viii.1999, all same collector.

Distribution. Korea, Japan, China, Taiwan, Vietnam.

Genus *Ommatissus* Fieber, 1875

Ommatissus [*sic*] Fieber 1875: p. 353; Metcalf 1954: pp. 1–165; Chou *et al.* 1985: p. 42; Asche & Wilson 1989: pp. 127–147. Type species: *Ommatissus binotatus* Fieber, 1876.

Ommatissus lofouensis Muir 1913 (Korean name: Bangpae-myeol-gu) (Fig. 6)

Ommatissus lofouensis Muir 1913: p. 267; Kim & Kim 1971: p. 150; Lee & Kwon 1977: p. 96; Chou *et al.* 1985: p. 43; Park *et al.* 1988: p. 188; Morimoto 1989: p. 89; Guglielmino 1997: p. 119.

Ommatissus binotatus: Kwon & Lee 1979: p. 64; Lee & Kwon 1979: p. 967; Kwon *et al.* 1994: p. 94; Kwon *et al.* 1996b: p. 123; Kwon & Huh 2001: p. 327.

Redescription. Length male: 4.1–4.4 mm including genitalia (brachypterous form), 4.3–4.6 mm (macropterous form); female: 4.5–4.8 mm. Body (Fig. 6a–c) short, dark

brown. Head (Fig. 6d) a little narrower than pronotum, apex of vertex to posterior part of mesonotum pale brown centrally; tegmen brown to dark brown, with ridged venation. Vertex more or less pentagonal, bounded by a ridged carina, anterior margin angulate and posteriorly concave, median carina inconspicuous; frons (Fig. 6e) with three ridged carinae forming furrow, two oval black spot beside median carina at base; median ocellus absent; post clypeus slanting down from epistomal suture with dark brown spot; anteclypeus conical protrusion paler; rostrum short.

Pronotum pentacarinated, exterior carinae missing in their basal part; anterior margin slightly convex, posterior one concave-angled, median margin reaching hind margin, laterally two distinct black spot on each side of the latero-external carina; mesonotum tricarinated with a distinct transverse suture separating the mesoscutellum, lateral corner dark brown. In macropterous form (Fig. 6c), tegmina longer than genital apex and in brachypterous form (Fig. 6a,b), tegmina shorter than genital apex, semihyaline, brown to dark brown, all longitudinal veins longer than clavus, vein prominent, ridged, apical margin rounded. Legs yellowish brown, extremities of all spines and claws blackish. Abdomen usually dark brown, inter-segmental folds yellowish.

Male genitalia. Genital styles (Fig. 6f) parabolic, large and symmetrical, length greater than width at base, apex slightly rounded; “S”-Shaped sclerotized aedeagus (lateral view) (Fig. 6g,h), with two symmetrical periandrium, almost equal to aedeagus length; anal segment short, less than half length of genital styles; ventral and lateral edges of pygofer subtruncate, compressed and symmetrical.

Material examined. 1 male, 4 females, Daegu, Gyeongsangbuk-do, 14.x.1984, Y.J. Kwon; 1 female, Duryunsan, Gyeongsangbuk-do, 2.x.1983; 1 male, Gorymyeon, Gyeongsangbuk-do, 10.x.1998; 1 female, Hakgasan, Gyeongsangbuk-do, 6.ix.1998; 5 males, Hwanghaksan, Gyeongsangbuk-do, 14.ix.1991; 2 females, Palgongsan, Gyeongsangbuk-do, 20.ix.1980; 1 female, same locality, 7.x.1984; 1 male, 2 females, same locality, 9.x.1984; 1 male, same locality, 6.ix.1985; 2 males, Seonuisan, Gyeongsangbuk-do, 21.ix.1997; 1 female, Hakilsan, Gyeongsangbuk-do, 21.ix.1997; 1 male, Masan city, Gyeongsangnam-do, 10.ix.1984; 1 female, Nojasan, Gyeongsangnam-do, 7.ix.1997; 2 males, 1 female, Weolgeongsan, Gyeongsangnam-do, 28.viii. 1997; 1 male, Taegumsan, Gyeongsangnam-do, 7.ix.1997; 1 male, 1 female, Unjangan, Jeollabuk-do, 28.viii.1998; 1 male, Hallasan, Jeju-do, 7.x.1990; 1 male, Baegunsan, Jeollanam-do, 11.ix.1999; 1 female, Suryeonsan, Jeollanam-do, 30.viii.1997, all same collector.

Distribution. Korea, Japan, China.

Remarks. *Ommatissus lofouensis* differs from *Ommatissus binotatus* as follows: the vertex narrowing slightly more towards the apex and the face towards the base, the medio-

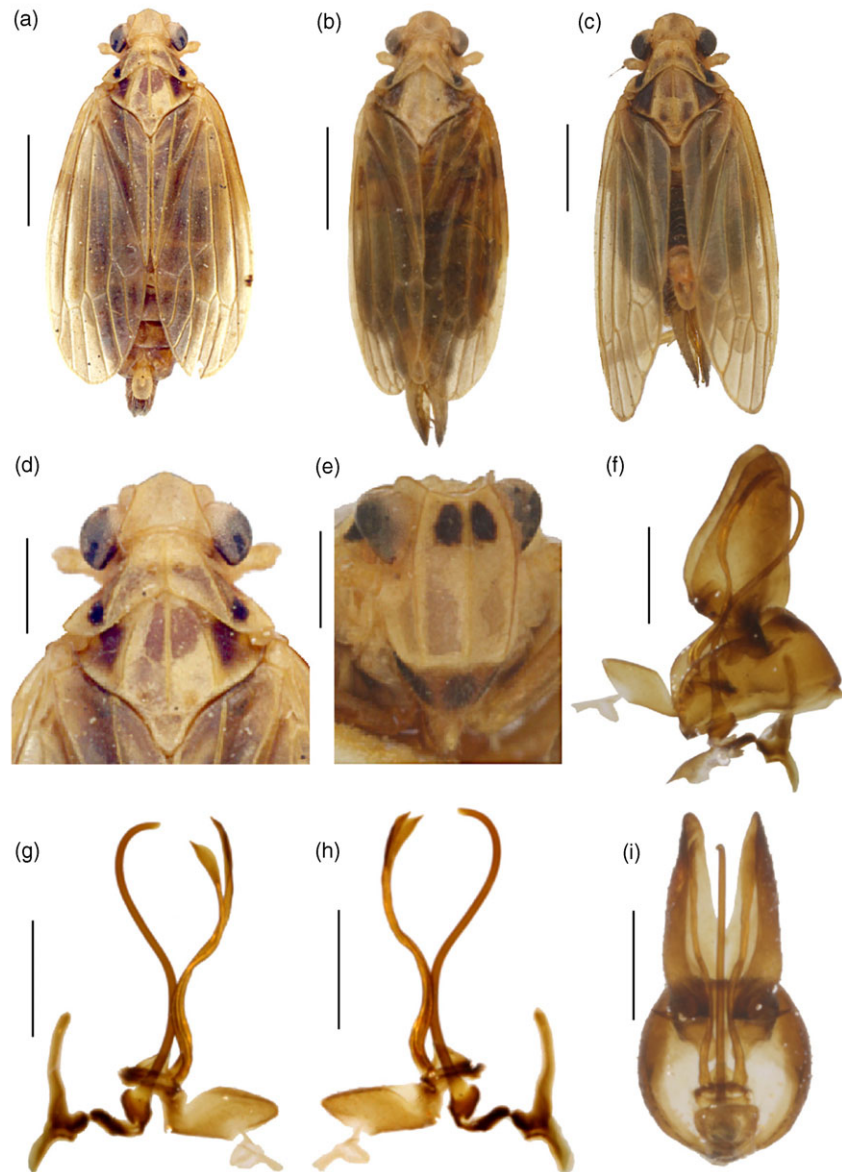


Figure 6 *Ommatissus lofouensis* Muir. (a) Dorsal habitus (female, brachypterous); (b) dorsal habitus (male, brachypterous); (c) dorsal habitus (male, macropterous); (d) vertex, pronotum and Mesonotum; (e) clypeus; (f) genital block with pygofer, penis, paramere and anal tube (lateral view); (g–h) male genitalia with penis and anal tube (right lateral and left lateral view); (i) genital block (dorsal view). Scale bars (a–c) 1.0 mm; (d–i) 0.5 mm.

apical portion of clypeus raised as a short, angular keel, basal half of clypeus dark; male pygofer slightly compressed, ventral and lateral edge subtruncate; anal segment less than half length of genital styles; styles large, subangular, length greater than width at the base, apex slightly rounded (as per description of Muir 1913). According to Guglielmino (1997), the genus *Ommatissus* includes 12 species among which four are known from the Oriental region and other eight are widespread in the Afrotropical and Palearctic regions.

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