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Notes on genera of Sarimini with description of two new species in the genera *Microsarimodes* and *Tetrichina* (Hemiptera: Fulgoromorpha: Issidae)

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Abstract

Two new species of the tribe Sarimini in the planthopper family Issidae: *Microsarimodes flavomaculata* **sp. nov.** and *Tetrichina fuscovinclum* **sp. nov.** are described from China. The genera *Duplexissus* Wang, Zhang & Bourgoin, 2019 and *Sarimissus* Wang, Zhang & Bourgoin, 2019 are reestablished as valid genera based on both morphological grounds and molecular analyses.

Key words: Fulgoroidea, morphology, taxonomy, new taxa, oriental, planthopper

Introduction

The tribe Sarimini Wang, Zhang & Bourgoin, 2016 represents the second largest tribe of the family Issidae Spinola, 1839 subfamily Hemisphaeriinae Melichar, 1906 with 25 genera and 126 species (Bourgoin, 2020). This tribe was recently reviewed (Chang *et al.*, 2019; Wang and Bourgoin, 2020) and is currently recognized from other Issidae tribes by features of the hindwing. In particular, a specific 3/4-lobed hindwing with an A2 lobe as wide as or wider than the other lobes, often notched at the A2 extremity, and all lobes without reticulated venations. The Pcu-A1 lobe is usually without transverse veins and the cubital band area between CuP and Pcu is always much wider than the intra-cubital band area between CuA and CuP. Vein Pcu and A1 anterior branch anastomoses on some distance and veins MP, Pcu, $A1_1$, $A1_2$ and A2 mostly single (Wang and Bourgoin, 2020).

From this tribe, the monotypic genera *Microsarimodes* Chang & Chen, 2019 and *Tetrichina* Chang & Chen, 2020 were recently described from China (Chang *et al.*, 2019, 2020). For each of them, we described one more new species.

Two other Sarimini genera recently described: *Duplexissus* Wang, Zhang & Bourgoin, 2019 and *Sarimissus* Wang, Zhang & Bourgoin, 2019 were synonymized by Gnezdilov (2020) respectively with *Euroxenus* Gnezdilov, 2009 and *Nikomiklukha* Gnezdilov, 2010. However, we confirm here that these two taxa are valid on both morphological and molecular evidences. A new updated molecular phylogeny of the tribe from Wang & Bourgoin (2020) is provided including the genus *Euroxenus*.

Materials and methods

The type specimens of new taxa are deposited in the Entomological Museum of Northwest A&F University (NWAFU), Yangling, Shaanxi province, China. The abbreviation IZCAS refers to the Institute of Zoology, Chinese Academy of Sciences, Beijing, China.

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The genitalia were separated and boiled in a 5ml beaker with 10% NaOH solution for a few minutes until muscles were completely dissolved. Then after rinsing in distilled water several times to clean the residual NaOH solution, genitalia were subsequently transferred to glycerin for dissection and observation. Dissected genitalia were stored under its related specimens in genitalia vials with few drops of glycerin for final conservation. Photographs for external morphology and genitalia characters were taken using Leica DFC495 camera attached to Leica M205A stereomicroscope and further refined with software LAS V3.8. Morphological terminology for male genitalia follows Bourgoin (1987), for female genitalia Bourgoin (1993), and forewing venation Bourgoin *et al.* (2015), hindwing venation Wang *et al.* (2019).

Molecular analyses follow the same procedures provided in Wang *et al.* (2016) except for in MrBayes v3.2.4 (Ronquist *et al.*, 2012) run with 30 million generations sampling every 1000 generations, using the same dataset from Wang and Bourgoin (2020) but adding one more taxon: *Euroxenus vayssieresi* (Bonfils, Attié & Reynaud, 2001) with partial sequence of 18S (first third of the gene not sequenced), 28S (D3–D5), 28S (D6–D7) and COI. Three species from three different tribes were used as outgroups, according to the classification of Wang *et al.* (2016) updated in Bourgoin *et al.* (2020): Issini (*Issus coleoptratus*), Parahiraciini (*Fortunia* sp.) and Hemisphaeriini (*Hemisphaerius coccinelloides*). All related registration numbers in GenBank are provided in Table 1.

Taxonomy

Family Issidae Spinola, 1839

Subfamily Hemisphaeriinae Melichar, 1906 (sec. Wang *et al.*, 2016)

Tribe Sarimini Wang, Zhang & Bourgoin, 2016

The tribe Sarimini was placed in doubt by Gnezdilov *et al.* (2020) who depicted them as a polyphyletic group with the two genera *Euroxenus* and *Darwalli*a Gnezdilov, 2010, excluded from Sarimini. Currently and *versus* Gnezdilov *et al.* (2020), we still recognize the tribe Sarimini as a monophyletic and valid group, as well as the clade Hemisphaeriinae, which is not invalided according the results of Gnezdilov *et al.* (2020).

1. New species description

Microsarimodes Chang & Chen, 2019

Type species: *Microsarimodes tumida* Chang & Chen, 2019

Diagnosis and original description. See Chang *et al.*, 2019: 137.

Supplementary description. Vertex with lateral margins paralleled or sinuate (Figs 1, 3). Mesonotum with sublateral carinae obscure or elevated (Figs 1, 3). Forewings with obvious (Figs 1, 3) or obscure transverse veins, the band areas of forewing before middle of MP, CuA and CuP veins almost without transverse veins (Fig. 2).

Distribution. China (Hainan, Yunnan).

Key to species of the genus *Microsarimodes* Chang & Chen, 2019

1. Frons yellow in basal 1/3 (Chang *et al.*, 2019, fig. 20); male anal tube in dorsal view with lateral margins gradually narrower from middle to the apex, anal opening located at middle (Chang *et al.*, 2019, fig. 24); the tumefied protuberance of capitulum in gonostylus located at the anterior-lateral margin (Chang *et al.*, 2019, fig. 25) . . . . . *Microsarimodes tumida* Chang & Chen, 2019

–. Frons yellow in basal half (Fig. 4); male anal tube in dorsal view with lateral margins paralleled in apical 2/3, anal opening located at basal 1/3 (Fig. 6); the tumefied protuberance of capitulum in gonostylus located at the posterior-lateral margin (Fig. 7). . . . . *Microsarimodes flavomaculata* **sp. nov.**

TABLE 1. Taxa sampling and the related GenBank reference numbers.

Species name	Collecting location	Gene 18S (1F-5R)	Gene 18S (3F-Bi)	Gene 18S (A2-9R)	Gene 28S (D3-D5)	Gene 28S (D6-D7)	COI	Cytb
Dactylissus armillarius Gnezdilov & Soulier-Perkins, 2014	Vietnam	KX702829	KX702829	KX702829			KX702929	KX702879
Darwallia barbata Gnezdilov & Bourgoin, 2014	Vietnam	KX702838	KX702838	KX702838	KX761410	KX702864	KX761464	KX702888
Duplexissus punctatulus Wang, Zhang & Bourgoin, 2019	China	KX761490	KX761490	KX761490	KX761531	KX761520	KX761501	KX761512
Eusarimissus hezhouensis Wang & Bourgoin, 2020	China		MN955873	MN955873	MN955872	MN955852	MN954323	
Euroxenus vayssieresi (Bonfils, Attié & Reynaud, 2001)	Reunion		MN165789	MN165789	MN266995	MN266964	MT318763	
Eusarima sp. 1	New Guinea	KX761495	KX761495	KX761495	KX761537	KX761524	KX761506	KX761515
Eusarima sp. 4	China	KX761488	KX761488	KX761488	KX761529	New Added	KX761499	KX761554
Gen. nov.	China	KX761478	KX761478	KX761478	KX761481	KX761484	KX761469	KX761473
Sarima bifurca Meng & Wang, 2016	China	KX702819	KX702819	KX702819	KX761447	KX702808	KX702921	KX761552
Syrgis sp.	Philippines	KX702840	KX702840	KX702840	KX761411		KX702938	KX702890
Longieusarima lunulia Wang, Bourgoin & Zhang, 2017	China	KX761477	KX761477	KX761477		KX761483	KX761468	
Tetrica sp.	China	KX702821	KX702821	KX702821	KX761449	KX702809	KX702922	KX702909
Tetrichina fuscovinclum **sp. nov.**	China	KX761489	KX761489	KX761489	KX761530	KX761519	KX761500	KX761511
Fortunia sp.	China	KX761487	KX761487	KX761487	KX761527	KX761518	KX761498	KX761509
Hemisphaerius coccinelloides (Burmeister, 1834)	Philippines	KX702834	KX702834	KX702834	KX761405	KX702861	KX702934	KX702884
Issus coleoptratus (Fabricius, 1781)	France	KX761568	KX761568	KX761568	KX761403	KX761560	KX702932	KX761550

***Microsarimodes flavomaculata* Wang & Bourgoin, sp. nov.**

ZooBank registration: LSID urn:lsid:zoobank.org:act:2A1DD540-D5FD-4895-9D39-29497A6668A3

(Figs 1–9)

Diagnosis. This new species is similar to *Microsarimodes tumida* Chang & Chen, 2019, but differs by: 1) Pronotum with several tubercles on the disc (Figs 1, 3), but without tubercles in *M. tumida* (Chang *et al.*, 2019, fig. 18); 2) The yellow patches on frons intersperse in basal half of frons (Fig. 4), while only basal 1/3 on frons in *M. tumida* (Chang *et al.*, 2019, fig. 20); 3) Male anal tube in dorsal view with lateral margins paralleled in apical 2/3, anal opening located at basal 1/3 of anal tube (Fig. 6), while lateral margins gradually narrower from middle part to the apex, anal opening located at middle of anal tube in *M. tumida* (Chang *et al.*, 2019, fig. 24); 4) Capitulum of gonostylus much longer, the tumefied protuberance located in the postero-lateral area with its apex exceeding to the apical margin (Fig. 7), while capitulum of gonostylus short, the tumefied protuberance located in the anterior-lateral area with its apex reaching to the middle in *M. tumida* (Chang *et al.*, 2019, fig. 25: b).

Etymology. Combination of Latin words "*flavus*" meaning yellow and *"macula"* meaning patch, referring to the yellow marking on the basal half of the frons.

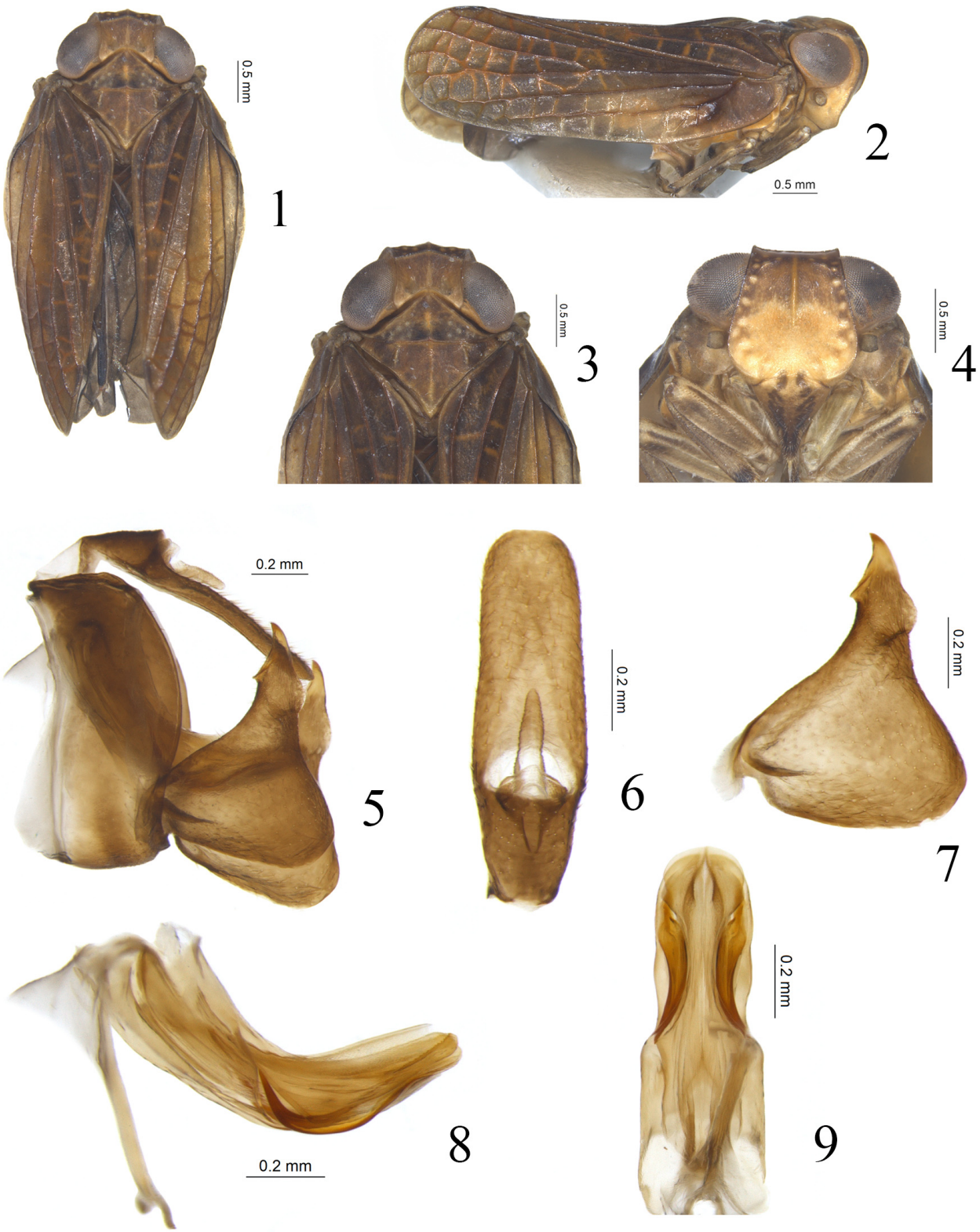
Description. Length: male (including forewings) (N=1): 5.2 mm.

Coloration. Vertex brown, margins brown, disc with weak yellow median carina (Figs 1, 3). Compound eyes grayish brown, supported by tawny callus (Figs 1, 3). Frons light yellow in basal half and brown in apical half, the boundary between the light yellow and brown areas M-shaped (Fig. 4); apical margin black, lateral margins mostly black with basal slightly yellow (Fig. 4); median carina yellow, only elevated and visible at apical half (Fig. 4). Frons with around 11 to 14 large irregular yellowish tubercles on apical and lateral areas (Fig. 4). Antennae brown (Fig. 4). Postclypeus yellow, with two broad interrupted brownish longitudinal bands (Fig. 4). Genae tawny (Fig. 2). Pronotum brown, anterior and posterior margins brown; median carina yellow, only visible at middle, lateral areas with several grayish inconspicuous tubercles (Figs 1, 3). Mesonotum brown, median carina yellow, sublateral carinae brown (Figs 1, 3). Forewings tawny, longitudinal veins mostly brown and transverse veins tawny (Figs 1, 2). Hindwings brown (Fig. 1). Legs light yellow (Fig. 4).

Head and thorax. Vertex 1.6 times wider in width at middle than length at middle, anterior margin slightly angularly convex, posterior margin roundly concave with the level deeper than anterior margin, lateral margins slightly concave inward at middle, then convex near base, postero-lateral angles rounded (Figs 1, 3). Frons 1.0 times wider at widest part than long in midline, 1.5 times wider at widest part than apical margin (Fig. 4); apical margin straight (Fig. 4). Pronotum 2.5 times wider in posterior margin than long in midline, 1.2 times longer in midline than vertex (Figs 1, 3); anterior margin sharply angularly convex, posterior margin straight (Figs 1, 3). Mesonotum with anterior margin 1.7 times wider than long in midline, 1.6 times longer in midline than pronotum, median carina from anterior margin to the base but not elevated, sublateral carinae elevated from anterior margin but not reaching to the posterior margin (Figs 1, 3). Forewings with MP_{1+2} bifurcate at apical 1/6, MP_{3+4} single (Fig. 2). Metatibiotarsal spinulation formula unknown (hind legs missing).

Male genitalia. Anal tube in lateral view with ventral margin straight (Fig. 5); in dorsal view long cylindrical, 3.3 times longer in midline than widest part, lateral margins paralleled at apical 2/3, then gradually narrower to base, apical margin convex with middle part almost straight (Fig. 6); anal opening located at basal 1/3 of anal tube (Fig. 6). Pygofer in lateral view rectangular, 2.4 times longer in midline than width at middle; dorsal margin straight, posterior margin slightly convex caudad (Fig. 5). Gonostylus triangular in lateral view, highest near middle, dorsal margin of gonostylus almost straight, oblique toward to capitulum, ventral margin with postero-ventral angle strongly convex (Figs 5, 7). Capitulum of gonostylus long and broad, triangular, gradually narrowing from base to apex, tip pointed, antero-lateral margin with a spinous process, postero-lateral margin with a roundly tumefied protuberance at base with its apex exceeding to the apical margin (Figs 5, 7). Periandrium dorsal lobe rounded in the apex in lateral view (Fig. 8); periandrium lateral lobe bearing density of minute teeth on dorsal margin (Fig. 8); periandrium ventral lobe slightly shorter than lateral lobes (Fig. 8), rounded in the apical margin in ventral view (Fig. 9). Aedeagus with a pair of large hook-like processes originated from apical 1/5 along the ventral margin, then curved to dorso-anterior, reaching to the middle of periandrium (Fig. 8), in ventral view, this pair of processes curved to outward (Fig. 9).

Type materials. Holotype: ♂, China, Yunnan Province, Mangshi, 30 iv 2012, coll. Menglin Wang.



FIGURES 1–9. ***Microsarimodes flavomaculata*** **sp. nov.** 1 adult, dorsal view 2 adult, lateral view 3 head and thorax, dorsal view 4 adult, frontal view 5 male genitalia, lateral view 6 male anal tube, dorsal view 7 gonostylus, lateral view 8 phallic complex, left lateral view 9 phallic complex, ventral view.

Tetrichina Chang & Chen, 2020

Type species: *Tetrichina trihamulata* Chang & Chen, 2020

Diagnosis and original description. See Chang *et al.*, 2020: 39.

Supplementary description. Vertex with anterior margin sharply angularly convex (Figs 10, 12) or obtusely convex. Lateral areas of frons with several tubercles enlarging from apex to base, the tubercles inconspicuous near base (Fig. 13) or without tubercles (Chang *et al.*, 2020, fig. 32). Mesonotum with transverse carina in some specimens (Figs 10, 12). ScP+RA vein of forewings with one forked short vein near base (Chang *et al.*, 2020, fig. 33) or this short vein not obvious (Fig. 11), the whole surface of forewing across with transverse veins (Figs 10, 11).

Distribution. China (Hainan).

Key to species of the genus *Tetrichina* Chang & Chen, 2020

1. Frons without large markings in the middle area (Chang *et al.*, 2020, fig. 32); the bidirectional hooked process of periandrium very large, around 3/4 length of periandrium (Chang *et al.*, 2020, fig. 38) . . . . . *Tetrichina trihamulata* Chang & Chen, 2020
- Frons with two large white markings in the middle area (Fig. 13); the bidirectional hooked process of periandrium much smaller, around 1/4 length of periandrium (Fig. 17) . . . . . *Tetrichina fuscovinclum* **sp. nov.**

Tetrichina fuscovinclum Wang & Bourgoin, sp. nov.

ZooBank registration: LSID urn:lsid:zoobank.org:act:97DD3616-423A-48A4-B750-84D596841EC6
(Figs 10–24)

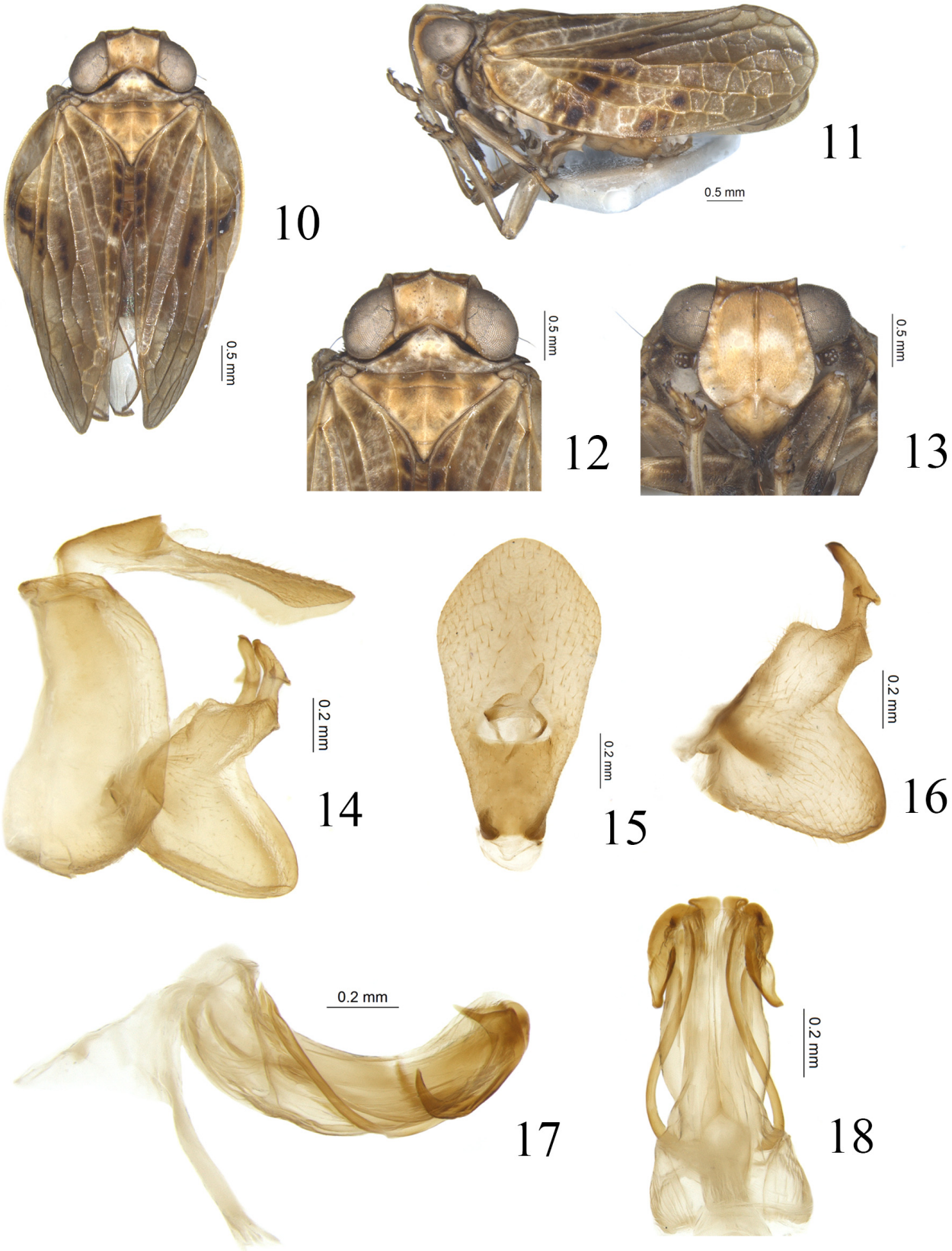
Diagnosis. This new species is similar to *Tetrichina trihamulata* Chang & Chen, 2020 in general appearance (both collected from Hainan province of China), but differs by: 1) Frons with two large white markings in the middle area (Fig. 13), but without these markings in *T. trihamulata* (Chang *et al.*, 2020, fig. 32); 2) The bidirectional hooked process of periandrium much smaller, around 1/4 length of periandrium (Fig. 17), while around 3/4 length of periandrium in *T. trihamulata* (Chang *et al.*, 2020, fig. 38).

Etymology. Combination of Latin words "*fuscus*" (meaning dark) and "*vinclum*" (meaning chain), referring to the brownish transverse markings on forewing. Gender: neutral.

Description. Length: male (including forewings) (N=1): 5.2 mm; female (including forewings) (N=1): 5.6 mm.

Coloration. Vertex light yellowish brown, anterior and lateral margins carinated and brown, vertex with two large obscure light brownish markings near base (Figs 10, 12). Compound eyes grey, supported by yellowish-brown callus (Figs 10, 12). Frons light yellowish brown, white at base, median area with one white transverse marking on each side of median carina (Fig. 13); apical and lateral margins carinated and brown, median carina tawny which extending from apex to frontoclypeal sulcus, sublateral carinae brown at apical 1/3 and light yellow at basal 2/3 (Fig. 13); lateral areas with unobvious nearly white tubercles enlarged from apex to base (Fig. 13). Antennae brown, with several grey spots (Fig. 13). Postclypeus dorsal half part light yellow and ventral half part brown, with a short white median carina near frontoclypeal sulcus (Fig. 13). Genae light brown, in lateral view with one light yellow transverse fascia below compound eyes on each side (Fig. 11). Pronotum light brown, anterior and posterior margins carinated and light brown (Figs 10, 12); median area light yellow, lateral areas with several inconspicuous grayish tubercles (Figs 10, 12). Mesonotum light yellowish brown, median and lateral carinae all light yellow (Figs 10, 12). Forewings light brown, longitudinal and transverse veins all brown; forewing with two brownish markings respectively from basal 1/4 and 1/2 of costal margin extending to middle surface of forewing on each side (Figs 10, 11). Hindwings grayish (Fig. 10). Legs grayish, with tip of spines black (Fig. 11).

Head and thorax. Vertex 1.5 times wider in width at middle than length at middle, the angularly protruding level of anterior margin stronger than in *T. trihamulata*, posterior margin inverted V-shaped (Figs 10, 12). Frons 1.0 times wider at widest part than long in midline, 1.4 times wider at widest part than apical margin (Fig. 13). Pronotum 3.1 times wider in posterior margin than long in midline, 1.0 times longer in midline than vertex (Figs 10, 12). Mesonotum with anterior margin 1.5 times wider than long in midline, 2.0 times longer in midline than pronotum, with an elevated transverse carina on disc (Figs 10, 12). Metatibiotarsal formula: 8-10-2.



FIGURES 10–18. ***Tetrichina fuscovinclum*** **sp. nov.** 10 adult, dorsal view 11 adult, lateral view 12 head and thorax, dorsal view 13 adult, frontal view 14 male genitalia, lateral view 15 male anal tube, dorsal view 16 gonostylus, lateral view 17 phallic complex, left lateral view 18 phallic complex, ventral view.

FIGURES 19–24. ***Tetrichina fuscovinclum*** **sp. nov.** 19 female anal tube, dorsal view 20 gonoplacs, dorsal view 21 gonapophysis IX and gonospiculum bridge, dorsal view 22 gonoplacs, lateral view 23 gonapophysis IX and gonospiculum bridge, lateral view 24 gonocoxa VIII and gonapophysis VIII, ventral view.

Male genitalia. Anal tube in lateral view extremely long and narrow, reaching to posterior margin of gonostyli (Fig. 14); in dorsal view long cylindrical, 1.8 times longer in midline than widest part, widest at apical 1/3, then narrowing to base, apical margin round arc-shaped; anal opening located at basal 1/3 of anal tube (Fig. 15). Pygofer in lateral view broad, dorsal margin straight, anterior and posterior margins sinuate, convex at the same level, posterior margin slightly convex to caudad at middle (Fig. 14). Gonostyli polygonal in lateral view, highest at middle, then

narrowing from middle to apex, dorsal margin sloping up then parallel with ventral margin near middle, posterior margin strongly concave in apical 1/3, basal 2/3 strongly protruded caudad with caudo-ventral angle rounded (Figs 14, 16). Capitulum of gonostyli very long and slender, apical part curved and directed cephalad, latero-posterior margin with an auriform process at middle, the anterior margin of auriform process not reaching to the anterior margin of capitulum (Figs 14, 16). Periandrium near apex with pair of bidirectional hooked processes extending 1/4 length of periandrium, this processes broad, with caudal hook apically rounded, anterior hook sharp, and distinctly concave between (Fig. 17); from ventral view these processes curved outward (Fig. 18). Aedeagus with pair of extremely long and slender processes originated from apical ventral part, extending along ventral margin of periandrium, then curved upward near middle reaching almost to the base of dorsal margin of periandrium, tip of these processes pointed (Fig. 17); in ventral view sinuately curved (Fig. 18).

Female genitalia. Anal tube in dorsal view long cylindrical, 2.4 times longer at midline than widest part, apical margin rounded, lateral margins paralleled, anal opening near base (Fig. 19). Gonoplacs in dorsal view very broad, broadest in basal 1/3, median part membranous, fused in middle near base (Fig. 20); in lateral view rounded (Fig. 22). Posterior connective lamina of gonapophysis IX in lateral view long and narrow, boat-shaped, dorsal margin slightly convex near base and middle, apical part sloping to caudad with a sharp process at apex of ventral margin (Fig. 23); in ventral view gonapophysis IX very narrow and clavate, median area membranous and bifurcated at basal 1/3, posterior ventral lobes sharp at apex (Fig. 21). Gonospiculum bridge large, triangular in lateral view (Fig. 23). Anterior connective lamina of gonapophysis VIII triangular, with four keeled teeth in lateral group and three teeth at apex, inner lateral margin without teeth (Fig. 24). Endogonocoxal process membranous, slightly shorter than anterior connective lamina (Fig. 24).

Type materials. Holotype: ♂, China, Hainan Province, Yinggeling, Yinggezui, N 19º 03.049′, E 109º 33.751′, 693 m, 25 viii 2010, coll. Guo Zheng (IZCAS).

Paratype: 1♀, Hainan Province, Jianfengling, 26 viii 2002, coll. Yanli Che and Peiming Wang (NWAFU)

Note. This new species refers to the same taxon "*Eusarima* sp. 2" in Wang *et al.* (2016). In our molecular analyses (Fig. 25), genus *Tetrichina* groups with the genus *Duplexissus* in a clade relatively basal within Sarimini.

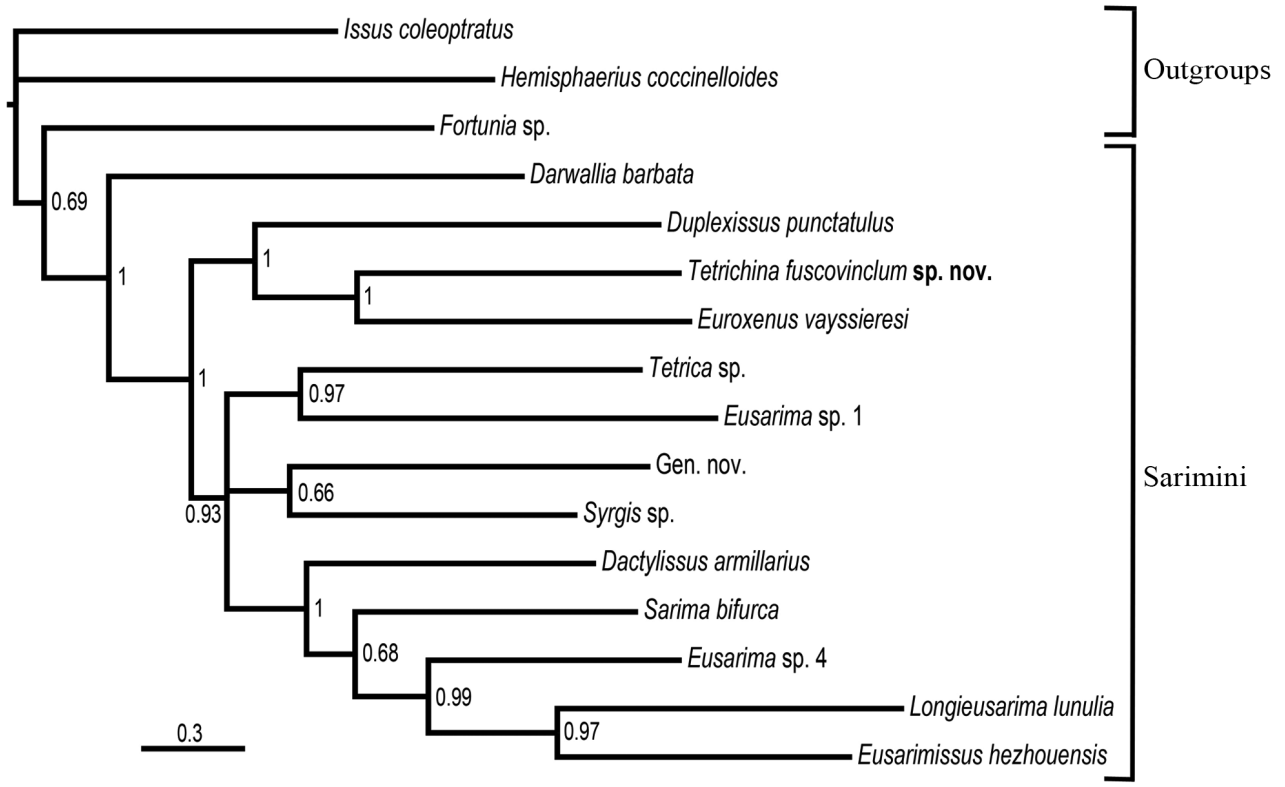


FIGURE 25. Bayesian 50% consensus tree of Sarimini based on combined genes of 18S rDNA, 28S rDNA, COI and Cytb using Issini (*Issus coleoptratus*), Parahiraciini (*Fortunia* sp.) and Hemisphaeriini (*Hemisphaerius coccinelloides*) as outgroups. The names 'Gen. nov.', '*Eusarima* sp. 1', and 'sp. 4' refer to the same taxa as in Wang *et al*. (2016). Posterior probability support value is provided at each node.

2. Notes about the synonymy of *Duplexissus* and *Sarimissus*

In a recent paper by Wang *et al.* (2019), the authors described two new genera of Sarimini: *Duplexissus* and *Sarimissus*, which were respectively put in synonymy with *Euroxenus* and *Nikomiklukha* by Gnezdilov (2020). Unfortunately, the last author did not examine the specimens for a thorough and complete evaluation and comparison of the taxa mentioned. Based on further morphological and molecular evidences as listed below, the two genera *Duplexissus* and *Sarimissus* are re-established as valid taxa.

Genus: *Sarimissus* Wang, Zhang & Bourgoin, 2019, stat. rev. [valid genus]
syn. of *Nikomiklukha* Gnezdilov, 2010: Gnezdilov, 2020: 1302 [error]

Type species: *Sarimissus maculifrons* Wang, Zhang & Bourgoin, 2019, **nom. rev. [valid name]**
Nikomiklukha maculifrons (Wang, Zhang & Bourgoin, 2019): Gnezdilov (2020): 1302 [error]

Sarimissus and *Nikomiklukha* differ by several morphological characters of generic value that allow us to regard them without any hesitation as two different taxa. In dorsal view, the vertex is around 1.5 times wider than long in *Sarimissus*, while it is longer than broad in *Nikomiklukha* (Gnezdilov, 2010: fig. 8). In frontal view, the head capsule is definitively much wider in *Sarimissus* than in *Nikomiklukha* and the frontal lateral carinae are much developed and foliated. In the hindwing, the apex of Pcu and $A1_1$ is single while it is bifurcated in *Nikomiklukha* (Gnezdilov, 2010: fig. 13). The male genitalia are also different with gonostyli longer than wide in *Sarimissus* while wider than long in *Nikomiklukha* (Gnezdilov, 2010: fig. 31), and with male genitalia ventro-lateral processes being subapical and convex in ventral view in *Sarimissus*, while situated in mid part and concave in *Nikomiklukha* (Gnezdilov, 2010: figs 28, 29). To avoid any confusion with *Nikomiklukha*, these characters should be added to the diagnosis already published for the genus *Sarimissus* Wang, Zhang & Bourgoin, 2019. Unfortunately, and despite several attempts, we could not yet get reliable sequences for the described taxa to further confirm, also from a molecular point of view, the validity of *Sarimissus* as a valid separate genus.

Genus: *Duplexissus* Wang, Zhang & Bourgoin, 2019, stat. rev. [valid genus]
syn. of *Euroxenus* Gnezdilov, 2009 in Gnezdilov (2020): 1300 [error]

Type species: *Duplexissus punctatulus* Wang, Zhang & Bourgoin, 2019, **nom. rev. [valid name]**
Euroxenus punctatulus (Wang, Zhang & Bourgoin, 2019): Gnezdilov, 2020: 1302 [error]

Since the paper by Wang *et al.* (2019) was published, we now have the COI sequence of *Euroxenus vayssieresi*, the type species of the genus, thanks to B. Reynaud and S. Nibouche (CIRAD, La Réunion) (GenBank reference MT318763). The molecular data of *Euroxenus* used in our molecular analysis, were also completed with partial 18S sequence (GenBank reference MN165789), D3–D5 and D6–D7 regions of 28S sequences (respectively referenced in GenBank as MN266995, MN266964) that were available in Gnezdilov *et al.* (2020).

The COI sequences of the two type species of the genera *Duplexissus* and *Euroxenus* differ by 121 bp (17.7%) of a total of 681bp, indicating clearly that the taxa belong to two different genera. The molecular analysis (Bayesian tree) based on combined genes (18S, 28S, COI and Cytb) also supports the validity of the genus *Duplexissus*, which appears as sister to the clade *Euroxenus* + *Tetrichina* (Fig. 25). Incidentally, the analysis also strongly supports the placement of *Euroxenus* within a monophyletic Sarimini, while it was shown as sister to *Picumna*, both genera sister to a new Issidae Issini clade (Thioniina + Issina) *sensus* Gnezdilov *et al.* (2020: fig. 1) strangely depicting a polyphyletic Sarimini.

Our molecular results are also confirmed by the morphological analysis showing *Duplexissus* differing from *Euroxenus* by several important characters: length of pronotum at middle slightly broader than vertex while obviously narrower than vertex in *Euroxenus* (Bonfils *et al.*, 2001, fig. 18); forewing with costal margin slightly convex while strongly convex and curved in *Euroxenus* (Bonfils *et al.*, 2001, fig. 22), ScP+RA single versus ScP+RA bifurcating basally in *Euroxenus* (Bonfils *et al.*, 2001, fig. 22); hindwing with two terminals in MP but only one in *Euroxenus* (Gnezdilov, 2020, fig. 1), CuA-CuP being adjacent but separate apically while fully fused in one vein in

Euroxenus (Gnezdilov, 2020, fig. 1); Pcu-A1 merging before mid-length of the wing but only in last third in *Euroxenus* (Gnezdilov, 2020, fig. 1) and A2 lobe wider than Pcu-A1 lobe while thinner in *Euroxenus* (Gnezdilov, 2020, fig. 1). These morphological characters should be added in the diagnosis and description of the genus *Duplexissus* (Wang *et al.*, 2019) to avoid further confusion with *Euroxenus*, although they are easily seen by direct comparison of the figures provided.

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