

New species of the genera *Megischus* Brullé and *Stephanus* Jurine from China (Hymenoptera: Stephanoidea: Stephanidae), with a key to world species of the genus *Stephanus*

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Three new species of the genera *Megischus* Brullé and *Stephanus* Jurine from China (Hymenoptera: Stephanoidea: Stephanidae) are described, illustrated and keyed. *Megischus ptosimae* Chao, 1964, from Fujian is redescribed and the specimen from India described as *M. ptosimae* Chao by van Achterberg (2002) is renamed as *M. alveolifer* spec. nov. and the Malaysian specimen of *M. ducalis* Westwood listed by van Achterberg (2002) is described as *M. ducaloides* spec. nov. *M. ducalis* Westwood, 1851, is reported for the first time from Cambodia, which is the first report after its description. A key to world species of the genus *Stephanus* is provided.

Introduction

The family Stephanidae Leach, 1815, is a rather small cosmopolitan family occurring mainly in subtropical and tropical forests. The species are usually medium-sized to large: length of fore wing ranging from 2-20 mm, body length of the largest species (in the genus *Megischus*) reach up to 35 mm (including ovipositor up to 70 mm). The best estimate for the number of valid species present in collections is 250-300. Stephanidae are conspicuous by the "crown" on the head (fig. 18), the more or less modified pronotum (figs 5, 16, 29) and in several species (e.g. of *Megischus*) by the shape of the hind leg (figs 20, 30, 31), by the often present ivory subapical band of the ovipositor sheath and usually by their large size. Nearly all species of *Megischus* and *Stephanus* are black or dark brown with frequently some parts (especially of head and legs) yellowish-, orange- or reddish-brown. Small parts may be ivory, most commonly a subapical band of the ovipositor sheath in some genera.

The scanty biological information indicates that Stephanidae are idiobiont ectoparasitoids of wood boring larvae (Taylor, 1967). In the tropics and subtropics Stephanidae can be found around tree trunks or branches of trees dead for about one year inhabited by beetle larvae and not infested yet by fungi. Stephanidae are nearly always reported as parasitoids of coleopterous larvae, mainly Buprestidae and Cerambycidae (van Achterberg, 2002).

For the identification of the genera of Stephanidae, see van Achterberg (2002). For the other known species of Stephanidae from China, see Chao (1964).

Because of some aberrant Australian species of the genus *Parastephanellus* Enderlein, 1926, the second and following couplets of van Achterberg (2002) may be amended as follows ("figs" refers to the figures in van Achterberg, 2002):

2. First subdiscal cell of fore wing comparatively wide basally, wider than first discal cell (figs 1, 639, 660, 678, 681) **or** vein 1-SR of fore wing not differentiated and first discal cell absent because of absence of vein 1-SR+M (figs 2, 639, 646); **if** vein 1-SR+M of fore wing developed and basally first subdiscal cell about equal to maximum width of first discal cell (fig. 665; the Afrotropical subgenus *Commatopus* van Achterberg, 2002 of the genus *Profoenatopus* van Achterberg, 2002) then vein 2-1A of fore wing strongly curved (fig. 291); hind tibia usually hardly longer than hind femur (figs 635, 658, 680), if much longer, then with strongly widened hind tibia (*Madegafoenus* Benoit, 1951; figs 643, 654); temple often with pale yellowish streak behind eye (figs 304, 656); inner side of hind tibia with a long oblique depression; neck emarginate anteriorly and often with upcurved rim ("flanged"; figs 299, 634, but often less developed in *Parastephanellus*) 3
- First subdiscal cell of fore wing comparatively narrow basally, about as wide as first discal cell or narrower (figs 3, 11, 122, 248, 626) **and** vein 1-SR of fore wing differentiated with first discal cell present because of presence of vein 1-SR+M (figs 3, 11, 285, 616); vein 2-1A of fore wing straight or nearly so (figs 138, 291, 626); hind tibia usually distinctly longer than hind femur (figs 47, 471), but subequal in *Afromegischus* van Achterberg, 2002 (figs 290, 292) with slender hind tibia (fig. 290); temple often with pale patch ventrally and usually without a pale yellowish streak behind eye (figs 242, 434); inner side of hind tibia variable, frequently without a long oblique depression (figs 379, 627); neck variable, if emarginate anteriorly then without distinctly upcurved anterior flange (figs 18, 72, 164) 6
3. Hind tibia strongly inflated, 2.8-3.7 times wider than short narrow basal part of tibia (figs 295, 643, 654); hind tibia distinctly longer than hind femur (fig. 654); neck with pair of oblique carinae and posteriorly proceeding under middle part of pronotum (figs 644, 649), resulting in a large cavity (fig. 650); Madagascar *Madegafoenus* Benoit, 1951
- Hind tibia at most moderately inflated, 1.3-2.2 times wider than narrow basal part of tibia (figs 287, 680); hind tibia usually hardly longer than hind femur (figs 635, 658, 680); neck variable, usually without pair of oblique carinae or not differentiated from remainder of pronotum (fig. 655) but sometimes with oblique carinae and a large cavity below pronotal fold 4
4. See couplet 3 (*Foenatopus* Smith, 1860).
5. See couplet 4 (*Parastephanellus* Enderlein, 1906, and *Profoenatopus* van Achterberg, 2002).
6. See couplet 5 (*Afromegischus* van Achterberg, 2002).
7. See couplet 7, etc.

The specimens listed in this paper are deposited in the Natural History Museum, London (BMNH), the Insect Museum of Chinese Academy of Forestry, Beijing (CAFB), the Canadian National Collection of Insects, Ottawa (CNC), Agricultural and Forestry University of Fujian, College of Plant Protection, Fuzhou (CPPF), Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussels (KBIN) and the Nationaal Natuurhistorisch Museum, Leiden (RMNH).

Systematics

Genus *Stephanus* Jurine, 1801

(figs 1-17)

Stephanus Jurine (in Panzer), 1801: 76, fig. 13; van Achterberg, 2002: 179-187, figs 267-287, 618-632 (revision). Type species (by monotypy): *Stephanus coronatus* Jurine (in Panzer), 1801 (= *Ichneumon serrator* Fabricius, 1798).

Diagnosis.— See van Achterberg (2002: 180); change “hind femur with 3 large ventral teeth and” to “hind femur with 2-3 large ventral teeth, rarely with 4 teeth, and” (see figs 2, 11 in this paper).

Distribution.— Oriental, Palaeartic.

Key to world species of the genus *Stephanus* Jurine

1. Temples smooth and shiny, at most with few punctures (figs 1, 10); hind femur shiny, largely smooth, superficially coriaceous or finely striate (figs 2, 11); outer side of hind tibia of ♀ with fine striae ventrally and ventrally with carina; base of pterostigma with indistinct pale brownish spot; femora blackish or dark brown dorso-apically; head dark orange- or reddish-brown and with yellowish spot between base of mandible and eye, hardly contrasting with temple or blackish and with distinct ivory spot; hind tibia of ♀ blackish or brown; East Palaeartic, Oriental (Sunda area) 2
 - Temples coriaceous, with several coarse punctures and rather matt; hind femur matt, distinctly finely granulate; outer side of hind tibia of ♀ without striae ventrally and ventrally without carina, only more or less angulate; base of pterostigma with distinct white spot; femora narrowly white-tipped dorso-apically (♀, more conspicuously so in ♂); head largely blackish or dark brown and with ivory spot between base of mandible and eye, distinctly contrasting with temple; hind tibia of ♀ yellowish-brown (of ♂ more or less dark brown); West Palaeartic (C & S Europe, including Turkey (M.R. Shaw, pers. comm.)) *S. serrator* (Fabricius, 1798)
2. First metasomal tergite about 9 times as long as its apical width (fig. 8); hind femur with 2 large ventral teeth (fig. 2); pronotum with deep cavity and no distinct pronotal fold medially (figs 4, 5); small part of vein M+CU of hind wing pigmented; scutellum densely rugose; China *S. bidentatus* spec. nov.
 - First tergite 3-5 times as long as its apical width (fig. 15); hind femur with 3 large ventral teeth (fig. 11), rarely with 4 teeth; pronotum with indistinct to medium-sized cavity and with a coarse to fine pronotal fold medially (figs 12, 16); large part of vein M+CU of hind wing pigmented; scutellum largely smooth 3
3. Head blackish and with a distinct ivory spot, contrasting with temple; temples rather angulate in dorsal view (fig. 10); pronotum without a distinct cavity below pronotal fold (fig. 16); medially vertex regularly and rather finely transversely striate (fig. 10); hind femur partly finely (rugose-)striate (fig. 11); East Palaeartic (China) *S. tridentatus* spec. nov.
 - Head dark orange- or reddish-brown and with yellowish spot between base of mandible and eye, hardly contrasting with temple; temples roundly narrowed in

- dorsal view; pronotum with a cavity below pronotal fold; medially vertex irregularly and densely rugose; hind femur mainly smooth, at most superficially coriaceous; Oriental (Sunda area) 4
4. Hind basitarsus dark brown, and not contrasting with hind tibia; at least basal half of outer side of hind coxa finely irregularly rugose; hind leg more robust (figs 284, 286, 287 in van Achterberg, 2002); pronotum and first metasomal tergite rather coarsely sculptured (fig. 283 l.c.); Borneo, Java *S. borneensis* (de Saussure, 1901)
- Hind basitarsus rather pale brown, and contrasting with dark hind tibia; outer side of hind coxa largely smooth; hind leg more slender (figs 272-274 l.c.); pronotum and first tergite finely sculptured (figs 270, 271, 276 l.c.); West Malaysia
..... *S. soror* van Achterberg, 2002

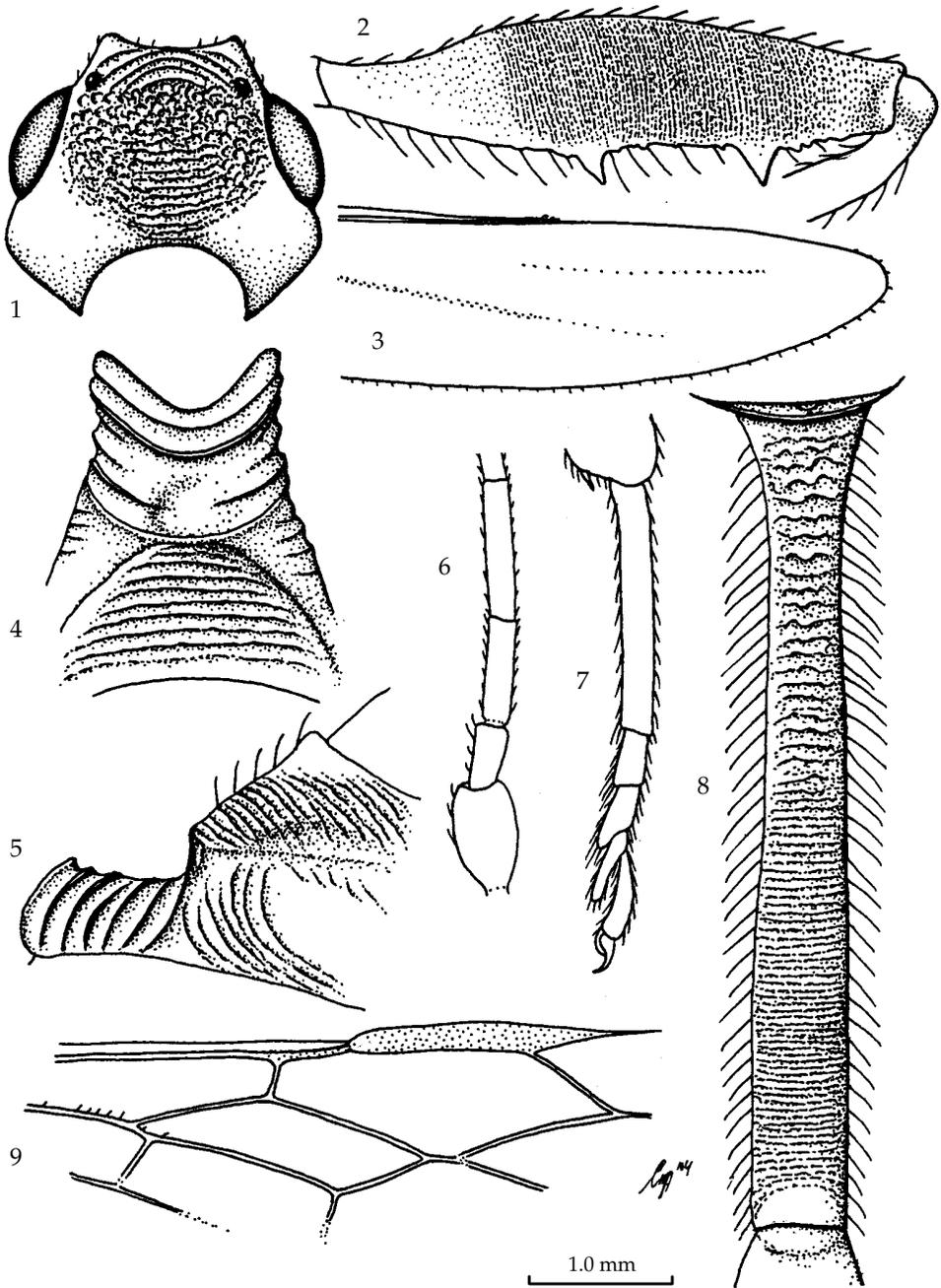
Stephanus bidentatus spec. nov.
(figs 1-9)

Material.— Holotype, ♀ (CAFB), "China: Henan, Longyuwan, Lianchuan, 700 m, on trunk of *Quercus* tree with Cerambycidae larvae, 13.vii.1996, Zhong-qi Yang".

Holotype, ♀, length of body 16.7 mm, and of fore wing 11.1 mm.

Head.— Third antennal segment moderately slender, 3.4 times as long as wide, and 0.8 times as long as fourth segment (fig. 6), antenna with 29 segments; three anterior lobe-shaped coronal teeth of head large, hardly larger than both posterior ones; with four curved carinae behind level of both posterior coronal lobes, medio-dorsally remainder of vertex finely and densely rugose, rugae more or less curved, laterally less densely so, including area behind posterior ocelli and without depression, sculpture becoming finer posteriorly and narrowly reaching occipital carina; temples smooth except some punctures ventrally, shiny and rather angulate in dorsal view (fig. 1); dorsally occipital carina evenly curved and distinctly developed, carina ventrally somewhat weaker than laterally and almost reaching hypostomal carina; postgenal bridge rather steep.

Mesosoma.— Neck robust and rather short, anteriorly distinctly concave (fig. 4), lateral length of neck 0.7 times its maximum width, neck postero-dorsally at lower level than medial part of pronotum, flat and smooth medially in front of pronotal fold, without a medio-longitudinal carina, and with five coarse carinae laterally of which two are also medio-anteriorly present, with large cavity in middle part of pronotum (fig. 5); pronotal fold absent medially and distinct laterally; middle part of pronotum robust, coarsely rugose, without median carina, with some irregular and rather strong transverse rugae, middle part not differentiated from posterior part of pronotum (in lateral view without "step" between these parts; fig. 5); lateral oblique groove of pronotum distinct and rather wide, impression largely smooth and ventral area below it finely rugose; laterally pronotum largely short setose and dorsally distinctly rugose, dorsally pronotum mainly distinctly rugose, and dorso-laterally short setose; mesoscutum densely coarsely vermiculate-rugose and with indistinct median groove; scutellum completely vermiculate-rugose; propleuron nearly flat and shiny, superficially rugose; mesopleuron shiny, convex part rugose-reticulate and no smooth interspaces, covered with short whitish and rather extensive setosity, including medially; flat dorsal part densely rugulose; mesosternum shiny, smooth but laterally rugose; medially metapleu-



Figs 1-9, *Stephanus bidentatus* spec. nov., ♀, holotype. 1, head, dorsal aspect; 2, hind femur, lateral aspect; 3, apical half of hind wing; 4, pronotum, dorsal aspect; 5, pronotum, lateral aspect; 6, base of antenna; 7, hind tarsus, lateral aspect; 8, first metasomal tergite, dorsal aspect; 9, detail of fore wing. 1-3, 8-9: scale-line (= 1.0 ×); 4-7: 2.0 ×.

ron rather elongate and strongly convex, with some short whitish setosity, and coarsely rugose-reticulate, antero-ventrally crenulate and with both anterior depressions deep and large; propodeum completely and coarsely reticulate-rugose, without smooth interspaces.

Wings.— Fore wing (fig. 9): vein 1-M 3.6 times as long as vein 1-SR and nearly straight; wing basally and area below parastigmal vein and pterostigma largely glabrous; vein M+CU of hind wing only partly pigmented, after middle of wing.

Legs.— Hind coxa rather slender, subparallel-sided, largely rugose and shiny, but posteriorly less sculptured; hind femur with two large teeth, femur 4.6 times as long as its maximum width (fig. 2), laterally largely finely transversely striate (but basally rather matt and somewhat coriaceous), sparsely long setose, without short setae; basal narrow part of hind tibia parallel-sided and 0.55 times as long as widened part, and with ventral carina, outer side of widened part of hind tibia coriaceous, convex, antero-dorsally with weak tubercle, ventrally with distinct oblique striae and no median carina, and rather narrowed apically, inner side flattened and widened part largely with densely bristly setosity, no distinct punctures, and with indistinct depression below tubercle; hind basitarsus parallel-sided, basally hardly curved, its ventral length 7.5 times its width (fig. 7).

Metasoma.— First tergite slender, 9.0 times as long as its apical width and its maximum width, and largely irregularly and coarsely transversely rugose basally and remainder finely and more densely rugose, parallel-sided (fig. 8); second tergite mainly smooth basally as remainder of tergite, shiny; pygidial area distinctly differentiated, moderately wide and triangular, not lamelliform posteriorly; length of ovipositor 2.45 times as long as fore wing.

Colour.— Black or blackish; face pale brownish; malar space and temple ventrally ivory, much paler than remainder of temple and vertex; fore wing membrane mainly subhyaline or nearly so; pterostigma dark brown, but basally rather pale brown; hind trochantellus, fore and middle femora, hind femur narrowly basally and latero-apically, tibiae, telotarsi and tegulae more or less dark brown; remainder of tarsi and palpi yellowish-brown; ovipositor sheath without a subapical ivory band.

Biology.— Probably a parasitoid of Cerambycidae larvae in *Quercus* species and other deciduous trees.

Distribution.— Palaearctic China (Qinling Mountains, Henan).

Note.— Unique in the Stephanidae by the combination of the five-segmented hind tarsus of the female and the hind femur with two large ventral teeth.

Stephanus tridentatus spec. nov.
(figs 10-17)

Material.— Holotype, ♀ (CAFB), "China: Henan, Longyuwan, Luanchuan, 700 m, ovipositing on Cerambycidae larva in Qishu tree [= *Toxicodendron vernicifluum* (Stokes); Anacardiaceae], 10.vii.1996, Zhong-qi Yang". Paratypes (26 ♀♀ + 3 ♂♂; CAFB, RMNH): 1 ♀, same data as holotype; 1 ♀, "China: Henan, Longyuwan, Luanchuan, ovipositing on Buprestidae larva in *Ulmus* tree, 13.vii.1996, Zhong-qi Yang"; 1 ♀, id., but 10.vii.1996; 23 ♀♀ + 3 ♂♂, "China: Shaanxi, Louguantai, 10.ix.1991, ovipositing on Cerambycidae larva in *Quercus* tree, Zhong-qi Yang" (but 9 ♀♀ 9.ix.1991, 4 ♀♀ 11.ix.1991, 4 ♀♀ 12.ix.1991, 1 ♀ 13.ix.1991, 2 ♀♀ 15.ix.1991 and from *Quercus* tree 1 ♂ 12.ix.1991, 1 ♂ 9.ix.1991 and 1 ♂ 4.ix.1991).

Holotype, ♀, length of body 15.0 mm, and of fore wing 10.1 mm.

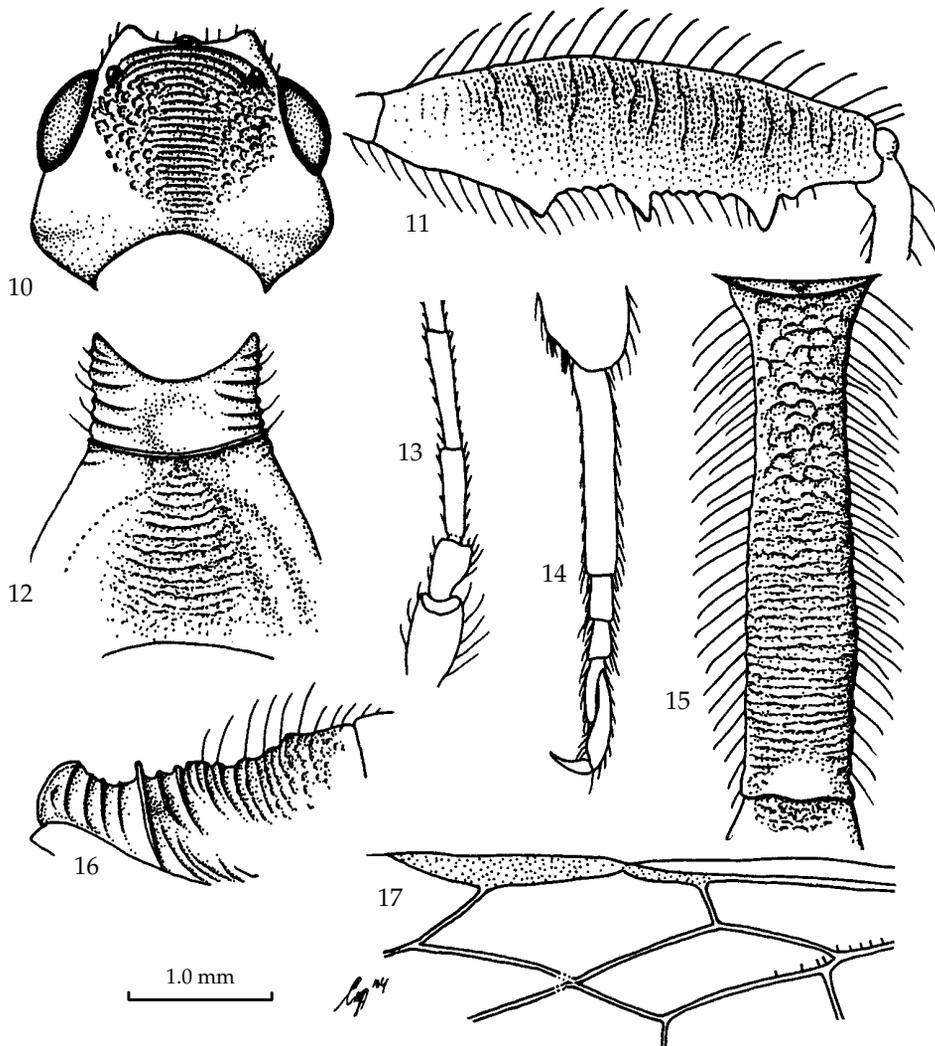
Head.— Third antennal segment moderately slender, 3.4 times as long as wide, and 0.8 times as long as fourth segment (fig. 13), antenna with 30 segments; three anterior lobe-shaped coronal teeth of head large, much larger than both posterior ones; with five curved carinae behind lamelliform carina carrying both posterior lobes, medio-dorsally remainder of vertex rather finely transversely striate, laterally reticulate, including area behind posterior ocelli and without depression, sculpture becoming finer posteriorly and narrowly reaching occipital carina (fig. 10); temples smooth except some punctures ventrally, shiny and rather angulate in dorsal view (fig. 10); dorsally occipital carina evenly curved and distinctly developed, carina ventrally hardly weaker than laterally and almost reaching hypostomal carina; postgenal bridge rather steep.

Mesosoma.— Neck robust and rather short, anteriorly rather concave (fig. 12), lateral length of neck 0.5 times its maximum width, neck postero-dorsally near level of medial part of pronotum, weakly depressed and smooth medially in front of pronotal fold, without a medio-longitudinal carina, and with five, partly rather weak carinae laterally, without cavity under pronotal fold (fig. 16); pronotal fold coarsely developed, and slightly sinuate in dorsal view (fig. 12); middle part of pronotum robust, without median carina directly behind pronotal fold, with some irregular and rather weak transverse carinae, middle part hardly differentiated from posterior part of pronotum (in lateral view without distinct “step” between these parts; fig. 16); lateral oblique groove of pronotum distinct and rather wide, impression largely smooth and ventral area below it finely rugose; postero-laterally narrowly short setose, distinctly transversely rugose, dorsally pronotum sparsely rugulose, but mainly smooth and glabrous; mesoscutum densely coarsely rugose-reticulate and with indistinct median groove; scutellum mainly smooth; propleuron nearly flat and shiny, with a few coarse punctures; mesopleuron shiny, convex part foveolate and interspaces largely smooth, covered with short whitish and rather sparse setosity but absent medially; flat dorsal part densely rugose; mesosternum shiny and with few coarse punctures; medially meta-pleuron rather short and strongly convex, without short whitish setosity, and coarsely foveolate-reticulate, antero-ventrally weakly crenulate and with dorsal anterior depression rather deep and ventral one shallow; propodeum densely and irregularly foveolate, laterally and posteriorly mainly rugose, with narrow smooth interspaces.

Wings.— Fore wing (fig. 17): vein 1-M 3.0 times as long as vein 1-SR and weakly curved; wing basally and area below parastigmal vein glabrous; vein M+CU of hind wing largely pigmented.

Legs.— Hind coxa rather robust, subelliptical, largely smooth and shiny, but anteriorly with some rugae; hind femur with three large teeth, femur 4.1 times as long as its maximum width (fig. 11), laterally largely finely transversely striate, sparsely long setose, without short setae; basal narrow part of hind tibia parallel-sided and 0.50 times as long as widened part, and with ventral carina, outer side of widened part of hind tibia coriaceous, convex, antero-dorsally with weak tubercle, ventrally with distinct oblique striae and weak median carina, and rather narrowed apically, inner side flattened, apically with densely bristly setose area, no distinct punctures, and with minute oblique depression below tubercle; hind basitarsus parallel-sided, basally hardly curved, its ventral length 6.6 times its width (fig. 14).

Metasoma.— First tergite robust, 4.7 times as long as its apical width and its



Figs 10-17, *Stephanus tridentatus* spec. nov., ♀, holotype. 10, head, dorsal aspect; 11, hind femur, lateral aspect; 12, pronotum, dorsal aspect; 13, base of antenna; 14, hind tarsus, lateral aspect; 15, first metasomal tergite, dorsal aspect; 16, pronotum, lateral aspect; 17, detail of fore wing. 10-11, 15, 17: scale-line (= 1.0 ×); 12-14, 16: 2.0 ×.

maximum width, and largely irregularly and rather coarsely transversely rugose basally and remainder superficially so, parallel-sided (fig. 15); second tergite distinctly rugose basally and remainder smooth, shiny; pygidial area distinctly differentiated, moderately narrow and triangular, narrowly lamelliform posteriorly; length of ovipositor 1.8 times as long as fore wing.

Colour.— Black or blackish; face brownish; malar space ivory, much paler than temple and vertex; fore wing membrane brownish, but basally and area below base of

pterostigma subhyaline or nearly so; hind trochantellus, hind femur latero-apically, tibiae (but hind tibia more or less darkened), and tarsi yellowish-brown, but telotarsi blackish; tegulae mainly dark brown; ovipositor sheath without a subapical ivory band.

Biology.— Parasitoid of Buprestidae and Cerambycidae larvae in deciduous trees.

Distribution.— Palaearctic China (Qinling Mountains, Henan; Shaanxi).

Variation.— Female: length of fore wing 6.7-12.8 mm; antenna with 27-32 segments; first tergite 4.6-5.0 times as long as its maximum length; length of ovipositor 1.6-1.8 times as long as fore wing; neck with 2-5 carinae; middle teeth of hind femur may be double, resulting in 4 ventral teeth in one leg and normal in the other leg; basal half of hind tibia often yellowish-brown and its apical half mainly dark brown; base of hind femur more or less yellowish.

Male: length of fore wing 8.4-8.7 mm; antenna with 27-29 segments; very similar to female.

Genus *Megischus* Brullé, 1846

(figs 18-32)

Megischus Brullé, 1846: 537; van Achterberg, 2002: 53-168 (Old World species); Aguiar & Johnson, 2003: 469-482 (Nearctic species). Type species (designated by Viereck, 1914): *M. annulator* Brullé, 1846 [examined; = *M. furcatus* (Lepeletier & Serville, 1835)].

Megiseleus Cameron, 1902: 32. Lapsus calami.

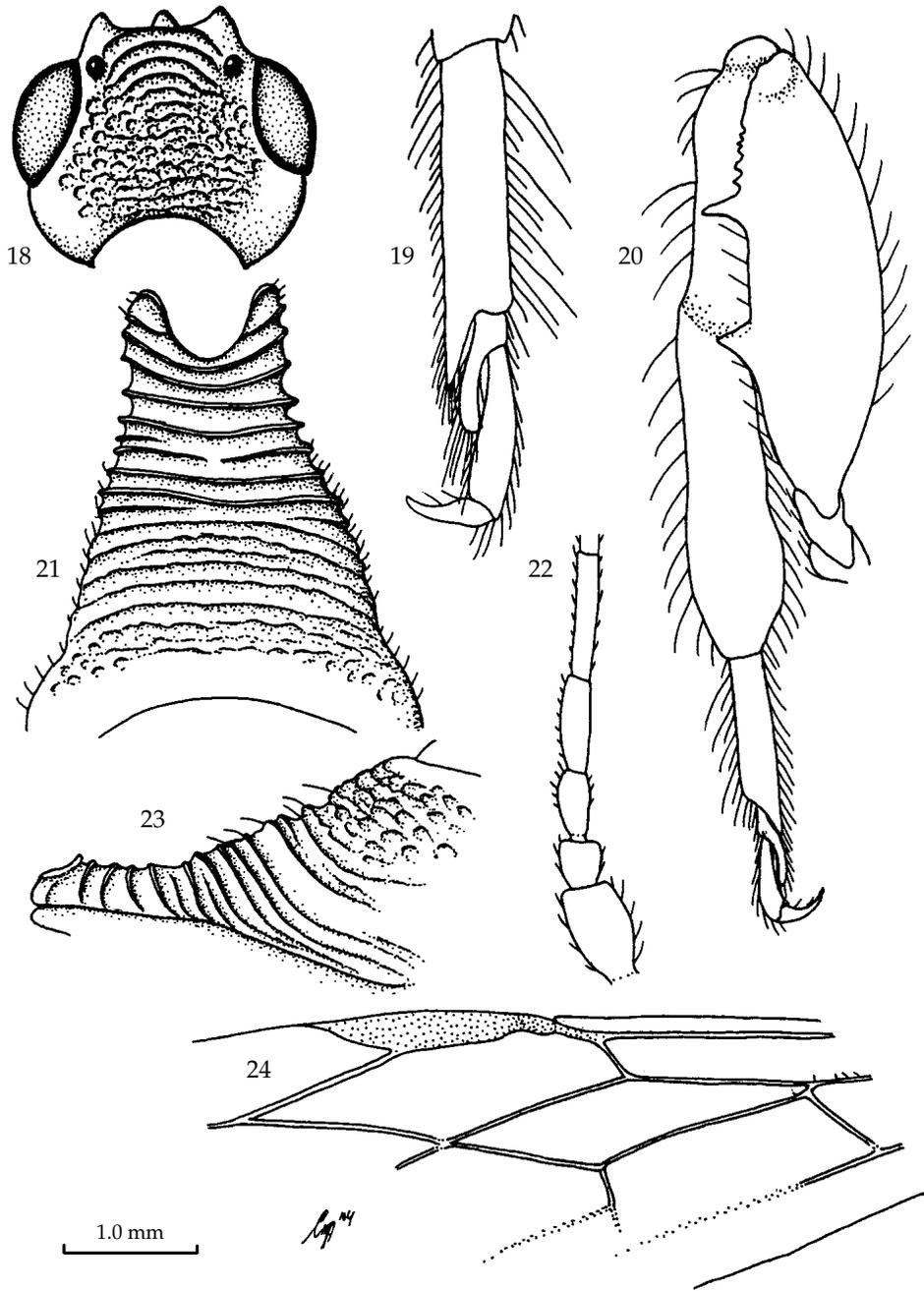
Bothriocerus Sichel, 1860: 759. Type species (by monotypy): *Bothriocerus europaeus* Sichel, 1860 (= *Stephanus anomalipes* Foerster, 1855, according to Madl, 1991).

Diagnosis.— See van Achterberg (2002).

Distribution.— Cosmopolitan (but absent in the Afrotropical region); mainly in tropical and subtropical regions.

Key to species of the genus *Megischus* Brullé from China

1. Hind tarsus of ♀ 5-segmented (figs 7, 14); inner side of hind tibia with only a short narrow oblique groove below a small convexity; ovipositor sheath without ivory subapical band; vein M+CU of hind wing partly pigmented; hind femur with 2-3 large ventral teeth (figs 2, 11), rarely with 4 teeth see key to species of the genus *Stephanus* Jurine, 1801
- Hind tarsus of ♀ 3-segmented (figs 19, 31); inner side of hind tibia with wide sub-medial depression at inner side, occupying whole width of tibia (fig. 31); ovipositor sheath with ivory subapical band; vein M+CU of hind wing not pigmented; hind femur with 2 large ventral teeth (figs 20, 30); genus *Megischus* Brullé, 1846 2
2. Apical half of hind tibia of ♀ weakly concave ventrally (fig. 20); pronotal fold absent and without a cavity (figs 21, 23); hind basitarsus about 4 times as long as wide (fig. 19); head mainly chestnut-brown; vein cu-a of fore wing strongly reclivous (fig. 24); ivory part of ovipositor sheath about twice as long as dark apical part; [= *Megischus ruficeps* sensu Chao, 1964] *M. chaoi* spec. nov.
- Apical half of hind tibia of ♀ distinctly concave ventrally (figs 30, 31; straight in ♂); pronotal fold distinct and with a cavity below it (figs 28, 29); hind basitarsus about 3 times as long as wide (fig. 31); head largely blackish or dark chestnut-brown; vein



Figs 18-24, *Megischus chaoi* spec. nov., ♀, holotype. 18, head, dorsal aspect; 19, hind tarsus, lateral aspect; 20, hind leg, lateral aspect; 21, pronotum, dorsal aspect; 22, base of antenna; 23, pronotum, lateral aspect; 24, detail of fore wing. 18: 1.1 ×; 19, 21-23: 2.0 ×; 20, 24: scale-line (= 1.0 ×).

cu-a of fore wing weakly reclivous or subvertical (fig. 26); ivory part of ovipositor sheath 1.1-1.5 times as long as dark apical part *M. ptosimae* Chao, 1964

Megischus chaoi van Achterberg, spec. nov.
(figs 18-24)

Megischus ruficeps; Chao, 1964: 378-9, 387-388; Belokobylskij, 1995: 22.

Material.— Holotype, ♀ (CPPF), “[China], Fukien [= Fujian], Foochow [= Fuzhou], 10.vi.1954, H.F. Chao coll.”; “*Megischus ruficeps* Chao Hsiu-Fu det.”.

Holotype, ♀, length of body 19.9 mm, and of fore wing 10.9 mm.

Head.— Antenna with 40 segments; length of third antennal segment 2.7 times its maximum width, and fourth segment 1.4 times as long as third segment, both segments distinctly wider than following segments (fig. 22); frons coarsely reticulate-rugose; three anterior coronal teeth large, lobe-shaped, both posterior ones smaller and wide, not part of a sinuate transverse and wide lamella; after corona two widely spaced coarse and one weaker regular curved carinae followed by coarse irregularly rugose flattened area, widely transversely rugose posteriorly and reaching occipital carina (fig. 18); temple roundly narrowed behind eye (fig. 18), largely smooth and shiny, except for some punctures laterally; occipital carina distinctly developed and reaching lower level of eyes, absent below this level and near hypostomal carina; post-genal bridge wide and gradually reclivous; hypostomal flange wide and smooth.

Mesosoma.— Neck moderately slender (fig. 21) and anteriorly distinctly emarginate, neck postero-dorsally at about same level as middle part of pronotum (fig. 23), narrowly smooth postero-medially and with three complete transverse carinae and one narrowly interrupted carina, followed by five complete and rather coarse transverse carinae on middle and posterior part (fig. 21); pronotal fold and concavity absent; medially middle part of pronotum not differentiated from posterior part, laterally with indistinct oblique groove and carinate; posterior part of pronotum only laterally distinctly convex and with some coarse punctures, not tuberculate postero-laterally (fig. 21), dorsally without short setosity and distinctly transversely carinate and smooth posteriorly; propleuron very coarsely and postero-laterally rather densely punctate; convex part of mesopleuron with rather sparse short whitish setosity and coarsely rugose and dorsally partly foveolate; mesosternum largely smooth (except for some coarse punctures) and sparsely long setose, without short setosity; convex part of metapleuron coarsely reticulate, rather slender and without dense short whitish setosity, both anterior depressions deep and large; propodeum coarsely and densely foveolate, with narrow smooth interspaces.

Wings.— Fore wing (fig. 24): vein 1-M 5.1 times as long as vein 1-SR and 1.2 times vein m-cu; vein 2-SR 1.2 times as long as vein r; vein r ends 0.3 times length of pterostigma behind level of apex of pterostigma; vein 1-SR 0.9 times as long as parastigmal vein; vein cu-a strongly reclivous (fig. 24).

Legs.— Hind coxa rather robust, subtriangular, coarsely more or less transversely and incompletely rugose; hind femur swollen and robust, hind femur without short setosity; outer side of hind tibia gradually depressed at base of widened part, widened part nearly straight to slightly concave ventrally and apical part moderately

robust (fig. 20), inner side convex, narrow part with irregular triple row of fine punctures and long setae, medially with rather deep transverse depression; hind basitarsus subparallel-sided, moderately slender (fig. 19), its ventral length 4.0 times its width and apically oblique.

Metasoma.— First tergite 7.6 times as long as its maximum width (and 9.2 times its apical width), and densely coarsely and rather regularly transversely striate and apically narrowly smooth; basally second tergite largely smooth; pygidial area distinctly differentiated and medially pimply, without coarse punctures and with row of medium-sized straight setae, shorter than setae of cerci; length of ovipositor sheath 2.2 times fore wing and 1.2 times body, ivory part twice as long as dark apical part.

Colour.— Dark brown, but temple, face, tegulae, first tergite, fore and middle tibiae and tarsi (except telotarsi) more or less brown; malar space pale yellowish, rather contrasting with temple and vertex; veins and pterostigma mainly dark brown; fore wing membrane largely light brownish.

Distribution.— Oriental China (Fujian).

Notes.— This species is named in honour of the late Prof. Dr Hsiu-Fu Chao (Fuzhou) for his important contributions to our knowledge of the entomofauna of China.

The new species runs in the key by van Achterberg (2002) to *M. rufus* (Elliott, 1927) from the Philippines. The new species differs by having the hind basitarsus about 4 times as long as wide, the propodeum foveolate and with distinct smooth interspaces, the malar space with a distinct pale yellowish patch, the head with five distinct coronal protuberances, the neck distinctly carinate and head mainly dark brown. The pronotum is similar to that of *M. reticulatus* (Elliott, 1926) from the Philippines and Sulawesi, and *M. luzonicus* van Achterberg, 2002, from the Philippines. However, the new species is not closely related and differs from both species by having the neck distinctly emarginate anteriorly, the third antennal segment robust, the mesopleuron shortly setose medially, the head largely dark brown; the middle part of the pronotum hardly differentiated from posterior part and the propodeum foveolate. Differs from the similar *Megischus saussurei* (Schulz, 1907) (= *M. ruficeps* de Saussure, 1904, not Cameron, 1887) by having the ivory part of the ovipositor sheath about twice as long as the dark apical part, the neck at a distinctly lower level than the middle part of the pronotum, the lack of a distinct pronotal fold, the widened part of the hind tibia nearly straight ventrally, the strongly reclivous vein cu-a of fore wing and the less robust and brownish hind basitarsus.

Megischus ptosimae Chao, 1964
(figs 25-32)

Megischus ptosimae Chao, 1964: 378, 387-388; Belokobylskij, 1995: 22. The large type series from Fuzhou (China, Fujian) including both sexes in the private collection of the late Prof. Chao could not be traced. The interpretation of the species by van Achterberg (2002) was based on the illustrations in the original paper. However, it proved to be incorrect when during a visit to Fuzhou the first author could examine some specimens from the type locality in the Chao collection under a label indicating that they were identified by Prof. Chao as *M. ptosimae*. They seem to belong at least partly to the series from which the holotype was selected. The specimen from India reported as *M. ptosimae* is renamed as *M. alveolifer* spec. nov. in this paper.

Material.— 9 ♀♀ (CPPF): “China: Fujian, Fuzhou, Westlake, 8.v.1963, Z. Zhang”; “China: Fujian, Fuzhou, 24.iv.1965, K. Shun”; “China: Fujian, Zaoan, 10.x.1980”; 1 ♀ (CAFB), “China: Shaanxi, Yangling, 30.viii.1994, ovipositing on larva of Buprestidae on *Prunus* sp. [= *Prunus cerasifera* Ehrh var. *atropurpurea* H. Jaeger; Rosaceae], Zhong-qi Yang”.

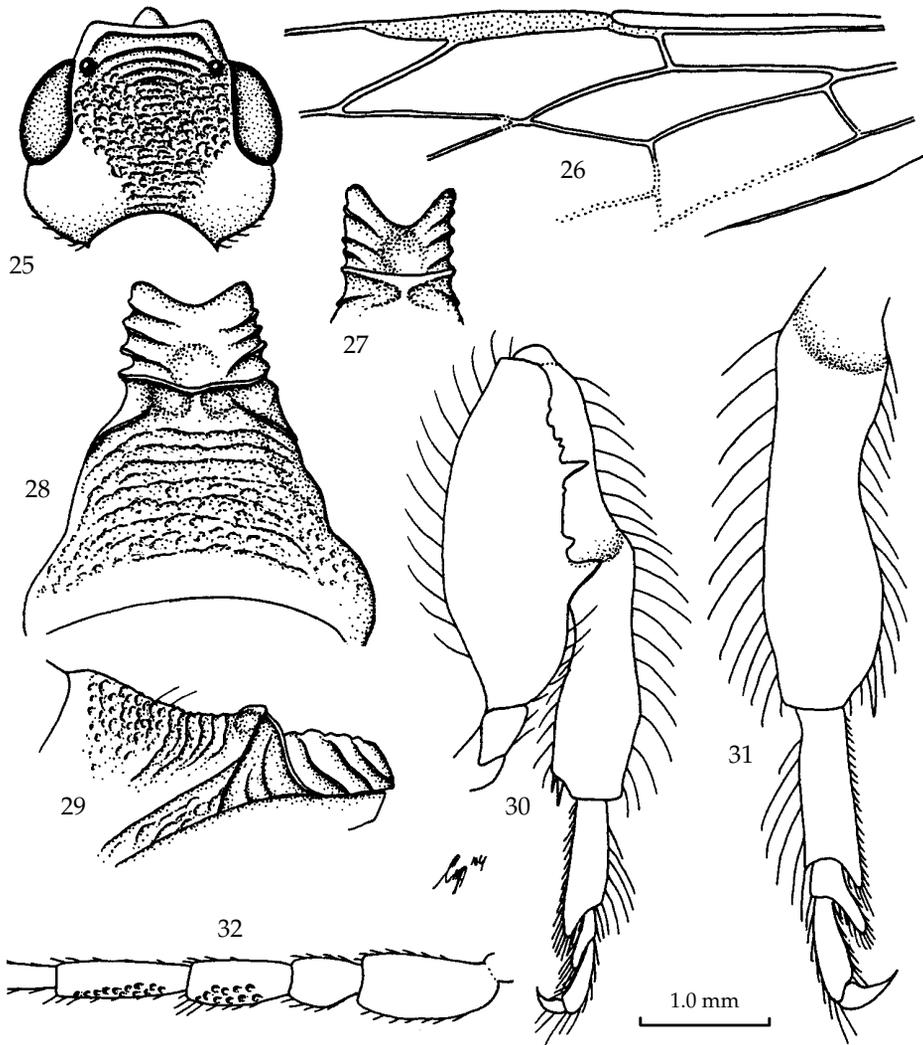
Redescribed after a ♀ from Fuzhou, length of body 17.5 mm, and of fore wing 10.0 mm.

Head.— Antenna with 38 segments; length of third antennal segment 2.5 times its maximum width, and fourth segment 1.3 times as long as third segment, both segments distinctly wider than following segments (fig. 32); frons coarsely reticulate-rugose; three anterior coronal teeth large, lobe-shaped, both posterior ones smaller and wide, part of transverse widened lamella narrowed medially; after this lamella three strong regular lamelliform carinae followed medially by a coarse and transversely rugose and flattened area, laterally coarsely reticulate and reaching occipital carina (fig. 25); temple slightly bulging behind eye (fig. 25), largely smooth (except for several coarse punctures laterally) and shiny, setose except dorsally; occipital carina strongly developed and almost reaching lower level of eyes, bent away from lamelliform hypostomal carina; postgenal bridge gradually depressed, without groove-like depression medially and no pair of distinct teeth above it; hypostomal flange large and with a strong oblique rugae, which is branched.

Mesosoma.— Neck moderately slender and anteriorly shallowly emarginate (fig. 28), but in small specimens rather deeply so (fig. 27), neck postero-dorsally at a much lower level than middle part of pronotum (fig. 29), widely flat and smooth postero-medially, with three coarse and widely interrupted oblique carinae (fig. 28); pronotal fold strongly developed laterally, weakly so medially, and below it distinctly concave and behind it a medium-sized crest-like median elevation; middle part of pronotum with five more or less complete, strong and laterally absent transverse carinae; middle part rather differentiated from posterior part of pronotum (fig. 29); posterior part of pronotum strongly convex, rather tuberculate postero-laterally (fig. 28), dorsally without short setosity with several very coarse punctures, postero-laterally coarsely crenulate and only posteriorly narrowly short setose; propleuron rather finely punctate and with some coarse punctures; convex part of mesopleuron without short whitish dense setosity, coarsely punctate-rugose and rather vermiculate; mesosternum largely smooth (except for lateral puncture, without short setosity and posteriorly long setose and remainder glabrous; convex part of metapleuron coarsely vermiculate-rugose, rather elongate and without short whitish setosity, upper anterior depression deep and large, lower one comparatively shallow; propodeum coarsely and densely foveolate, with most of smooth interspaces narrow.

Wings.— Fore wing (fig. 26): vein 1-M 5.3 times as long as vein 1-SR and 1.3 times vein m-cu; vein 2-SR 1.3 times vein r; vein r ends 0.1 times length of pterostigma behind level of apex of pterostigma; vein 1-SR 0.9 times as long as parastigmal vein; basal bristles of vein 1-1A comparatively coarse and long; vein cu-a subvertical.

Legs.— Hind coxa rather robust, elliptical, coarsely rugose, but posteriorly coarsely transversely striate; hind femur swollen and robust (fig. 30), narrow part of hind tibia comparatively robust, apical third of hind femur without short setosity; outer side of hind tibia widely and rather steeply depressed at base of widened part (fig. 30), widened part distinctly concave ventrally and apical part robust (fig. 31), inner



Figs 25-32, *Megischus ptosimae* Chao, ♀, China, Fuzhou. 25, head, dorsal aspect; 26, detail of fore wing; 27, anterior part of pronotum of small specimen, dorsal aspect; 28, pronotum, dorsal aspect; 29, pronotum, lateral aspect; 30, hind leg, lateral aspect; 31, apical half of hind tibia and hind tarsus, inner lateral aspect; 32, base of antenna. 25, 26, 30: scale-line (= 1.0 ×); 27: 1.1 ×; 28-29, 32: 2.0 ×; 31: 1.6 ×.

side convex, narrow part finely punctate and with triple row of coarse punctures and long bristly setae, medially with deep transverse depression; hind basitarsus somewhat widened apically, robust (fig. 31), its ventral length 3.0 times its width and apically oblique.

Metasoma.— First tergite 7.7 times as long as its maximum width (and 9.0 times its apical width), and basally coarsely rugose, medially regularly transversely striate and its apical third weakly sculptured, nearly or completely smooth; basally second

tergite mainly smooth; pygidial area distinctly impressed and posteriorly glabrous and matt, with submedial row of medium-sized punctures with medium-sized setae; length of ovipositor sheath 1.7 times fore wing and as long as body, ivory part of sheath 1.3 times as long as its dark apical part.

Colour.— Black or blackish; palpi, antenna, temple, vertex posteriorly, tegulae, legs (but hind coxa black and excluding tarsi), veins, pterostigma (but pale brown basally) dark brown; malar space pale yellowish, area rather extending on temple, distinctly contrasting with temple and vertex; face, more or less tarsi (but telotarsi blackish) hind trochantellus and apex of hind femur yellowish-brown; fore wing membrane evenly light brownish.

Host.— *Ptosima chinensis* Marseul, 1867 (Buprestidae) in peach trees (Chao, 1964), and Buprestidae in other *Prunus* species.

Distribution.— Oriental and South Palaearctic China (Fujian, Shaanxi).

Variation.— Antenna with 32-38 segments; length of fore wing 6.8-10.0 mm; antero-medially neck weakly (large specimens) to distinctly emarginate (small specimens); mesopleuron may be sparsely short setose; vein 1-1A of fore wing with 9-13 bristles; hind coxa densely to sparsely sculptured; ovipositor sheath 1.6-1.8 times as long as fore wing; body may be largely brown.

Notes.— Similar to *Megischus alveolifer* spec. nov. from India, but this species has the postgenal bridge deeply grooved medially and with a pair of distinct teeth above it, the neck more concave anteriorly and with complete carinae, vein 1-M of fore wing about 7.5 times as long as vein 1-SR, and hind femur and widened part of hind tibia less robust.

Runs in the key by van Achterberg (2002) to *M. saussurei* (Schulz, 1907) but *M. ptosimae* differs by having the base of the hind tibia more robust, the neck with only one oblique carina and carinae widely interrupted medially, the head largely dark brown, the ovipositor sheath 1.6-1.8 times as long as fore wing, the hind basitarsus yellowish-brown, and the occipital carina remains distinctly removed from the hypostomal carina.

Megischus alveolifer van Achterberg, spec. nov.

Megischus ptosimae; van Achterberg, 2002: 141-144, figs 170-178, 538-545.

Material.— Holotype, ♀ (CNC), "S India, Anamalai Hills, Madras St., 3500' [ft], v.1969, P.S. Nathan".

For the description see van Achterberg (2002) as "*Megischus ptosimae* Chao".

Megischus ducaloides van Achterberg, spec. nov.

Megischus ducalis; van Achterberg, 2002: figs 71-78, 391, 392.

Material.— Holotype, ♀ (BMNH), "[W. Malaysia], Malay Penin.: Selangor, F.M.S., Kuala Lumpur, 4.iii.1937".

For the description of the new species see the description of *Megischus ducalis* Westwood, 1851, in van Achterberg (2002), except for the differences indicated in the key below.

Recently, the first author examined three females of *M. ducalis* Westwood from Cambodia (KBIN, RMNH: "Cambodia, Angkor Than, net catching, IG.30.192, 16-31.vii.2003, Daniel R. Jump") owing to the kindness of Dr Alain Pauly (Brussels). This series shows that the specimen from West Malaysia listed and figured by van Achterberg (2002) belongs to a different species (here renamed as *M. ducaloides* spec. nov.) and that the series from Cambodia represents the real *M. ducalis*. Up to now only the holotype was known of *M. ducalis* and its type locality was uncertain ("East India"). Obviously two very similar species are involved: one from above the isthmus of Kra (the real *M. ducalis*) and one from below the isthmus of Kra (*M. ducaloides* spec. nov.). *M. ducalis* is here reported for the first time from Cambodia and has been recollected for the first time since its description more than 150 years ago! The two species can be separated as follows ("fig." and "figs" refer to the figures in van Achterberg, 2002):

1. Hind femur distinctly inflated (fig. 393); subapically hind tibia much wider than hind basitarsus and about twice as wide as basal part of hind tibia (figs 396, 398); vein 1-SR of fore wing shorter than parastigmal vein (fig. 297); ventral length of hind basitarsus 4.8-5.2 times its width (fig. 398); malar space orange-brown, concolourous with temple; fore and middle legs black; Cambodia, "E India"
..... *M. ducalis* Westwood, 1851
Note.— The width of the transverse sculpture of the vertex varies from narrow to medium-sized, but the main part of the vertex remains reticulate-rugose.
- Hind femur less inflated (fig. 75); subapically hind tibia less widened compared to hind basitarsus and about 1.5 times as wide as basal part of hind tibia (figs 75, 76); vein 1-SR of fore wing about as long as parastigmal vein (fig. 77); ventral length of hind basitarsus about 5.5 times its width (fig. 76); malar space slightly paler than temple (fig. 73); fore and middle legs (except blackish coxae) dark brown; Malaysia *M. ducaloides* spec. nov.

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