

Addenda to the Revisions of the Genera *Gergithus* Stål and *Hemisphaerius* Schaum (Hemiptera, Auchenorrhyncha, Fulgoroidea: Issidae)¹

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Abstract—The genus *Gnezdilovius* Meng, Webb et Wang, 2017 is revised. *Maculergithus* Constant et Pham, 2016, which was described as a subgenus of *Gergithus* Stål, 1870, is upgraded to a genus. *Ishiharanus* Hori, 1969 is reinstated from synonymy with *Gergithus* and considered a valid name. Two new genera are erected, *Ceratoergithus* Gnezdilov, **gen. n.** (type species: *Gergithus spinosus* Che, Zhang et Wang, 2007) and *Ophthalmosphaerius* Gnezdilov, **gen. n.** (type species: *Hemisphaerius trilobulus* Che, Zhang et Wang, 2006). *Hemisphaerius bistriatus* Schumacher, 1915, *Gergithus carbonarius* Melichar, 1906, *G. rosticus* Chan et Yang, 1994, *G. nummarius* Chan et Yang, 1994, and *G. rotundus* Chan et Yang, 1994 are transferred to the genus *Epyhemisphaerius* Chan et Yang, 1994, *Gergithus quinquemaculatus* Che, Zhang, Wang, 2007—to the genus *Maculergithus*, *Gergithus chelatus* Che, Zhang, Wang, 2007 and *G. pseudotessellatus* Che, Zhang, Wang, 2007—to the genus *Ceratoergithus*, *Hemisphaerius binocularis* Chen, Zhang, Chang, 2014—to the genus *Ophthalmosphaerius*, and *Gergithus robustus hoozanensis* Schumacher, 1915—to the genus *Gnezdilovius*. The male genitalia of *Gergithus herbaceus* (Kirby, 1891) and *Hemisphaerius interclusus* Noualhier, 1896 are illustrated for the first time.

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The genera *Gergithus* Stål, 1870 and *Hemisphaerius* Schaum, 1850 are among the largest taxa of the family Issidae (comprising over 60 and 90 species, respectively (Zhang and Che, 2009; Gnezdilov, 2013; Bourgoin, 2017)), and the necessity of their revision is long overdue. One of the first attempts at such revision was undertaken by Hori (1969) who erected the genus *Ishiharanus* for *Gergithus iguchii* Matsumura, 1916 described from Japan (Honshu); however, later this name was reduced to the synonyms of *Gergithus* Stål (Che et al., 2007). I compared the external morphological characters, including the characters of the structure of the head and phallobase, of *Ishiharanus iguchii* (Matsumura) and the representatives of the genus *Gergithus* sensu stricto and have found that *Ishiharanus* Hori, 1969 is a distinct monotypical genus (see below the diagnosis). Recently Constant and Pham (2016) established the subgenus *Maculergithus* within *Gergithus* for four species from Northern Vietnam (Tam Dao) and from Hainan Island (China).

Thus, after their publication, the genus *Gergithus* Stål should be considered within at least two subgenera, *Gergithus* sensu stricto and *Maculergithus* Constant et Pham; however, officially this division was made only next year by Meng with coauthors (Meng et al., 2017), who gave the diagnosis of *Gergithus* sensu stricto and listed 22 species belonging to this taxon. In the same publication, the new genus *Gnezdilovius* Meng, Webb et Wang, 2017 with the type species *Gergithus lineatus* Kato, 1933 was erected; it included 40 species previously attributed to the genus *Gergithus* Stål (Meng et al., 2017). However, *Gnezdilovius* included both the species attributed by Constant and Pham to the subgenus *Maculergithus* (Constant and Pham, 2016), and the type species of the genus *Ishiharanus* Hori, 1969 (Meng et al., 2017), which automatically makes all the three names synonyms. It is noteworthy that the name *Gnezdilovius* was published for the first time in August of 2016 as *nomen nudum*; in this publication dealing with the phylogeny of the family Issidae (Wang et al., 2016), *Gnezdilovius* sensu Meng et al. was considered as a paraphyletic taxon since it falls into three 3 species-groups. However, as

¹ This article was originally submitted by the author in Russian and is first published in translation.

it is shown below, none of the species of *Gnezdilovius* sensu stricto was involved in analysis by Wang with coauthors (Wang et al., 2016). The resulting confusion with the distribution of the species between the four mentioned taxa of a generic rank makes it necessary to revise the composition of these taxa, based, first of all, on the characters of the type species.

The comparison of the type species of *Maculergithus* and *Gnezdilovius* has shown essential morphological differences, which allows me to treat these taxa as distinct generic groups differing from both *Gergithus* sensu stricto and *Ishiharanus*. The presence or absence of asymmetry in the structure of the phallobase should be considered one of the main differences between *Maculergithus* and *Gnezdilovius*. In addition, in the course of the revision of the species attributed by Meng with coauthors (Meng et al., 2017) to the genus *Gnezdilovius*, I have found a group of the species differing in the structure of the phallobase and pygofer (see the diagnoses below) from *Gnezdilovius* sensu stricto as well as from *Maculergithus*, *Ishiharanus*, and *Gergithus* sensu stricto, which gives me grounds to erect for this group a new genus, *Ceratogergithus* gen. n. Part of the species included in *Gnezdilovius* earlier should, on the contrary, be transferred to the genus *Epyhemisphaerius* Chan et Yang, 1994, according to the structure of their asymmetrical phallobase.

A revision of the genus *Hemisphaerius* Schaum, 1850 is a matter for the future, but already now I can tell that it is a complex of the genera with various patterns in the structure of the male genitalia. In particular, *Hemisphaerius* sensu stricto is characterized by the asymmetrical phallobase with rounded or triangular unequal subapical processes on the right and left dorsolateral lobes and by the aedeagus lacking ventral hooks (Figs. 1–7). The new genus *Ophthalmosphaerius* gen. n. established here for *Hemisphaerius trilobulus* Che, Zhang et Wang, 2006 and *H. binocularis* Chen, Zhang et Chang, 2014 is characterized by the presence of narrow horn-shaped subapical processes of the phallobase and by asymmetry in the number of these processes on the left and right dorsolateral lobes (Figs. 54, 55).

The material examined is deposited in the collection of the Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia (ZIN) and in the collection of Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany (SDEI).

Family ISSIDAE Spinola

Tribe Hemisphaeriini Melichar

Genus *Hemisphaerius* Schaum, 1850

Type species *Hemisphaerius coccinelloides* Burmeister, 1834.

Diagnosis. Metope wide, widened above clypeus, flat, smooth, without intermediate carinae. Lateral margins of metope roof-like hang over antennae. Clypeus without carinae. Coryphe transverse (at least 5 times as wide as long along midline). Paradiscal fields of pronotum very narrow behind eyes. Pro- and mesonotum without carinae. Costal margin of fore wing semicircularly projecting below eyes (in lateral view), without shoulder-like projections (in dorsal view). Hind wing rudimentary. Hind tibia with 2 lateral spines in distal half. Phallobase asymmetric (Figs. 1, 2). Aedeagus without ventral hooks (Fig. 3). Posterior margin of pygofer of male convex (Fig. 1). Stylus with short and wide neck (Figs. 4, 5). Anal tube wide (in dorsal view) (Fig. 6).

Notes. The diagnosis is based on examination of the type species of the genus and also the similar species *H. interclusus* Noualhier, 1896.

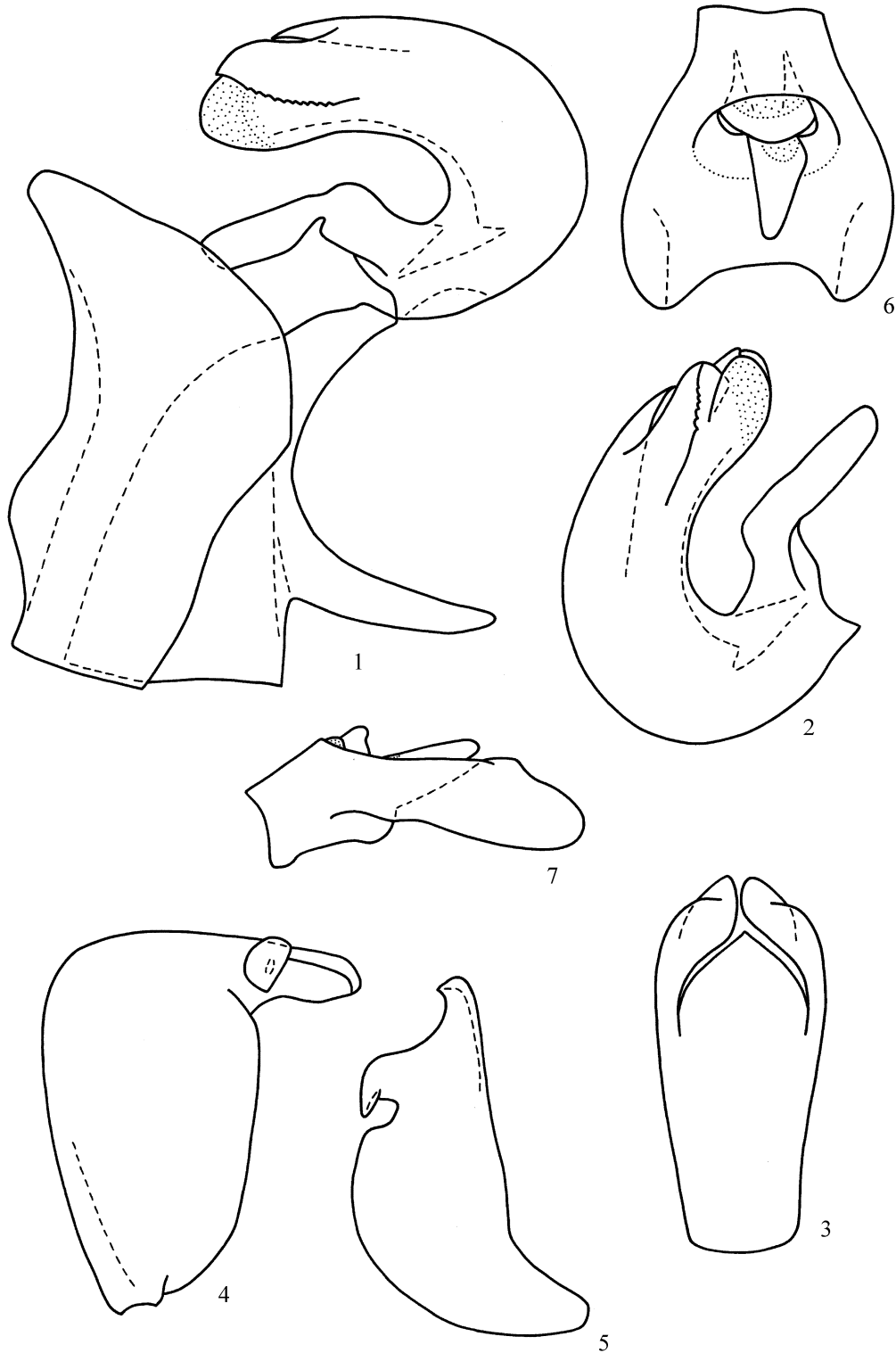
Hemisphaerius interclusus Noualhier, 1896 (Figs. 1–7)

Material. Vietnam: 1 ♂, *Dong Nai Province*, Cat Tien National Park, 11°25'N 107°25'E, 18.XI.2012, V.M. Gnezdilov leg. (ZIN).

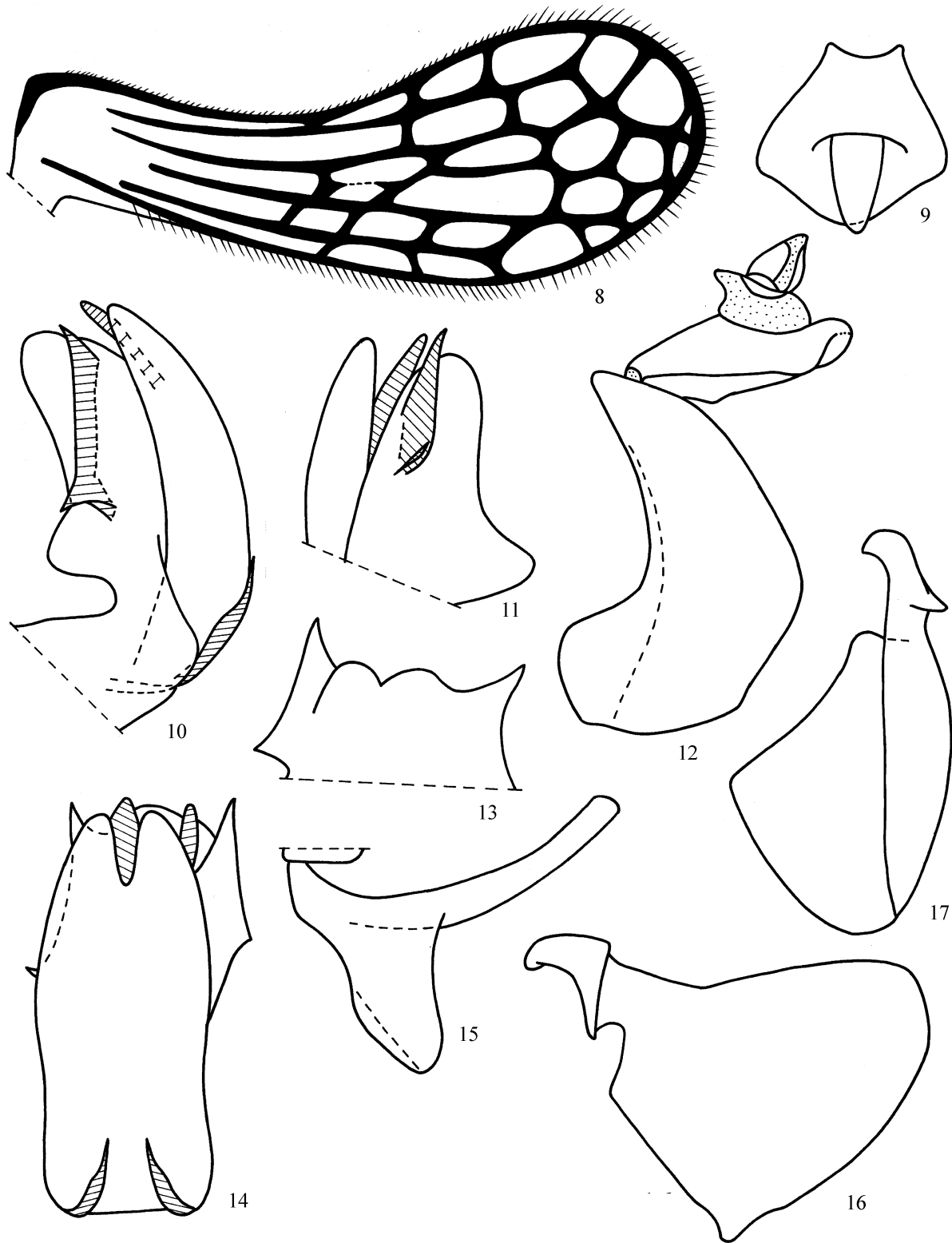
Genus *Gergithus* Stål, 1870

Type species *Hemisphaerius schaumii* Stål, 1855.

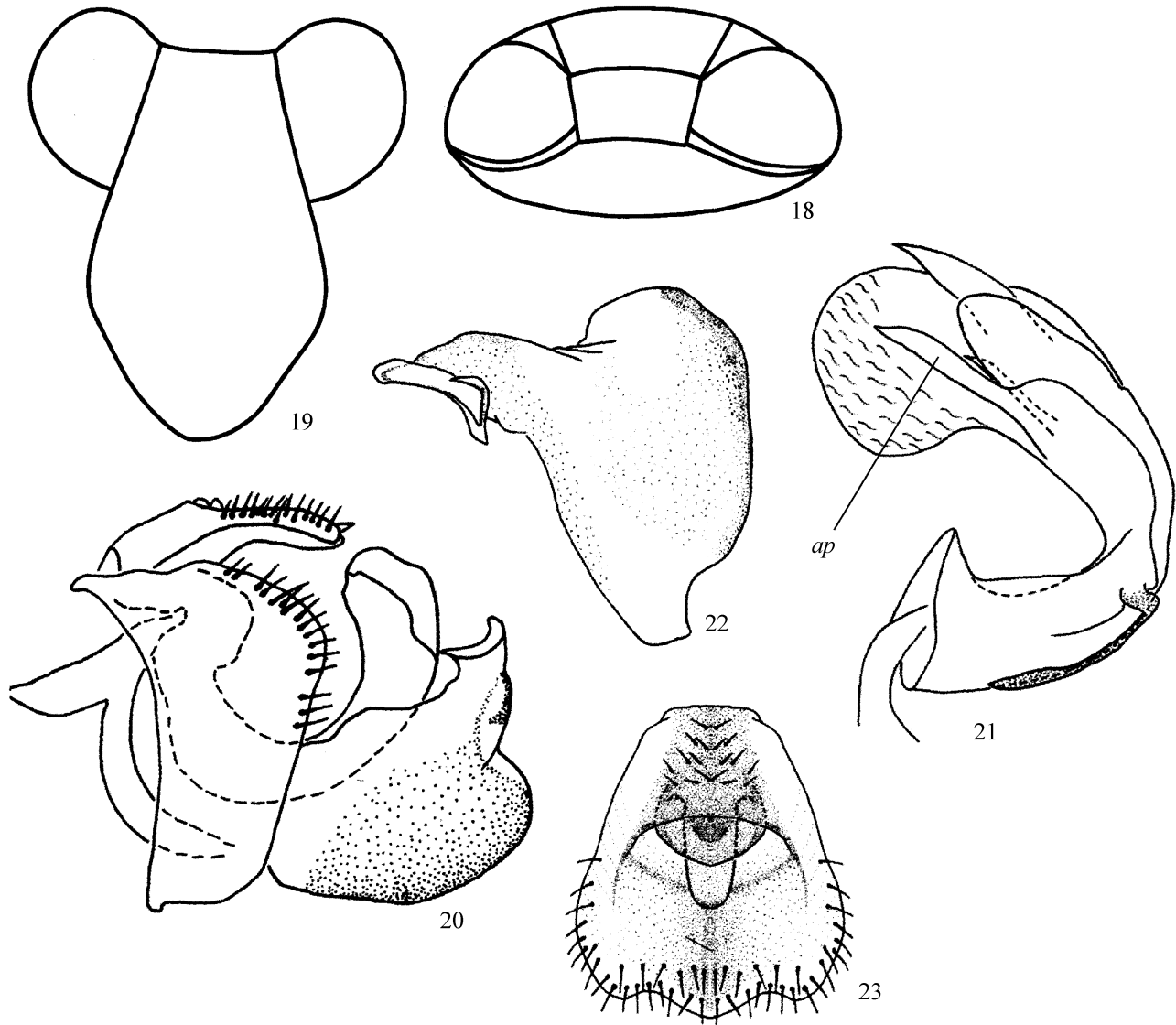
Diagnosis. Metope elongate, narrow, widened above clypeus, smooth, without intermediate carinae (Meng et al., 2017, fig. 7C). Coryphe transverse (about twice as wide as long along midline). Postclypeus with strong prominent median carina (Meng et al., 2017, fig. 7E). Fore wing with “shoulder” basally: costal margin sharply convex (in dorsal view) but not projecting under eyes (in lateral view) (Meng et al., 2017, figs. 7A, 7B). Hind wing well developed, one-lobed (Fig. 8). Phallobase asymmetrical, with subapical processes differing in shape and size on left and right dorsolateral lobes (Figs. 10, 11, 13, 14). Aedeagus with pair of short ventral hooks directed toward its apex. Anal tube of male wide (in dorsal view) (Fig. 9). Posterior margin of pygofer of male convex, without



Figs. 1–7. *Hemisphaerius interclusus* Noualhier, male genitalia: (1) pygofer, penis, and connective (right lateral view); (2) penis (left lateral view); (3) penis (ventral view); (4) stylus (lateral view); (5) stylus (dorsal view); (6) anal tube (dorsal view); (7) anal tube (lateral view).



Figs. 8–17. *Gergithus herbaceus* (Kirby): (8) hind wing, (9) anal tube of male (dorsal view), (10) penis (right lateral view), (11) apex of penis (left lateral view), (12) pygofer and anal tube of male (lateral view), (13) apex of phallobase (posterior view), (14) penis (ventral view), (15) connective (lateral view), (16) stylus (lateral view), (17) stylus (dorsal view).



Figs. 18–23. *Ishiharanus iguchii* (Matsumura), after Chen et al., 2014, modified and supplemented: (18) head and pronotum (dorsal view); (19) head (front view); (20) male genitalia (lateral view); (21) penis (right lateral view); (22) stylus (lateral view); (23) anal tube of male (dorsal view). *ap*, apical process of dorsolateral lobe of phallobase.

processes (Fig. 12). Stylus with short neck (Figs. 16, 17). Connective with large cup (Fig. 15).

Composition and distribution. 22 species listed by Meng with coauthors (Meng et al., 2017 : 6), most part of which is known from Sri Lanka and India; some species were recorded from Southern China (Yunnan), Indonesia, Malaysia, Thailand, and Burma.

Notes. The diagnostic characters of the male genitalia are listed based on examination of *Gergithus herbaceus* (Kirby, 1891) (specimen was identified by E. Schmidt in 1910) from Sri Lanka. The structure of the male genitalia of the type species of the genus, *G. schaumii* (Stål, 1855), has not been examined.

***Gergithus herbaceus* (Kirby, 1891)**
(Figs. 8–17)

Material. Sri Lanka: 1 ♂, “Süd Ceylon / Mai 1889 / H. F. Fruhstorfer” // “*Gergithus / herbaceus* Kirby / ♂ Edm. Schmidt / determ. 1910” (SDEI).

Genus *Ishiharanus* Hori, 1969

Type species *Gergithus iguchii* Matsumura, 1916.

Diagnosis. Metope narrow between eyes, widened above clypeus (becoming twice as wide), without intermediate carinae (Fig. 19). Clypeus without carinae. Coryphe transverse, about twice as wide as long along midline (Fig. 18). Fore wing without shoulder-like

projections (in dorsal view); costal margin not projecting under eyes (in lateral view). Hind wing well developed, one-lobed. Phallobase symmetrical; each dorsolateral lobe with long narrow horn-shaped apical process (Fig. 21, *ap*). Aedeagus with pair of long ventral hooks directed toward its base. Stylus with wide neck (in lateral view) (Figs. 22). Posterior margin of pygofer of male strongly convex in upper part (Fig. 20). Anal tube wide, widened toward apex; posterior margin spout-like convex in median part (in dorsal view) (Fig. 23).

Composition and distribution. The monotypical genus is known from Japan (Honshu, Shikoku, Kyushu, Tsushima Islands), Eastern and Southeastern China (Chekiang, Fujian, Guangdong), and Northern Vietnam (Matsumura, 1916; Hori, 1969; Fennah, 1978; Chen et al., 2014; Hayashi and Fujinuma, 2016; Meng et al., 2017). In the structure of the metope and coryphe and also in the presence of narrow long apical processes of the phallobase, *Ishiharanus iguchii* is closely related to *Bruneastrum cardinale* Gnezdilov, 2015 from Borneo; however, the latter lacks ventral hooks of the aedeagus (Gnezdilov, 2015). The narrow long apical processes of the phallobase are also characteristic of the genus *Neohemisphaerius* Chen, Zhang et Chang, 2014, in particular, its type species, *N. wugangensis* Chen, Zhang et Chang, 2014 from Southern China, but the species of the genus *Neohemisphaerius* clearly differ in the presence of a distinct median carina of the metope (Chen et al., 2014).

Ishiharanus iguchii (Matsumura, 1916)
(Figs. 18–23)

Material. Vietnam: 1 ♀, *Hoa Binh Province*, Mai Chau District, Pa Co, 1100–1200 m, 20°45'N 104°54'E, 27–28.IV.2002, S.A. Belokobylskij leg. (ZIN).

Genus *Epyhemisphaerius* Chan et Yang, 1994

Type species *Hemisphaerius tappanus* Matsumura, 1916.

Diagnosis. Metope wide (Fig. 24), without intermediate carinae. Clypeus without carinae. Coryphe transverse, at least 3 times as wide as long along midline (Fig. 25). Fore wing without shoulder-like projections (in dorsal view); costal margin not projecting under eyes (in lateral view). Hind wing rudimentary. Phallobase asymmetric: subapical processes of dorsolateral lobes differing in size and shape (Figs. 28–31).

Aedeagus with pair of long ventral hooks directed toward its base (Fig. 32). Posterior margin of pygofer of male weakly convex (Fig. 27). Anal tube of male wide, widened from base to upper part, with shallow median emargination (Fig. 26).

Composition and distribution. Six species distributed in Taiwan and Japan (Honshu, Shikoku, Kyushu) (Hori, 1969; Chan and Yang, 1994).

Notes. *Gergithus nummarius* Chan and Yang, 1994 and *G. rosticus* Chan and Yang, 1994 are placed in this genus provisionally, as they are characterized by weak asymmetry of the phallobase, without clear differences in the shape and size of the processes of the dorsolateral lobes.

Epyhemisphaerius bistratus
(Schumacher, 1915), comb. n.

Hemisphaerius bistratus Schumacher, 1915a : 136.

= *Hemisphaerius bizonatus* Matsumura, 1916 : 96, after Hori, 1969 : 57.

Gergithus bistratus: Chan and Yang, 1994 : 31, fig. 11.

Gnezdilovius bistratus: Meng et al., 2017 : 18.

Epyhemisphaerius carbonarius
(Melichar, 1906), comb. n.

Gergithus carbonarius Melichar, 1906 : 65.

Gergithus variabilis carbonarius: Hori, 1969 : 52, pl. 2: 4.

Gergithus carbonarius: Chan and Yang, 1994 : 29, fig. 9.

Gnezdilovius carbonarius: Meng et al., 2017 : 18.

Epyhemisphaerius nummarius
(Chan et Yang, 1994), comb. n.

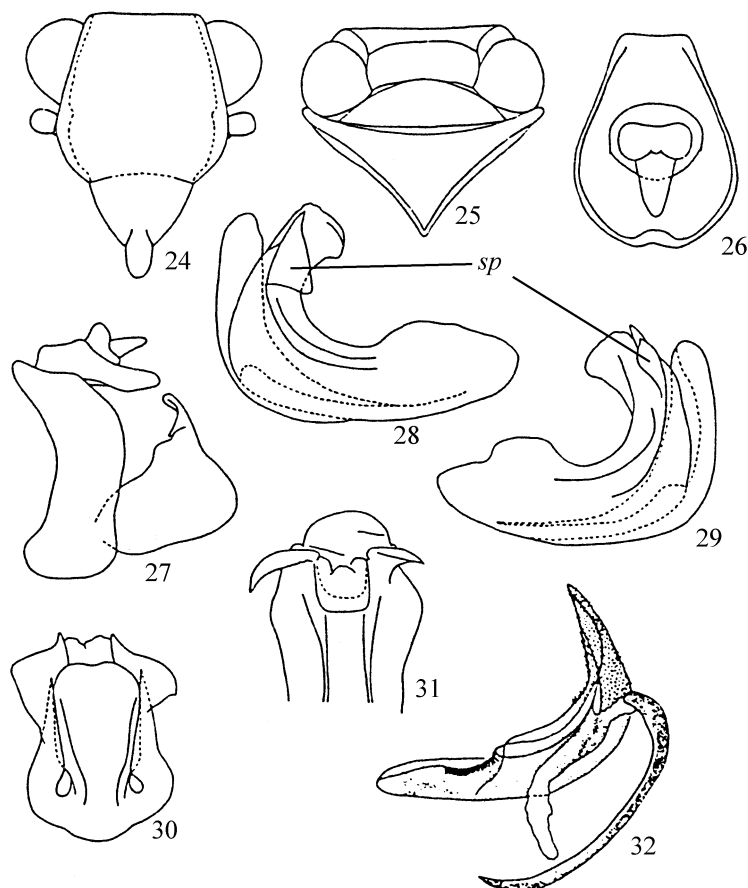
Gergithus nummarius Chan and Yang, 1994 : 23, fig. 7.

Gnezdilovius nummarius: Meng et al., 2017 : 18.

Epyhemisphaerius rosticus
(Chan et Yang, 1994), comb. n.

Gergithus rosticus Chan and Yang, 1994 : 34, fig. 12.

Gnezdilovius rosticus: Meng et al., 2017 : 19.



Figs. 24–32. *Epyhemisphaerius tappanus* (Matsumura), after Chan and Yang, 1994, modified: (24) head (front view); (25) head, pronotum and mesonotum (dorsal view); (26) anal tube of male (dorsal view); (27) pygofer, anal tube, and stylus (lateral view); (28) phallobase (left lateral view); (29) phallobase (right lateral view); (30) phallobase (ventral view); (31) phallobase (posterodorsal view); (32) aedeagus (lateral view). *sp.*, subapical process of dorsolateral lobe of phallobase.

Epyhemisphaerius rotundus
(Chan et Yang, 1994), comb. n.

Gergithus rotundus Chan and Yang, 1994 : 36, fig. 13.

Gnezdilovius rotundus: Meng et al., 2017 : 19.

Genus ***Maculergithus***
Constant et Pham, 2016, stat. n.

Type species *Gergithus (Maculergithus) tamdao*
Constant et Pham, 2016.

Diagnosis. Metope wide, widened above clypeus (Constant and Pham, 2016, fig. 2G). Clypeus without carinae. Coryphe transverse, at least 4 times as wide as long along midline (Constant and Pham, 2016, fig. 5A). Fore wing without shoulder-like projections; costal margin not projecting under eyes (in lateral view). Hind wing well developed, one-lobed (Constant

and Pham, 2016, fig. 3E). Phallobase asymmetrical, with large wide process on left side (Figs. 35, 36). Aedeagus with pair of short ventral hooks bent in dorsal surface of phallobase. Posterior margin of pygofer of male convex, without processes (Fig. 33). Anal tube of male wide, elongate (Fig. 34).

Composition and distribution. Four species from Northern Vietnam and Southern China (Guansi, Hainan Island).

Notes. Judging by the original description (Meng and Wang, 2012, figs. 16, 17), *Gergithus nonomaculatus* Meng et Wang, 2012 included in *Maculergithus* by Constant and Pham (2016) is characterized by a symmetrical phallobase, which puts in question the attribution of this species to the genus *Maculergithus* in its current treatment (see the diagnosis). Also doubts are cast upon the correctness of the identification of this

species for the molecular studies in Wang et al., 2016, where *G. nonomaculatus* and *G. multipunctatus* are included in one cluster as sister taxa with a hundred-per-cent support.

Maculergithus luteomaculatus

Constant et Pham, 2016

Gergithus (Maculergithus) luteomaculatus Constant and Pham, 2016 : 6, figs. 2A, 2B, 3, 4.

Gnezdilovius luteomaculatus: Meng, Webb, Wang, 2017 : 18.

Maculergithus multipunctatus

(Che, Zhang et Wang), 2007

Gergithus multipunctatus Che, Zhang, Wang, 2007 : 621.

Gergithus (Maculergithus) multipunctatus Constant and Pham, 2016 : 9, figs. 2C–2D.

Gnezdilovius multipunctatus: Meng, Webb, Wang, 2017 : 18.

Maculergithus quinquemaculatus

(Che, Zhang et Wang, 2007), comb. n.

Gergithus quinquemaculatus Che, Zhang, Wang, 2007 : 615, figs. 5–13.

Gnezdilovius quinquemaculatus: Meng, Webb, Wang, 2017 : 18.

Maculergithus tamdao Constant et Pham, 2016

(Figs. 33–36)

Gergithus (Maculergithus) tamdao Constant and Pham, 2016 : 11, figs. 2G–2H, 5, 6.

Gnezdilovius tamdao: Meng, Webb, Wang, 2017 : 19.

Genus ***Gnezdilovius*** Meng, Webb et Wang, 2017

Type species *Gergithus lineatus* Kato, 1933.

Diagnosis. Metope wide, slightly widened above clypeus (becoming 1.3 times as wide), without intermediate carinae (Fig. 37). Clypeus without carinae. Coryphe transverse, 3 times as wide as long along midline (Fig. 38). Fore wing without shoulder-like projections (in dorsal view); costal margin not projecting under eyes (in lateral view) (Meng et al., 2017, figs. 9E, 9F). Hind wing well developed, one-lobed. Phallobase symmetrical: each dorsolateral lobe with semicircular apical process, without long narrow horn-shaped process (Figs. 42–44). Aedeagus with pair of

long hooks directed toward its base (Fig. 41). Stylus with narrow neck (in lateral view) (Fig. 40). Posterior margin of pygofer of male moderately convex. Anal tube of male wide, widened from base to upper part (in dorsal view); its posterior margin straight, gently convex, or emarginate (Fig. 39).

Composition and distribution. 15 species, one of which is presented by two subspecies. The overwhelming majority of the species were recorded from Taiwan; some species are known from China (Chungking) and Japan (Honshu, Shikoku, Kyushu, Tsushima Islands).

Notes. The species listed below are attributed to the genus *Gnezdilovius*, based on examination of illustrations in the publications of Chan and Yang (1994) and Hori (1969).

Gnezdilovius affinis (Schumacher, 1915)

Gergithus affinis Schumacher, 1915a : 135.

Gergithus affinis: Chan and Yang, 1994 : 23, fig. 6.

Gnezdilovius affinis: Meng et al., 2017 : 17.

Gnezdilovius chihpensis (Chan et Yang, 1994)

Gergithus chihpensis Chan and Yang, 1994 : 38, figs. 14.

Gnezdilovius chihpensis: Meng et al., 2017 : 18.

Gnezdilovius formosanus (Metcalf, 1955)

Gergithus formosanus Metcalf, 1955 : 263, nom. nov. pro *Gergithus reticulatus* Matsumura, 1916 nec *Hemisphaerius reticulatus* Distant, 1906.

Gergithus formosanus: Chan and Yang, 1994 : 38, fig. 15.

Gnezdilovius formosanus: Meng et al., 2017 : 18.

Gnezdilovius hosticus (Chan et Yang, 1994)

Gergithus hosticus Chan and Yang, 1994 : 31, fig. 10.

Gnezdilovius hosticus: Meng et al., 2017 : 18.

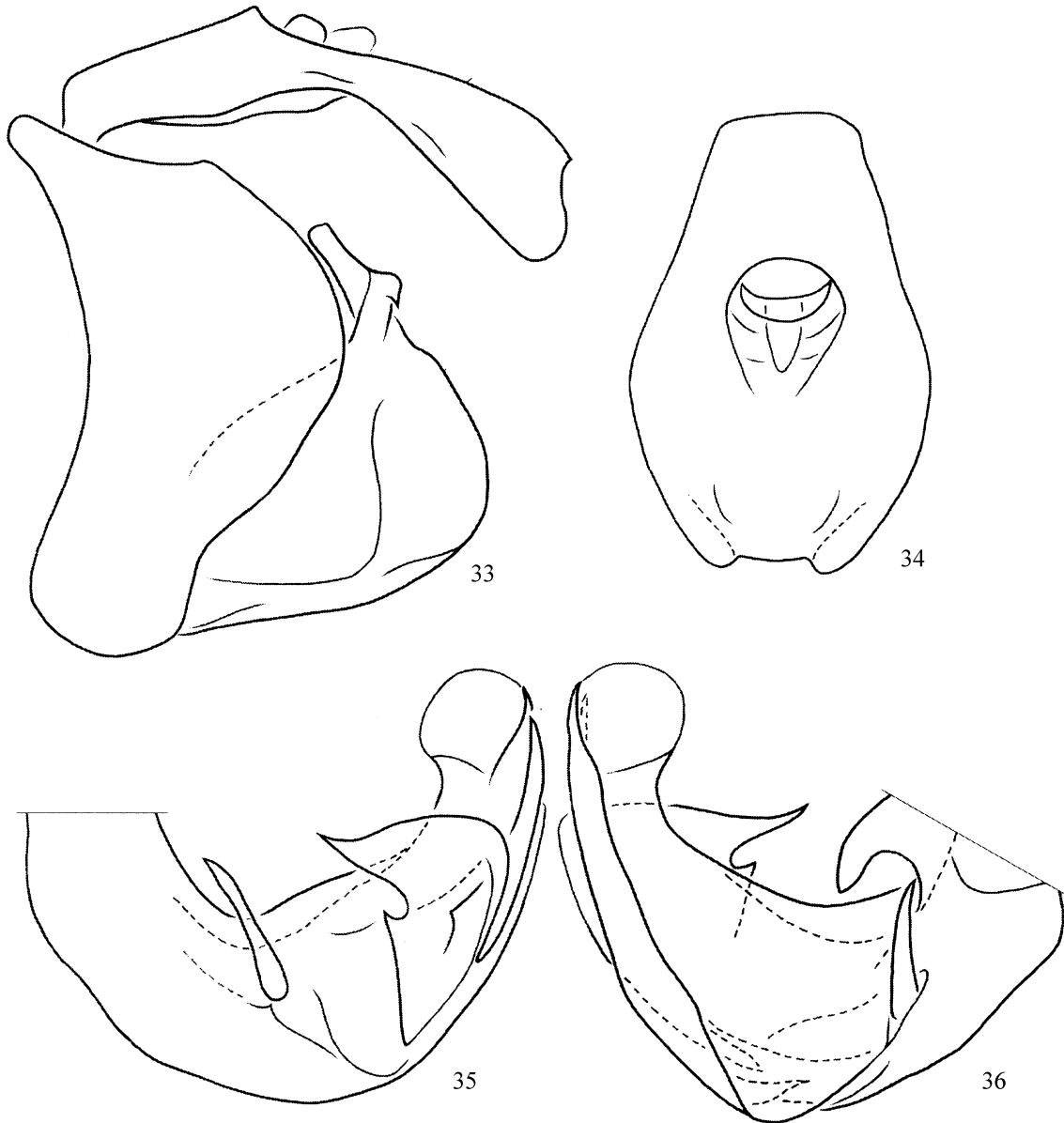
Gnezdilovius lineatus (Kato, 1933)

(Figs. 37–44)

Gergithus lineatus Kato, 1933 : 461.

Gergithus lineatus: Chan and Yang, 1994 : 43, fig. 17.

Gnezdilovius lineatus: Meng et al., 2017 : 18.



Figs. 33–36. *Maculergithus tamdao* Constant et Pham, after Constant and Pham, 2016, modified: (33) pygofer, anal tube, and stylus (lateral view); (34) anal tube of male (dorsal view); (35) phallobase (right lateral view); (36) phallobase (left lateral view).

Material. Taiwan: 4 ♂, 1 ♀, Kaohsiung, Shanping Forest Research Station, Aiyong Rd. ca. 6 km, 1200 m, 22°57'32"N 120°41'43"E, 24.VI.2004, D.A. Dmitriev leg. (ZIN).

Gnezdilovius longulus (Schumacher, 1915)

Gergithus longulus Schumacher, 1915a : 135.

= *Gergithus kuyanianus* Matsumura, 1916 : 103, sensu Hori 1969 : 56.

Gergithus longulus: Chan and Yang, 1994 : 47, fig. 20.

Gnezdilovius longulus: Meng et al., 2017 : 18.

Gnezdilovius nigrolimbatus
(Schumacher, 1915)

Gergithus nigrolimbatus Schumacher, 1915a : 134.

Gergithus nigrolimbatus: Chan and Yang, 1994 : 45, fig. 28.

Gnezdilovius nigrolimbatus: Meng et al., 2017 : 18.

Gnezdilovius pendulus (Chan et Yang, 1994)

Gergithus pendulus Chan and Yang, 1994 : 47, fig. 19.

Gnezdilovius pendulus: Meng et al., 2017 : 18.

Gnezdilovius robustus robustus (Schumacher, 1915)

Gergithus robustus Schumacher, 1915b : 127.

Gergithus robustus: Chan and Yang, 1994 : 50, fig. 21.

Gnezdilovius robustus: Meng et al., 2017 : 19.

Gnezdilovius robustus hoozanensis
(Schumacher, 1915), comb. n.

Gergithus robustus hoozanensis Schumacher, 1915b : 127.

Gnezdilovius rugiformis (Zhang et Che, 2009)

Gergithus rugiformis Zhang and Che, 2009 : 183, figs. 1–15.

Gnezdilovius rugiformis: Meng et al., 2017 : 19.

Gnezdilovius stramineus (Hori, 1969)

Gergithus stramineus Hori, 1969 : 58, pl. 3: 3.

Gergithus stramineus: Chan and Yang, 1994 : 54, fig. 23.

Gnezdilovius stramineus: Meng et al., 2017 : 19.

Gnezdilovius tessellatus (Matsumura, 1916)

Gergithus tessellatus Matsumura, 1916 : 100.

Gergithus tessellatus: Chan and Yang, 1994 : 41, figs. 16.

Gnezdilovius tessellatus: Meng et al., 2017 : 19.

Gnezdilovius unicolor (Melichar, 1906)

Gergithus variabilis unicolor Melichar, 1906 : 66.

Gergithus variabilis unicolor: Hori, 1969 : 52, pl. 2: 2.

Gergithus unicolor: Chan and Yang, 1994 : 27, fig. 8.

Gnezdilovius unicolor: Meng et al., 2017 : 19.

Gnezdilovius variabilis (Butler, 1875)

Hemisphaerius variabilis Butler, 1875 : 98.

Gergithus variabilis: Hori, 1969 : 51, fig. 2: 8–10, pl. 2: 1, 3.

Gergithus variabilis: Metcalf, 1958 : 126.

Gergithus variabilis: Chan and Yang, 1994 : 26.

Gnezdilovius variabilis: Meng et al., 2017 : 19.

Gnezdilovius yayeyamensis (Hori, 1969)

Gergithus yayeyamensis Hori, 1969 : 55, fig. 1: 10, 11, pl. 2: 11.

Gergithus yayeyamensis: Chan and Yang, 1994 : 52, fig. 22.

Gnezdilovius yayeyamensis: Meng et al., 2017 : 19.

Genus ***Ceratogergithus*** Gnezdilov, gen. n.

Type species *Gergithus spinosus* Che, Zhang et Wang, 2007.

Diagnosis. Metope wide, without intermediate carinae (Fig. 45). Clypeus without carinae. Coryphe sub-square or transverse (twice as wide as long along midline). Fore wing without shoulder-like projections (in dorsal view); costal margin not projecting under eyes (in lateral view). Hind wing well developed, one-lobed. Posterior margin of pygofer of male with large horn-shaped tooth in upper part on each side (Fig. 46). Phallobase symmetrical, with characteristic long narrow processes at base (Figs. 47, 48, *bp*). Stylus with distinct neck (Fig. 49). Anal tube of male wide (in dorsal view).

Etymology. The name is derived from a combination of the Greek word “κέρατο” [= horn] and the name of the genus *Gergithus*, which emphasizes the presence of a characteristic horn-shaped tooth at the posterior margin of the pygofer.

Composition and distribution. Three species from Hainan Island (China).

Comparison. The new genus clearly differs from all the genera of the tribe Hemisphaeriini in the presence of a large spine at the posterior margin of the pygofer and in long basal processes of the phallobase.

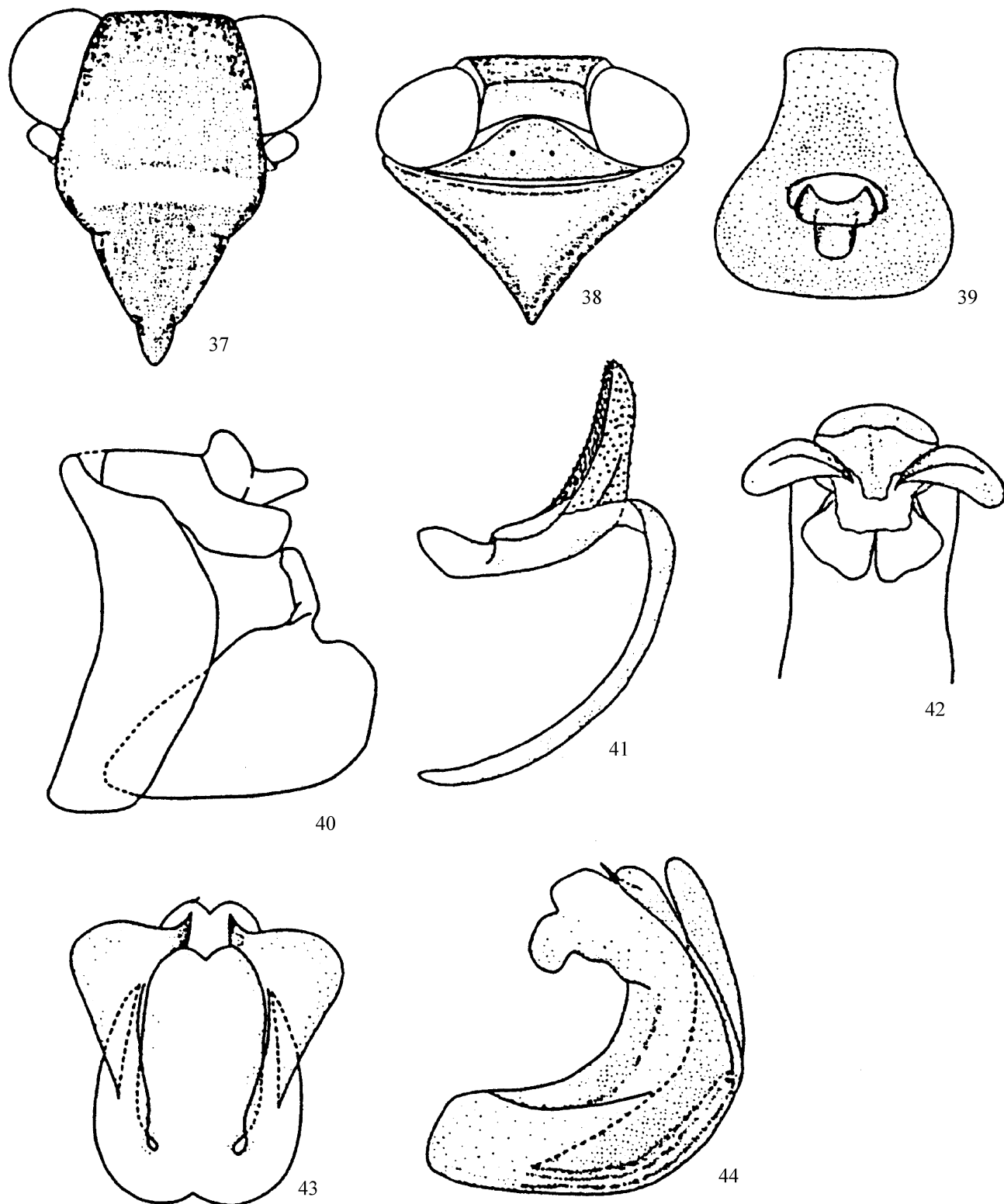
Notes. The diagnosis is based on examination of illustrations in Che et al. (2007); however, the presence or absence of ventral hooks of the aedeagus on them cannot be reliably recognized. According to the molecular data (Wang et al., 2016), *Gergithus spinosus* and *G. pseudotessellatus* are distinguished into a separate cluster on the phylogenetic tree of Issidae, which indirectly confirms the validity of the erection of a new genus.

Ceratogergithus chelatus

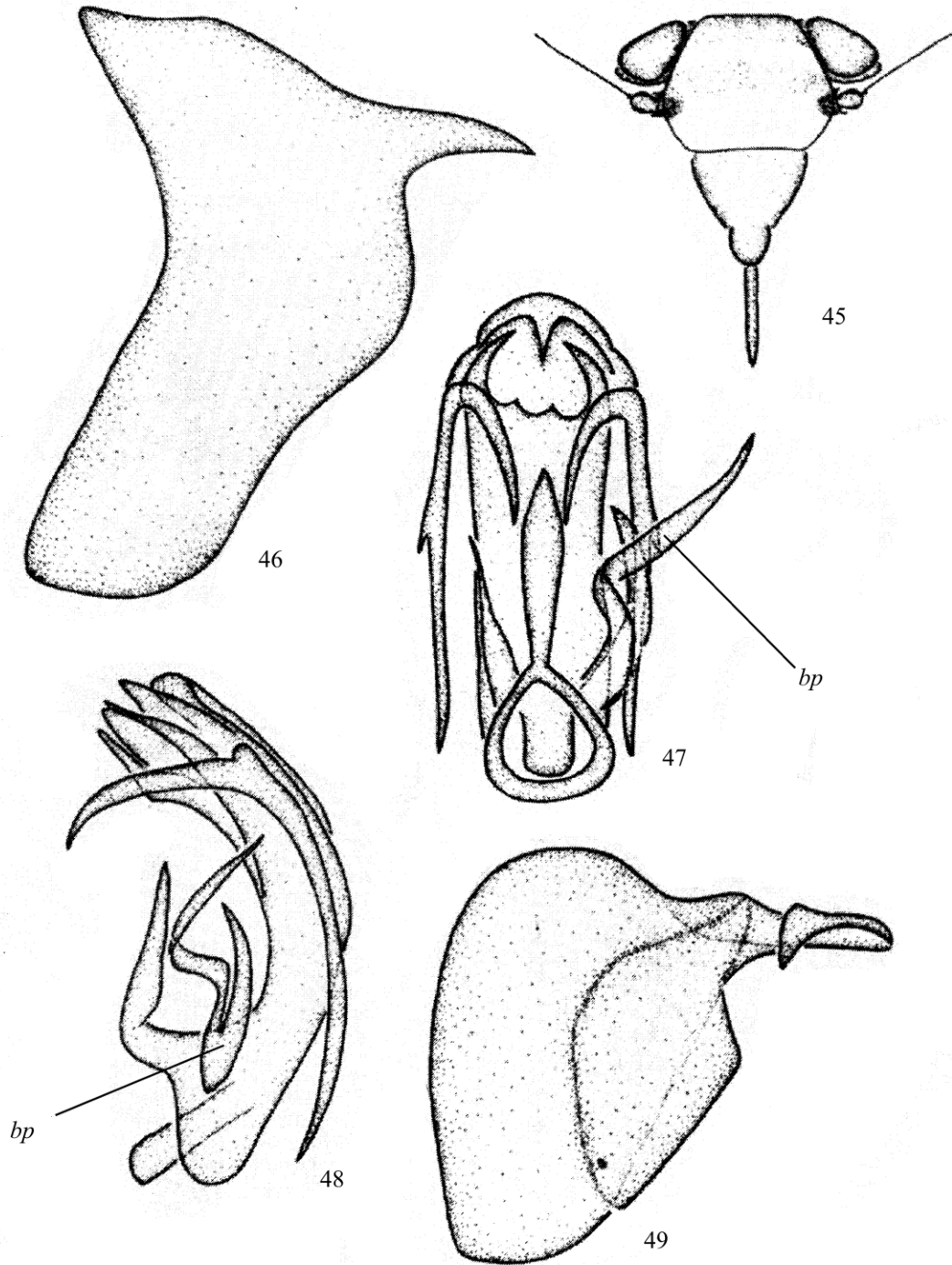
(Che, Zhang et Wang, 2007), comb. n.

Gergithus chelatus Che, Zhang, Wang, 2007 : 617, figs. 24–32.

Gnezdilovius chelatus Meng et al., 2017 : 18.



Figs. 37–44. *Gnezdilovius lineatus* (Kato), after Chan and Yang, 1994, modified: (37) head (front view); (38) head and pro- and mesonotum (dorsal view); (39) anal tube of male (dorsal view); (40) pygofer, anal tube, and stylus (lateral view); (41) aedeagus (lateral view); (42) phallobase (posterodorsal view); (43) phallobase (ventral view); (44) phallobase (right lateral view).



Figs. 45–49. *Ceratogergithus spinosus* (Che, Zhang et Wang), after Che et al., 2007, modified: (45) head (front view); (46) pygofer (lateral view); (47) phallobase (posterior view); (48) phallobase (right lateral view); (49) stylus (lateral view); *bp*, basal processes of phallobase.

Ceratogergithus pseudotessellatus

(Che, Zhang et Wang, 2007), comb. n.

Gergithus pseudotessellatus Che, Zhang, Wang, 2007 : 623, figs. 51–59.

Gnezdilovius pseudotessellatus Meng et al., 2017 : 18.

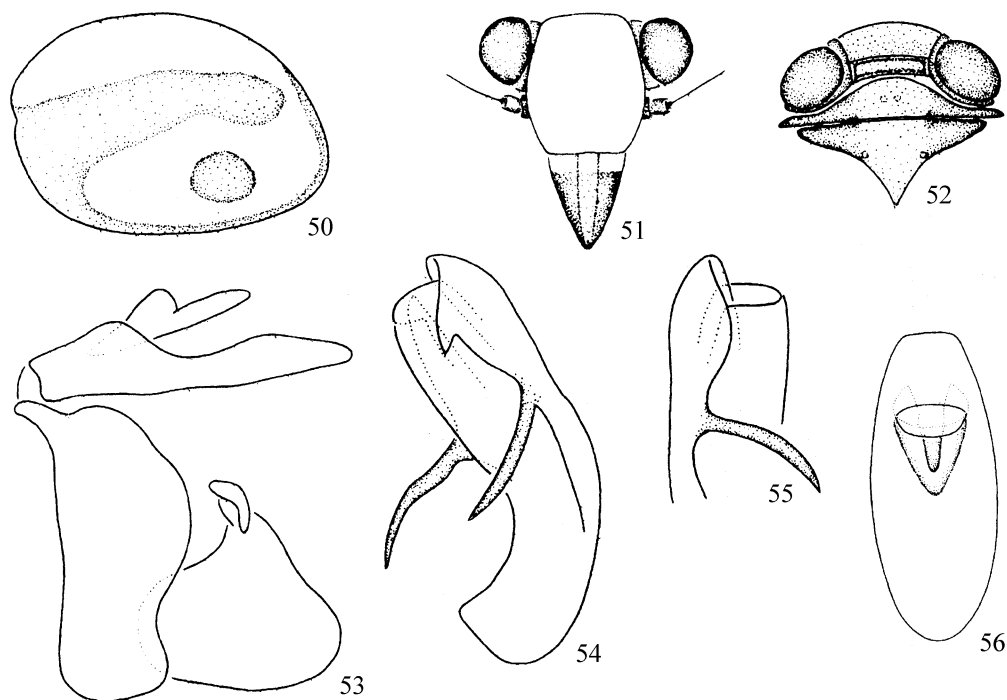
Ceratogergithus spinosus

(Che, Zhang et Wang, 2007), comb. n.

(Figs. 45–49)

Gergithus spinosus Che, Zhang, Wang, 2007 : 615, figs. 14–23.

Gnezdilovius spinosus Meng et al., 2017 : 19.



Figs. 50–56. *Ophthalmosphaerius trilobulus* (Che, Zhang et Wang), after Che et al., 2006, modified: (50) fore wing; (51) head (front view); (52) head and pro- and mesonotum (dorsal view); (53) pygofer, anal tube, and stylus (lateral view); (54) penis (right lateral view); (55) apex of penis (left lateral view); (56) anal tube of male (dorsal view).

Genus *Ophthalmosphaerius* Gnezdilov, gen. n.

Type species *Hemisphaerius trilobulus* Che, Zhang et Wang, 2006.

Diagnosis. Metope wide, smooth, with curved lateral margins, weakly narrowed in upper part and above clypeus, without intermediate carinae (Fig. 51). Coryphe transverse, 8 times as wide as long along midline (Fig. 52). Fore wing without shoulder-like projections (in dorsal view); costal margin not projecting under eyes (in lateral view). Hind wing rudimentary. Phallobase asymmetrical, with 2 long horn-shaped processes on left dorsolateral lobe and 1 similar process on right dorsolateral lobe (Figs. 54, 55). Aedeagus without ventral hooks. Posterior margin of pygofer of male moderately convex (Fig. 53). Capitulum of stylus on short and wide neck. Anal tube elongate (in dorsal view) (Fig. 56). Fore wing with characteristic ocellate pattern (Fig. 50).

Etymology. The name is derived from a combination of the Greek words “οφθαλμός” [= eye] and “σφαίρα” [= sphere], which emphasizes the presence of a characteristic ocellate pattern on the hemispherical fore wings.

Composition and distribution. Two species from Southern China (Yunnan).

Comparison. The new genus differs from *Hemisphaerius* Schaum in the presence of three long processes of the phallobase.

Notes. The diagnosis is based on examination of illustrations in Che et al., 2006 and Chen et al., 2014.

Ophthalmosphaerius binocularis
(Chen, Zhang et Chang, 2014), comb. n.

Hemisphaerius binocularis Chen, Zhang, Chang, 2014 : 62, fig. 2: 22.

Ophthalmosphaerius trilobulus
(Che, Zhang et Wang, 2006), comb. n.
(Figs. 50–56)

Hemisphaerius trilobulus Che, Zhang, Wang, 2006 : 161, figs. 10–19.

Species with an Uncertain Taxonomic Position

Gergithus bimaculatus Zhang et Che, 2009 (China: Yunnan): judging by the published figures and photographs (Zhang and Che, 2009; Meng and Wang, 2012), the aedeagus and phallobase are asymmetrical,

and the aedeagus lacks ventral hooks. The definition of the taxonomic position requires detailed figures of the phallobase and aedeagus.

Gergithus gravidus Melichar, 1906 is closely related to the representatives of the genus *Maculergithus* Constant et Pham in the presence of an asymmetrical phallobase with processes of a different shape on its left and right lobes (Chen et al., 2014, figs. 2–15, K–M); however, this species was described from Northern Vietnam (Tonkin) (Melichar, 1906), but the illustration in the book of Chen with coauthors (Chen et al., 2014) shows a specimen from China.

Gergithus okinawanus Matsumura, 1936 (Japan, islands of Ryukyu: Okinawa), *G. satsumensis* Matsumura, 1916 (Japan: Kyushu; islands of Ryukyu), and *G. taiwanensis* Hori, 1969 (Taiwan) occupy a separate position because of the asymmetrical arrangement of the ventral hooks of the aedeagus: the left and right hooks originate from the aedeagus at different levels and their apices are differently directed (Hori, 1969).

Gergithus tristriatus Meng et Wang, 2012 (China: Yunnan) is characterized by a sharply angularly convex posterior margin of the pygofer (Meng and Wang, 2012, fig. 38) and, thus, it is similar to the representatives of the genus *Ceratogergithus* gen. n., However, the structure of the phallobase in the figures and photographs given by Meng and Wang (2012) is obscure.

Gergithus parallelus Che, Zhang et Wang, 2007 (China: Yunnan, Hainan Island) is similar to the representatives of the genus *Ceratogergithus* gen. n. in the presence of branchy subapical processes of the phallobase (or the aedeagus? It is not clear from the figure!), However, the base of the phallobase lacks long processes, and the posterior margin of the pygofer bears no spine; the aedeagus lacks ventral hooks (Che et al., 2007).

Gergithus yunnanensis Che, Zhang et Wang, 2007 (China: Yunnan): the structure of the phallobase is not understood from the illustrations in Che et al., 2007.

Gergithus flaviguttatus Hori 1969 (Taiwan), *G. flavimacula* (Walker, 1851) (China: Hong Kong), and *G. horishanus* Matsumura, 1916 (Taiwan): the structure of the male genitalia has not been described; the species were attributed to the genus *Gnezdilovius* by Meng with coauthors (Meng et al., 2017), which requires verification.

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