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Issid planthoppers from Bach Ma and Phong Dien in Central Vietnam: (II) Tribe Hemisphaeriini (Hemiptera: Fulgoromorpha: Issidae)

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Abstract. Eight species of Issidae (Hemiptera: Fulgoromorpha) belonging to the tribe Hemisphaeriini, including seven species new to science, were collected in recent years in Bach Ma National Park and Phong Dien District in Thừa Thiên-Huế Province in Central Vietnam. One belongs to a new genus, *Varisphaerius* gen. nov., erected for the new species *V. hoaiae* sp. nov. from Bach Ma National Park. A new species of the genus *Ceratogergithus* Gnezdilov, 2018, *C. pictus* sp. nov., is described from Bach Ma National Park and Phong Dien District and represents the first record of the genus in Vietnam. Two new species of the genus *Hemisphaerius* Schaum, 1850 are described: *H. annamiticus* sp. nov. and *H. thaydoius* sp. nov. from several localities in the Central Annamites; one new species of the genus *Gergithoides* Schumacher, 1915: *G. devyveri* sp. nov. from Bach Ma National Park; two new species of the genus *Ishiharanus* Hori, 1969: *I. dinhanus* sp. nov. from the summit of Bach Ma National Park and *I. pulchellus* sp. nov. from Bach Ma National Park, Phong Dien District and several localities in the Central Annamites. The distribution of *I. iguchii* (Matsumura, 1916) is expanded southwards by about 500 km, to Central Vietnam, in Bach Ma and Vu Quang National Parks. The species is also recorded from the capital Hanoi and the four provinces of Ha Tinh, Hai Phong, Thanh Hoa and Thừa Thiên-Huế for the first time. These eight species, added to the eight species of the tribe Parahiraciini previously recorded/described from Thừa Thiên Huế Province, amount to a total number of 16 species of Issidae for this province. Accordingly, the Vietnamese issid fauna now counts 65 species in 34 genera. Additionally, the first observation of a trophobiotic interaction of a member of the tribe Hemisphaeriini is reported between *Ceratogergithus pictus* sp. nov. and ants of an unidentified species of the genus *Camponotus* Mayr, 1861 (Hymenoptera: Formicidae: Formicinae).

Keywords. Bach Ma National Park, biodiversity, Fulgoroidea, Indochina, Phong Dien District, trophobiosis.

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Introduction

The family Issidae Spinola, 1839 is a large family of planthoppers (Hemiptera, Fulgoromorpha), which currently contains more than 1100 species in about 230 genera (Bourgoin 2025), representing about 8% of the species of Fulgoromorpha. Although it has a worldwide distribution, the fauna of some major regions such as tropical Africa, South America, New Guinea and Australia remains very poorly documented (Gnezdilov & Fletcher 2010; Gnezdilov 2013b, 2017; Gnezdilov *et al*. 2022; Constant & Semeraro 2023).

We recently published a complete checklist of the Issidae fauna of Vietnam (Constant & Pham 2024a) and shortly thereafter added seven new species and one new genus to reach a total of 58 species in 33 genera in the country (Constant & Pham 2024b). These studies showed a high level of endemism of the Vietnamese issid planthoppers, with about 74% of the species found in the country known only from Vietnam. However, we also pointed out a great need for research, as no species of Issidae is documented from ⅔ of the provinces in the country, and the assessment of endemism is impeded by the poor knowledge of the fauna of the neighbouring countries. Indeed, the fauna of Laos is currently comprised of only six species (Gnezdilov 2014; Constant 2021; Bourgoin 2025) and that of Cambodia of three species (Constant & Bartlett 2019). Furthermore, despite the impressive recent progress in the knowledge of the family Issidae in Vietnam, we estimated that current numbers do not exceed 15% of the actual diversity in the country (Constant & Pham 2024a). This is further supported by the documented / expected higher endemism rate in mountainous areas, and from material still unidentified / undescribed in the collections (Constant & Pham 2024b).

Our study of recent material of Issidae, collected during fieldwork in Bach Ma National Park and Phong Dien District in Thừa Thiên-Huế Province in Central Vietnam, revealed a total of eight species belonging to the tribe Hemisphaeriini. All but one of them were found to be new to science, with one representing a new genus. Previously, eight species of Issidae, all of them in the tribe Parahiraciini, were recorded from this province as a result from the same collecting effort (Constant & Pham 2024b). The most recent checklist of Issidae from Vietnam gives 26 species of Hemisphaeriini (in 12 genera) for the country, with 17 (65%) of them having been described or recorded after 2010 (Constant & Pham 2011, 2014, 2015, 2016, 2017, 2024a; Gnezdilov 2013a, 2022; Gnezdilov & Soulier-Perkins 2017; Gnezdilov *et al*. 2017).

The present paper aims to describe one new genus and seven new species; it is the second part of a complete study of the Issidae from Bach Ma National Park and Phong Dien District, the first part dealing with the Parahiraciini (Constant & Pham 2024b) and the last part with the Sarimini.

Material and methods

The specimens were captured by hand using small transparent vials with which they were slowly covered or by sweeping the lower vegetation, bushes and lower branches of trees in the forest, along trails or along the road. The study was mainly conducted in different habitats in Thừa Thiên-Huế Province, in Bach Ma National Park and Phong Dien District (Figs 1–5).

The photographs of habitats and live specimens were taken with an Olympus Tough 6 camera. In two cases, specimens were placed in a fine mesh cage, which is mentioned in the captions. The collected specimens were photographed with a Leica EZ4W stereo microscope with integrated camera, and the images were stacked with CombineZ software and optimized with Adobe Photoshop CS3; all photographs are by the first author. The distribution maps were produced with SimpleMappr (Shorthouse 2010). The genitalia were extracted after soaking the abdomen in a 10% solution of potassium hydroxide (KOH) at room temperature for about 12 hours. Some drops of saturated alcoholic Chlorazol Black solution were added for contrasting when necessary (Carayon 1969). The pygofer was separated from the abdomen and the aedeagus dissected with a needle blade for examination. The whole was thoroughly rinsed in

70 % ethanol and then placed in glycerine for preservation in a tube attached to the pin of the corresponding specimen. The hind wings were glued with white glue on a small white cardboard rectangle attached to the pin of the corresponding specimen.

The external morphological terminology follows O'Brien & Wilson (1985) and for the terminalia, Bourgoin & Huang (1990), Gnezdilov (2003) and Gnezdilov *et al*. (2014b). The metatibiotarsal formula gives the number of spines on (side of metatibia) apex of metatibia / apex of first metatarsus / apex of second metatarsus. The terminology of the wing venation follows Bourgoin *et al*. (2015). The higher classification follows the most recent one as published by Gnezdilov *et al*. (2022).

Fig. 1. Map of the sampled localities in Thừa Thiên-Huế Province, Vietnam.

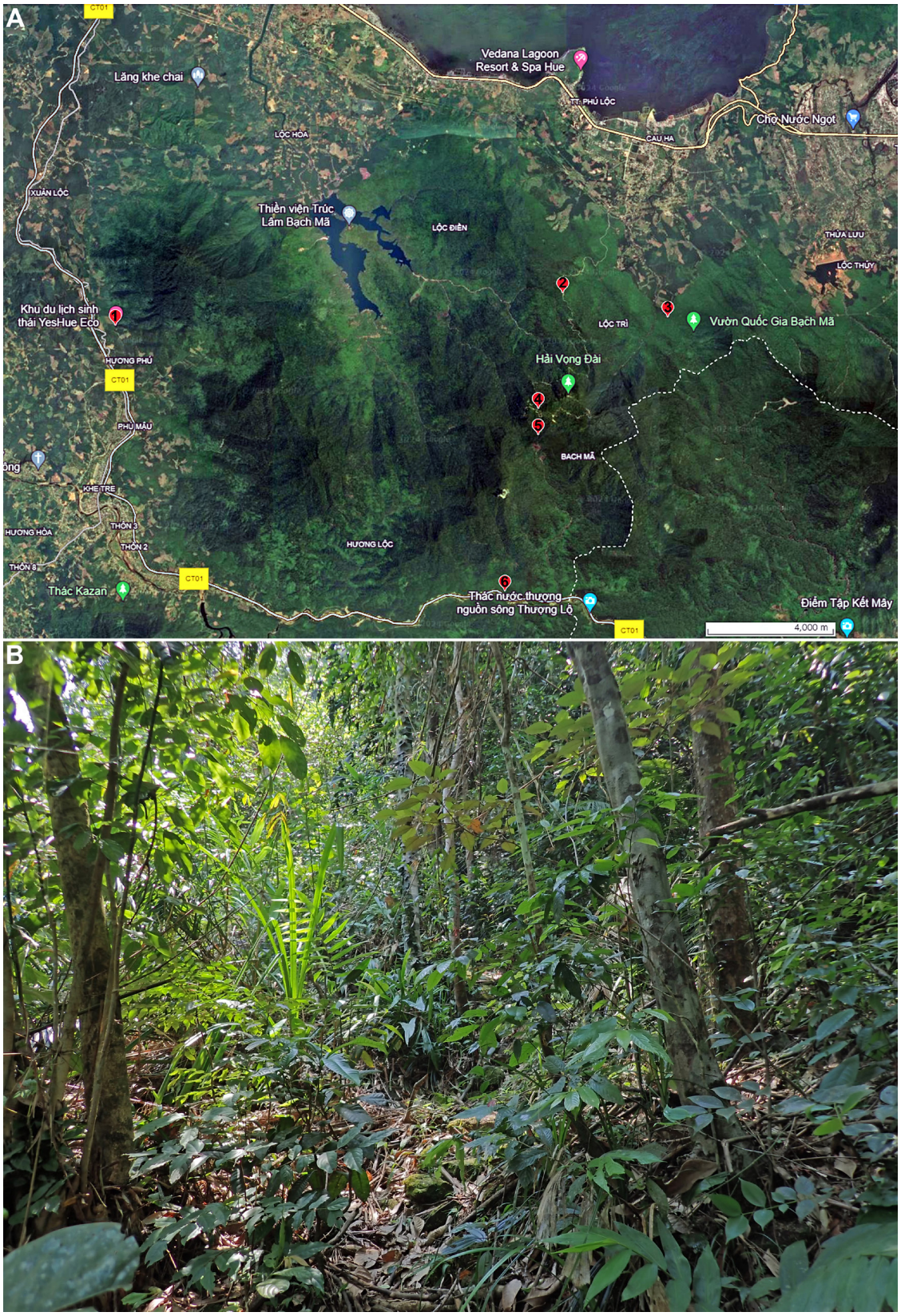

Fig. 2. Bach Ma National Park, habitats. **A**. Detailed map of the sampling areas (1 = 'Yes Hue Eco'; 2 = 'pheasant trail'; 3 = 'low altitude'; 4 = 'roadside'; 5 = 'summit'; 6 = 'near ranger station'. **B**. Typical habitat at 'Yes Hue Eco' sampling area, 17 May 2023.

Fig. 3. Bach Ma National Park, habitats. **A**. Typical habitat at 'pheasant trail' sampling area, 20 May 2023. **B**. Typical habitat at 'low altitude' sampling area, 15 May 2023.

Fig. 4. Bach Ma National Park, habitats. **A**. Typical habitat at 'roadside' sampling area, 21 May 2023. **B**. Typical habitat at 'summit' sampling area, 11 May 2023.

Fig. 5. Bach Ma National Park and Phong Dien District, habitats. **A**. Typical habitat at 'ranger station' sampling area, 18 May 2023. **B**. Typical habitat at Phong Dien sampling area, 23 May 2023.

Abbreviations

Measurements

The measurements were taken as in Constant (2004) and the following abbreviations are used (see p. 8):

BB = maximum breadth of the body
BF = maximum breadth of the frons
BTg = maximum breadth of the tegmen
BV = maximum breadth of the vertex
BW = maximum breadth of the hind wing
LF = length of the frons in median line
LT = total length (apex of head to apex of tegmina)
LTg = maximum length of the tegmen
LV = length of the vertex in median line
LW = maximum length of the hind wing

Male terminalia

ae = aedeagus
An = anal tube
bl = basal lobe of the periandrium
ca = capitulum of the gonostylus
co = connective of the aedeagus
dl = dorsal lobe of the periandrium
dsp = dorsal spinose process of the aedeagus
G = gonostylus
ldp = laterodorsal process of the periandrium
ll = lateral lobe of the periandrium
lp = lateral process of the periandrium
lvp = lateroventral process of the aedeagus
Py = pygofer
te = tectiductus of the aedeagus
vl = ventral lobe of the periandrium

Repositories

MHNG = Muséum d'Histoire Naturelle de Genève, Geneva, Switzerland
MNHN = Museum national d'Histoire naturelle, Paris, France
MZUF = Museo Zoologico dell'Università, Firenze, Italy
RBINS = Royal Belgian Institute of Natural Sciences, Brussels, Belgium
VNMN = Vietnam National Museum of Nature, Hanoi, Vietnam

Results

Class Insecta Linnaeus, 1758
Order Hemiptera Linnaeus, 1758
Suborder Auchenorrhyncha Duméril, 1806
Infraorder Fulgoromorpha Evans, 1946
Superfamily Fulgoroidea Latreille, 1807
Family Issidae Spinola, 1839
Subfamily Issinae Spinola, 1839
Tribe Hemisphaeriini Melichar, 1906

Subtribe **Hemisphaeriina** Melichar, 1906

Type genus

Hemisphaerius Schaum, 1850.

Diagnosis

The subtribe Hemisphaeriina was defined by Wang *et al*. (2016) based on a combination of characters of the hind wings: rudimentary hind wing with venation not evident or a drop-like hind wing, proximally thinner with costal and anal margins distinctly concave and a strongly reticulated venation; lacking anal lobe.

Checklist of the Hemisphaeriini of Vietnam (new species in bold)

Bolbosphaerius belokobylskiji Gnezdilov, 2013
Ceratogergithus pictus sp. nov.
Clypeosmilus centrodasus Gnezdilov & Soulier-Perkins, 2017
Euxaldar jehucal Fennah, 1978
E. lenis Gnezdilov, Bourgoin & Wang, 2017
Gergithoides devyveri sp. nov.
G. gnezdilovi Constant & Pham, 2017
G. nui Constant & Pham, 2017
G. olivaceus Constant & Pham, 2024
Hemisphaerius annamiticus sp. nov.
H. bresseeli Constant & Pham, 2024
H. cattienensis Constant & Pham, 2011
H. hippocrepis Constant & Pham, 2011
H. interclusus Noualhier, 1896
H. lygaeus Melichar, 1906
H. lysanias Fennah, 1978
H. palaemon Fennah, 1978
H. thaydoius sp. nov.
Ishiharanus iguchii (Matsumura, 1916)
I. dinhanus sp. nov.
I. pulchellus sp. nov.
Macrodaruma brevinaso Constant & Pham, 2014
M. pertinax Fennah, 1978
Maculergithus luteomaculatus (Constant & Pham, 2016)
M. tamdao (Constant & Pham, 2016)
Melichergithus gravidus (Melichar, 1906)
Mongoliana signifer (Walker, 1851)
M. vietnamica Constant & Pham, 2024
Neogergithoides baviana Constant & Pham, 2015
N. grootaerti Constant & Pham, 2015
N. scapularis Constant & Pham, 2024
Superciliaris anichkini Gnezdilov, 2022
Varisphaerius hoaiae sp. nov.

Ceratogergithus Gnezdilov, 2018

Ceratogergithus Gnezdilov, 2018: 1347. Type species: *Gergithus spinosus* Che, Zhang & Wang, 2007 by original designation.

Diagnosis

The distinctive characters of the genus were given by Gnezdilov (2018):

(1) the hind wings well developed (longer than half length of tegmen);
(2) the frons wide (wider than long in midline), without median carina;
(3) the clypeus without carina;
(4) the vertex wider than long in midline;
(5) the tegmina without "shoulder-like" projection or anterocostal lobe projecting under the eye;
(6) the posterior margin of the pygofer of males with a strong spine in upper portion on each side;
(7) the aedeagus symmetrical, with median long, narrow dorsal spinose process on base of periandrium;
(8) the anal tube of male wide, more or less round.

Note: Gnezdilov (2018) also gave a distinct neck of the capitulum of the male gonostylus as a diagnostic character of the genus. However, this character is not clear in *Ceratogergithus pseudotessellatus* (Che, Zhang & Wang, 2007) or in *C. pictus* sp. nov.; hence, it was removed from the diagnosis.

Species included

Ceratogergithus brachyspinus Yang & Chen, 2019
C. chelatus (Che, Zhang & Wang, 2007)
C. pictus sp. nov.
C. pseudotessellatus (Che, Zhang & Wang, 2007)
C. spinosus (Che, Zhang & Wang, 2007)

Remarks

The species of *Ceratogergithus* should be identified based on the comparison of male terminalia with reliable illustrations.

The placement of *Ceratogergithus brachyspinus* Yang & Chen, 2019 in this genus by Yang *et al*. (2019) is erroneous: despite the presence of a strong spine on the posterior margin of the pygofer, the species shows a narrower vertex, a distinctly narrower and not strongly convex frons, a bulged clypeus and a distinct claval suture on the tegmina. The generic placement of this species needs to be re-assessed and it might represent an undescribed genus.

Ceratogergithus pictus sp. nov.
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Figs 1–3, 4B, 5–8

Diagnosis

Ceratogergithus pictus sp. nov. can be recognized by:

(1) the robust shape of the laterodorsal spine of the hind margin of the pygofer, wide and moderately elongate (*Py* – Fig. 7A);
(2) the rather short gonostyli, about 1.4 times as long as high (without capitulum) in lateral view (*G* – Fig. 7A);
(3) the laterodorsal process of the periandrium very narrow and elongate, twisted and strongly S-shaped in lateral view (*ldp* – Fig. 7E–L);
(4) the lateroventral process of the aedeagus with posterior portion elongate, pointed apically, sinuate in lateral view, and curved dorsomesad, and with the anterior portion strongly elongate and narrow, moderately curved (following curvature of aedeagus), pointed apically and reaching base of aedeagus (*lvp* – Fig. 7E–L).

Differential diagnosis

The closest species is *Ceratogergithus pseudotessellatus* (Che, Zhang & Wang, 2007), described from Hainan Island (Che *et al*. 2007). However, the latter species can be differentiated by the characters of the male terminalia (see Che *et al*. 2007: figs 55–59), with a thinner and more elongate process of the posterior margin of the pygofer, more elongate gonostyli (1.7 times as long as high in lateral view) and the much shorter, less strongly sinuate, laterodorsal processes of the periandrium.

Etymology

The species epithet '*pictus*' is a Latin adjective meaning 'painted'. It refers to the beautiful colour pattern of the species.

Material examined

Holotype

VIETNAM • ♂ (dissected); Thừa Thiên-Huế Province, Bach Ma National Park, pheasant trail; [16°13′38″ N, 107°51′20″ E]; 6 Mar. 2023; by net; V.T. Trung leg.; VNMN.

Paratypes

VIETNAM • 1 ♀; same collection data as for holotype; 2022; VNMN • 2 ♀♀; Thừa Thiên-Huế Province, Bach Ma National Park, Xue Su; [16°14′10″ N, 107°52′44″ E]; 2022; near stream; V.T. Trung leg.; VNMN • 1 ♂, 11 ♀♀; Thừa Thiên-Huế Province, Bach Ma National Park, near ranger station; 16°08′37″ N, 107°49′36″ E; 300–600 m a.s.l.; 18 May 2023; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS • 4 ♀♀; same collection data as for preceding; VNMN • 2 ♀♀; Thừa Thiên-Huế Province, Bach Ma National Park, Yes Hue Eco; 16°13′05″ N, 107°43′27″ E; 200–300 m a.s.l.; 17 May 2023; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS • 2 ♀♀; Thừa Thiên-Huế Province, Bach Ma National Park, low altitude; 16°13′14″ N, 107°53′10″ E; 100–200 m a.s.l.; 17 May 2023; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS • 2 ♂♂, 5 ♀♀; Thừa Thiên-Huế Province, Bach Ma National Park, summit; 16°11′18″ N, 107°50′56″ E; 1300–1400 m a.s.l.; 11–21 May 2023; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS • 1 ♂, 12 ♀♀; Thừa Thiên-Huế Province, Bach Ma National Park, pheasant trail; 16°13′38″ N, 107°51′20″ E; 500–600 m a.s.l.; 10–20 May 2023; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS • 2 ♀♀; same collection data as for preceding; VNMN • 1 ♀; Thừa Thiên-Huế Province, Bach Ma National Park, pheasant trail; 16°12′ N, 107°52′ E; daytime collecting; 12–17 Jul. 2011; J. Constant and J. Bresseel leg.; I.G.: 31.933; RBINS • 6 ♀♀; Thừa Thiên-Huế Province, Bach Ma National Park, summit; 16°12′ N, 107°52′ E; 15–16 Jul. 2011; daytime collecting; J. Constant and J. Bresseel leg.; I.G.: 31.933; RBINS • 1 ♀; Thừa Thiên-Huế Province, Bach Ma National Park, pheasant trail; 16°12′ N, 107°52′ E; 10–16 Apr. 2017; J. Constant and J. Bresseel leg.; I.G.: 33.447; RBINS • 1 ♂; Thừa Thiên-Huế Province, Bach Ma National Park, pheasant trail; 16°13′38″ N, 107°51′20″ E; 350-600 m a.s.l.; 18 Oct. 2024; J. Constant, L. Semeraro and Hoai T.T. Nguyen leg.; I.G.: 34.893; RBINS • 1 ♂, 4 ♀♀; Thừa Thiên-Huế Province, Bach Ma National Park, ranger station, Nam Dong District; 16°08′37″ N, 107°49′36″ E; 150–500 m a.s.l.; 19 Oct. 2024; J. Constant, L. Semeraro and Hoai T.T. Nguyen leg.; I.G.: 34.893; RBINS • 6 ♀♀; same collection data as for preceding; VNMN • 1 ♂; Thừa Thiên-Huế Province, Bach Ma National Park, stairs going up to Hai Vong Dai; 16°11′53.77″ N, 107°51′26.92″ E; 1272 m a.s.l.; May 2023; by net; Hoai T.T. Nguyen leg.; AU 00499; VNMN.

Other material

VIETNAM • 1 ♀; Vietnam, Thừa Thiên-Huế Province, Phong Dien District; 16°30′27″ N, 107°16′05″ E; 350–400 m a.s.l.; 23 May 2023; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS.

Description

Measurements and ratios. LT: ♂ (n = 4): 5.4 mm (5.2–5.6), ♀ (n = 5): 5.9 mm (5.5–6.2); LT/BB = 1.36; LTg/BTg = 1.61; LW/BW = 2.16; BV/LV = 1.79; LF/BF = 0.78.

Head (Fig. 6A–E). Vertex distinctly wider than long in midline, brown in anterior portion and whitish yellow to bright yellow in posterior portion with lateral margins weakly carinate; anterior and posterior margins smooth, subparallel and curved; disc shallowly excavate. Side of head yellow with dark brown marking from eye to level of transverse fascia of frons. Frons smooth, convex, about 1.3 times as wide under antennae as long in midline, with lateral margins distinctly curved; upper ⅓ brown, lower ⅔ yellowish white to bright yellow with transverse, complete, curved, dark brown to black fascia in middle. Clypeus black-brown with apical yellowish spot and yellow on sides. Labium brown with last segment longer than broad, and shorter than penultimate one. Antennae yellowish with scape short, ring-shaped and pedicel bulbous.

Thorax (Figs 6A–E, 8B–E). Colour varies individually from pale to dark form. Pronotum very short, about 0.4 times length of mesonotum in midline, smooth with 2 impressed points on disc; anterior margin carinate; brown with paranotal lobes with broad black band along ventral margin. Mesonotum triangular, smooth; transverse carina along anterior margin; in pale form: brown with large, transverse marking on disc in anterior half, not reaching lateral angles; in dark forms: black with anterolateral angles brown. Tegulae brown.

Tegmina (Figs 6A–E, 8B–E). Strongly convex; about 1.15 times as long as wide when taken together in dorsal view; sides regularly rounded, apex rounded; smooth with weakly distinct reticulum of veins and veinlets; mains veins barely distinct basally; brown with bright yellow markings to black with whitish yellow markings or even entirely black. Bright yellow/whitish markings more or less developed, at maximum as follows: elongate basicostal marking, more or less elongate marking posterior to basal cell, transverse marking dorsally at midlength, at level of clavus, elongate, oblique marking at midlength, originating from "costal cell", narrow band along costal margin on posterior third, followed cephalad, along postclaval margin, by a regularly spaced series of up to five bands, each getting shorter and more oblique towards the anterior; in palest forms, blackish markings between bright yellow markings on distal portion of tegmina.

Hind wings (Fig. 6F). Brown, unilobed, with veins darker than cells; elongate, slightly shorter than tegmina. Venation reticulate with main longitudinal veins distinct basally (C, ScP+R, MP, CuA); numerous cross-veinlets. Anal area obsolete. Costal and cubital margins weakly sinuate, distal margin rounded.

Legs (Fig. 6A–D, G–H). Elongate and slender, with pro- and mesofemora slightly flattened and wider than corresponding tibiae. Pro- and mesocoxae black with base and apex yellow; all trochanters yellow; profemora black with 2 yellow rings; mesofemora yellow with irregular black markings; pro- and meso tibiae with external margin lined with dark brown to black; pro- and mesotarsi yellow with black claws; metafemora dark brown to black; metatibiae yellow with base infuscate and lateral and apical spines black; metatarsi yellow with basal segment black ventrally along posterior margin. Metatibiae with 2 lateral spines on apical half and 6 apical spines. Metatibiotarsal formula: (2) 6 / 8 / 2.

Abdomen (Fig. 6B). Sternites yellowish with basilateral brown marking on each side.

Male terminalia (Fig. 7). Pygofer (*Py* – Fig. 7A–D) higher than broad in lateral view, with posterior margin bisinuate, with a massive spinose process at laterodorsal angle; ventral margin rounded in lateral view; circular in caudal view. Gonostyli (*G* – Fig. 7A–B, D) rather short, about 1.4 times as long as high

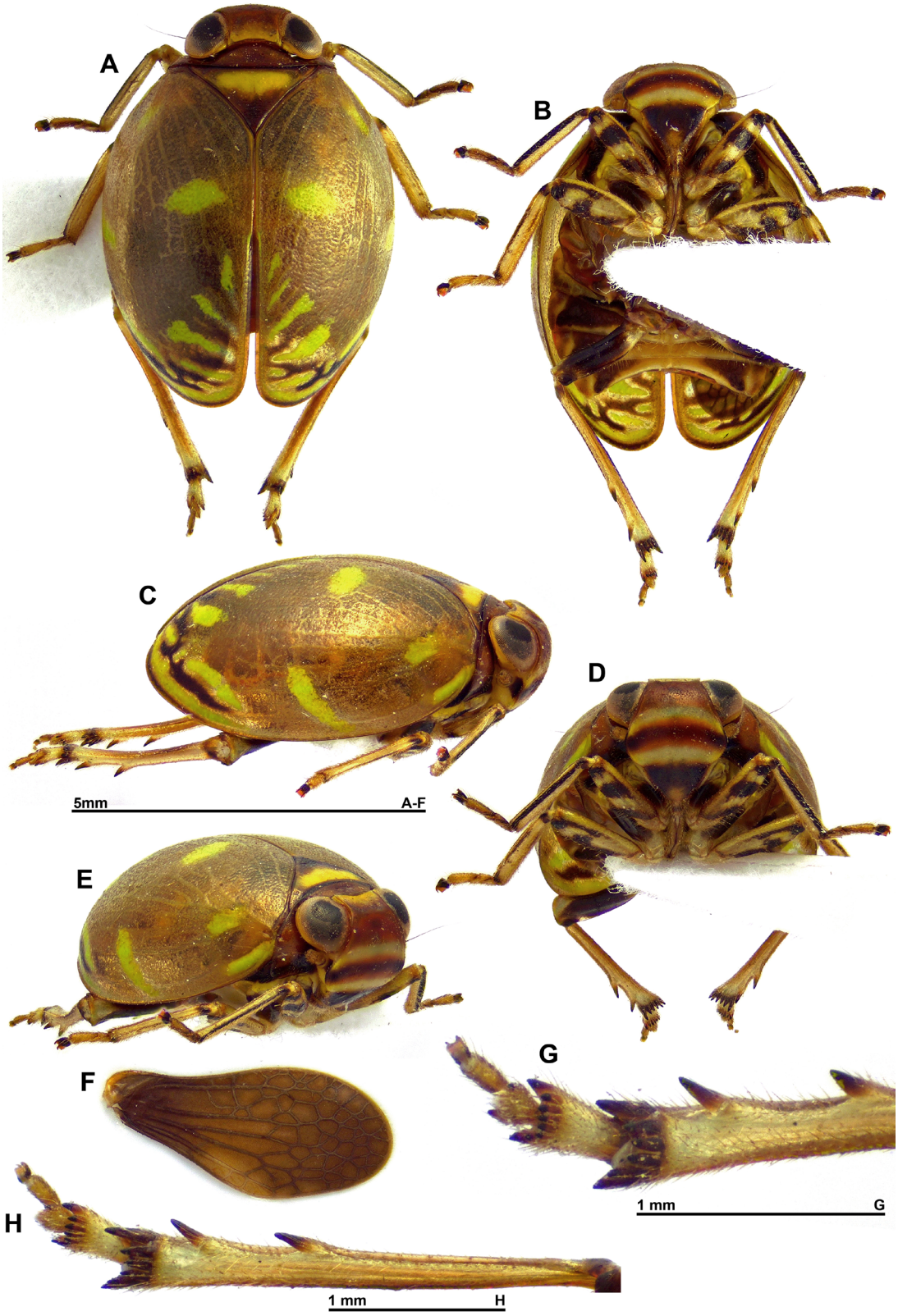

Fig. 6. *Ceratogergithus pictus* sp. nov., dissected paratype, ♂ (RBINS). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. Habitus, lateral view. **D**. Habitus, perpendicular view of frons. **E**. Habitus, anterolateral view. **F**. Right hind wing. **G**. Metatarsus and apex of metatibia, ventral view. **H**. Right hind leg, ventral view.

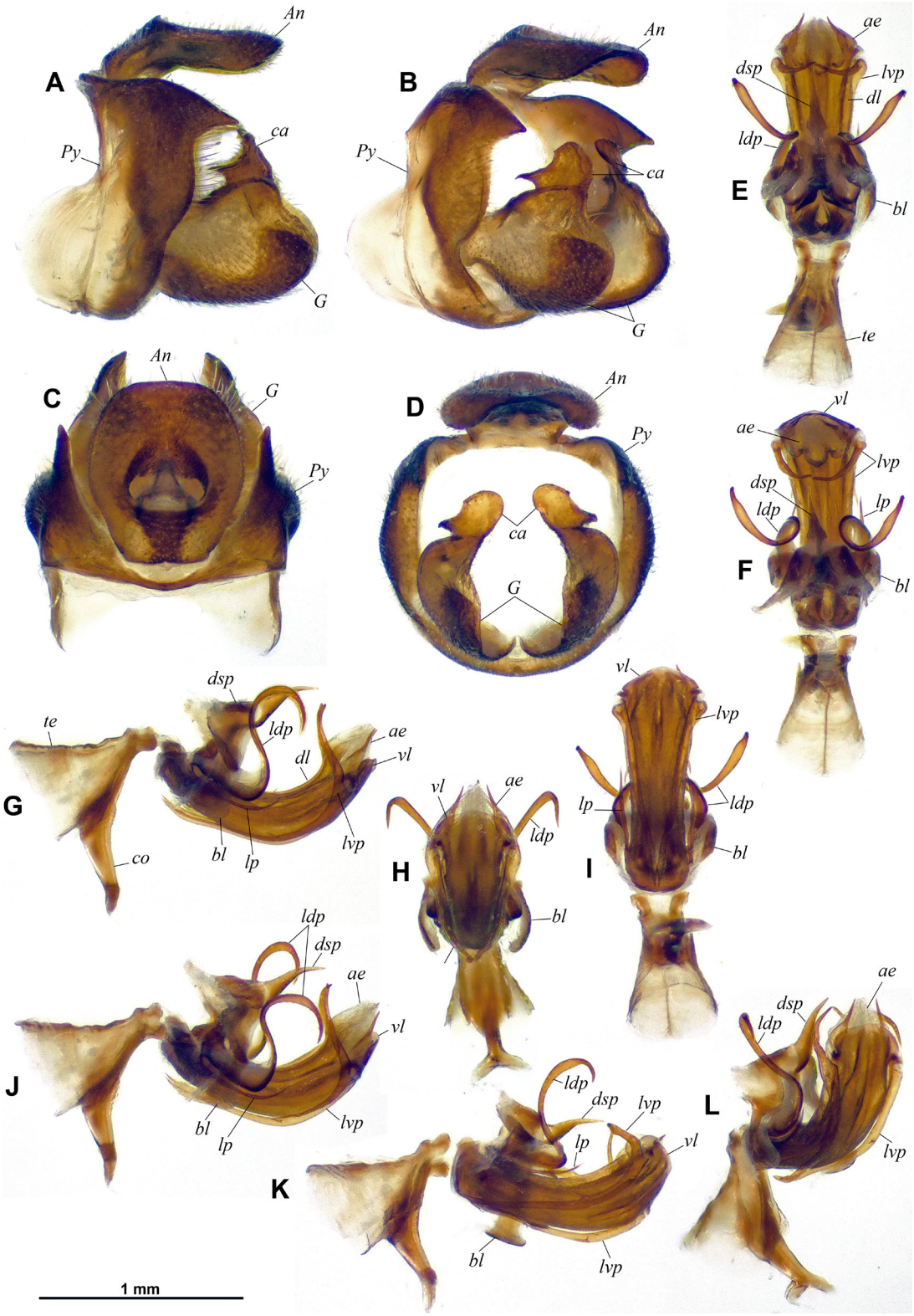

Fig. 7. *Ceratogergithus pictus* sp. nov., holotype, ♂ (VNMN), terminalia. **A–D**. Pygofer, anal tube and gonostyli. **A**. Left lateral view. **B**. Posterolateral view. **C**. Dorsal view. **D**. Caudal view. **E–L**. Aedeagus. **E**. Dorsal view. **F**. Anterodorsal view. **G**. Left lateral view. **H**. Posteroventral view. **I**. Ventral view. **J**. Left laterodorsal view. **K**. Left lateroventral view. **L**. Posterolateral view. Abbreviations: see Material and methods.

Fig. 8. *Ceratogergithus pictus* sp. nov., live specimens in Bach Ma National Park. **A–C**. Pheasant trail, 12 May 2023. **D**. Near ranger station, 18 May 2023. **E–F**. Summit trail, 20 May 2023. **G–H**. Trophobiosis with ant, *Camponotus* sp., near ranger station, 17 May 2023.

(without capitulum) in lateral view, ventral margin broadly rounded, apical margin rounded and dorsal margin sinuate; capitulum (*ca*) with short, wide neck, twisted, with mesoposterior margin rounded and anterolateral margin with strong tooth and margin concave above tooth. Anal tube (*An* – Fig. 7A–D) moderately long, about 1.15 times as long in midline as wide slightly before midlength in dorsal view; dorsoventrally flattened with lateral margins downcurved, suboval with apical margin broadly rounded in dorsal view; in lateral view, curved at basal ⅓ (level of anal opening). Aedeagus moderately curved posterodorsally, complex, with strong median, dorsal, spinose process (*dsp*) directed caudad (Fig. 7E–L). Periandrium with moderately developed, rounded basal lobe (*bl*) covering base of lateral process (*lp*) and of laterodorsal process (*ldp*); lateral process of periandrium (*lp*) very slender, pointed, not reaching half length of aedeagus; laterodorsal process of periandrium (*ldp*) very narrow and elongate, twisted and strongly S-shaped in lateral view, with distal portion slightly dilated before ending in acute point, generally directed posterodorsad with apex recurved ventrad; ventral lobe (*vl*) of periandrium slightly widening towards apex and with apical margin rounded; dorsal lobe of periandrium (*dl*) slightly shorter than aedeagus; aedeagus (*ae*) with 2 apical acute points directed posterodorsad; lateroventral process of aedeagus (*lvp*) with posterior portion elongate, pointed apically, sinuate in lateral view and curved dorsomesad, and with anterior portion strongly elongate and narrow, moderately curved (following curvature of aedeagus), pointed apically and reaching base of aedeagus, and with minute lateral spine at about midlength of process. Connective (*co*) slightly curved, with strongly developed tectiductus (*te*), subtriangular in lateral view.

Biology

Ceratogergithus pictus sp. nov. was collected between March and May and in July and October in montane evergreen tropical forest as well as in lowland evergreen forest in Bach Ma, at altitudes between about 200 m and 1400 m a.s.l. In Bach Ma National Park, it was found at the following collecting site/habitats (Fig. 2A): "Yes Hue Eco" (Fig. 2A(1), B), "pheasant trail" (Figs 2A(2), 3A), "low altitude" (Figs 2A(3), 3B), "summit" (Figs 2A(5), 4B) and "ranger station" (Figs 2A(6), 5A), and in Phong Dien District (Fig. 5B). The species lives on the low vegetation and the specimens were usually found sitting on the main veins of leaves or on small twigs (Fig. 8A–F). A single specimen was observed at night, at the "ranger station" site in Bach Ma National Park, in a trophobiotic interaction with ants collecting the honeydew produced by the planthopper. The ants belong to an unidentified species of the genus *Camponotus* Mayr, 1861 (Hymenoptera: Formicidae: Formicinae) (Fig. 8G–H); the behaviour of the ants included antennal, palpal and proleg contact/palpation which are regarded as a way to stimulate honeydew production by the planthopper (Bourgoin *et al*. 2023).

Distribution

Vietnam: Thừa Thiên-Huế Province, Bach Ma National Park and Phong Dien District (Fig. 1).

Genus ***Gergithoides*** Schumacher, 1915

Gergithoides Schumacher, 1915: 126. Type species: *Gergithoides carinatifrons* Schumacher, 1915 by monotypy.

Daruma Matsumura, 1916: 103 (preoccupied). Type species: *Daruma nitobei* Matsumura, 1916, by original designation. Synonymized by Ishihara (1965: 208) under the erroneous spelling "*Darma*".

Darumara Metcalf, 1952: 227. New name for *Daruma* Matsumura, 1916. Synonymized by Gnezdilov (2009: 85) [previously synonymized by Ishihara (1965)].

Darma Ishihara, 1965: 208. Misspelling of *Daruma*.

Diagnosis

The definition of the genus extrapolated from the key to the genera of Hemisphaeriini provided by Sun *et al.* (2012) features the following distinctive set of characters:

(1) the hind wing longer than half length of tegmen;
(2) the frons with a complete median carina;
(3) the lateral margins of the frons not elevated;
(4) a row of tubercles along the lateral margins of the frons.

At species level, the shape of the bi- or trispinose lateral processes of the periandrium provides very stable and reliable characters.

The Vietnamese species of *Gergithoides* were treated in Constant & Pham (2017), and a species from North Vietnam was later added by the same authors (Constant & Pham 2024a).

Species included

Gergithoides carinatifrons Schumacher, 1915
G. caudospinosus Chen, Zhang & Chang, 2014
G. devyveri sp. nov.
G. gibbosus Chou & Wang, 2003
G. gnezdilovi Constant & Pham, 2017
G. jejudoensis Rahman, Kwon & Suh, 2012
G. nui Constant & Pham, 2017
G. olivaceus Constant & Pham, 2024
G. rugulosus (Melichar, 1906)
G. undulatus Wang & Che, 2003

Remarks

The species of *Gergithoides* should be identified based on a comparison of the male terminalia with reliable illustrations. We explained in detail all pending issues in the identity of some species of *Gergithoides*, especially in the fauna of China (Constant & Pham 2017), but those were not addressed in Zhang *et al*. (2020).

Gergithoides devyveri sp. nov.
urn:lsid:zoobank.org:act:E9D5D161-26D3-4AAF-BFF6-94DFBDFA6073
Figs 1, 2A, 4, 9–11

Diagnosis

Gergithoides devyveri sp. nov. can be recognized by:

(1) the yellow basal patch of tegmina ("shoulder"), contrasting with the olivaceous brown general colour of the insect (Figs 9A, 11);
(2) the lateroventral trispinose processes of aedeagus (*lvp*), asymmetrical: left process with anterodorsal spine strongly elongate, strongly curved mesodorsad on dorsal lobe, anteroventral spine much shorter, parallel to anterodorsal spine, posterior spine abruptly recurved ventrocephalad with point directed cephalad (Fig. 10H–K); right process with anterodorsal spine strongly elongate, regularly curved dorsoposteriorly, anteroventral spine much shorter, parallel to anterodorsal spine, posterior spine abruptly curved ventrad more or less at right angle (Fig. 10I);
(3) posterior margin of pygofer strongly rounded around ventral ⅓ in lateral view (*Py* – Fig. 10A);

(4) anal tube slightly longer than wide in midline in dorsal view, dorsoventrally flattened with sides bisinuate, diverging to midlength and with apical margin bisinuate in dorsal view, with apicolateral angles rounded (*An* – Fig. 10D).

Differential diagnosis

The closest species, sharing the character of a trispinose lateroventral process of the aedeagus with anterodorsal spine very elongate, is *G. gnezdilovi* Constant & Pham, 2017 described from Bidoup-Nui Ba National Park in Central Vietnam (Constant & Pham 2017). However, *G. devyveri* can be differentiated by a wider vertex, 2.2 times as wide as long in midline, while it is only 1.65 times as wide as long in *G. gnezdilovi* (Constant & Pham 2017: fig 1a), the absence of a transverse, wide, dark band on tegmina, well visible in *G. gnezdilovi* (Constant & Pham 2017: fig 1a, c), the left trispinose process of aedeagus (*lvp*) with anterodorsal spine strongly elongate, strongly curved mesodorsad on the dorsal lobe, while it is directed dorsad in *G. gnezdilovi* (Constant & Pham 2017: fig. 2d), and the right trispinose posterior spine moderately long and curved ventrad more or less at a right angle, while the corresponding spine is strongly, acutely recurved cephalad in *G. gnezdilovi* (Constant & Pham 2017: fig. 2f).

Etymology

The species epithet is a patronym dedicated to Dr Bernard Devyver, surgeon in Namur (Belgium) in acknowledgement for operating JC in 2015 after a severe indoor rock climbing accident, hence allowing the continuation of the fieldwork in SE Asia and Australia.

Material examined

Holotype

VIETNAM • ♂ (dissected); Thừa Thiên-Huế Province, Bach Ma National Park; Rhododendron trail; 19 Mar. 2023; 1158 m a.s.l.; V.T. Trung leg.; VNMN.

Paratypes

VIETNAM • 1 ♀; Thừa Thiên-Huế Province, Bach Ma National Park, surroundings of Hotel Morin; 16.2° N, 107.85° E; 1350–1400 m a.s.l.; 23–28 May 2014; L. Bartolozzi, G. Chelazzi, A. Bandinelli, S. Bambi and F. Fabiano leg.; n° Magazz. 2978; MZUF • 2 ♂♂, 1 ♀; Thừa Thiên-Huế Province, Bach Ma National Park; 16°11′44″ N, 107°50′44″ E; 1200–1300 m a.s.l.; 22 May 2023; roadside; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS • 1 ♂, 3 ♀♀; Thừa Thiên-Huế Province, Bach Ma National Park, summit; 16°11′18″ N, 107°50′56″ E; 1300–1400 m a.s.l.; 11–21 May 2023; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS • 1 ♂, 3 ♀♀; same collection data as for preceding; VNMN • 2 ♂♂, 1 ♀; Thừa Thiên-Huế Province, Bach Ma National Park, stairs going up to Hai Vong Dai; 16°11′53.77″ N, 107°51′26.92″ E; 1272 m a.s.l.; 16 Sep. 2024; by net; Hoai T.T. Nguyen leg.; AU 00499; VNMN.

Description

Measurements and ratios. LT: ♂ (n = 5): 5.9 mm (5.4–6.3), ♀ (n = 5): 6.5 mm (6.3–6.6); LT/BB = 1.47; LTg/BTg = 1.70; LW/BW = 2.06; BV/LV = 2.23; LF/BF = 1.22.

Head (Fig. 9A–E). Vertex longer in midline than broad, yellow brown with margins carinate; anterior margin convex, posterior one concave, angular in middle, and lateral converging anteriorly; disc excavate with obsolete median line. Side of head yellowish. Frons elongate and rugulose, dark reddish brown; median carina yellowish, narrowly margined with a black line, extending from dorsal margin, fading down to frontoclypeal suture; row of yellowish tubercles on black background along dorsal and lateral margins extending to level of base of eyes; lateral margins yellowish under eyes, the yellowish line often marginated by inner thin black line. Clypeus dark brown with basilateral yellowish spot and black on sides and apex, slightly elevated medially. Labium blackish brown with last segment longer

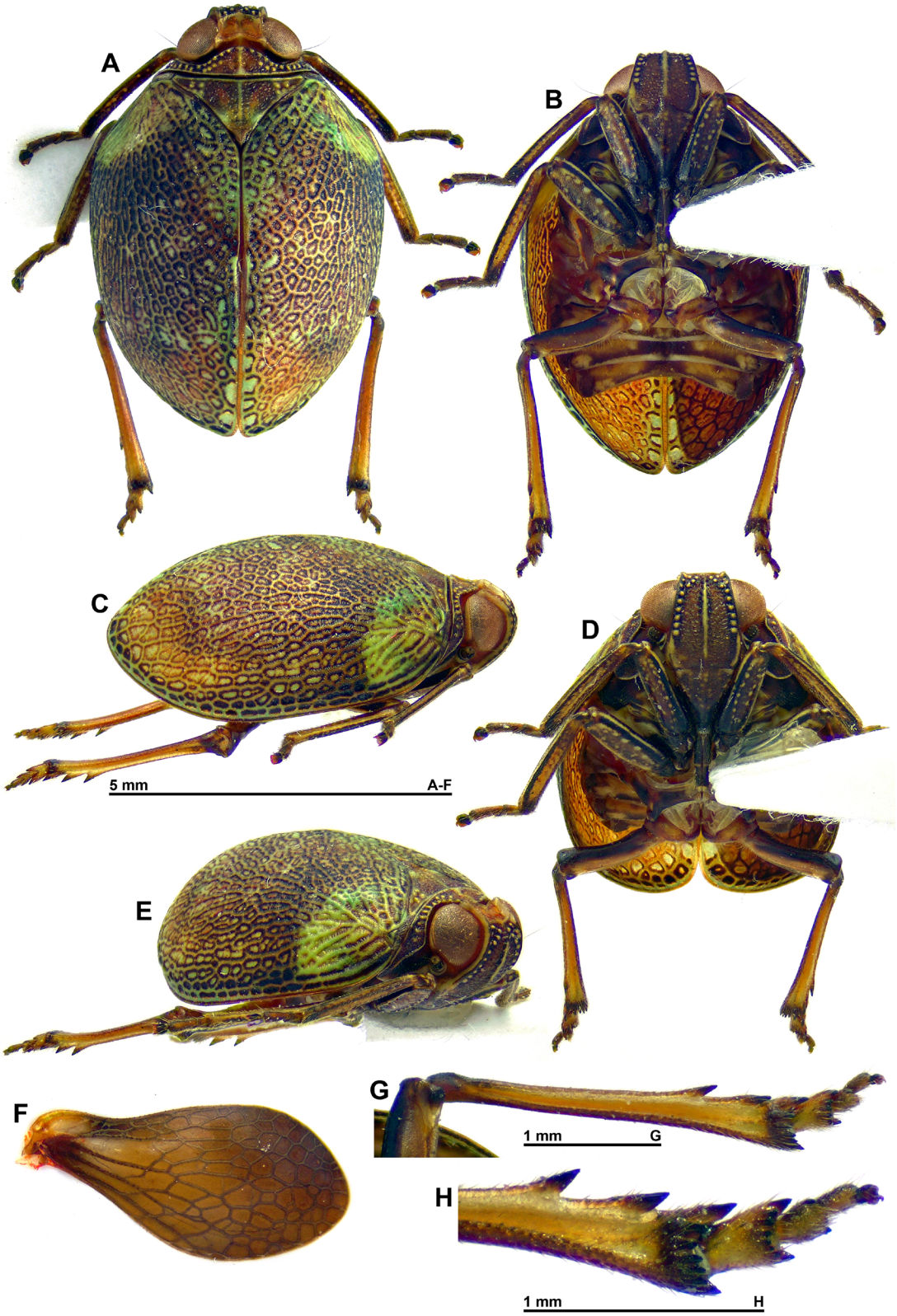

Fig. 9. *Gergithoides devyveri* sp. nov., dissected paratype, ♂ (RBINS). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. Habitus, lateral view. **D**. Habitus, perpendicular view of frons. **E**. Habitus, anterolateral view. **F**. Right hind wing. **G**. Right hind leg, ventral view. **H**. Metatarsus and apex of metatibia, ventral view.

than broad and shorter than penultimate one. Antennae blackish brown with scape short, ring-shaped and pedicel bulbous.

Thorax (Fig. 9A–E). Variegated olivaceous brown and blackish. Pronotum very short, about half length of mesonotum in midline, with median carina; anterior and posterior margins carinate; disc rugulose, concave with an impressed point on each side of median carina; row of yellowish tubercles along anterior margin extending on paranotal fields to level of base of eyes; another oblique row of 3–4 yellowish tubercles on each side of disc, parallel to anterior margin. Mesonotum short, slightly coriaceous with yellowish median carina; transverse carina along anterior margin yellowish; 2–4 yellowish blunt tubercles grouped at each external angle; yellowish suffused marking on each side of scutellum; apex of scutellum elevated and brown. Tegulae olivaceous brown.

Tegmina (Fig. 9A–C, E). Strongly convex; about 1.2 times as long as broad when taken together in dorsal view; slightly concave at basicostal angle; subcoriaceous with dense reticulum of slightly raised veins and veinlets; main veins barely distinct basally; large yellowish mark at base, remaining portion yellowish brown with brown to black irregular markings, especially along inner margin of cells, making the insect look olivaceous from a distance.

Hind wings (Fig. 9F). Brown, unilobed, with veins slightly darker than cells; elongate, slightly shorter than tegmina. Venation reticulate with main longitudinal veins distinct basally (C, ScP+R, MP, CuA); numerous cross-veinlets. Anal area obsolete. Costal and cubital margins sinuate, distal margin rounded.

Legs (Fig. 9A–D). Elongate and slender, pro- and mesofemora slightly flattened, wider and slightly shorter than corresponding tibiae; brown with trochanters, base of femora and line along externoventral margin of femora black; black-brown line on ventral carinae of tibiae; base and apex of tibiae, claws and apex of metatibial spines black-brown; pro- and mesofemora with pale yellow tubercles. Metatibiae with 2 lateral spines on apical ⅓ and 7 apical spines. Metatibiotarsal formula: (2) 6 / 8–9 / 2.

Abdomen (Fig. 9B). Sternites yellow brown with middle, posterior and lateral areas darker, often with irregular paler markings on sides.

Male terminalia (Fig. 10). Pygofer (*Py* – Fig. 10 A–D) 2.4 times as high as broad in lateral view, with posterior margin strongly rounded around ventral ⅓; nearly circular in caudal view; ventral margin rounded in lateral view. Gonostyli (*G* – Fig. 10A–C) rather short in lateral view, with ventral margin broadly rounded, posterior margin more narrowly, dorsal margin strongly oblique basally to neck of capitulum, more posteriorly forming a straight angle with neck of capitulum; capitulum (*ca*) with elongate neck, narrow and directed dorsad in lateral view, curved mesad in posterior view; apical portion anteroposteriorly laminate, elongate in caudal view, bearing one dorsal tooth, one tooth at inner angle and one tooth pointing anteroventrally at anterobasal angle, followed posterad by a lateral lamina curved ventrad looking like an additional tooth in caudal view. Anal tube (*An* – Fig. 10A–D) about 1.1 times as long as wide in midline in dorsal view, dorsoventrally flattened with sides bisinuate, diverging to midlength, apical margin bisinuate in dorsal view, with lateral angles rounded and slightly surpassing median lobe; in lateral view, anal tube curved ventrally; apicolateral angles roundly projecting lateroventrally. Aedeagus strongly curved posterodorsally, rather simple (Fig. 10E–L). Lateroventral processes of aedeagus (*lvp*) at basal half showing 3 spines and asymmetrical; left process with anterodorsal spine strongly elongate, strongly curved mesodorsad on dorsal lobe, anteroventral spine much shorter, curved cephalodorsad, parallel to anterodorsal spine, posterior spine moderately long and abruptly recurved ventrocephalad with point directed cephalad (Fig. 10 H–K); right process with anterodorsal spine strongly elongate, regularly curved dorsoposteriorly, anteroventral spine much shorter, curved cephalodorsad, parallel to anterodorsal spine, posterior spine moderately long and abruptly, moderately curved ventrad more or less at a right angle (Fig. 10I); periandrium with lateral lobe (*ll*) foliaceous and reflexed cephalad on each

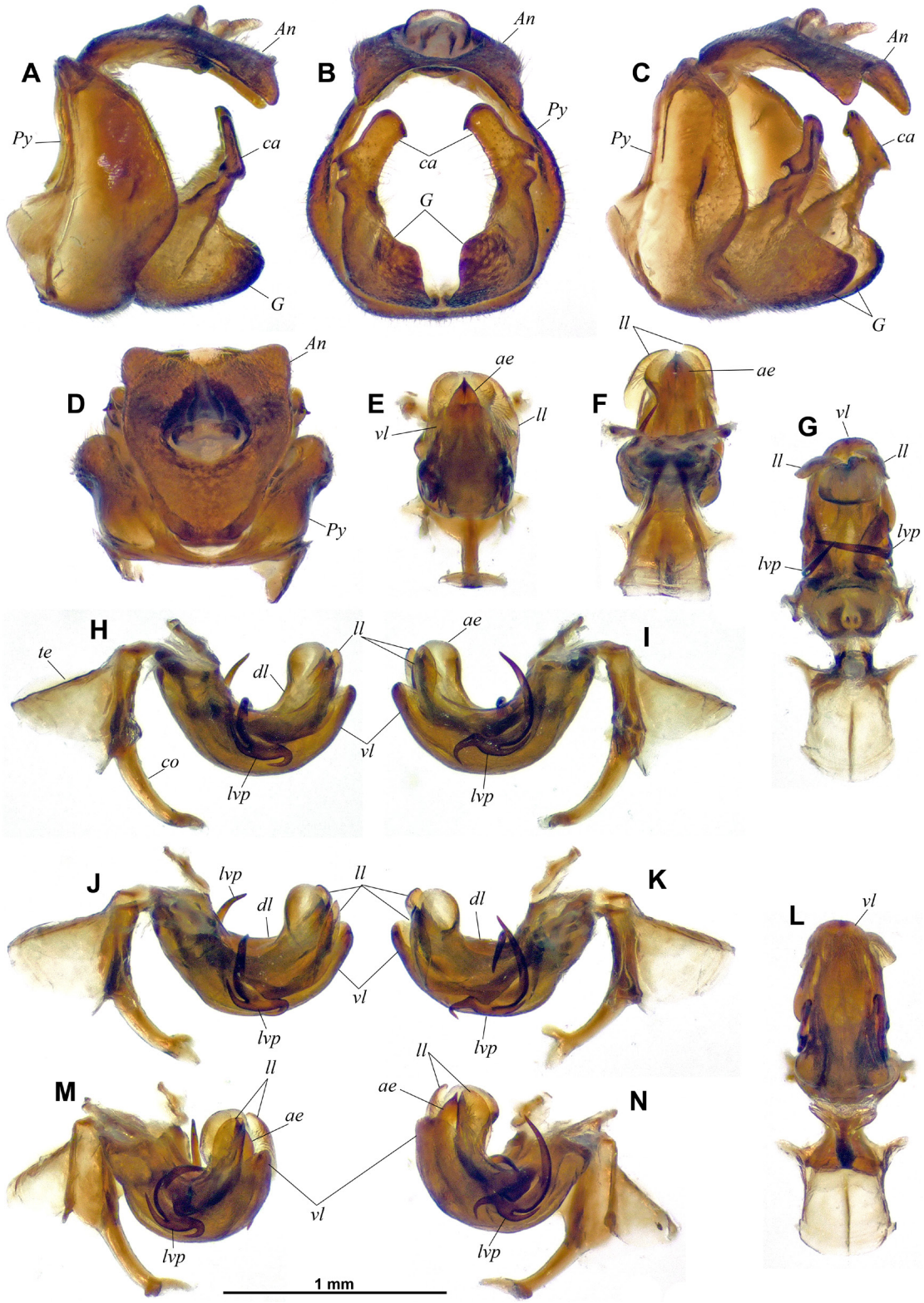

Fig. 10. *Gergithoides devyveri* sp. nov., holotype, ♂ (VNMN), terminalia. **A–D**. Pygofer, anal tube and gonostyli. **A**. Left lateral view. **B**. Caudal view. **C**. Posterolateral view. **D**. Dorsal view. **E–N**. Aedeagus. **E**. Posteroventral view. **F**. Anterodorsal view. **G**. Dorsal view. **H**. Left lateral view. **I**. Right lateral view. **J**. Left laterodorsal view. **K**. Right laterodorsal view. **L**. Ventral view. **M**. Left posterolateral view. **N**. Right posterolateral view. Abbreviations: see Material and methods.

Fig. 11. *Gergithoides devyveri* sp. nov., Bach Ma National Park. **A–D**. Summit trail, specimens, 11–13 May 2023. **E–H**. Rhododendron trail, 14 May 2023. **E–G**. Specimens. **H**. Microhabitat.

side in distal portion, with right one slightly more developed and projecting slightly further laterally than left one; aedeagus (*ae*) largely membranous and with 2 median processes side by side pointed apically; ventral lobe of periandrium (*vl*) broad with apical margin rounded.

Biology

Gergithoides devyveri sp. nov. was collected in March, May and September on lower vegetation and bushes (Fig. 11), in moist evergreen tropical mountain forest, only at higher altitudes between about 1100 and 1400 m a.s.l. in Bach Ma National Park, at the "summit" area (Figs 2A(5), 4B) as well as at "roadside" (Figs 2A(4), 4A) collecting sites.

Distribution

Vietnam: Thừa Thiên-Huế Province, Bach Ma National Park (Fig. 1).

Genus ***Hemisphaerius*** Schaum, 1850

Hemisphaerius Schaum, 1850: 71. Type species: *Hemisphaerius coccinelloides* (Burmeister, 1834).

The characters defining the genus were given by Gnezdilov (2018):

(1) frons flat, smooth, widened above clypeus, with lateral margins slightly projecting on sides;
(2) frons and postclypeus without carinae;
(3) vertex wider than long;
(4) pro- and mesonotum without carinae;
(5) costal margin of tegmina not strongly projecting anteriorly under eye;
(6) hind wings rudimentary;
(7) metatibiae with 2 lateral spines;
(8) periandrium asymmetrical;
(9) aedeagus without ventral hooks;
(10) posterior margin of pygofer rounded in lateral view;
(11) gonostyli with short and wide capitulum;
(12) anal tube wide in dorsal view.

Distribution

China, Japan, Taiwan, Vietnam, Cambodia, Myanmar, Thailand, India, Sri Lanka, Malaysia, Singapore, Philippines, Indonesia, New Guinea, Solomon Islands (Bourgoin 2025).

Hemisphaerius annamiticus sp. nov.

urn:lsid:zoobank.org:act:B3E132F9-F659-48B3-AE0A-1C643BCBD013

Figs 2–4, 5A, 12–17

Diagnosis

Hemisphaerius annamiticus sp. nov. varies in body colour, with tegmina varying from pale greenish testaceous or pinkish orange and postclaval margin narrowly reddish, to black with a reddish brown band along postclaval margin, often more or less dark reddish brown with black dot at ⅔ of length, testaceous band along basal half of postclaval margin and often a more or less developed testaceous marking on distal portion, all often with a black dot in middle at ⅔ of length (Figs 12–14, 16). However, the species can be recognized by:

(1) the shape of the pygofer in lateral view, with posterior margin forming an oblique slope in dorsal ⅓ ending in a strong rounded lobe at about midheight, then sinuate in ventral ⅓ in lateral view (Fig. 15A);
(2) the shape of the anal tube, subtriangular with apical margin concave in dorsal view, and with posterolateral angles projecting lateroventrad at obtuse angle in lateral view (*An* – Fig. 15A–D);
(3) the lateral aspect of the aedeagus, strongly posterodorsally curved at an obtuse angle (Fig. 15H–I);
(4) the asymmetrical lateral lobes of the periandrium longitudinally twisted, laminate with outer margin sinuate and with numerous small teeth (*ll* – Fig. 15G, M, R);
(5) the ventral lobe of the periandrium apically lanceolate (*vl* – Fig. 15M, R).

Differential diagnosis

The closest species is *H. bresseeli* Constant & Pham, 2024 from North Vietnam and southern China (including Hainan Island), which shares the asymmetrical aedeagus with teeth along the external margin of the lateral lobes of the periandrium (Constant & Pham 2024a). However, *H. annamiticus* sp. nov. differs by having the upper ⅓ portion of the posterior margin of the pygofer in lateral view forming an oblique slope (Fig. 15A), while it is rounded in *H. bresseeli* (Constant & Pham 2024a: fig. 8a), by the anal tube having the posterior margin concave in dorsal view (Fig. 15D) and with the posterolateral angles projecting posteroventrad at an obuse angle in lateral view (Fig. 15A), while in *H. bresseeli* the posterior margin is straight to slightly convex in dorsal view (Constant & Pham 2024a: fig. 8d) and the posterolateral angles are curved ventrad at a right angle in lateral view (Constant & Pham 2024a: fig. 8a), by the shape of the aedeagus being curved, reflexed dorsad at an obtuse angle at midlength in lateral view (Fig. 15H–I), while it is curved at a right angle in *H. bresseeli* (Constant & Pham 2024a: fig. 8e–f), and by having the longitudinally twisted lateral lobes of the periandrium with outer margin sinuate in distal portion (Fig. 15G, M, R), while in *H. bresseeli* they are not distinctly twisted and the outer margin is rounded in the distal portion (Constant & Pham 2024a: fig. 8e–g, k).

Additionally, in *H. bresseeli* colour sexual dimorphism seems to occur, with the males being red (Constant & Pham 2024a: figs 5, 7a–c) and the females green (Constant & Pham 2024a: figs 6, 7e–g), while in *H. annamiticus* the colour variation seems to be similar in both sexes, the species is generally darker, and no green specimen has been observed so far (Fig. 16).

Etymology

The species epithet refers to the Annamite Mountains, where the new species was collected at several locations.

Material examined

Holotype

VIETNAM • ♂ (dissected); Central Vietnam, [Thua Thien-Hue Province], Bach Ma National Park; 16°12′ N, 107°52′ E; day collection; 12–17 Jul. 2011; J. Constant and J. Bresseel leg.; I.G.: 31.933; VNMN.

Paratypes

VIETNAM • 4 ♂♂, 4 ♀♀; same collection data as for holotype; RBINS • 1 ♂; [Thua Thien-Hue Province], Bach Ma National Park, summit; 16°12′ N, 107°52′ E; 15–16 Jul. 2011; [1400 m a.s.l.]; daytime collection; J. Constant and J. Bresseel leg.; I.G.: 31.933; RBINS • 1 ♂; [Thua Thien-Hue Province], Bach Ma National Park; 600 m a.s.l.; 8 May 2003; V.T. Hoang leg.; VNMN • 1 ♀; Thừa Thiên-Huế Province, Bach Ma National Park, pheasant trail; 16°12′ N, 107°52′ E; 10–16 Apr. 2017; [500–600 m a.s.l.]; J. Constant and J. Bresseel leg.; I.G.: 33.447; RBINS • 4 ♂♂, 10 ♀♀; Thừa Thiên-Huế Province, Bach Ma National Park, pheasant trail; 16°13′38″ N, 107°51′20″ E; 500–600 m a.s.l.;

10–20 May 2023; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS • 1 ♂, 2 ♀♀; same collection data as for preceding; VNMN • 1 ♂, 2 ♀♀; Thừa Thiên-Huế Province, Bach Ma National Park; 16°11′44″ N, 107°50′44″ E; 1200–1300 m a.s.l.; 22 May 2023; roadside; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS • 2 ♂♂, 5 ♀♀; Thừa Thiên-Huế Province, Bach Ma National Park, summit; 16°11′18″ N, 107°50′56″ E; 1300–1400 m a.s.l.; 11–21 May 2023; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS • 1 ♂, 2 ♀♀; same collection data as for preceding; VNMN • 3 ♂♂, 11 ♀♀; Thừa Thiên-Huế Province, Bach Ma National Park, low altitude; 16°13′14″ N, 107°53′10″ E; 100–200 m a.s.l.; 17 May 2023; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS • 2 ♀♀; Thừa Thiên-Huế Province, Bach Ma National Park, near ranger station; 16°08′37″ N, 107°49′36″ E; 300–600 m a.s.l.; 18 May 2023; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS • 2 ♀♀; Thừa Thiên-Huế Province, Bach Ma National Park, Yes Hue Eco; 16°13′05″ N, 107°43′27″ E; 200–300 m a.s.l.; 17 May 2023; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS • 1 ♂; Thừa Thiên-Huế Province, Bach Ma National Park, pheasant trail; [16°13′38″ N, 107°51′20″ E]; 6 Mar. 2023; by net; V.T. Trung leg.; VNMN • 2 ♀♀; Thừa Thiên-Huế Province, Bach Ma National Park, Yes Hue Eco; 16°13′05″ N, 107°43′27″ E; 152 m a.s.l.; 1 Jun. 2023; N.T.T. Hoai leg.; VNMN • 1 ♂, 1 ♀; Thừa Thiên-Huế Province, Bach Ma National Park; 16.193° N, 107.853° E; 1250 m a.s.l.; 28 May–1 Jun. 2017; L. Bartolozzi, E. Orbach, V. Sbordoni, S. Bambi and A. Bandinelli leg.; numero Mag. 3089; MZUF • 1 ♀; same collection data as preceding; at light; MZUF • 1 ♀; Thừa Thiên-Huế Province, A Luoi, A Roang; [16°07′04″ N, 107°24′19″ E]; 700 m a.s.l.; 20 Jul. 2004; H.T. Pham leg.; Ho.0134; VNMN • 1 ♂; Thừa Thiên-Huế Province, A Luoi, A Roang; 700 m a.s.l.; 21 Jul. 2004; H.T. Pham leg.; Ho.0137; VNMN • 1 ♀; Thừa Thiên-Huế Province, A Luoi, A Roang; 700 m a.s.l.; 22 Jul. 2004; H.T. Pham leg.; Ho.0138; VNMN • 1 ♀; Thừa Thiên-Huế Province, A Luoi, A Roang; 700 m a.s.l.; 25 Jul. 2004; H.T. Pham leg.; Ho.0143; VNMN • 1 ♂, 1 ♀; Thừa Thiên-Huế Province, Bach Ma National Park, pheasant trail; 16°13’38″ N, 107°51’20″ E; 350–600 m a.s.l.; 18 Oct. 2024; J. Constant, L. Semeraro, Hoai T.T. Nguyen leg.; I.G.: 34.893; RBINS • 1 ♂; Thừa Thiên-Huế Province, Bach Ma National Park, road to Bach Ma Peak; 16°11′45.73″ N, 107°51′46.34″ E; 1325 m a.s.l.; 14 Sep. 2024; [by] net; Hoai T.T. Nguyen leg.; VNMN • 1 ♂, 1 ♀; Da Nang Province, Ba Na-Nui Chua Nature Reserve; 16°00′ N, 108°01′ E; 16–19 Jul. 2017; GTI Project; J. Constant and J. Bresseel leg.; I.G.: 33.498; RBINS • 1 ♂; Kon Tum Province, Kon Plong, Mang Kanh; 14°39′43″ N, 108°15′45″ E; 16–20 Aug. 2019; GTI Project; J. Constant and J. Bresseel leg.; I.G.: 34.048; RBINS • 1 ♂; Quang Tri Province, Da Krong Nature Reserve; 16°37′ N, 106°47′ E; 5–10 Jul. 2011; J. Constant and J. Bresseel leg.; I.G.: 31.933; RBINS • 1 ♂; Quang Tri Province; Huong Hoa, Huong Phung, Deo Sa Mu; [16°48′00″ N, 106°35′10″ E]; 900–1000 m a.s.l.; 4 Jun. 2006; H.T. Pham leg.; VNMN • 1 ♂; Ha Tinh Province, Vu Quang National Park, near Khe Chè station; 18°22′38″ N, 105°18′41″ E; 13–15 Jul. 2023; V.T. Trung and N.T.T. Hoai leg.; VNMN • 1 ♂; same data as for preceding; J. Constant, J. Bresseel and L. Semeraro leg.; I.G.: 34.661; RBINS.

Description

Note: The bright colour of the live specimens (Fig. 16) tends to fade in collection specimens with the turquoise colour of the markings on the thorax and head turning to yellow and the rest of the body tending to become more yellowish as well (Figs 12–14).

Measurements and ratios. LT: ♂ (n = 5): 4.3 mm (4.1–4.5), ♀ (n = 5): 4.7 mm (4.5–4.9); LT/BB = 1.39; LTg/BTg = 1.39; LW/BW = 2.57; BV/LV = 2.18; LF/BF = 1.00.

Head (Figs 12A–C, E–F, 13A–E, 14). Vertex strongly broader than long in midline, orange to bright red, flat with median shallow groove and margins not carinate; anterior margin weakly curved, posterior one concave and lateral ones oblique, converging cephalad. Side of head yellowish orange to bright red, paler under antennae. Frons convex, slightly elongate and weakly rugulose, widest under antennae, yellowish orange to bright red with turquoise marking at dorsolateral angles; no carina. Clypeus black, often with narrow basal transverse band coloured as frons under frontoclypeal suture, convex, smooth.

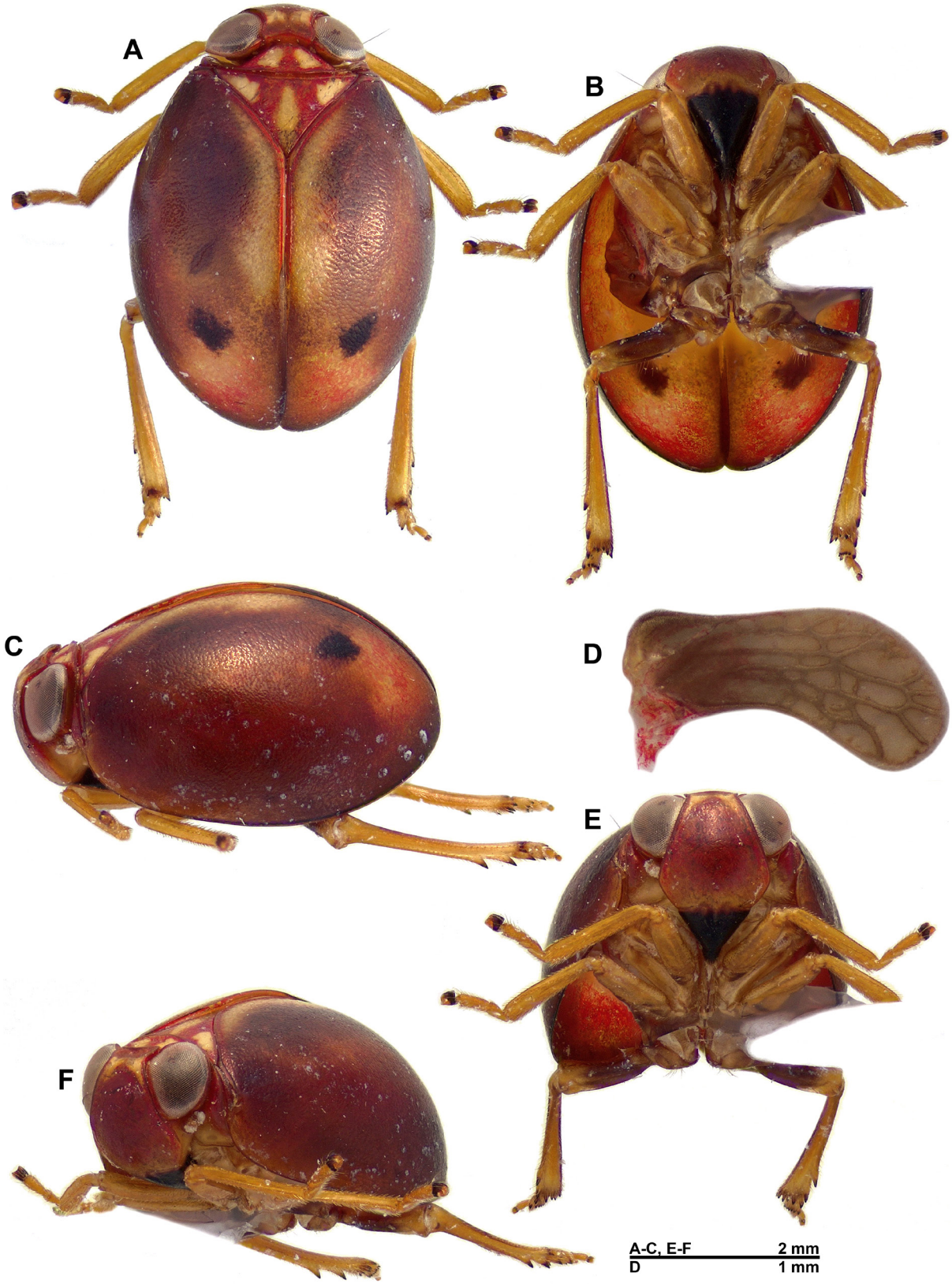

Fig. 12. *Hemisphaerius annamiticus* sp. nov., dissected holotype, ♂ (VNMN). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. Habitus, lateral view. **D**. Right hind wing. **E**. Habitus, perpendicular view of frons. **F**. Habitus, anterolateral view.

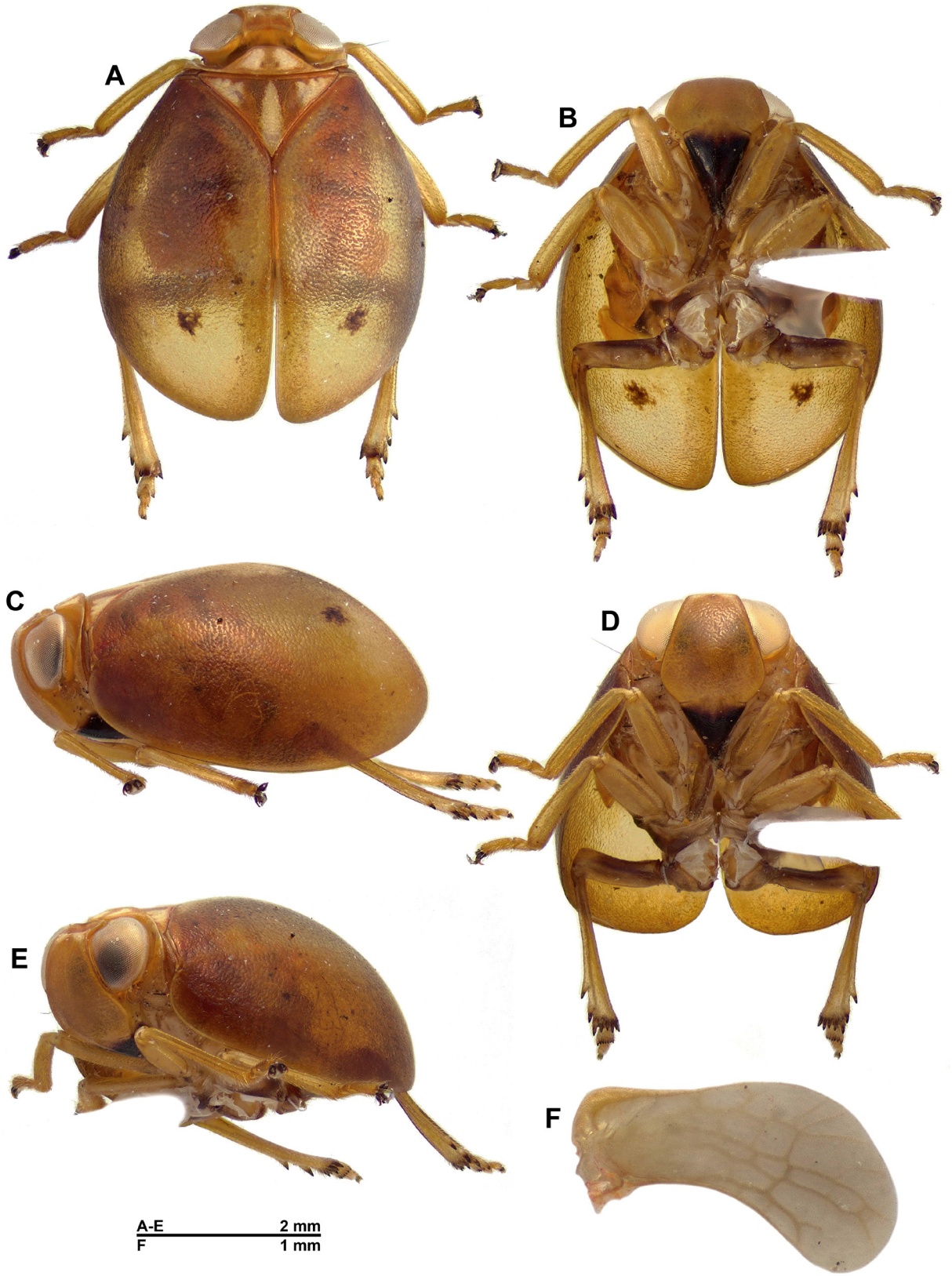

Fig. 13. *Hemisphaerius annamiticus* sp. nov., dissected paratype, ♂ from Da Krong, Quang Tri Province (RBINS). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. Habitus, lateral view. **D**. Habitus, perpendicular view of frons. **E**. Habitus, anterolateral view. **F**. Right hind wing.

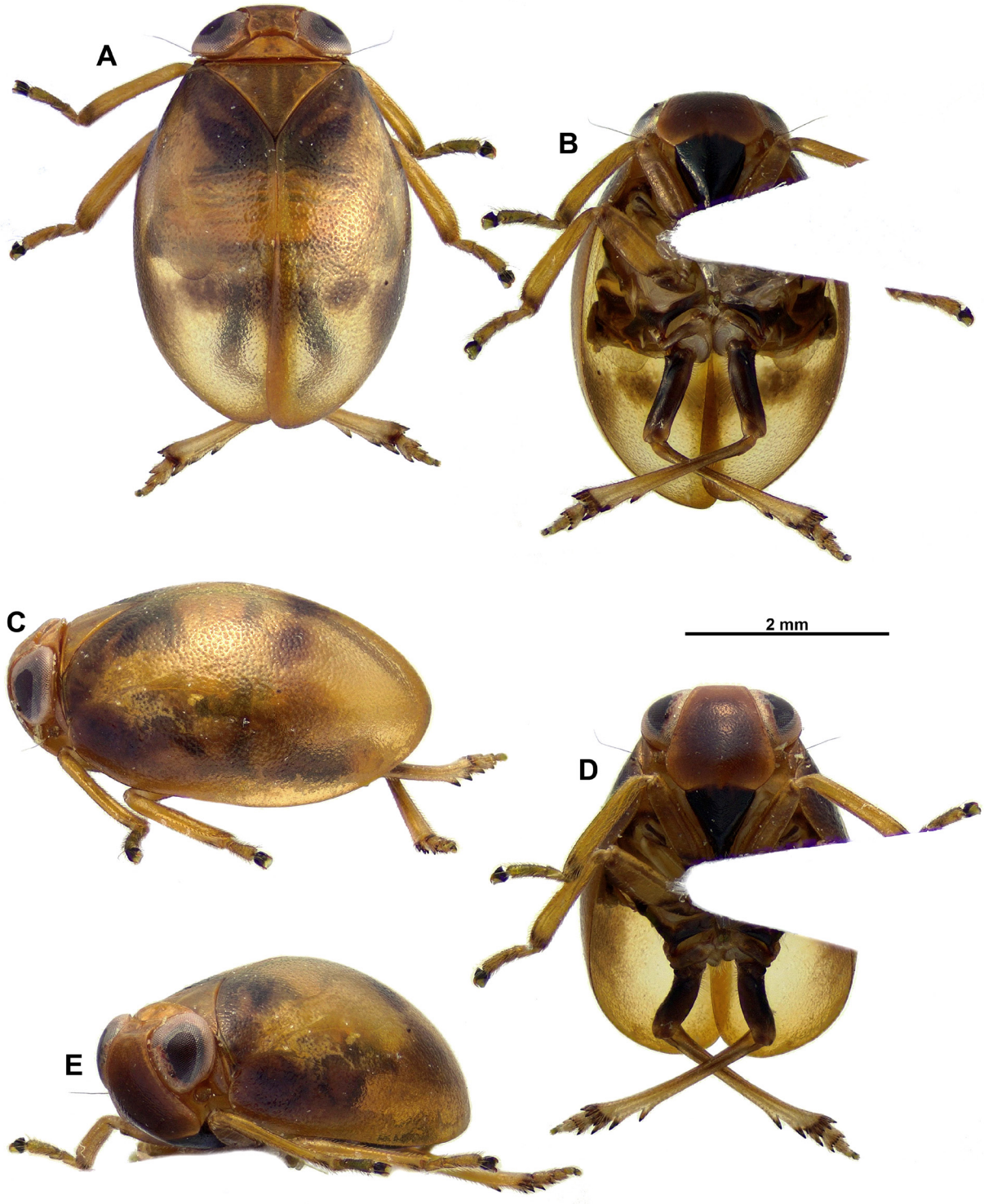

Fig. 14. *Hemisphaerius annamiticus* sp. nov., dissected paratype, ♂ from Mang Kanh, Kon Tum Province (RBINS). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. Habitus, lateral view. **D**. Habitus, perpendicular view of frons. **E**. Habitus, anterolateral view.

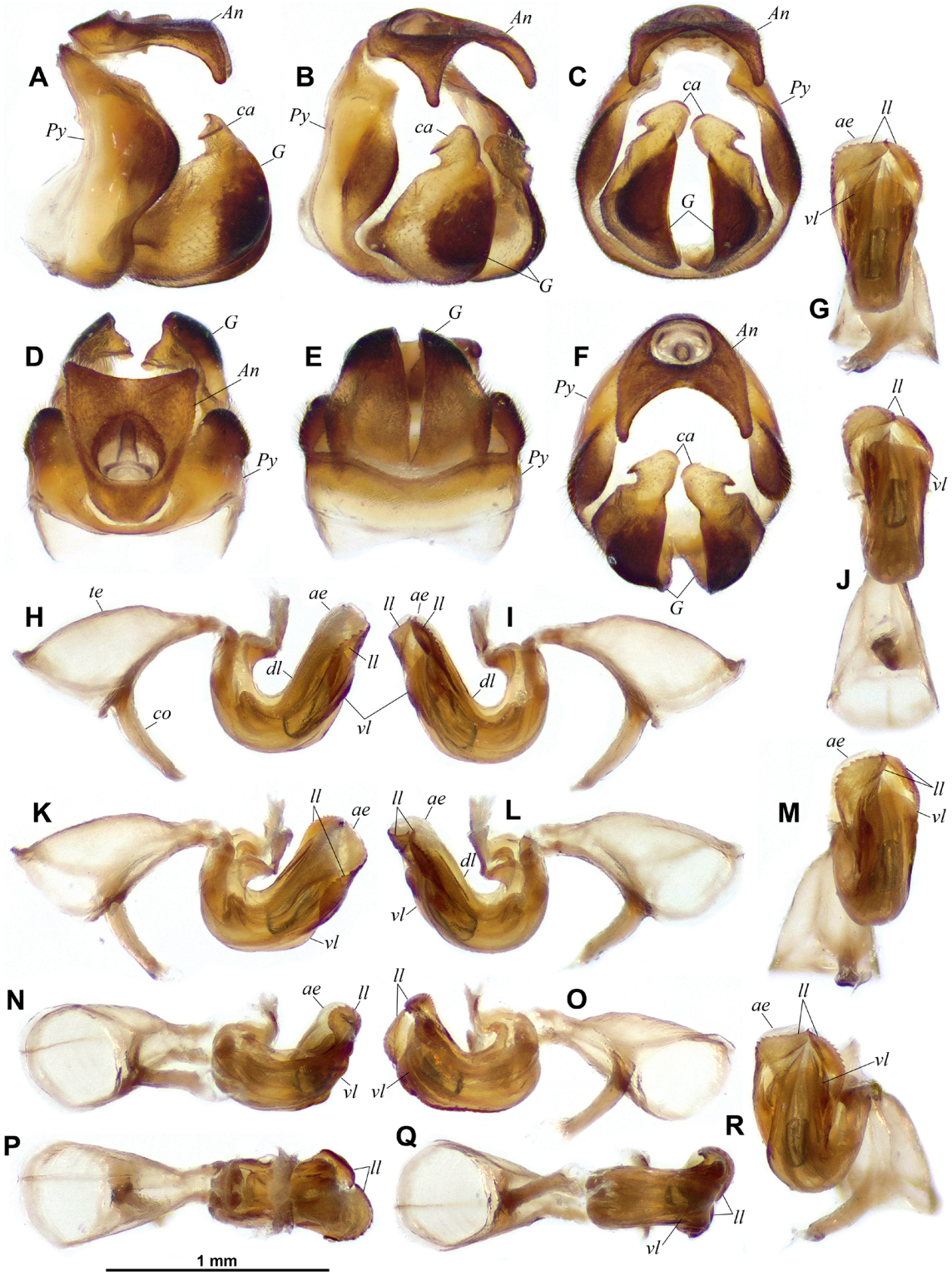

Fig. 15. *Hemisphaerius annamiticus* sp. nov., holotype, ♂ (VNMN), terminalia. **A–F**. Pygofer, anal tube and gonostyli. **A**. Left lateral view. **B**. Posterolateral view. **C**. Caudal view. **D**. Dorsal view. **E**. Ventral view. **F**. Posterodorsal view. **G–R**. Aedeagus. **G**. Caudal view. **H**. Left lateral view. **I**. Right lateral view. **J**. Posteroventral view. **K**. Left laterodorsal view. **L**. Right laterodorsal view. **M**. Left posterolateral view. **N**. Left lateroventral view. **O**. Right lateroventral view. **P**. Dorsal view. **Q**. Ventral view. **R**. Right posterolateral view. Abbreviations: see Material and methods.

Labium yellow brown with last segment longer than broad, about as long as penultimate one. Antennae yellow-brown; scape short, ring-shaped; pedicel bulbous.

Thorax (Figs 12A, E–F, 13A, C–E, 14A, C–E, 16). Pronotum orange to bright red with 2 subtriangular turquoise markings on disc; very short, about ⅓ length of mesonotum in midline, extremely narrow behind eyes, smooth, without median carina, with fine carinae along anterior and posterior margins; disc with small, impressed point on each side of median red line; paranotal lobes orange to red, paler at ventral inner angle, without black marking. Mesonotum bright red with median turquoise line not reaching anterior margin and triangular turquoise marking on lateral angles; rather short, weakly rugulose with fine transverse carina along anterior margin but without longitudinal carinae. Tegulae coloured as tegmina, orange to red or dark brown.

Tegmina (Figs 12A, C, 13A, C, 14A, C, 16). Colour variable, from pale greenish testaceous or pinkish orange with a black dot in middle at ⅔ of length and postclaval margin narrowly reddish, to black with a reddish brown band along postclaval margin, often more or less dark reddish brown with black dot at ⅔ of length, testaceous band along basal half of postclaval margin, and often a more or less developed testaceous marking in distal portion; strongly convex, rugulose; nearly 1.2 times as long as broad when taken together in dorsal view; costal margin broadly rounded, apical margin rounded; venation obsolete.

Hind wings (Figs 12D, 13F). Brown with basal portion suffused with red and cells of distal half irregularly darker; strongly reduced, curved and widening from base to ⅘ of length. Veins indistinct on basal ⅓, reticulate on remaining portion.

Legs (Figs 12A–C, E, 13A–E, 14A–E). Elongate and moderately slender, yellowish brown; all tarsi with black-brown onychium; pro- and mesofemora slightly wider than corresponding tibiae; metacoxae, metatrochanters and basal ¾ of metafemora dark brown; apex of metatibial spines and metatarsal spines black-brown. Metatibiae with 2 lateral spines on apical ⅓ and 6 apical spines. Metatarsi short with first segment about as long as combined length of remaining segments. Metatibiotarsal formula: (2)6/8–9/2.

Abdomen. Brown with middle and posterior areas darker, sometimes black.

Male terminalia (Fig. 15). Pygofer (*Py* – Fig. 15A–F) about 2.5 times as high as long at midheight in lateral view, with posterior margin forming oblique slope in dorsal ⅓ ending in a strong rounded lobe at about midheight, then sinuate in ventral ⅓ in lateral view; oval in caudal view. Gonostyli (*G* – Fig. 15A–F) convex, sub-semicircular in lateral view with dorsal margin weakly rounded and ventroapical margin strongly rounded, with an emargination at base of capitulum; capitulum (*ca*) with short and wide neck in lateral view, projecting dorsomesad, with dorsal tooth directed anteromesad and lateral slightly laminate tooth curved lateroventrad. Anal tube (*An* – Fig. 15A–D) dorsoventrally flattened, subtriangular, slightly longer in midline than wide and with anal opening at about basal ⅓; small pointed process directed ventrad on ventral side, before half length; lateral margins weakly sinuate, more or less evenly diverging, and posterior margin distinctly concave in dorsal view; dorsal margin straight with apicodorsal angle obtuse, and ventral margin sinuate ventrad in lateral view; apical angles strongly projecting lateroventrad; apical margin roundly curved in caudal view, with outer margins weakly diverging ventrad. Aedeagus (Fig. 15G–R) asymmetrical, strongly curved, slightly twisted, reflexed dorsad at obtuse angle at midlength in lateral view. Ventral lobe of periandrium (*vl*) laminate, moderately lanceolate apically and shorter than lateral lobes (Fig. 15G, J, M, R). Lateral lobes of periandrium (*ll*) laminate and longitudinally twisted, with outer lateral margin sinuate and bearing regular small teeth in distal portion, a slightly larger one at apical angle; inner margin smooth; right lobe moderately more developed than left one in laterocaudal view (perpendicular to plane of lobes – Fig. 15R). Connective (*co* – Fig. 15H–Q) strongly developed,

Fig. 16. *Hemisphaerius annamiticus* sp. nov., live specimens in Bach Ma National Park. **A–D**. Pheasant trail. **A–B**. 12 May 2023. **C–D**. 20 May 2023. **E–G**. Low altitude location, 15 May 2023. **H**. Near ranger station, 18 May 2023.

corpus connective long and regularly curved in lateral view, tectiductus (*te*) strongly developed, curved, conical with wide anterior foramen and with crista visible as a weak carina.

Biology

Hemisphaerius annamiticus sp. nov. was collected in March to September at altitudes between 100 and 1400 m a.s.l. in moist evergreen tropical forest. The specimens were sitting on lower vegetation and bushes on small branches, and more often on leaves, and seemed to prefer smooth leaves. In Bach Ma National Park it was found at the following collecting site/habitats (Fig. 2A): "Yes Hue Eco" (Fig. 2A(1), B), "pheasant trail" (Figs 2A(2), 3A), "low altitude" (Figs 2A(3), 3B), "roadside" (Figs 2A(4), 4A), "summit" (Figs 2A(5), 4B) and "ranger station" (Figs 2A(6), 5A), and in Phong Dien District (Fig. 5B).

Fig. 17. *Hemisphaerius annamiticus* sp. nov., distribution map.

Distribution

Vietnam: provinces of Thừa Thiên-Huế (Bach Ma National Park, Phong Dien District, A Roang), Da Nang (Ba Na-Nui Chua Nature Reserve), Kon Tum (Mang Kanh), Ha Tinh (Vu Quang National Park) and Quang Tri (Da Krong National Park; Deo Sa Mu) (Fig. 17).

Hemisphaerius thaydoius sp. nov.
urn:lsid:zoobank.org:act:6FDB7F3D-396B-409A-8617-0C38E95C3D8E
Figs 2A, 3A, 18–22

Diagnosis

Hemisphaerius thaydoius sp. nov. varies in body colour from nearly entirely orange with or without turquoise markings on frons, pro- and mesonotum, and with or without irregular (but symmetrical) brown markings on tegmina, to creamy yellow with large black markings or even to entirely blackish brown (Figs 18–19, 21), but can be recognized by:

(1) the black band along the ventral margin of the paranotal lobes of the prothorax (Fig. 18D–E, 19D–E);
(2) the shape of the anal tube, subtriangular with apical margin weakly convex in dorsal view, and with posterolateral angles weakly developed and weakly projecting lateroventrad (*An* – Fig. 20A–D);
(3) the strongly posterodorsally curved at a distinct obtuse angle lateral aspect of the aedeagus (Fig. 20I–J);
(4) the left lateral lobe of the periandrium being distinctly larger and projecting further posteriorly than the right one, the outer lateral margin with an elongate, subtriangular process curved anteromesad and a rounded externodorsal lobe followed by a strong spinose process oblique in posterior view and directed cephalodorsad (Fig. 20E–L);
(5) the right lateral lobe of the periandrium with the outer margin more or less rounded, the dorsal inner angle projecting as a curved tooth directed mesocephalad, hidden by the left lobe in caudal view (Fig. 20E–H).

Differential diagnosis

The closest species are *H. hippocrepis* Constant & Pham, 2011 and *H. rufovarius* Walker, 1858. However, *H. thaydoius* sp. nov. differs from *H. hippocrepis* by having a subtriangular anal tube in dorsal view (Fig. 20D), while it is suboval and apically truncate in *H. hippocrepis* (Constant & Pham 2011: fig. 8) and by the left lateral lobe of the periandrium with the outer lateral margin with an elongate, subtriangular process curved anteromesad and a rounded externodorsal lobe followed by a strong spinose process, oblique in posterior view (Fig. 20 E–J), while it shows a wide, apically rounded lobe curved cephalodorsad and a much shorter spine in *H. hippocrepis* (Constant & Pham 2011: figs 11–13); from *H. rufovarius*, it differs by the absence of a ventral spine on the anal tube (Fig. 20A), while *H. rufovarius* shows a very distinct one (Constant & Pham 2024a: fig. 12a) and by the triangular and rounded laminate lobes on the left lobe of the periandrium as described above (Fig. 20E–J), while no such lobes are visible in *H. rufovarius* (Constant & Pham 2024a: fig. 12e–h).

Etymology

The species epithet *thaydoius* is derived from the Vietnamese phrase ‘thay đổi’, meaning ‘changing, variable’. It refers to the highly variable colouration of this species.

Material examined

Holotype

VIETNAM • ♂ (dissected); Thừa Thiên-Huế Province, Phong Dien District; 16°30′27″ N, 107°16′05″ E; 350–400 m a.s.l.; 23 May 2023; J. Constant and L. Semeraro leg.; I.G.: 34.640; VNMN.

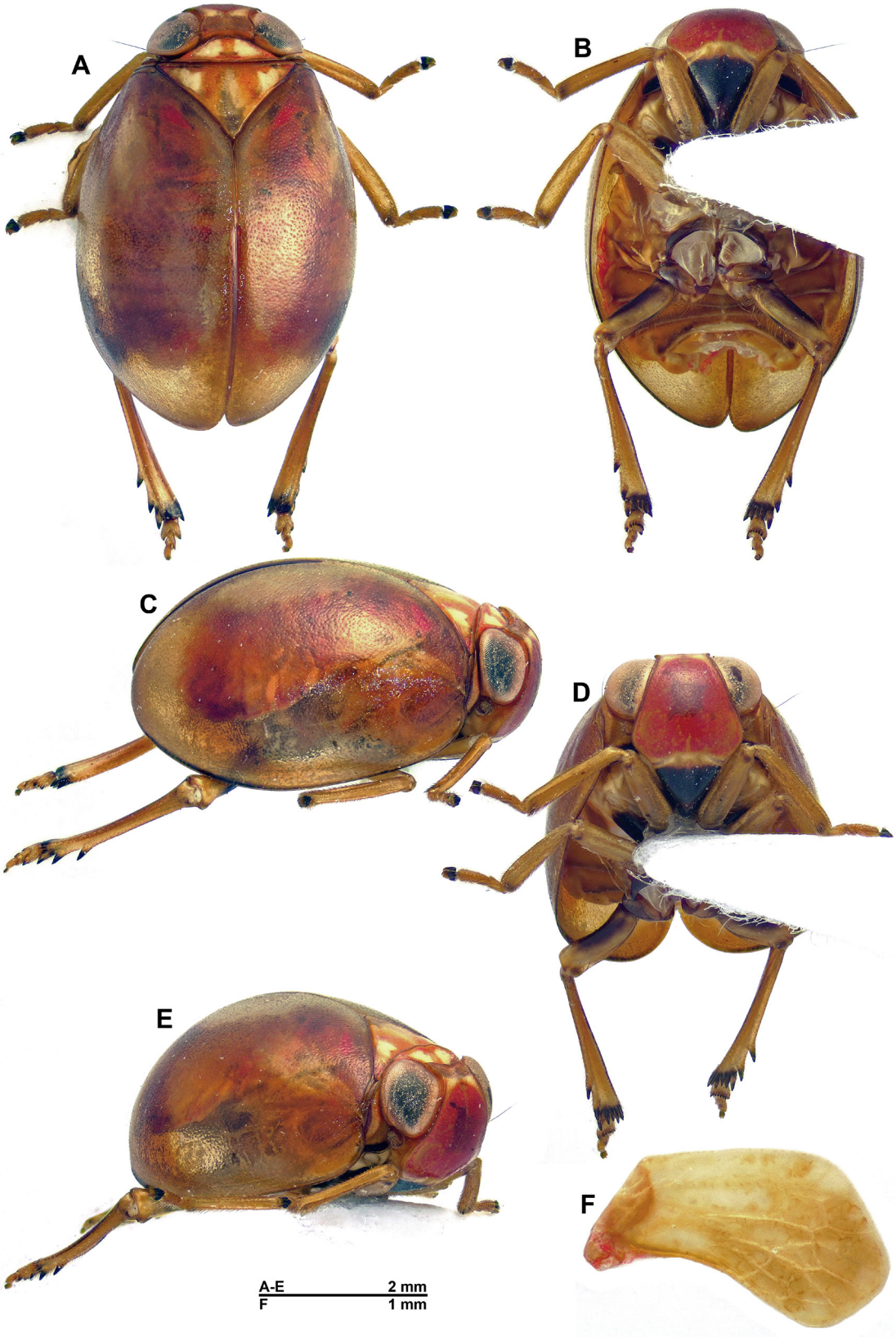

Fig. 18. *Hemisphaerius thaydoius* sp. nov., dissected holotype, ♂ (VNMN). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. Habitus, lateral view. **D**. Habitus, perpendicular view of frons. **E**. Habitus, anterolateral view. **F**. Right hind wing.

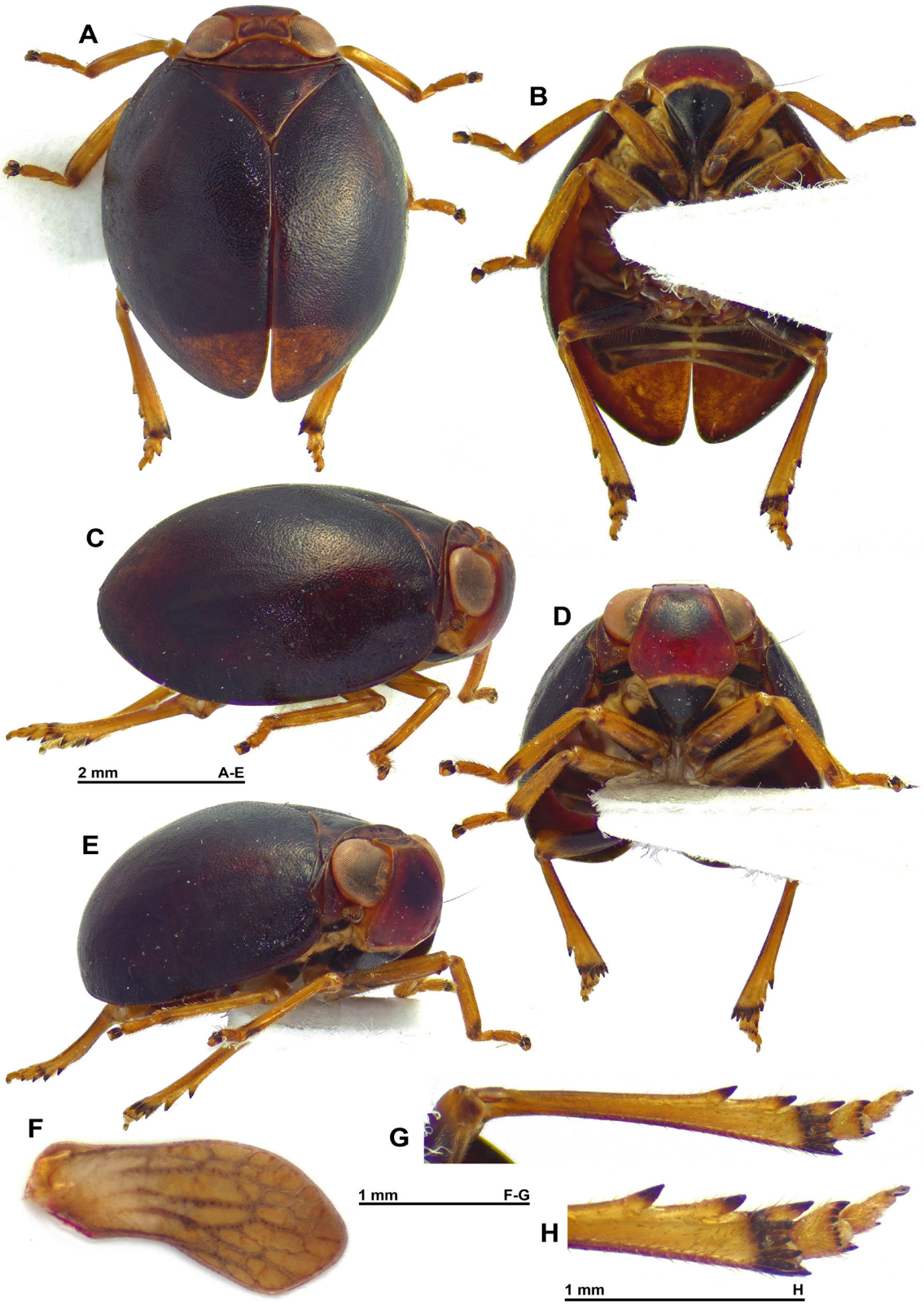

Fig. 19. *Hemisphaerius thaydoius* sp. nov., dissected paratype, ♂, black morph, from Bach Ma National Park (RBINS). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. Habitus, lateral view. **D**. Habitus, perpendicular view of frons. **E**. Habitus, anterolateral view. **F**. Right hind wing. **G**. Left hind leg, ventral view. **H**. Metatarsus and apex of metatibia, ventral view.

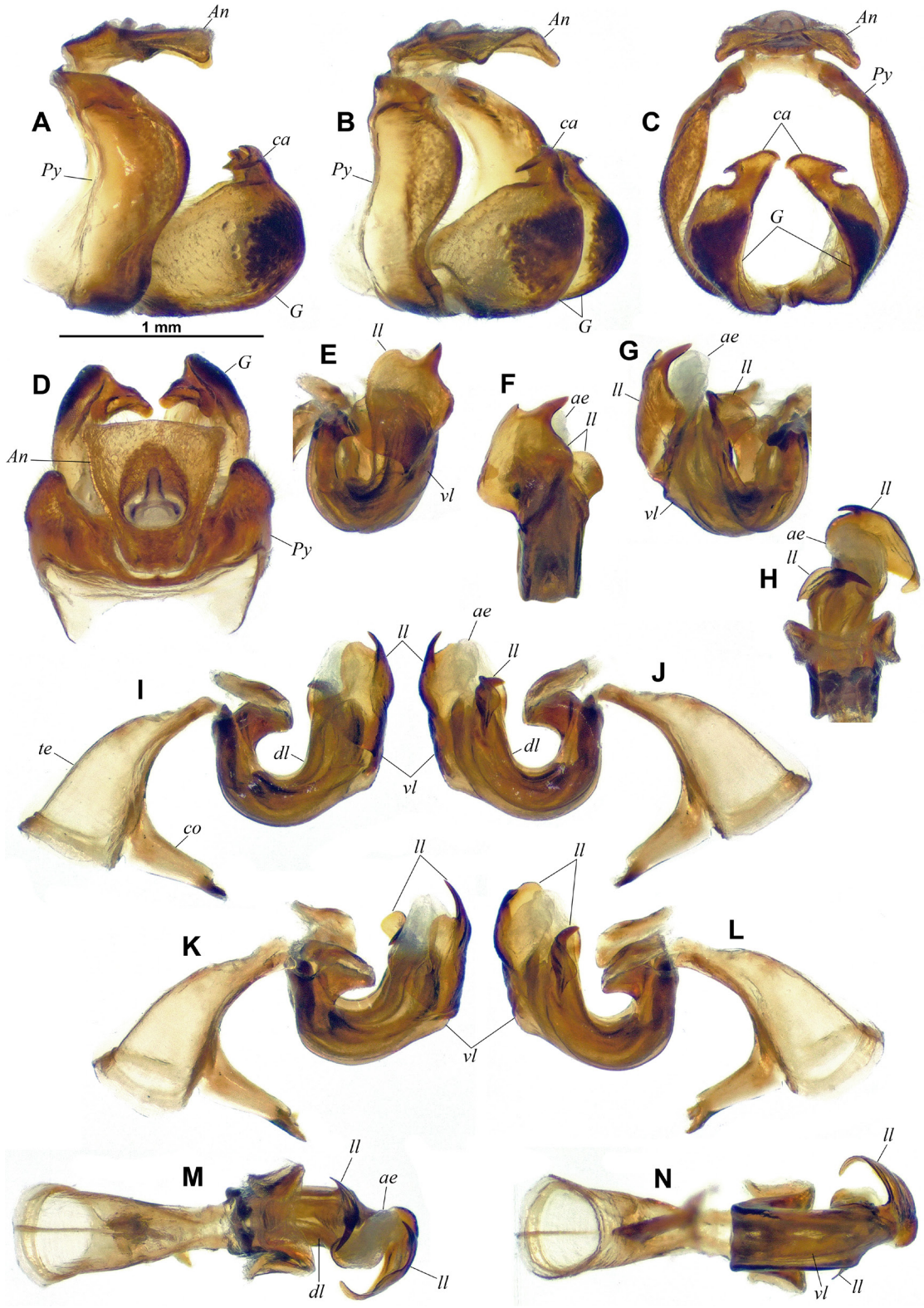

Fig. 20. *Hemisphaerius thaydoius* sp. nov., dissected holotype, ♂ (VNMN), terminalia. **A–D**. Pygofer, anal tube and gonostyli. **A**. Left lateral view. **B**. Posterolateral view. **C**. Caudal view. **D**. Dorsal view. **E–N**. Aedeagus. **E**. Left posterolateral view. **F**. Caudal view. **G**. Right posterolateral view. **H**. Anterodorsal view. **I**. Left lateral view. **J**. Right lateral view. **K**. Left laterodorsal view. **L**. Right laterodorsal view. **M**. Dorsal view. **N**. Ventral view. Abbreviations: see Material and methods.

Paratypes

VIETNAM • 2 ♀♀; same collecting data as for holotype; VNMN • 1 ♂, 3 ♀♀; same collecting data as for holotype; RBINS • 1 ♂, 1 ♀; Thừa Thiên-Huế Province, Bach Ma National Park, [pheasant trail]; 16°12′ N, 107°52′ E; 10–16 Apr. 2017; [500–600 m a.s.l.]; J. Constant and J. Bresseel leg.; I.G.: 33.447; RBINS • 1 ♂, 1 ♀; Thừa Thiên-Huế Province, A Luoi, A Roang; [16°07′04″ N, 107°24′19″ E]; 600–700 m a.s.l.; 4 May 2005; H.T. Pham leg.; Ho.1585, 1589; VNMN • 1 ♂, 1 ♀; Thừa Thiên-Huế Prov., Bach Ma National Park, ranger station, Nam Dong District; 16°08′37″ N, 107°49′36″ E; 150–500 m a.s.l.; 19 Oct. 2024; J. Constant, L. Semeraro and Hoai T.T. Nguyen leg.; I.G.: 34.893; RBINS • 1 ♀; same collection data as for preceding; VNMN • 1 ♀; Thừa Thiên-Huế Province, Bach Ma National Park, near ranger station; 16°08′37″ N, 107°49′36″ E; 300–600 m a.s.l.; 18 May 2023; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS • 2 ♀♀; same collection data as for preceding; VNMN • 1 ♂; Quang Tri Province, Huong Hoa, Huong Phung, Deo Sa Mu; [16°48′00″ N, 106°35′10″ E]; 900–1000 m a.s.l.; 4 Jun. 2006; H.T. Pham leg.; VNMN • 1 ♂; Ha Tinh Province, Vu Quang National Park, near Khe Chè station; 18°22′38″ N, 105°18′41″ E; 13–15 Jul. 2023; V.T. Trung and N.T.T. Hoai leg.; VNMN • 1 ♂, 2 ♀♀; same data as for preceding; J. Constant, J. Bresseel and L. Semeraro leg.; I.G.: 34.661; RBINS.

Description

Note: The bright colour of the live specimens (Fig. 21) tends to fade in collection specimens, with the turquoise colour of the markings on the thorax and head turning to yellow and the rest of the body, in the paler forms, tending to become more yellowish as well.

Measurements and ratios. LT: ♂ (n = 4): 4.7 mm (4.5–4.8), ♀ (n = 5): 4.8 mm (4.2–5.0); LT/BB = 1.49; LTg/BTg = 1.52; LW/BW = 1.76; BV/LV = 3.88; LF/BF = 0.87.

Head (Figs 18A–E, 19A–E, 21A–G). Vertex strongly broader than long in midline, orange to dark brown, flattish with weak median carina, sometimes obsolete, and lateral and posterior margins weakly carinate; anterior margin weakly curved, posterior one concave and lateral ones sinuate, converging cephalad. Side of head yellowish orange to reddish brown, paler under antennae. Frons convex, slightly elongate and weakly rugulose, widest under antennae, orange to reddish brown with large darker area in middle, to entirely blackish brown; orange specimens often with turquoise marking at dorsolateral angles; no carina; frontoclypeal suture marked by a transverse pale yellow band. Clypeus black with basilateral pale yellow marking prolongating band on frontoclyeal suture, convex, smooth. Labium yellow brown with last segment longer than broad, about as long as penultimate one. Antennae yellow-brown; scape short, ring-shaped; pedicel bulbous.

Thorax (Figs 18A–E, 19A–E, 21A–G). Pronotum orange, often with 2 subtriangular turquoise markings on disc, to entirely blackish brown; very short, about ⅓ length of mesonotum in midline, extremely narrow behind eyes, without median carina, with fine carinae along anterior and posterior margins; disc with small, impressed point on each side of median line; paranotal lobes paler than dorsum and with distinct black band along ventral margin. Mesonotum orange, often with median turquoise line not reaching anterior margin and triangular turquoise marking on lateral angles, to entirely blackish brown; rather short, weakly rugulose with fine transverse carina along anterior margin but without longitudinal carinae. Tegulae coloured as tegmina, orange to blackish brown.

Tegmina (Figs 18A, C, 19A, C, 21A–G). Colour variable, from entirely orange to orange, orangish testaceous or creamy yellow with irregular but symmetrical brown markings (often with transverse band at ¾ of total length), to entirely blackish brown; strongly convex, rugulose; about 1.2 times as long as broad when taken together in dorsal view; costal margin broadly rounded, apical margin rounded; venation obsolete.

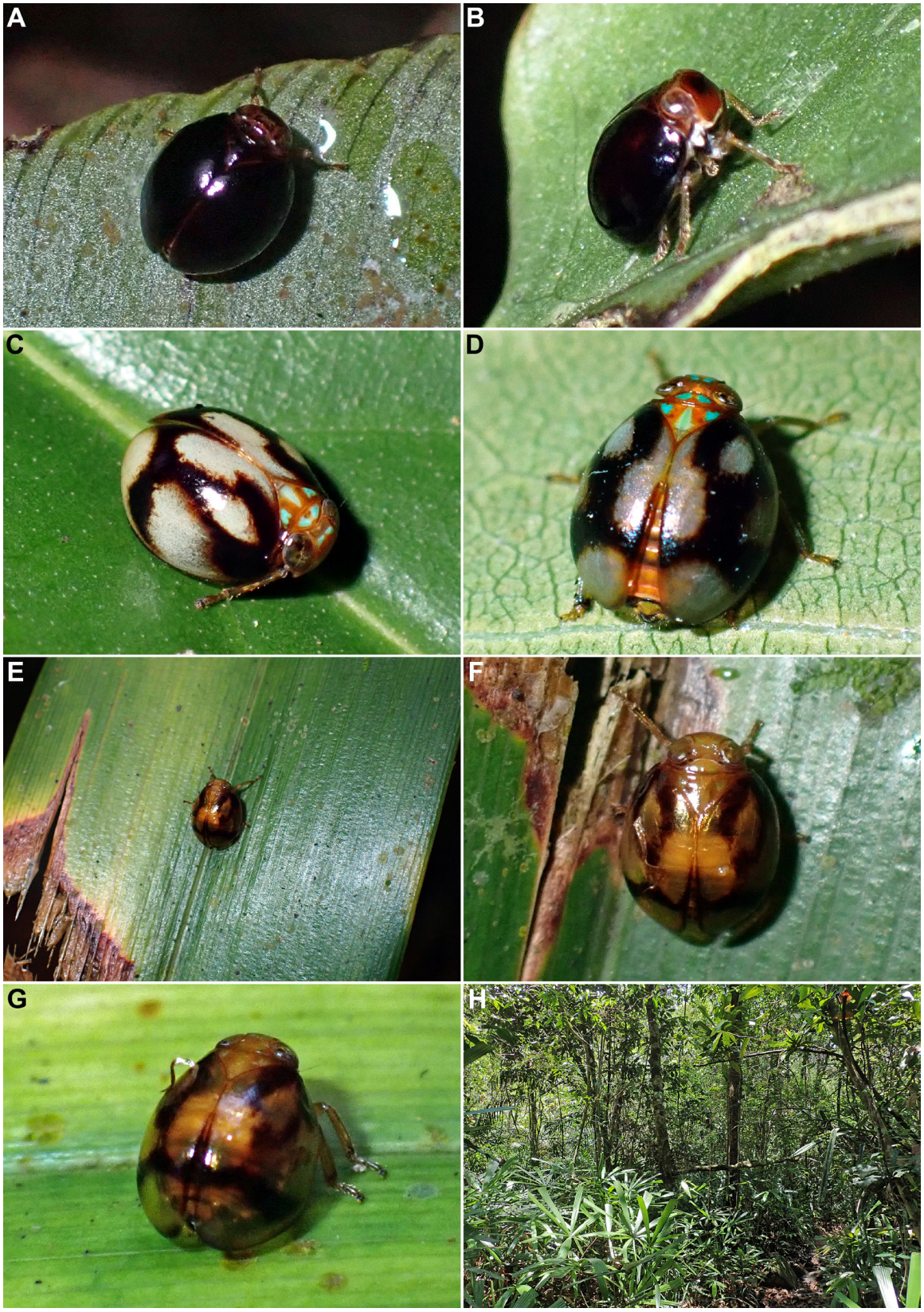

Fig. 21. *Hemisphaerius thaydoius* sp. nov. **A–B**. Live specimen in Bach Ma National Park, pheasant trail, 12 May 2023. **C–D**. Bach Ma National Park, near ranger station. **C**. 18 May 2023. **D**. 19 Oct. 2024 (photographed in cage). **E–H**. Phong Dien District, 23 May 2023. **E–G**. Specimen. **H**. Microhabitat.

Hind wings (Figs 18F, 19F). Brown with basal portion suffused with red and veins slightly darker; strongly reduced, curved and widening from base to ⅘ of length. Veins indistinct on basal ⅓, reticulate on remaining portion.

Legs (Figs 18A–E, 19A–E). Elongate and moderately slender, yellowish brown; all tarsi with black-brown onychium; pro- and mesofemora slightly wider than corresponding tibiae; coxae, trochanters and basal ¾ of metafemora (at least partly) dark brown; in dark forms, distal portion of pro- and mesotibiae dark brown; apex of metatibial spines and metatarsal spines black-brown. Metatibiae with 2 lateral spines on apical ⅓ and 6 apical spines. Metatarsi short with first segment about as long as combined length of remaining segments. Metatibiotarsal formula: (2)6/8–9/2.

Abdomen (Figs 18B, 19B). Sternites yellowish, turning brown along posterior margin, to dark brown.

Fig. 22. *Hemisphaerius thaydoius* sp. nov., distribution map.

Male terminalia (Fig. 20). Pygofer (*Py* – Fig. 20A–D) about 2.6 times as high as long at midheight in lateral view, with posterior margin projecting posterad into a round lobe in dorsal ⅔, then sinuate in ventral ⅓ in lateral view; subcircular in caudal view. Gonostyli (*G* – Fig. 20A–D) convex, suboval in lateral view (without capitulum), with dorsal margin weakly sinuate and ventroapical margin strongly rounded, with an emargination at base of capitulum; capitulum (*ca*) with short and wide neck in lateral view, projecting dorsomesad, with dorsal tooth curved anteromesad and lateral slightly laminate tooth curved lateroventrad. Anal tube (*An* – Fig. 20A–D) dorsoventrally flattened, rather short, subtriangular, slightly wider than long in midline and with anal opening at about basal ⅓; small hump on ventral side, at around half length; lateral margins weakly sinuate, more or less evenly diverging and posterior margin weakly convex in large middle portion in dorsal view; dorsal margin straight with apicodorsal angle straight and ventral margin slightly curved ventrad in lateral view; apical angles weakly produced lateroventrad; apical margin weakly curved in caudal view. Aedeagus (Fig. 20E–N) asymmetrical, strongly curved, slightly twisted, reflexed dorsad at distinct obtuse angle slightly beyond midlength in lateral view. Ventral lobe of periandrium (*vl*) laminate, moderately lanceolate apically, projecting on right side between lateral lobes and shorter than these lobes (Fig. 20E–G). Lateral lobes of periandrium (*ll*) laminate and longitudinally twisted, with left lobe distinctly larger and projecting further posteriorly than right one; left lobe with outer lateral margin with elongate, subtriangular process curved anteromesad and rounded externodorsal lobe followed by strong spinose process, oblique in posterior view and directed cephalodorsad, inner margin strongly sinuate under tooth; right lobe with outer margin more or less rounded, dorsal inner angle projecting as curved tooth directed mesocephalad, hidden by left lobe in caudal view. Connective (*co* – Fig. 20I–J) strongly developed, corpus connective long and regularly curved in lateral view, tectiductus (*te*) strongly developed, curved, conical, with wide anterior foramen and with crista visible as a weak carina.

Biology

Hemisphaerius thaydoius sp. nov. was collected in April, May, June, July and October at altitudes between 150 and 700 m a.s.l., in moist evergreen tropical forest. The specimens were sitting on lower vegetation and bushes on small branches, and more often on leaves, and seemed to prefer smooth leaves. In Bach Ma National Park it was found at the collecting sites/habitats "pheasant trail" (Figs 2A(2), 3A) and "ranger station" (Figs 2A(6), 5A). It was also collected in Phong Dien District, not far from a stream (Figs 5B, 21H).

Distribution

Vietnam: Thừa Thiên-Huế Province (Bach Ma National Park, Phong Dien District, A Roang), Quang Tri Province (Deo Sa Mu) and Ha Tinh Province (Vu Quang National Park) (Fig. 22).

Genus ***Ishiharanus*** Hori, 1969

Ishiharanus Hori 1969: 58. Type species: *Gergithus iguchii* Matsumura, 1916 by original designation.

Ishiharanus – Che *et al*. 2007: 611 (proposed as junior synonym of *Gergithus* Stål, 1870 – erroneous!). — Chen *et al*. 2014: 49 (treated as a junior synonym of *Gergithus* Stål, 1870 – erroneous!). — Gnezdilov 2018: 1342 (reinstated as a valid genus, diagnosis, composition, distribution, compared to *Bruneastrum* Gnezdilov, 2015 and *Neohemisphaerius* Chen, Zhang & Chang, 2014). — Cho *et al*. 2024: 983 (notes on previous taxonomic changes).

Note: Meng *et al*. (2017) erected the new genus *Gnezdilovius* Meng, Webb & Wang, 2017 (type species*: Gergithus lineatus* Kato, 1933) to include a number of species previously placed in *Gergithus* Stål, 1870. However, they included *Gergithus iguchii* Matsumura, 1916, the type species of *Ishiharanus*, in

Gnedilovius, and hence implicitely treated the two genera as synonyms, without considering the priority of *Ishiharanus* or even mentioning the genus in their work. This issue was resolved by Gnezdilov (2018) by reinstating *Ishiharanus* as a monotypical genus containing only *I. iguchii* (Matsumura, 1916), distributed from Japan to eastern and southeastern China, and south to Central Vietnam.

Diagnosis

The genus is defined by the following distinctive set of characters (modified from Gnezdilov 2018):

(1) the smooth frons narrow between the eyes, wider above clypeus (twice as wide) and about 1.1–1.3 times as long as wide;
(2) the clypeus without carina;
(3) the vertex transverse, about 1.7–1.9 times as wide as long in midline;
(4) the tegmina without a "shoulder-like" projection in dorsal view and without a projection under the eye in lateral view;
(5) the hind wings well developed, nearly as long as tegmina;
(6) the asymmetrical aedeagus, upcurved and twisted, with a pair of apical pointed processes and a pair of lateroventral processes in the basal portion;
(7) the capitulum of the gonostyli with a long, wide neck;
(8) the posterior margin of the pygofer convex, without a spine;
(9) the anal tube widening from base to apex, with the posterior margin more or less distinctly trilobed ("with median spout-like process" according to Gnezdilov 2018).

Remarks

Gnezdilov (2018) stated that the periandrium in *Ishiharanus* is symmetrical, while the illustrations in Hori (1969: fig. 2, 2) and Chen *et al*. (2014: fig 2-16, k–l) show an asymmetrical, twisted aedeagus, confirmed by our observations of specimens of the type species *I. iguchii* (Matsumura, 1916) and of the other species treated hereunder.

Species included

Ishiharanus dinhanus sp. nov.
I. iguchii (Matsumura, 1916)
I. pulchellus sp. nov.

Ishiharanus dinhanus sp. nov.
urn:lsid:zoobank.org:act:9F31FA85-8686-4C0E-B235-5395E980DCD9
Figs 1, 2A, 4B, 23–25

Diagnosis

Ishiharanus dinhanus sp. nov. can be recognized by:

(1) its colour pattern with the dorsum more or less dark brown with bright pale yellow markings: one on scutellum, three elongate ones on tegmina (basal, mediodorsal and anteapical) and some longitudinal lines along veins (Figs 23, 25);
(2) the profemora colour being dark brown, turning more or less paler towards the apex (Fig. 23B, E);
(3) the anal tube in dorsal view about 1.50 times as long in midline as wide, rather elongate with curved sides, and with apical margin deeply excavate and moderately bisinuate (*An* – Fig. 24D);
(4) the lateroventral processes of the aedeagus (*lvp* – Fig. 24G–R) rather short, apically pointed, strongly sinuate with basal portion curved anterolaterad, then recurved anteromesad.

Differential diagnosis

The closest species, sharing some colouration characters of *I. dinhanus* sp. nov., is *I. pulchellus* sp. nov., which also shows pale yellow markings (in the paler forms) on the mesonotum and on tegmina. However, *I. dinhanus* is larger: LT: ♂: 5.1–5.2 mm, ♀ 5.5–5.9 mm, as compared to LT: ♂: 4.1–4.6 mm, ♀: 4.1–4.9 mm in *I. pulchellus*; *I. dinhanus* shows dark brown profemora, turning slightly paler towards the apex (Fig. 23B, E), while the profemora are pale yellow with basal and apical black brown rings in *I. pulchellus* (Fig. 29B, D), and the brown tegmina show three bright, elongate, pale yellow markings but no concentric lines parllel to the posterior margin (Fig. 23A, D), while *I. pulchellus* shows round yellow markings on the disc of the tegmina that are more or less distinct (according to colour form, not visible in dark specimens) and two pale yellow concentric lines parallel to the posterior margin (Figs 29A, C, 30A, C, 31A, C, G). The two species also clearly differ in the shape of the lateroventral processes of the aedeagus, rather short, apically pointed, strongly sinuate and generally directed cephalad in *I. dinhanus* (*lvp* – Fig. 24G–R), while in *I. pulchellus* they show two pointed, moderately curved, elongate portions, one directed cephalad and the other directed posteroventrad (*lvp* – Figs 32G–L, 33H–I).

Etymology

The species epithet *dinhanus* is a Latinised form of the Vietnamese word ‘dinh’, meaning ‘summit’. It refers to the habitat of the species, the forest covering the summit of Bach Ma National Park.

Material examined

Holotype

VIETNAM • ♂ (dissected); Bach Ma [National Park], summit; 16°12′ N, 107°52′ E; 15–16 Jul. 2011; day [collecting]; J. Constant and J. Bresseel leg.; I.G.: 31.933; VNMN.

Paratypes

VIETNAM • 1 ♂; Thua Thien-Hue [Province], Bach Ma [National Park]; 1300 m a.s.l.; 5 Jun. 2002; H.T. Ta leg.; VNMN • 1 ♂, 1 ♀; Thừa Thiên-Huế Province, Bach Ma National Park, surroundings of Hotel Morin; 16.2° N, 107.85° E; 1350–1400 m a.s.l.; 23–28 May 2014; L. Bartolozzi, G. Chelazzi, A. Bandinelli, S. Bambi and F. Fabiano leg.; n° Magazz. 2978; MZUF • 4 ♂♂, 2 ♀♀; Thừa Thiên-Huế Province, Bach Ma National Park, summit; 16°11′18″ N, 107°50′56″ E; 1300–1400 m a.s.l.; 11–21 May 2023; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS • 1 ♂; same collection data as for preceding; VNMN • 1 ♂, 1 ♀; Thừa Thiên-Huế Province, Bach Ma National Park, stairs going up to Hai Vong Dai; 16°11′53.77″ N, 107°51′26.92″ E; 1272 m a.s.l.; 16 Sep. 2024; by net; Hoai T.T. Nguyen leg.; AU 00693; VNMN.

Description

Measurements and ratios. LT: ♂ (n = 5): 5.2 mm (5.1–5.2), ♀ (n = 3): 5.7 mm (5.5–5.9); LT/BB = 1.41; LTg/BTg = 1.66; LW/BW = 1.83; BV/LV = 1.91; LF/BF = 1.06.

Head (Figs 23A–B, D–F, 25). Vertex broader than long in midline, brown with posterior margin weakly carinate; anterior margin convex, posterior one concave and lateral subparallel; disc shallowly excavate. Side of head brown with paler area under antenna. Frons elongate and smooth, brown turning paler towards frontoclypeal suture; clypeus blackish brown. Labium brown with last segment longer than broad, and shorter than penultimate one. Scape short, ring-shaped, brown; pedicel bulbous, brown.

Thorax (Figs 23A–B, D–F, 25). Pronotum very short, about one third length of mesonotum in midline; anterior and posterior margins carinate; disc concave with an impressed point on each side of median line, with extremely narrow lateral fields behind eyes; blackish brown with disc brown. Mesonotum subtriangular, smooth, bright straw yellow with anterolateral angles dark brown. Tegulae brown.

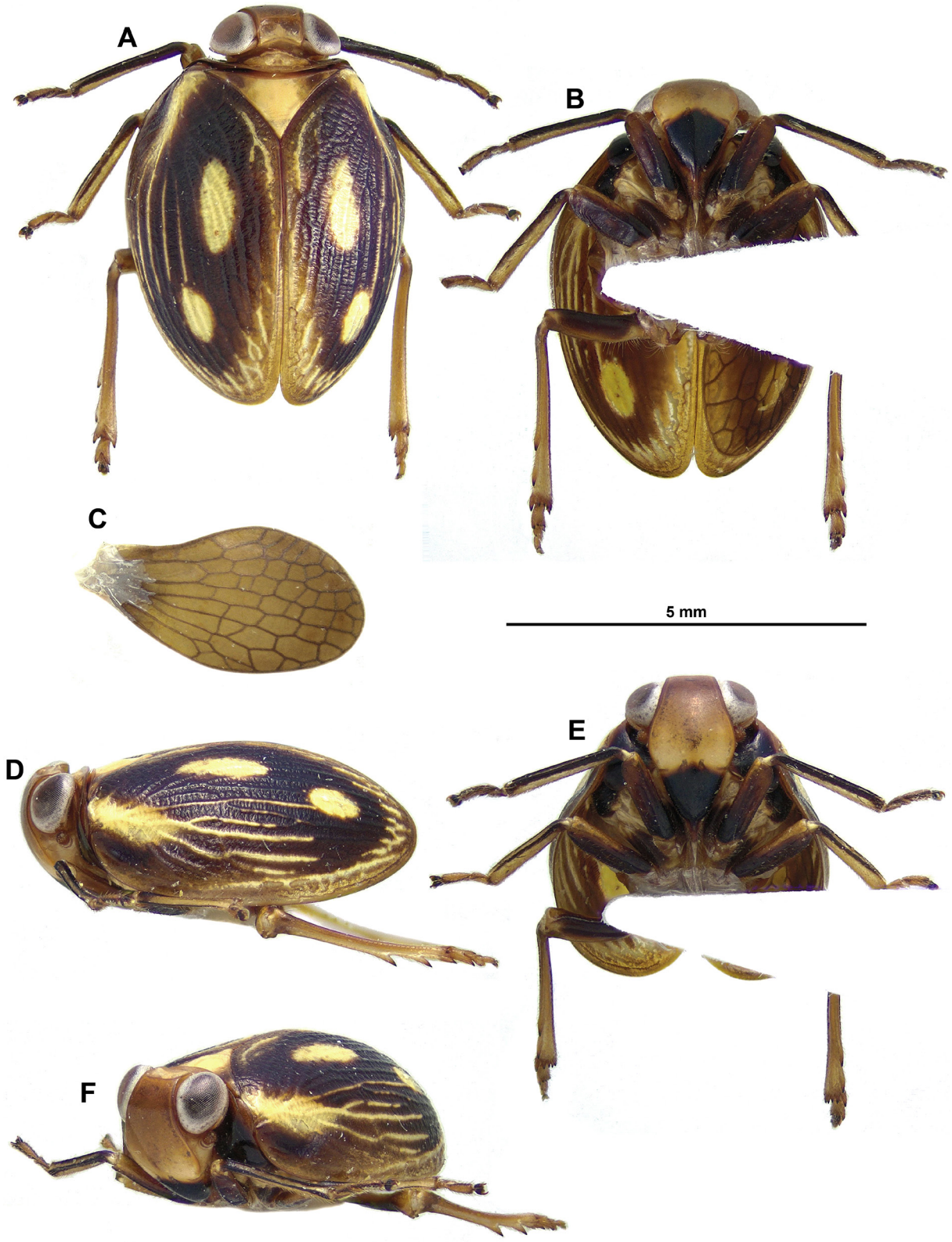

Fig. 23. *Ishiharanus dinhanus* sp. nov., dissected holotype, ♂ (VNMN). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. Right hind wing. **D**. Habitus, lateral view. **E**. Habitus, perpendicular view of frons. **F**. Habitus, anterolateral view.

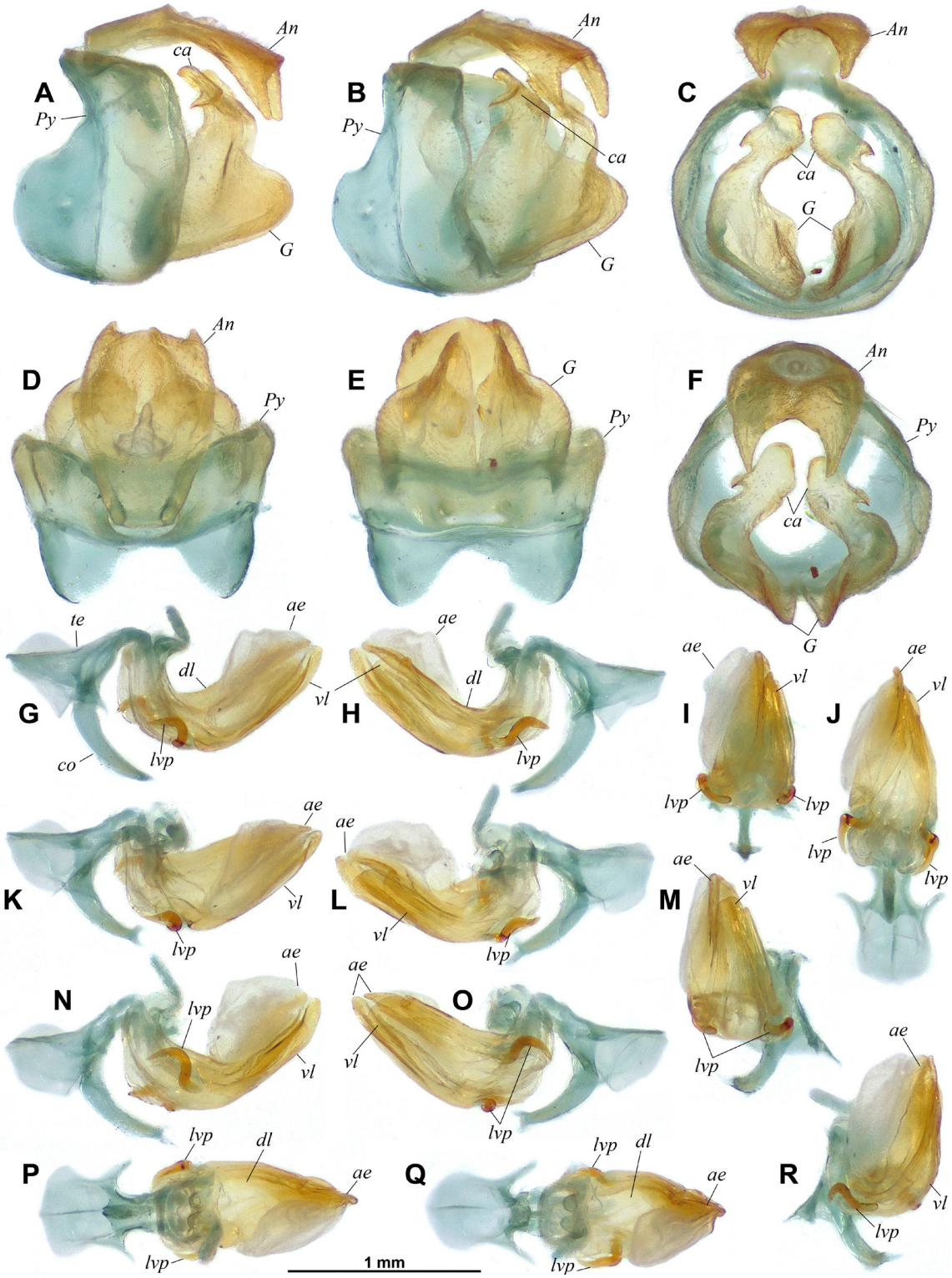

Fig. 24. *Ishiharanus dinhanus* sp. nov., holotype, ♂ (VNMN), terminalia. **A–F**. Pygofer, anal tube and gonostyli. **A**. Left lateral view. **B**. Posterolateral view. **C**. Caudal view. **D**. Dorsal view. **E**. Ventral view. **F**. Posterodorsal view. **G–R**. Aedeagus. **G**. Left lateral view. **H**. Right lateral view. **I**. Caudal view. **J**. Ventral view. **K**. Left laterodorsal view. **L**. Right laterodorsal view. **M**. Right posterolateral view. **N**. Left lateroventral view. **O**. Right lateroventral view. **P**. Dorsal view. **Q**. Anterodorsal view. **R**. Left posterolateral view. Abbreviations: see Material and methods.

Tegmina (Figs 23A–B, D, F, 25). Strongly convex; about 1.2 times as long as broad when taken together in dorsal view; slightly concave at basicostal angle; rugulose with dense reticulum of weakly raised veins and veinlets; main veins weakly distinct; dark brown with paler band along costal, postclaval and apical margins; veins in paler band bright straw yellow; in dark portion, 3 large, bright straw yellow markings: one elongate at base, including basal cell, one elongate, quite dorsal, at midlength, one smaller and weakly elongate in distal ⅓; some longitudinal veins marked with straw yellow, departing from basal marking and reaching to ⅔ of length.

Hind wings (Fig. 23C). Brown, unilobed, with veins darker than cells; elongate, slightly shorter than tegmina. Venation reticulate with main longitudinal veins distinct basally (C, ScP+R, MP, CuA); numerous cross-veinlets. Anal area obsolete. Costal margin sinuate, cubital margin broadly rounded, distal margin rounded.

Legs (Fig. 23A–B, D–F). Elongate and slender; femora wider and shorter than corresponding tibiae, dark brown turning more or less paler towards apex; pro- and mesotibiae pale yellowish with black line along externoventral carina; metatibiae yellowish brown with black spines. Metatibiae with 2 lateral spines on distal half and 6 apical spines. Metatibiotarsal formula: (2)6/8/2.

Abdomen. Yellow brown.

Male terminalia. Pygofer (*Py* – Fig. 24A–F) 2.7 times as high as long in lateral view; in lateral view, dorsal margin nearly horizontal followed posteriorly by rounded angle and strongly oblique slope leading to moderate, rounded angle protruding posterad at half height; ventral half slightly obliquely bisinuate; more or less circular in caudal view. Gonostyli (*G* – Fig. 24A–F) in lateral view with ventral margin broadly rounded, posterior margin rounded, projecting caudad, dorsal margin oblique, slightly bisinuate basally, then upcurved to neck of capitulum; capitulum (*ca*) with elongate, twisted neck, directed dorsocephalad in lateral view, subspatulate with upper angle rounded and directed mesodorsad in caudal view, with small, rather blunt tooth at anterodorsal angle followed posterad by carina on external side strongly recurved cephalad and ending in a tooth projecting cephalad in lateral view; in caudal view deep, round emargination under carina. Anal tube (*An* – Fig. 24A–F) elongate; in dorsal view about 1.50 times as long in midline as wide, suboval in shape with apical margin strongly bisinuate, dorsoventrally flattened with posterior angles projecting posteroventrad; in lateral view, anal tube curved posteroventrad; apical margin deeply, roundly emarginate in caudal view. Aedeagus curved posterodorsally and twisted, rather simple, asymmetrical (Fig. 24G–R); lateroventral processes of aedeagus (*lvp* – Fig. 24G–R) rather short, apically pointed, strongly sinuate, with basal portion curved anterolaterad, then recurved anteromesad; ventral lobe of periandrium (*vl*) well developed, shorter than aedeagus, shifted to the right and regularly tapering towards roundly truncate apex; dorsal lobe of periandrium (*dl*) shorter than aedeagus; aedeagus largely membranous with pair of elongate, roundly pointed processes. Connective (*co*) well developed and curved, with tectiductus (*te*) well developed, with widely open foramen.

Biology

Ishiharanus dinhanus sp. nov. (Fig. 25) was collected in the months of May to July and in September on lower vegetation and bushes, in moist evergreen tropical mountain forest, only at higher altitude between about 1300 and 1400 m a.s.l. in Bach Ma National Park, at the “summit” area (Figs 2A(5), 4B) collecting site.

Distribution

Vietnam: Thừa Thiên-Huế Province (Bach Ma National Park) (Fig. 1).

Fig. 25. *Ishiharanus dinhanus* sp. nov., live specimen from Bach Ma National Park summit, 19 May 2023, photographed in cage. **A**. Dorsal view. **B**. Laterodorsal view.

Ishiharanus iguchii (Matsumura, 1916)
Figs 1, 2A, 4B, 26–28

Gergithus igushii [sic!] Matsumura, 1916: 98 (described).

Gergithus iguchii – Matsumura 1916: 86, 97, 116 (listed), 118 (key). — Esaki 1932: [1797], pl. 13 fig. 1 (described, illustrated); 1950: 322 (described), fig. 867 (illustrated). — Esaki *et al.* 1938: 65, pl. 29 fig. 113-2 (described, illustrated). — Fennah 1956: 506 (described, recorded from China, Che Kiang province, now Zhejiang), figs 17e–f (head and thorax), 19A (tegmen); 1978: 265 (recorded from Vietnam, Ninh Binh Province). — Metcalf 1958: 130 (catalogued). — Ishihara 1965: 131 (described), pl. 66 fig. 8 (dorsal habitus). — Chou *et al*. 1985: 124 (redescribed), fig. 116 (habitus, frons). — Che *et al*. 2007: 612 (transferred back from *Ishiharanus* to *Gergithus*). — Zhang & Che 2009: 182 (listed). — Meng & Wang 2012: 5 (in key to species of *Gergithus*). — Gnezdilov & Constant 2012: 573 (listed from Vietnam). — Chen *et al*. 2014: 52 (redescribed), fig. 2-16 (habitus, details, male terminalia). — Gnezdilov *et al*. 2014a: 93 (recorded from Hoa Binh Province, Vietnam). — Constant & Pham 2016: 2 (notes). — Hayashi & Fujinuma 2016: 352 (listed, distribution).

Ishiharanus iguchii – Hori 1969: 60 (transferred to *Ishiharanus*, records from Japan), fig. 2, 1–4 (dorsal head and thorax, frons, aedeagus, anal tube), pl. 3 fig. 6 (dorsal habitus). — Gnezdilov 2018: 1343 (transferred back to *Ishiharanus* from *Gnezdilovius* Meng, Webb & Wang, 2017), figs 18–23 (head and male terminalia). — Constant & Pham 2024a: 78 (in list of Issidae from Vietnam).

Gnezdilovius iguchii – Meng *et al*. 2017: 18, 22 (transferred to *Gnezdilovius*), fig. 7g–h (head). — Zhang *et al*. 2020: 205 (in key in Chinese), 237 (described), 548 (in key in English), fig. 84 (head, wings, male and female terminalia), pl. 18a–c (habitus, frons).

Diagnosis

Ishiharanus iguchii (Matsumura, 1916) can be recognized by:

(1) its colour pattern with frons chestnut brown and clypeus black, separated by distinct whitish line on suture and tegmina bright orange or red with large black markings, variable, from showing black markings merging together to completely black dorsally (Figs 26, 28A–B);
(2) the profemora colour divided into three broad bands, successively from base to apex, black, pale yellow and chestnut/dark brown (Figs 26B, D, G, 28G);
(3) the anal tube in dorsal view about 1.31 times as long in midline as wide, suboval in shape with apical margin bisinuate (*An* – Fig. 27D);
(4) the lateroventral processes of the aedeagus symmetrical (*lvp* – Fig. 27N–O, S), curved following curvature of aedeagus and more or less C-shaped and apically pointing laterad.

Differential diagnosis

The species is immediately separated from the other species of *Ishiharanus* by its unique colour pattern in the spotted form (Fig. 26A, C). The dark brown/black form (Figs 26G, 28B) is superficially similar to the black form of *Melichergithus gravidus* (Melichar, 1906) but can be separated by having a narrower, longer than wide, frons (1.18 times as long in midline as wide), while it is wider than long in midline (0.85 times as long in midline as wide) in *M. gravidus* (Constant & Pham 2024a: fig. 14).

Material examined

JAPAN • 1 ♂; Honshu, Nara, forest above Nara Park; [34°41′06″ N, 135°51′00″ E]; 200–250 m a.s.l.; 3 Oct. 1994; C. Lienhard leg.; MHNG.

VIETNAM • 1 ♂; Thừa Thiên-Huế Province, Bach Ma National Park, stairs going up to Hai Vong Dai; 16°11′53.77″ N, 107°51′26.92″ E; 1272 m a.s.l.; May 2023; [by] net; Hoai leg.; VNMN • 1 ♂, 1 ♀; Thừa Thiên-Huế Province, Bach Ma National Park, summit; 16°11′18″ N, 107°50′56″ E; 1300–1400 m a.s.l.; 11–21 May 2023; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS • 3 ♂♂; Ninh Binh Province, Cuc Phuong National Park; 20°20′53″ N, 105°35′52″ E; 5–7 Apr. 2017; J. Constant and J. Bresseel leg.; I.G.: 33.447; RBINS • 1 ♂; Ninh Binh Province, Cuc Phuong National Park; 20°19′00″ N, 105°36′30″ E; 19–23 Jul. 2011; J. Constant and J. Bresseel leg.; I.G.: 31.933; RBINS • 1 ♂; Ninh Binh Province, Cuc Phuong National Park; 20°20′53″ N, 105°35′52″ E; 28 Apr. 2018; H.T. Pham leg.; VNMN • 2 ♀♀; Ninh Binh Province, Cuc Phuong [National Park]; 20°20′55″ N, 105°35′52″ E; 413 m a.s.l.; 16 Sep. 2015; forest; A. Soulier-Perkins leg.; MNHN (EH 24627 and 24637) • 1 ♂; Ninh Binh Province, Cuc Phuong National Park; 20°19′21″ N, 105°37′36″ E; 200 m a.s.l.; 3–5 May 2014; L. Bartolozzi, G. Chelazzi, A. Bandinelli, S. Bambi and F. Fabiano leg.; n° Magazz. 2978; MZUF • 1 ♂; Ninh Binh Province, Cuc Phuong National Park, near Bong Center; 20°21′05″ N, 105°35′30″ E; 385 m a.s.l.; 19–22 May 2019; L. Bartolozzi and S. Bambi leg.; n° Magazz. 3121; MZUF • 1 ♂; Hai Phong Province, Cat Ba National Park; [20°47′50″ N, 107°24′25″ E]; 17 Jul. 2003; H.T. Pham leg.; VNMN • 2 ♀♀; Hoa Binh Province, [Ngoc Son-] Ngo Luong Nature Reserve; 20°26′16″ N, 105°20′15″ E; 25–30 Jul. 2016; GTI Project; J. Constant and J. Bresseel leg.; I.G.: 33.282; RBINS • 1 ♂, 8 ♀♀; Thanh Hoa Province, Pu Hu Nature Reserve, near Yên; 20°28′50″ N, 104°52′32″ E; 2–5 Jul. 2023; J. Constant, J. Bresseel and L. Semeraro leg.; I.G.: 34.661; RBINS • 1 ♂; Ha Tinh Province, Vu Quang National Park, near Khe Chè station; 18°22′38″ N, 105°18′41″ E; 13–15 Jul. 2023; V.T. Trung and N.T.T. Hoai leg.; VNMN • 1 ♂; same data as for preceding; J. Constant, J. Bresseel and L. Semeraro leg.; I.G.: 34.661; RBINS • 2 ♂♂, 1 ♀; Hanoi Province, Ba Vi National Park; 21°04′04″ N, 105°21′30″ E; 25–29 Jul. 2015; daytime collecting; J. Constant and J. Bresseel leg.; I.G.: 33.092; RBINS.

Redescription

Measurements and ratios. LT: ♂ (n = 1): 5.3 mm, ♀ (n = 1): 5.8 mm; LT/BB = 1.12; LTg/BTg = 1.38; LW/BW = 1.84; BV/LV = 1.72; LF/BF = 1.18.

Head (Fig. 26A–E, G). Vertex broader than long in midline, yellow-brown with posterior margin weakly carinate; anterior margin convex, posterior one concave and lateral subparallel; disc shallowly excavate with weak median carina. Side of head yellowish brown with vertical black band under eye, reaching level of frontoclypeal suture but not including base of antenna, remaining posteroventral portion pale yellowish, prolongating band on frontoclypeal suture. Frons elongate and smooth, chestnut brown (dark brown in dark form) and clypeus black, separated by distinct whitish line on suture; base of anteclypeus pale yellowish, apex black. Labium brown with last segment longer than broad, and shorter than penultimate one. Scape short, ring-shaped, brown; pedicel bulbous, dark brown.

Thorax (Fig. 26A, C–E, G). Pronotum very short, less than a quarter length of mesonotum in midline; anterior and posterior margins carinate; disc concave with an impressed point on each side of median line, with extremely narrow lateral fields behind eyes; chestnut brown, black behind eyes, all dark brown/black in dark form. Mesonotum subtriangular, smooth, yellowish orange turning darker, brownish, in anterolateral angles, on scutellum and on transverse carina along anterior margin yellowish, all dark brown/black in dark form. Tegulae blackish brown.

Tegmina (Figs 26A, C, E, G, 28A–B). Strongly convex; as long as broad when taken together in dorsal view; slightly concave at basicostal angle; smooth with dense reticulum of weakly raised veins and veinlets; mains veins barely distinct basally; bright orange or red with large black markings: on each tegmen, one basal, three aligned, more or less fused, at basal third, two aligned with lateral one larger,

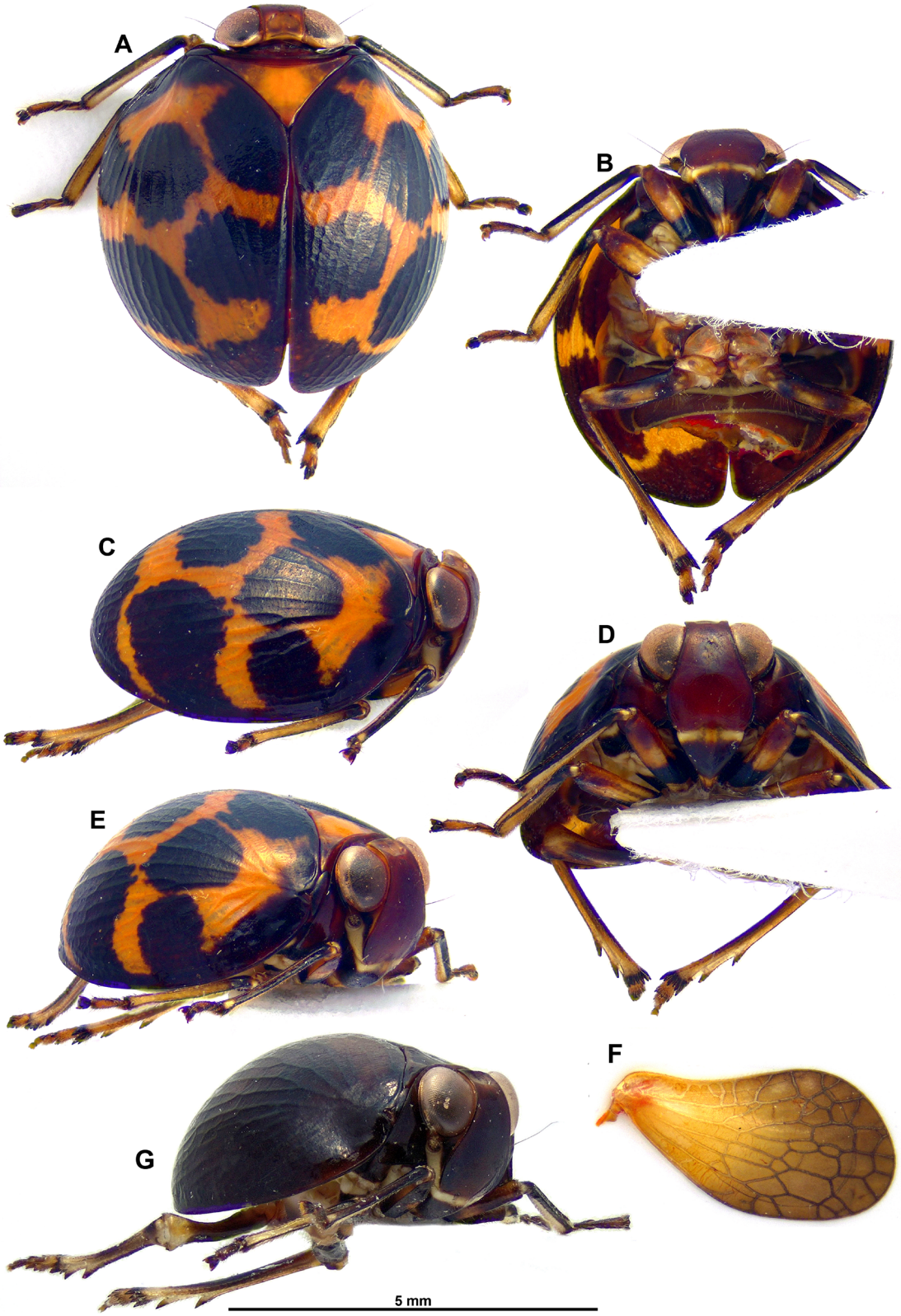

Fig. 26. *Ishiharanus iguchii* (Matsumura, 1916). **A–F**. Dissected ♂ (RBINS) from Bach Ma. **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. Habitus, lateral view. **D**. Habitus, perpendicular view of frons. **E**. Habitus, anterolateral view. **F**. Right hind wing. **G**. Dissected ♂ from Cuc Phuong (RBINS) , anterolateral view.

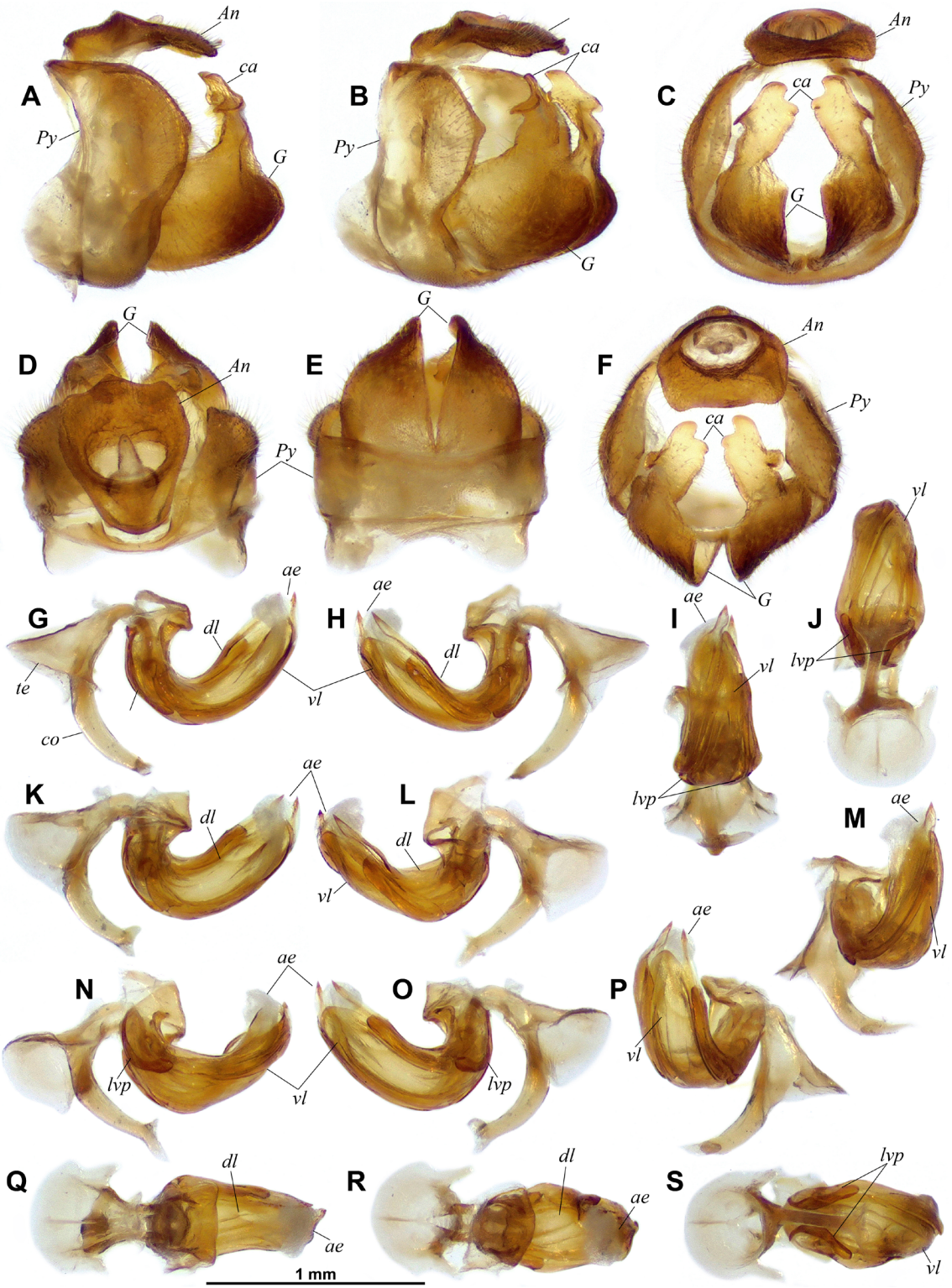

Fig. 27. *Ishiharanus iguchii* (Matsumura, 1916), ♂ (RBINS) from Cuc Phuong National Park, terminalia. **A–F**. Pygofer, anal tube and gonostyli. **A**. Lateral view. **B**. Posterolateral view. **C**. Caudal view. **D**. Dorsal view. **E**. Ventral view. **F**. Posterodorsal view. **G–S**. Aedeagus. **G**. Left lateral view. **H**. Right lateral view. **I**. Caudal view. **J**. Caudoventral view. **K**. Right laterodorsal view. **L**. Left posterolateral view. **M**. Left laterocaudal view. **N**. Left lateroventral view. **O**. Right lateroventral view. **P**. Right laterocaudal view. **Q**. Anterodorsal view. **R**. Dorsal view. **S**. Ventral view. Abbreviations: see Material and methods.

slightly beyond half-length, one apical; costal and postclaval margins bordered with black, all dark brown/black in dark form.

Hind wings (Fig. 26F). Yellow brown, turning to brown in distal half, unilobed, with veins darker than cells in brown area; elongate, about 1.85 times as long as wide, slightly shorter than tegmina. Venation reticulate with main longitudinal veins distinct basally (C, ScP+R, MP, CuA); numerous cross-veinlets. Anal area obsolete. Costal margin sinuate, cubital margin broadly rounded, distal margin rounded.

Legs (Fig. 26A–E, G). Elongate and slender; pro- and mesofemora wider and shorter than corresponding tibiae, colour divided into three broad bands, successively from base to apex, black, pale yellow and chestnut brown, more contratsed on profemora; pro- and mesotibiae pale yellowish with basal ring and line along externoventral carina, black; metafemora variegated yellowish brown and black-brown; metatibiae yellowish brown with black spines. Metatibiae with 2 lateral spines on distal half and 6 apical spines. Metatibiotarsal formula: (2)6/8–9/2.

Abdomen (Fig. 26B). Brown.

Male terminalia. Pygofer (*Py* – Fig. 27A–F) 1.9 times as high as long in lateral view; in lateral view, dorsal margin horizontal followed posteriorly by rounded angle and oblique slope leading to abrupt, obtuse angle protruding posterad at upper ⅓; ventral ⅔ obliquely bisinuate; more or less circular in caudal view. Gonostyli (*G* – Fig. 27A–F) robust in lateral view, with ventral margin broadly rounded in lateral view, posterior margin with middle portion projecting caudad, dorsal margin oblique basally, then upcurved to neck of capitulum; capitulum (*ca*) with elongate, twisted neck, directed dorsocephalad in lateral view, subrectangular with upper angle rounded and directed mesodorsad in caudal view, with small tooth at anterodorsal angle followed posterad by carina on external side curved cephalad at a right angle and ending in a tooth projecting cephalad in lateral view, in caudal view with deep, round emargination under carina. Anal tube (*An* – Fig. 27A–D, F) rather short; in dorsal view about 1.31 times as long in midline as wide, suboval in shape with apical margin distinctly bisinuate, dorsoventrally flattened; in lateral view, anal tube weakly curved posteroventrad; apical margin straight in caudal view. Aedeagus curved posterodorsally and twisted, rather simple (Fig. 27G–S); lateroventral processes of aedeagus symmetrical (*lvp*), curved following curvature of aedeagus and more or less C-shaped and apically pointing laterad; ventral lobe of periandrium (*vl*) well developed, lanceolate and ending in rounded angle, shorter than aedeagus; dorsal lobe of periandrium (*dl*) shorter than aedeagus; aedeagus largely membranous with pair of elongate, pointed processes. Connective (*co*) well developed and curved, with tectiductus (*te*) well developed, with widely open foramen.

Biology

Ishiharanus iguchii was collected in April, May, July and October on lower vegetation and bushes (Fig. 28A–B), in moist evergreen tropical forest, at altitudes between 200 and 1400 m a.s.l.; in Bach Ma National Park it was only found at higher altitude between about 1300 and 1400 m a.s.l. at the “summit” area (Figs 2A(5), 4B) collecting site.

Distribution

China: Fujian, Guangdong and Zhejiang; Japan: Honshu, Kyushu, Shikoku; Korean Peninsula; Vietnam (Fig. 28C): Hanoi capital*, provinces of Ha Tinh*, Hai Phong*, Hoa Binh, Ninh Binh, Thanh Hoa*, Thừa Thiên-Huế* (* = new province records).

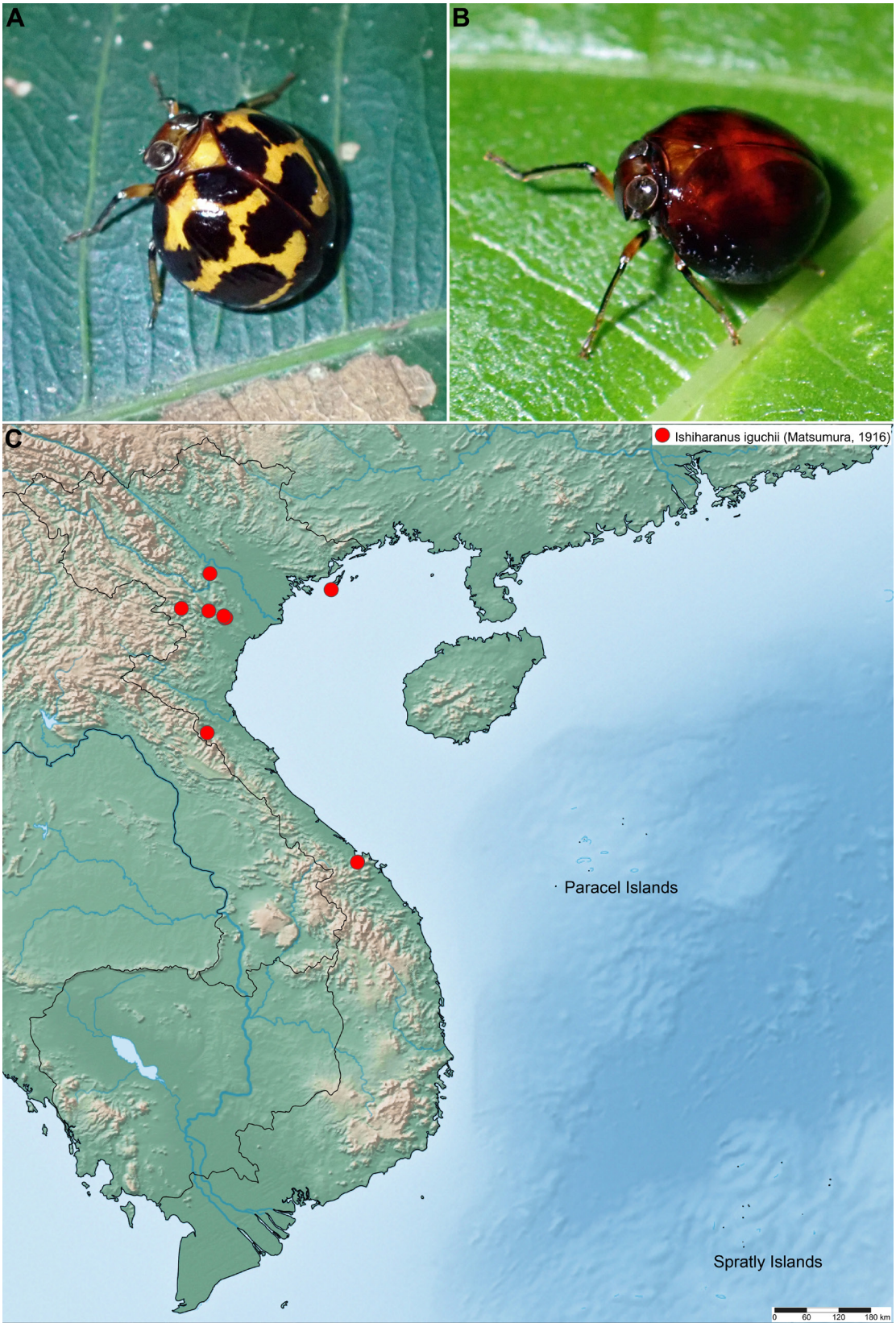

Fig. 28. *Ishiharanus iguchii* (Matsumura, 1916). **A**. Live specimen, spotted morph, Bach Ma National Park, roadside near summit, 21 May 2023. **B**. Live specimen, dark brown morph, Pu Hu Nature Reserve, 5 Jul. 2023. **C**. Distribution in Vietnam.

Ishiharanus pulchellus sp. nov.
urn:lsid:zoobank.org:act:63484DED-CA93-4F5C-A0E8-20EDDDDC9DDE
Figs 2A, 3A, 4B, 5B, 29–35

Diagnosis

Ishiharanus pulchellus sp. nov. can be recognized by:

(1) its colour pattern with the dorsum more or less dark brown, with round yellow markings on the disc of the tegmina more or less distinct (according to colour form, not visible in dark specimens) and two pale yellow concentric lines parallel to posterior margin (Figs 29A, C, 30A, C, 31A, C, G);
(2) the profemora pale yellow with basal and apical black brown rings (Fig. 29B, D);
(3) the anal tube, in dorsal view, about 1.64 times as long in midline as wide, rather elongate with curved sides, and with apical margin moderately excavate and bisinuate (*An* – Fig. 32D);
(4) the lateroventral processes of the aedeagus showing two pointed, moderately curved, elongate portions, one directed cephalad and the other directed posteroventrad (*lvp* – Figs 32G–L, 33H–I).

Differential diagnosis

The closest species, sharing some colouration characters of *I. pulchellus* sp. nov. (in its paler forms), is *I. dinhanus* sp. nov. which also shows pale yellow markings on the mesonotum and on tegmina. However, *I. pulchellus* is smaller: LT: ♂: 4.1–4.6 mm, ♀: 4.1–4.9 mm, as compared to LT: ♂: 5.1–5.2 mm, ♀ 5.5–5.9 mm in *I. dinhanus*; *I. pulchellus* shows profemora pale yellow with basal and apical black brown rings (Fig. 29B, D), while in *I. dinhanus* they are dark brown, turning slightly paler towards apex (Fig. 26B, E), and *I. pulchellus* shows round yellow markings on the disc of the tegmina, more or less distinct (according to colour form, not visible in dark specimens), and two pale yellow concentric lines parallel to the posterior margin (Figs 29A, C, 30A, C, 31A, C, G), while in *I. dinhanus* the brown tegmina show three bright, elongate, pale yellow markings but no concentric lines parllel to the posterior margin (Fig. 26A, D). The two species also clearly differ in the shape of the lateroventral processes of the aedeagus, which in *I. pulchellus* show two pointed, moderately curved, elongate portions, one directed cephalad and the other directed posteroventrad (*lvp* – Figs 32G–L, 33H–I), while in *I. dinhanus* they are rather short, apically pointed, strongly sinuate and generally directed cephalad (*lvp* – Fig. 27G–R).

Etymology

The species epithet '*pulchellus*' is a Latin adjective that means 'small and beautiful, pretty' and it refers to the small size and colour pattern of this species.

Material examined

Holotype

VIETNAM • ♂ (dissected); Thừa Thiên-Huế Province, Bach Ma National Park, summit; 16°12′ N, 107°52′ E; 15–16 Jul. 2011; daytime collecting; J. Constant and J. Bresseel leg.; I.G.: 31.933; VNMN.

Paratypes

VIETNAM • 4 ♂♂, 4 ♀♀; same collection data as for holotype; RBINS • 1 ♂, 1 ♀; same collection data as for holotype; VNMN • 1 ♀; Thừa Thiên-Huế Province, Bach Ma National Park; 16°12′ N, 107°52′ E; 12–17 Jul. 2011; daytime collecting; J. Constant and J. Bresseel leg.; I.G.: 31.933; RBINS • 1 ♀; Thừa Thiên-Huế Province, Bach Ma National Park, [pheasant trail]; 16°12′ N, 107°52′ E; 10–16 Apr. 2017; J. Constant and J. Bresseel leg.; I.G.: 33.447; RBINS • 1 ♂; Thừa Thiên-Huế Province, Bach Ma National Park, summit; 16°11′18″ N, 107°50′56″ E; 1300–1400 m a.s.l.; 11–21 May 2023; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS • 2 ♂♂, 4 ♀♀; Thừa Thiên-Huế Province, Bach Ma National Park, pheasant trail; 16°13′38″ N, 107°51′20″ E; 500–600 m a.s.l.; 10–20 May 2023; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS • 1 ♀; Thừa Thiên-Huế Province, Bach Ma National Park;

16.193° N, 107.853° E; 1250 m a.s.l.; 28 May–1 Jun. 2017; L. Bartolozzi, E. Orbach, V. Sbordoni, S. Bambi and A. Bandinelli leg.; numero Mag. 3089; MZUF • 1 ♀; Thừa Thiên-Huế Province, Bach Ma National Park, Xue Su; [16°14′10″ N, 107°52′44″ E]; 2022; near stream; V.T. Trung leg.; VNMN • 1 ♀; Thừa Thiên-Huế Province, Bach Ma National Park, Rhododendron trail; 19 Mar. 2023; 1158 m a.s.l.; V.T. Trung leg.; VNMN • 2 ♂♂, 1 ♀; Thừa Thiên-Huế Province, Bach Ma National Park, summit; 16°11′18″ N, 107°50′56″ E; 20 Oct. 2024; 1200–1400m; J. Constant, L. Semeraro, Hoai T.T. Nguyen leg.; I.G.: 34893; RBINS • 2 ♂♂, 3 ♀♀; Thừa Thiên-Huế Province, Bach Ma National Park, stairs going up to Hai Vong Dai; 16°11′53.77″ N, 107°51′26.92″ E; 1272 m a.s.l.; 16 Sep. 2024; by net; Hoai T.T. Nguyen leg.; VNMN • 6 ♂♂, 2 ♀♀; Thừa Thiên-Huế Province, Phong Dien District; 16°30′27″ N, 107°16′05″ E; 350–400 m a.s.l.; 23 May 2023; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS • 1 ♂, 2 ♀♀; Thừa Thiên-Huế Province, A Luoi, A Roang; [16°07′04″ N, 107°24′19″ E]; 600–700 m a.s.l.; 4 May 2005; H.T. Pham leg.; Ho.1583, 1586, 1587; VNMN • 2 ♂♂, 4 ♀♀; Gia Lai Province, Kon Chu Rang Nature Reserve; 14°28′28″ N, 108°32′27″ E; 600–1200 m a.s.l.; 13–20 Jul. 2018; GTI Project; J. Constant, J. Bresseel and X. Vermeersch leg.; I.G.: 33.769; RBINS • 1 ♂, 1 ♀; same collection data as for preceding; VNMN • 1 ♂, 1 ♀; Quang Tri Province, Dak Rong, Ta Rut; [16°25′49″ N, 106°58′55″ E]; 500 m a.s.l.; 17 Jul. 2004; H.T. Pham leg.; Ho.0120, 121; VNMN • 1 ♂; Quang Nam Province, Nam Giang, Ta Bhinh; [15°39′36″ N, 107°40′30″ E]; 100–250 m a.s.l.; 30 Apr. 2005; H.T. Pham leg.; Ho.1610; VNMN • 1 ♂; Quang Nam Province, Song Thanh National Park, Phuoc My District; 15°19′31″ N, 107°44′13″ E; 430–800m; 15–17 Oct. 2024; J. Constant, L. Semeraro and Hoai T.T. Nguyen leg.; VNMN • 1 ♂; same data as for preceding; I.G.: 34893; RBINS.

Description

Measurements and ratios. LT: ♂ (n = 5): 4.3 mm (4.1–4.6), ♀ (n = 5): 4.6 mm (4.1–4.9); LT/BB = 1.38; LTg/BTg = 1.60; LW/BW = 1.81; BV/LV = 1.84; LF/BF = 1.28.

Head (Figs 29A–E, 30A–E, 31A–E). Vertex broader than long in midline, bright pale yellow with anterior portion brown, with posterior margin weakly carinate; anterior margin convex, posterior one concave and lateral one subparallel; disc shallowly excavate. Side of head brown with pale yellow marking from insertion of antennae to genoclypeal suture. Frons elongate and smooth, chestnut brown with distinct pale yellow band along frontoclypeal suture. Clypeus chestnut to blackish brown, yellowish apically. Labium yellow brown with last segment longer than broad, black tipped and shorter than penultimate. Scape short, ring-shaped, brown; pedicel bulbous, brown.

Thorax (Figs 29A, C–E, 30A, C–E, 31A, C–E). Pronotum very short, about one third the length of mesonotum in midline; anterior and posterior margins carinate; disc concave with an impressed point on each side of median line, with extremely narrow lateral fields behind eyes; chestnut brown with ventral portion of paranotal lobes blackish brown. Mesonotum subtriangular, smooth, with carina along anterior margin; colour varying from black-brown, with median brown line in darker forms, to bright straw yellow with anterolateral angles brown in paler forms. Tegulae brown.

Tegmina (Figs 29A, C, E, 30A, C, E, 31A, C, E, G). Strongly convex; about 1.1–1.2 times as long as broad when taken together in dorsal view; slightly concave at basicostal angle; slightly rugulose with dense reticulum of weakly raised veins and veinlets; main veins weakly distinct; dark brown with yellowish markings more or less developed depending on colour forms; usuallly one rather large basal marking, one round marking at midlength in dorsal portion and one anteapical along postclaval margin, the latter merging with apex of two subparallel, concentric lines following costal and apical margins, apical margin lined with black; in dark forms, pale markings may be reduced to only more external yellowish line along posterior margin; in pale forms, basal marking expanded and merging with first concentric line, leaving dark brown area forming a circle around dorsal yellowish spot.

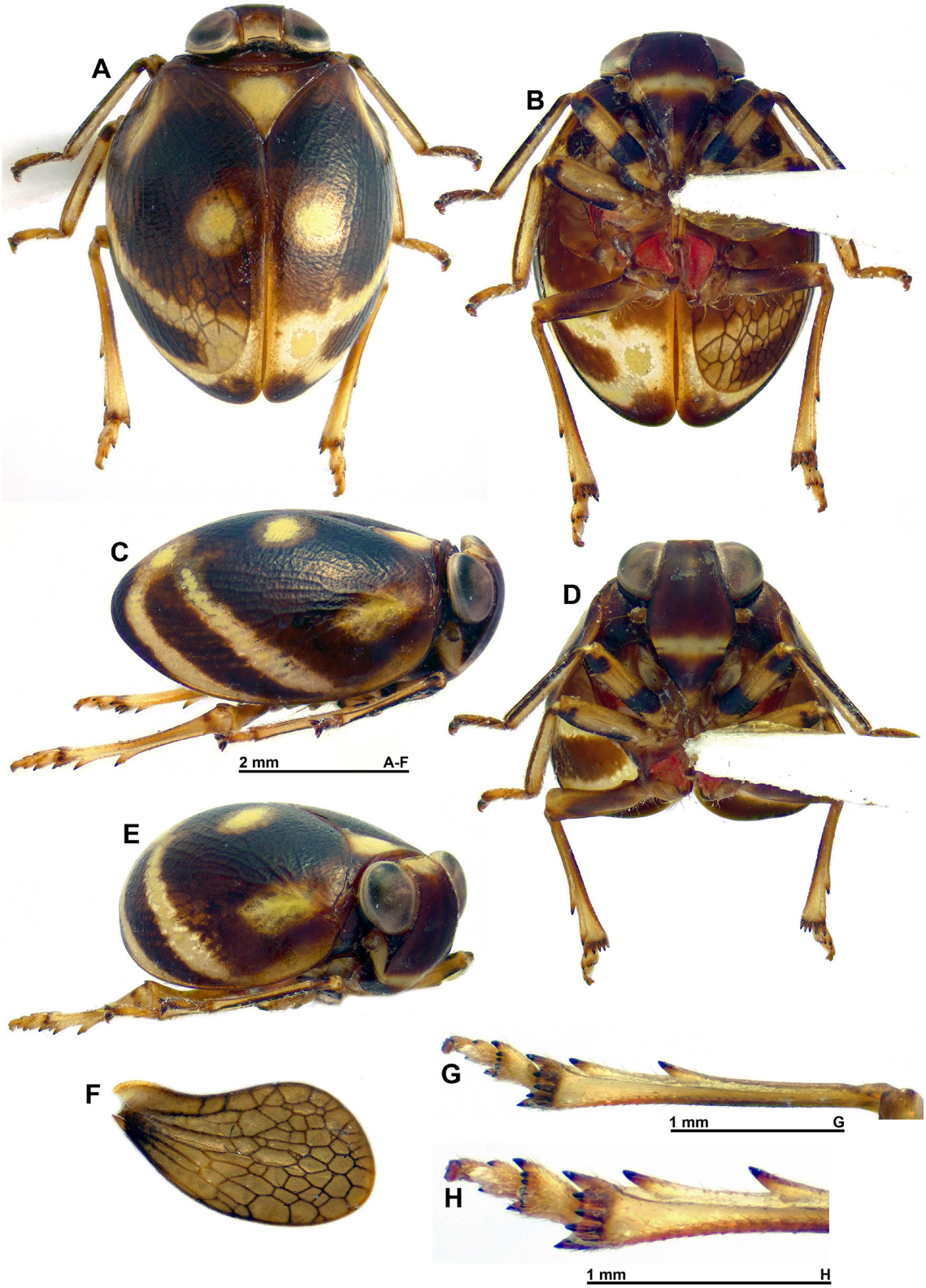

Fig. 29. *Ishiharanus pulchellus* sp. nov., dissected holotype, ♂ (VNMN). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. Habitus, lateral view. **D**. Habitus, perpendicular view of frons. **E**. Habitus, anterolateral view. **F**. Right hind wing. **G**. Right hind leg, ventral view. **H**. Metatarsus and apex of metatibia, ventral view.

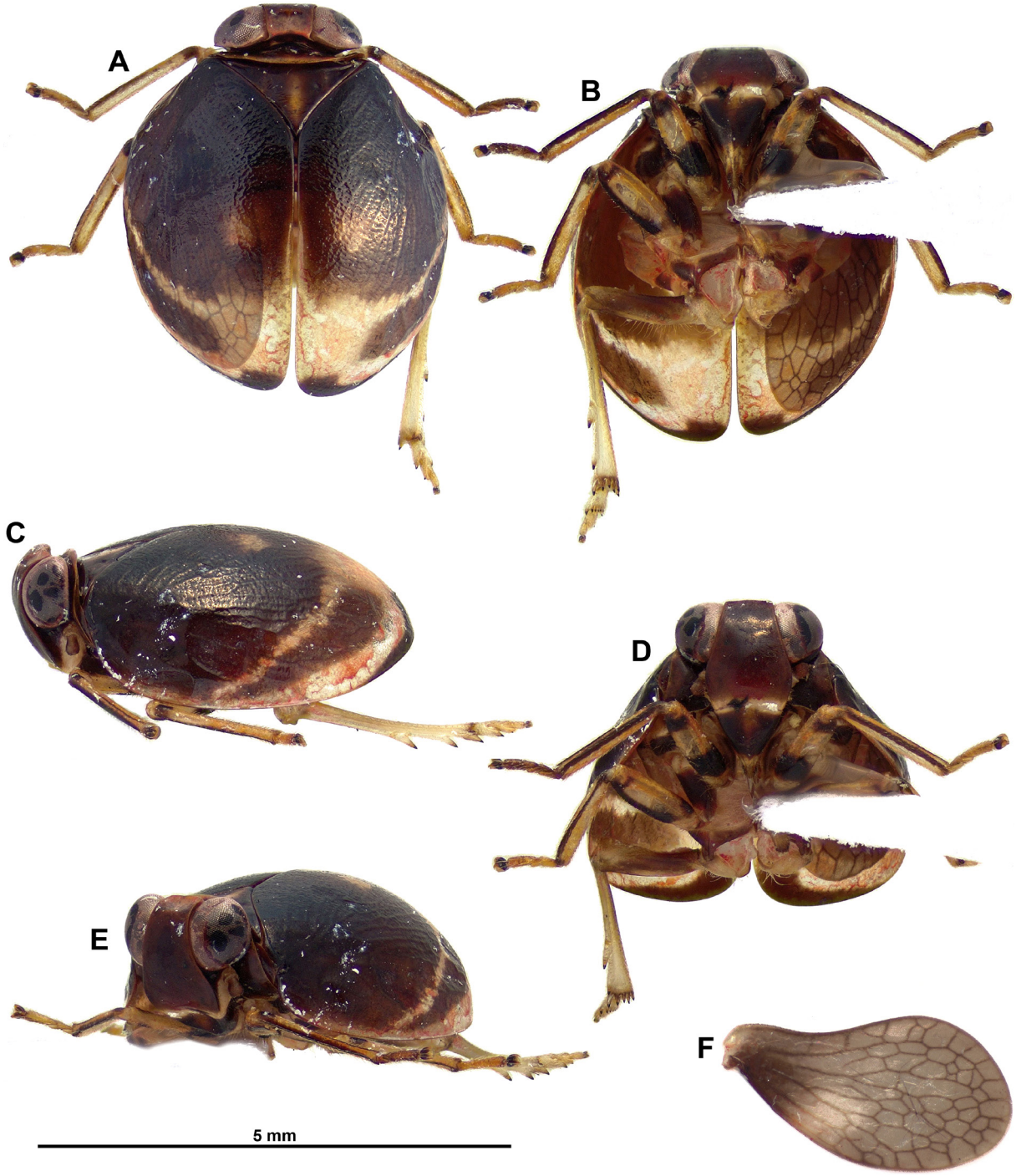

Fig. 30. *Ishiharanus pulchellus* sp. nov., dissected paratype, ♂ (RBINS) from Bach Ma National Park, dark morph. **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. Habitus, lateral view. **D**. Habitus, perpendicular view of frons. **E**. Habitus, anterolateral view. **F**. Right hind wing.

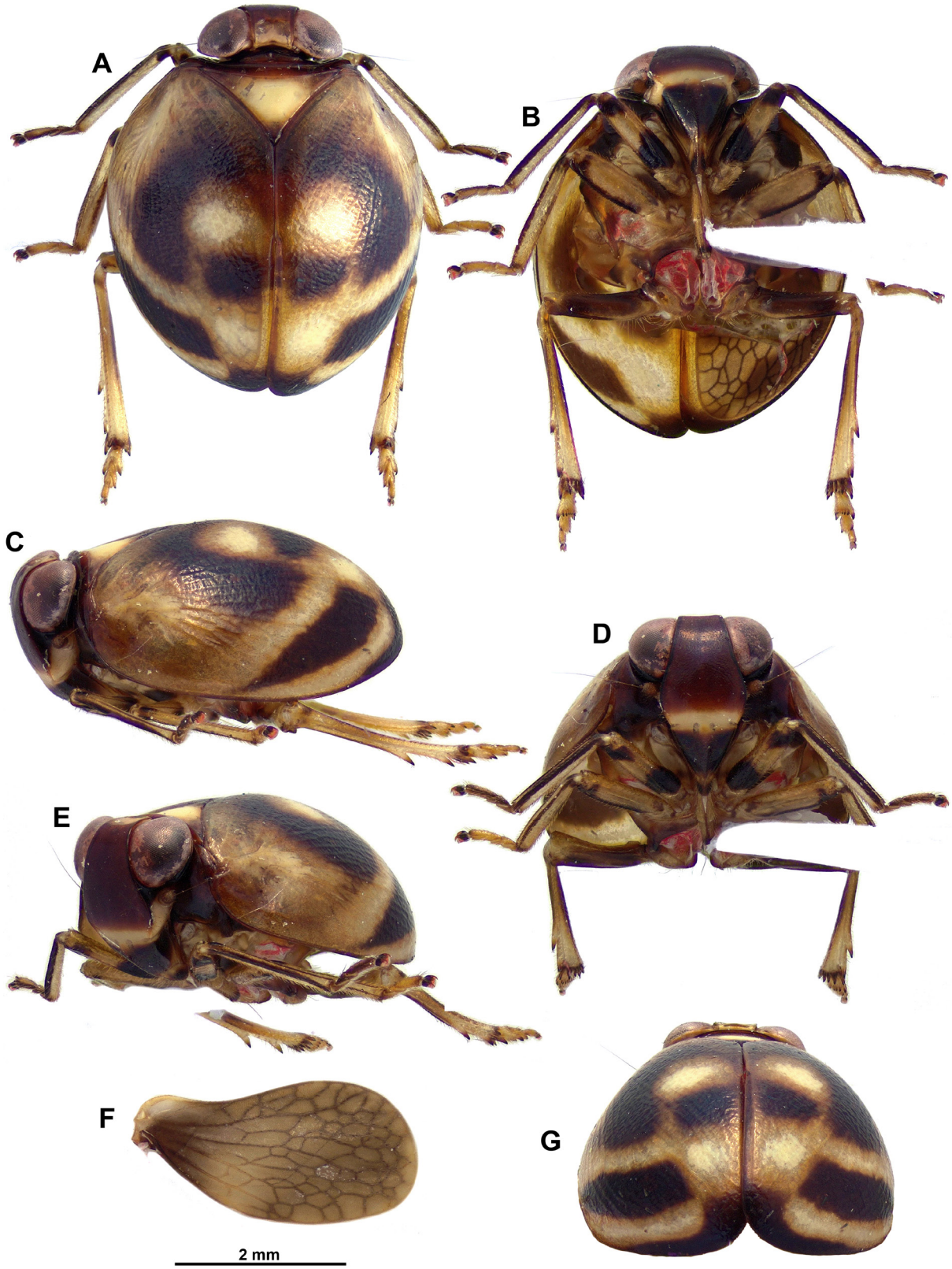

Fig. 31. *Ishiharanus pulchellus* sp. nov., dissected paratype, ♂ (RBINS) from Kon Chu Rang National Park, pale morph. **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. Habitus, lateral view. **D**. Habitus, perpendicular view of frons. **E**. Habitus, anterolateral view. **F**. Right hind wing. **G**. Caudal view.

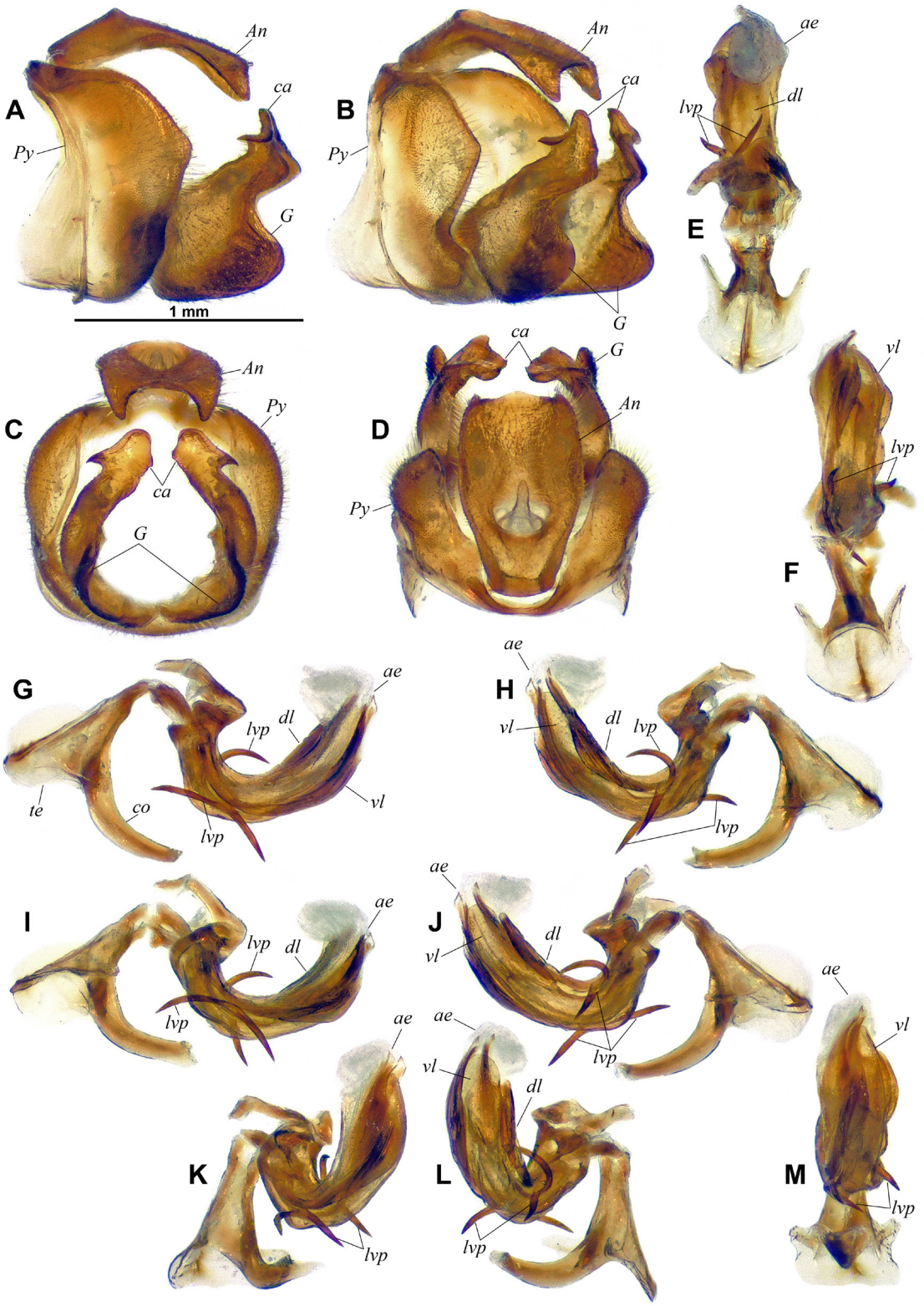

Fig. 32. *Ishiharanus pulchellus* sp. nov., dissected holotype, ♂ (VNMN), terminalia. **A–D**. Pygofer, anal tube and gonostyli. **A**. Left lateral view. **B**. Posterolateral view. **C**. Caudal view. **D**. Dorsal view. **E–M**. Aedeagus. **E**. Dorsal view. **F**. Ventral view. **G**. Left lateral view. **H**. Right lateral view. **I**. Left lateroventral view. **J**. Right lateroventral view. **K**. Left posterolateral view. **L**. Right posterolateral view. **M**. Caudal view. Abbreviations: see Material and methods.

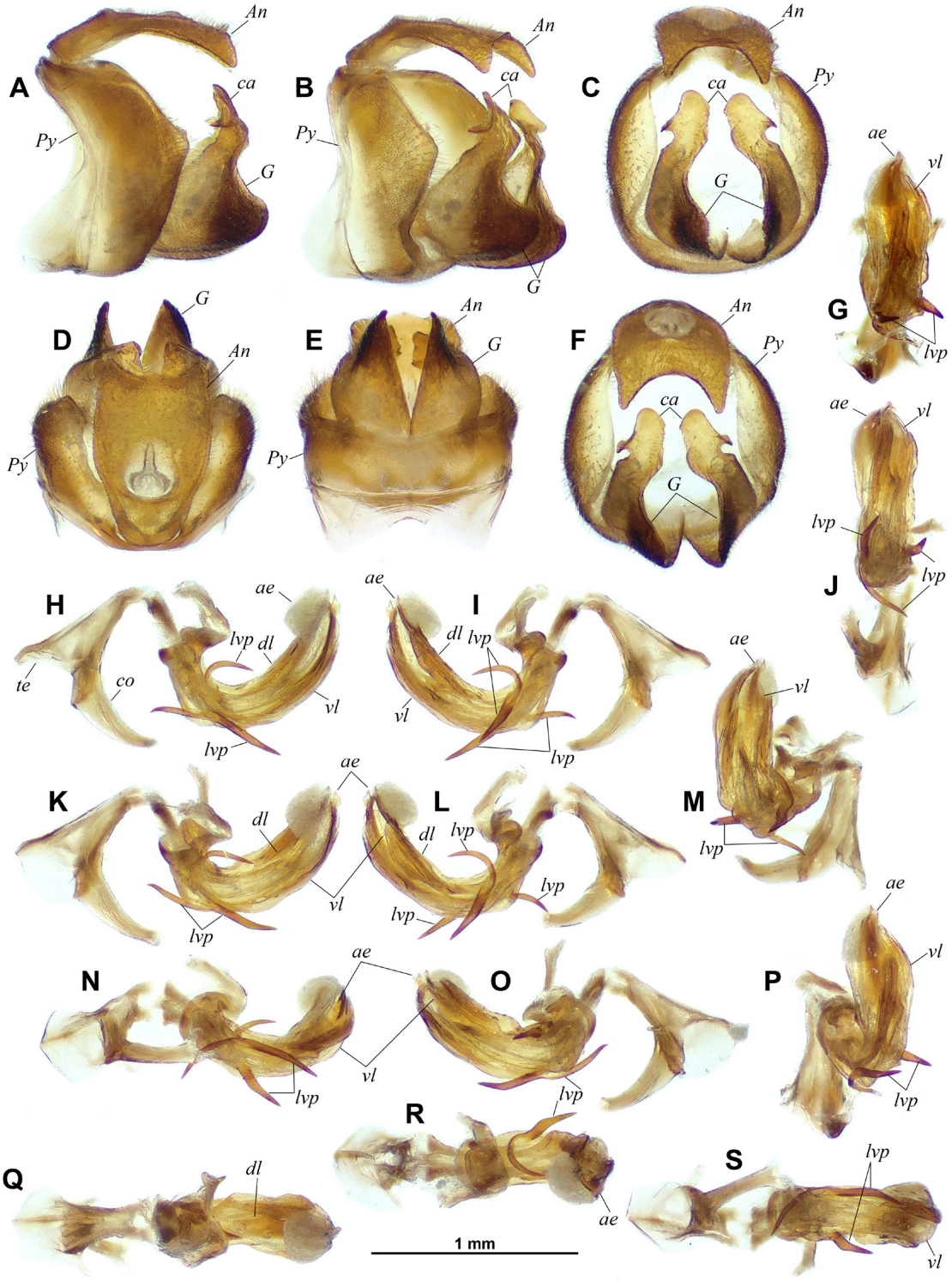

Fig. 33. *Ishiharanus pulchellus* sp. nov., paratype, ♂ (RBINS) from Kon Chu Rang National Park, pale morph, terminalia. **A–F**. Pygofer, anal tube and gonostyli. **A**. Left lateral view. **B**. Posterolateral view. **C**. Caudal view. **D**. Dorsal view. **E**. Ventral view. **F**. Posterodorsal view. **G–S**. Aedeagus. **G**. Caudal view. **H**. Left lateral view. **I**. Right lateral view. **J**. Posteroventral view. **K**. Left laterodorsal view. **L**. Right laterodorsal view. **M**. Right posterolateral view. **N**. Left lateroventral view. **O**. Right lateroventral view. **P**. Left posterolateral view. **Q**. Dorsal view. **R**. Posterodorsal view. **S**. Ventral view. Abbreviations: see Material and methods.

Hind wings (Figs 29F, 30F, 31F). Brown, unilobed, with veins darker than cells; elongate, slightly shorter than tegmina. Venation reticulate with main longitudinal veins distinct basally (C, ScP+R, MP, CuA); numerous cross-veinlets. Anal area obsolete. Costal margin sinuate, cubital margin broadly rounded, distal margin rounded.

Legs (Figs 29A–B, G–H, 30A–B, 31A–B). Elongate and slender; femora wider and shorter than corresponding tibiae; profemora pale yellow with basal and apical black brown rings; mesofemora pale yellow with posterior margin lined with black and anteapical incomplete black ring; metafemora brown, turning yellowish towards base and apex; pro- and mesotibiae pale yellowish with black line along externoventral carina and basal blackish ring; pro- and mesotarsi yellowish with black onychium; metatibiae yellowish, darker (brown) in middle portion with black tipped spines. Metatibiae with 2 lateral spines on distal half and 6 apical spines. Metatibiotarsal formula: (2)6/8/2.

Abdomen. Yellow brown.

Male terminalia. Pygofer (*Py* – Figs 32A–D, 33A–F) 2.1 times as high as long in lateral view; in lateral view, dorsal margin nearly horizontal, weakly sinuate followed posteriorly by a distinct oblique slope leading to distinct rounded angle protruding posterad at half height; ventral half oblique; more or less circular in caudal view. Gonostyli (*G* – Figs 32A–D, 33A–F) in lateral view with ventral margin broadly rounded, posterior margin rounded, projecting caudad, dorsal margin oblique basally, prolongated to neck of capitulum; capitulum (*ca*) in lateral view with elongate, twisted neck, directed dorsocephalad, and with posterior margin strongly projecting posterad in a rounded straight angle, in caudal view subspatulate with upper angle rounded and directed mesodorsad, with small, rather blunt tooth at anterodorsal angle followed posterad by carina on external side strongly recurved cephalad and ending in a tooth projecting cephalad in lateral view, in caudal view with rather deep, round emargination under carina. Anal tube (*An* – Figs 32A–D, 33A–F) elongate; in dorsal view about 1.45–1.60 times as long in midline as wide, regularly widening from base to basal ⅖, then subparallel (broadly rounded), with apical margin moderately bisinuate with middle portion upcurved; dorsoventrally flattened with posterior angles projecting posteroventrad; in lateral view, anal tube moderately curved posteroventrad; apical margin deeply, roundly emarginate in caudal view. Aedeagus curved posterodorsally and twisted, rather simple, asymmetrical (Figs 32E–M, 33G–S); lateroventral processes of aedeagus (*lvp* – Figs 32E–M, 33G–S) showing two pointed, moderately curved, elongate portions, one directed cephalad and the other directed posteroventrad; ventral lobe of periandrium (*vl*) well developed and elongate but shorter than aedeagus, shifted to the right and regularly tapering towards roundly truncate apex; dorsal lobe of periandrium (*dl*) shorter than aedeagus; aedeagus largely membranous with pair of elongate, strong, pointed processes. Connective (*co*) well developed and curved, with tectiductus (*te*) well developed, with widely open foramen and well developed crista.

Biology

Ishiharanus pulchellus sp. nov. was collected from March to July and in September and October at altitudes between 100 and 1400 m a.s.l., in moist evergreen tropical forest. The specimens were sitting on lower vegetation and bushes on small branches, and more often on leaves, and seemed to prefer smooth leaves. The species was found at the collection sites/habitats (Fig. 2A) ‘pheasant trail’ (Figs 2A(2), 3A) and ‘summit’ (Figs 2A(5), 4B) in Bach Ma National Park, as well as in Phong Dien District (Fig. 5B).

Distribution

Vietnam, Central Annamites: provinces of Thừa Thiên-Huế (Bach Ma National Park, Phong Dien District, A Roang), Gia Lai (Kon Chu Rang Nature Reserve), Quang Nam (Ta Bhinh, Song Thanh National Park) and Quang Tri (Da Krong National Park) (Fig. 35).

Fig. 34. *Ishiharanus pulchellus* sp. nov., live specimens. **A–D**. In Bach Ma National Park, summit trail. **A–B**. 19 May 2023. **C–D**. 20 May 2023. **E–H**. Phong Dien District, 23 May 2023.

Fig. 35. *Ishiharanus pulchellus* sp. nov., distribution map.

Genus ***Varisphaerius*** gen. nov.
urn:lsid:zoobank.org:act:AA5E3911-84F5-40AA-AF7D-8517BEBE6178

Type species

Varisphaerius hoaiae sp. nov., by present designation.

Diagnosis

Varisphaerius gen. nov. can be differentiated from all other genera of Hemisphaeriini by the following combination of characters:

(1) the hind wings unilobous, rather elongate and rudimentary;
(2) the strongly rounded costal margin of the tegmina (in dorsal view) and very convex body making the insect strongly hemispherical;

(3) the frons much longer than wide, smooth, without carina;
(4) the clypeus distinctly keeled in midline but not projecting cephaloventrad;
(5) the pro- and mesofemora without contrasting transverse black lines or rings;
(6) the pygofer without spine on posterior margin;
(7) the asymmetrical aedeagus with a basal lateral laminate process on each side of the periandrium;
(8) the pair of well developed, elongate lateroventral processes of the aedeagus.

Differential diagnosis

The most similar genera are *Ceratogergithus* Gnezdilov, 2018, *Gergithus* Stål, 1870, *Hemisphaerius* Schaum, 1850, *Ishiharanus* Hori, 1969, *Maculergithus* Constant & Pham, 2016 and *Melichergithus* Constant & Pham, 2024. However, *Varisphaerius* can be separated from all of these genera, except for *Hemisphaerius*, by its reduced hind wings. The character of possessing reduced hind wings is shared with *Hemisphaerius*, but *Varisphaerius* shows a much more elongate frons (1.4 times as long as wide vs 0.9–1.1 times in *Hemisphaerius*), a keeled clypeus (not keeled in *Hemisphaerius*), as well as a well developed pair of lateroventral processes of the aedeagus and a basal lateral laminate process on each side of the periandrium (all absent in *Hemisphaerius*).

Additionally, *Varisphaerius* gen. nov. can be separated:

(1) from *Ceratogergithus* by the absence of a spine on the posterior margin of the pygofer (always present in species of *Ceratogergithus*), by the strongly elongate frons (frons wider than long in *Ceratogergithus*), by the keeled clypeus (not keeled in *Ceratogergithus*) and by the lateral laminate processes of the periandrium (absent in *Ceratogergithus*);
(2) from *Gergithus* Stål, 1870 by the clypeus being keeled but not strongly projecting anteroventrally;
(3) from *Ishiharanus* by having a keeled clypeus (not keeled in *Ishiharanus*) and by the lateral laminate processes of the periandrium (absent in *Ishiharanus*);
(4) from *Maculergithus* by the strongly elongate frons (frons wider than long in *Maculergithus*) and by having a keeled clypeus (not keeled in *Maculergithus*);
(5) from *Melichergithus* by the strongly elongate frons (frons wider than long in *Melichergithus*) and by having a keeled clypeus (not keeled in *Melichergithus*).

Etymology

The genus name is formed from the combination of '*varius*' (adj., Latin) meaning 'diverse, various, variegated, varied' and '*Hemisphaerius*', the name of the type genus of the tribe Hemisphaeriini. It refers to the striking and highly variable colouration of the type species, and to the character of possessing reduced hind wings, shared with *Hemisphaerius*.

Description

Rather large (5.0–6.6 mm), very convex, round-bodied Hemisphaeriini.

Colour. Very variable combinations of chocolate brown to black, bright (golden) yellow and white.

Head. Vertex broader than long in midline, weakly concave; anterior margin weakly curved, posterior one concave. Frons weakly convex, distinctly longer in midline than wide, smooth; maximum width slightly under level of antennae. Clypeus convex, smooth, medially keeled. Labium with last segment longer than broad, shorter than penultimate one. Antennae with scape short, ring-shaped, and bulbous pedicel.

Thorax. Pronotum wider than head, short, about ¼ length of mesonotum in midline; disc concave; paranotal lobes with angularly rounded lateroventral angle. Mesonotum subtriangular with postrolateral

margins slightly incurved, smooth with weak transverse carina parallel to anterior margin; without longitudinal carinae.

Tegmina. Strongly convex, with rounded lateral margins in dorsal view (making the insect look hemispherical); about as wide as long when taken together in dorsal view; apical margin rounded; venation weakly distinct, with longitudinal veins marked as weak, blunt ridges.

Hind wings. Strongly reduced and shorter than tegmina, rather elongate, unilobed. Venation reticulate with main longitudinal veins distinct basally (C, ScP+R, MP, CuA) and numerous cross-veinlets in distal portion. Costal margin slightly sinuate; sutural margin sinuate, rounded after midlength and apical margin rounded.

Legs. Distinctly elongate and slender, with pro- and mesofemora dorsoventrally flattened; pro- and mesotibiae slender with mesotibiae slightly shorter and wider; pro- and mesotarsi rather elongate; metatibiae with 2 lateral spines in distal half and 6 apical spines. Metatarsi rather short with first segment shorter than combined length of remaining segments. Metatibiotarsal formula: (2)6/12/2.

Male terminalia. Pygofer short, about 2.2 times as high as long at midheight in lateral view, with posterior margin angularly rounded in lateral view. Gonostyli convex, with posterior margin roundly projecting caudad in lateral view; capitulum rather elongate, with a wide neck with posterior margin sinuate, with apical tooth directed mesad and lateral laminate process in distal portion. Anal tube dorsoventrally flattened, rather wide in dorsal view and with anal opening in basal half. Aedeagus asymmetrical, strongly curved posterodorsad in lateral view. Ventral lobe of periandrium laminate and gently twisted to the right; lateral lobes of periandrium laminate, rounded, partly covering elongate lateroventral processes of aedeagus. Connective well developed, corpus connective long, regularly curved in lateral view, tectiductus well developed, conical with anteroventral apodemes and wide anterior foramen.

Distribution

Vietnam: Thừa Thiên-Huế Province.

Species included

Varisphaerius hoaiae sp. nov.

Varisphaerius hoaiae sp. nov.
urn:lsid:zoobank.org:act:47A50950-1C3B-4145-AA08-DC6E7AD85DAD
Figs 1, 2A, 3A, 4, 36–39

Diagnosis

Varisphaerius hoaiae sp. nov. is the only species in the genus *Varisphaerius* gen. nov. The characters of the male terminalia are probably relevant diagnostic features to recognize the species, e.g., the oboval, apically roundly emarginate anal tube in dorsal view, the shape of the gonostyli, including the capitulum in lateral view, and the size and shape (curvature) of the lateroventral processes of the aedeagus.

Differential diagnosis

The most similar species belong to the genera *Gergithus* Stål, 1870 and *Ishiharanus* Hori, 1969, which can be separated by the characters given for the genus *Varisphaerius* gen. nov.

Etymology

The species epithet is a patronym dedicated to Hoài Thị Thu Nguyễn (VNMN) who collected several specimens of the type series of this new species.

Material examined

Holotype

VIETNAM • ♂ (dissected); Thừa Thiên-Huế Province, Bach Ma National Park, pheasant trail; 16°13′38″ N, 107°51′20″ E; 500–600 m a.s.l.; 10–20 May 2023; J. Constant and L. Semeraro leg.; I.G.: 34.640; VNMN.

Paratypes

VIETNAM • 1 ♂, 4 ♀♀; same collection data as for holotype; RBINS • 2 ♂♂; Thừa Thiên-Huế Province, Bach Ma National Park, summit; 16°11′18″ N, 107°50′56″ E; 1300–1400 m a.s.l.; 11–21 May 2023; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS • 1 ♂; Thừa Thiên-Huế Province, Bach Ma National Park; 16°11′44″ N, 107°50′44″ E; 1200–1300 m a.s.l.; 22 May 2023; roadside; J. Constant and L. Semeraro leg.; I.G.: 34.640; RBINS • 6 ♀♀; [Thừa Thiên-Huế Province], Bach Ma National Park, [pheasant trail]; 16°12′ N, 107°52′ E; daytime collection; 12–17 Jul. 2011; J. Constant and J. Bresseel leg.; I.G.: 31.933; RBINS • 4 ♀♀; Thừa Thiên-Huế Province, Bach Ma National Park, pheasant trail; [16°13′38″ N, 107°51′20″ E]; 29 May 2023; by net; N.T.T. Hoai leg.; VNMN • 1 ♀; Thừa Thiên-Huế Province; Bach Ma National Park, pheasant trail; 16°13′41.18″ N, 107°51′16.82″ E; 344 m a.s.l.; 15 Sep. 2024; N.T.T.Hoai leg.; VNMN.

Description

Note: Two very distinct colour forms were found in this species; they are described below and are referred to as (1) ‘spotted form’ (Figs 36, 39A–D) and (2) ‘reticulated form’ (Figs 37, 39E–H).

Measurements and ratios. LT: ♂ (n = 5): 5.2 mm (5.0–5.4), ♀ (n = 5): 6.2 mm (5.8–6.6); LT/BB = 0.85–1.07; LTg/BTg = 1.38; LW/BW = 2.52; BV/LV = 1.36; LF/BF = 1.40.

Head (Figs 36A–E, 37A–E, 39). In both forms, vertex broader than long in midline, with median weak carina, brown, sometimes washed with yellow in middle area, with all margins weakly carinate; anterior margin slightly convex, posterior one concave and lateral ones subparallel; disc excavate. Side of head brown with whitish marking from insertion of antennae to genoclypeal suture. Frons elongate and smooth, chestnut brown, with distinct but narrow whitish band along frontoclypeal suture not reaching side angles. Clypeus subtriangular, medially keeled, chestnut to blackish brown, with whitish band along frontoclypeal suture, sometimes interrupted in middle. Labium yellow brown, with last segment longer than broad, and shorter than penultimate one. Scape short, ring-shaped, brown; pedicel bulbous, reddish brown.

Thorax (Figs 36A–E, 37A–E, 39). In both forms, pronotum very short, about one fourth length of mesonotum in midline; anterior and posterior margins carinate; disc concave, with extremely narrow lateral fields behind eyes; dark brown with posterior portion of disc and a large ventral portion of paranotal lobes chestnut brown. Mesonotum subtriangular, smooth, with carina along anterior margin; in (1) ‘spotted form’, golden yellow with tip of scutellum and lateral angles chestnut to blackish brown; in (2) ‘reticulated form’, golden yellow with tip of scutellum, line at lateral angles and two more or less developed bands on disc, not reaching anterior margin and tapering towards posterior, chestnut to blackish brown. Tegulae dark brown.

Tegmina (Figs 36A–E, 37A–E, 39). Strongly convex; about 1.1–1.3 times as broad as long when taken together in dorsal view; slightly concave at basicostal angle; slightly rugulose with dense reticulum of

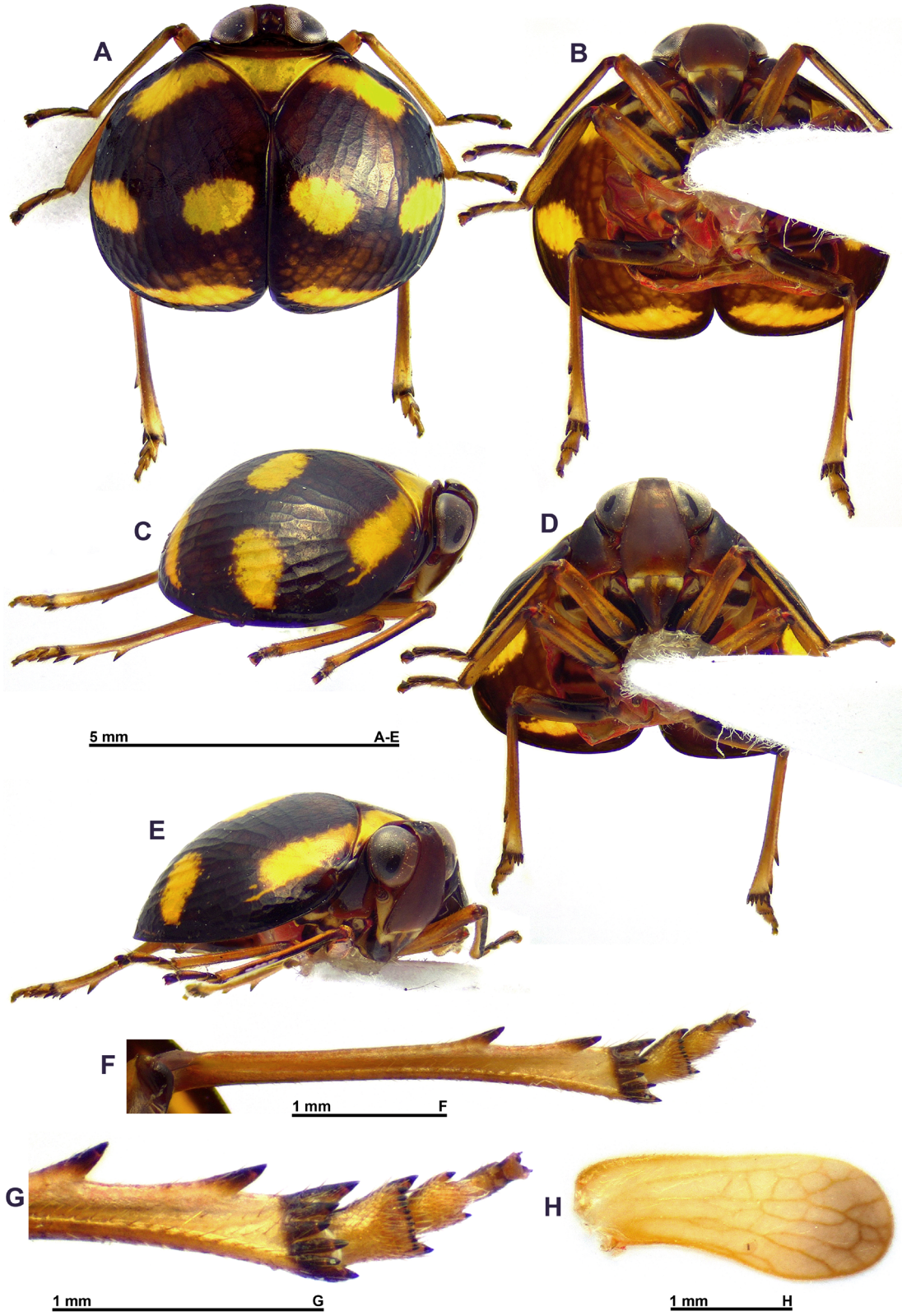

Fig. 36. *Varisphaerius hoaiae* sp. nov., dissected paratype, ♂ (RBINS) spotted morph. **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. Habitus, lateral view. **D**. Habitus, perpendicular view of frons. **E**. Habitus, anterolateral view. **F**. Left hind leg, ventral view. **G**. Metatarsus and apex of metatibia, ventral view. **H**. Right hind wing.

Fig. 37. *Varisphaerius hoaiae* sp. nov., dissected paratype, ♂ (RBINS) reticulated morph. **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. Habitus, lateral view. **D**. Habitus, perpendicular view of frons. **E**. Habitus, anterolateral view. **F**. Right hind wing.

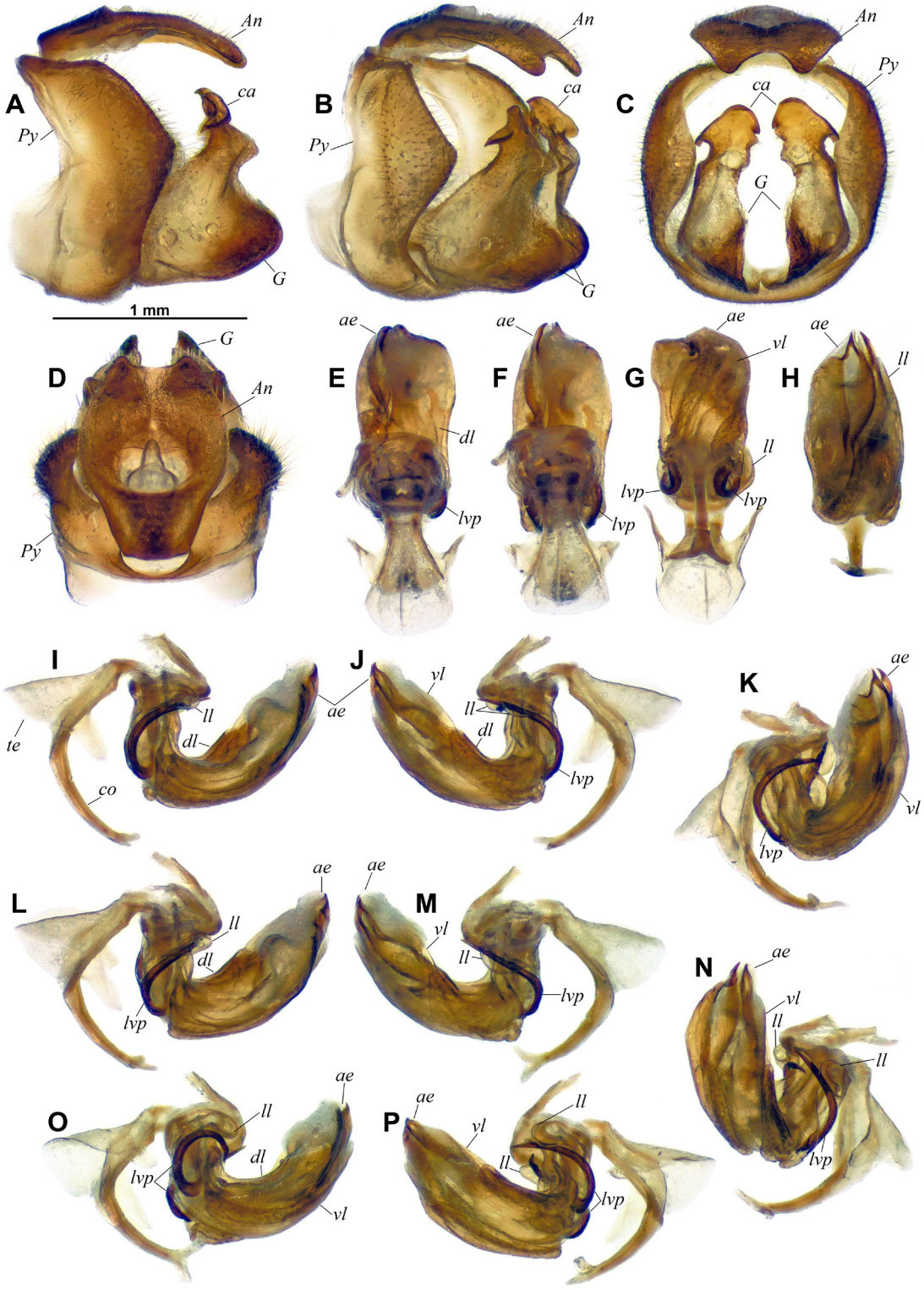

Fig. 38. *Varisphaerius hoaiae* sp. nov., dissected holotype, ♂ (VNMN), terminalia. **A–D**. Pygofer, anal tube and gonostyli. **A**. Left lateral view. **B**. Posterolateral view. **C**. Caudal view. **D**. Dorsal view. **E–P**. Aedeagus. **E**. Dorsal view. **F**. Anterolateral view. **G**. Ventral view. **H**. Caudal view. **I**. Left lateral view. **J**. Right lateral view. **K**. Left posterolateral view. **L**. Left laterodorsal view. **M**. Right laterodorsal view. **N**. Right posterolateral view. **O**. Left lateroventral view. **P**. Right lateroventral view. Abbreviations: see Material and methods.

weakly raised veins and veinlets; main veins weakly distinct. (1) 'Spotted form': chestnut to blackish brown with four golden yellow markings: wide subbasal transverse one prolongating yellow marking of mesonotum laterally (the whole resulting in a continuous yellow band), two large round spots in a row at about midlength, lateral one not reaching costal margin and dorsal one not reaching subclaval margin (when both tegmina combined, forming a row of four evenly spaced spots), a rather wide transverse, subapical marking along posterior margin, tapering towards lateral. (2) 'Reticulated form', golden yellow background with network of veins and cross-veinlets lined with black-brown, black-brown colour lining thicker (sometimes filling cell) in areas corresponding to dark brown zones of spotted form.

Hind wings (Figs 36F, 37F). Yellowish, infuscate towards apex, unilobed, with veins slightly darker than cells; elongate but rudimentary and clearly shorter than tegmina. Venation reduced, reticulate distally, main longitudinal veins distinct basally (C, ScP+R, MP, CuA). Costal margin nearly straight, cubital sinuate, distal margin rounded.

Legs (Figs 36A–E, 37A–E, 39). Elongate and slender; femora wider and shorter than corresponding tibiae. Coxae largely brown, trochanters yellow with brown markings. Pro- and mesofemora yellow more or less marked with brown at base and apex; protibiae yellow with black line along externoventral carina; mesotibiae similarly coloured but with black line less developed, sometimes obsolete; pro- and mesotarsi yellowish brown; metafemora brown, turning yellowish towards base and apex; metatibiae yellowish brown, paler towards apex, with black tipped spines; metatarsi yellowish. Metatibiae with 2 lateral spines on distal half and 6 apical spines. Metatibiotarsal formula: (2) 6 / 12 / 2.

Abdomen. Yellow brown, darker on sides.

Male terminalia. Pygofer (*Py* – Fig. 38A–D) 2.2 times as high as long at midheight in lateral view; in lateral view, dorsal margin nearly horizontal, weakly incurved, followed posteriorly by distinct oblique slope leading to distinct rounded angle protruding posterad at half height; ventral half slightly excavate; subsquarish in caudal view. Gonostyli (*G* – Fig. 38A–D) convex, in lateral view with ventral margin weakly sinuate, posterior margin rounded, projecting caudad, anterodorsal margin oblique, slightly rounded basally, then upcurved to neck of capitulum. Capitulum (*ca*) in lateral view with rather elongate, wide, twisted neck, directed dorsocephalad, and with posterior margin strongly sinuate, projecting posterad in a rounded slightly acute angle; in caudal view, upper angle rounded and directed mesodorsad; small tooth at anterodorsal angle followed posterad by carina on external side, strongly recurved cephalad and ending in a tooth projecting ventrocephalad in lateral view; in caudal view, deep, round emargination under carina. Anal tube (*An* – Fig. 38A–D) elongate; in dorsal view rather wide, about 1.30 times as long in midline as wide, regularly widening from base to basal ⅖, then sinuate, and broadly rounded in distal portion, with apical margin deeply excavate, posterior angles apically rounded; in lateral view, anal tube moderately curved posteroventrad. Aedeagus strongly curved posterodorsally and twisted, rather simple, asymmetrical (Fig. 38E–P); lateroventral processes of aedeagus (*lvp*) rod-like, very elongate, basally recurved cephalad, then coiled around basal portion of periandrium to dorsum; ventral lobe of periandrium (*vl*) laminate, well developed and elongate but shorter than aedeagus, gently shifted to the right and with rounded apex; dorsal lobe of periandrium (*dl*) shorter than aedeagus; lateral lobes of periandrium (*ll*) laminate, rounded ("ear-shaped") and partly covering lateroventral processes of aedeagus; aedeagus largely membranous with pair of elongate, strong, pointed processes slightly hooked apically. Connective (*co*) well developed and curved, with tectiductus (*te*) well developed, conical with moderate crista, anteroventral apodemes and wide anterior foramen.

Biology

Varisphaerius hoaiae sp. nov. was collected in May, July and in September on lower vegetation and bushes (Fig. 39), in moist evergreen tropical mountain forest, at altitudes between about 500 and

Fig. 39. *Varisphaerius hoaiae* sp. nov., live specimens in Bach Ma National Park, pheasant trail. **A**. 17 Jul. 2011. **B**. 12 May 2023. **C**. 21 May 2023. **D–F**. 15 May 2023. **G**. 21 May 2023. **H**. 20 May 2023.

1400 m a.s.l. in Bach Ma National Park, at the "summit" area (Figs 2A(5), 4B), "roadside" (Figs 2A(4), 4A) and "pheasant trail" (Figs 2A(2), 3A) collecting sites. The specimens were found sitting on leaves and stems, and one was found on a tree trunk. Despite intensive collecting, no specimen could be found at lower altitude, as well as during the 2017 collecting trip in April, although the same spot as in 2011 and 2023 was explored, at pheasant trail.

Distribution

Vietnam: Thừa Thiên-Huế Province (Bach Ma National Park) (Fig. 1).

Discussion

We provide the first record of trophobiosis for the tribe Hemisphaeriini (Fig. 8G–H), between *Ceratogergithus pictus* sp. nov. and ants of an unidentified species of the genus *Camponotus* (Hymenoptera: Formicidae). So far, only 13 records of trophobiosis have been documented for the family Issidae, all with ants except for one, which involved Blattodea (Bourgoin *et al*. 2023).

The present study also adds one new genus and seven new species to the fauna of Issidae of Vietnam, which represents a nearly 14% increase in the number of species recorded from the country. Together with the eight species of the tribe Parahiraciini previously recorded (Constant & Pham 2024b), Thừa Thiên-Huế Province now counts sixteen species in ten genera and becomes the best documented and richest province of Vietnam in terms of the Issidae diversity (see Constant & Pham 2024a). The new data greatly extend the distribution of the genus *Ishiharanus* Hori, 1969 by about 500 km to the south, and provide the first record of the genus *Ceratogergithus* Gnezdilov, 2018 in Vietnam. It is noteworthy that seven of the eight species of Hemisphaeriini found in Thừa Thiên-Huế Province so far were undescribed, although three of them seem to have a wider distribution in Central Vietnam, namely *Hemisphaerius annamiticus* sp. nov. (Fig. 17), *H. thaydoius* sp. nov. (Fig. 22) and *Ishiharanus pulchellus* sp. nov. (Fig. 35).

In Bach Ma National Park, two species, *Ishiharanus iguchii* and *I. dinhanus* sp. nov., seem restricted to the cloud forest at the very top of the mountain, adding to the four species of Parahiraciini presenting the same altitudinal distribution pattern, previously described in Constant & Pham (2024b).

Although Hemisphaeriini can be rather colourful (see Figs 8, 16, 25, 28, 34, 39) and can be found sitting on leaves, they are nonetheless rather small insects, usually well hidden in their habitat where they often sit at the base of leaves and stems. Combined with their exceptional ability to escape by suddenly jumping away when feeling threatened, under-collecting/under-documenting could be confounding assessments of environmental management requirements of these species. In order to attribute an accurate conservation status to these insects instead of automatically relegating them to the "data deficient" category (e.g., Cardoso *et al*. 2011; Moir & Brennan 2020), more surveys are required to recognize the microhabitats, host plants and response to disturbance by these planthoppers. It seems clear that a strict protection of the remaining good forest habitats in Thừa Thiên-Huế Province is needed in order to preserve their unique fauna.

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