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A new species and new records of the anthophorine bee subgenus *Glossamegilla* Brooks, 1988 in Vietnam (Hymenoptera: Apidae)

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Abstract. Eight species of the subgenus *Glossamegilla* Brooks, 1988 are treated from Vietnam. *Amegilla* (*Glossamegilla*) *sonla*, new species, is described from the northern part of the country. In addition, four species are newly recorded for Vietnam, including *A.* (*G.*) *jacobi* (Lieftinck, 1944), *A.* (*G.*) *mesopyrrha* (Cockerell, 1930), *A.* (*G.*) *pendleburyi* (Cockerell, 1929), and *A.* (*G.*) *yunnanensis* Wu, 1983. Notes on the taxonomy and subgeneric status of *Amegilla fimbriata* (Smith, 1879) are given. All recognised species, except *A.* (*G.*) *pseudobomboides* (Meade-Waldo, 1914) are illustrated, including the male terminalia, along with a key to Vietnamese species of *Glossamegilla*.

Key words. Anthophorini, Apoidea, digger bees, morphology, Vietnam

INTRODUCTION

Anthophorine bees comprise robust, fast-flying, and hairy species with long tongues. They are also known as digger bees because they nest in burrows made by moistening clay with regurgitated water or nectar in banks or flat ground (except for subgenus *Clisodon* Patton, 1879 of the genus *Anthophora* Latreille, 1803 which nests in rotten wood or pithy stems) (Michener, 2007). Information about their classification position, nesting structure and behavior, as well as floral associations is limited. *Amegilla* Friese, 1897, the second largest genus of anthophorine bees, comprises about 250 species in 11 subgenera worldwide (Brooks, 1988; Michener, 2007). Of these, about 12% of species are placed in the subgenus *Glossamegilla*, and may be found from India to Southeast Asia (Lieftinck, 1944, 1956; Wu, 1983, 2000). The subgenus was erected by Brooks (1988) based on the type species, *Anthophora mesopyrrha* Cockerell, 1930, with another 28 species recognised as subgenus members. Subsequently, *Amegilla hainanensis* Wu, 2000 was discovered and described from Hainan Province, China. However, this species was recently synonymised to *A. himalajensis* (Radoszkowski, 1882) (Niu et al., 2025). Therefore, prior to this study, a total of 29 valid species of *Glossamegilla* were known worldwide.

The subgenus *Glossamegilla* is prominent in Southeast Asia, with 21 known species, with Indonesia having the greatest known diversity, i.e., 14 species (Ascher & Pickering, 2024). Prior to this study, only three species have been found in Vietnam: *A. fimbriata* (Smith, 1879), *A. himalajensis*, and *A. pseudobomboides* (Meade-Waldo, 1914) (Ascher & Pickering, 2024; Niu et al., 2025). In this work, we discuss the classificatory position of one of these species—*A. fimbriata*, considering the arguments of Attasopa & Warrit (2012) in support of the species' placement in the subgenus *Aframegilla* instead of *Glossamegilla*. Despite reasons provided by the latter authors, we choose to retain the current placement of *A. fimbriata* in *Glossamegilla* after carefully considering the other diagnostic features of this species including sterna VII and VIII, as well as its biogeographical distribution region. Moreover, we report and provide diagnoses for five additional species of *Glossamegilla* from Vietnam, including one new species. We also provide new distribution data for two of the three species already known from Vietnam—*A. fimbriata* and *A. himalajensis*; additional material of the third known species *A. pseudobomboides* was not found herein. The latter species has previously been recorded from Lào Cai Province, northwestern Vietnam. An illustrated key to all known species in Vietnam is also provided.

MATERIAL AND METHODS

In this work, a total of 51 specimens deposited in the Hymenopteran collection of the Institute of Biology (IB), Hanoi, Vietnam were examined. Adult morphological and colour characters were examined with a Nikon SMZ745 stereomicroscope, while photographs were taken with a Nikon SMZ800N stereomicroscope and an attached ILCE-5000L/WAP2 digital camera. Stacked-focus images were prepared using Helicon Focus 7 and all files were processed with

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Adobe Photoshop CS6. Male terminalia were dissected from relaxed specimens and then incubated in TE-Proteinase K solution for 24h at 56°C, so as to remove tissue and partially clear the integument. The treated terminalia were mounted in Kleen® hand sanitiser gel for observation and photography.

Morphological terminology used in the descriptions follows Engel (2001) and Michener (2007), with the following body metrics as used in earlier papers, e.g., Tran et al. (2024a): 1) body length: measured from the base of the antennal torulus to metasomal apex (in dorsal view), 2) head length: measured from the medioapical margin of the clypeus to the upper margin of the vertex (in facial view), 3) head width: measured at the widest point of the head across the compound eyes (in facial view), 4) eye width: the greatest width of the compound eye (in profile), 5) genal width: the greatest width of the gena (in profile), 6) intertegular distance: measured between the inner rims of the tegulae (in dorsal view). Arabic numbers indicate quantitative values (e.g., metrics, number of elements), while Roman numerals indicate the identity of a particular element in a series. For example, '10 flagellomeres' refers to a collective group of 10 flagellomeres, while 'flagellomere III' refers to the third flagellomere of a series (following the example of Tran et al., 2024b).

TAXONOMY

Family Apidae Latreille, 1802

Tribe Anthophorini Dahlbom, 1835

Genus *Amegilla* Friese, 1897

Subgenus *Glossamegilla* Brooks, 1988

Amegilla (*Glossamegilla*) Brooks, 1988: 512. Type species: *Anthophora mesopyrrha* Cockerell, 1930, by original designation.

Diagnosis. The subgenus *Glossamegilla* can be separated from others by combinations of the following characters: 1) elongate mouthparts (galea and glossa up to 11 and 23 mm, respectively), 2) mesosoma with short, dense, velvety, brown setae; metasoma with appressed, brown setae, covering tergal discs evenly or only apically as bands (except for *A*. (*G*.) *pseudobomboides*, *A*. (*G*.) *violacea* (Lepeletier, 1841), and *A*. (*G*.) *fimbriata* without brown setae, see comments in Brooks, 1988: p. 513, and the new species, see description below), 3) sternum VII of males broad and round apically, with two blunt lobes apico-laterally, 4) sternum VIII of males broad with two blunt lobes apico-laterally, lateral margins slightly diverging to slightly converging distally, 5) gonocoxite with one or two lobes apically, and 6) gonostylus absent (except for *A*. (*G*.) *fimbriata* with well-developed gonostylus).

Generally, the subgenera of *Amegilla* are most reliably separated mainly based on male terminalia (see Table 2).

Amegilla (*Glossamegilla*) *fimbriata* (Smith, 1879)
(Figs. 1, 2, 13A–B, 15A–B)

Anthophora fimbriata Smith, 1879: 122; Bingham, 1897: 530.
Podalirius fimbriatus – Dalla Torre, 1896: 268.
Amegilla (*Glossamegilla*) *fimbriata* – Brooks, 1988: 513; Roubik, 1992: 405; Wu, 2000: 292.

Diagnosis. In both sexes, head mostly, mesoscutum and anterior part of mesoscutellum with white setae intermixed with black setae; posterior margin of mesoscutellum and metanotum with white setae; metasoma black, with short, white setal bands on terga IV–V (in females) or on terga IV–VI (in males). In males, tergum VII slightly undulated apically, and latero-apical spines of tergum VII gradually narrowed toward apex and rounded apically; sternum VII with small expansion apically, midsection of disc with small tooth laterally; sternum VIII broad apically and emarginated medio-apically; inner margin of the penis valve concave, resulting in a distinct half-circle lobe; gonocoxite with short, dense setae apically; gonostylus present and well-developed.

Material examined. VIETNAM: 1 male, Cao Bằng Province, Nguyên Bình District, Tam Kim Commune, Nà Vạ Village, 23°36′17″N, 106°01′47.5″E, alt. 320 m, coll. Minh Phượng Nguyễn, Cường Quang Nguyễn, 5 November 2016; 1 female, Yên Bái Province, Mù Căng Chải District, Khao Mang Commune, 21°51′40″N, 104°2′42″E, coll. Liên Thị Phương Nguyễn, 12 September 2017; 2 females, Sơn La Province, Mường La District, Nặm Păm Commune, alt. 660 m, coll. Liên Thị Phương Nguyễn, Phong Huy Phạm & J Kojima, 25 July 2009; 2 males, Sơn La Province, Vân Hồ District, Chiềng Xuân Commune, Pò Hồng Village, coll. Phong Huy Pham, 13–17 June 2018; 2 females, Vĩnh Phúc Province, Phúc Yên District, Mê Linh Biodiversity Station, coll. Cường Quang Nguyễn, 2 June 2018; 1 male, Vĩnh Phúc Province, Phúc Yên District, Mê Linh Biodiversity Station, coll. Phong Huy Pham, 12 June 2018; 1 female, Hòa Bình Province, Lương Sơn District, coll. Department of Insect Ecology, 24 August 2018; 1 female, Gia Lai Province, Kbang District, Sơn Lang Commune, Kon Chư Răng Natural Reserve, coll. Liên Thị Phương Nguyễn et al., 19 September 2017; 1 female, Đắk Lắk Province, Ea Kar District, Ea So Commune, Ea So Natural Reserve, 13°01′24.5″N, 108°33′13.6″E, alt. 264 m, coll. Liên Thị Phương Nguyễn, Đại Đắc Nguyễn, Minh Phượng Nguyễn, 14 April 2015; 1 male, Đắk Lắk Province, Krông Bông District, Chư Yăng Sin National Park, 12°24′56.8″N, 108°21′02.1″E, alt. 772 m, Liên Thị Phương Nguyễn, Lam Xuân Trương, Tuấn Viết Lương, 9 May 2018; 1 male, Đắk Lắk, Buôn Ma Thuột City, Tan An Commune, Hoa Thị Quỳnh Bùi, 8 August 2020.

Remarks. *Amegilla fimbriata* has been historically placed in *Glossamegilla* but Attasopa & Warrit (2012) noted that this species, based on currently understood characters for the subgenera, was best placed in *Aframegilla*. The authors did not formally transfer the species but we believe that their assignment is somewhat unjustified and needs to be considered. Specifically, and most critically, is the present and well-developed male gonostylus (Fig. 15A, B in this study

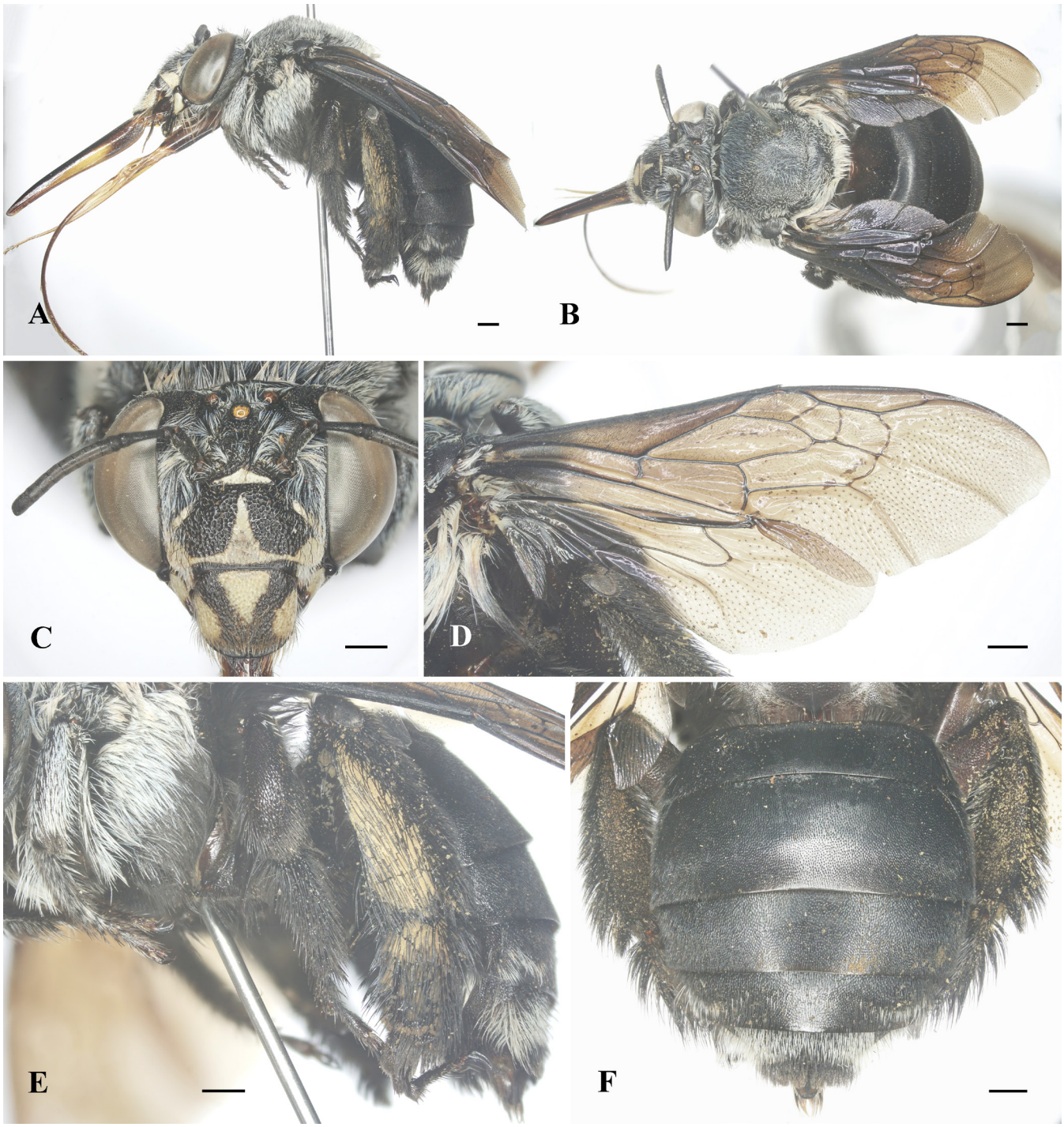

Fig. 1. A–F, *Amegilla* (*Glossamegilla*) *fimbriata* (Smith, 1879), female; A, habitus, lateral view; B, habitus, dorsal view; C, head, frontal view; D, right wings; E, legs, outer view; F, metasoma, dorsal view. Scale bars = 1 mm.

and see Fig. 36J, K in Brooks (1988)) in *A. fimbriata* (the gonostylus is usually absent in *Glossamegilla*: Figs. 15C–F, 16A–F in this study). For sterna VII and VIII, those of *A. fimbriata* are only partially similar to *A. nubica* (Lepeletier, 1841), type species of the subgenus *Aframegilla*: sternum VII of males for both species has angulate apico-lateral margins, but is medio-apically nearly straight in *A. fimbriata* while medio-apically convex in *A. nubica* (Fig. 13A in this study and see Fig. 36I in Brooks (1988)); sternum VIII for both species is broad apically, but medio-apically broad and emarginate in *A. fimbriata*, while medio-apically with extremely narrowed emargination in *A. nubica* (Fig. 13B in this study and see Fig. 36L in Brooks (1988)). For a full redescription of the species refer to Attasopa & Warrit (2012).

Despite the justifications presented by Attasopa & Warrit (2012), including presence of the gonostylus and partial similarity in genitalic structure between *A. fimbriata* and the type species of *Aframegilla*, there may still be insufficient basis to transfer *A. fimbriata* from *Glossamegilla* to *Aframegilla*:

Aframegilla is an Ethiopian subgenus occurring more or less south from latitude 15° North (Brooks, 1988), a distributional

Table 1. Species currently of the subgenus *Glossamegilla* Brooks in Southeast Asia

Species	Sexes known	Distribution	Floral association	Source
Amegilla (*G.*) *amymone* (Bingham, 1896)	Both sexes	Indonesia	*Impatiens* cf. *oncidioides* (Balsaminaceae)	Lieftinck (1956)
Amegilla (*G.*) *bouwmani* (Lieftinck, 1944)	Female	Indonesia	Unknown	Lieftinck (1944)
Amegilla (*G.*) *cinnyris* (Lieftinck, 1944)	Both sexes	Indonesia	*Impatiens oncidioides* (Balsaminaceae), *Cyrtandra pendula* (Gesneriaceae), *Donax canniformis* (Marantaceae)	Lieftinck (1944, 1956)
Amegilla (*G.*) *cyrtandrae* (Lieftinck, 1944)	Both sexes	Indonesia	*Dicliptera tinctoria*, *Strobilanthes cernua*, *S. alata* (Acanthaceae), *Impatiens platypetala*, *I. chonoceras* (Balsaminaceae), *Cyrtandra pendula*, *C.* cf. *cuneata*, *Liebigia barbata* (Gesneriaceae), *Coleus galeatus*, *Paraphlomis oblongifolia*, *Scutellaria javanica* (Lamiaceae), *Polygala veneosa* (Polygalaceae), *Stachytarpheta jamaicensis* (Verbenaceae)	Lieftinck (1944)
Amegilla (*G.*) *elephas* (Lieftinck, 1944)	Both sexes	Indonesia, Malaysia	*Imperata cylindrica* (Poaceae), *Lantana camara* (Verbenaceae), *Etlingera solaris* (Zingiberaceae)	Lieftinck (1944)
Amegilla (*G.*) *feronia* (Lieftinck, 1944)	Both sexes	Indonesia	*Hellenia speciosa* (Costaceae), *Cyrtandra pendula* (Gesneriaceae), *Achyrospermum densiflorum*, *Coleus galeatus* (Lamiaceae), *Donax canniformis* (Marantaceae), *Polygala veneosa* (Polygalaceae), *Globba marantina* (Zingiberaceae)	Lieftinck (1944)
Amegilla (*G.*) *fimbriata* (Smith, 1879)	Both sexes	Cambodia, Thailand, Malaysia, Myanmar, Vietnam	*Amomum villosum* (Zingiberaceae)	Wu (2000), Attasopa & Warrit (2012), this work
Amegilla (*G.*) *gigas* (Friese, 1922)	Female	Indonesia	Unknown	Ascher & Pickering (2024)
Amegilla (*G.*) *hanitschi* (Meade-Waldo, 1914)	Both sexes	Indonesia, Malaysia	*Lantana camara* (Verbenaceae)	Lieftinck (1944)
Amegilla (*G.*) *himalajensis* (Radoszkowski, 1822)	Both sexes	Cambodia, Laos, Malaysia, Myanmar, Thailand, Vietnam	*Thunbergia affinis* (Acanthaceae), *Argyreia* sp. (Convolvulaceae), *Clerodendrum deflexum* (Lamiaceae)	Lieftinck (1956), this work
Amegilla (*G.*) *insularis* (Smith, 1857)	Both sexes	Brunei, Indonesia, Malaysia, Singapore	*Donax canniformis* (Marantaceae), *Alpinia romburghiana* (Zingiberaceae)	Lieftinck (1956)
Amegilla (*G.*) *jacobi* (Lieftinck, 1944)	Both sexes	Indonesia, Vietnam	*Argyreia* sp. (Convolvulaceae), *Hellenia speciosa* (Costaceae), *Coleus galeatus* (Lamiaceae), *Donax canniformis* (Marantaceae), *Cyrtandromoea decurrens* (Phrymaceae), *Lantana camara*, *Stachytarpheta jamaicensis* (Verbenaceae), *Globba marantina*, *Meistera vespertilio* (Zingiberaceae)	Lieftinck (1944), this work
Amegilla (*G.*) *lieftincki* Brooks, 1988	Both sexes	Malaysia	*Crotalaria* sp. (Fabaceae)	Brooks (1988)
Amegilla (*G.*) *luzonica* (Cockerell, 1914)	Female	Philippines	Unknown	Ascher & Pickering (2024)

Species	Sexes known	Distribution	Floral association	Source
Amegilla (*G.*) *malaccensis* (Friese, 1918)	Both sexes	Malaysia, Thailand	Unknown	Lieftinck (1956), Ascher & Pickering (2024)
A. (*G.*) *mesopyrrha* (Cockerell, 1930)	Both sexes	Vietnam	*Amomum villosum* (Zingiberaceae)	This work
Amegilla (*G.*) *pagdeni* Lieftinck, 1956	Both sexes	Malaysia	Unknown	Lieftinck (1956)
Amegilla (*G.*) *pendleburyi* (Cockerell, 1929)	Both sexes	Indonesia, Malaysia, Thailand, Vietnam	*Impatiens* cf. *oncidioides* (Balsaminaceae), *Cyrtandra pendula* (Gesneriaceae), *Lantana* sp. (Verbenaceae), *Alpinia romburghiana* (Zingiberaceae)	Lieftinck (1944, 1956), this work
Amegilla (*G.*) *proboscidea* Lieftinck, 1956	Female	Indonesia	Unknown	Lieftinck (1956)
Amegilla (*Glossamegilla*) *pseudobomboides* (Meade-Waldo, 1914)	Both sexes	Vietnam	*Impatiens* sp. (Balsaminaceae)	Niu et al. (2025)
Amegilla (*G.*) *sonla*, new species	Male	Vietnam	Unknown	This work
Amegilla (*G.*) *subrussata* (Cockerell, 1925)	Both sexes	Philippines	Unknown	Ascher & Pickering (2024)
Amegilla (*G.*) *sumatrana* Lieftinck, 1956	Both sexes	Indonesia	*Saurauia* cf. *pendula* (Actinidiaceae), *Impatiens* cf. *oncidioides* (Balsaminaceae), *Lantana camara* (Verbenaceae)	Lieftinck (1956)
Amegilla (*G.*) *vigilans* (Smith, 1861)	Female	Indonesia	Unknown	Ascher & Pickering (2024)
Amegilla (*G.*) *yunnanensis* Wu, 1983	Both sexes	Vietnam	*Argyeria* sp. (Convolvulaceae), *Impatiens* sp. (Balsaminaceae), *Meistera vespertilio* (Zingiberaceae)	This work

range not aligned with that of *A. fimbriata* known from the Oriental region. In particular, the subgenus includes three distinct groups (Brooks, 1988): (I) African species with blue or metallic green setae on the metasomal terga; (II) *Amegilla africana* (Friese, 1905) with orange setae on body; (III) *Amegilla nubica* with essentially white setae on the mesosoma and apical metasomal terga (tergum IV in females and terga III–V in males). Generally, setal colour and distribution on the body of *A. fimbriata* are somewhat similar to *A. nubica*. However, setae are not always reliable traits for identification because they are often highly modified.

Although the presence of a well-developed male gonostylus and specific condition of sterna VII and VIII in males may be important diagnostic features of the subgenus, such characters may not fully represent the diversity or synapomorphies of *Aframegilla*. Thus, we retain the original placement of *A. fimbriata* in the subgenus *Glossamegilla* (Table 1) based on other important diagnostic characters such as long tongues, shapes of male sterna VII and VIII, and male genitalia which best align with *Glossamegilla* rather than other subgenera.

This species has been recorded from Di Linh District, Lâm Đồng Province in the Central Highlands, Vietnam (Ascher & Pickering, 2024). In this study, the distribution area is expanded toward neighbouring provinces (Gia Lai and Đắk Lắk) of the previously recorded locality and recorded from the northern provinces for the first time (Cao Bằng, Yên Bái, Sơn La, Vĩnh Phúc, and Hòa Bình). This species was collected on flowers of *Amomum villosum* (Zingiberaceae) (Wu, 2000).

Distribution. India, Nepal, Bangladesh, China, Cambodia, Thailand, Malaysia, Myanmar, and Vietnam (Northern and Central Highlands).

Amegilla (*Glossamegilla*) *himalajensis* (Radoszkowski, 1882)

(Figs. 3, 4, 13C–D, 15C–D)

Anthophora himalajensis Radoszkowski, 1882: 75.
Anthophora proserpina – Gribodo, 1893: 286.
Anthophora pahaugensis – Meade-Waldo, 1914: 58.
Amegilla (*Glossamegilla*) *himalajensis* – Brooks, 1988: 513; Lieftinck, 1956: 16; Wu, 2000: 294.
Amegilla (*Glossamegilla*) *hainanensis* – Niu et al., 2025: 12.

Table 2. Summary of male terminalia and biogeographical distribution of the subgenera in the genus *Amegilla* (Characters were taken from Brooks (1988))

Subgenus	Sternum VII	Sternum VIII	Gonocoxite	Gonostylus	Biogeographical distribution
Ackmonopsis Brooks, 1988	Entire medio-apically, greatly expanded laterally, submedian circular area present, basal half of disc relatively broad, with tooth lateally	Broad apically essentially entire to weakly emarginate	Apex of gonocoxite flattened dorso-ventrally with inner margin bilobed or trilobed	Absent (except a blister in *A. mimadvena*)	Eastern, Central and narrowly into western Africa and Yemen
Aframegilla Popov, 1950	Angulate apico-laterally	Broad apically, shallowly emarginate medially and small lobes apico-laterally	An inwardly projecting blunt to acute process apically (in ventral view)	Present, membranous to completely sclerotised	Ethiopia
Amegilla s. str. Friese, 1897	Entire apically with lateral subapical lightly sclerotised circular area	More or less rounded apically	Weakly bilobed apically as seen in profile	Absent (except *A. capensis* and *ochroleuca*)	Eastern and southern Africa, the Mediterranean region, Central Europe, eastward to northern India
Asaropoda Cockerell, 1926	Somewhat quadrate apically, emarginated medio-apically	Narrowed apically	Gonocoxite bilobed apically with long, narrow, upper lobe and small ventral lobe	Well-developed	Australia
Dizonamegilla Brooks, 1988	Entire medio-apically, produced bluntly and expanded laterally without lightly sclerotised submedian circular area	Narrowly tapered and weakly bilobed apically, almost straight laterally	Expanded apically and flattened dorso-ventrally	Present, reduced to a blister	Somalia, India, and Timor
Glossamegilla Brooks, 1988	Broad and round apically, with two blunt lobes apico-laterally	Broad with two blunt lobes apico-laterally, lateral margins slightly diverging to slightly covering distally	Gonocoxite with one or two lobes apicaly	Absent (except well-developed in *A. fimbriata*)	India to Southeast Asia
Megamegilla Brooks, 1988	Entire medio-apically, expanded laterally, without lateral subapical circular area	Broad apically, with apico-median emargination, either diverging or parallel distally laterally	Apex of gonocoxite flattened dorso-ventrally	Present	Ethiopia
Micramegilla Brooks, 1988	Entire medio-apically with a dense setal patch and without lateral, subapical, lightly sclerotised, circular area	Bilobed medio-apically, lobes small and close together, and broad apically	Simple apically and flattened dorso-ventrally	Absent	Southern, Central and Eastern Africa to the Mediterranean region of Europe and eastward to northern India

Subgenus	Sternum VII	Sternum VIII	Gonocoxite	Gonostylus	Biogeographical distribution
Notomegilla Brooks, 1988	Greatly expanded apico-laterally, without lateral subapical circular area	Narrowed, truncate or rounded apically	Apex of gonocoxite flattened dorso-ventrally, bent inward apico-ventrally	Absent	Australia
Zebramegilla Brooks, 1988	Entire and rounded or trilobed apically, rounded to angulate apico-laterally, submedian circular area present	Narrowed apically, lateral margins on distal third to half converging distally	Apex of gonocoxite flattened dorso-ventrally, bent inward apically, inner apical margin subtruncate to rounded	Present (except *A. langi* absent) but reduced to a blister	Throughout Africa, the Mediterranean region to southern India
Zonamegilla Popov, 1950	Entire and rounded apically, occasionally acute apico-medially, laterally with subapical carina and circular area present, lateral margin without tooth on basal half	Bilobed, narrowed apically	Apex of gonocoxite triangular (in ventral view, except the Chinese *zonata*, quadrate), bent inward	Present, reduced to blister or knob	Australia to southeast China and India

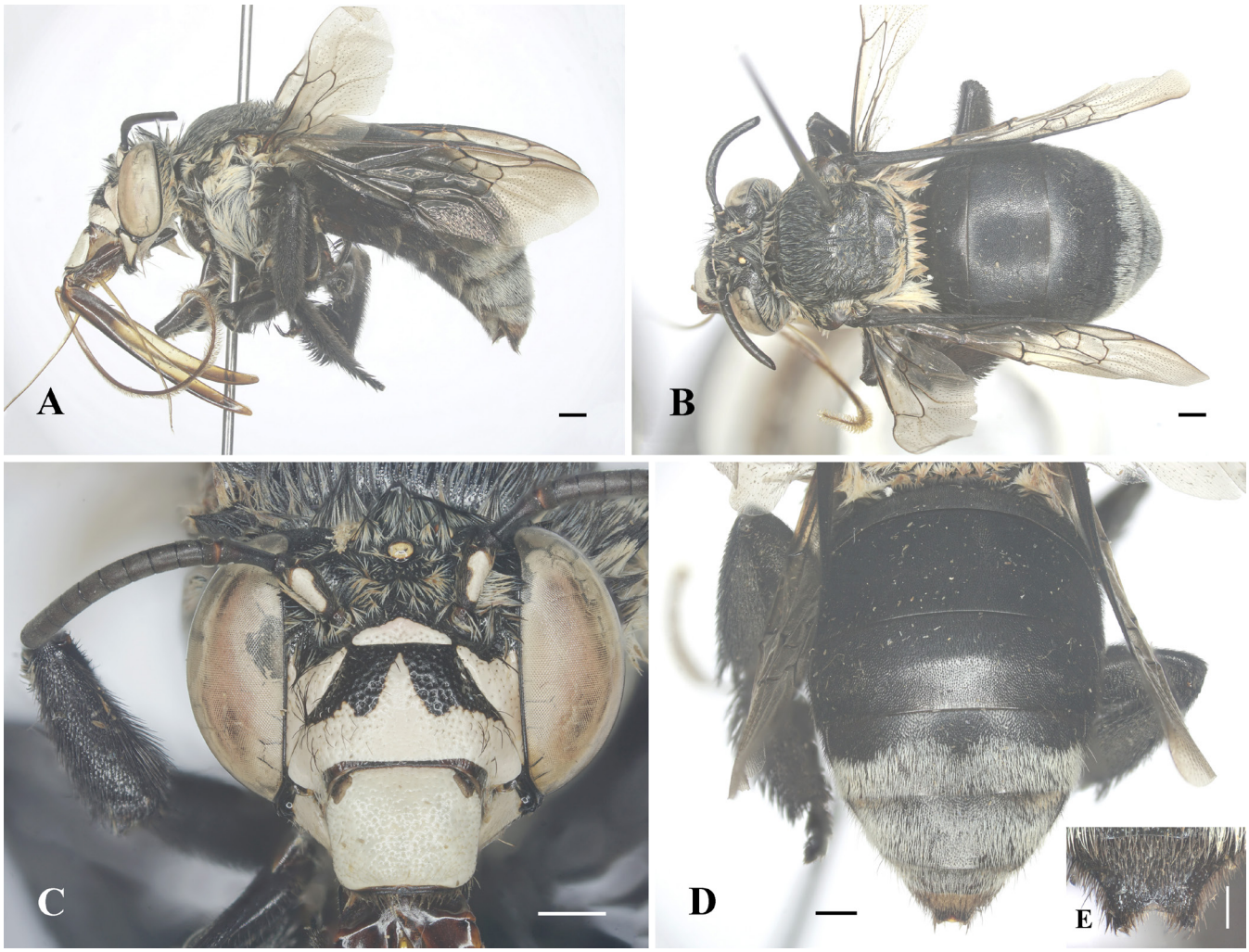

Fig. 2. A–E, *Amegilla* (*Glossamegilla*) *fimbriata* (Smith, 1879), male; A. habitus, lateral view; B, habitus, dorsal view; C, head, frontal view; D, metasoma, dorsal view; E, tergum VII, dorsal view. Scale bars = 1 mm (A–D), 0.5 mm (E).

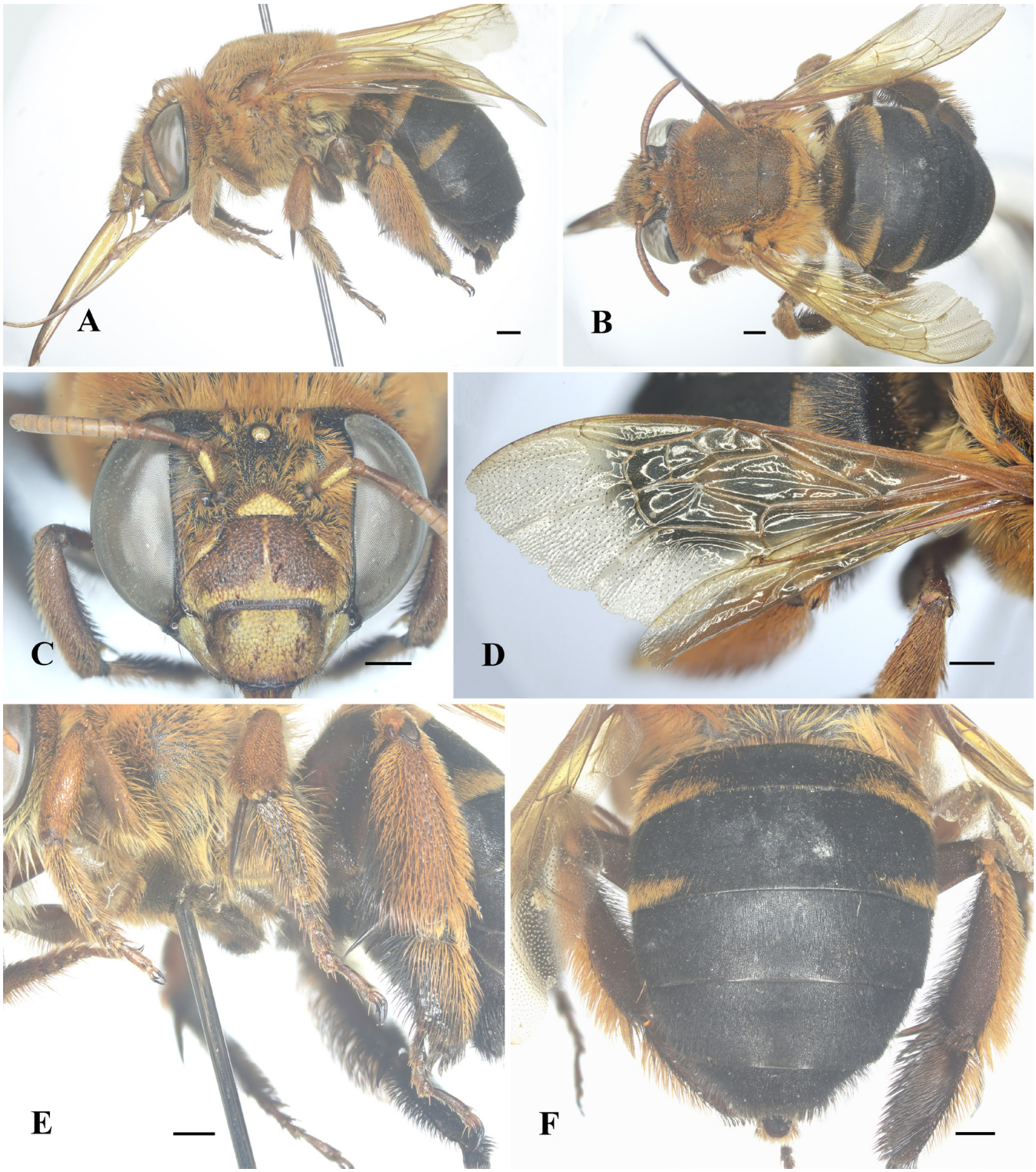

Fig. 3. A–F, *Amegilla* (*Glossamegilla*) *himalajensis* (Radoszkowski, 1882), female; A, habitus, lateral view; B, habitus, dorsal view; C, head, frontal view; D, right wings; E. legs, outer view; F, metasoma, dorsal view. Scale bars = 1 mm.

Diagnosis. In both sexes, clypeus yellow except for large ferruginous maculations baso-laterally; antenna ferruginous except scape with yellow maculation ventrally; mesosoma with fulvous setae. In females, legs mostly ferruginous; metasomal terga I–II with fulvous setal patches laterally. In males, first two or three metasomal terga covered with short, dense, fulvous setae and black setae on remainder, without setal bands on terga; tergum VII concave apically, and latero-apical spines of tergum VII rather rounded apically; sternum VII with distal portion of laterals slightly swollen and rather strongly raised medio-apically; sternum VIII concave medio-apically; gonocoxite rather thick and with some setae on baso-anterior and apico-posterior margins.

Material examined. VIETNAM: 2 males, Cao Bằng Province, Hạ Lang District, Đức Quang Commune, 22°43′12″N, 106°39′21″E, alt. 454 m, Liên Thị Phương Nguyễn, Anh Đức Nguyễn, Ngát Thị Trần, 21 September

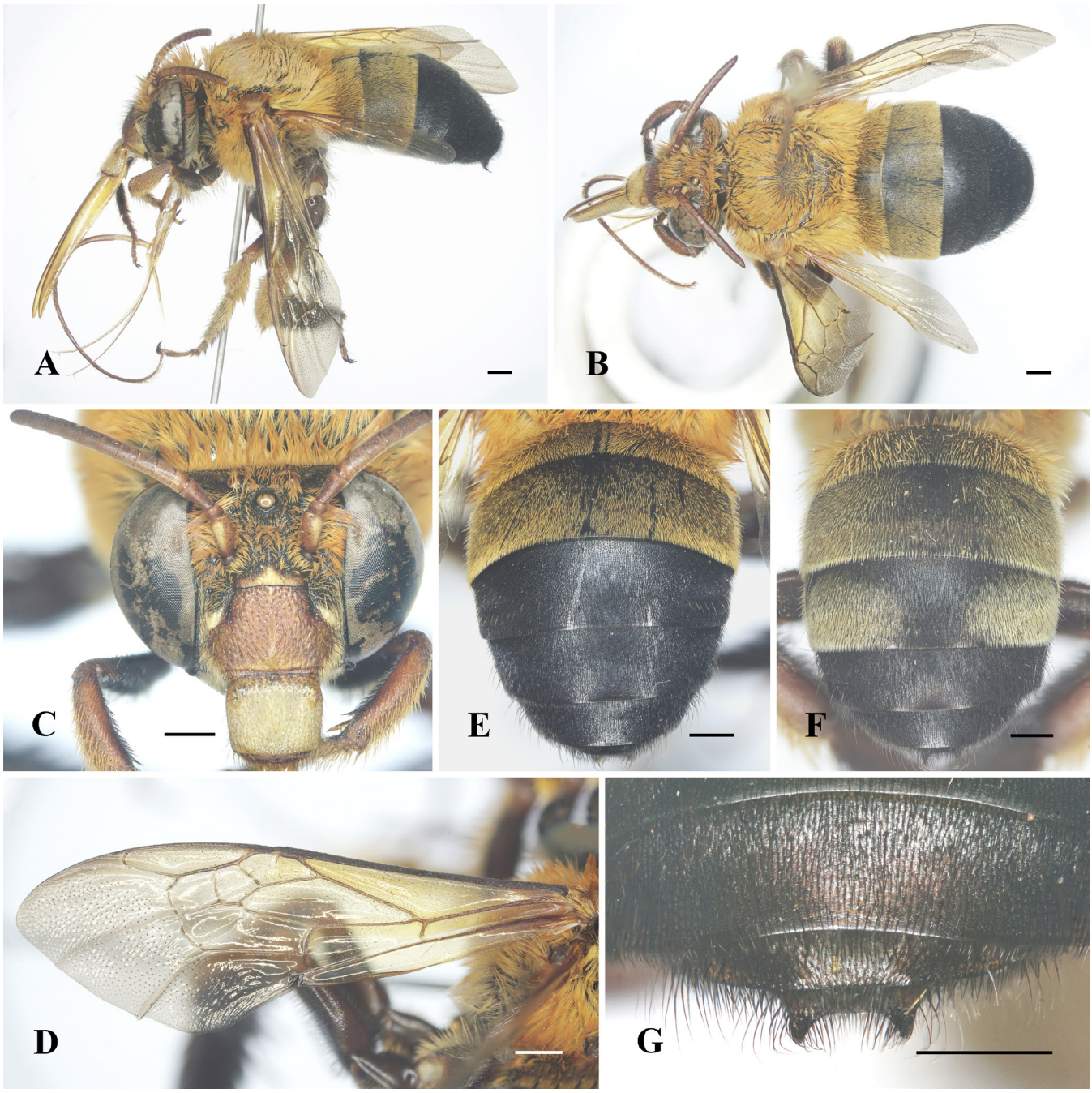

Fig. 4. A–G, *Amegilla* (*Glossamegilla*) *himalajensis* (Radoszkowski, 1882), male; A. habitus, lateral view; B, habitus, dorsal view; C, head, frontal view; D, left forewing; E, F, metasoma, dorsal view; G, terga V–VII, dorsal view. Scale bars = 1 mm.

2023; 1 male, Gia Lai Province, Kbang District, Sơn Lang Commune, Kon Chư Răng Natural Reserve, coll. Liên Thị Phương Nguyễn et al., 20 September 2017; 1 female, Gia Lai Province, Kbang District, Sơn Lang Commune, Kon Chư Răng Natural Reserve, 14°31′10.4″N, 108°36′24.9″E, alt. 860 m, coll. Lam Xuân Trương, Tuấn Viết Lương, 6 September 2018; 1 female, Gia Lai Province, Mang Yang District, Auyn Commune, Kon Ka Kinh National Park, 14°12′29.6″N, 108°19′0.8″E, alt. 914 m, coll. Hoa Thị Đặng, 15 September 2023; 1 female, Đồng Nai Province, Tân Phú District, Nam Cát Tiên National Park, coll. Liên Thị Phương Nguyễn & J Kojima, 10 August 2005.

Remarks. In Vietnam, this species has been found in Tuyên Quang Province (Northern), Lâm Đồng Province (Central Highlands), and Kiên Giang Province (Southern) (Ascher & Pickering, 2024). In this study, *A.* (*G.*) *himalajensis* is further recorded in other provinces of these three regions, meaning the species has a wide distribution in the country, recognised from northern to southern provinces of Vietnam. Males were found on flowers of *Argyreia* sp. (Convolvulaceae) (Fig. 17B).

Distribution. India, Nepal, China, Cambodia, Laos, Malaysia, Myanmar, Thailand, and Vietnam (Northern, Central Highlands, and Southern).

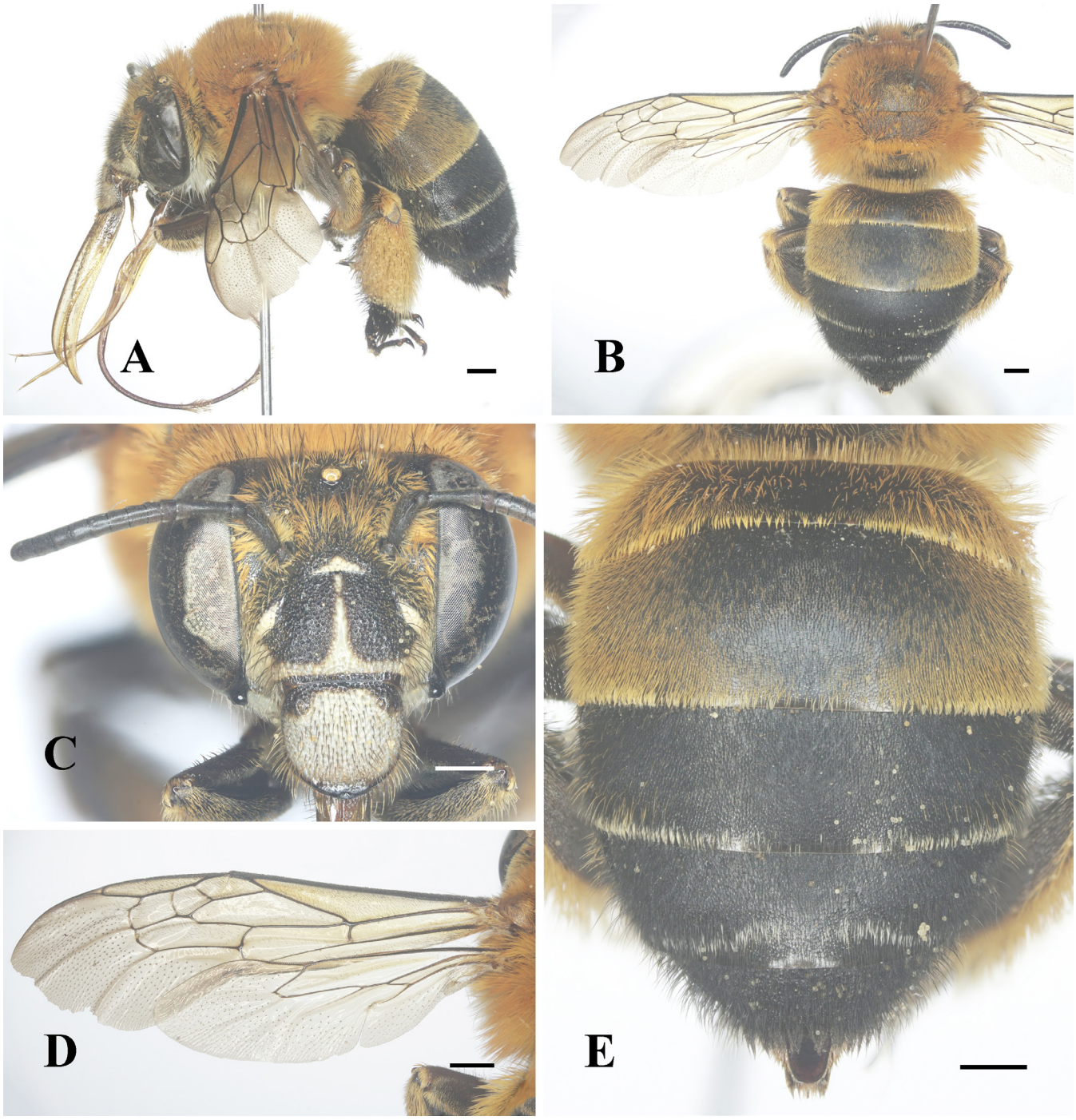

Fig. 5. A–E, *Amegilla* (*Glossamegilla*) *jacobi* (Lieftinck, 1944), female; A, habitus, lateral view; B, habitus, dorsal view; C, head, frontal view; D, left wings; E, metasoma, dorsal view. Scale bars = 1 mm.

***Amegilla* (*Glossamegilla*) *jacobi* (Lieftinck, 1944)**
(Figs. 5, 6, 13E–F, 15E–F)

Anthophora jacobi Lieftinck, 1944: 116.
Amegilla (Glossamegilla) jacobi – Brooks, 1988: 513; Lieftinck, 1956: 25; Wu, 2000: 299.

Diagnosis. In both sexes, clypeus creamy white except black maculations baso-laterally; antenna mostly black; mesosoma with fulvous to rufous setae intermixed with some black setae. In females, legs mostly black; metasomal terga I–II covered with dense, short, fulvous setae except little sparser setae on median areas, metasomal terga III–IV covered with dense, short, black setae, metasomal terga I–IV with extremely thin, lighter yellowish setal bands apically. In males, setae on metasomal terga I–II sparser than those of females, especially on median areas; tergum VII concave apically, and latero-apical spines of tergum VII rather sharp apically; sternum VII round and slightly convex apically, sternum VIII concave medio-apically, with some short setae, and gonocoxite round apically and wavy on apico-anterior margin, with some setae on baso-anterior margin.

Material examined. VIETNAM: 1 female, Cao Bằng Province, Nguyên Bình District, Phia Oắc - Phia Đén National Park, 22°35′28″N, 105°51′21″E, coll. Ngát Thị Trần, 2 July

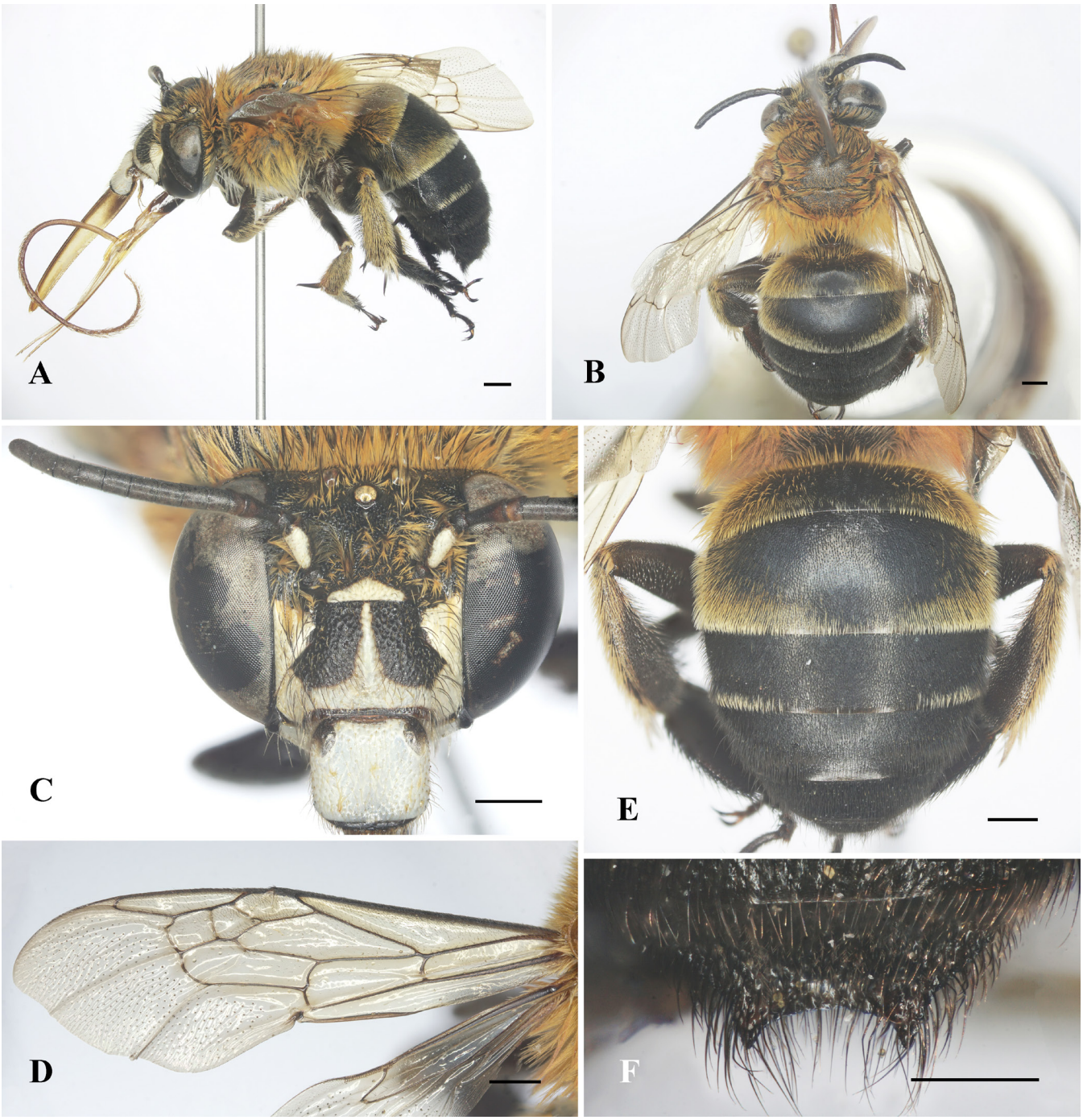

Fig. 6. A–F, *Amegilla* (*Glossamegilla*) *jacobi* (Lieftinck, 1944), male; A, habitus, lateral view; B, habitus, dorsal view; C, head, frontal view; D, left forewing; E, metasoma, dorsal view; F, tergum VII, dorsal view. Scale bars = 1 mm (A–E), 0.5 mm (F).

2022; 1 female, Cao Bằng Province, Trà Lĩnh District, Thang Hen lake, 22°45′48″N, 106°17′38″E, alt. 611 m, coll. Liên Thị Phương Nguyễn, Cường Quang Nguyễn, Ngát Thị Trần, 3 August 2022; 2 females, Cao Bằng Province, Trà Lĩnh District, Thang Hen lake, 22°45′47.5″N, 106°17′35.7″E, alt. 619 m, coll. Liên Thị Phương Nguyên, Ngát Thị Trần, Cường Quang Nguyễn, 19 May 2023; 1 female, Cao Bằng Province, Nguyên Bình District, Phia Oắc – Phia Đén National Park, 22°34′19″N, 105°52′33″E, alt. 1044 m, coll. Ngát Thị Trần, 1 June 2023; 1 female, Cao Bằng Province, Nguyên Bình District, Phan Thanh Commune, Salmon Station 2, Phia Oắc - Phia Đén National Park, 22°35′28″N, 105°51′20″E, alt. 1046 m, coll. Ngát Thị Trần, 2 June 2023; 2 females, Cao Bằng Province, Nguyên Bình District, Phan Thanh Commune, Ca My Station of Resources Protection, Phia Oắc - Phia Đén National Park, 22°38′30″N, 105°50′59″E, alt. 1009 m, coll. Ngat Thi Tran, 3 June 2023; 1 male, Cao Bằng Province, Trà Lĩnh District, Thang Hen lake, 22°45′47″N, 106°17′36″E, coll. Liên Thị Phương Nguyễn, Anh Đức Nguyễn, Ngát Thị Trần, 18 September 2023; 2 males, Cao Bằng Province, Hạ Lang District, Đức Quang Commune, 22°43′12″N, 106°39′21″E, alt. 454 m, coll. Liên Thị Phương Nguyễn, Anh Đức Nguyễn, Ngát Thị Trần, 21 September 2023; 1 female, Lào Cai Province, Văn Bàn District, Nậm Xé Commune, Hoàng Liên – Văn Bàn Natural Reserve, 22°2′47.9″N, 103°58′13″E, alt. 900 m, coll. Liên

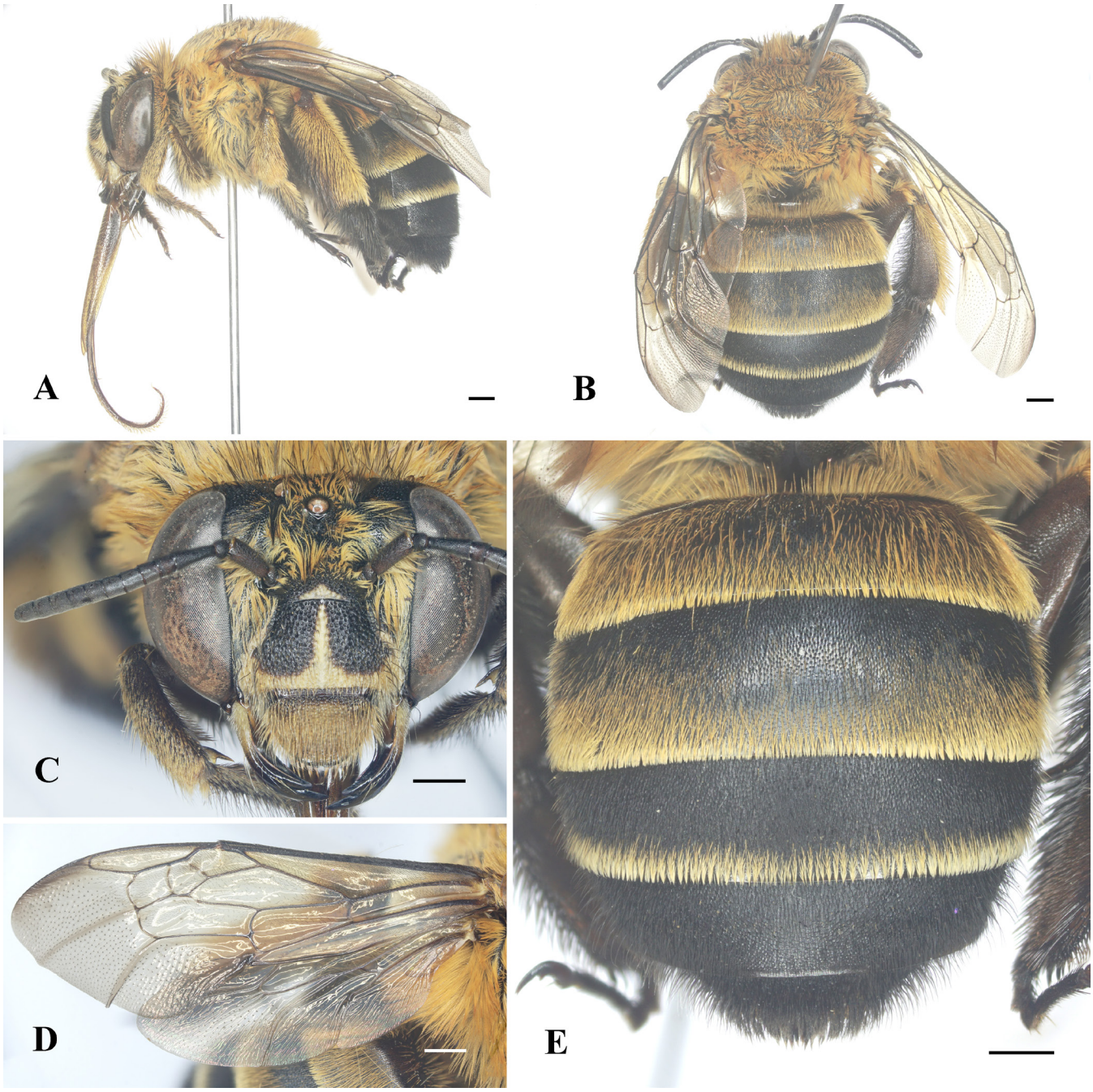

Fig. 7. A–E, *Amegilla* (*Glossamegilla*) *mesopyrrha* (Cockerell, 1930), female; A, habitus, lateral view; B, habitus, dorsal view; C, head, frontal view; D, left wings; E, metasoma, dorsal view. Scale bars = 1 mm.

Thị Phương Nguyễn, Ngát Thị Trần, 24 April 2021; 1 male, Lào Cai Province, Sa Pa District, Sa Pa Town, Cát Cát Village, 22°19′41″N, 103°49′54″E, alt. 1264 m, coll. Ngát Thị Trần, 27 October 2020; 1 male, Ninh Bình Province, Nho Quan District, Cúc Phương National Park, coll. Liên Thị Phương Nguyễn, Anh Đức Nguyễn, Ngát Thị Trần, Michael S. Engel, 21 August 2023; 2 females, Bắc Giang, Lục Nam District, Tây Yên Tử Natural Reserve, mountain top, 21°9′34.1″N, 106°43′12.4″E, alt. 950–1000m, coll. Anh Đức Nguyễn, 17 July 2025; 1 female, Gia Lai Province, Kbang District, Sơn Lang Commune, Kon Chư Răng Natural Reserve, 14°28′27″N, 108°32′24.3″E, alt. 832 m, coll. Liên Thị Phương Nguyễn, Đại Đắc Nguyễn, Minh Phượng Nguyễn, 19 April 2015; 1 male, Gia Lai Province, Kbang District, Kon Chư Răng Natural Reserve, coll. Liên Thị Phương Nguyễn, Đại Đắc Nguyễn, Minh Phượng Nguyễn, 20 April 2015; 1 female, Gia Lai Province, Kbang District, Đắk Rông Commune, 14°28′55.7″N, 108°29′57.6″E, alt. 1140 m, coll. Liên Thị Phương Nguyễn, Đại Đắc Nguyễn, Ngát Thị Trần, 28 April 2016.

Remarks. The species is recorded from Vietnam for the first time and quite easy to find in the northernmost province of Vietnam (Cao Bằng). Given its known occurrence, it can be reasonably predicted to also occur in southern China. In this work, males visited flowers of *Argyreia* sp. (Convolvulaceae) (Fig. 17B) and *Meistera vespertilio* (Gagnep.) (Zingiberaceae) (Fig. 17F).

Fig. 8. A–F, *Amegilla* (*Glossamegilla*) *mesopyrrha* (Cockerell, 1930), male; A, habitus, lateral view; B, habitus, dorsal view; C, head, frontal view; D, left wings; E, metasoma, dorsal view; F, tergum VII, dorsal view. Scale bars = 1 mm (A–E), 0.5 mm (F).

Distribution. Indonesia and Vietnam (Northern and Central Highlands).

***Amegilla* (*Glossamegilla*) *mesopyrrha* (Cockerell, 1930)**
(Figs. 7, 8, 14A–B, 16A–B)

Anthophora mesopyrrha Cockerell, 1930: 53.
Amegilla mesopyrrha – Popov, 1950: 259.
Amegilla (*Glossamegilla*) *mesopyrrha* – Brooks, 1988: 513; Wu, 2000: 302.

Diagnosis. In both sexes, clypeus yellow except black maculations baso-laterally; antenna mostly black; mesosoma with fulvous setae intermixed with some black setae. In females, legs mostly black; metasomal terga I–II covered with dense, short, fulvous setae except setae a little sparser on tergum II medio-basally, metasomal terga I–III with obviously lighter yellowish setal bands apically. In males, setae on metasoma sparser than those of females, especially on tergum II basally; tergum VII slightly concave apically,

and latero-apical spines of tergum VII short and rather blunt apically; sternum VII slightly concave apico-laterally and slightly convex medio-apically; sternum VIII slightly concave medio-apically; gonocoxite strongly swollen, with tuft of short setae apically and some longer setae on baso-anterior and apico-posterior margins.

Material examined. VIETNAM: 1 female, Cao Bằng Province, Nguyên Bình District, Phia Oắc – Phia Đén National Park, 22°34′17″N, 105°52′30″E, alt. 1032 m, coll. Ngát Thị Trần, 30 June 2022; 1 female, Gia Lai Province, Mang Yang District, Ayun Commune, Kon Ka Kinh National Park, 14°12′29″N, 108°18′51″E, alt. 918 m, coll. Liên Thị Phương Nguyễn, Cường Quang Nguyễn, Ngát Thị Trần, 28 March 2022; 1 male, Gia Lai Province, Kbang District, Son Lang Commune, Kon Chư Răng Nature Reserve, near Dầm Station, 14°28′57.9″N, 108°30′59.8″E, alt. 860 m, coll. Liên Thị Phương Nguyễn, Đại Đắc Nguyễn, Ngát Thị Trần, 27 April 2016; 1 female, Đắk Lắk Province, Krông Bông District, Krông Kmar Commune, Chư Yăng Sin National Park, 12°25′02.8″N, 108°22′30.8″E, alt. 1081 m, coll. Liên Thị Phương Nguyễn, Đại Đắc Nguyễn, Ngát Thị Trần, 4 May 2016.

Remarks. This species is newly recorded from Vietnam.

Distribution. China, Vietnam (Northern and Central Highlands).

Amegilla (*Glossamegilla*) *pendleburyi* (Cockerell, 1929)
(Fig. 9)

Anthophora insularis pahangensis Cockerell, 1927: 531.
Anthophora insularis pendleburyi Cockerell, 1929, replacement name: 285.
Amegilla anthreptes – Lieftinck, 1944: 135.
Amegilla (*Glossamegilla*) *pendleburyi* – Brooks, 1988: 513; Lieftinck, 1956: 21.

Diagnosis. In both sexes, clypeus yellow except brownish-black maculations baso-laterally; antenna brownish-black except scape with yellow maculation ventrally and flagellomere I orange maculation apico-ventrally; mesosoma with fulvous to ochraceous-buff setae intermixed with black setae. In females, legs mostly ferruginous; metasomal terga I–IV covered with short, dense, yellowish-orange setae and thin, lighter yellowish setal bands apically. In males, metasomal terga I–V covered with short, dense, ochraceous-tawny to buckthorn-brown setae and thin setal bands apically (see Lieftinck, 1944: p. 97 and Lieftinck, 1956: p. 4); tergum VII undulated apically, and latero-apical spines of tergum VII rather sharp apically; sternum VII convex apically; sternum VIII concave apically; gonocoxite broad and plate-shaped, with tuft of short setae apically and some longer setae on apico-posterior margin (see Lieftinck, 1944: figs. 75–79).

Material examined. VIETNAM: 1 female, Gia Lai Province, Kbang District, Sơn Lang Commune, Kon Chư Răng Natural Reserve, 14°31′10.5″N, 108°36′24.3″E, alt. 742 m, coll. Tuấn Viết Lương, 10 September 2018.

Remarks. This species is newly recorded from Vietnam.

Distribution. Indonesia, Malaysia, Thailand, and Vietnam (Central Highlands).

Amegilla (*Glossamegilla*) *sonla*, new species
(Figs. 10, 14C–D, 16C–D)

Type material. Holotype. VIETNAM: male, Sơn La Province, Mường La District, Ngọc Chiến Commune, Chom Khâu Village, Mường La Natural Reserve, coll. Dương Đình Trần, 23 July 2024.

Diagnosis. The male of this new species can be distinguished from its congeners by the unique male terminalia, extremely long glossa, and colouration of the body setation and facial maculations. In the male terminalia, sternum VII is expanded on apical half, broadly emarginate apico-medially forming two rounded lobes laterally, and with a tuft of short setae in the apicomedial area; sternum VIII deeply and broadly emarginate apico-medially, with some short setae in the apicomedial area and some long setae on the apical margin; male gonocoxite thin, long, and with some long setae on apico-posterior margin; mesosoma with long, dense, orangish-yellow setae intermixed with black setae dorsally; metasomal tergum I with shorter, orangish-yellow setae latero-dorsally; metasomal terga IV–VII ferruginous except black on basal half of tergum IV and baso-medial area of tergum V; terga IV–VII with short, dense, orange setae intermixed with some black setae; clypeus and supraclypeal area black, with subtriangular yellow maculation medially; most of labrum yellow except black on margins.

Description. Male. Total body length 15 mm, forewing 13 mm. Head broader than long, approximately 1.4× as broad as long (Fig. 10A); mandible with two teeth; clypeus convex and broader than long, approximately 1.5× as broad as long (Fig. 10A, C); galea and glossa extremely long; labrum round apically, approximately as broad as long; scape short, flagellomere I longest, flagellomere II shortest and flagellomere I approximately 2.7× length of flagellomere II, flagellomeres III–X subequal in length and about 2.7× length of flagellomere II and flagellomere X little longer than flagellomeres IX, about 1.4× as long as broad. Mesoscutellum short and with apical margin rounded, not overhanging metanotum (Fig. 10B). Forewing with three submarginal cells, first and third submarginal cells broader than second submarginal cell, 1m-cu entering beyond half of second marginal cell (Fig. 10D). Metasoma relatively long (Fig. 10A, E); mesosomal tergum VII concave apically forming two elongated spines laterally (Fig. 10F). Sternum VII expanded in apical half, broadly emarginate apico-medially forming two rounded lobes laterally, tuft of short setae in apicomedial area (Fig. 14C); sternum VIII deeply and broadly emarginate apico-medially, with some short setae in apicomedial area, some long setae on apical margin (Fig. 14D); male gonocoxite thin, long, with some long setae on apico-posterior margin (Fig. 16C, D).

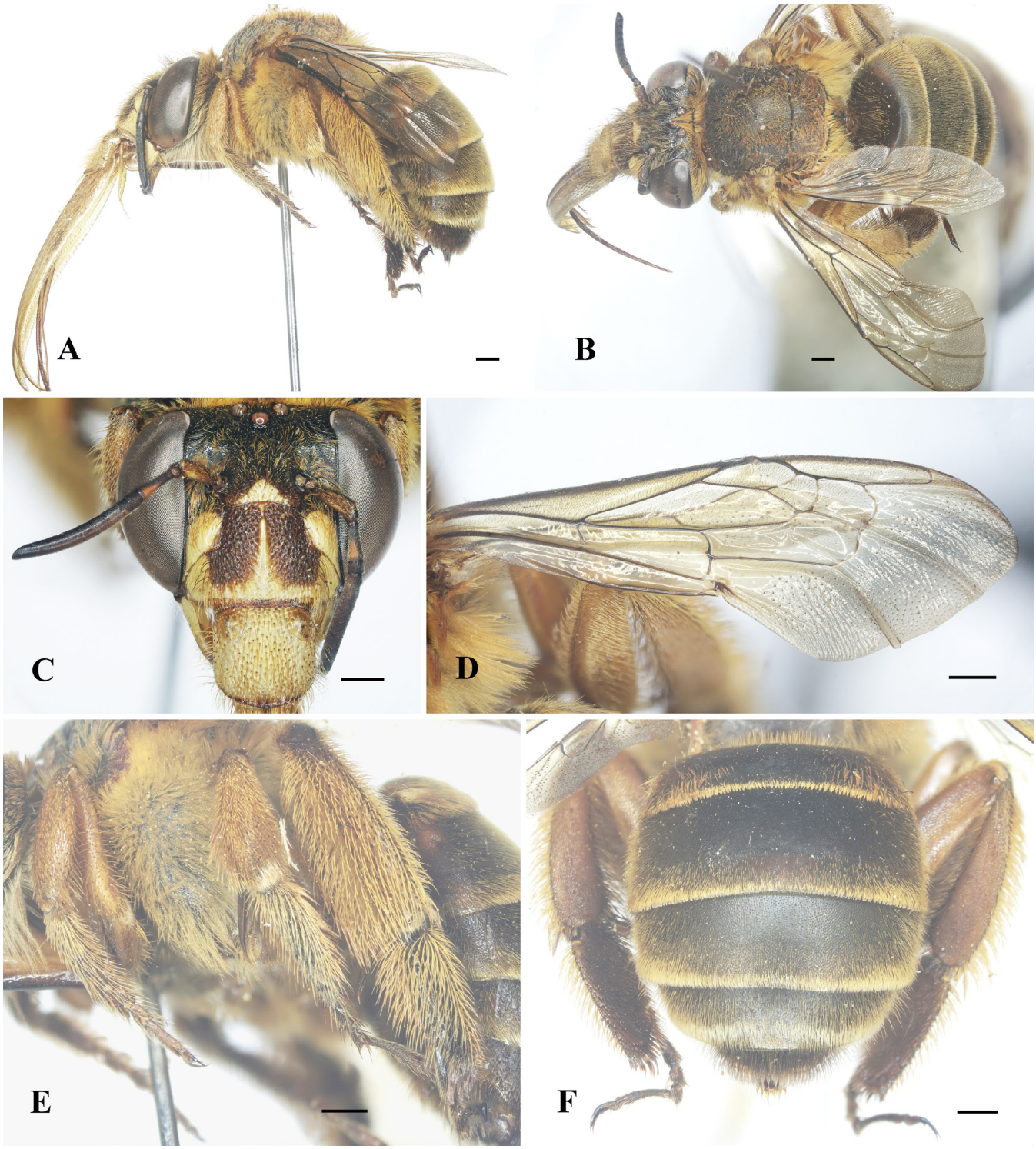

Fig. 9. A–F, *Amegilla* (*Glossamegilla*) *pendleburyi* (Cockerell, 1929), female; A, habitus, lateral view; B, habitus, dorsal view; C, head, frontal view; D, right wings; E, legs, outer view; F, metasoma, dorsal view. Scale bars = 1 mm.

Clypeus with relatively dense punctures separated by 0.5–2× puncture width, except yellow triangular maculation impunctate medially. Punctures on labrum similar to clypeus in size and distinct except yellow maculation with faint, much sparser punctures medially (Fig. 10C); supraclypeal area with small, dense punctures except yellow triangular maculation impunctate apico-medially. Paraocular area, frons, and vertex with small, dense punctures, punctures size equal to those on supraclypeal area and smaller than those on clypeus and labrum. Mesoscutum, mesoscutellum, metasomal terga with small, dense punctures, punctures smaller than those on frons (Fig. 10B, E).

Labrum yellow except black on margins; clypeus black, with triangular yellow maculation medially, top reaching about ⅔ length of clypeus; supraclypeal area with small subtriangular yellow maculation medially (Fig. 10C); wings slightly smoky (Fig. 10D); metasomal terga I–II with dark

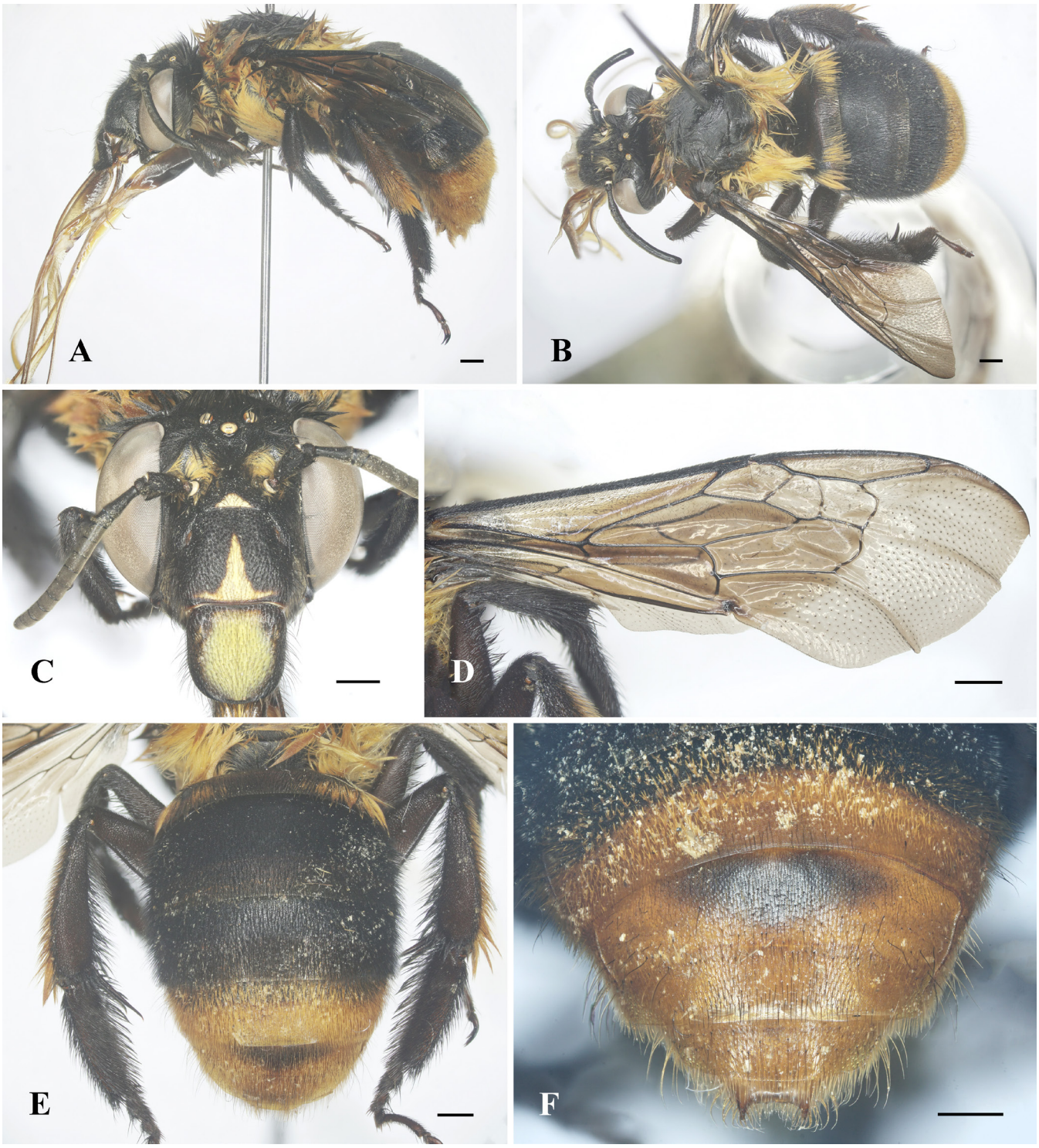

Fig. 10. A–F, *Amegilla* (*Glossamegilla*) *sonla*, new species, male; A, habitus, lateral view; B, habitus, dorsal view; C, head, frontal view; D, right wings; E, metasoma, dorsal view; F, terga IV–VII, dorsal view. Scale bars = 1 mm.

ferruginous laterally (see lateral view); metasomal terga IV–VII ferruginous except black on basal half of tergum IV and baso-medially on tergum V (Fig. 10F).

Clypeus with short, sparse, black setae except longer and denser setae apico-laterally intermixed with shorter fuscous lighter setae apico-laterally. Labrum with short, sparse, black setae except longer setae lateral margins. Paraocular area with dense, black setae. Scape with short, dense, black setae. Face above antennal torulus with fulvous tuft of setae. Frons and vertex with long, dense, black setae (Fig. 10C). Gena with long, dense, fulvous setae extending from base to middle level of compound eye and black setae on remainder of gena (Fig. 10A). Pronotum with long, dense, fulvous setae laterally (Fig. 10A). Mesosoma with long, dense, fulvous setae intermixed with black setae dorsally, fulvous setae laterally (Fig. 10A, B). Profemur with long, black setae intermixed with fulvous setae ventrally. Pro- and mesotibiae with short, black setae, metatibia with longer, denser, ferruginous setae (Fig. 10A). All basitarsi with black

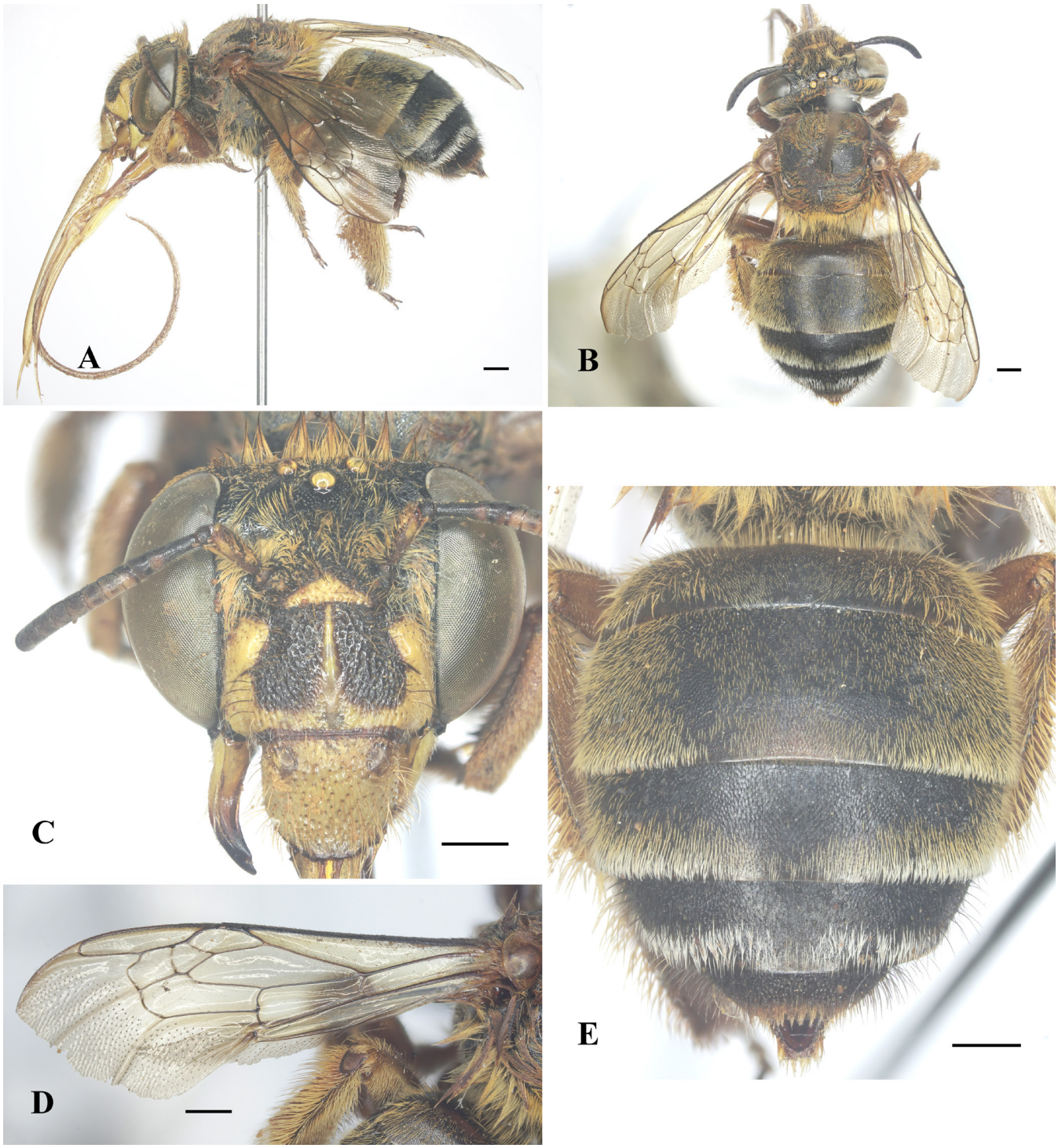

Fig. 11. A–E, *Amegilla* (*Glossamegilla*) *yunnanensis* Wu, 1983, female; A, habitus, lateral view; B, habitus, dorsal view; C, head, frontal view; D, left wings; E, metasoma, dorsal view. Scale bars = 1 mm.

setae, and stiffer setae on inner surfaces. Metasomal tergum I with fulvous setae latero-dorsally; terga II–III with short, black setae; terga IV–VII with short, dense, ferruginous setae intermixed with some black setae (Figs. 10E, F); metasomal sterna I–III with short, black setae and sterna IV–VI with short, fulvous setae.

Female. Unknown.

Remarks. At first glance, the new species looks like a bumble bee because the mesosoma having long, dense, fulvous setae intermixed with black setae dorsally; a similar case occurs in *A*. (*G.*) *pseudobomboides*, which mesosoma with long, dense, yellow setae, except for black setal band medio-horizontally between tegulae (see Niu et al., 2025: fig. 1e).

Distribution. Vietnam (Northern).

Etymology. The specific epithet refers to the type locality, Sơn La Province, it is treated as a noun in apposition.

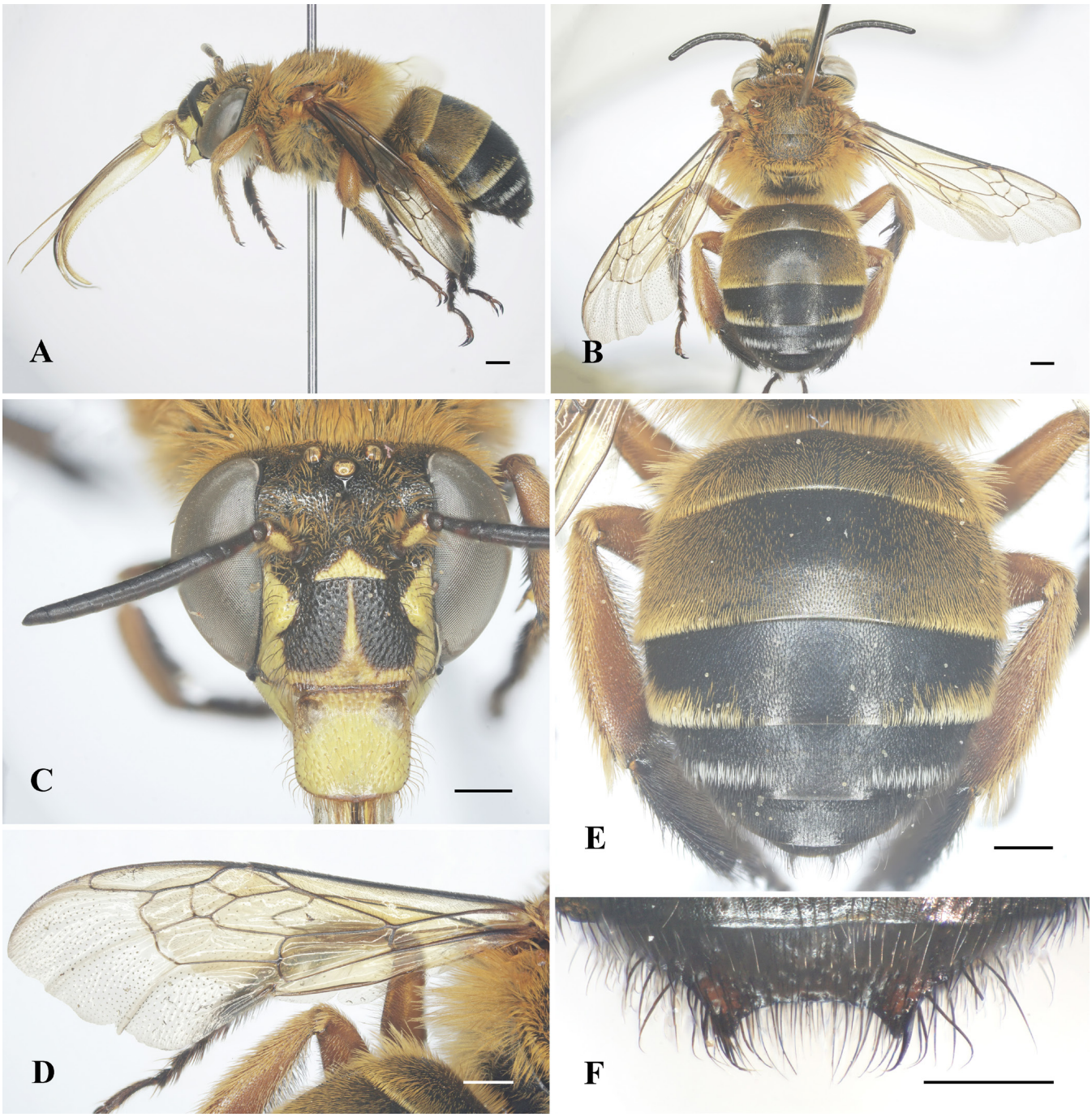

Fig. 12. A–F, *Amegilla* (*Glossamegilla*) *yunnanensis* Wu, 1983, male; A, habitus, lateral view; B, habitus, dorsal view; C, head, frontal view; D, left wings; E, metasoma, dorsal view; F, tergum VII, dorsal view. Scale bars = 1 mm (A–E), 0.5 mm (F).

***Amegilla* (*Glossamegilla*) *yunnanensis* Wu, 1983**
(Figs. 11, 12, 14E–F, 16E–F, 17C–E)

Amegilla yunnanensis Wu, 1983: 223.
Amegilla (*Glossamegilla*) *yunnanensis* – Brooks, 1988: 513; Wu, 2000: 298.

Diagnosis. In both sexes, clypeus yellow except black maculations baso-laterally; antenna brownish-black except scape with yellow maculation ventrally; mesosoma with fulvous setae. In females, legs mostly ferruginous; first three metasoma terga covered with short, dense, fulvous setae, sparser on tergum III, metasomal terga II–IV with creamy white setae apically, forming a more distinct whitish band on tergum IV. In males, setae brighter than those of females; tergum VII concave apically, and latero-apical spines of tergum VII with pointed apically; sternum VII expanded on apical half and slightly convex apically; sternum VIII nearly straight apically; gonocoxite broad and plate-shaped, with some short setae apically and longer setae on apico-posterior margin.

Material examined. VIETNAM: 1 female, Cao Bằng Province, Nguyên Bình District, Tam Kim Commune, Nà Vạ Village, 23°36′17″N, 106°01′47.5″E, alt. 320 m, coll. Minh Phượng Nguyễn, Cường Quang Nguyễn, 5 November 2016; 1 male, Cao Bằng Province, Trà Lĩnh District, Thang Hen lake, 22°45′47″N, 106°17′35″E, alt. 619 m, coll. Liên Thị

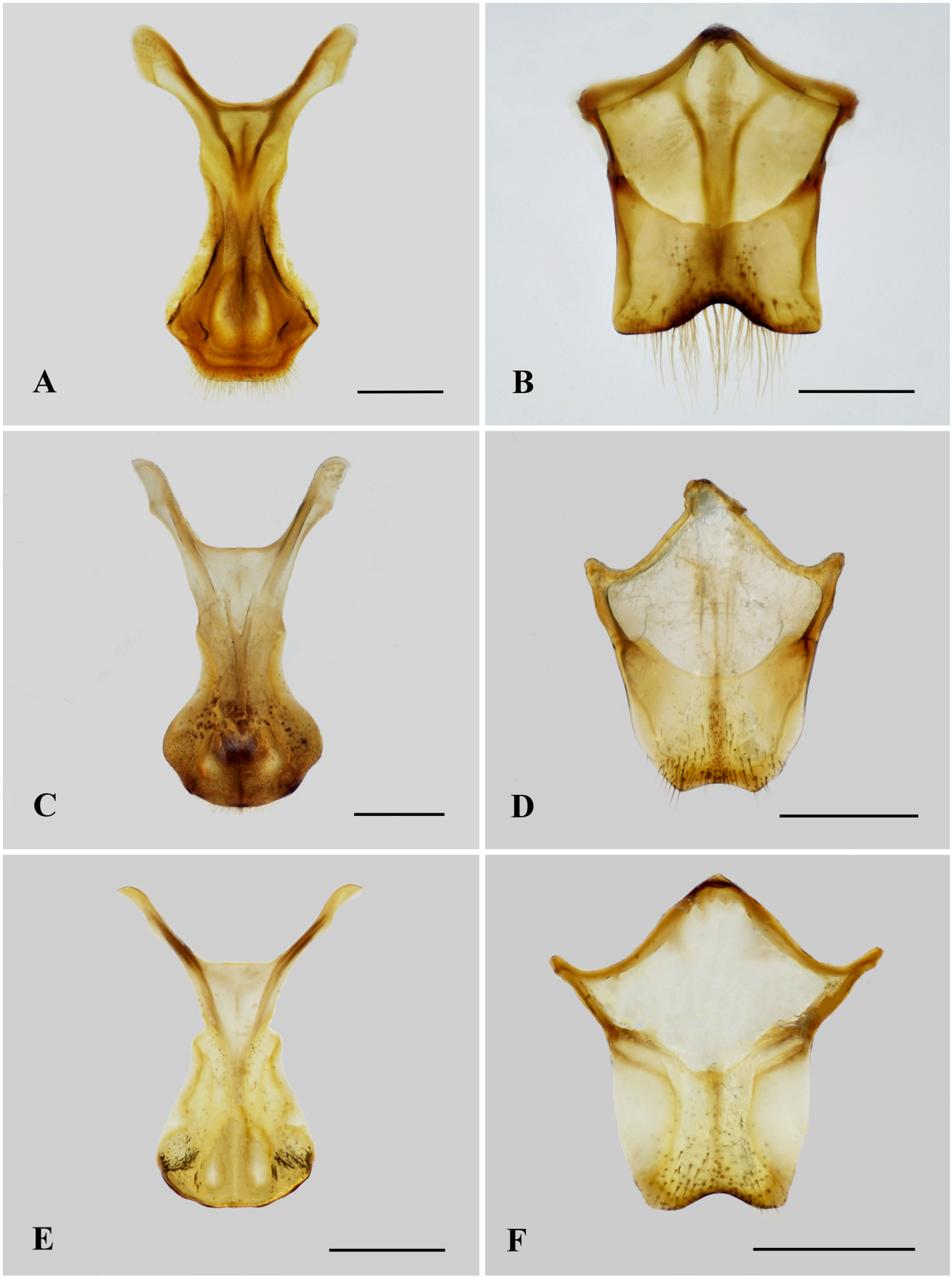

Fig. 13. A–F, Sterna VII–VIII of *Glossamegilla* in Vietnam (A, C, E, sternum VII; B, D, F, sternum VIII); A, B, *fimbriata*; C, D, *himalajensis*; E, F, *jacobi*. Scale bars = 0.5 mm.

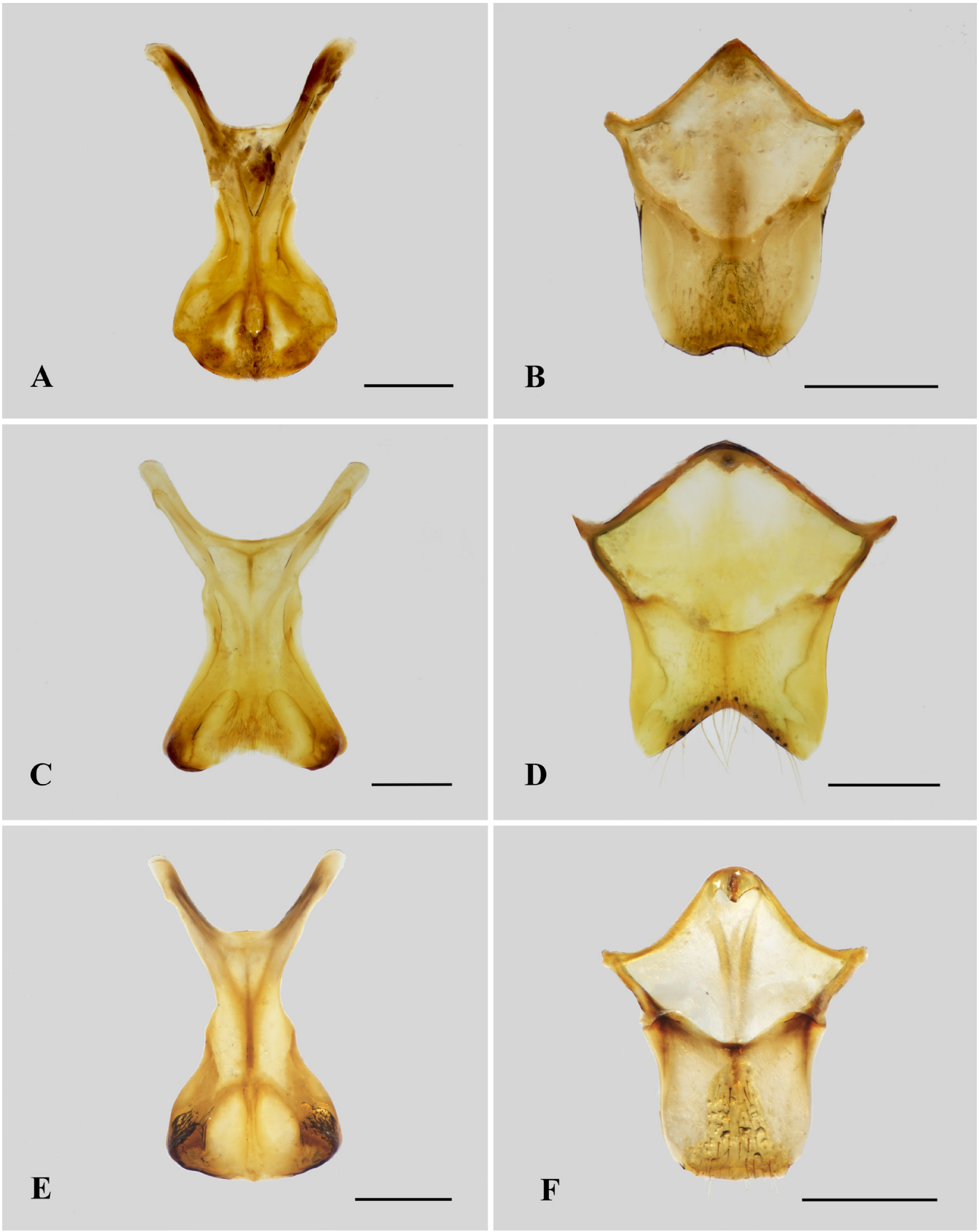

Fig. 14. A–F, Sterna VII–VIII of *Glossamegilla* in Vietnam (A, C, E, sternum VII; B, D, F, sternum VIII); A, B, *mesopyrrha*; C, D, *sonla*; E, F, *yunnanensis*. Scale bars = 0.5 mm.

Fig. 15. A–F, Male genitalia of *Glossamegilla* in Vietnam (A, C, E, dorsal view; B, D, F, ventral view); A, B, *fimbriata*; C, D, *himalajensis*; E, F, *jacobi*. Scale bars = 0.5 mm.

Phương Nguyễn, Ngát Thị Trần, Cường Quang Nguyễn, 20 May 2023; 1 male, Cao Bằng Province, Hạ Lang District, Đức Quang Commune, 22°43′12″N, 106°39′21″E, alt. 454 m, coll. Liên Thị Phương Nguyễn, Anh Đức Nguyễn, Ngát Thị Trần, 21 September 2023; 1 female, Cao Bằng Province, Hạ Lang District, Đồng Loan Commune, bat cave, 22°44′50″N, 106°44′44″E, alt. 405 m, coll. Liên Thị Phương Nguyễn, Ngát Thị Trần, 20 September 2023; 1 male, Ninh Bình Province, Nho Quan District, Cúc Phương National Park, coll. Liên Thị Phương Nguyễn, Anh Đức Nguyễn, Ngát Thị Trần, Michael S. Engel, 21 August 2023; 1 female, Quảng Nam Province, Phước Sơn District, Phước Mỹ Commune, alt. 450 m, coll. Liên Thị Phương Nguyễn, 2 May 2005.

Remarks. This species is a newly recorded one for the Vietnamese fauna. Males were recorded at flowers of *Argyreia* sp. (Convolvulaceae) (Fig. 17B), *Impatiens* sp. (Balsaminaceae) (Fig. 17D), and *Meistera vespertilio* (Gagnep.) (Zingiberaceae) (Fig. 17F).

Distribution. China and Vietnam (Northern and Central).

Key to species of the subgenus *Glossamegilla* from Vietnam

The female of *A.* (*G.*) *sonla* remains unknown.

1. Female 2
– Male 8
2. Mesoscutum and anterior part of mesoscutellum with white setae intermixed with black setae; posterior margin of mesoscutellum and metanotum with white setae; metasomal terga IV–V black with short, white setal bands (Figs. 1A, B) ..... *A.* (*G.*) *fimbriata* (Smith, 1879)
– Mesosoma with fulvous setae or pale yellow except black setal band medio-horizontally; apical metasomal terga with ferruginous setae or fulvous/black setae with lighter yellowish setal bands 3
3. Mesosoma with pale yellow setae except broad black setal band medio-horizontally between tegulae (see Niu et al., 2025: fig. 1e); apical half of metasomal tergum III and subsequent terga with ferruginous setae (see Niu et al., 2025: fig. 1f)..... *A.* (*G.*) *pseudobomboides* (Meade-Waldo, 1914)
– Mesosoma and metasoma with fulvous setae 4
4. Clypeus with large ferruginous maculations baso-laterally, antenna ferruginous except scape with yellow maculation ventrally (Fig. 3C); wings ferruginous (Fig. 3D); metasomal terga I–II with fulvous setal patches laterally (Fig. 3F)..... *A.* (*G.*) *himalajensis* (Radoszkowski, 1882)
– Clypeus with brownish-black or black maculations baso-laterally, antenna black to brownish-black (Figs 5C, 7C, 9C, 11C); wings subhyaline, without ferruginous colouration (Figs 5D, 7D, 9D, 11D); metasomal terga I–IV with lighter yellowish setal bands apically (Figs 5E, 7E, 9E, 11E) 5
5. Legs mostly ferruginous..... 6
– Legs mostly black 7
6. Metasomal terga I–IV covered with short, dense, fulvous setae and thin, lighter yellowish setal bands apically (Fig. 9F) ..... *A.* (*G.*) *pendleburyi* (Cockerell, 1929)
– First three metasomal terga covered with short, dense, fulvous setae, metasomal terga II–IV with creamy white setae apically, forming a more distinct whitish band on tergum IV (Fig. 11E) ..... *A.* (*G.*) *yunnanensis* Wu, 1983
7. Face with creamy white maculations (Fig. 5C); metasomal terga I–II covered with dense, short, fulvous setae except little sparser setae on median areas, metasomal terga I–IV with extremely thin setal bands apically (Fig. 5E) ..... *A.* (*G.*) *jacobi* (Lieftinck, 1944)
– Face with yellow maculations (Fig. 7C); metasomal terga I–II covered with dense, short, fulvous setae except setae a little sparser on tergum II medio-basally, metasomal terga I–III with obviously thicker setal bands apically (Fig. 7E)..... *A.* (*G.*) *mesopyrrha* (Cockerell, 1930)
8. Gonostylus well-developed (Figs. 15A, B); mesoscutum and anterior part of mesoscutellum with white setae intermixed with black setae; posterior margin of mesoscutellum and metanotum with white setae; metasoma black, with short, white setal bands on terga IV–VI (Figs. 2A, B) *A.* (*G.*) *fimbriata* (Smith, 1879)
– Gonostylus absent (Figs. 15B–D, 16); mesosoma with fulvous setae or pale yellow except black setal band medio-horizontally; apical metasomal terga with ferruginous setae or fulvous/black with lighter yellowish setal bands 9
9. Mesosoma with yellow setae except broad black setal band medio-horizontally between tegulae; metasoma wholly or partly ferruginous; gonocoxite thin and long..... 10
– Mesosoma covered with uniform, fulvous setae; metasoma wholly black; gonocoxite thicker and swollen 11
10. Metasomal terga IV–VII ferruginous except black area on basal half on tergum IV and baso-medially on tergum V; terga IV–VII with short, dense, ferruginous setae intermixed with some black setae (Fig. 10E, F); sternum VIII with V-shaped and deeply emarginated apico-medially, with some short setae in apicomedial area, some long setae on apical margin (Fig. 14D)..... *A.* (*G.*) *sonla*, new species
– Metasoma wholly with ferruginous setae (see Brooks, 1988: p. 513); sternum VIII with semicircle-shaped and shallower emarginated apico-medially, without setae (see Wu, 2000: fig. 150e) ..... *A.* (*G.*) *pseudobomboides* (Meade-Waldo, 1914)
11. Clypeus with large ferruginous maculations baso-laterally, antenna ferruginous except scape with yellow maculation ventrally (Fig. 4C); first two or three metasomal terga covered with short, dense, fulvous setae and black setae on remainder, without setal bands on terga (Fig. 4E, F); sternum VII with distal portion of laterals slightly swollen and rather strongly raised medio-apically (Fig. 13C); sternum VIII concave medio-apically (Fig. 13D) ..... *A.* (*G.*) *himalajensis* (Radoszkowski, 1882)
– Clypeus with brownish-black or black maculations baso-laterally, antenna black to brownish-black; metasoma with thin setal bands on terga apically; metasomal sterna VII–VIII not as above 12
12. Legs mostly ferruginous..... 13
– Legs mostly black 14
13. Metasomal terga I–V covered with short, dense, ochraceous-tawny to buckthorn-brown setae and thin setal bands apically; sternum VII convex apically (see Lieftinck, 1944: fig. 77); sternum VIII concave apically (see Lieftinck, 1944: fig. 76).. *A.* (*G.*) *pendleburyi* (Cockerell, 1929)
– First three metasomal terga covered with short, densefulvous setae, metasomal terga II–IV with creamy white setae apico-laterally (Fig. 12E); sternum VII less convex apically (Fig. 14E); sternum VIII nearly straight apically (Fig. 14F)..... *A.* (*G.*) *yunnanensis* Wu, 1983
14. Body less robust, about 12 mm (Fig. 6A); face with creamy white maculations (Fig. 6C); gonocoxite less swollen and nearly bare except some setae on baso-anterior margin (Fig. 15E, F)..... *A.* (*G.*) *jacobi* (Lieftinck, 1944)
– Body strongly robust, about 13.5 mm (Fig. 8A); face with yellow maculations (Fig. 8C); gonocoxite strongly swollen, with tuft of short setae apically and some longer setae on apico-posterior and baso-anterior margins (Fig. 16A, B)..... *A.* (*G.*) *mesopyrrha* (Cockerell, 1930)

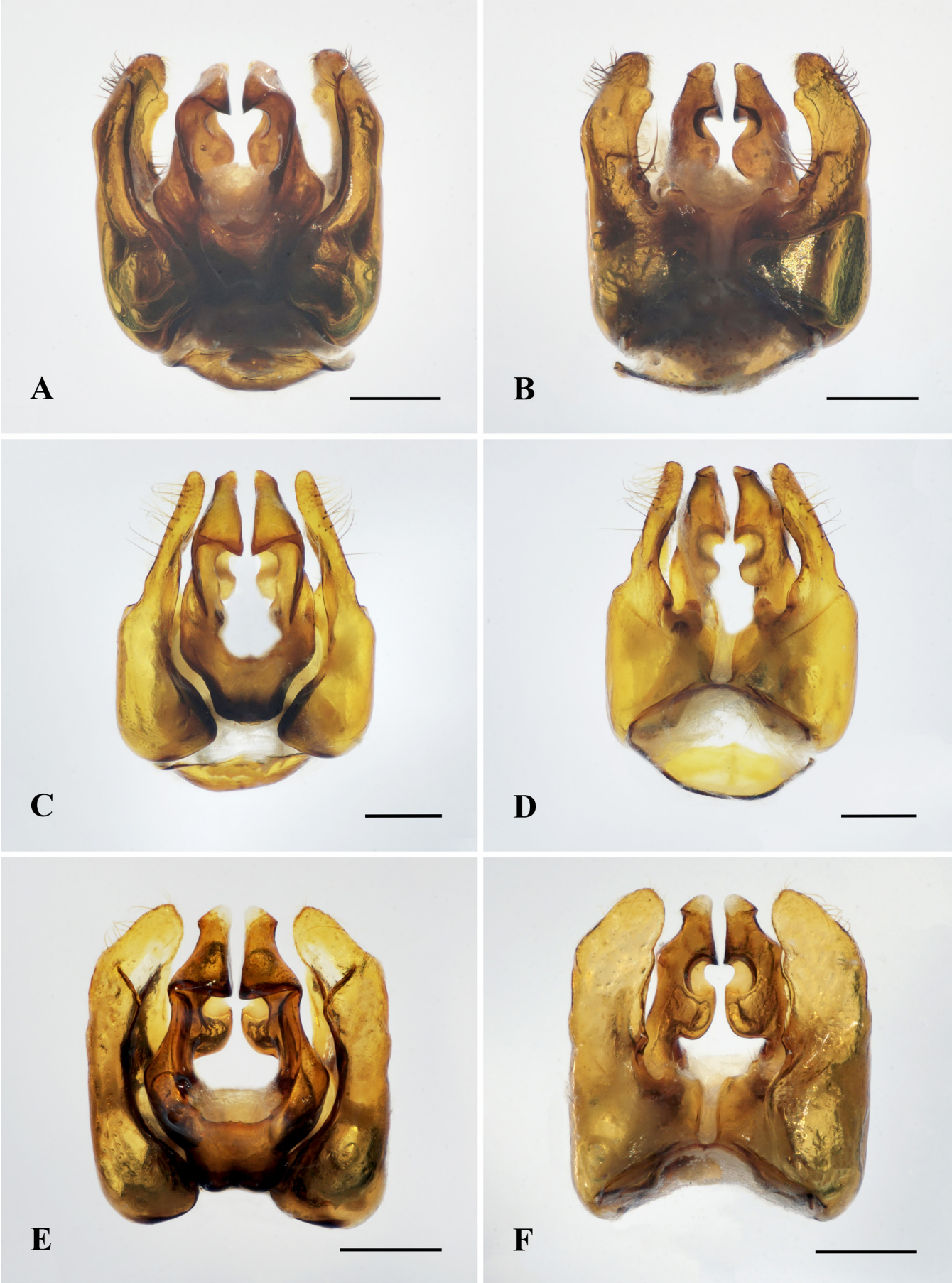

Fig. 16. A–F, Male genitalia of *Glossamegilla* in Vietnam (A, C, E, dorsal view; B, D, F, ventral view); A, B, *mesopyrrha*; C, D, *sonla*; E, F, *yunnanensis*. Scale bars = 0.5 mm.

Fig. 17. A–F, Habitat and floral associations of *Glossamegilla* in Vietnam; A, B, habitat and flowers of *Argyreia* sp. (Convolvulaceae) at which males of *jacobi*, *himalajensis*, and *yunnanensis* were collected; C, D, habitat and flowers of *Impatiens* sp. (Balsaminaceae) at which males of *yunnanensis* were recorded; E, F, habitat and flowers of *Meistera vespertilio* (Gagnep.) (Zingiberaceae) at which males of *jacobi* and *yunnanensis* were found.

Fig. 18. A–C, Habitat and initial nest entrance trace of *Amegilla* (*Glossamegilla*) *jacobi* (Lieftinck, 1944); A, Habitat where the nest was found; B, a soil piece on the floor was chosen to construct the nest; C, initial nest entrance trace (red arrow).

DISCUSSION

The subgenus *Glossamegilla* can be organised into two distinct groups based on the setal colour of the mesosoma and metasoma. Of all known species, 26 have fulvous setae (group I), but only four species (group II), including the new species (i.e., *A. fimbriata*, *A. pseudobomboides*, *A. violacea*, and *A. sonla*), have white, yellow or ferruginous tufts of setae. In this study, we expanded the number of known species of *Glossamegilla* in Vietnam to eight and updated information on distributions of just seven out of all eight known species due to lack of additional material of *A. pseudobomboides*. Notably, four species of *Glossamegilla*, including *A.* (*G.*) *fimbriata*, *A.* (*G.*) *himalajensis*, *A.* (*G.*) *jacobi*, and *A.* (*G.*) *mesopyrrha* can be found in both the Northern and Central Highlands. This suggests that they occur widely in Vietnam.

Their presence may also reflect similarities in elevation, climate, and pollen sources between these two regions.

Species of *Glossamegilla* are mainly active in strong daylight, and fly away rapidly when they feel insecure due to surrounding influences, which makes their capture difficult. However, these bees are quite noisy and can often be tracked via sound before they are visually observed. They pollinate many moderate-sized and flashy flowers, especially those of the plant families Balsaminaceae, Gesneriaceae, Lamiaceae, Marantaceae, Verbenaceae, and Zingiberaceae (Table 1), and they serve important functions in the pollination of these plants and balancing the ecosystem, supporting the maintenance and spread of plant populations for these families. In fact, the presence of these plants often indicates nesting locations of *Glossamegilla* in the general area.

Digger bees comprising *Amegilla* and its relatives tend to build nests in soil under local wooden houses near the forest (Tran & Engel, 2025). This includes *A*. (*G*.) *jacobi*, which has been observed making an initial nest entrance in the soil with a thin layer of moss located on the floor of a stilt house in Phia Oắc – Phia Đén National Park (Cao Bằng Province) (Fig. 18). Several surveys should be conducted to get more information about the nest and the phenology of the bees. Ultimately, research on the biological characteristics (encountered habitat, nest behavior, nest structure, and developmental stages) of anthophorine bees, as well as their floral associations, are essential for the general protection and conservation of these important pollinating bee populations.

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