

On the family Leucospidae (Hymenoptera: Chalcidoidea) from Vietnam, with new records of three *Leucospis* species

О семействе Leucospidae (Hymenoptera: Chalcidoidea) из Вьетнама, с новыми находками трех видов *Leucospis*

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КЛЮЧЕВЫЕ СЛОВА: *Leucospis*, новые находки, Ориентальная область, Южный Вьетнам, таксономия.

ABSTRACT. The family Leucospidae from Vietnam is studied. Four species of the genus *Leucospis* are registered from the country: *L. femoricincta* Bouček, 1974, *L. guzeratensis* Westwood, 1839, *L. histrio* Maindron, 1878, and *L. pediculata* Guérin-Méneville, 1835. Except the first species, the others are new records from Vietnam. An illustrated key to Vietnamese species of *Leucospis* is included.

РЕЗЮМЕ. Изучено семейство Leucospidae из Вьетнама. Четыре вида рода *Leucospis*: *L. femoricincta* Bouček, 1974, *L. guzeratensis* Westwood, 1839, *L. histrio* Maindron, 1878 и *L. pediculata* Guérin-Méneville, 1835 зарегистрированы в стране. За исключением первого вида, остальные являются новыми находками для Вьетнама. Включен иллюстрированный ключ вьетнамских видов *Leucospis*.

Introduction

Leucospidae is a small and rarely encountered family, and it is worldwide distributed. The family consists of 141 species distributed in four genera: *Leucospis* Fabricius, 1775, *Polistomorpha* Westwood, 1839, *Micrapion* Kriechbaumer, 1894, and *Neleucospis* Bouček, 1974 [Bouček, 1974; Noyes, 2022]. *Leucospis* is the only genus in Leucospidae known from the Oriental Region. The genus consists of 123 valid species, of which 119 are assigned to 16 species groups, and

29 species have been recorded from the region [Bouček, 1974; Bouček, Narendran, 1981; Darling, Cardinal, 2005; Sankararaman *et al.*, 2020; Noyes, 2022].

The genus *Leucospis* is characterized by the anterior margin of the clypeus emarginate and usually dentate medially; 4-segmented maxillary palpi; 3-segmented labial palpi; the mandibles bare apically, with a strong lower tooth; ocell-ocular distance is clearly longer than post-ocellar distance; scutellum without cross-carina; dorsellum rounded or bituberculate dorsally; propodeum often with a median carina; hind femur large and dentate ventrally; hind tibia with the outer spur shorter than the inner spur, and often spined ventroapically; in females, sixth gastral tergite separated from epipygium and the ovipositor curved upward; in males, second gastral tergite transverse [Bouček, 1974; Ye *et al.*, 2017].

Studies of the Leucospid wasp fauna are very limited in Vietnam. *Leucospis femoricincta* described by Bouček in 1974 is the only species known from the country. In this present study, we study the family Leucospidae from Vietnam and record three species of the genus *Leucospis* as new for the country.

Material and methods

Specimens were collected using sweep nets and Malaise traps from 2019 to 2023 at localities in the following provinces: Ha Noi, Hoa Binh, Tay Ninh, and Thai Binh. Identification was made using keys in Bouček [1974] and Ye *et al.* [2017] and by the aid

of a stereomicroscope (Nikon SMZ745). A key to the species of the genus *Leucospis* was constructed based on the original description of *L. femoricincta* by Bouček [1974], illustrations of *L. femoricincta* by Ye *et al.* [2017] and the specimens of the other *Leucospis* species in the present study. Photographic images were taken using a Nikon SMZ800N microscope camera. Morphological terms used in the text follow Bouček [1974].

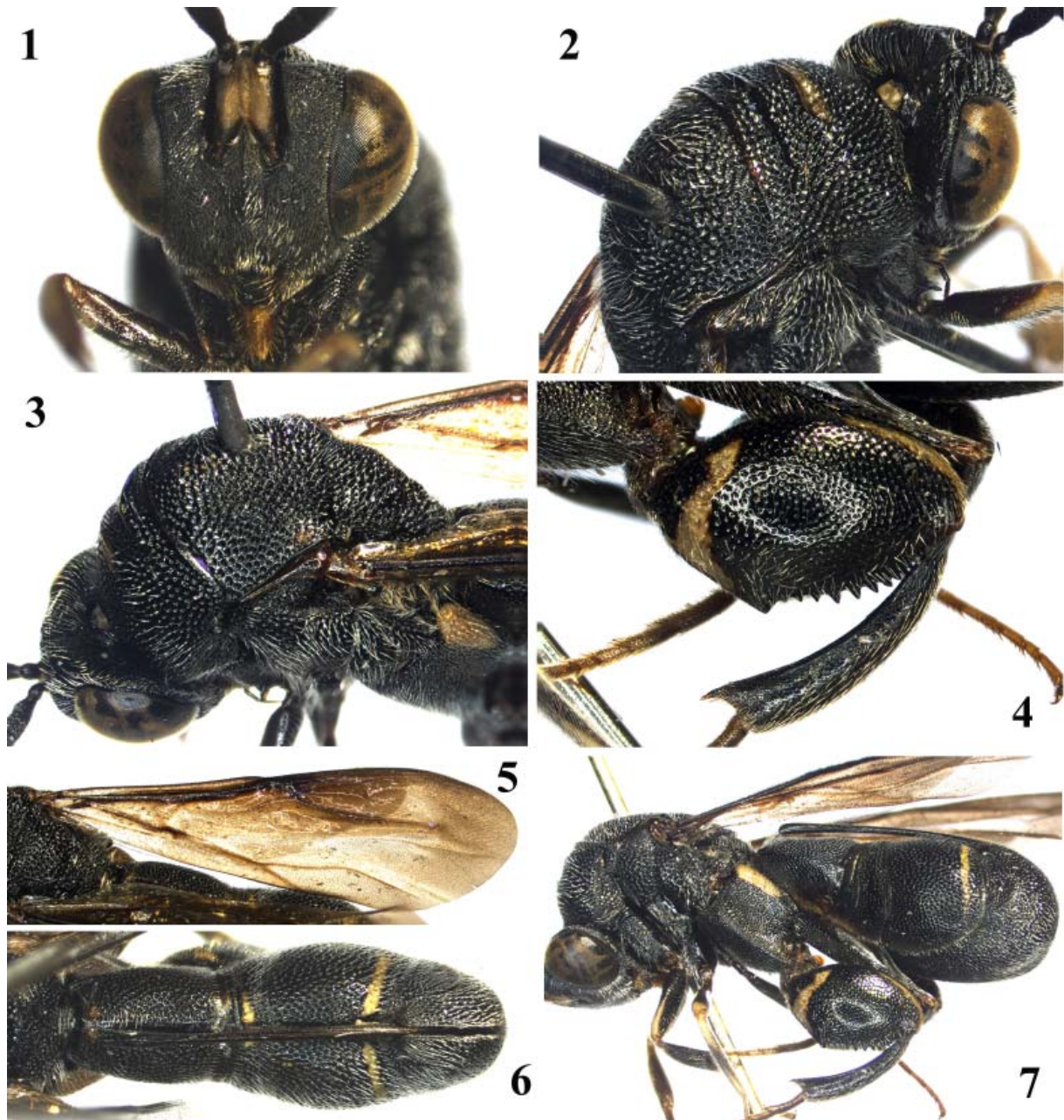
Voucher specimens of the present study are deposited at the Institute of Ecology and Biological Resources (IEBR), Vietnam Academy of Science and Technology, Ha Noi, Vietnam.

Taxonomy

Leucospidae Walker, 1834

Leucospidae Walker, 1834: 13. Type genus: *Leucopsis* Duméril, 1823 (= *Leucospis* Fabricius, 1775).

Leucospidae Walker: Haliday 1839: ii; Habu 1962: 165; Bouček 1974: 9; Schmid-Egger 2010.



Figs 1–7. *Leucospis guzeratensis* Westwood, female. 1 — head, frontal view; 2 — pronotum, dorsolateral view; 3 — mesosoma, dorsal view; 4 — hind femur and tibia; 5 — forewing; 6 — gaster, dorsal view; 7 — habitus, lateral view.

Рис. 1–7. *Leucospis guzeratensis* Westwood, самка. 1 — голова спереди; 2 — переднеспинка сверху-сбоку; 3 — мезосома сверху; 4 — заднее бедро и голень; 5 — переднее крыло; 6 — брюшко сверху; 7 — общий вид сбоку.

Genus *Leucospis* Fabricius, 1775

Leucospis Fabricius, 1775: 361. Type species: *Leucospis dorsigera* Fabricius, 1775, by monotypy.

Leucospis Fabricius: Habu 1962: 169; Bouček 1974: 28; Narendran 1986: 43; Madl, Schwarz 2012: 1222.

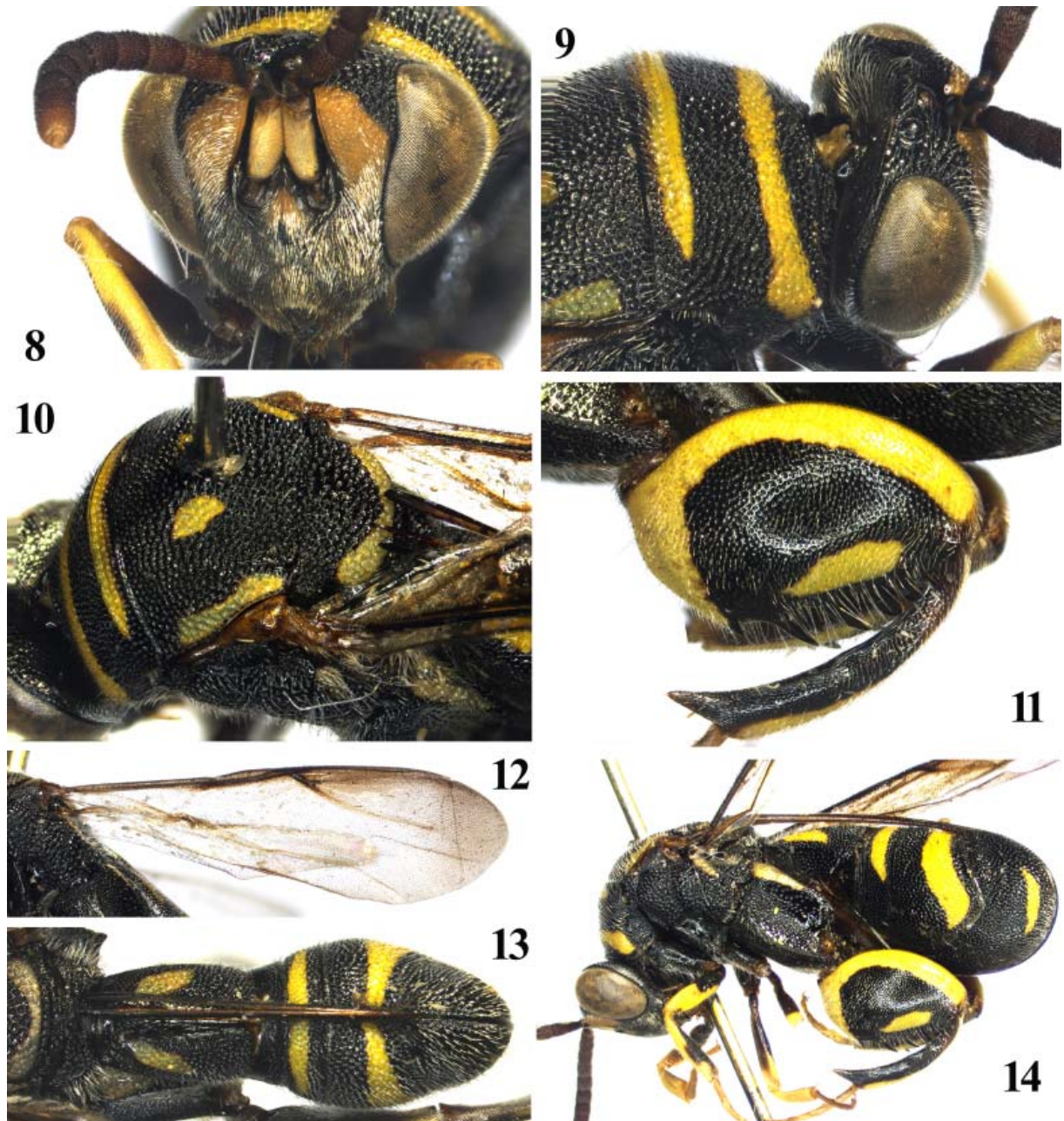
KEY TO THE *LEUCOSPIS* SPECIES FROM VIETNAM

1. Ventral surface of hind femur medially with three long and large teeth, basally with short and small tooth, and

distally with teeth fused (Figs 11, 14, 17, 18); pronotum without discal cross-carina (Figs 9, 16); apex of hind tibia obliquely produced into a spine (Figs 11, 14, 17, 18); ovipositor reaching propodeum (Figs 13, 14, 17, 18); frons with yellow spots (Figs 8, 15); mesoscutum with a pair of yellow spots medially (Figs 10, 16); hind femur yellow basally (Figs 11, 14, 17, 18)

***Leucospis histrio* Maindron**

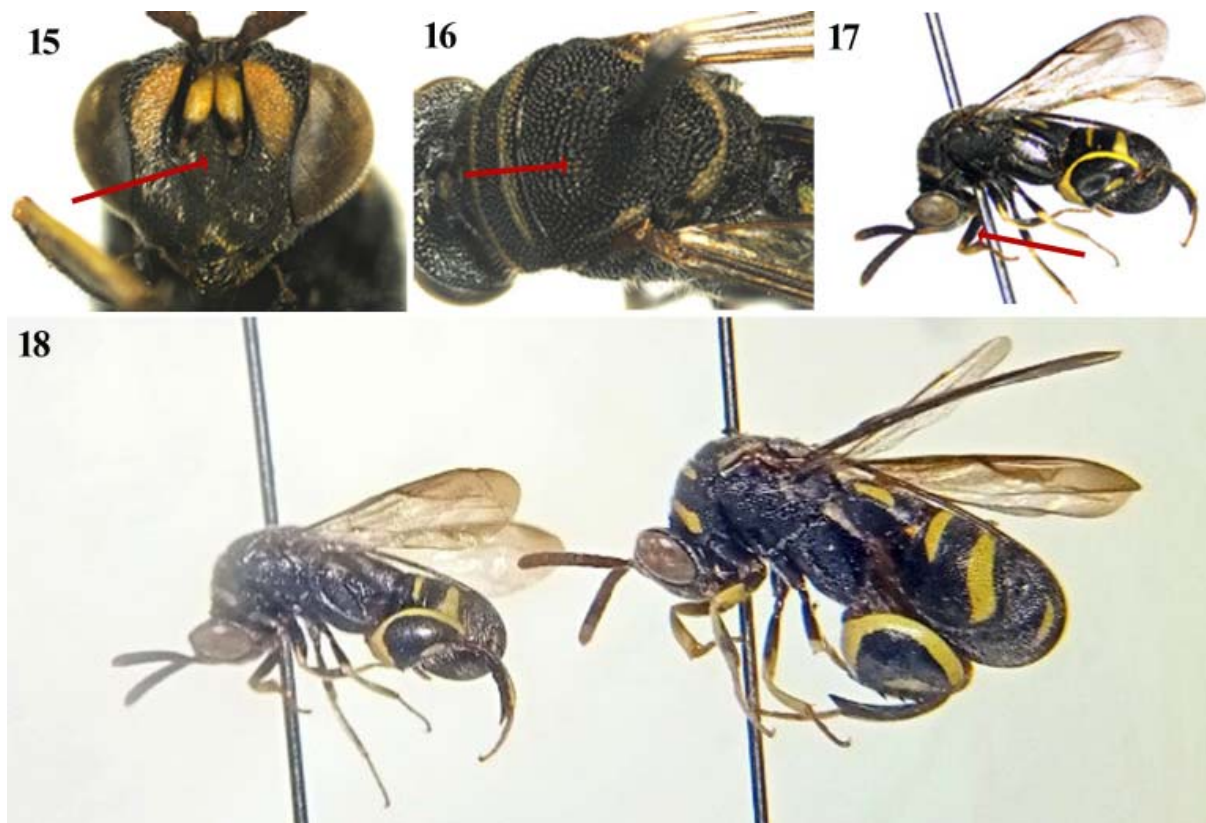
– Ventral surface of hind femur medially with many small teeth, basally with large and strong tooth, and distally



Figs 8–14. *Leucospis histrio* Maindron, female. 8 — head, frontal view; 9 — pronotum, dorsolateral view; 10 — mesosoma, dorsal view; 11 — hind femur and tibia; 12 — forewing; 13 — gaster, dorsal view; 14 — habitus, lateral view.

Рис. 8–14. *Leucospis histrio* Maindron, самка. 8 — голова спереди; 9 — переднеспинка сверху-сбоку; 10 — мезосома сверху; 11 — заднее бедро и голень; 12 — переднее крыло; 13 — брюшко сверху; 14 — общий вид сбоку.

- with teeth not fused (Figs 4, 7, 22, 25; also see Ye *et al.* [2017]); pronotum with discal cross-carina (Figs 2, 20; also see Ye *et al.* [2017]); apex of hind tibia truncate (Figs 4, 7, 25; also see Ye *et al.* [2017]); ovipositor not reaching propodeum (Figs 6, 7, 24, 25; also see Ye *et al.* [2017]); frons without yellow spots (Figs 1, 19; also see Ye *et al.* [2017]); mesoscutum without a pair of yellow spots medially (Figs 2, 3, 21; also see Ye *et al.* [2017]); hind femur black basally (Figs 4, 7, 22, 25; also see Ye *et al.* [2017])2
2. Hind femur ventrally with very small regular teeth (Figs 22, 25); hind tibia truncate apically (Fig. 25); discal and premarginal carinae of pronotum regularly slightly arched (Figs 20, 21); dorsellum bidentate (Fig. 21); ovipositor short, reaching fifth tergite (Figs 24, 25); fifth tergite conspicuously convex (Fig. 25); pronotum with two yellow bands (Figs 20, 21, 25); wing hyaline (Fig. 23).....
.....*Leucospis pediculata* Guérin-Méneville
- Hind femur ventrally with more or less irregular, small teeth (Figs 4, 7; also see Ye *et al.*, 2017); hind tibia acuminate apically (Figs 4, 7; also see Ye *et al.* [2017]); discal and premarginal carinae of pronotum high, subangulately raised, with margin highest in the middle and directed backwards (Fig. 2; also see Ye *et al.* [2017]); dorsellum round, without teeth (Fig. 3; also see Ye *et al.* [2017]); ovipositor long, reaching first tergite (Figs 6, 7; also see Ye *et al.* [2017]); fifth tergite slightly convex (Fig. 7; also see Ye *et al.* [2017]); pronotum with yellow band (Figs 2, 3, 7; also see Ye *et al.* [2017]); wings infuscated, with violaceous tinge (Fig. 5; also see Ye *et al.* [2017])3
3. Ovipositorial furrow on first tergite parallelly sided; fifth tergite shorter than first; hind femur with lunate cross-band basally; discal carina of pronotum embedded in a large yellow band; mesoscutum with yellow bands dorsolaterally; scutellum with apical yellow band; body less conspicuously pubescent; wings rather regularly infuscate; gaster posteriorly with simple pilosity (see Bouček [1974] and Ye *et al.* [2017])
.....*Leucospis femoricincta* Bouček
- Ovipositorial furrow on first tergite narrowing anteriorly (Fig. 6); fifth tergite as long as first (Figs 6, 7); hind femur without lunate cross-band basally (Figs 4, 7); discal carina of pronotum embedded in a narrow yellow band (Figs 2, 3); mesoscutum without yellow bands (Figs 2, 3, 7); scutellum without apical yellow band (Figs 2, 3); body with conspicuous white pilosity (Fig. 7);



Figs 15–18. *Leucospis histrio* Maindron, female in a small specimen. 15 — head, frontal view; 16 — mesosoma, dorsal view; 17 — habitus, lateral view; 18 — habitus, lateral view, small female (left) and large female (right). Arrows show variation of yellow markings in a small specimen compared to that of yellow markings in large specimens (Figs 8, 10).

Рис. 15–18. *Leucospis histrio* Maindron, самка мелкого экземпляра. 15 — голова спереди; 16 — мезосома сверху; 17 — общий вид сбоку; 18 — общий вид сбоку, мелкая самка (слева) и крупная самка (справа). Стрелки показывают вариации желтых пятен у мелкого экземпляра в сравнении с желтыми пятнами у крупных экземпляров (рис. 8, 10).

wings conspicuously infuscate anteriorly (Fig. 5); gaster posteriorly with moderate pilosity (Fig. 6)
 *Leucospis guzeratensis* Westwood

The *elegans* species-group

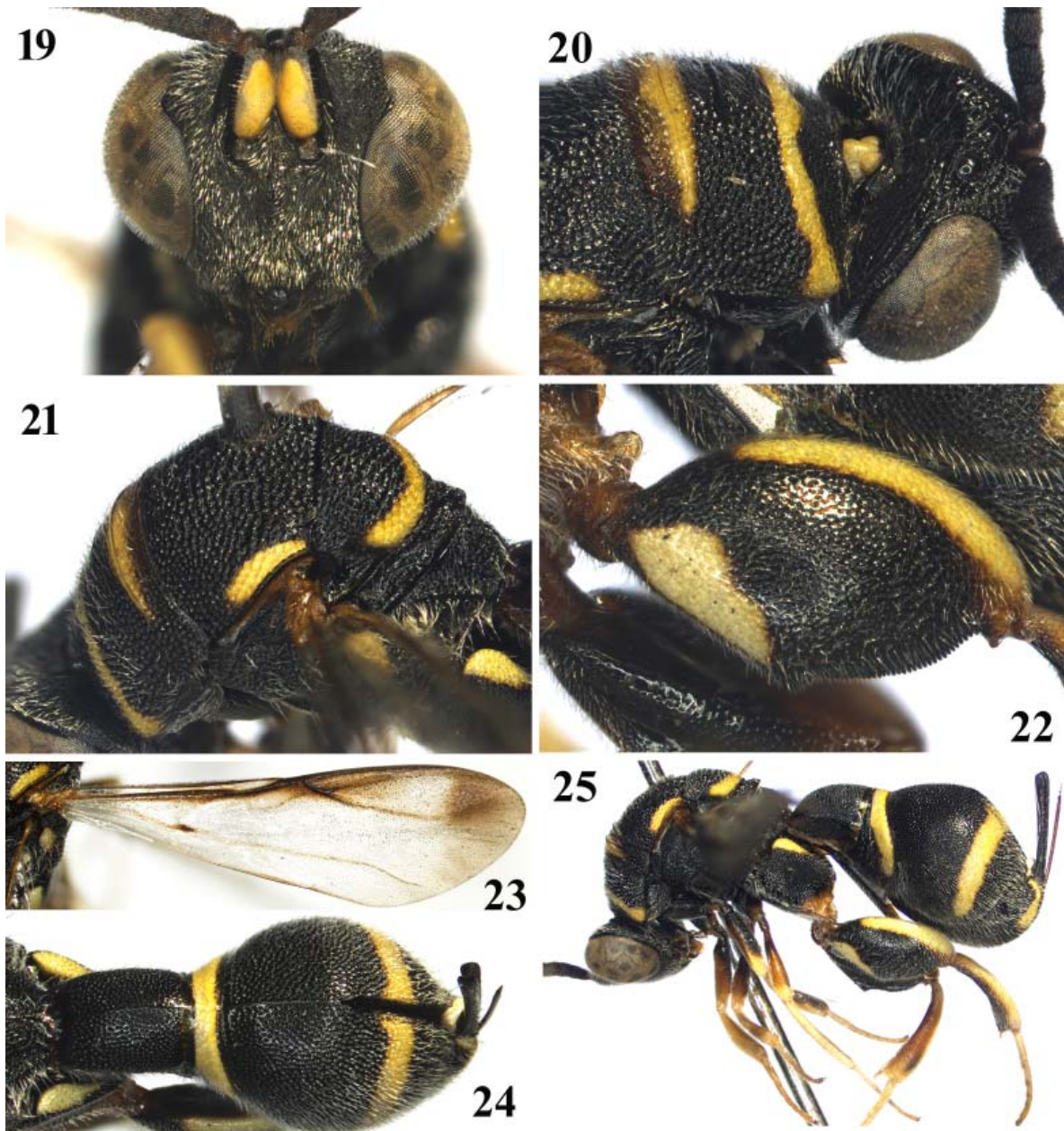
DIAGNOSIS. Pronotum with discal, marginal, and pre-marginal carinae distinct and conspicuously angulate and conspicuously recurved toward mesoscutum; hind femur robust, length at most twice maximum width [Darling, Cardinal, 2005].

Leucospis femoricincta Bouček, 1974

Leucospis femoricincta Bouček, 1974: 184; Bouček, Narendran, 1981: 12.

DISTRIBUTION. Vietnam: Hoa Binh, Cho-Ganh (= Ghenh market, near Ghenh station, Ninh Binh province), Annam (= Central Vietnam), Ten Sin. *Elsewhere*: China [Bouček, 1974; Ye *et al.*, 2017].

REMARKS. Bouček [1974] listed examined specimens of *L. femoricincta* from South Vietnam, but placed this locality as Annam, Ten Sin. Annam belongs to central Vietnam, but it does not belong to South Vietnam. Ten Sin may be a location in a certain province and we do not know where it is. Although



Figs 19–25. *Leucospis pediculata* Guérin-Méneville, female. 19 — head, frontal view; 20 — pronotum, dorsolateral view; 21 — mesosoma, dorsal view; 22 — hind femur and tibia; 23 — forewing; 24 — gaster, dorsal view; 25 — habitus, lateral view.

Рис. 19–25. *Leucospis pediculata* Guérin-Méneville, самка. 19 — голова спереди; 20 — переднеспинка сверху-сбоку; 21 — мезосома сверху; 22 — заднее бедро и голень; 23 — переднее крыло; 24 — брюшко сверху; 25 — общий вид сбоку.

L. femoricincta was found in both North and South Vietnam by Bouček [1974], unfortunately we do not collect its specimens.

Leucospis guzeratensis Westwood, 1839

Figs 1–7.

Leucospis guzeratensis Westwood, 1839: 253.

Leucospis bengalensis Weld, 1922: 32; syn. by Bouček [1974].

Leucospis ramakrishnai Mani, 1935: 248; syn. by Bouček [1974].

Polistomorpha paivai Mani, 1936: 338; syn. by Bouček [1974].

Leucospis bengalensis var. *mackenzii* Mani, 1936: 339, Syn. by Bouček [1974].

Leucospis bombayensis Mani, 1935: 246; syn. by Bouček & Narendran [1981].

MATERIAL EXAMINED. VIETNAM: Tay Ninh (South Vietnam): 2 ♀♀, Phan, Duong Minh Chau, 11°22'13.75"N; 106°11'12.60"E, 39 m, Malaise traps, 28.iv–14.v.2023, coll. Van Tho Le.

DISTRIBUTION. Vietnam: Tay Ninh. Elsewhere: India, Bangladesh, Myanmar and Pakistan [Bouček, 1974; Bouček, Narendran, 1981; Sankararaman *et al.*, 2020]. New record for Vietnam.

The *gigas* species-group

DIAGNOSIS. Pronotum without discal carina, or with very weak discal carina; first and second basal femoral teeth oriented at an angle relative to distal teeth; distal femoral teeth parallel-sided, apices rounded; fifth gastral tergite short, less than 4 times length of fourth gastral tergite [Darling, Cardinal, 2005].

Leucospis histrio Maindron, 1878

Figs 8–18.

Leucospis histrio Maindron, 1878: cxxx; Bouček, 1974: 164; Bouček, Narendran, 1981: 7; Narendran, 1986: 44.

Leucospis ornatifrons Weld, 1922: 22; syn. by Bouček [1974].

Leucospis malabarensis Brues, 1925: 27; syn. by Bouček [1974].

Polistomorpha indica Mani, 1935: 243; syn. by Bouček [1974].

Leucospis meenakshiae Mani, 1935: 244; syn. by Bouček [1974].

Leucospis assamensis Mani, 1936: 339; syn. by Bouček [1974].

SPECIMENS EXAMINED. VIETNAM: Tay Ninh (South Vietnam): 1♀, Phan, Duong Minh Chau, 11°22'13.75"N; 106°11'12.60"E, 39 m, Malaise traps, 11.vi–3.vii.2023, coll. Van Tho Le; 1♀, Ninh Son, Tay Ninh City, 11°22'4.97"N, 106°9'19.39"E, 35 m, Malaise traps, 28.iv–14.v.2023, coll. Van Tho Le. Hanoi (North Vietnam): 1♀, Co Nhue 2, Bac Tu Liem, 3.vii.2019, coll. Phong Huy Pham; 1♀, Co Nhue 2, Bac Tu Liem, 16.vi.2023, coll. Mai Ut Pham. Hoa Binh (North Vietnam): 1♀, Tan Thanh, Luong Son, Malaise traps, 1–15.viii.2020, coll. Phong Huy Pham. Thai Binh (North Vietnam): 2 ♀♀, Hong Minh, Hung Ha, 24.vi.2022, coll. Phong Huy Pham.

DISTRIBUTION. Vietnam: Hanoi, Hoa Binh, Tay Ninh, Thai Binh. Elsewhere: Australia, Bangladesh, China, India, Malaysia, Myanmar, Papua New Guinea, Philippines, Solomon Islands, Sri Lanka, Thailand [Bouček, 1974; Bouček, Narendran, 1981; Sankararaman *et al.*, 2020]. New record for Vietnam.

REMARKS. *Leucospis histrio* has large variations in the body size (from 6 to 8.6 mm long) (Fig. 18) and yellow markings. For the latter, variations are as follows: in small specimens, the supraclypeal area without a yellow spot (Fig. 15) (in large specimens the supraclypeal area with a yellow spot (Fig. 8)), the mesoscutum with a pair of very small yellow spots medially (Fig. 16) (in large specimens the mesoscutum with a pair of very large yellow spots medially (Fig. 10)), and

the ventral surface of fore femur with a very short yellow band (Fig. 17) (in large specimens, the ventral surface of fore femur with a long yellow band (Fig. 14)).

The *pediculate* species-group

DIAGNOSIS. Stigmal vein bilobed, stigma and uncus distinct; hind femur with comb of 25 or more very small teeth or with irregular row of medium-sized teeth [Bouček, 1974; Darling, Cardinal, 2005].

Leucospis pediculata Guérin-Méneville, 1835

Figs 19–25.

Leucospis pediculata Guérin-Méneville, 1835: 413.

MATERIALS EXAMINED. VIETNAM: Tay Ninh (South Vietnam): 2 ♀♀, Ninh Son, Tay Ninh City, 11°22'4.97"N, 106°9'19.39"E, 35 m, Malaise traps, 3.iii–8.iii.2023, 28.iv–14.v.2023, coll. Van Tho Le.

DISTRIBUTION. Vietnam: Tay Ninh. Elsewhere: India, Indonesia, Myanmar, Malaysia, Singapore [Bouček, 1974; Bouček, Narendran, 1981; Sankararaman *et al.*, 2020]. New record for Vietnam.

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