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A DISCOVERY OF THE GENUS *Philoplitis* Nixon, 1965 (Hymenoptera: Braconidae: Microgastrinae) IN VIETNAM, WITH DESCRIPTION OF TWO NEW SPECIES

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ABSTRACT

The small microgastrine genus *Philoplitis* Nixon, 1965 from Vietnam is newly recorded. As a result, two new species are described and fully illustrated, viz. *Philoplitis ipunctatus* Long, sp. nov. and *Philoplitis cariniferus* Long, sp. nov.. Additionally, the genus *Philoplitis* is recorded for the first time for Vietnam, and the comparative characters of *Philoplitis* species summarized in a table.

Keywords: Ichneumonoidea, Microplitini, new record, parasitoid wasp, Afrotropical, Oriental.

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INTRODUCTION

The designated genus *Philoplitis* by Nixon (1965) is a small one in the subfamily Microgastrinae. This genus can be distinguished from all the other microgastrine genera by the large scutellum, which is prolonged posteriorly above the propodeum (Nixon, 1965; Mason, 1981). *Philoplitis* was revised by Fernandez-Triana & Goulet (2009), with the description of three new species, and later a key to all already known species was provided by Ranjith et al. (2019). Up to now, the genus *Philoplitis* comprises nine species, of those, eight species distributed in the Oriental and one species distributed in the Afrotropical regions (Ranjith et al., 2019). Recently, only one *Philoplitis* species, *Philoplitis keralensis* Ranjith & Fernandez-Triana, 2019, was reported with its host, with a mass of five wasp cocoons found (Ranjith et al., 2019).

Philoplitis has been revised twice in the past ten years (Fernandez-Triana & Goulet 2009, Ranjith et al. 2019), with the latest paper recording nine species, and in the latter paper authors suspected a few more species will be found when more collections are studied, but the genus does not seem to be species rich (Ranjith et al., 2019). *Philoplitis* species are mainly found in the Oriental region, but it was also recorded in the Afrotropical and Palaearctic regions (Ranjith et al., 2019).

In Vietnam, little is known of the Braconidae generally and Microgastrinae especially. The first list compiled in 2003 by Long & Belokobylskij (2003) contained 257 braconid species belonging to 21 subfamilies, then some papers were published by Long (2004), Long & van Achterberg (2014) and Long (2017) reported 298 braconid species, including 110 microgastrine species, however, without *Philoplitis* species. The new *Philoplitis* species described in this paper were discovered by investigating hymenopteran parasitoid wasps and their related agricultural and horticultural insect pests during 2018–2024. The genus *Philoplitis* is newly recorded from Vietnam and two new species are described and fully illustrated.

MATERIALS AND METHODS

Specimens used for this study are deposited at the Braconid collection of the Institute of Ecology and Biological Resources (IEBR), the Vietnam Academy of Science and Technology (Ha Noi, Vietnam). All specimens were collected in Malaise traps. For separating the microgastrine genera see Nixon (1965) & Mason (1981). Morphological terms and wing venation designations used in this paper follow Goulet & Huber (1993) and Sharkey & Wharton (1997). All the type specimens (holotypes) are kept in the collection of IEBR. For an easy comparison, the description of the new *Philoplitis* species follows the format used by Ranjith et al. (2019), and the terminology used in this paper. The abbreviations used in this paper are following Ranjith et al. (2019), e.g. F2 and F15 refer to antennal flagellomeres 2 and 15; T1, T2 and T3 are used for metasomal mediotergites 1, 2 and 3; and L and W refrer to length and width, respectively. For references to the descriptions of the species and the distribution of nine already known *Philoplitis* species outside Vietnam, see Fernandez-Triana & Goulet (2009) and Ranjith et al. (2019). For additional references and data, see Yu et al. (2016). We used an Olympus® SZ61 binocular microscope for studying the morphology; the photographs were made with a Sony® 6000 digital camera attached to a Nikon® SMZ800N binocular microscope connected to a PC at IEBR and the figures were processed with Helicon Focus®8 stacking software and Adobe Photoshop CS5 to adjust the size and background. The scale-lines of the plates indicate size in mm. Abbreviations used in this paper are as follows: POL = postocellar line; OOL = ocular-ocellar line; OD = diameter of posterior ocellus; MT: Malaise trap; "Mic.+**number**': code number indexing for specimens of the Microgastrinae in the collection at IEBR (Ha Noi, Vietnam); NE: Northeastern, NW: Northwestern.

RESULTS

TAXONOMIC HIERARCHY

Class Hexapoda Blainville, 1816

Order Hymenoptera Linnaeus, 1758

Family Braconidae Nees von Esenbeck, 1811

Subfamily: Microgastrinae Foerster, 1863

Tribe: Microplitini Mason, 1981

Genus *Philoplitis* Nixon, 1965

Philoplitis Nixon, 1965: 267. Type species: *Philoplitis coniferens* Nixon, 1965 by original designation and monotypy.

Philoplitis Nixon, 1965: Mason, 1981: 130; Fernadez-Triana & Goulet, 2009: 286.

Description of new species

***Philoplitis cariniferus* Long, sp. nov. (**Figs 1–3)

Type material. Holotype, ♀, labelled "Mic.**2159**" (IEBR), NE Vietnam: Lang Son province, Huu Lung, Huu Lien NR, forest, MT2, 21°39'4" N 106°21'51" E, 200 m, 25.iii.2024, PQ Mai, TD Duong. Paratypes, 1 ♂, labelled "Mic.**2160**" (IEBR), data as holotype; 1♀, labelled "Mic.**2163**" (IEBR), ibid., but 15.iv.2024, PQ Mai, TD Duong.

Figure 1. Diagnostic characters of *Philoplitis cariniferus* Long, **sp. nov**., holotype, female. **A** Habitus, lateral view; **B** First antennomeres, arrow indicates first curved flagellomere; **C** Head, frontal view, arrow indicates yellow 4th–5th maxillary palpomeres

Comparative diagnosis

Philoplitis cariniferus, **sp. nov.** is easily separated from other species in the genus by having metafemur with distinct carina on the inner upper side. Antenna pale brown; scapus brown, but yellow ventrally; frons and occiput with fine transverse striae; area between posterior ocelli and occipital carina transversely rugose, with oval deep smooth pit centrally near occipital carina; notauli rather deeply impressed anteriorly, fading posteriorly with dense setae; mesoscutum densely rugo-punctate anteriorly and laterally; scutellar sulcus deep, with 6 carinae; in lateral view, scutellar disc slightly raised upwards; scutellar disc foveolate-rugose; precoxal sulcus shallow, finely crenulate; mesopleuron shiny and smooth medio-

posteriorly, finely rugose dorsally, largely rugose ventrally; metapleuron densely rugo-punctate; propodeum densely rugose with complete medio-longitudinal carina; pterostigma broad; fore wing vein r exiting behind middle of pterostigma; metatibial spurs pale brown basally, whitish yellow to white apically; median length of T1 2.3 × its apical width.

Table 1. Comparative characters of *Philoplitis* species(*)

Species (type specimen)	Scutellum L/W	F2 L/W	F15 L/W	r/2RS r/3RS	Metafemur L/W	Tergite 1 L/W
Philoplitis adustipalpus Ahmad, 2005 (♀)	1.2	2.0	3.9		3.5	2.2
Philoplitis cariniferus Long, **sp. nov.** (♀)"Mic.**2159**"	0.94	3.1	2.3	0.8 1.7	4.4	2.3
Philoplitis ipunctatus Long, **sp. nov.** (♂)"Mic.**1970**"	0.95	2.4	missing	0.6 1.3	3.4	2.9
Philoplitis coniferens Nixon, 1965 (♀)	1.24(5)	2.3	2.7	0.62–0.73 1.33	3.42–3.64	2.2
Philoplitis dzangasangha Fernandez-Triana & Ranjith, 2019 (♂)	1.2	2.5	3.0	1.0 3.0	3.2	3.0
Philoplitis keralensis Ranjith & Fernandez-Triana, 2019 (♀)	1.27	3.09	1.94	0.66 1.6	3.72	2.42
Philoplitis margalla Fernandez-Triana & Ranjith, 2019 (♀)	1.2	2.4	2.8	0.83 1.1	3.5	2.5
Philoplitis masneri Fernandez-Triana & Goulet, 2009 (♂)	1.06	2.4	2.7	1.1 3.3	2.95	2.12
Philoplitis punctatus Fernandez-Triana & Goulet, 2009 (♂)	0.92	2.7	3.0	0.5 1.0	3.1	2.0
Philoplitis striatus Fernandez-Triana & Goulet, 2009 (♂)	1.1	2.3	2.8	0.95 2.05	3.15	1.74
Philoplitis trifoveatus Fernandez-Triana & Ranjith, 2019 (♀)	1.27	2.9	2.04	0.8 1.0	3.4	2.35

Notes:(*): The compared characters of *Philoplitis* species outside Vietnam were taken from Fernandez-Triana & Goulet (2009) and Ranjith et al. (2019).

Comparative notes. *P. cariniferus*, **sp. nov.** (female) resembles *P. margalla* Fernandez-Triana & Ranjith, from Pakistan, but differs from the latter as follows: 1) Metafemur with distinct carina on its inner upper side and 4.4 × as long as its maximum width (metafemur without carina and 3.5 × as long as its maximum width in *P. margalla*); 2) Length of second antennomere 3.1 × its maximum width (vs 2.4 × in *P. margalla*); and 3) Vein r 1.7 × vein 3RSa (vs 1.1 × in *P. margalla*) (Table 1).

Description

Holotype, female, body length 2.7 mm, antenna 3.0 mm, fore wing length 2.9 mm (Fig. 1).

Head distinctly rugose. Frons and occiput transversely striate, without a medio-longitudinal carina (Fig. 2C). Occipital carina strongly defined and crenulate dorsally. Large and smooth oval pit centrally between posterior ocelli and occipital carina (Fig. 2C). Antenna longer than body, F2 curved subbasally, L of F2 4.85 × its W, L of F15 2.3 × its W. Mesoscutum transversely rugo-punctate anteriorly, coarsely rugose centrally, mostly covered with silver setae posteriorly. Notauli hardly defined. Scutellar disc densely foveolate (Fig. 2E). Scutellar disc subequal to width of anterior margin, L:W = 17:18, and its L 0.7 × that of mesoscutum. Mesopleuron mostly densely rugo-punctate, but with smooth area medio-

posteriorly. Metapleuron rugose. Propodeum with complete medio-longitudinal carina, largely rugose and densely setose medially (Fig. 2G). Fore wing ratios, r:3Rsa = 5:3 (1.7 ×); r:r-m = 5:2 (2.5 ×); r:2RS + 5:6 (0.8 ×); 3Rsa:2M = 3:5 (0.6 ×); 2RS:2M = 6:5 (1.2 ×); r-m:2M = 2:5 (0.4 ×); r:r-2M = 3:5 (0.6 ×); height of second submarginal cell (from 2M to the point where r meets both 2RS and 3RSa) as long as r-2M (Fig. 2A); vein 1-CU1 1.75 × cu-a; vein 1-CU1 0.70 × 2-CU1. Metafemur with distinct carina in the inner upper side (Fig. 2D). Length of metafemur and metatibia 4.4 × and 4.9 × its maximum width, respectively; inner spur of metatibia 0.5 × L of first metatarsomere. T1 distinctly widened basally, parallel-sided medio-posteriorly (Fig. 2H), mostly sculptured on posterior 0.7 (anterior 0.3 mostly coriaceous), T1 L 2.3 × its width at posterior margin. T2 smooth, subtriangular, poorly defined by divergent grooves (Fig. 2H), T2 medial L 0.3 × its W at posterior margin (approximate value). T3 smooth.

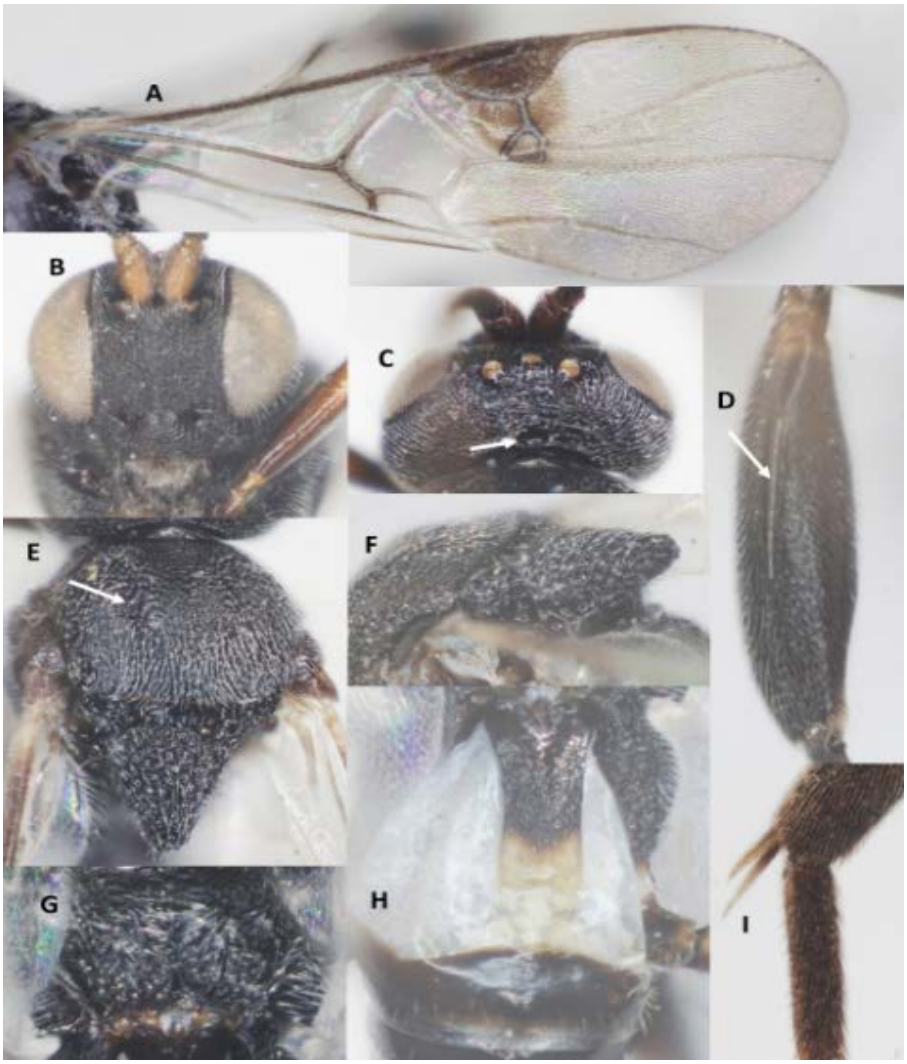

Figure 2. Diagnostic characters of *Philoplitis cariniferus* Long, **sp. nov**., holotype, female. **A** Fore wing; **B** Head, frontal view; **C** Head, dorsal view, arrow indicates smooth oval pit; **D** Inner side of metafemur, arrow indicates carina; **E** Mesoscutum, arrow indicates anterior rugose depression; **F** Lateral side of scutellum; **G** Propodeum; **H** Metasomal tergites 1–3; **F** Metatibial spurs

Colour. Head and mesosoma dark brown to black; scape yellow ventrally, brown dorsally; flagellomeres pale brown; maxillary palpi dark brown, except 4th and 5th maxillary palpomeres yellowish brown; pro- and mesocoxae reddish-yellow; pro- and mesofemorae brownish-yellow or infuscate; protibia yellow, mesotibia partially brownish-yellow and partially yellow; pro- and mesotarsa yellow; hind legs mostly dark brown to black (except for hind second-fifth tarsus brownish-yellow); metatibial spurs pale brown basally, light yellow apically (Fig. 2I); most wing veins light yellow to transparent, except for pterostigma brown and area beneath pterostigma surrounding vein r smoky (Fig. 2A); metasoma dorsally mostly dark brown, except for posterior 0.2 of T1 pale yellow; entire T2 is yellow-white; laterotergites 1–3 cream-white, rest mostly dark brown.

Variation. Paratypes (female and male) are very similar to the holotype, except the following characters in the male: metafemur without distinct carina in the inner upper side; 4th and 5th maxillary palpomeres brownish yellow (Fig. 3A); and metatibial spurs mostly brown, brownish yellow at extreme apex (Fig. 3B).

Host. Unknown.

Etymology. From “carina” (Latin for “keel”), and “fero” (Latin for “cary”, because inner lateral side of hind femur with longitudinal carina).

Distribution. NE Vietnam (Lang Son province).

Figure 3. Diagnostic characters of *Philoplitis cariniferus* Long, **sp. nov**., paratype, male. **A** Head, frontal view, arrow indicates 4th and 5th maxillary palpomeres; B Metatibial spurs

***Philoplitis ipunctatus* Long, sp. nov.** (Figs 4, 5)

Type material. Holotype, ♂, labelled “Mic.**1970**” (IEBR), NW Vietnam: Hoa Binh province, Luong Son, Thanh Lap commune, fruit orchard, MT, 20°48’46” N 105°37’58” E, 20 m, 25.x.2018, STCT.

Diagnosis

Antenna dark brown; frons with dense and fine transverse striae; area between posterior ocelli and occipital carina transversely rugose, with deep rugose pit centrally near occipital carina; notauli rather narrowly impressed anteriorly, fading posteriorly, with dense setosity; mesoscutum densely rugo-punctate anteriorly and laterally; scutellar sulcus deep, with 6 carinae; in lateral view, scutellar disc weakly raised upwards and coarsely rugose; lateral groove of scutellum areolate; precoxal sulcus finely crenulate; metapleuron densely rugo-punctate; propodeum largely rugose with complete medio-longitudinal carina, densely setose medially; pterostigma broad; fore wing vein r 1.3 × vein 3RSa; metatibial spurs dark brown; median length of T1 2.9 × apical width.

Comparative notes. *Philoplitis ipunctatus* **sp. nov.** (male) is relatively close to *P. punctatus* Fernandez-Triana & Goulet, from Thailand, but differs from the latter as follows: 1) Median length of T1 2.9 × its apical width (*vs*

2.0 × in *P. punctatus*); 2) Vein r of fore wing 1.3 × 3RSa (*vs* 1.0 × in *P. punctatus*); 3) Mesoscutum with groove-like rugose depression along lateral margins (*vs* with coarse punctures along lateral margins in *P. punctatus*); 4) Scutellar disc densely foveolate (*vs* coarsely punctate in *P. punctatus*); and 5) Clypeus black (*vs* clypeus brown in *P. punctatus*) (Table 1).

Description

Holotype, male, body length 3.0 mm, antenna 4.3 mm, fore wing length 3.1 mm (Fig. 4).

Antenna missing 16–18th antennomeres, but distinctly longer than body. Head distinctly rugose. Frons and occiput transversely striate (Fig. 5C). Occipital carina strongly developed and crenulate. Large rugose pit centrally between posterior ocelli and occipital carina (Fig. 5C). Antenna longer than body length, F1 curved subbasally (Fig. 5D); length of F2 2.4 × its W; F15 missing.

Mesoscutum transversely rugo-punctate anteriorly, coarsely rugose centrally, with groove-like rugose depression along lateral margin (Figs 5E, H), mostly covered with silver setae posteriorly. Notauli rather long and deep, rugo-punctate (Fig. 5E). Scutellar disc densely foveolate (Fig. 5E). Scutellar disc L:W = 20:16 (1.25 ×), and its L 0.8 × that of mesoscutum. Mesopleuron largely rugose ventrally, rugose anteriorly with smooth medio-posterior zone. Metapleuron largely rugose; propodeum largely rugose with complete medio-longitudinal carina, densely setose medially (Fig. 5G). Pterostigma broad (Figs 4, 5A). Fore wing ratios, r:3Rsa = 4:3 (1.3 ×); r:r-m = 4:3 (1.3 ×); r:2RS = 4:7 (0.6 ×); 3Rsa:2M = 3:5 (0.6 ×); r-m:2M = 3 : 5 (0.6 ×); r : r-2M = 4 : 5.5 (0.7 ×); height of second submarginal cell (from 2M to the point where r meets both 2RS and 3RSa) 0.9 × as long as vein r-2M; vein 1-CU1 1.2 × cu-a; 1-CU1:2-CU1 = 6:12 (0.5 ×).

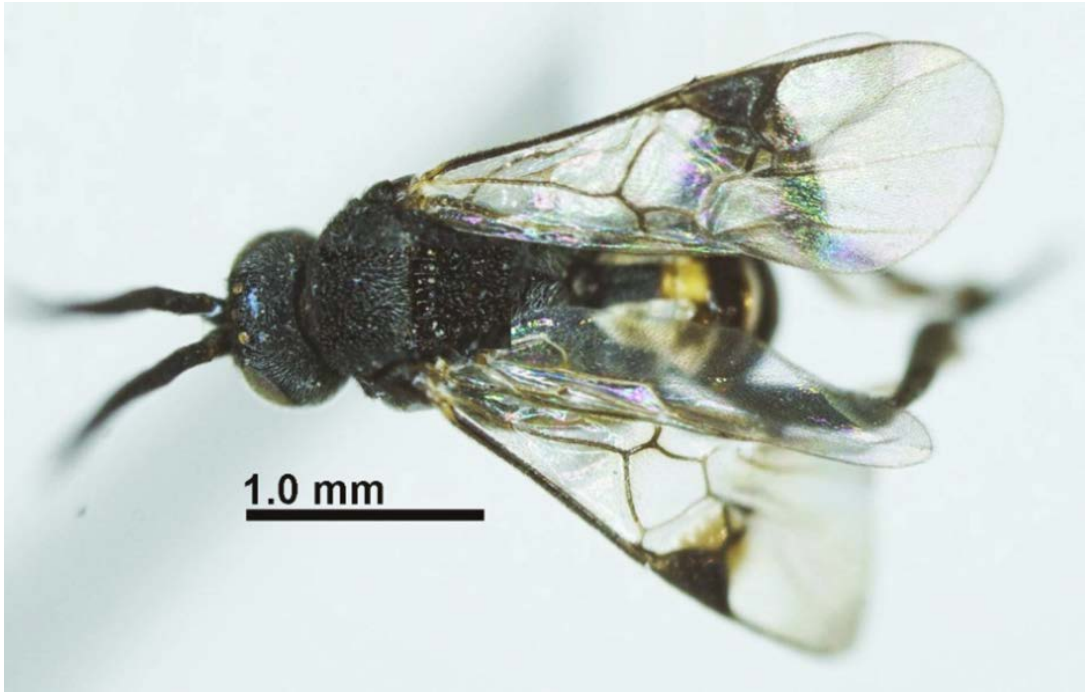

Figure 4. Habitus of *Philoplitis ipunctatus* Long, **sp. nov**., holotype, female, dorsal view

Length of metafemur and metatibia 3.4 × and 4.9 × their maximum width, respectively. Inner spur of metatibia 0.3 × L of first metatarsomere. T1 roundly widened basally, parallel-sided medio-posteriorly (Fig. 5F); median length of T1 2.9 × apical width T1

with smooth excavation on anterior 0.2, median groove almost extending 0.45 of tergite length, the remainder rugo-punctate, except extreme apex smooth (Fig. 5F); T2 smooth; T3 smooth with sparse setae apically; remainder of metasoma smooth.

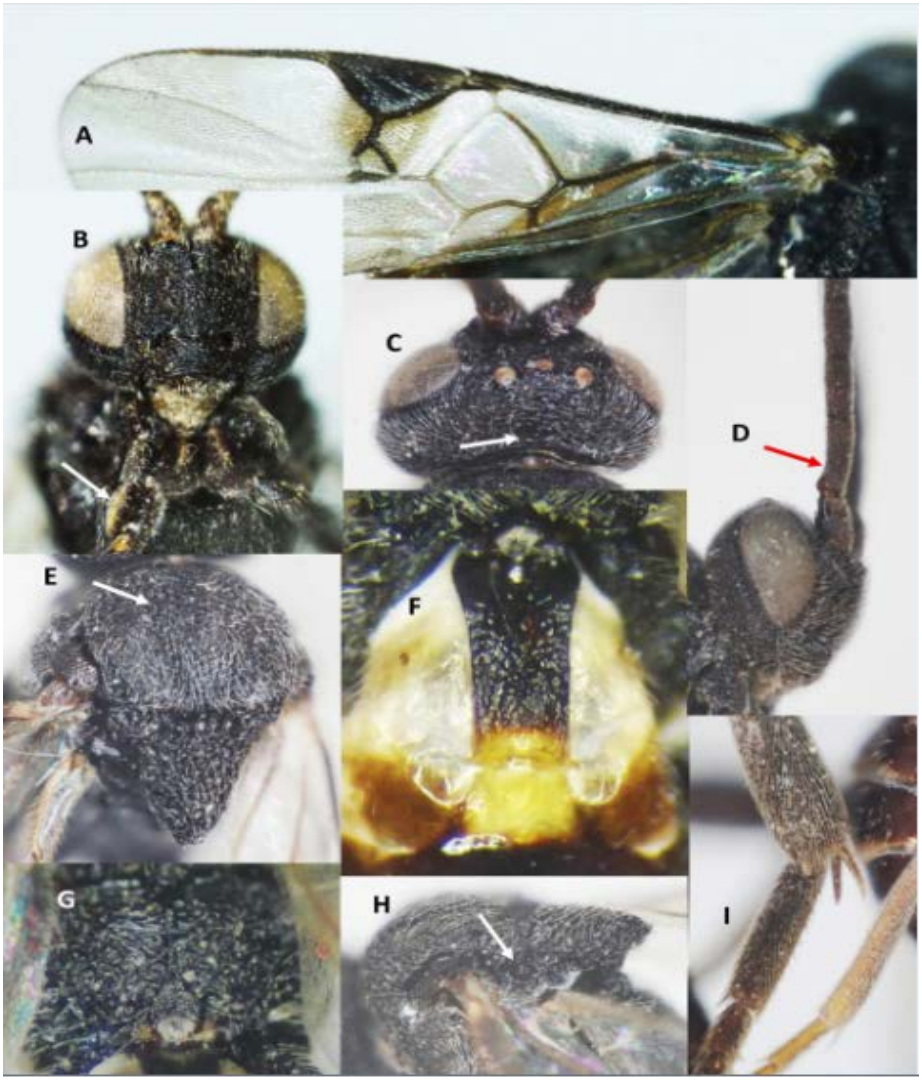

Figure 5. Diagnostic characters of *Philoplitis ipunctatus* Long, **sp. nov.** Holotype, male. **A** Fore wing; **B** Head, frontal view, arrow indicates yellow 4th and 5th maxillary palpomeres; **C** Head, dorsal view, arrow indicates large rugose pit; **D** First and second flagellomeres, arrow indicates curved base of first flagellomere; **E** Mesoscutum, arrow indicates rugose groove; **F** Metasomal tergites 1+2; **G** Propodeum; **H** Lateral side of scutellum, arrow indicates areolate area; **I** Metatibial spurs

Colour. Head and mesosoma black; palpi dark brown, except 4th and 5th maxillary palpomeres light yellow (Fig. 5B); antenna brown; all coxae black; profemur brown basally, yellow apically; protibia and protarsus yellow; mesofemur brown; mesotibia brownish yellow; mesotarsus yellow; metafemur black; metatibia dark brown; metatarsus brownish yellow to brown; metatibial spurs dark brown; wing veins and

pterostigma light brown with a brownish cloud beneath that extends nerar vein 2M (Figs 4, 5A); wing membrane hyaline; T1 almost black, yellow at extreme apex and whitish yellow laterally (Fig. 5F); T2 yellow medially, brownish yellow laterally; T3 and remainder of metasoma brown.

Female. Unknown.

Host. Unknown.

Etymology. From "i" (Latin means "not"), because it is close to but different from *Philoplitis punctatus* Fernandez-Triana & Goulet, 2009, from Thailand.

Distribution. NE Vietnam (Lang Son province); NW Vietnam (Hoa Binh province).

REMARKS

The genus *Philoplitis* is recorded for the first time for Vietnam, the limitation in our paper is that the type specimens of the nine described species were not examined. However, based on the detailed descriptions of all described species by Ranjith et al. (2019) and Fernandez-Triana & Goulet (2009), both species from Vietnam are new because they have several distinguishable characters as indicated in the diagnoses and notes.

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REFERENCES

Fernández-Triana J., Goulet H., 2009. Revision of the genus *Philoplitis* Nixon (Hymenoptera, Braconidae, Microgastrinae). In: Johnson N (Ed) Advances in the systematics of Hymenoptera. Festschrift in honour of Lubomír Masner. *ZooKeys*, 20: 285–298. https://doi.org/10.3897/zookeys.20.84

Long K. D., 2004. Key to the subfamilies of Braconidae (Hymenoptera) and a complementary list of braconid wasp species from Vietnam. *Academia Journal of Biology*, 26(3a): 8–14 (in Vietnamese, summary in English).

Long K. D., 2017. Fauna of Vietnam, vol. 27, subfamily Microgastrinae: 614–663 (in Vietnamese with English summary).

Long K. D., Belokobylskij S. A., 2003. A preliminary list of the Braconidae (Hymenoptera) of Vietnam. *Russian Entomological Journal*, 12(4): 385–398.

Long K. D., van Achterberg C., 2014. An additional list with new records of braconid wasps of the family Braconidae (Hymenoptera) from Vietnam. *Academia Journal of Biology*, 36(4): 397–415. http://doi.org/10.15625/0866-7160/v36n4.5979

Mason W., 1981. The polyphyletic nature of *Apanteles* Foerster (Hymenoptera: Braconidae): A phylogeny and reclassification of Microgastrinae. Memoirs of the Entomological Society of Canada 115: 1–147.

Nixon G., 1965. A reclassification of the tribe Microgasterini (Hymenoptera: Braconidae). *Bulletin of the British Museum* (*Natural History*), Entomology series, Supplement 2: 1–284.

Ranjith A. P., Fernandez-Triana J., Veena T., Priyadarsanan D. R., Nasser M., 2019. Four new species of *Philoplitis* Nixon (Braconidae, Microgastrinae) with an updated key and illustrations of all described species. *ZooKeys*, 841: 125–150. doi: 10.3897/zookeys.841.33549

Yu D. S., van Achterberg C., Horstmann K., 2016. Taxapad 2016, Ichneumonoidea 2015. Database on flash-drive. www.taxapad.com, Nepean, Ontario.