

Leiobracon, a new genus of the subfamily Braconinae (Hymenoptera, Braconidae) from Vietnam

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Abstract

The genus *Leiobracon* **gen. nov.** and the type species *Leiobracon vietnamicus* **sp. nov.**, are described from Vietnam. The new genus differs morphologically from all known braconine genera with bifurcate tarsal claws (*Mesobracon* group of genera) by having the metasoma smooth, the first metasomal tergite more than $2.6 \times$ longer than wide medially, with its lateral areas largely reduced and without crenulations.

Key words: Ichneumonoidea, Braconinae, taxonomy, parasitoid wasp, Oriental

Introduction

The subfamily Braconinae, one of the largest subfamilies of Braconidae, contains more than 190 genera with more than 3,000 described species (Quicke 1987; Quicke & Polaszek 2000; van Achterberg & Sigwalt 1987; Yu *et al.* 2016; Li *et al.* 2017, 2021; Ranjith *et al.* 2016; Ranjith *et al.* 2023). Only four genera are known to possess bifurcate tarsal claws (= *Mesobracon* group of genera): *Macrobracon* Szépligeti, 1902 (type-species: *Macrobracon concolor* Szépligeti, 1902), *Mesobracon* Szépligeti, 1902 (type-species: *Mesobracon pulchripennis* Szépligeti, 1902), *Pseudoshirakia* van Achterberg, 1993 (type-species: *Bracon yokohamensis* Cameron, 1910, and *Pseudospinaria* Enderlein, 1905 (type-species: *Spinaria attenuata* Westwood, 1882 (Quicke 1987). The new genus *Leiobracon* Long & van Achterberg, gen. nov. represents the fifth genus of the *Mesobracon* group and the 17th genus of Braconinae in Vietnam.

So far, 16 braconine genera are reported from Vietnam, viz. *Amyosoma* Viereck, *Angustibracon* Quicke, *Annectobracon* Chishti & Quicke, *Bracon* Fabricius, *Campyloneurus* Szépligeti, *Chaoilta* Cameron, *Iphiaulax* Förster, *Megalomum* Szépligeti, *Nedinoschiza* Cameron, *Pseudochivinia* Long & van Achterberg, *Pseudoshirakia* van Achterberg, *Pseudospinaria* Enderlein, *Stenobracon* Szépligeti, *Testudobracon* Quicke, *Tropobracon* Cameron and *Zaglyptogaster* Ashmead (Dzuong *et al.* 2022, Long & Belokobylskij 2003, Long & Mai 2015, Long & van Achterberg 2023, Long *et al.* 2004, Long *et al.* 2023, Mai *et al.* 2023, Oanh *et al.* 2023). To date, only two genera belonging to the *Mesobracon* group of genera: *Pseudospinaria* and *Pseudoshirakia* occur in Vietnam. *Leiobracon* Long & van Achterberg, gen. nov. represents the third genus of *Mesobracon* group of genera occurring in Vietnam.

Materials and methods

The type series was collected by using a sweep net or a Malaise trap. The holotype is deposited in the Braconidae Collection of the Institute of Ecology & Biological Resources (IEBR), Vietnam Academy of Science and Technology (VAST). Sculpture terms are based on Harris (1979), and vein terminology follows the modified Comstock-Needham system (van Achterberg 1993). For a key to the subfamilies of Braconidae see van Achterberg (1993) and the key to the Old World genera of the braconine wasps see Quicke (1987); for additional references and data, see Yu *et al.* (2016).

For studying the morphology we used an Olympus SZ61 or SZX11 binocular microscope; the photographs were made with a Sony 6000 digital camera attached to a Nikon SMZ 800N binocular microscope and Helicon Focus 8 stacking software. The plates were slightly processed with Adobe Photoshop CS5 to adjust the size and background.

“Bracn.+number”—code number indexing for Braconinae specimens in the collection at IEBR;

IEBR—Institute of Ecology & Biological Resources, Vietnam Academy of Science and Technology, Ha Noi, Vietnam;

MT- Malaise trap;

NE—Northeastern;

NP—National Park;

NW—Northwestern;

OD—maximum diameter of posterior ocellus;

OOL—minimum ocular-ocellar line;

POL—minimum postocellar line;

Leiobracon Long & van Achterberg, gen. nov.

(Figures 1, 2)

Type species: *Leiobracon vietnamicus* Long & van Achterberg, sp. nov.

Diagnosis. Body medium-sized and about 8 mm in length, reddish yellow; scape nearly globose, longer dorsally than ventrally in lateral view; terminal flagellomere apiculate/mucronate; in lateral view face with dense and long setosity; clypeus separated from coriaceous face by a fine carina; glossa long, deeply bilobed; galea rather long, broad (Fig. 2B); maxillary palp 5-segmented; labial palp 3-segmented; notauli absent; scutellar sulcus narrow, shallow and smooth; in lateral view pronotum densely setose; mesopleuron convex, smooth; propodeum smooth; hind tibial spurs straight, setose; tarsal claws with small inner tooth and widened subbasally; vein 1-SR+M of fore wing strongly curved posteriorly after arising from vein 1-SR and vein r of fore wing long (Fig. 2H); apex of vein C+SC+R of hind wing with one short, robust bristle; apex of vein R1 with three curved hamuli; vein 2-SC+R vertical and vein 1r-m long (Fig. 2I); vein cu-a strongly reclivous; first metasomal tergite elongate, $2.9 \times$ longer than width apically (Figs 1B, 2F); metasoma entirely smooth; hypopygium sclerotized throughout, acute apically and reaching apex of metasoma (Fig. 1C); ovipositor sheath densely setose, subequal to hind tibia; ovipositor with pre-apical dorsal nodus and apico-ventral serrations (Fig. 2G).

Distribution. Oriental (Vietnam; one species).

Biology. Unknown.

Etymology. Name derived from “leios” (Greek for smooth, bald), because of the smooth body, and the generic name *Bracon* Fabricius.

Comments. *Leiobracon* gen. nov. shares with other genera of the *Mesobracon* group of genera the bifurcate tarsal claws (Quicke 1987) and the comparatively long vein r of the fore wing, but can be distinguished by having the metasoma largely smooth (*vs* metasoma coarsely sculptured in *Mesobracon* group of genera) and vein 1-SR+M of fore wing strongly bent (*vs* straight). Tarsal claws bifurcate or with a small separate tooth on its inner side found in the new genus and other *Mesobracon* group of genera may be interpreted as the plesiomorphic state. The new genus resembles the *Myosoma* group of genera by sharing the following synapomorphies: the first metasomal tergite more than $2.6 \times$ longer than wide medially and its lateral areas largely reduced, the second metasomal tergite

triangular, the outer side of the hind femur and tibia densely setose and with longitudinal depression, the metasoma smooth and shiny and the second metasomal suture smooth.

Leiobracon gen. nov. will run to couplet 10 in the key to world genera by Quicke (1987), where it can be distinguished from *Pseudoshirakia* as follows (based on female):

- 10a Metasoma largely smooth and its second suture shallow, smooth (Figs 1B, 2F); first metasomal tergite more than $2.6 \times$ longer than wide medially, its lateral areas largely reduced and without crenulations; second metasomal tergite triangular, without triangular basal area (Fig. 2F) ***Leiobracon* Long & van Achterberg, gen. nov.**
- 10b Metasoma largely sculptured and its second suture deep, crenulate (Fig. 4B); first metasomal tergite less than $2.0 \times$ longer than wide medially and its lateral areas distinct and with crenulations; second metasomal tergite rectangular with triangular basal area (Fig. 4B) ***Pseudoshirakia* van Achterberg, 1993**

Description of species

(Figures 1, 2)

Leiobracon vietnamicus Long & van Achterberg, sp. nov.

Type material. Holotype, ♀, “Bracn.1018” (IEBR), NW Vietnam: Ha Tinh, Huong Son, Vu Quang NP, forest, sweep [net], 23.ix.2009, KD Long. Paratypes, 2♀, “Bracn.068” (IEBR), NE Vietnam: Vinh Phuc, Tam Dao NP, forest, 900m, sweep [net], 04.vii.2003, NTP LIEN; “Bracn.1255” (IEBR), NE Vietnam: Cao Bang, Tinh Tuc, Phia Oac-Phia Den NP, forest, MT, 8–18.v.2013, PT NHI.

Description. Holotype, female, body 8.6 mm, fore wing 9.0 mm, ovipositor sheath 2.3 mm.

Head. Antenna incomplete, with 57 antennomeres remaining, [in paratype apical flagellomere with spine and $1.75 \times$ longer than its maximum width (without spine) Figs 3A, B]; scape nearly globose, in lateral aspect longer dorsally than ventrally (Fig. 2C); length of scape $1.2 \times$ longer than width apically; flagellomeres short, nearly quadrate; first flagellomere $1.1 \times$ longer than second; first and second flagellomeres 1.1 and $1.0 \times$ longer than wide, respectively; length of maxillary palp $0.7 \times$ as long as height of head; clypeus height: inter-tentorial distance: tentorio-ocular distance = $9 : 17 : 6$; clypeus separated from face by a fine carina (Fig. 2B); face coriaceous and with fine punctures, in lateral view densely setose (Fig. 2C); eye height : shortest distance between eyes : head width = $33 : 26 : 57$; face $1.2 \times$ wider than long; width of hypoclypeal depression $1.3 \times$ longer than distance from it to eye margin; malar suture absent, malar space $0.7 \times$ basal width of mandible; frons flat and smooth (Fig. 2A); vertex smooth, with rather short setae; OOL : OD : POL = $14 : 5 : 6$; temples roundly narrowed behind eyes and eye $1.85 \times$ as long as temple (Fig. 2A); in lateral view transverse width of eye $1.9 \times$ as long as temple.

Mesosoma. Length of mesosoma $1.8 \times$ its height; pronotum smooth, densely setose; mesopleuron slightly convex and smooth (Fig. 1A); metapleuron flat and smooth, fused with propodeum dorsally (without suture between metapleuron and propodeum); notauli absent (Fig. 2D); mesoscutum smooth, scutellar sulcus shallow, narrow and smooth (Fig. 2D); scutellum slightly convex and smooth; propodeum smooth; propodeal spiracle small, situated behind far from middle of propodeum; mesonotum and propodeum sparsely setose.

Wings. Fore wing with pterostigma $3.5 \times$ as long as its maximum width; angle between 1-SR and C+SC+R about 75° (Fig. 2H); r: 3-SR: 2-SR: SR1 = $15 : 28 : 22 : 42$; strongly bent posteriorly after arising from vein 1-SR (Fig. 2H); vein r nearly as long as vein 2-SR; vein 1-M $1.7 \times$ longer than m-cu; vein 1-CU1 short and thick, nearly quadrate; vein cu-a distinctly reclivous, slightly postfurcal (Fig. 2H). Hind wing with vein 2-SC+R vertical; vein cu-a reclivous (Fig. 2I), SC+R1: 1r-m = $15 : 27$.

Legs. Length of fore femur : tibia : tarsus = $20 : 23 : 28$; length of hind femur, tibia and basitarsus, 3.55 , 5.75 and $4.0 \times$ longer than their maximum width, respectively; hind basitarsus $0.4 \times$ as long as hind tibia and $0.7 \times$ second-fifth tarsal segments combined; inner and outer hind tibial spurs 0.40 and $0.35 \times$ as long as hind basitarsus, respectively, inner side of hind tarsal claw with a separate tooth (Fig. 2E).

Metasoma. Metasoma $1.1 \times$ as long as mesosoma and head combined; first tergite $2.9 \times$ its apical width, surface smooth; lateral grooves of first tergite smooth (Fig. 2F); second suture indistinct; second–sixth tergites smooth; setose part of ovipositor sheath $0.25 \times$ as long as fore wing; hypopygium medium-sized, sclerotized throughout, apically acute, and sparsely setose (Fig. 1C); ovipositor sheath densely setose, subequal to hind tibia; ovipositor with pre-apical dorsal nodus and apico-ventral serrations (Fig. 2G).

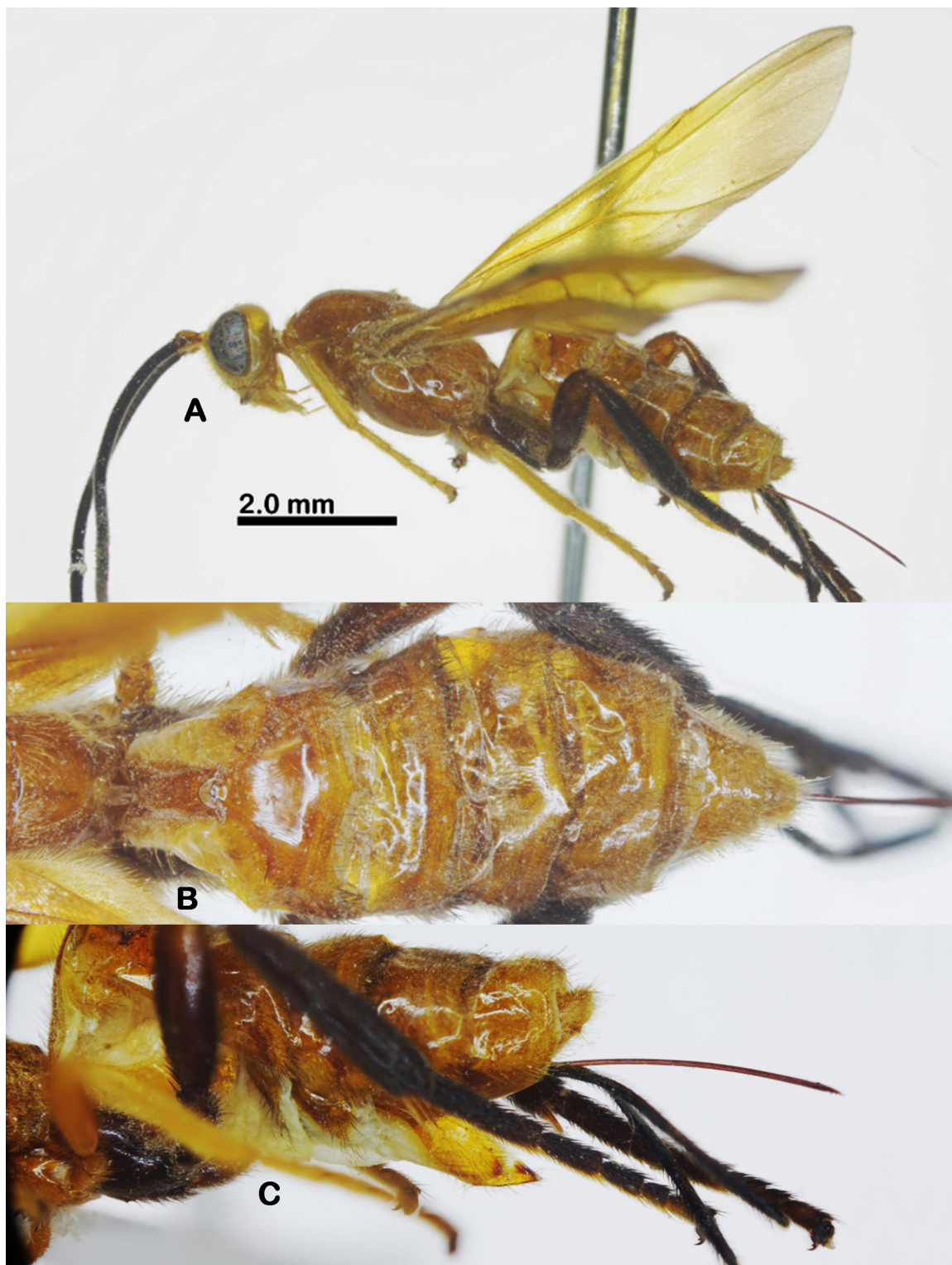


FIGURE 1. *Leiobracon vietnamicus* Long & van Achterberg, sp. nov., holotype, female. **A** Habitus, lateral **B** Metasoma, dorsal **C** Ovipositor and apex of metasoma lateral.

In addition, the type species of *Pseudoshirakia* van Achterberg and *Pseudospinaria* Enderlein were previously reported from Vietnam.

Colour. Reddish yellow; scape and pedicel yellow, contrasting with brown flagellum; fore and middle legs yellow; hind leg yellowish brown to dark brown; spurs yellow; wings yellow, parastigma dark brown, large dark brown spot of fore wing extending to middle of vein 1-SR+M (Fig. 2H); ovipositor sheath brownish black, ovipositor yellow.

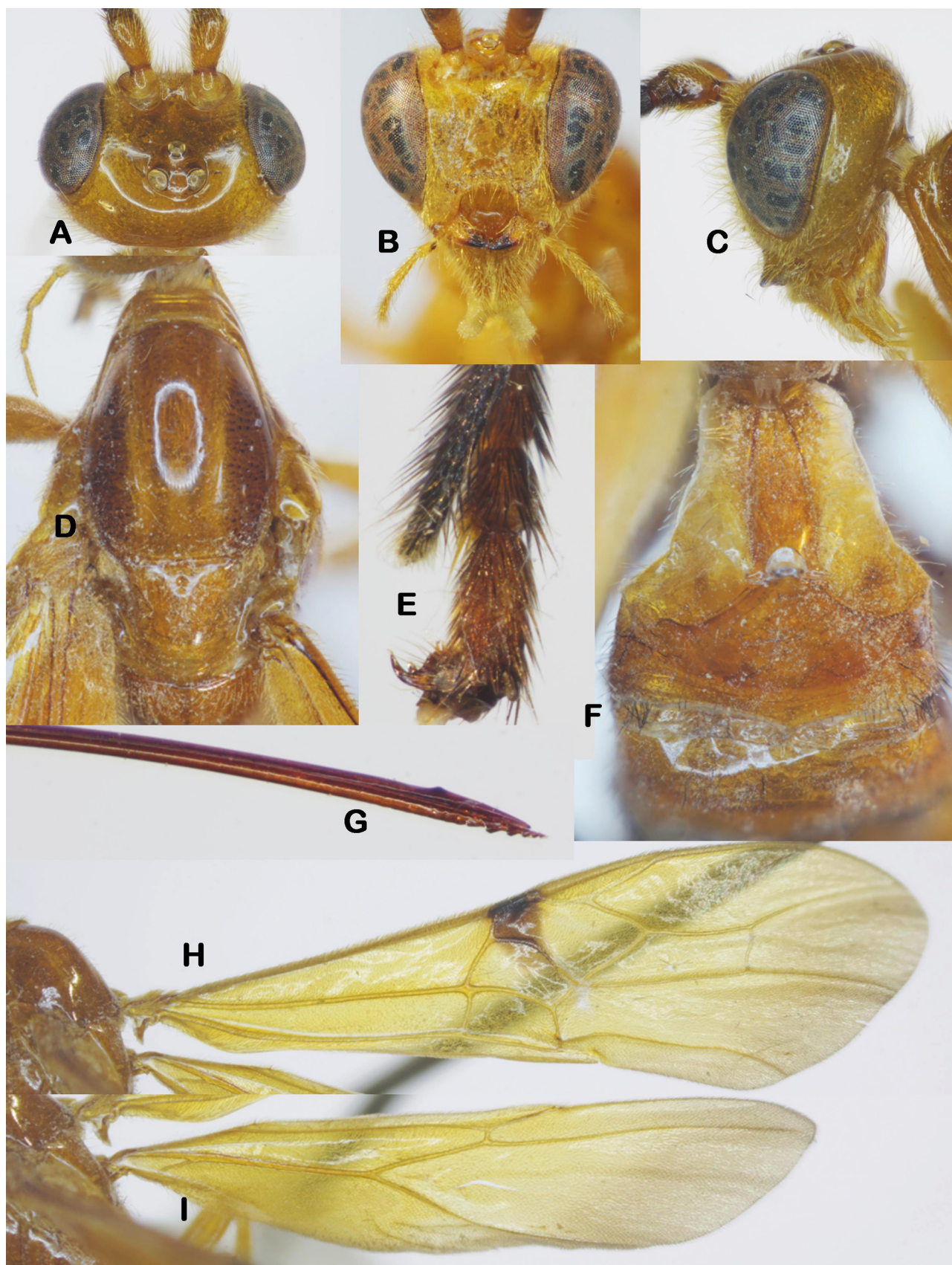


FIGURE 2. *Leiobracon vietnamicus* Long & van Achterberg, sp. nov., holotype, female. **A** Head, dorsal **B** Head, anterior **C** Head, lateral **D** Mesonotum, dorsal **E** Hind telotarsus and tarsal claw **F** Metasomal tergites 1–3, dorsal **G** Apex of ovipositor, lateral **H** Fore wing **I** Hind wing.



FIGURE 3. *Leiobracon vietnamicus* Long & van Achterberg, sp. nov., paratype, female. **A** Habitus, dorso-lateral **B** Apical flagellomere, arrow indicates apical spine

Variation. Paratypes, females, body 8.6–9.0 mm, fore wing 9.8–10.5 mm, ovipositor sheath 2.5–2.6 mm, antennal segments 66.

Biology. Unknown.

Male. Unknown.

Distribution. Northeast Vietnam (Cao Bang and Vinh Phuc provinces) and North Central Vietnam (Ha Tinh province).

***Pseudospinaria attenuata* (Westwood, 1882)**

(Fig. 4A)

Spinaria attenuata Westwood 1882: 229 (type species: *Spinaria attenuata* Westwood, 1882 (monobasic and original designation); Quicke 1987: 127; Li *et al.* 2021: 154; Long *et al.* 2023: 29.

Distribution. Northeast Vietnam (Bac Giang province).

***Pseudoshirakia yokohamensis* (Cameron, 1910)**

(Fig. 4B, C)

Bracon yokohamensis Cameron, 1910; van Achterberg, 1983: 74 (type species: *Bracon yokohamensis* Cameron, 1910; monobasic and original designation); Long *et al.*, 2004: 88.

Distribution. Northwest Vietnam (Hoa Binh province).

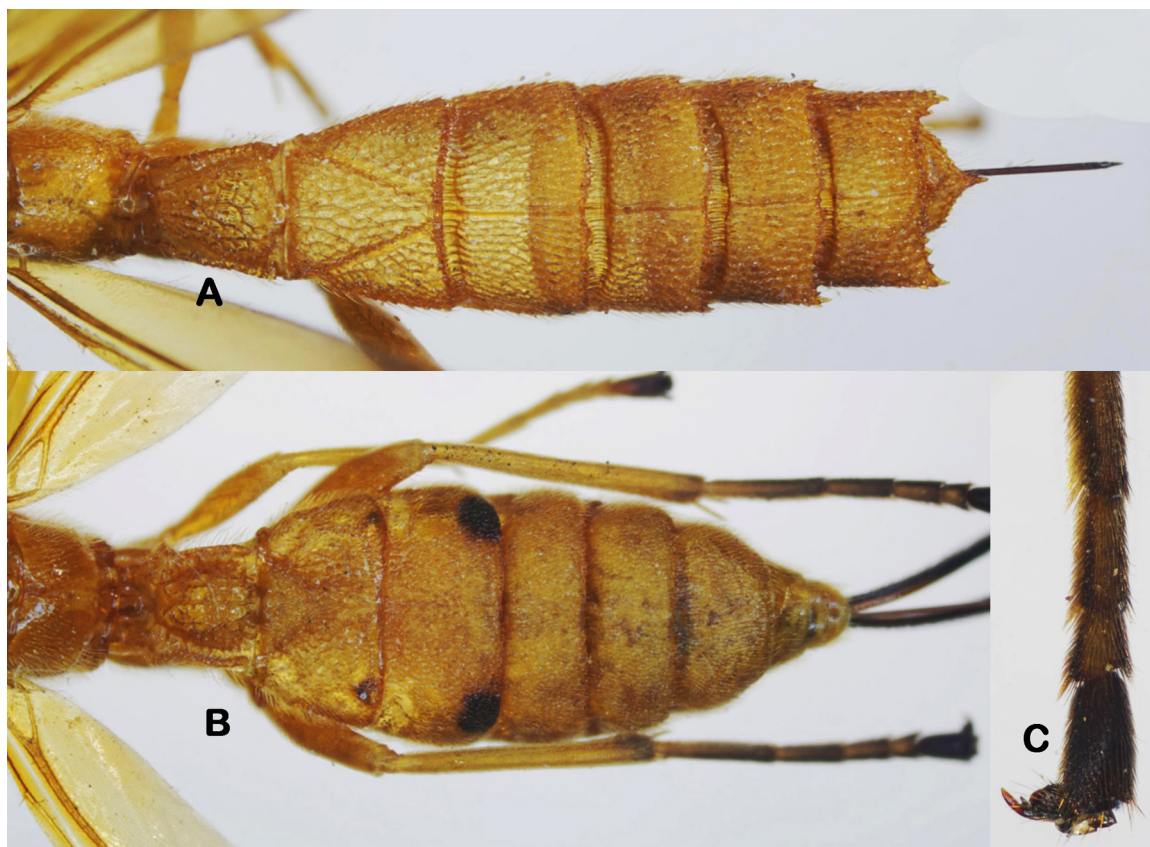


FIGURE 4. Metasoma of *Pseudospinaria attenuata* (A) and *Pseudoshirakia yokohamensis* (B) C Hind telotarsus and tarsal claw of *Pseudoshirakia yokohamensis*.

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