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Review of the genus *Wroughtonia* Cameron, 1899 (Hymenoptera, Braconidae, Helconinae), with the description of 12 new species from Vietnam

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ABSTRACT

The genus *Wroughtonia* Cameron (Hymenoptera, Braconidae, Helconinae) is reviewed. Twelve new species of the genus *Wroughtonia* are described and illustrated: *Wroughtonia angularis*, sp. nov.; *W. aspera*, sp. nov.; *W. coffeana*, sp. nov.; *W. elongata,* sp. nov.; *W. laevis*, sp. nov.; *W. plana*, sp. nov.; *W. similis*, sp. nov.; *W. simulata*, sp. nov.; *W. sonla*, sp. nov., and *W. vietnamica*, sp. nov., authored by Long, and *W. hatinhensis*, sp. nov., and *W. undulata*, sp. nov., authored by Long and van Achterberg. A new subgenus (*Neowroughtonia,* type species *Wroughtonia angularis*) is proposed for the species with mandibles angularly bend ventrally; malar suture absent; occipital carina indistinct mediodorsally and vein 2-SC+R of hind wing vertical. Five species are newly recorded for the Braconidae fauna of Vietnam, viz. *W. bifurcata* Yan and van Achterberg, 2017; *W. brevicarinata* (Yan and Chen, 2014); *W. indica* (Singh, Belokobylskij and Chouhan, 2005); *W. cornuta* Cameron, 1899, and *W. varifemora* Yan and Chen, 2017. A key to Vietnamese species of *Wroughtonia* is provided.

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INTRODUCTION

Wroughtonia Cameron, 1899 (Helconinae, Helconini), has its main distribution in the East Palaearctic and northeastern Oriental regions, with comparatively few species in the West Palaearctic, Nearctic, northern Neotropical regions, and the remainder of the Oriental region. The generic limits of *Wroughtonia* were studied by Yan et al. (2017) and resulted in the synonymy of *Spasskia* Belokobylskij, 1989. *Wroughtonia* can be separated by having the occipital flange medium sized to wide, lamelliform and protruding below base of mandible; the apex of the ovipositor sheath normally setose or with some long setae apically; the occipital carina straight ventrally or weakly curved, only very rarely distinctly curved; the frons with a median lamella (rarely bifurcate) or with an obtuse protuberance between antennal sockets, tuberculate dorsally and with distinct ledge halfway; the basal part of the first metasomal sternite about as wide as long or distinctly transverse and basally smooth, more or less united with the first tergite, but sometimes distinctly longer than wide and basally more or less sculptured; the mesopleuron in front of the prepectal carina oblique and gradually lowered; the hind femur serrate ventrally, with a ventral flange or with a more or less tooth-shaped protuberance; the marginal cell of the hind wing often distinctly widened apically; the antenna of the female often partly white, ivory, or pale yellowish, rarely pale part reduced to one segment or basal half of antenna mainly brownish yellow. The tribe Helconini Foerster was revised by Yan et al. (2017), including 31 species, of which 27 species occur in China. In the Oriental region *Wroughtonia* comprises 32 valid species (Yu et al., 2016; Yan et al., 2017). *Wroughtonia* has been reared as koinobiont endoparasitoid of Coleoptera larvae in wood or cones, especially of Cerambycidae and Buprestidae (Viereck, 1912; Gupta and Sharma, 1976; Marsh, 1979; van Achterberg, 1987a; Sheng, 1990; Chou and Hsu, 1998).

To date, only two genera of the subfamily Helconinae, *Helcon* Nees, 1812, and *Helconidea* Viereck, 1914, have been reported in the literature from Vietnam (Long and Belokobylskij, 2003). In this paper we review the genus *Wroughtonia*, including one new subgenus and 12 new species and we present a new identification key for all species known from Vietnam.

Material and Methods

Specimens studied are deposited in the Braconidae Collection of the Institute of Ecology and Biological Resources (IEBR) and of the Vietnam National Museum of Nature (VNMN) at Ha Noi, Vietnam. Most specimens of helconine wasps were collected in Malaise traps set in the understory vegetation of slightly disturbed tropical forest in North Central Vietnam during the collaboration survey with entomologists from American Museum of Natural History (AMNH) from 1998 through 2000. Additional specimens were collected in the numerous surveys throughout Vietnam recently organized by the first author.

The types (holotypes and paratypes) are mainly kept in the two first-listed depositories at Ha Noi; some paratypes are donated to and deposited in the American Museum of

Natural History, New York (AMNH), and the Naturalis Biodiversity Center, Leiden, the Netherlands (RMNH).

Terminology used in this paper follows van Achterberg (1993), sculpture terms are based on Harris (1979), and vein terminology follows the modified Comstock-Needham system (van Achterberg, 1993). For identification of the subfamilies, see van Achterberg (1993); for a key to the genera of the tribe Helconini, see Yan et al. (2017); for additional references and data, see Yu et al. (2016). We used an Olympus® SZ61 binocular microscope together with fluorescent lamps for sorting, identification, and descriptions. The key to species and description of species are based on females. Measurements were carried out using an Olympus® SZ40 binocular microscope. The scale-lines of the plates indicate size in mm. The photographs were made with a Sony® 5000 digital camera attached to a Nikon® SMZ 800N binocular microscope connected to a PC at IEBR and processed with Adobe Photoshop CS5 to adjust the size and background. An asterisk (*) in the checklist indicates a newly recorded species for Vietnam's braconid fauna.

Abbreviations used in this paper are as follows: **POL,** postocellar line; **OOL,** ocular-ocellar line; **OD,** diameter of posterior ocellus; **MT,** Malaise trap; "Hel.+number": code number indexing for specimens of the Helconinae in the collection at IEBR and VNMN. Locations: **C**: Central; **NC**: North Central; **NE**: Northeastern; **NW**: Northwestern; **NP**: National Park; **NR,** Nature Reserve.

The following acronyms are used: **AMNH,** American Museum of Natural History, New York; **IEBR,** Institute of Ecology and Biological Resources, Vietnam Academy of Science and Technology, Ha Noi, Vietnam; **RMNH,** Naturalis Biodiversity Center, Leiden, the Netherlands; **VNMN,** Vietnam National Museum of Nature, Vietnam Academy of Science and Technology, Ha Noi, Vietnam.

SYSTEMATICS

Checklist and Distribution of Oriental Species of the Genus *Wroughtonia*

(Oriental: 32; Vietnam: 18 (in bold); new record (*): 5; new species: 12)

Wroughtonia ***angularis***/ NW Vietnam: Son La.

Wroughtonia alba (Chou and Hsu, 1998)/ China-Taiwan

Wroughtonia ***aspera***/ NC Vietnam: Ha Tinh.

Wroughtonia atkinsoni Gupta and Sharma, 1976/ Myamar

Wroughtonia* ***bifurcata* Yan and van Achterberg, 2017/ China (Yunnan) (Yan et al., 2017: 423); NC Vietnam: Ha Tinh.

Wroughtonia* ***brevicarinata* Yan and Chen, 2017)/ China (Guizhou, Yunnan) (Yan et al., 2017: 426); NE Vietnam: Tuyen Quang; NC Vietnam: Ha Tinh.

Wroughtonia claviventris (Wesmael, 1835)/ China-Taiwan, Europe.

Wroughtonia ***coffeana***/ NW Vietnam: Son La.

Wroughtonia* ***cornuta* (Cameron, 1899)/ India (Gupta and Sharma, 1976: 361); N Vietnam: Ha Noi; NE Vietnam: Vinh Phuc, Ha Giang; NW Vietnam: Son La.

Wroughtonia ***elongata***/ NC Vietnam: Ha Tinh.

Wroughtonia granulosa Gupta and Sharma, 1976/ India

Wroughtonia ***hatinhensis***/ NC Vietnam: Ha Tinh; NE Vietnam: Tuyen Quang; NW Vietnam: Hoa Binh.

Wroughtonia himachali Gupta and Sharma, 1976/ India

Wroughtonia* ***indica* (Singh, Belokobylskij, and Chauhan, 2005)/ China (Yunnan); India; NE Vietnam: Tuyen Quang.

Wroughtonia ***laevis***/ NW Vietnam: Phu Tho.

Wroughtonia obtusa Yan and van Achterberg, 2017/ China (Yunnan) (Yan et al., 2017: 440)

Wroughtonia petila Chou and Hsu, 1998/ China-Taiwan

Wroughtonia ***plana***/ NW Vietnam: Son La.

Wroughtonia pterolophiae Chou and Hsu, 1998/ China-Taiwan

Wroughtonia rugosa Yan and Chen, 2017/ China (Yunnan) (Yan et al., 2017: 442)

Wroughtonia ***similis***/ C Vietnam: Thua Thien- Hue.

Wroughtonia ***simulata***/ NC Vietnam: Ha Tinh.

Wroughtonia ***sonla***/ NW Vietnam: Son La.

Wroughtonia spinator (Lepeletier, 1825)/ China-Taiwan; Japan, Europe.

Wroughtonia striata Gupta and Sharma, 1976/ Myamar

Wroughtonia truncata Gupta and Sharma, 1976/ India

Wroughtonia uchidai (Watanabe, 1931)/ China-Taiwan; Japan; Russia.

Wroughtonia ***undulata***/ NC Vietnam: Ha Tinh.

Wroughtonia ***unicornis*** (Turner, 1918)/ China; Laos; Vietnam (Long and Belokobylskij, 2004) S Vietnam: Lam Dong.

Wroughtonia* ***varifemora* Yan and Chen, 2017/ China (Guangxi) (Yan et al., 2017: 448); NC Vietnam: Ha Tinh.

Wroughtonia ***vietnamica***/ NE Vietnam: Tuyen Quang; Vinh Phuc (Tam Dao).

Wroughtonia zhejiangensis Yan and van Achterberg, 2017/ China (Zhejiang) (Yan et al., 2017: 452).

TAXONOMY

Wroughtonia Cameron, 1899

Wroughtonia Cameron, 1899: 56; Watanabe, 1972: 3; Gupta and Sharma, 1976: 353; van Achterberg, 1987b: 276–278; Chou and Hsu, 1998: 298–301; Belokobylskij, 1998: 26–40, 412–413, 418–419; Yan et al., 2017: 414. Type species: *Wroughtonia cornuta* Cameron, 1899, by monotypy.

Duportia Kieffer, 1921: 129–140. Synonymized by Watanabe (1972). Type species: *Duportia cincticornis* Kieffer, 1921 [= *Wroughtonia unicornis* (Turner, 1918)], by monotypy.

Spasskia Belokobylskij, 1989: 26–27, 1998: 420; Singh et al., 2005: 95–96; Yan et al., 2014: 2. Type species: *Spasskia sigalphoides* Belokobylskij, 1989, by original designation. Synonymized by Yan et al. (2017).

Diagnostic Characters (Vietnamese Species)

Antenna of female often with cream white or ivory band, rarely pale part consisting of only one antennal segment or basal half of antenna ivory (figs. 14, 38, 48, 116, 126); occipital carina straight ventrally, connected to hypostomal carina below or near level of mandibular base, resulting in a linear occipital flange (figs. 51, 74, 95, 119) or a distinctly lobe-shaped lamelliform flange below base of mandible; epistomal suture narrow and rather shallow to wide and moderately deep; pronope deep and usually close to anterior margin of pronotum; frons with median lamella or with obtuse protuberance between antennal sockets; prepectal carina present medioventrally, oblique and gradually lowered (figs. 19, 43, 64); medioposterior depression of scutellum wide and usually comparatively short; area in front of tegulum with a more or less developed carina and with crenulae; hind femur with a triangular ventral tooth, with wide (more or less serrate) protuberance (figs. 44, 54, 66, 79) or only with serrations (figs. 10, 24, 36); hind tarsus often whitish or pale yellowish; vein 1-SR of forewing present; recurrent vein of forewing antefurcal (figs. 12, 20, 35); marginal cell of hind wing distinctly widened apically (figs. 13, 22, 37); vein 2A of hind wing present; first metasomal tergite either robust and its apical width 2.6–3.6× its basal width (figs. 23, 34, 55) or slenderer and its apical width 2.0–2.6× its basal width (figs. 46, 68, 81); third and following tergites smooth, rarely third tergite extensively finely sculptured or finely punctate laterally.

Notes: The subgenus *Neowroughtonia*, subgen. nov. (type species: *Wroughtonia angularis*v.) is proposed by Long for the species having the following characters: (1) mandibles angularly bend ventrally (fig. 3) (evenly curved ventrally in all the species of the genus *Wroughtonia*); (2) the malar suture absent (fig. 5) (present in the traditional *Wroughtonia* species); (3) the occipital carina indistinct mediodorsally; and (4) vein 2-SC+R of hind wing vertical (fig. 13). The subgenus is only known from Vietnam and the biology is unknown. The name is derived from *neo-* (Greek for "new, young, recent") and the generic name *Wroughtonia*. Gender: feminine. Based on the above mentioned aberrant character-states differentiated from the traditional *Wroughtonia* species, only one species, *Wroughtonia angularis*, sp. nov., represents a new subgenus.

Descriptions of Species

***Wroughtonia* (*Neowroughtonia*) *angularis*,** sp. nov.

Figures 1–13

Type Material: Holotype, ♀, "Hel.090" (IEBR), NW Vietnam: Son La, Moc Chau, 900 m, bushes, 25.iv.2014, sweep net, K.D. Long.

Distribution: NW Vietnam: Son La.

Biology: Unknown.

Diagnosis: Antenna with 35 segments and antennal segments 10–18 cream white; frontal protuberance lamelliform and acute dorsally; height of eye 1.55× width of temple in lateral view. Mesosoma 1.9× longer than high (in lateral view); notauli deep, crenulate anteriorly, posteriorly areolate-rugose and with a median carina; propodeum without areola, coarsely rugose. Foretarsus 1.3× as long as foretibia; length of forewing 3.3× its maximum width; vein 3-SR 1.15× vein r; vein 2-M 2.3× 3-SR; hind wing vein 1-M 0.95× vein 1r-m; basal cell distinctly widened apically; vein 2-SC+R vertical; hind wing with four hamuli. Hind femur only with ventral serrations; length of hind femur 3.5× its maximum width (without serrations); outer side of hind coxa and femur sparsely finely punctate. First tergite short, 0.9× as long as its apical width; dorsal carinae present in basal 0.4 of tergite; median length of second tergite 0.5× its basal width and 1.2× third tergite; first tergite foveate-rugulose medially, largely rugose laterally; second tergite punctate-reticulate medially and rugose-punctate laterally.

Description: Holotype, ♀, body length 8.4 mm, antenna 6.2 mm, forewing length 6.9 mm, ovipositor sheath 7.0 mm (fig. 1).

Head: Antenna with 35 segments; third antennal segment 1.1× as long as fourth (16:14); in anterior view height of eye 2.6× as long as its transverse width (34:13); width of face 2.2× length of face and clypeus combined (50:23); malar space 0.75× as long as mandible width (15:20) and 0.6× height of eye (20:34) (fig. 3); maxillary palp missing; distance between tentorial pits equal to distance from pit to eye margin; in dorsal view width of head 1.7× its median length (80:47); height of eye 1.55× as long as temple (28:18); POL:OD:OOL = 9:7:16; distance between anterior and posterior ocelli 0.25× as long as OOL (4:16) (fig. 2); frontal protuberance lamelliform and acute dorsally (fig. 4); in lateral view length of eye 1.4× its transverse width (36:26); transverse width of eye 1.4× width of temple (26:19) (fig. 5); face coarsely rugose; frons, vertex, and temple almost smooth, somewhat coriaceous.

Mesosoma: Mesosoma 1.9× longer than its height (79:42) (in lateral view); pronotal side crenulate anteriorly and medially, rugose ventrally and dorsally; mesopleuron almost flat, coriaceous (fig. 7); metapleuron areolate-rugulose; notauli deep, crenulate anteriorly, posteriorly areolate-rugose with a coarse median ruga (fig. 6); median lobe of mesoscutum smooth anteriorly, foveolate-rugose posteriorly; lateral lobes of mesoscutum almost smooth; scutellar sulcus deep, with carinae, 0.75× as long as scutellum (12:16); scutellum narrowed laterally, coriaceous; propodeum without areola, transversely rugose (fig. 8).

Wings. Forewing: length of forewing 3.3× its maximum width (116:35); pterostigma 3.5× longer than wide (46:13); vein r arising from middle of pterostigma (16:30); vein 3-SR 1.2× vein r (15:13); r:2-SR:3-SR:SR1:r-m = 13:20:15:83:19; vein cu-a oblique, 1-CU1:cu-a:2-CU1 = 5:14:23; second submarginal cell trapezium-shaped, long base 2.3× as long as short base (35:15) (fig. 12); hind wing vein 1-M 0.95× as long as vein 1r-m (19:20); basal cell distinctly widened apically; vein 2-SC+R vertical (fig. 13); hind wing with four hamuli.

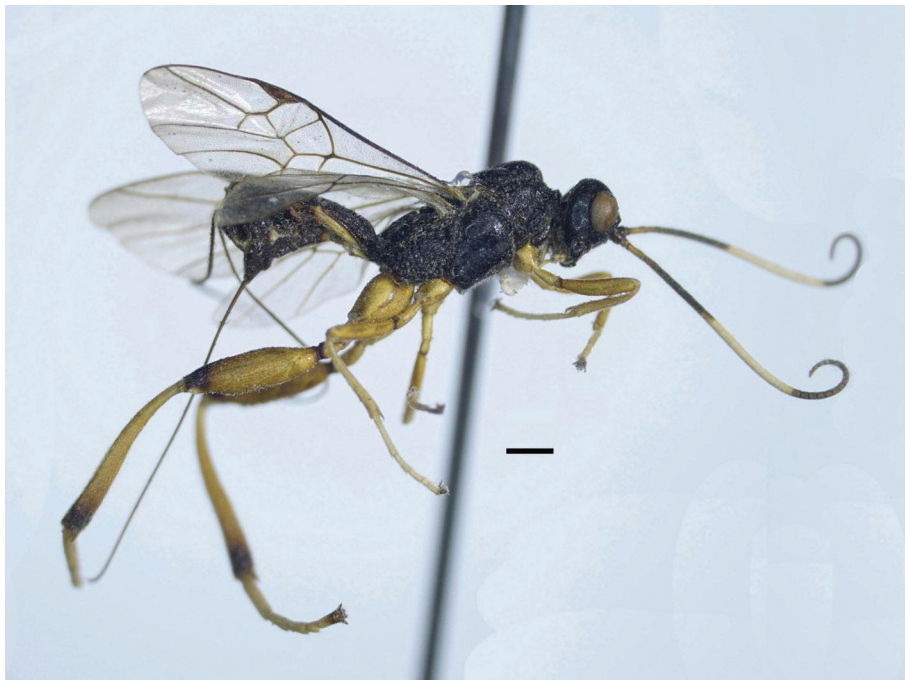


FIGURE 1. *Wroughtonia angularis*, sp. nov., habitus (holotype, female, lateral).

Legs: Foretarsus 1.3× longer than foretibia (55:43); hind femur with ventral serrations, without tooth-shaped protuberance (fig. 10); length of hind femur (without serrations), tibia, and basitarsus 3.5 (56:16), 8.3 (75:9), and 6.5× (26:4) as long as their maximum width, respectively; hind tibia distinctly curved subbasally (fig. 9); hind basitarsus 0.8× as long as hind tibia (59:75); hind basitarsus 0.74× as long as hind tarsal segments 2–5 (26:35); fourth hind tarsal segment 0.40× as long as telotarsus (4:10); outer side of hind coxa and femur sparsely finely punctate (figs. 9, 10).

Metasoma: Metasoma 0.7× as long as head and mesosoma combined (34:50); first tergite short, 0.9× as long as its apical width (46:49) (fig. 11); dorsal carinae present in basal 0.4 of tergite (20:46); median length of second tergite 0.5× as long as its basal width (24:51), and 1.2× as long as third tergite (24:20); first tergite foveate-rugulose medially, largely rugose laterally; second tergite punctate-reticulate medially and rugose-punctate laterally; third tergite smooth (fig. 11); ovipositor sheath slightly longer than forewing (70:69).

Color: Body black, scapus brown; remainder of antenna brown with third and fourth segments yellow and segments 10–18 cream white; palpi pale yellow; fore- and middle legs yellow, except whitish yellow tarsus; hind leg yellow, but hind tarsus whitish yellow, femur and tibia apically dark brown (figs. 9, 10); pterostigma brown; wing veins brownish yellow; wing membrane hyaline (figs. 12, 13).

Male: Unknown.

Etymology: From *angulus* (Latin for "corner, bend"), because the mandible is angularly bent ventrally.

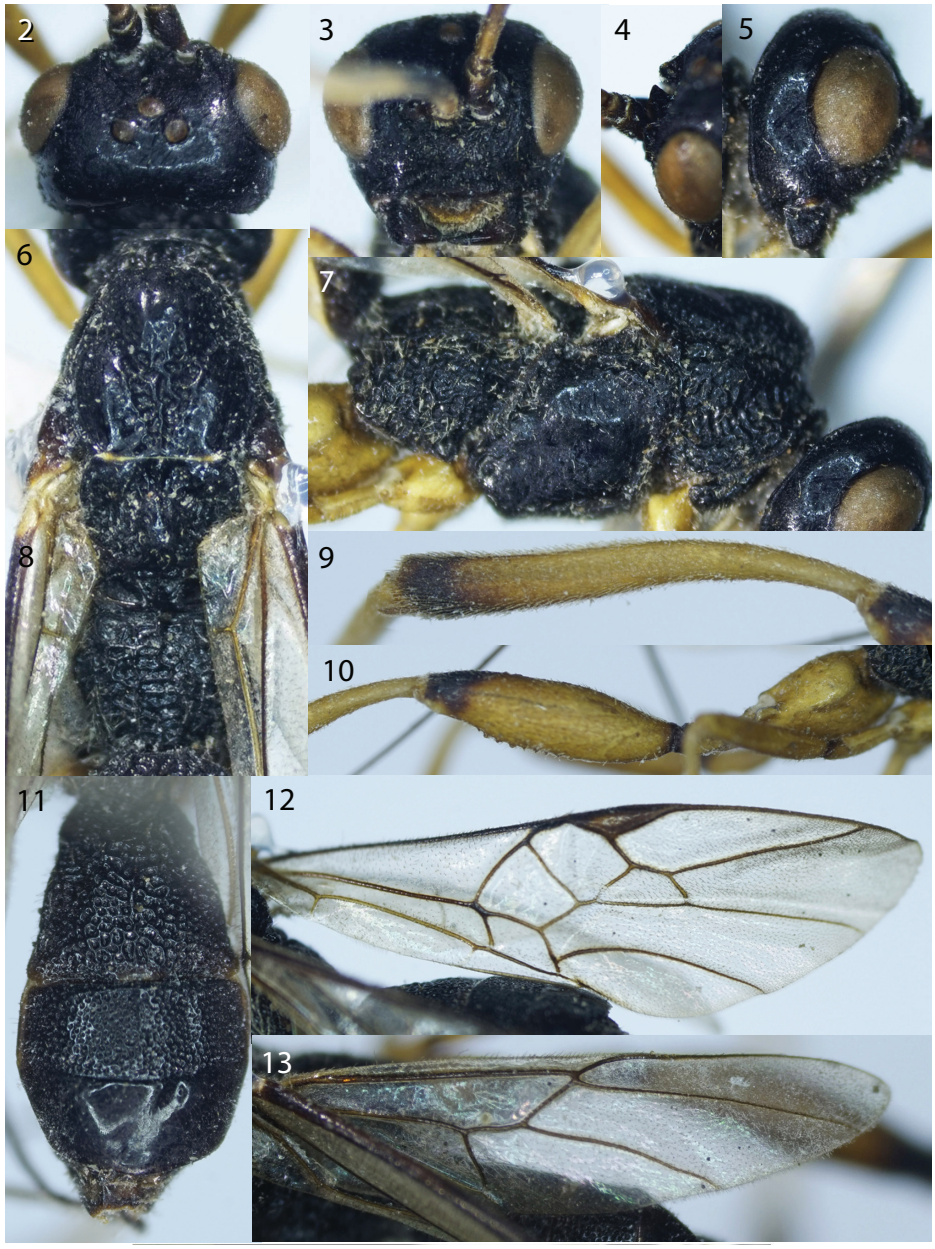


FIGURE 2–13. *Wroughtonia angularis* (holotype, female). **2.** Head, dorsal. 3. Head, frontal. **4.** Frontal protuberance, latreal. **5.** Head, lateral. **6.** Mesoscutum. **7.** Mesopleuron. **8.** Propodeum. **9.** Hind tibia, lateral. **10.** Hind femur and coxa, lateral. **11.** Metasoma. **12.** Forewing. **13.** Hind wing.

***Wroughtonia aspera*,** sp. nov.

Figures 14–26

Type Material: Holotype, ♀, "Hel.049" (IEBR), NC Vietnam: Ha Tinh, Huong Son, 18°**22**′N 106°13′E, 900 m, April 20–28, 1998, Malaise [trap], AMNH, K. Long.

Distribution: NC Vietnam: Ha Tinh (Huong Son).

Biology: Unknown.

Diagnosis: Antenna with 38 segments, with antennal segments 11–20 cream white; maxillary palp 1.6× as long as head; frontal protuberance long, acute and raised higher than lateral carinae of frons; in dorsal view width of head 1.6× its median length; height of eye 1.55× temple. Length of mesosoma 1.9× as long as high; notauli wide and shallow, largely rugose, fused posteriorly with longitudinal rugosities; scutellum rather short, rugose; propodeum coarsely rugose. Foretarsus 1.2× longer than foretibia; forewing 3.1× longer than its maximum width; vein 3-SR short, 0.6× vein r; second submarginal cell trapezium-shaped, vein 2-M 3.7× 3-SR; vein 1-M of hind wing 0.55× vein 1r-m; vein 2-SC+R transverse; hind wing with 4 hamuli. Hind femur robust, with a rather wide obtuse protuberance, without distinct ventral serrations; length of hind femur (without protuberance) 3.1× its maximum width; outer side of hind coxa sparsely finely punctate; hind femur densely punctate laterally. First tergite 1.1× longer than its apical width; dorsal carinae in basal 0.7 of tergite; median length of second tergite 0.6× as long as its basal width, and 1.15× third tergite; first tergite largely smooth basally, transversely rugose mediolaterally and nearly areolate-rugulose medioapically; second tergite punctate-reticulate, but smooth medially and remainder shiny and smooth.

Notes: *W. aspera,* sp. nov., runs in the key by Yan et al. (2017) to *W. zhejiangensis* Yan and van Achterberg, 2017, from China and can be separated as follows: (1) frontal protuberance near antennal sockets evenly narrowed from base to apex, roundly pointed apically (frontal protuberance with posterior protruding narrow lamella in *W. zhejiangensis*); (2) forewing vein r 1.7× vein 3-SR (1.1× in *W. zhejiangensis*); and (3) hind wing vein 1-M 0.55× vein 1r-m (0.4× in *W. zhejiangensis*).

The new species is also similar to *W. albobasalis* van Achterberg and Chen, 2017, from China, but differs from the latter by having: (1) hind femur slender, length 3.1× its maximum width (2.8× in *W. albobasalis*); (2) vein r of forewing 1.7× vein 3-SR (1.1× in *W. albobasalis*); (3) vein 1-M of hind wing 0.55× vein 1r-m (0.4× in *W. albobasalis*); and (4) occiput smooth (sparsely punctate in *W. albobasalis*), 11th–20th antennal segments 11–20 cream white (3–11 in *W. albobasalis*).

Description: Holotype, ♀, body length 11.4 mm, forewing length 7.5 mm, ovipositor sheath 7.7 mm (fig. 14).

Head: Antenna with 38 segments; third antennal segment 1.2× fourth (19:17); in frontal view height of eye 2.1× its transverse width (27:13); width of face 1.85× length of face and clypeus combined (39:21); malar space 1.2× as long as mandible width (18:15) and 0.5× height of eye (18:39) (fig. 16); maxillary palp 1.6× as long as head (50:32); in dorsal view, width of head 1.6× as long as median length (75:47); height of eye 1.5× as long as temple (30:20);

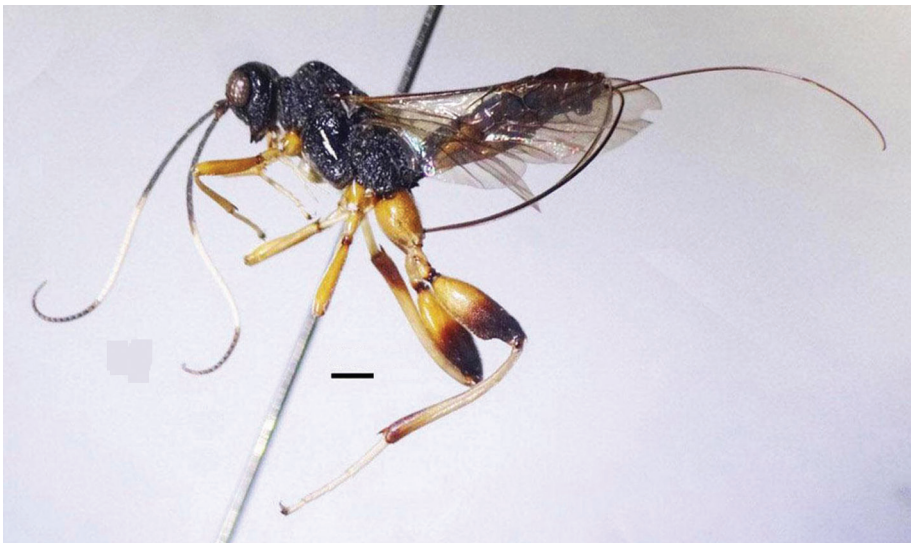


FIGURE 14. *Wroughtonia aspera*, sp. nov., habitus (holotype, female, lateral).

POL:OD:OOL = 10:7:19 (fig. 15); distance between front and hind ocelli 0.3× as long as OOL (6:19); in lateral view, length of eye 1.3× as long as transverse width (38:30) (fig. 17); frontal protuberance long, acute and raised above lateral carinae of frons; face coarsely rugose; frons deeply depressed, smooth; vertex rugose-punctate anteriorly and smooth medioposteriorly; occiput largely smooth; temple nearly rugose-punctate, but coarsely rugose ventrally.

Mesosoma: Mesosoma 1.9× longer than high (100:52); pronotal side coarsely rugose; mesopleuron largely smooth medially, rugose-punctate ventrally (fig. 19); metapleuron coarsely rugose; median lobe of mesoscutum nearly finely punctate, but rugose lateroapically; notauli wide and shallow, largely rugose, fused posteriorly with longitudinal rugosities (fig. 18); scutellar sulcus with 4 carinae, 0.5× as long as scutellum (7:13); scutellum rather short, rugose; propodeum coarsely rugose (fig. 21).

Wings. Forewing: length of forewing 3.1× its maximum width (140:45); pterostigma 2.9× longer than wide (38:13); vein 3-SR short, 0.6× vein r (7:12); r:2-SR:3-SR:SR1:r-m = 12:17:7:65 :16; vein cu-a oblique, 1-CU1:cu-a:2-CU1 = 6:17:28; second submarginal cell trapezium-shaped, vein 2-M 3.7× 3-SR (26:7) (fig. 20). Hind wing with vein m-cu as an antefurcal spectral trace; vein 1-M 0.55× as long as vein 1r-m (10:18); vein 2-SC+R transverse (fig. 22); hind wing with 4 hamuli.

Legs: Foretarsus 1.2× as long as foretibia (43:35); hind femur robust, with rather a wide obtuse protuberance, without distinct ventral serrations (fig. 25); length of hind femur (without protuberance), tibia, and basitarsus 3.1 (74:24), 9.2 (110:12), and 5.5× (33:6) as long as their maximum width, respectively; hind tibia evenly curved basally (fig. 26); hind basitarsus 0.3× as long as hind tibia (33:110); hind basitarsus 0.7× as long as hind tarsal segments 2–5 (33:49); fourth hind tarsal segment 0.4× as long as telotarsus (6:16). Outer side of hind coxa sparsely finely punctate (fig. 24); hind femur densely punctate laterally.

Metasoma: Metasoma about as long as head and mesosoma combined (65:66); first tergite 1.1× longer than its apical width (36:33) (fig. 23); dorsal carinae in basal 0.7 of tergite (31:43); median length of second tergite 0.6× as long as its basal width (31:52), and 1.15× third tergite (31:27); first tergite almost smooth basally, transversely rugose mediolaterally, nearly areolate-rugulose medioapically; second tergite as long as third (19:19); second tergite punctate-reticulate (fig. 23); remainder of metasoma shiny, smooth; ovipositor sheath slightly longer forewing (77:75).

Color: Body black, scapus brown; antenna brown with antennal segments 11–20 cream white; palpi whitish yellow, but first and second segments yellowish brown; fore- and middle legs yellow, but tarsus whitish yellow; hind coxa yellow; hind femur yellow basally and brown apically (fig. 25); hind tibia whitish yellow, but infuscate apically (fig. 26); pterostigma brown, but yellow basally; wing veins brownish yellow; wing membrane hyaline (figs. 20, 22).

Male: Unknown.

Etymology: From *asper* (Latin for "rough," "harsh"), because the flat medioposterior area of mesoscutum is coarsely rugose.

Wroughtonia coffeana, sp. nov.

Figures 27–37

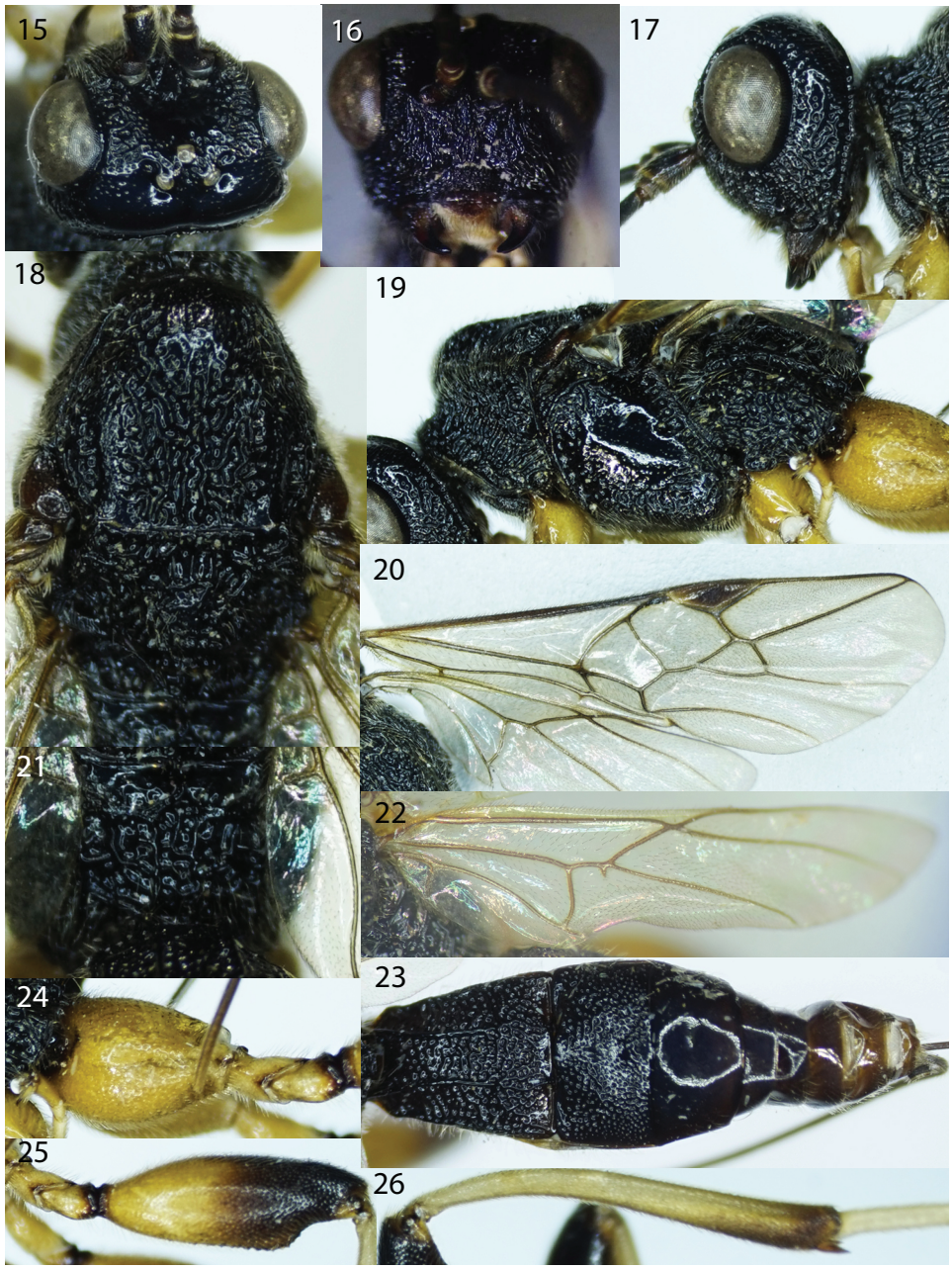
Type Material: Holotype, ♀, **"Hel.**076" (IEBR), NW Vietnam: Son La, coffee orchard, M[alaise] T[rap], 21°18′06″N 103°55′36″E, 663 m, 01.v.2017, K.D. Long.

Distribution: NW Vietnam: Son La.

Biology: Unknown.

Diagnosis: Antenna with 32 segments; antennal segments 11–14 cream white; maxillary palp short, 1.1× length of head; in dorsal view width of head 1.6× its median length; height of eye 2.4× temple; frontal protuberance acute, slightly higher than lateral frontal carina. Mesosoma 2.3× longer than high; notauli crenulated, fused posteriorly with transversely rugose area; propodeum with basal carina and areola; areola and propodeum medially areolate-rugulose, coriaceous basally and apically. Length of forewing 3.3× its maximum width; vein 3-SR slightly longer vein r; vein 2-M 2.6× 3-SR; hind wing vein 1-M 0.7× vein 1r-m; vein 2-SC+R transverse; hind wing with 3 hamuli. Foretarsus 1.4× as long as foretibia; hind femur only with ventral serrations; length of hind femur (without serrations) 3.7× its maximum width; outer side of hind coxa almost smooth, with scattered fine punctures; hind femur rugose-punctate. First metasomal tergite widened from base to apex, length 1.1× its apical width (fig. 34); first tergite with dorsal carinae in basal 0.9 of tergite; median length of second tergite 0.55× as long as its basal width; second tergite slightly longer than third tergite; first tergite nearly smooth basally and laterally, foveate-rugulose medioapically; second suture distinct; second tergite punctate laterally and foveate-punctate medially; third tergite smooth.

Notes: *W. coffeana,* sp. nov., runs out in couplet 3 of the key by Yan et al. (2017), because of the following characters: frontal protuberance near antennal sockets blunt dorsally; scapus densely setose ventrally; ventral margin of hind femur without tooth-shaped



FIGURES 15–26. *Wroughtonia aspera* (holotype, female, lateral). **15.** Head, dorsal. **16.** Head, frontal **17.** Head, lateral. **18.** Mesoscutum. **19.** Mesopleuron. **20.** Forewing. **21.** Propodeum. **22.** Hind wing. **23.** Metasoma. **24.** Hind coxa, lateral. **25.** Hind femur, lateral. **26.** Hind tibia, lateral.

FIGURE 27. *Wroughtonia coffeana,* sp. nov., habitus (holotype, female, lateral).

protuberance and only with serrations; first metasomal tergite pale yellow and smaller (body length 4.3 mm).

Description: Holotype, ♀, body length 4.3 mm, forewing length 3.6 mm, ovipositor sheath 3.5 mm (fig. 27).

Head: Antenna with 32 segments; third antennal segment 1.1× fourth (9:8); in frontal view height of eye 2.1× its transverse width (19:9); width of face 2.0× length of face and clypeus combined (26:13); malar space 0.85× as long as mandible width (6:7) and 0.3× height of eye (6:22) (fig. 29); maxillary palp short, 1.1× length of head (36:34); in dorsal view width of head 1.6× as long as its median length (43:27); height of eye 2.4× as long as temple (17:7); ocelli in high triangle, POL:OD:OOL = 6:4:9; distance between front and hind ocelli 0.3 as long as OOL (3:9) (fig. 28); in lateral view height of eye 0.9× as long as transverse width (23:15); width of eye 1.7× as long as temple (15:9) (fig. 30); frontal protuberance acute, slightly higher than lateral frontal carina (fig. 28); face rugose; frons, vertex, and temple smooth.

Mesosoma: Mesosoma 2.3× longer than high (80:35) (fig. 32); pronotal side largely carinate-rugose medially, largely rugose dorsally and ventrally; mesopleuron slightly depressed medially, largely smooth (fig. 32); metapleuron coarsely rugose; lobes of mesoscutum largely smooth; notauli crenulated, fused posteriorly with transversely rugose area; scutellar sulcus deep, curved, with one carina, 0.55× as long as scutellum (5:9) (fig. 31); scutellum coriaceous; propodeum with basal carina and areola; areola and propodeum medially areolate-rugulose, coriaceous basally and apically (fig. 33).

Wings. Forewing: length of forewing 3.3× its maximum width (107:32); pterostigma 3.7× longer than wide (26:7); vein 3-SR slightly longer than vein r, r:2-SR:3-SR:SR1:r-m = 5:9:6:42:7; vein 1-CU1 nearly quadrate (fig. 35); cu-a:2-CU1 = 7:14; , vein 2-M 2.6× 3-SR

(13:5) (fig. 35);; hind wing vein 1-M 0.7× vein 1r-m (6:9); vein 2-SC+R transverse (fig. 37); hind wing with 3 hamuli.

Legs: Foretarsus 1.4× as long as foretibia (19:14); hind femur with ventral serrations, without ventral tooth-shaped protuberance (fig. 36); length of hind femur (without serrations), tibia, and basitarsus 3.7 (52:14), 7.7 (69:9), and 5.5× (22:4) as long as their maximum width, respectively; hind basitarsus 0.3× as long as hind tibia (22:69), and 0.6× as long as second–fifth hind tarsal segments (22:36); fourth hind tarsal segment 0.45× as long as telotarsus (5:11); outer side of hind coxa almost smooth, with scattered fine punctures; hind femur rugose-punctate (fig. 36).

Metasoma: Metasoma 0.9× as long as head and mesosoma combined (48:55); first metasomal tergite widened from base to apex, 1.1× longer than its apical width (31:28) (fig. 34); first tergite with long dorsal carinae in basal 0.9 of tergite (27:31); median length of second tergite 0.55× its basal width (16:29), and slightly longer third tergite (16:15); first tergite nearly smooth basally and laterally, foveate-rugulose medioapically; second suture distinct; second tergite punctate laterally and foveate-punctate medially; third tergite smooth; ovipositor sheath about as long as forewing (35:36).

Color: Body dark brown, antenna brown, yellowish brown basally, with 11th–14th antennal segments cream white; palpi pale yellow; fore- and middle legs yellow; hind coxa, trochanter and trochantellus yellow; hind femur yellow basally and brown apically; hind tibia brown, but whitish yellow basally; hind tarsus pale yellow, but basitarsus basally and telotarsus brown; pterostigma and wing veins brownish yellow; wing membrane hyaline; first metasomal pale yellow; second–sixth tergites brown; ovipositor sheath brown.

Male: Unknown.

Etymology: Named after the plant genus *Coffea* Linnaeus, because the new species was collected in a Malaise trap set in a coffee orchard.

***Wroughtonia elongata*,** sp. nov.

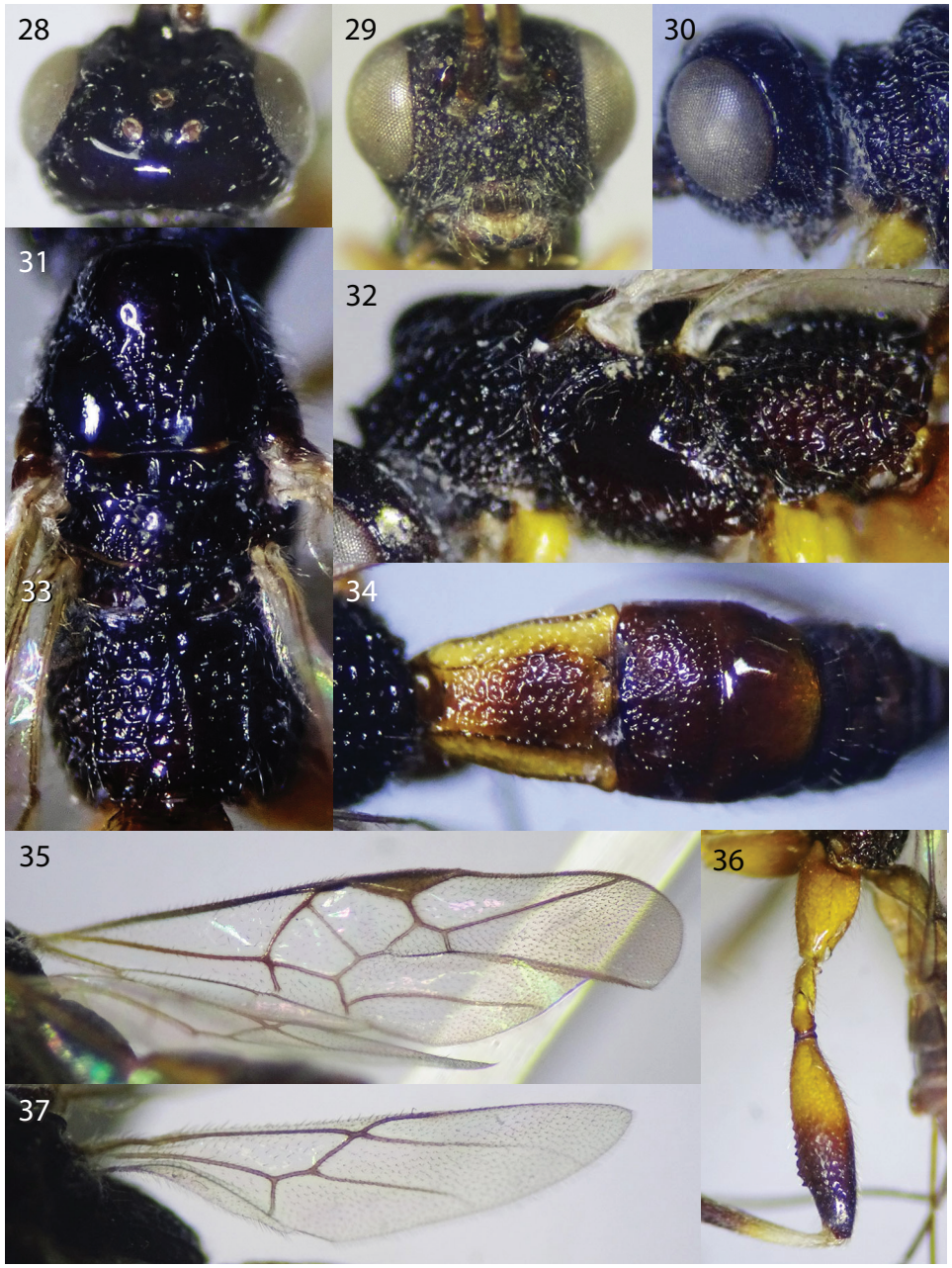
Figures 38–47

Type Material: Holotype, ♀, "Hel.016" (IEBR), NC Vietnam: Ha Tinh, Huong Son, 18°22′N 106°13′E, 900 m, April 20–28, 1998, Malaise [trap], AMNH, K. Long.

Distribution: NC Vietnam: Ha Tinh (Huong Son).

Biology: Unknown.

Diagnosis: Antenna with 46 segments; antennal segments 13–26 cream white; maxillary palp long, 1.9× longer than head; frontal protuberance behind antennal sockets blunt apically, much higher than lateral frontal carina; in dorsal view width of head 1.4× median length; height of eye 1.2× temple; in lateral view, height of eye 1.5× its transverse width; transverse width of eye 1.2× temple. Mesosoma 2.4× longer than high; notauli crenulated anteriorly, fused with longitudinal rugosities posteriorly; propodeum with basal carina and areola, rugulose-lacunose baso-laterally and sparsely rugose apically. Length of forewing 3.6× its maximum width; pterostigma 4.0× as long as wide; vein 3-SR 1.85× longer vein r;



FIGURES 28–37. *Wroughtonia coffeana* (holotype, female). **28.** Head, dorsal. **29.** Head, frontal. **30.** Head, lateral. **31.** Mesoscutum. **32.** Mesopleuron. **33.** Propodeum. **34.** Metasoma. **35.** Forewing. **36.** Hind coxa and femur, lateral. **37.** Hind wing.

vein 2-M 1.7× 3-SR; hind wing vein 1-M 1.2× vein 1r-m; vein 2-SC+R long, 0.4× vein 1r-m; hind wing with 4 hamuli. Foretarsus 1.6× foretibia; hind femur slender, with ventral serrations and stout tooth-shaped protuberance; length of hind femur (without tooth or serrations) 4.7× as long as its maximum width; outer side of hind coxa and femur evenly punctate. First metasomal tergite long, slightly narrowed apically, 2.3× as long as its apical width; dorsal carinae in basal 0.6 of tergite; second tergite long and almost parallel sided, median length of second tergite 1.5× its basal width, and 1.4× third tergite; second suture faint medially; first tergite nearly smooth laterally and apically, areolate-rugulose basally and medially; second and third tergites largely smooth.

Notes: *W. elongata*, sp. nov., is similar to *W. eurygenys* Yan and Chen, 2017, from China according to couplet 3b of the key by Yan et al. (2017), but differs as follows: (1) length of first metasomal tergite 2.3× as long as its apical width (1.4× in *W. eurygenys*); (2) vein r of forewing 0.5× 3-SR (0.8× in *W. eurygenys*) and (3) vein 1-M of hind wing 1.2× longer than vein 1r-m (1-M 0.7× 1r-m in *W. eurygenys*).

Description: Holotype, ♀, body length 13.5 mm, forewing length 10.6 mm, ovipositor 28.2 mm (fig. 38).

Head: Antenna with 46 segments; third antennal segment 1.05× as long as fourth segment (23:22); in frontal view height of eye 2.0× its transverse width (32:16); width of face 1.8× length of face and clypeus combined (41:23); malar space 0.9× as long as mandible width (16:18) and 0.3× height of eye (16:48) (fig. 40); maxillary palp long, 1.9× as long as head (65:34); distance between tentorial pits 0.9× distance between pit and eye (13:14); frontal protuberance behind antennal sockets blunt apically, much higher than lateral frontal carina; in dorsal view width of head 1.4× its median length (68:49); height of eye 1.2× as long as temple (24:20) (fig. 39); ocelli in high triangle, POL:OD:OOL = 11:7:21; distance between front and hind ocelli 0.3× OOL (7:21) (fig. 39); in lateral view height of eye 1.5× as long as its transverse width (33:22); transverse width of eye 1.2× as long as temple (22:19) (fig. 41); face coarsely rugose; frons and vertex smooth; temple smooth with scattered fine punctures.

Mesosoma: Mesosoma 2.4× longer than high (66:27); notauli crenulated anteriorly, fused with longitudinal rugosities posteriorly (fig. 42); median lobe of mesoscutum largely sparsely punctate, but rugose-punctate laterally; lateral lobes of mesoscutum sparsely punctate; scutellar sulcus rugose, with one median carina, 0.6× as long as scutellum (14:22); scutellum rugose-punctate; pronotal side coarsely carinate-rugose medially, punctate dorsally, largely rugose ventrally; mesopleuron flat and smooth medially, sparsely punctate dorsally and ventrally (fig. 43); metapleuron foveate-rugose medially, coarsely rugose ventroapically; propodeum with basal carina and areola, rugulose-lacunose baso-laterally, sparsely rugose apically (fig. 45).

Wings: Length of forewing 3.6× its maximum width (107:30); pterostigma 4.0× as long as wide (32:8); vein 3-SR 1.85× longer vein r; r:2-SR:3-SR:SR1:r-m = 7:12:13:56:10; vein 1-M distinctly curved (fig. 47); vein 1-CU1 thick, 1-CU1:cu-a:2-CU1 = 6:21:38; vein 2-M 1.7× 3-SR (38:22). Hind wing: vein 1-M 1.2× longer vein 1r-m (14:12); vein 2-SC+R long, 0.4× as long as vein 1r-m (5:12); hind wing with 4 hamuli.

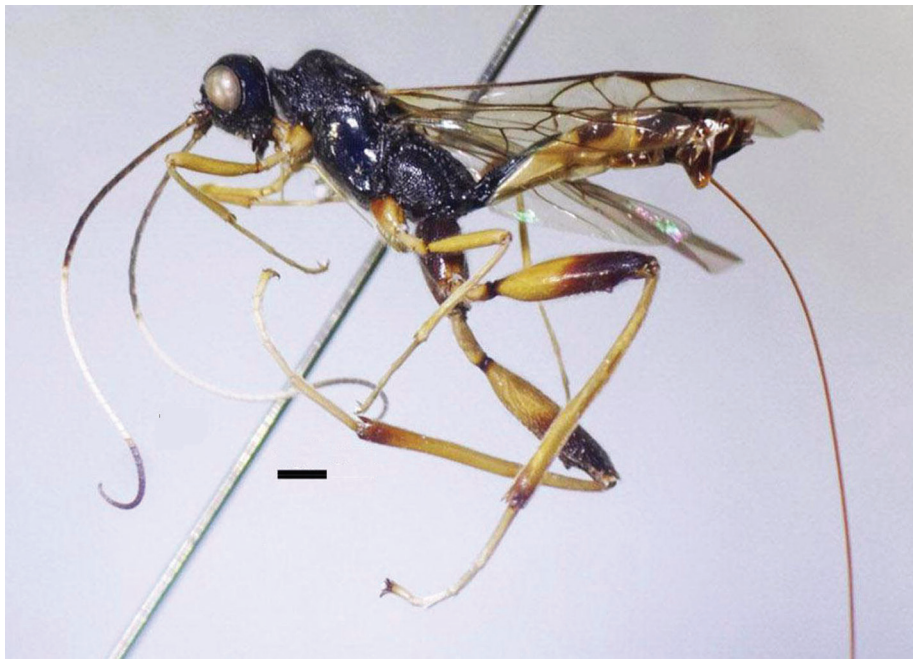


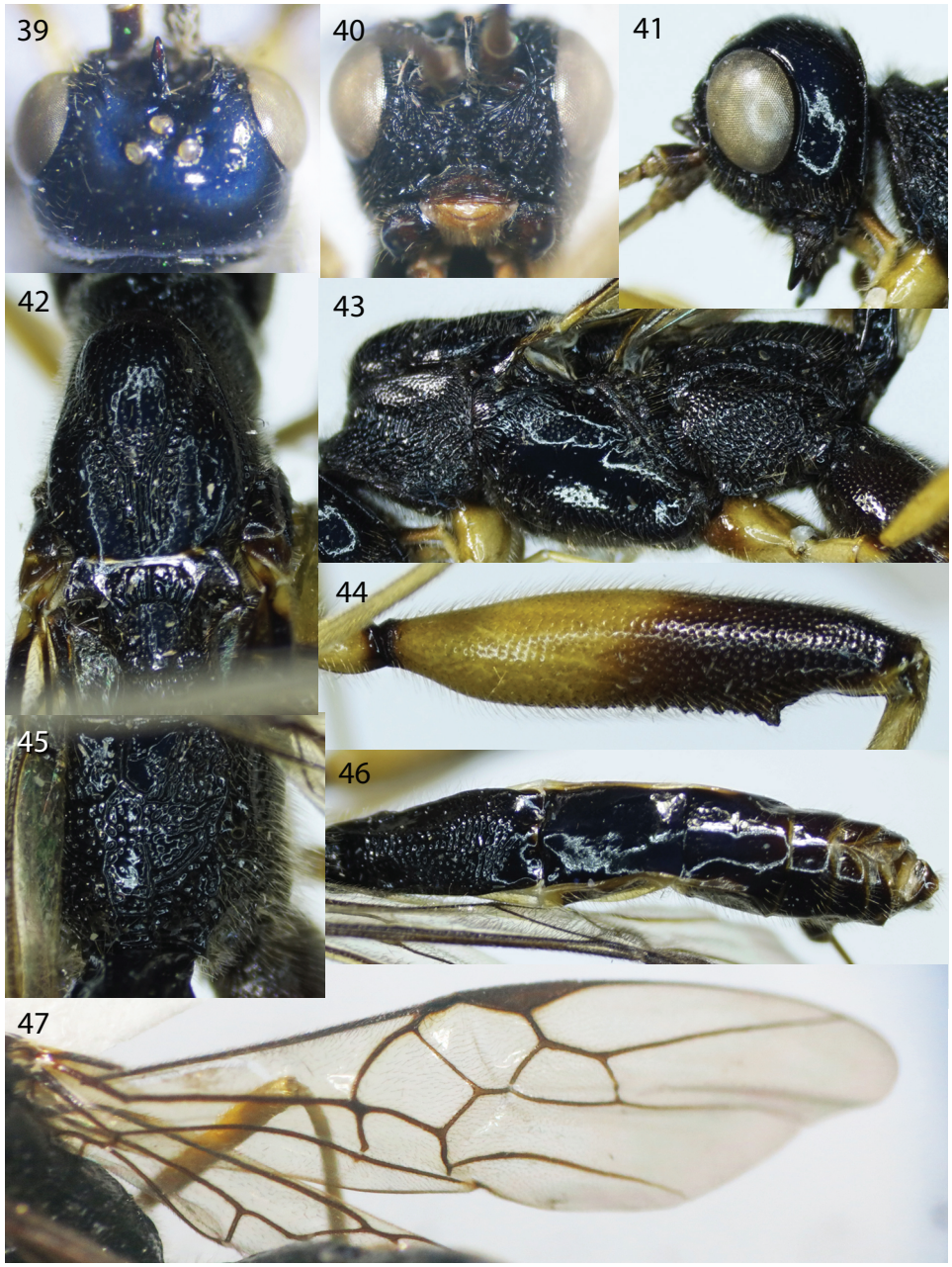
FIGURE 38. *Wroughtonia elongata*, sp. nov., habitus (holotype, female, lateral).

Legs: Foretarsus 1.6× longer than foretibia (66:42); hind femur slender, with ventral serrations and stout tooth-shaped protuberance (fig. 44); length of hind femur (without tooth or serrations), tibia, and basitarsus 4.7 (84:18), 12.7 (127:10), and 8.75× (35:4) as long as their maximum width, respectively; hind basitarsus 0.3× as long as hind tibia (35:127), and 0.6× as long as hind tarsal segments 2–5 (35:56); fourth hind tarsal segment 0.4× as long as telotarsus (6:14); hind coxa and femur evenly punctate (fig. 44).

Metasoma: Metasoma 0.95× as long as head and mesosoma combined (56:59); first metasomal tergite long, slightly narrowed apically, 2.3× longer than its apical width (80:35) (fig. 46); dorsal carinae in basal 0.7 of tergite (53:80); second tergite long and almost parallel sided, median length of second tergite 1.5× its basal width (52:35), and 1.4× third tergite (52:37) (fig. 46); first tergite largely smooth laterally and apically, areolate-rugulose basally and medially (fig. 46); second suture faint medially; second and third tergites largely smooth; tergites 4–6 protruding latero-posteriorly; ovipositor sheath missing, ovipositor very long, 2.7× as long as forewing (282:106), and 2.1× as long as body (282:135).

Color: Body black, scapus brown; antenna brown, but yellowish brown basally, with antennal segments 13–26 cream white; palpi pale yellow, but first segments brownish yellow; fore- and middle legs yellow; hind coxa brown; hind trochanters and trochantellus yellow; hind femur yellow basally and brown apically; hind tibia yellow, but infuscate apically; hind tarsus whitish yellow; pterostigma and wing veins brown; wing membrane hyaline.

Male: Unknown.



FIGURES 39–47. *Wroughtonia elongata* (holotype, female). **39.** Head, dorsal. **40.** Head, frontal. **41.** Head, lateral. **42.** Mesoscutum. **43.** Mesopleuron. **44.** Hind femur, lateral. **45.** Propodeum. **46.** Metasoma. **47.** Forewing.

Etymology: From *elongatus* (Latin for "prolonged"), because of the elongate second metasomal tergite and the long ovipositor.

***Wroughtonia hatinhensis*,** sp. nov.

Figures 48–58

Type Material: Holotype, ♀, "Hel.040" (IEBR), NC Vietnam: Ha Tinh, Huong Son, 18°22′N 106°13′E, 450 m, April 7–13, 1998, Malaise [trap], AMNH, K. Long. Paratypes: 4♀: "Hel.041" (AMNH), same place, but 900 m, May 5, 1998, Malaise [trap], AMNH, K. Long; "Hel.038" (AMNH), Ha Tinh, Huong Son, 18°22′N 106°13′E, 600 m, April 15–20, 1998, Malaise [trap], AMNH, K. Long; "Hel.066" (IEBR), same place, but 900 m, April 15–20, 1998, Malaise [trap], AMNH, K. Long; "Hel.027" (IEBR), NC Vietnam: Ha Tinh, Huong Son, 18°22′N 106°13′E, 900 m, April 20–28, 1998, Malaise [trap], AMNH, K. Long; 2♂: "Hel.070" (AMNH), same place, but May 18, 1998, Malaise [trap], AMNH, K. Long; "Hel.079" (IEBR), same place, but May 20, 1998, Malaise [trap], AMNH, K. Long; 2♀, "Hel.025" (VNMN), NE Vietnam: Tuyen Quang, Na Hang, Trung Phin, sweeping, 18.ix.2017, HTHCT; "Hel.001" (RMNH), NW Vietnam: Hoa Binh, Cuc Phuong NP, M[alaise] T[rap], 20°23′06″N 105°34′11″E, 315 m, 20–30.vi.2002, K.D. Long.

Distribution: NC Vietnam: Ha Tinh (Huong Son); NE Vietnam: Tuyen Quang (Na Hang NP); NW Vietnam: Hoa Binh (Cuc Phuong NP).

Biology: Unknown.

Diagnosis: Females have antenna with 34–37 segments and antennal segments 10–22 cream white; males have antenna with 38–39 segments and antennal segments 10–27 cream white; maxillary palp 1.9× as long as head; malar space 0.9× as long as mandible width and 0.35× height of eye; frontal protuberance bifurcate, broader apically, as high as lateral frontal carina; in dorsal view width of head 1.3× its median length; height of eye 2.0× as long as temple; in lateral view width of eye 1.6× as long as temple. Mesosoma 2.1× longer than high; notauli crenulate anteriorly, fused posteriorly with median carina in wide and coarsely rugose area; scutellum sparsely punctate; propodeum with distinct areola and coarsely rugose. Length of forewing 3.2× its maximum width; pterostigma 3.7× as long as wide; vein 3-SR shorter vein r; vein 2-M 3.1× 3-SR; hind wing: vein 1-M 0.5× vein 1r-m; vein 2-SC+R short, nearly quadrate, hind wing with 4 hamuli. Foretarsus 1.4× as long as foretibia; hind femur with ventral serrations and acute tooth-shaped protuberance; length of hind femur (without tooth or serrations) 3.7× its maximum width; hind coxa densely punctate laterally; hind femur largely rugose-punctate. First metasomal tergite as long as its apical width; dorsal carinae in basal 0.7 of tergite; first tergite smooth medially, sparsely rugose basally and laterally, transversely rugose apically; median length of second tergite 0.35× its basal width; median length of second tergite 0.8× third tergite; second tergite largely smooth, but with faint divergent striae baso-laterally; third tergite largely smooth.

Notes: *W. hatinhensis,* sp. nov., runs to couplet 16a of the key by Yan et al. (2017), but differs from all species after couplet 16 by the following characters: (1) in dorsal view length of eye 2× as long as temple; (2) second metasomal tergite with divergent striae baso-laterally (fig. 55); (3)

hind coxa pale yellow and hind femur brown (except pale yellow base of latter) and (4) antennal segments 10–22 cream white.

Description: Holotype, ♀, body length 8.7 mm, forewing length 8.1 mm, ovipositor sheath 5.3 mm (fig. 48).

Head: Antenna with 36 segments; third antennal segment 1.05× fourth segment (20:19); frontal protuberance bifurcate, broader apically, as high as lateral frontal carina; in frontal view height of eye 2.1× its transverse width (42:20); width of face 1.8× length of face and clypeus combined (49:27); malar space 0.9× as long as mandible width (15:17) and 0.35× height of eye (15:42) (fig. 50); maxillary palp 1.9× as long as head (68:35); in dorsal view width of head 1.3× as long as its median length (85:64); height of eye 2.0× as long as temple (36:18); ocelli in high triangle, POL:OD:OOL = 7:6:18; distance between front and hind ocelli 0.2× as long as OOL (4:18) (fig. 49); in lateral view length of eye 1.5× its transverse width (50:33); width of eye 1.2× temple (33:27) (fig. 51); face coarsely rugose, narrow area between antennal sockets and eye margin crenulate; clypeus rugose; malar space coarsely rugose; frons smooth; vertex and temple almost smooth, with scattered fine punctures.

Mesosoma: Mesosoma 2.1× longer than high (87:41); pronotal side coarsely carinate medially, rugose-punctate dorsally and largely rugose ventrally (fig. 53); mesopleuron narrowly depressed and smooth medially, sparsely punctate dorsally, punctate-reticulate ventrally; metapleuron foveate-reticulate; median lobes of mesoscutum sparsely punctate, but posteriorly near notauli largely rugose; lateral lobes of mesoscutum almost smooth; notauli crenulate anteriorly, fused posteriorly with median carina in wide coarsely rugose area (fig. 52); scutellar sulcus with 3 carinae, 0.5× scutellum (12:23); scutellum sparsely punctate; propodeum with distinct areola and coarsely rugose (fig. 56).

Wings. Forewing: length of forewing 3.2× its maximum width (81:25); pterostigma 3.7× as long as wide (56:15); vein r arising behind middle of pterostigma (fig. 57); vein 3-SR shorter vein r; r:2-SR:3-SR:SR1:r-m = 16:27:13:87:15; 1-CU1:cu-a:2-CU1 = 5:17:27; , vein 2-M 3.1× 3-SR (40:13). Hind wing: vein 1-M 0.5× vein 1r-m (12:24) (fig. 58); vein 2-SC+R short, nearly quadrate; hind wing with 4 hamuli.

Legs: Foretarsus 1.4× longer than foretibia (51:36); hind femur with ventral serrations and acute tooth-shaped protuberance (fig. 54); length of hind femur (without tooth or serrations), tibia, and basitarsus 3.7 (88:24), 9.8 (137:14) and 7.3× (44:6) as long as their maximum width, respectively; hind coxa densely punctate laterally; hind femur largely rugose-punctate (fig. 54); hind basitarsus 0.3× hind tibia (44:137), and 0.8× as long as second–fifth hind tarsal segments (44:58); fourth hind tarsal segment 0.6× as long as telotarsus (8:14).

Metasoma: Metasoma 0.7× as long as head and mesosoma combined (44:61); first tergite as long as its apical width (37:37) (fig. 55); dorsal carinae in basal 0.7 of tergite (22:33); first tergite smooth medially, sparsely rugose basally and laterally, transversely rugose apically; median length of second tergite 0.35× its basal width (14:40); and 0.8× third (14:17) (fig. 55); second tergite largely smooth, with faint divergent striae baso-laterally; second

FIGURE 48. *Wroughtonia hatinhensis*, sp. nov., habitus (holotype, female, lateral).

suture distinct; third tergite and remainder of metasoma largely smooth; ovipositor sheath 0.65× as long as forewing (53:81).

Color: Body dark brown, scapus light brown; antenna brown, light brown basally with 11th–22nd antennal segments cream white; palpi pale yellow; foreleg pale yellow, but tibia yellow; hind coxa, trochanter and trochantellus yellow; hind femur largely brown, but yellow basally; hind tibia yellow basally, brown apically; hind tarsus whitish yellow; pterostigma and wing veins brown; wing membrane hyaline; first and second metasomal tergites brown; tergites 3–6 light brown; ovipositor sheath brown.

Etymology: The new species named after the type locality (Ha Tinh province) in north-central Vietnam.

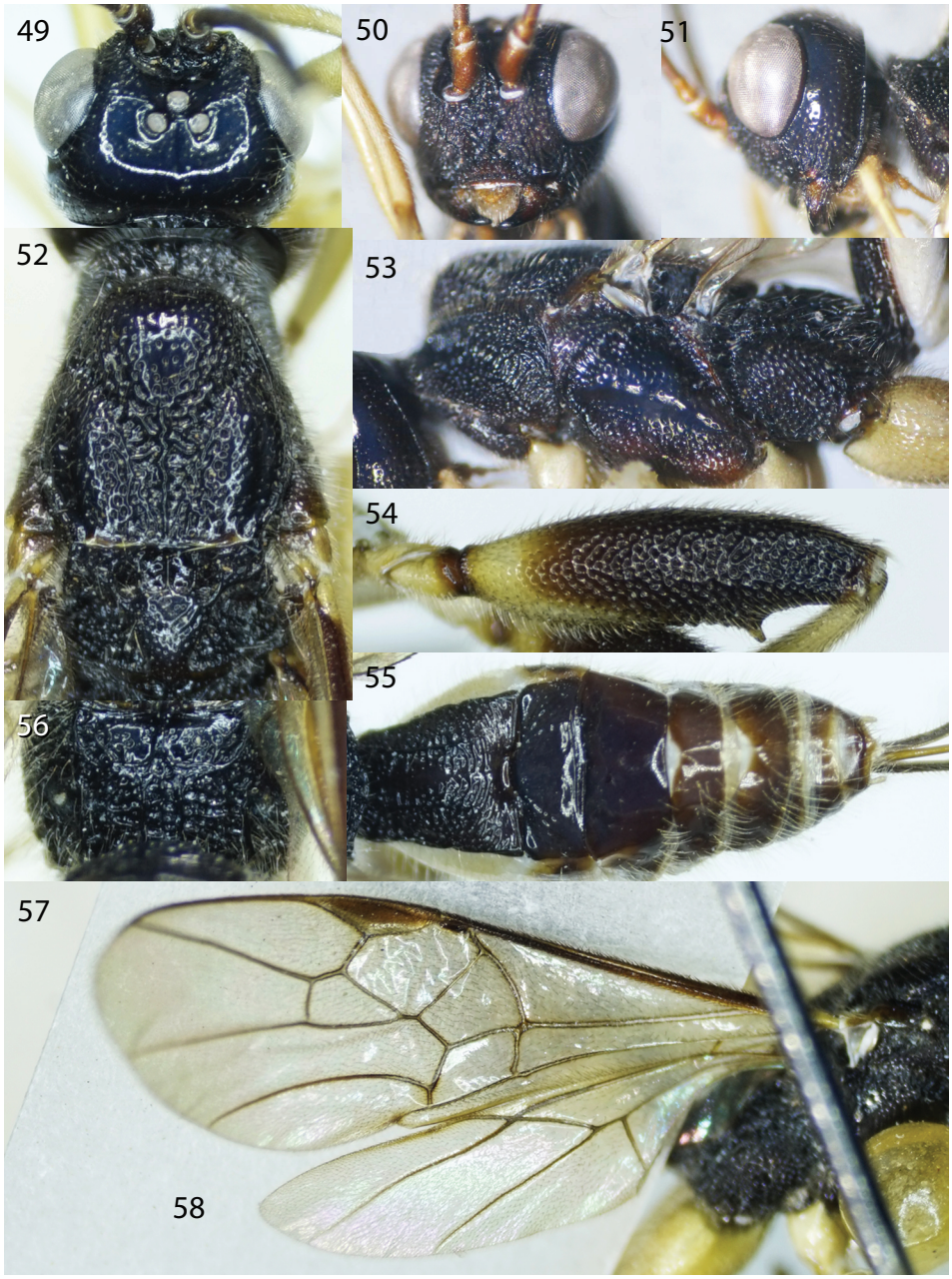
Variation: Paratype ♀, "Hel.027," body length 9.5 mm, forewing length 7.3 mm, ovipositor sheath 4.7 mm. Female antenna with 34–37 segments, 10th–22nd antennal segments cream white; male antenna with 38–39 segments; 10th–27th antennal segments cream white.

***Wroughtonia laevis*, sp. nov.**

Figures 59–70

Type Material: Holotype, ♀, "Hel.002" (IEBR), NW Vietnam: Phu Tho, Xuan Son NP, xom Lap, 9.v.2005, PT Nhi.

Distribution: NW Vietnam: Phu Tho (Xuan Son NP).



FIGURES 49–58. *Wroughtonia hatinhensis* (holotype, female). **49.** Head, dorsal. **50.** Head, frontal. **51.** Head, lateral. **52.** Mesoscutum. **53.** Mesopleuron. **54.** Hind femur, lateral. **55.** Metasoma. **56.** Propodeum. **57.** Forewing. **58.** Hind wing.

Biology: Unknown.

Diagnosis: Antenna with 42 segments; 14th–22nd antennal segments cream white; frontal protuberance lamelliform, blunt apically; maxillary palp long, 1.7× height of head; malar space 0.4× height of eye; in dorsal view width of head 1.35× its median length; height of eye 1.2× temple; in lateral view height of eye 1.75× its transverse width; transverse width of eye 0.95× temple. Mesosoma 2.3× longer than high; notauli narrow, crenulated anteriorly, rugose posteriorly, divided by median posterior carina; scutellar sulcus 0.4× scutellum; propodeum with basal carina and areola; propodeum rugose-punctate. Length of forewing 3.5× its maximum width; vein 3-SR 1.45× vein r; vein 2-M 1.9× 3-SR; hind wing vein 1-M 0.6× vein 1r-m; hind wing with 4 hamuli. Foretarsus 1.4× longer than foretibia; hind femur only with serrations; hind coxa sparsely punctate; hind femur largely rugose-punctate; length of hind femur (without serrations) 4.35× its maximum width. First metasomal tergite 2.0× longer than its apical width; dorsal carinae in basal 0.75 of tergite; first tergite smooth basally and apically; mediolateral and median area between dorsal carinae of first tergite sparsely foveolate-punctate; median length of second tergite 0.8× its basal width; second tergite 1.2× third tergite; second and third tergites shiny and smooth.

Notes: *W. laevis,* sp. nov., is similar to *W. eurygenys* Yan and Chen, 2017, from China according to the key by Yan et al. (2017), but differs as follows: (1) first metasomal tergite 2× as long as its apical width (1.4× in *W. eurygenys*); (2) scapus densely setose ventrally (scapus with few medium-sized setae in *W. eurygenys*); (3) ovipositor sheath 1.5× longer than forewing (as long as forewing in *W. eurygenys*) and (4) antennal segments 14–22 cream white (13th–18th in *W. eurygenys*).

Description: Holotype, ♀, body length 8.4 mm, forewing length 8.0 mm, ovipositor sheath 12.0 mm (fig. 59).

Head: Antenna with 42 segments; third antennal segment nearly as long as fourth (19:17); in frontal view height of eye 2.0× its transverse width (34:17); width of face 1.5× length of face and clypeus combined (40:27); clypeus narrow; malar space as long as mandible width (15:15) and 0.4× height of eye (15:34) (fig. 61); maxillary palp long, 1.7× height of head (106:61); in dorsal view width of head 1.35× its median length (72:53); height of eye 1.2× temple (26:22); ocelli in rather low triangle, POL:OD:OOL =7:5:16 (fig. 60); distance between front and hind ocelli 0.2× OOL (3:16) (fig. 60); frontal protuberance lamelliform, blunt apically (fig. 65); in lateral view height of eye 1.75× its transverse width (35:20); transverse width of eye 0.95× temple (20:21) (fig. 62); face coarsely rugose; frons rugose-coriaceous anteriorly and smooth posteriorly; vertex and temple smooth.

Mesosoma: Mesosoma 2.3× longer than high (82:36); pronotal side crenulated anteriorly, finely punctate dorsally, coarsely rugose ventrally and posteriorly; mesopleuron almost flat, smooth; metapleuron areolate-rugulose (fig. 64); lobes of mesoscutum almost smooth, with scattered fine punctures; notauli narrow, crenulated anteriorly, rugose posteriorly, divided by median posterior carina (fig. 63); scutellar sulcus narrow, with one carinae, 0.4× scutellum (8:22); scutellum almost smooth; propodeum with basal carina and long areola (fig. 67); propodeum rugose-punctate.

FIGURES 59. *Wroughtonia laevis*, sp. nov., habitus (holotype, female, lateral).

Wings: Forewing: length of forewing 3.5× its maximum width (98:28); pterostigma 4.0× as long as wide (48:12); vein 3-SR 1.45× vein r; r:2-SR:3-SR:SR1:r-m = 11:18:16:87:13; 1-CU1:cu-a:2-CU1 = 3:16:30; 1-M:r-m = 31:14 (fig. 69); vein 2-M 1.9× 3-SR (31:16). Hind wing: vein 1-M 0.6× vein 1r-m (14:24) (fig. 70); hind wing with 4 hamuli.

Legs: Foretarsus 1.4× longer than foretibia (58:42); hind femur only with serrations (fig. 67); hind coxa sparsely punctate; hind femur largely rugose-punctate (fig. 66); length of hind femur (without serrations), tibia, and basitarsus 4.35 (74:17), 10.6 (106:10), and 9.25× (37:4) as long as their maximum width, respectively; hind basitarsus 0.3× hind tibia (37:106), and 0.7× hind tarsal segments 2–5 (37:56); fourth hind tarsal segment 0.4× as long as telotarsus (6:14).

Metasoma: Metasoma 0.7× as long as head and mesosoma combined (35:49); first tergite 2.0× longer than its apical width (55:27) (fig. 68); dorsal carinae in basal 0.75 of tergite (41:55); first tergite smooth basally and apically; mediolateral and median area between dorsal carinae of first tergite sparsely foveolate-punctate (fig. 68); median length of second tergite 0.8× its basal width (24:31), and 1.2× third tergite (24:20); second and third tergites shiny and smooth; ovipositor sheath 1.5× as long as forewing (120:80).

Color: Body yellowish brown, scapus brown; antenna brownish yellow basally, with antennal segments 14–22 cream white; palpi yellow; fore- and middle legs yellow; hind leg yellow, with apical third of hind femur and tibia apically infuscate; pterostigma and wing veins brown; wing membrane yellow; metasoma reddish brown; ovipositor sheath dark brown.

Male: Unknown.

Etymology: From *laevis* (Latin for "smooth, polished"), because of the highly polished mesoscutum.

***Wroughtonia plana*, sp. nov.**

Figures 71–81

Type Material: Holotype, ♀, "Hel.003" (IEBR), NW Vietnam: Son La, Thuan Chau, Copia NR, 1200 m, 5.vi.2008, L.X. Hue.

Distribution: NW Vietnam: Son La (Thuan Chau).

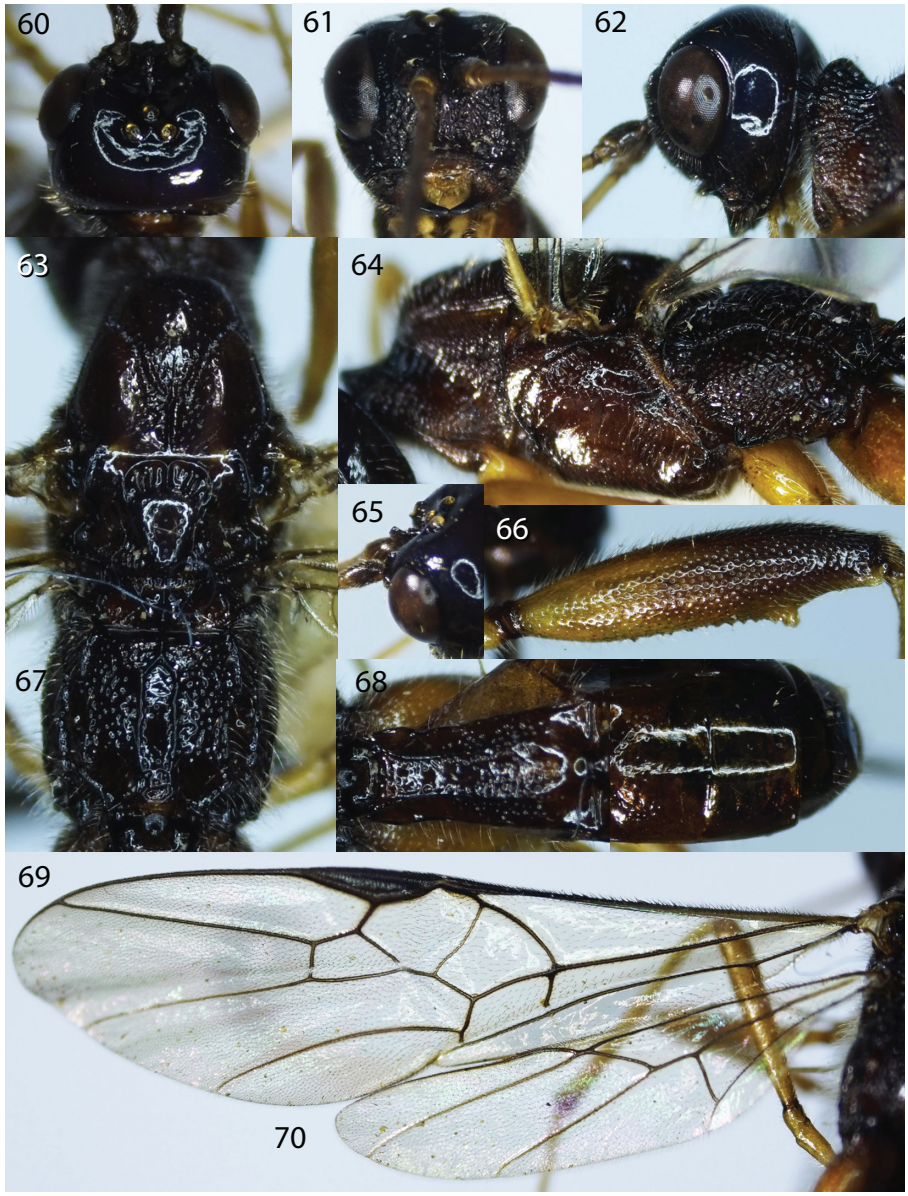
Biology: Unknown.

Diagnosis: Antenna with 31 segments; antennal segments 3–19 pale yellow; maxillary palp 1.75× as long as head; in frontal view width of face 1.8× length of face and clypeus combined; frontal protuberance robust, higher than lateral frontal carina; in dorsal view width of head 1.5× its median length; height of eye 1.9× temple; in lateral view height of eye 1.3× its transverse width; transverse width of eye 1.7× temple; face coarsely rugose; frons, vertex, and temple mat. Mesosoma 2.3× as long as high; notauli narrow, sparsely crenulate, fused posteriorly with median carina in rather flat posterior area of mesoscutum; scutellar sulcus 0.5× as long as scutellum; propodeum with basal carina and areola; propodeal areola mat; propodeum transversely rugose laterally. Length of forewing 3.3× its maximum width; vein 3-SR 1.45× as long as vein r; vein 2-M 2.1× 3-SR; hind wing vein 1-M 0.7× vein 1r-m; vein 2-SC+R transverse, 0.2× vein 1r-m. Foretarsus 1.65× as long as foretibia; hind femur with ventral serrations and acute tooth-shaped protuberance; hind femur (without tooth or serrations) 3.8× as long as its maximum width and rugose-punctate. First metasomal tergite 1.8× its apical width; dorsal carinae in basal 0.6 of tergite; first tergite largely smooth, except sparsely punctate-reticulate medioapical area; median length of second tergite 0.9× its apical width, and 1.25× third tergite; second and third tergites smooth.

Notes: *W. plana,* sp. nov., runs to *W. eurygenys* Yan and Chen, 2017, from China in the key by Yan et al. (2017), but differs as follows: (1) in dorsal view length of eye 1.9× as long as temple (1.2× in *W. eurygenys*); (2) first metasomal tergite 1.8× as long as its apical width (1.4× in *W. eurygenys*); and (3) hind coxa and femur yellow and only infuscate apically (reddish brown in *W. eurygenys*).

Description: Holotype, ♀, body length 7.8 mm, forewing length 7.3 mm, ovipositor sheath 7.7 mm (fig. 71).

Head: Antenna with 31 segments; third antennal segment 1.1× fourth segment (15:14); maxillary palp 1.75× as long as head (51:29); in frontal view height of eye 2.1× its transverse width (23:11); width of face 1.8× length of face and clypeus combined (29:16) (fig. 73); malar space 0.9× as long as mandible width (10:11) and 0.3× height of eye (10:34); frontal protuberance robust, higher than lateral frontal carina (fig. 74); in dorsal view width of head 1.5× as long as median length (67:44); height of eye 1.9× temple (27:14); POL:OD:OOL = 7:6:13; distance between front and hind ocelli 0.4× OOL (5:13) (fig.); in lateral view height of eye 1.3× as long as transverse width (34:26); transverse width of eye 1.7× as long as temple (26:15) (fig. 74); face coarsely rugose; frons, vertex, and temple mat.



FIGURES 60–70. *Wroughtonia laevis* (holotype, female). **60.** Head, dorsal. **61.** Head, frontal. **62.** Head, lateral **63.** Mesoscutum. **64.** Mesopleuron. **65.** Frontal protuberance, lateral. **66.** Hind femur, lateral. **67.** Propodeum. **68.** Metasoma. **69.** Forewing. **70.** Hind wing.

Mesosoma: Mesosoma 2.3× longer than high (95:42); pronotal side crenulate anteriorly, largely rugose ventrally and posteriorly, punctate dorsally; mesopleuron flat, mat (fig. 76); metapleuron areolate-rugulose anteriorly, coarsely rugose posteriorly; mesoscutum with sparse punctures; notauli narrow, sparsely crenulate, fused posteriorly with median carina in rather flat area of mesoscutum (fig. 75); scutellar sulcus with 3+ carinae, 0.5× as long as scutellum (8:17); scutel-

FIGURE 71. *Wroughtonia plana*, sp. nov., habitus (holotype, female, dorsal).

lum sparsely punctate; propodeum with basal carina and areola; propodeal areola smooth medially, rugose-punctate laterally (fig. 78); propodeum transversely rugose laterally (fig. 78).

Wings. Forewing: length of forewing 3.3× its maximum width (118:36); pterostigma 3.8× as long as wide (50:13); vein 3-SR 1.45× as long as vein r; r:2-SR:3-SR:SR1:r-m = 11:20:16:90; 1-CU1:cu-a:2-CU1 = 4:14 :27; second submarginal cell trapezium shaped, vein 2-M 2.1× 3-SR (33:16) (fig. 77); hind wing: vein 1-M 0.7× 1r-m (17:23); vein 2-SC+R transverse, 0.2× vein 1r-m (5:23); hind wing with 4 hamuli.

Legs: Foretarsus 1.65× longer than foretibia (43:26); hind femur with ventral serrations and acute tooth-shaped protuberance (fig. 79); length of hind femur (without tooth or serrations) 3.8× as long as its maximum width and rugose-punctate; hind coxa sparsely finely punctate laterally; hind tibia slightly curved basally (fig. 80); hind femur, tibia, and basitarsus 3.8 (79:21), 9.2 (110:12), and 6.3× (38:6) as long as their width, respectively; hind basitarsus 0.35× as long as hind tibia (38:110) and 0.7× as long as hind tarsal segments 2–5 (38:52); fourth hind tarsal segment 0.3× as long as telotarsus (5:17).

Metasoma: Metasoma 0.75× as long as head and mesosoma combined (53:70); first tergite 1.8× longer than its apical width (57:32); first tergite largely smooth, except sparsely punctate-reticulate medioapical area; dorsal carinae in basal 0.6 of tergite (32:57) (fig. 81); median length of second tergite 0.9× its apical width (30:33), and 1.25× third tergite

(30:24); second and third tergites smooth; ovipositor sheath 1.1× as long as forewing (77:73).

Color: Body black; scapus brown; antenna brown, with 13th–19th antennal segments pale yellow; palpi yellow; fore- and middle leg yellow; hind leg yellow, except hind femur and tibia apically brown; hind tarsus pale yellow; pterostigma and wing veins brown; wing membrane yellow; metasomal tergites and ovipositor sheath brown.

Male: Unknown.

Etymology: From *planus* (Latin for "even, flat"), because of the flat mesopleuron.

***Wroughtonia similis*,** sp. nov.

Figures 82–91

Type Material: Holotype, ♀, "Hel.009" (IEBR), C Vietnam: Thua Thien-Hue, A Luoi, A Roang, 600–900 m, 29.v.2006, H.V. Tru.

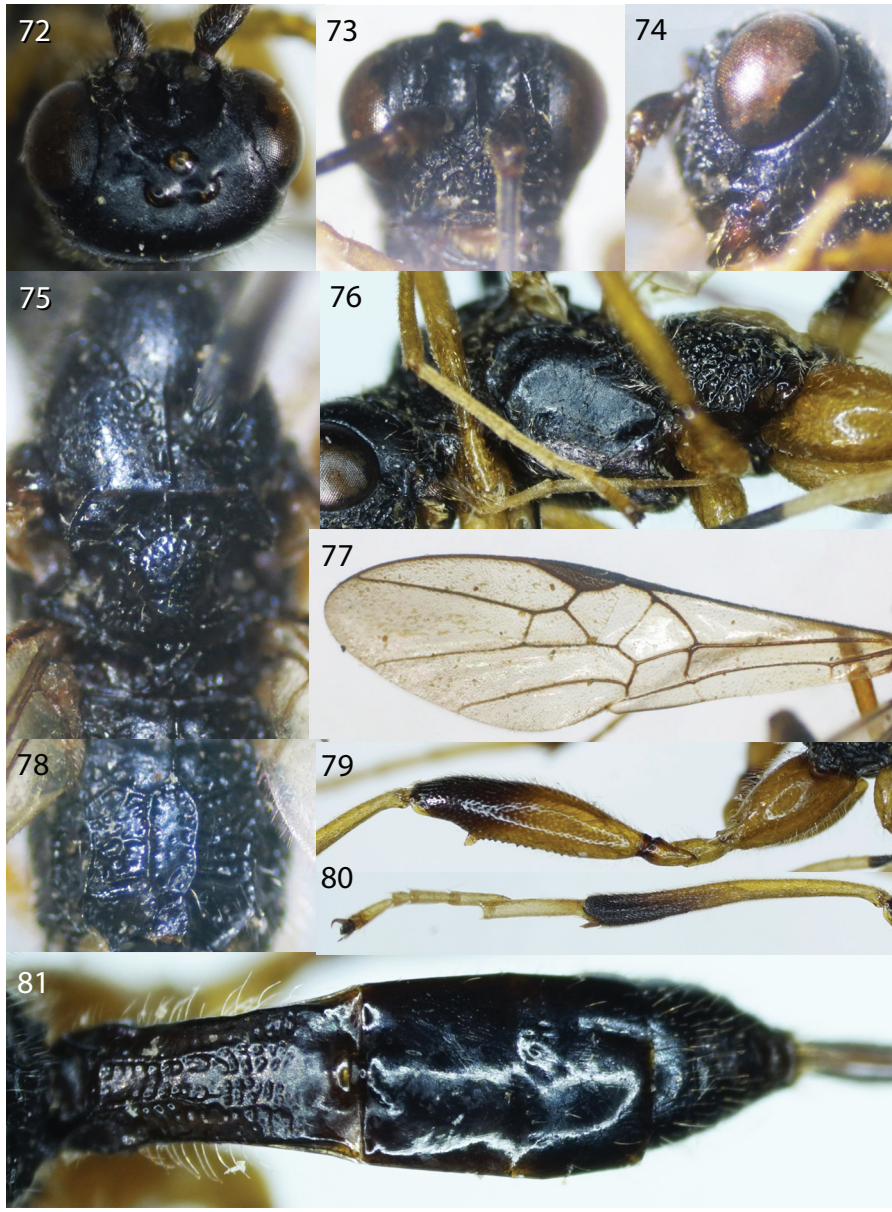
Distribution: C Vietnam: Thua Thien-Hue.

Biology: Unknown.

Diagnosis: Antenna with 41 segments; antennal segments 12–23 cream white; maxillary palp 1.7× as long as head; in frontal view width of face 1.8× length of face and clypeus combined; frontal protuberance with distinct ledge halfway and blunt dorsally; in dorsal view width of head 1.4× its median length; height of eye 1.5× as long as temple; in lateral view height of eye 1.4× as long as its transverse width; transverse width of eye 1.4× temple. Mesosoma 2.4× as long as high; notauli crenulated anteriorly, fused with coarsely rugose area posteriorly; scutellar sulcus 0.5× as long as scutellum; propodeum with basal median carinae and narrow areola; propodeum almost areolate-rugulose. Length of forewing 3.5× its maximum width; vein 3-SR 2.0× vein r; vein 2-M 2.0× as long as vein 3-SR; hind wing vein 1-M 0.5× vein 1r-m; vein 2-SC+R long, 0.3× as long as vein 1r-m; hind wing with 5 hamuli. Foretarsus 1.5× longer than foretibia; hind femur with ventral serrations and stout protuberance; length of hind femur (without protuberance or serrations) 4.4× its maximum width; hind coxa sparsely punctate; hind femur largely rugose-punctate. First metasomal tergite 1.8× as long as its apical width; dorsal carinae in basal 0.6 of tergite; first tergite smooth basally and apically, punctate laterally, punctate-reticulate medially between dorsal carinae; median length of second tergite 0.7× its basal width, and as long as third tergite; second suture distinct; second tergite smooth with sparse punctures laterobasally; third tergite smooth.

Notes: *W. similis,* sp. nov., runs to *W. eurygenys* Yan and Chen, 2017, from China in couplet 3b of the key by Yan et al. (2017), but differs as follows: (1) first metasomal tergite 1.8× as long as apical width (1.4× in *W. eurygenys*); (2) scapus densely setose ventrally (scapus with few medium-sized setae in *W. eurygenys*); (3) vein r of forewing 0.5× vein 3-SR (0.8× in *W. eurygenys*); (4) vein 1-M of hind wing 0.5× vein 1r-m (0.7× in *W. eurygenys*) and (5) antennal segments 12–23 cream white (13–18 in *W. eurygenys*).

Description: Holotype, ♀, body length 11.0 mm, forewing length 9.5 mm, ovipositor sheath 13.0 mm (fig. 82).



FIGURES 72–81. *Wroughtonia plana* (holotype, female). **72.** Head, dorsal. **73.** Head, frontal. **74.** Head, lateral. **75.** Mesoscutum. **76.** Mesopleuron. **77.** Forewing. **78.** Propodeum. **79.** Hind femur and coxa, lateral. **80.** Hind tibia, lateral. **81.** Metasoma.

Head: Antenna with 41 segments; third antennal segment as long as fourth segment (18:18); maxillary palp 1.7× as long as head (54:32); in frontal view height of eye 1.9× its transverse width (40:21); width of face 1.8× length of face and clypeus combined (48:26) (fig. 84); malar space 0.8× as long as mandible width (14:17) and 0.3× height of eye (14:41); frontal protuberance with distinct ledge halfway and blunt dorsally, higher than lateral frontal carina; in dorsal view width of

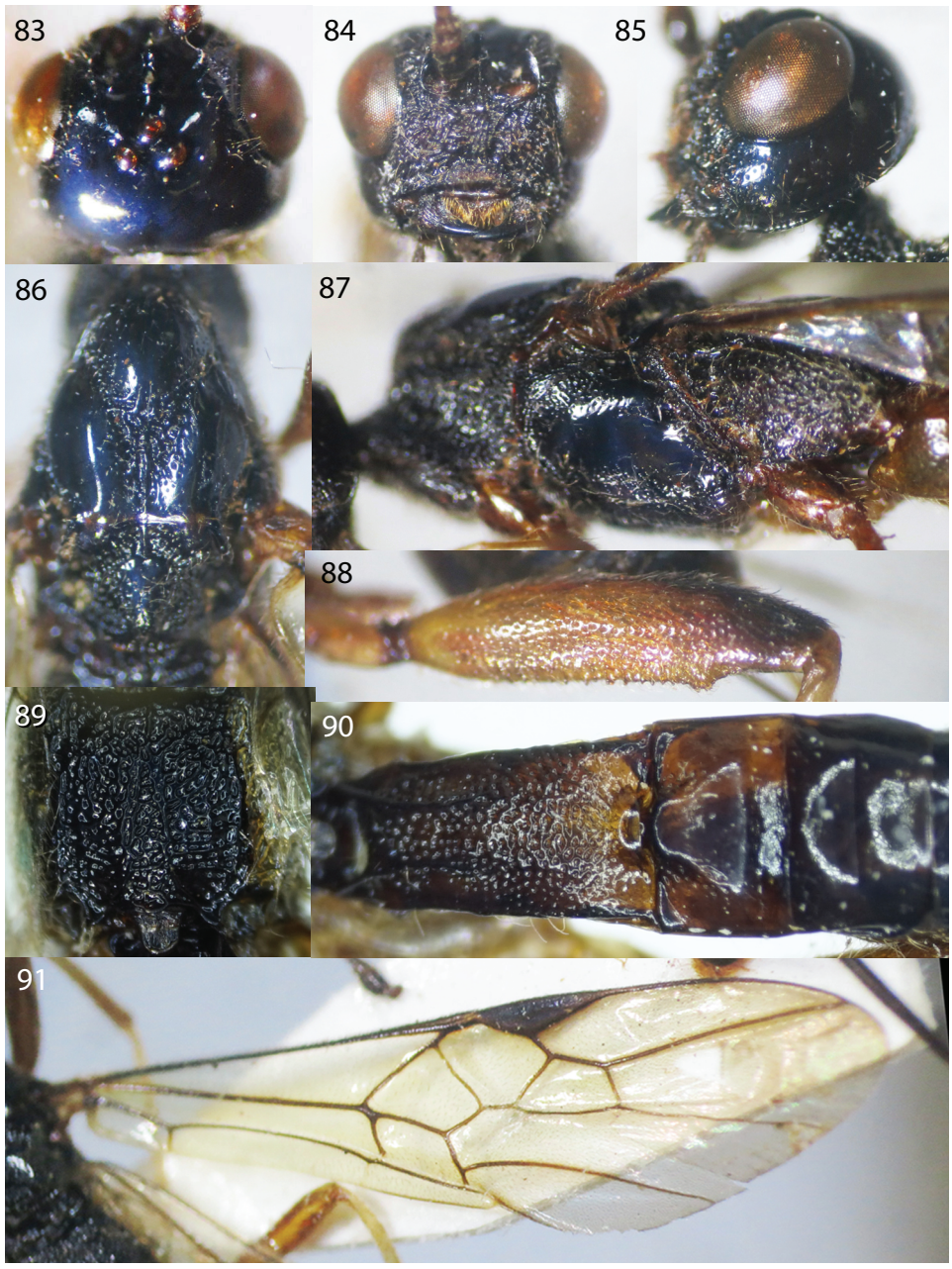
FIGURE 82. *Wroughtonia similis*, sp. nov., habitus (holotype, female, lateral).

head 1.4× its median length (83:61); height of eye 1.5× as long as temple (32:21); ocelli in rather low triangle, POL:OD:OOL = 9:7:19 (fig. 83); distance between front and hind ocelli 0.3× as long as OOL (6:19) (fig. 83); in lateral view height of eye 1.4× its transverse width (38:27); transverse width of eye 1.35× as long as temple (27:20) (fig. 85); face coarsely rugose; frons, vertex, and temple smooth.

Mesosoma: Mesosoma 2.4× longer than high (97:40); pronotal side crenulate anteriorly, punctate dorsally, coarsely rugose ventrally and posteriorly; mesopleuron largely smooth medially; sparsely punctate dorsally and ventrally (fig. 87); metapleuron coarsely rugose; lobes of mesoscutum smooth; notauli crenulated anteriorly, fused posteriorly with coarsely rugose area (fig. 86); scutellar sulcus rugose, with 4 carinae, 0.5× as long as scutellum (12:23); scutellum sparsely punctate; propodeum with basal median carinae and without areola (fig. 89); propodeum largely areolate-rugulose.

Wings: Forewing: length of forewing 3.5× its maximum width (139:40); pterostigma 3.6× as long as wide (61:17); vein 3-SR 2.0× as long as vein r; r:2-SR:3-SR:SR1:r-m = 9:20:18:87; 1-CU1:cu-a:2-CU1 = 4:13:24; vein 2-M 2.0× as long as vein 3-SR (53:27) (fig. 91); hind wing: vein 1-M 0.5× vein 1r-m (15:29); vein 2-SC+R long, 0.3× vein 1r-m (8:29); hind wing with 5 hamuli.

Legs: Foretarsus 1.5× longer than foretibia (53:36); hind femur with ventral serrations and stout protuberance (fig. 88); length of hind femur (without protuberance or serrations), tibia, and basitarsus 4.4 (88:20), 11.5 (126:11), and 8.6× (43:5) as long as their maximum width, respectively; hind coxa sparsely punctate; hind femur largely rugose-punctate (fig. 88); hind basitarsus 0.3× hind tibia (43:126), and 0.7× as long as hind tarsal segments 2–5 (43:58); fourth hind tarsal segment 0.4× telotarsus (6:14).



FIGURES 83–91. *Wroughtonia similis* holotype, female. **83.** Head, dorsal. **84.** Head, frontal. **85.** Head, lateral. **86.** Mesoscutum. **87.** Mesopleuron. **88.** Hind femur, lateral. **89.** Propodeum. **90.** Metasomal tergites 1+2+3. **91.** Forewing.

Metasoma: Metasoma 0.8× as long as head and mesosoma combined (55:67); first tergite 1.8× as long as its apical width (64:35) (fig. 90); dorsal carinae in basal 0.6 of tergite (36:61); first tergite smooth basally and apically, punctate laterally, punctate-reticulate medially between dorsal carinae (fig. 90); median length of second tergite 0.7× its basal width (26:39) and as long as third tergite (26:26); second suture distinct; second tergite smooth with sparse punctation laterobasally; third tergite smooth; ovipositor sheath 1.4× as long as forewing (130:95).

Color: Body dark brown, scapus brown; antenna brown, with antennal segments 12–23 cream white; palpi yellow; fore- and middle leg yellow, except tarsus pale yellow; hind leg yellow, but hind femur and tibia apically infuscate; hind tarsus whitish yellow; pterostigma and wing veins brown; wing membrane hyaline; first metasomal tergite yellow; tergites 2–6 brown; ovipositor sheath brown.

Male: Unknown.

Etymology: From *similis* (Latin for "like, resembling"), because this new species similar to *Wroughtonia eurygenys* Yan and Chen, 2017, from China.

***Wroughtonia simulata*, sp. nov.**

Figures 92–103

Type Material: Holotype, ♀, "Hel.064" (IEBR), NC Vietnam: Ha Tinh, Huong Son, 18°22′N 106°13′E, 450 m, May 5, 1998, Malaise trap, AMNH, K. Long.

Distribution: NC Vietnam: Ha Tinh (Huong Son).

Biology: Unknown.

Diagnosis: Antenna with 36 segments; antennal segments 11–18 cream white; maxillary palp 1.45× as long as head; in frontal view width of face 1.7× length of face and clypeus combined; frontal protuberance lamelliform and without ledge halfway; in dorsal view width of head 1.9× as long as median length; height of eye 1.7× temple; in lateral view height of eye 1.3× its transverse width; transverse width of eye 1.6× temple. Mesosoma 1.9× longer than high; notauli wide and shallow, coarsely rugose; scutellar sulcus wide, 0.6× scutellum; scutellum rugose-punctate; propodeum with basal carina, areolate-rugose. Length of forewing 3.0× its maximum width; vein 3-SR 0.9× as long as vein r; vein 2-M 2.0× as long as vein 3-SR; hind wing vein 1-M 0.4× vein 1r-m; hind wing with 3 hamuli. Foretarsus 1.65× foretibia; hind femur only with serrations; length of hind femur (without serrations) 3.3× as long as its maximum width; outer side of hind coxa finely punctate; hind femur punctate laterally. First metasomal tergite 1.3× as long as its apical width; dorsal carinae in basal 0.8 of tergite; first tergite almost smooth basally, foveolate-rugulose medially and apically; median length of second tergite 0.6× its basal width, and 1.2× third tergite; second tergite rugose medially, rugose-punctate laterally; third tergite smooth.

Notes: *W. simulata,* sp. nov., runs to *W. zhejiangensis* Yan and van Achterberg, 2017, from China in couplet 10a of the key by Yan et al. (2017), but differs as follows: (1) frontal protuberance narrowed from base to apex, blunt apically (with posterior protruding narrow

lamella in *W. zhejiangensis*); (2) foretarsus 1.65× as long as foretibia (1.1× in *W. zhejiangensis*); (3) first metasomal tergite 1.3× as long as apical width (1.1× in *W. zhejiangensis*) and (4) antenna with 8 (11th–18th) cream white segments (6 [13th–18th] in *W. zhejiangensis*).

The new species is also similar to *W. albobasalis* van Achterberg and Chen, 2017, from China, but differs as follows: (1) frontal protuberance acute (triangular in *W. albobasalis*); (2) hind femur more slender, 3.5× longer than its maximum width (2.8× in *W. albobasalis*); (3) vein 1-M of hind wing 0.7× vein 1r-m (0.4× in *W. albobasalis*); and (4) antenna dark brown with segments 11–20 cream white (3rd–11th in *W. albobasalis*).

Description: Holotype, ♀, body length 7.1 mm, forewing length 5.3 mm, ovipositor sheath 5.6 mm (fig. 92).

Head: Antenna with 36 segments; third antennal segment slightly longer than fourth segment (15:12); in frontal view height of eye 1.9× its transverse width (28:15); width of face 1.7× length of face and clypeus combined (38:22); clypeus wide; malar space 1.3× as long as mandible width (13:10) and 0.5× height of eye (13:28) (fig. 94); maxillary palp 1.45× as long as head (67:46); frontal protuberance lamelliform, without ledge halfway; in dorsal view width of head 1.9× as long as its median length (65:34); height of eye 1.7× as long as temple (22:13); ocelli in rather low triangle, POL:OD:OOL = 8:4:12 (fig. 93); distance between front and hind ocelli 0.3× as long as OOL (4:12) (fig. 93); in lateral view height of eye 1.3× its transverse width (28:22); transverse width of eye 1.6× temple (22:14) (fig. 95); face longitudinally rugose; frons rugose; vertex and temple dorsally smooth; temple ventrally rugose.

Mesosoma: Mesosoma 1.9× longer than high (90:47); pronotal side largely crenulate medially, coarsely rugose dorsally and ventrally; mesopleuron shiny, smooth medially; rugose-punctate ventrally; metapleuron areolate-rugulose (fig. 97); median lobes of mesoscutum coriaceous anteriorly and rugose posteriorly; notauli wide and shallow, coarsely rugose (fig. 96); lateral lobes of mesoscutum rugose-punctate; scutellar sulcus wide, with three carinae, 0.6× as long as scutellum (9:16); scutellum rugose-punctate; propodeum with basal carina and areolate-rugose (fig. 98).

Wings: Forewing: length of forewing 3.0× its maximum width (125:41); pterostigma 3.1× as long as wide (40:13); vein 3-SR 0.9× as long as vein r; r:2-SR:3-SR:SR1:r-m = 10:14:9:68; 1-CU1:cu-a:2-CU1 = 3:12:21; 1-M 2.2× vein m-cu (26:12); vein 2-M almost 2.0× as long as vein 3-SR (22:9) (fig. 102); hind wing vein 1-M 0.4× vein 1r-m (11:27); hind wing with 3 hamuli.

Legs: Foretarsus 1.65× longer than foretibia (43:36); hind femur only with serrations (fig. 101); length of hind femur (without serrations), tibia, and basitarsus 3.3 (60:18), 10.2 (82:8), and 6.25× (25:4) as long as their maximum width, respectively; hind basitarsus 0.3× as long as hind tibia (25:82) (fig. 103), and 0.75× as long as hind tarsal segments 2–5 (25:33); fourth hind tarsal segment 0.4× as long as telotarsus (4:11); hind coxa finely punctate laterally (fig. 99); hind femur punctate laterally (fig. 101).

Metasoma: Metasoma subequal to head and mesosoma combined (35:36); first tergite 1.3× longer than its apical width (58:46) (fig. 100); dorsal carinae in basal 0.8 of tergite (48:58); first tergite largely smooth basally, foveolate-rugulose medially and apically (fig.

100); median length of second tergite 0.6× its basal width (28:48), and 1.2× third tergite (28:23); second tergite rugose medially, rugose-punctate laterally; third tergite smooth; ovipositor sheath 1.1× as long as forewing (56:53).

Color: Head and mesosoma dark brown to black; scapus brown; antenna brown, but with 11th–18th antennal segments cream white; palpi yellow; fore- and middle legs light yellow; hind leg yellow, hind femur yellow, but apical two thirds of hind femur and extreme apex of hind tibia infuscate; pterostigma and wing veins brown; wing membrane yellow; metasoma brown; ovipositor sheath dark brown.

Male: Unknown.

Etymology: From *simulatus* (Latin for "imitated, copied because this species is similar to two species (*Wroughtonia albobasalis* van Achterberg and Chen and *W. zhejiangensis* Yan and van Achterberg) from China.

***Wroughtonia sonla*, sp. nov.**

Figures 104–115

Type Material: Holotype, ♀, "Hel.057" (IEBR), NW Vietnam: Son La, coffee orchard, MT, 21°18′06″N 103°55′36″E, 663 m, but 10.v.2017, K.D. Long. Paratypes: 4♀, "Hel.023" (IEBR), NW Vietnam: Son La, MT, 21°18′03″N 103°55′38″E, 671 m, 25.iv-5.v.2016, K.D. Long; "Hel.054" (IEBR), "Hel.055" (AMNH), "Hel.056" (RMNH), NW Vietnam: Son La, coffee orchard, MT, 21°18′06″N 103°55′36″E, 663 m, 01.v.2017, K.D. Long.

Distribution: NW Vietnam: Son La.

Biology: Unknown.

Diagnosis: Antenna with 34–36 segments; antennal segments 10–18 cream white; maxillary palp 1.3× as long as head (74:52); in frontal view height of eye 2× its transverse width; width of face 2.0× length of face and clypeus combined; malar space 0.5× height of eye; frontal protuberance lamelliform, not pointed apically; in dorsal view width of head 1.5× longer than its median length; height of eye 1.7× temple; in lateral view height of eye 1.4× its transverse width; transverse width of eye 1.4× temple; face largely rugose; frons, vertex, and temple smooth. Mesosoma 2.05× longer than high; notauli narrow and deep, crenulated anteriorly, punctate-reticulate posteriorly; scutellar sulcus wide and shallow, 0.6× scutellum; scutellum largely smooth; propodeum with large foveolate areola and transversely rugose laterally. Length of forewing 3.4× its maximum width; vein 3-SR 1.1× as long as vein r; vein 1-M 1.9× vein m-cu; vein 2-M 2.2× 3-SR; hind wing vein 1-M 0.75× vein 1r-m; hind wing with 3 hamuli. Foretarsus 1.5× as long as foretibia; hind femur only with ventral serrations; length of hind femur (without serrations) 3.7× its maximum width; hind coxa sparsely punctate; hind femur largely rugose-punctate. First metasomal tergite about as long as its apical width; dorsal carinae in basal 0.4 of tergite; first tergite foveolate-reticulate; median length of second tergite 0.5× its basal width, and as long as third tergite; second tergite punctate-reticulate; third tergite smooth.

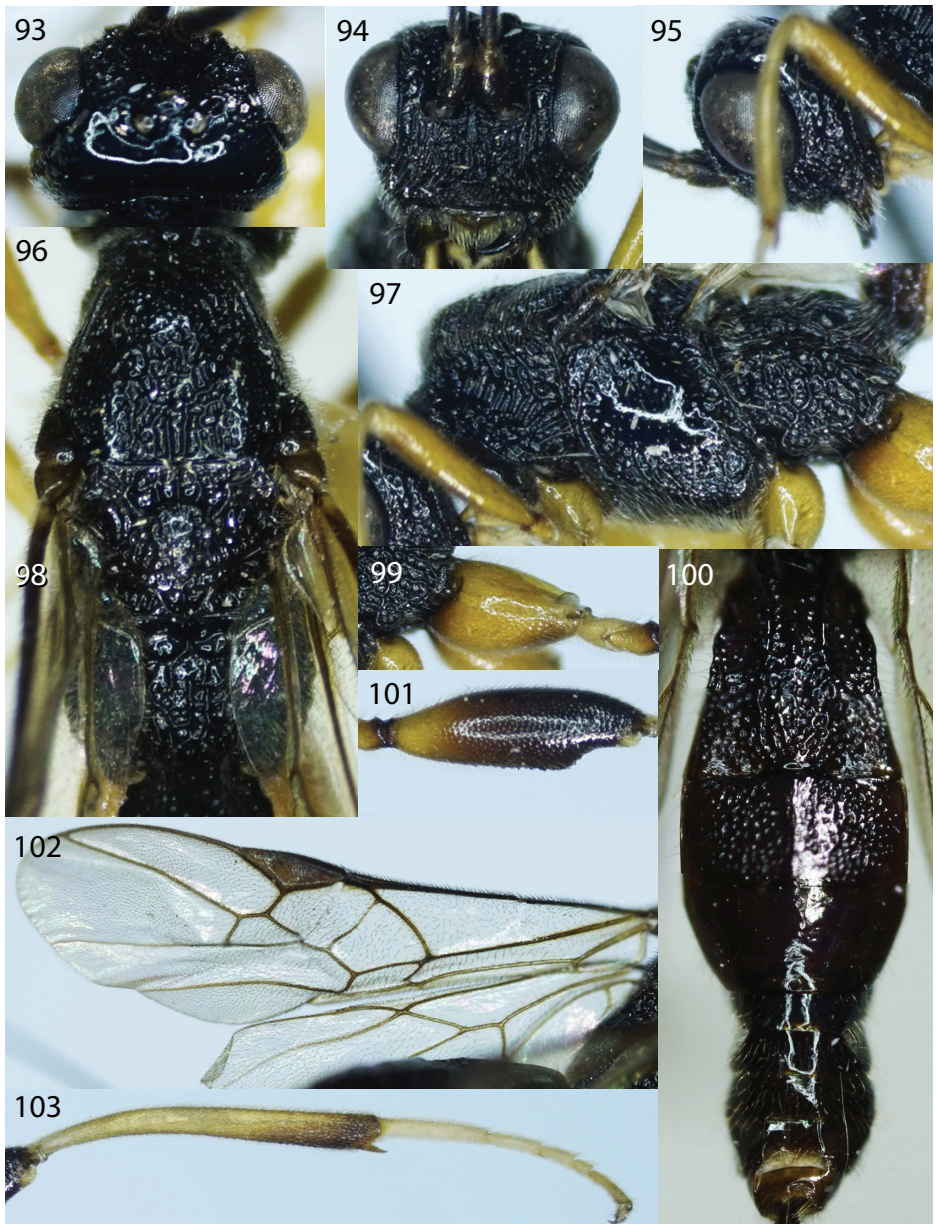
FIGURE 92. *Wroughtonia simulata*, sp. nov., habitus (holotype, female, lateral).

Notes: *W. sonla,* sp. nov., runs to *W. brevicarinata* (Yan and Chen, 2014) (couplet 14b) in the key by Yan et al. (2017), but differs as follows: (1) hind femur slenderer, length of hind femur 3.7× as long as its maximum width (without serrations) (3.3× in *W. brevicarinata*); (2) vein r of forewing distinctly shorter vein 3-SR (vein r 1.3× 3-SR× in *W. brevicarinata*); and (3) antenna dark brown with segments 11–18 cream white (9–21 in *W. brevicarinata*).

Description: Holotype, ♀, body length 7.5 mm, forewing length 6.1 mm, ovipositor sheath 5.5 mm (fig. 104).

Head: Antenna with 35 segments; third antennal segment as long as fourth segment (16:12); maxillary palp 1.3× as long as head (74:52); in frontal view height of eye 2.0× its transverse width (30:15); width of face 2.0× length of face and clypeus combined (44:22) (fig. 106); malar space 1.3× as long as mandible width (14:11) and 0.5× height of eye (14:30); clypeus wide; frontal protuberance lamelliform, not pointed apically; in dorsal view width of head 1.5× its median length (70:46); height of eye 1.7× as long as temple (25:15); ocelli in rather low triangle, POL:OD:OOL = 10:5:15 (fig. 105); distance between front and hind ocelli 0.3× as long as OOL (4:15) (fig. 105); in lateral view height of eye 1.4× its transverse width (31:22); transverse width of eye 1.4× as long as temple (22:16) (fig. 107); face largely rugose; frons, vertex, and temple smooth.

Mesosoma: Mesosoma 2.05× longer than high (82:40) (fig. 109); pronotal side crenulated medially, rugose dorsally and ventrally; mesopleuron largely smooth medially; subalar space rugose-punctate; metapleuron areolate-rugulose; lobes of mesoscutum shiny, smooth; notauli



FIGURES 93–103. *Wroughtonia simulata* holotype, female. **93.** Head, dorsal. **94.** Head, frontal. **95.** Head, lateral. **96.** Mesoscutum. **97.** Mesopleuron. **98.** Propodeum. **99.** Hind coxa, lateral. **100.** Metasoma **101.** Hind femur, lateral. **102.** Forewing. **103.** Hind tibia, lateral.

FIG. 104. *Wroughtonia sonla*, sp. nov., habitus (holotype, female, lateral).

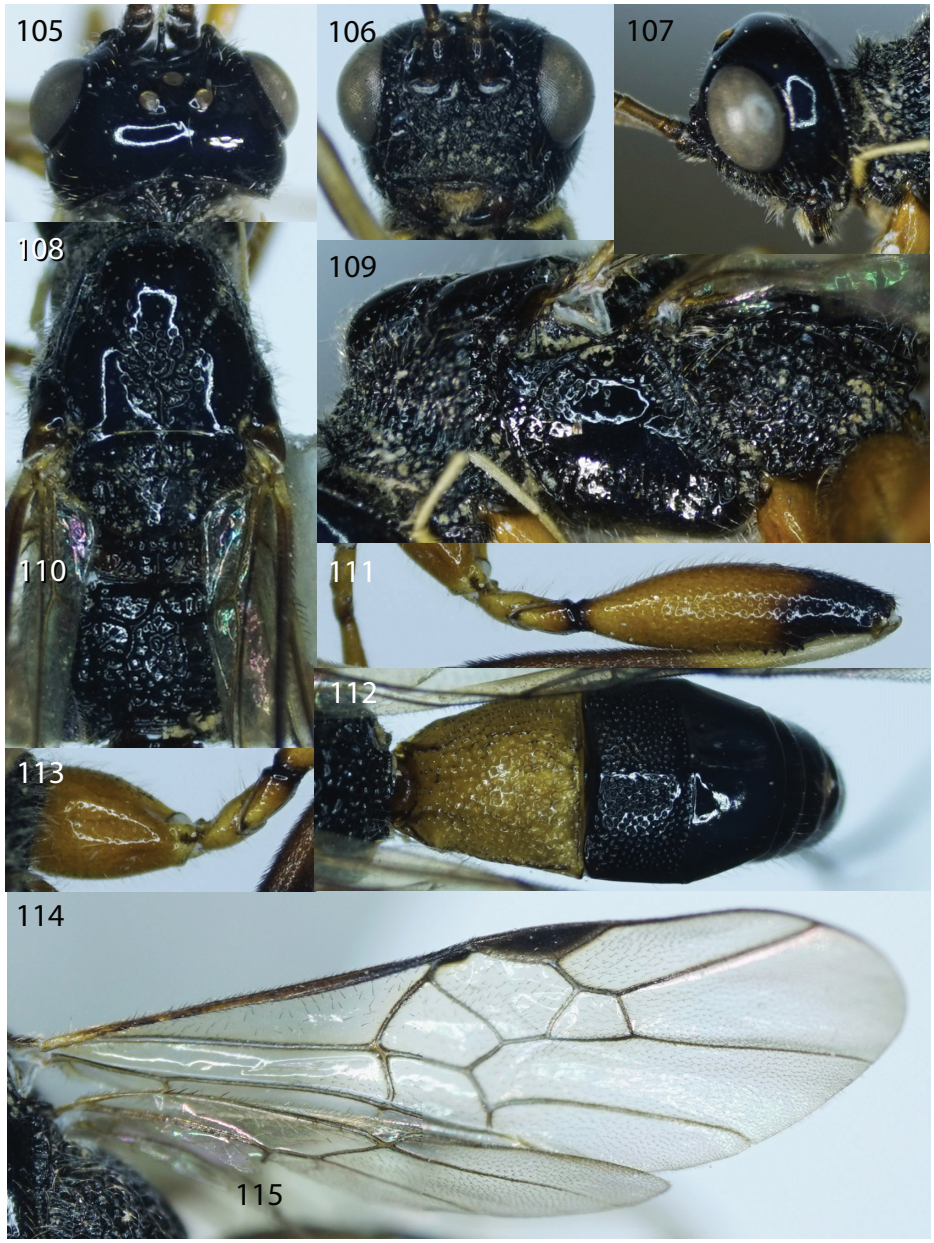
narrow and deep, crenulated anteriorly, punctate-reticulate posteriorly (fig. 108); scutellar sulcus wide and shallow, with three carinae, 0.6× as long as scutellum (10:16); scutellum largely smooth; propodeum with large areola, areola foveolate; propodeum transversely rugose laterally (fig. 110).

Wings. Forewing: length of forewing 3.4× its maximum width (115:34); pterostigma 3.3× as long as wide (40:12); vein 3-SR 1.1× as long as vein r; r:2-SR:3-SR:SR1:r-m = 9:14:10:61; 1-CU1:cu-a:2-CU1 = 3:12:20; vein 1-M almost straight, 1.9× vein m-cu (23:12) (fig. 114); vein 2-M 2.2× 3-SR (22:10); hind wing vein 1-M 0.75× vein 1r-m (12:16) (fig. 115); hind wing with 3 hamuli.

Legs: Foretarsus 1.5× longer than foretibia (60:41); hind femur with ventral serrations, without tooth-shaped protuberance (fig. 111); hind coxa sparsely punctate; hind femur largely rugose-punctate (fig. 111); length of hind femur (without serrations), tibia, and basitarsus 3.7 (67:18), 9.7 (97:10) and 6.2× (31:5) as long as their maximum width, respectively; hind basitarsus 0.3× as long as hind tibia (31:97), and 0.7× as long as second–fifth hind tarsal segments (31:45); fourth hind tarsal segment 0.5× as long as telotarsus (6:13).

Metasoma: Metasoma 0.7× as long as head and mesosoma combined (31:44); first tergite about as long as its apical width (55:53) (fig. 112); dorsal carinae in basal 0.4 of tergite (20:55); first tergite foveolate-reticulate (fig.); median length of second tergite 0.5× its basal width (27:54), and as long as third tergite (27:27); second tergite punctate-reticulate; third tergite smooth; ovipositor sheath 0.9× as long as forewing (55:61).

Color: Body black, scapus black; antenna yellowish brown basally, with antennal segments 11–18 cream white; palpi whitish yellow; fore- and middle legs yellow, but fore- and middle tarsi whitish yellow; hind leg yellow, hind coxa and femur reddish yellow, but apical one fourth of hind



FIGS. 105–115. *Wroughtonia sonla* holotype, female. **105.** Head, dorsal. **106.** Head, frontal. **107.** Head, lateral. **108.** Mesoscutum. **109.** Mesopleuron. **110.** Propodeum. **111**. Hind femur, lateral. **112.** Metasoma. **113.** Hind coxa, lateral. **114.** Forewing. **115.** Hind wing.

femur blackish brown; hind tibia brown, but basal third whitish yellow; hind tarsal segments 1–4 whitish yellow; hind telotarsus infuscate; pterostigma and wing veins brown; wing membrane yellow; first metasomal tergite pale yellow; tergites 2–6 black; ovipositor sheath brown.

Male: Unknown.

Etymology: Named after the province of the type locality (Son La province) in northwest Vietnam.

Variation: Female antenna with 34–36 segments, with segments 10–17 cream white; body length 6.0–7.8 mm; forewing 5.0–6.5 mm; ovipositor sheath 5.0–6.0 mm; hind wing with 3 hamuli.

***Wroughtonia undulata*, sp. nov.**

Figures 116–125

Type Material: Holotype, ♀, "Hel.065" (IEBR), NC Vietnam: Ha Tinh, Huong Son, 18°22′N 106°13′E, 900 m, May 18, 1998, Malaise trap, AMNH, K. Long. Paratypes: 2♀, "Hel.077" (AMNH), same place; "Hel.078" (VNMN), same place, but May 18, 1998, AMNH, K. Long.

Distribution: NC Vietnam: Ha Tinh (Huong Son).

Biology: Unknown.

Diagnosis: Antenna with 34–35 segments, antennal segments 10–23 cream white; maxillary palp 1.6× as long as head; in frontal view height of eye 2.2× its transverse width; width of face 2.2× length of face and clypeus combined; frontal protuberance lamelliform, lower than level of lateral carina of frons; in dorsal view width of head 1.6× its median length; height of eye 1.45× temple; in lateral view height of eye 1.3× its transverse width; transverse width of eye 1.4× temple; face coarsely rugose; lateral area between antennal sockets and eye margin with transverse rugosities; clypeus rugose-punctate, malar space coarsely rugose. Mesosoma 1.65× longer than high; notauli wide, sparsely crenulate anteriorly, fused posteriorly with two parallel rugosities in large longitudinally rugose area close to scutellar sulcus; scutellar sulcus wide, 0.7× as long as scutellum; propodeum with basal median carina and large areola; propodeal areola nearly smooth, coriaceous; lateral areas of propodeum with transverse rugosities. Length of forewing 2.4× its maximum width; vein 3-SR short, 0.5× vein r; vein 2-M 3.4× 3-SR; hind wing broad, vein 1-M short, 0.3× vein 1r-m; vein SR of hind wing sinuate; vein 2-SC+R transverse; hind wing with 4 hamuli. Foretarsus 1.3× as long as foretibia; hind femur robust, with ventral serrations and stout tooth-shaped protuberance; length of hind femur (without protuberance and serrations) 3.2× its maximum width; hind coxa sparsely punctate laterally; hind femur reticulate-rugulose laterally. First metasomal tergite 1.4× longer than its apical width, with long dorsal carinae almost up to apex of tergite; first tergite largely smooth, somewhat coriaceous; median length of second tergite 0.7× its apical width, and 1.1× third tergite; second tergite smooth, with sparse large punctures apically.

Notes: *W. undulata,* sp. nov., runs to *W. pterolophiae* (Chou and Hsu, 1998), from China (couplet 20a) in the key by Yan et al. (2017), but differs as follows: (1) first tergite largely smooth or coriaceous with sparse punctures (smooth to moderately foveolate-punctate in *W. pterolophiae*); (2) hind tarsus whitish yellow (fourth and fifth tarsal hind seg-

ments brown, darker than third segment in *W. pterolophiae*); and (3) vein SR of hind wing sinuate (vein SR of hind wing slightly curved in *W. pterolophiae*).

Description: Holotype, ♀, body length 9.7 mm, forewing length 8.0 mm, ovipositor sheath 4.5 mm (fig. 116).

Head: Antenna with 35 segments; third antennal segment 1.1× as long as fourth segment (18:16); in frontal view height of eye 2.2× its transverse width (40:18); width of face 2.2× length of face and clypeus combined (53:24); malar space as long as mandible width (15:15) and 0.4× height of eye (15:40) (fig. 118); maxillary palp 1.6× as long as head (51:31); tentorial pits distinct, distance between tentorial pits 0.9× distance between pit and eye (17:19); frontal protuberance lamelliform, lower than level of lateral carina of frons; in dorsal view width of head 1.6× its median length (87:54); height of eye 1.45× as long as temple (29:20); ocelli rather large, POL:OD:OOL = 10:7:20; distance between front and hind ocelli 0.25× OOL (5:20) (fig. 117); in lateral view height of eye 1.3× its transverse width (39:29); transverse width of eye 1.2× temple (29:24) (fig. 119); face coarsely rugose; lateral area between antennal sockets and eye margin with transverse rugosities; clypeus rugose-punctate, malar space coarsely rugose; frons smooth; vertex and temple almost smooth with scattered fine punctures.

Mesosoma: Mesosoma 1.65× longer than high (48:29) (fig. 121); pronotal side coarsely rugose, densely punctate dorsally; mesopleuron smooth medially, punctate-reticulate ventrally; metapleuron areolate-rugulose; median lobe of mesoscutum sparsely punctate, reticulate-rugulose posteriorly; lateral lobes of mesoscutum almost smooth; notauli wide, sparsely crenulate anteriorly, fused posteriorly with two parallel rugosities in large longitudinally rugose area close to scutellar sulcus (fig. 120); scutellar sulcus wide, with 3 carinae, two lateral carinae sinuate, 0.7× as long as scutellum (15:21); scutellum sparsely punctate; propodeum with mediobasal carina and large areola (fig. 123); areola smooth or coriaceous; lateral areas of propodeum with transverse rugosities.

Wings: Forewing: length of forewing 2.4× its maximum width (120:49); pterostigma 3.4× longer than wide (41:12); vein 3-SR short, 0.5× vein r; r:2-SR:3-SR:SR1:r-m = 15:18:8:60:12; 1-CU1:cu-a:2-CU1 = 4:13:21; second submarginal cell trapezium-shaped, vein 2-M 3.4× 3-SR (27:8); hind wing broad, vein 1-M short, 0.3× vein 1r-m (3:10); vein 2-SC+R transverse (fig. 125); hind wing with 4 hamuli.

Legs: Foretarsus 1.3× longer than foretibia (45:35); hind femur robust, with ventral serrations and stout tooth-shaped protuberance (fig. 122); length of hind femur (without protuberance or serrations), tibia, and basitarsus 3.2 (57:18), 9.9 (89:9), and 7.25× (29:4) as long as their maximum width, respectively; hind coxa sparsely punctate laterally; hind femur reticulate-rugulose laterally; hind basitarsus 0.3× as long as hind tibia (29:89), and 0.7× as long as hind tarsal segments 2–5 (29:41); fourth hind tarsal segment 0.4× as long as telotarsus (5:14).

Metasoma: Metasoma 0.7× as long as head and mesosoma combined (45:63); first tergite 1.4× longer than its apical width (55:40), with long dorsal carinae almost up to apex of tergite, converging apically (fig. 124); first tergite almost smooth or coriaceous (fig. 124); median length of second tergite 0.7× its apical width (28:42), and 1.1× third tergite (28:25); second

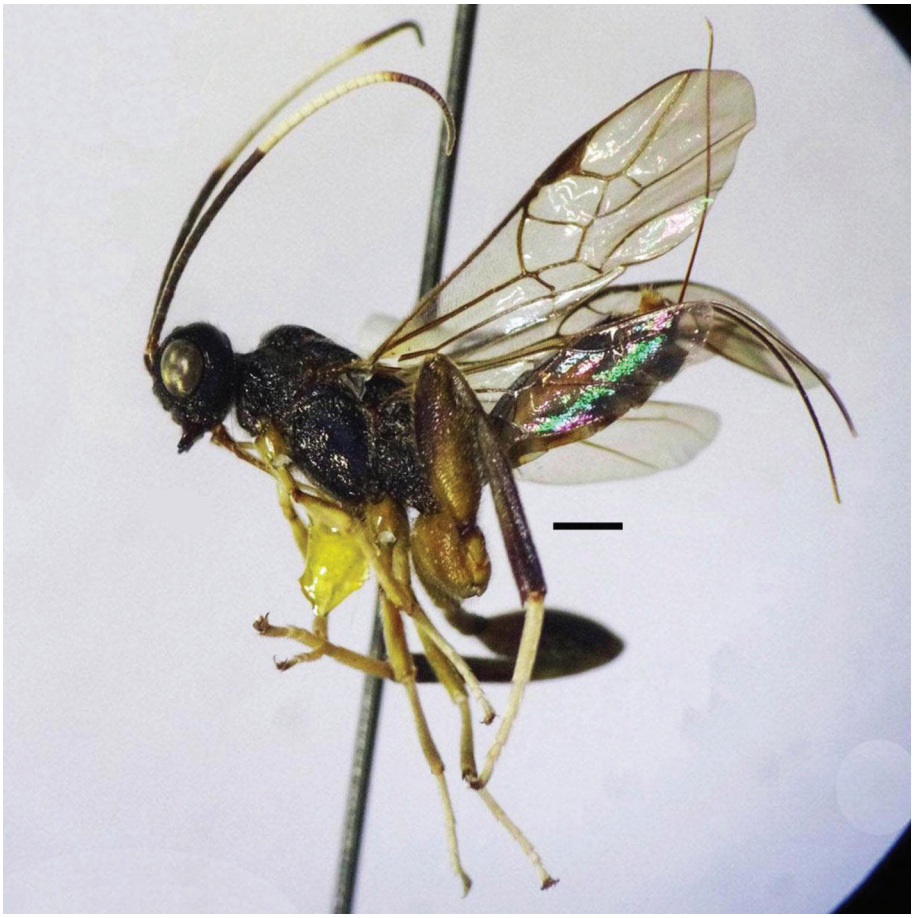


FIG. 116. *Wroughtonia undulata*, sp. nov., habitus (holotype, female, lateral)

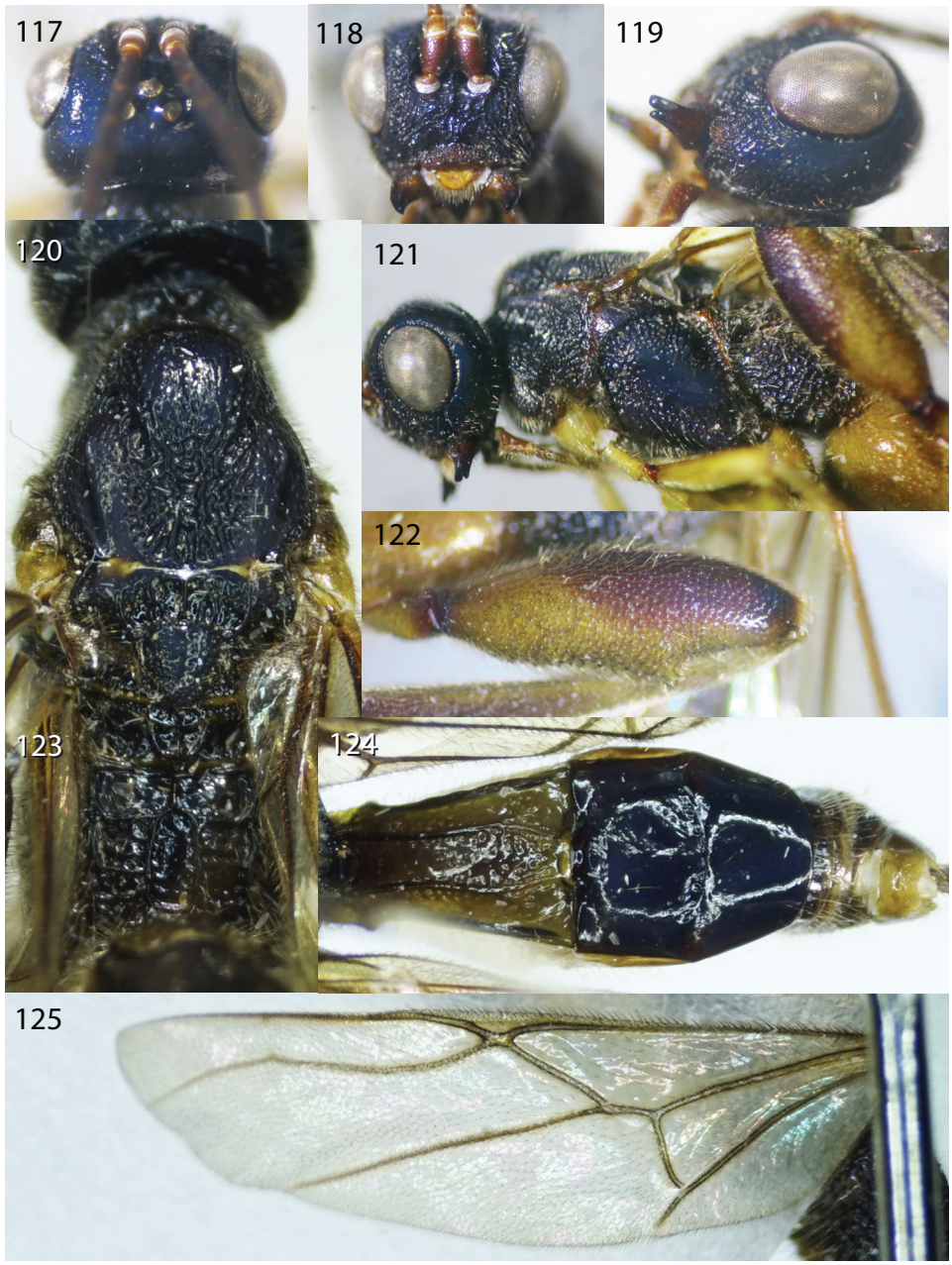
tergite smooth, with sparse large punctures apically; third tergite smooth; ovipositor sheath 0.6× as long as forewing (45:80).

Color: Body dark brown; scapus light brown; antenna brown, with 11th–23rd antennal segments cream white; palpi yellow; fore- and middle legs yellow, but tibia pale yellow, tarsus whitish yellow; hind coxa, trochanter, and trochantellus yellow; hind femur yellow basally and ventrally, brown dorsoapically; hind tibia yellow basally, infuscate medially, brown apically; hind tarsus whitish yellow; pterostigma and wing veins brown; wing membrane yellow; first metasomal tergite yellow; second and third tergites dark brown; remainder of metasoma light brown, ovipositor sheath brown.

Male: Unknown.

Etymology: From *undulatus* (Latin for "wavy"), because of the sinuate vein SR of the hind wing.

Variation: Female paratypes: antenna with 34–35 segments and 10th–22nd segments cream white; body length 8.0–8.5 mm; forewing 6.4–6.8 mm; ovipositor sheath 4.4–4.6 mm; hind wing with 3 hamuli.



FIGS. 117–125. *Wroughtonia undulata* holotype, female. **117.** Head, dorsal. **118.** Head, frontal. **119.** Head, lateral. **120.** Mesoscutum. **121.** Mesopleuron. **122.** Hind femur, lateral. **123.** Propodeum. **124.** Metasoma. **125.** Hind wing.

Wroughtonia vietnamica, sp. nov.

Figures 126–136

Type Material: Holotype, ♀, "Hel.039" (IEBR), NE Vietnam: Tuyen Quang, Na Hang, Son Phu, forest, MT, 20°17′32″N 105°28′19″E, 573 m, 25.v.2017, K.D. Long. Paratype: 1♀, "Hel.019" (VNMN), NE Vietnam: Vinh Phuc, Tam Dao NP, forest, M[alaise]T[rap], 21°17′N 105°38′E, 950 m, 1-10.vi.2012, K.D. Long.

Distribution: NE Vietnam: Tuyen Quang (Na Hang NP), Vinh Phuc (Tam Dao NP).

Biology: Unknown.

Diagnosis: Antenna with 36–38 segments, segments 10–24 cream white; maxillary palp 1.8× as long as head; frontal protuberance large, with distinctly ledge halfway and blunt dorsally (fig. 127); in dorsal view width of head 1.7× its median length; height of eye 1.4× temple; in frontal view height of eye 1.7× its transverse width; width of face 1.8× length of face and clypeus combined; malar space 0.3× height of eye; in lateral view height of eye 1.3× as long as transverse width; transverse width of eye 1.6× temple. Mesosoma 2.2× longer than high; notauli deep, sparsely crenulate anteriorly, fused posteriorly with two rugosities forming one median carina close to scutellar sulcus; scutellar sulcus 0.5× scutellum; propodeum with mediobasal carina and trace of round areola, largely rugose. Length of forewing 2.9× its maximum width; vein 3-SR 1.1× vein r; vein 2-M 2.1× 3-SR; hind wing vein 1-M 0.9× vein 1r-m; vein 2-SC+R vertical; hind wing with 4 hamuli. Foretarsus 1.3× as long as foretibia; hind femur robust, with ventral serrations and stout tooth-shaped protuberance; length of hind femur (without tooth or serrations) 3.2× as long as its maximum width; hind coxa punctate laterally; hind femur largely rugose-punctate laterally. First metasomal tergite slightly widened apically, 1.3× longer than its apical width; dorsal carinae in basal 0.7 of tergite; first tergite smooth basally and apically, coriaceous medially, areolate-rugulose subapically and laterally; median length of second tergite 0.4× its apical width; length of second tergite 0.8× as long as third tergite; second and third tergites smooth.

Notes: *W. vietnamica,* sp. nov., runs in the key by Yan et al. (2017) to *W. unicornis* (Turner, 1918) but differs as follows: (1) in dorsal view eye 1.4× as long as temple (1.8–2.0× in *W. unicornis*); (2) hind femur robust, length of hind femur 3.2× its maximum width (4.0 in *W. unicornis*); and (3) vein 2-SC+R of hind wing vertical (vein 2-SC+R horizontal in *W. unicornis*).

Description: Holotype, ♀, body length 8.6 mm, forewing length 6.9 mm, ovipositor sheath 5.4 mm (fig. 126).

Head: Antenna with 36 segments; third antennal segment 1.1× longer than fourth segment (18:17); in frontal view height of eye 1.7× its transverse width (30:18); width of face 1.8× length of face and clypeus combined (43:24); malar space 0.85× as long as mandible width (12:14) and 0.3× height of eye (12:39) (fig. 128); maxillary palp 1.8× as long as head (64:36); frontal protuberance large, with distinct ledge halfway and blunt dorsally; in dorsal view width of head 1.7× its median length (78:47); height of eye 1.4× temple (29:16); ocelli rather large, POL:OD:OOL = 6:6:17; distance between front and hind ocelli, 0.2× OOL (4:17)

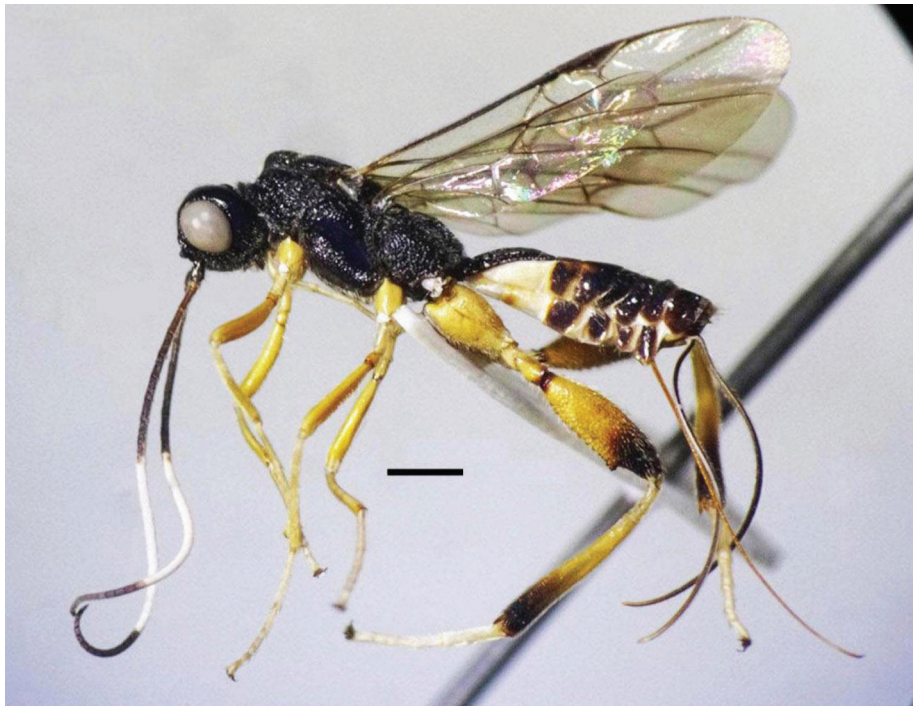


FIGURE 126. *Wroughtonia vietnamica*, sp. nov., habitus (holotype, female, lateral).

(fig. 127); in lateral view height of eye 1.3× its transverse width (39:29); transverse width of eye 1.6× temple (28:17) (fig. 129); face coarsely rugose; clypeus rugose; frons, vertex, and temple smooth.

Mesosoma: Mesosoma 2.2× longer than high (63:29) (fig. 131); pronotal side coarsely carinate-rugose medioanteriorly; largely rugose ventrally and posteriorly; mesopleuron smooth medially, foveolate-punctate ventrally; metapleuron areolate-rugulose; lobes of mesoscutum sparsely punctate, but median lobe largely rugose posteriorly; notauli deep, sparsely crenulate anteriorly, fused posteriorly with two rugosities forming one median carina close to scutellar sulcus (fig. 130); scutellar sulcus smooth, with 3 carinae, 0.5× as long as scutellum (10:21); scutellum sparsely punctate; propodeum with mediobasal carina and trace of round areola (fig. 134), largely rugose.

Wings: Forewing: length of forewing 2.9× its maximum width (106:36); pterostigma 3.3× as long as wide (50:15); vein 3-SR 1.1× vein r; r:2-SR:3-SR:SR1:r-m = 15:20:17:76:15; 1-CU1:cu-a:2-CU1 = 4:16:28; second submarginal cell trapezium-shaped, vein 2-M 2.1× 3-SR (36:17) (fig. 136); hind wing vein 1-M 0.9× as long as vein 1r-m (13:15); vein 2-SC+R vertical (fig. 135); hind wing with 4 hamuli.

Legs: Foretarsus 1.3× longer than foretibia (39:29); hind femur robust, with ventral serrations and stout tooth-shaped protuberance (fig. 133); length of hind femur (without tooth or serrations), tibia, and basitarsus 3.2 (73:23), 8.3 (108:13), and 5.4× (38:7) as long as their maximum width, respectively; hind coxa punctate laterally; hind femur largely rugose-punctate

laterally (fig. 133); hind basitarsus 0.35× as long as hind tibia (38:108), and 0.8× as long as hind tarsal segments 2–5 (38:50); fourth hind tarsal segment 0.5× telotarsus (6:13).

Metasoma: Metasoma 0.9× as long as head and mesosoma combined (45:50); first tergite slightly widened apically, 1.3× longer than its apical width (58:43); dorsal carinae in basal 0.7 of tergite (44:60) (fig. 132); first tergite smooth basally and apically, coriaceous medially, areolate-rugulose subapically and laterally (fig. 132); median length of second tergite 0.4× its apical width (20:45), and 0.8× third tergite (20:25); second suture distinct; second and third tergites smooth; ovipositor sheath 0.8× as long as forewing (54:69).

Color: Body black; scapus black; antenna dark brown, with antennal segments 11–22 cream white; palpi pale yellow; fore- and middle legs yellow; hind coxa, trochanter and trochantellus yellow; hind femur and tibia yellow, but both apically brown; hind tarsus pale yellow; pterostigma and wing veins brown; wing membrane hyaline; metasoma dark brown to black, but first sternite cream white; ovipositor sheath brown.

Male: Unknown.

Etymology: The new species is named after the country where the new species was discovered (Vietnam).

Variation: Female paratype: body length 10.5 mm, forewing 8.7 mm, ovipositor sheath 7.0 mm, antenna with 38 segments and antennal segments 10–24 cream white.

Five Species Newly Recorded for Vietnam

Wroughtonia bifurcata Yan and van Achterberg, 2017

Material Examined: 2 ♀, "Hel.011" (IEBR), NC Vietnam: Ha Tinh, Huong Son, 18°22′N 106°13′E, 1250 m, May 20, 1998, Malaise trap, AMNH, K. Long; "Hel.063" (AMNH), same place, but 600 m, May 2–10, 1998, Malaise trap, AMNH, K. Long.

Distribution: NC Vietnam: Ha Tinh (Huong Son).

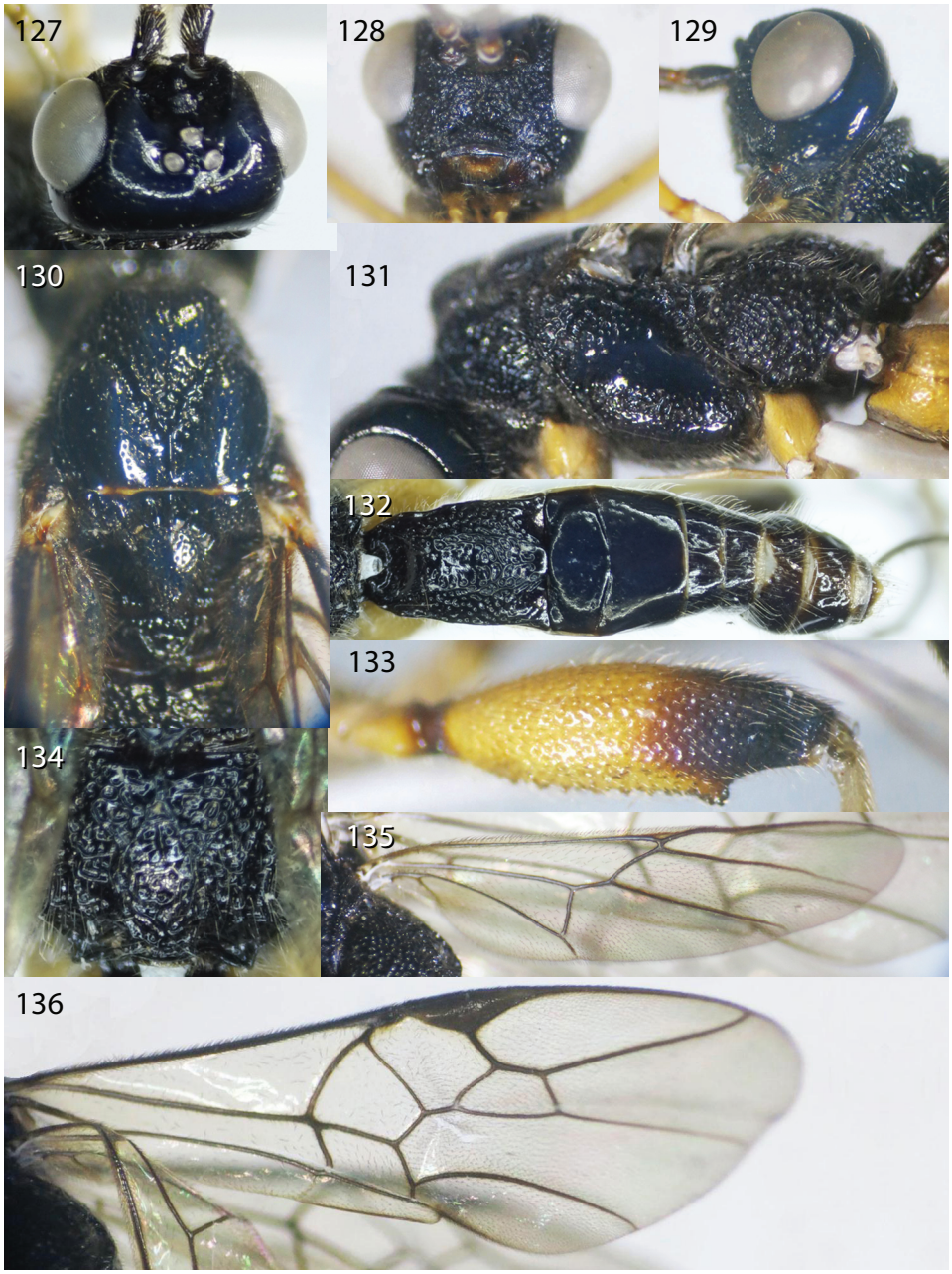
Biology: Unknown.

Diagnosis:

Female: body length 5.5–6.0 mm; forewing 4.0–4.5 mm; ovipositor sheath 3.0–3.5 mm; antenna pale yellow basally, with 31–32 segments and 9th–19th segments cream white; hind wing with 3 hamuli.

Wroughtonia brevicarinata (Yan and Chen, 2014)

Material Examined: 1 ♀, "Hel.028" (VNMN), NE Vietnam: Tuyen Quang, Na Hang, Son Phu, forest, M[alaise]T[rap], 22°17′32″N 105°28′19″E, 573 m, 25.v.2017, K.D. Long; 2 ♂, "Hel.060" (IEBR), NC Vietnam: Ha Tinh, Huong Son, 18°22′N 106°13′E, 450 m, April 22–May 1, 1998, Malaise [trap], AMNH, K. Long; "Hel.061" (IEBR), same place, but 600 m, May 20, 1998, Malaise trap, AMNH, K. Long; 7 ♀, "Hel.062" (AMNH), same place, but 900 m, May 18, 1998, Malaise trap, AMNH, K. Long; "Hel.067" (IEBR), same place, but May 20, 1998, Malaise trap, AMNH, K. Long; "Hel.068" (AMNH), same place, but May 18, 1998, Malaise [trap], AMNH, K. Long; "Hel.069" (IEBR), same place, but 450 m, May 10–20, 1998, Malaise trap,



FIGURES 127–136. *Wroughtonia vietnamica* holotype, female. **127.** Head, dorsal. **128.** Head, frontal. **129.** Head, lateral. **130.** Mesoscutum. **131.** Mesopleuron. **132.** Metasoma. **133.** Hind coxa and femur, lateral. **134.** Propodeum. **135.** Hind wing. **136.** Forewing.

AMNH, K. Long; "Hel.080" (IEBR), same place, but 900 m, May 20, 1998, Malaise [trap], AMNH, K. Long; "Hel.081" (EBR) same place, but May 18, 1998, Malaise trap, AMNH, K. Long; "Hel.082" (AMNH), same place, but April 22–May 1, 1998, AMNH, K. Long.

Distribution: NC Vietnam: Ha Tinh (Huong Son); NE Vietnam: Tuyen Quang (Na Hang NP).

Biology: Unknown.

Diagnosis: Female, body length 6.8–8.0 mm; forewing 5.3–6.4 mm; ovipositor sheath 3.7–7.0 mm; antenna 33–36 segments, with segments 9–21 cream white; hind wing with 4 hamuli (female); with 3 hamuli (male).

Wroughtonia cornuta Cameron, 1886 (figures 137–141)

Material Examined: ♀, "Hel.088" (IEBR), N Vietnam: Ha Noi, Tu Liem, Minh Khai, citrus and sapodilla orchard, M[alaise]T[rap], 21°03′31″N 105°44′50″E, 10 m, 17.iv-2.v.2018, K.D. Long, N.D. Hiep; 1♀ "Hel.015" (IEBR), NE Vietnam: Vinh Phuc, Tam Dao NP, forest, M[alaise]T[rap], 21°17′N 105°38′E, 950 m, 20.vi.2012, K.D. Long; 2♀, "Hel.017" (IEBR), "Hel.018" (VNMN), same place, but 1-10.vi.2012, K.D. Long; 1♀, "Hel.042" (AMNH), NE. Vietnam: Ha Giang, Vi Xuyen, Cao Bo, M[alaise]T[rap], 900 m, 05.x-05.xi.2001; , K.D. Long; 6♀, "Hel.043", NW. Vietnam: Son La, coffee orchard, M[alaise]T[rap], 21°18′06″N 103°55′36″E, 663 m, 01.v.2017, K.D. Long; "Hel.044," "Hel.045," "Hel.046" (IEBR), "Hel.047" (AMNH), same place, but 20.v.2017, K.D. Long; 1♀, "Hel.048" (RMNH), same place, but 01.vi.2017, K.D. Long.

Distribution: NE Vietnam: Ha Giang (Tay Con Linh Mts.), Ha Noi (Tu Liem), Vinh Phuc (Tam Dao NP); NW Vietnam: Son La.

Biology: Unknown.

Diagnosis:

Females: body length 7.2–8.9 mm; forewing 5.3–7.5 mm, with antennal segments 11–20 cream white (fig. 137); ovipositor sheath 6.1–7.6 mm; hind wing with 4 hamuli.

["Hel.088": Female, body length 8.9 mm, forewing length 7.5 mm, ovipositor sheath 7.6 mm].

Head: Antenna with 38 segments; third antennal segment 1.3× as long as fourth; antennal segments 11–19 cream white; in frontal view height of eye 1.5× its transverse width; width of face 1.7× length of face and clypeus combined; malar space as long as mandible width (10:10) and 0.4× height of eye; maxillary palp 1.6× as long as head; in dorsal view width of head 1.6× its median length; height of eye 1.8× as long as temple; in lateral view width of eye 1.35× as long as temple; POL:OD:OOL = 10:6:17; distance between front and hind ocelli 0.3× as long as OOL; frontal protuberance long, acute and raised above lateral carina of frons; face coarsely rugose; frons deeply depressed, smooth; vertex rugose-punctate anteriorly, smooth medioposteriorly, occiput largely smooth; temple largely rugose-punctate, but coarsely rugose ventrally.

Mesosoma: Mesosoma 2.25× longer than high; pronotal side coarsely rugose; mesopleuron largely smooth medially, rugose-punctate ventrally (fig. 139); metapleuron coarsely

rugose; median lobe of mesoscutum largely finely punctate, but rugose lateroapically; notauli narrow, sparsely crenulate, fused posteriorly with mediolongitudinal carina; scutellar sulcus wide, with one carina, 0.9× as long as scutellum; scutellum strongly narrowed posteriorly, rugose-punctate; propodeum without areola and coarsely rugose.

Wings: Forewing: length of forewing 3.5× its maximum width; pterostigma 4.0× longer than wide; vein r arising from basal 0.8 of pterostigma; vein 3-SR 1.3× vein r; r: 2-SR:3-SR:SR1:r-m = 12:13:9:60:10; 1-CU1: cu-a:2-CU1 = 3:10:21; vein 1-M 2.3× as long as vein r-m; second submarginal cell trapezium shaped, long base 2.1× as long as its short base; hind wing vein 1-M 0.8× as long as vein 1r-m (14:18); hind wing with 4 hamuli.

Legs: Foretarsus 1.3× longer than foretibia; hind femur long, ventral protuberance of hind femur tooth shaped and stout (fig. 140); length of hind femur (without tooth), tibia and basitarsus 5.0, 12.8, and 8.0× as long as their maximum width, respectively; hind tibia slightly curved basally (fig. 141); hind basitarsus 0.3× as long as hind tibia; outer hind tibial spur 0.2× as long as telotarsus; hind basitarsus 0.75× as long as hind tarsal segments 2–5; fourth hind tarsal segment 0.4× as long as telotarsus; outer side of hind coxa sparsely finely punctate; hind femur densely punctate laterally.

Metasoma: Metasoma 0.8× as long as head and mesosoma combined; first tergite 1.8× longer than its apical width (fig. 138); median length of second tergite 0.75× its basal width; dorsal carinae in basal 0.4 of tergite; first tergite smooth basally and medially narrowly foveolate-punctate; second tergite 1.4× longer than third tergite; second tergite sparsely puncticulate basolaterally, almost smooth; remainder of metasoma shiny and smooth; ovipositor sheath almost as long as forewing and 0.85× as long as body.

Wroughtonia indica (Singh, Belokobylskij and Chouhan, 2005)

Material Examined: 3♀, "Hel.030" (IEBR), NE Vietnam: Tuyen Quang, Na Hang, Son Phu, forest, M[alaise]T[rap], 22°17′32″N 105°28′19″E, 573 m, 25.v.2017, KD Long.

Distribution: NE Vietnam: Tuyen Quang (Na Hang NP).

Biology: Unknown.

Diagnosis: *Female:* body length 6.3 mm; forewing 5.2 mm; ovipositor sheath 3.7 mm; hind wing with 3 hamuli.

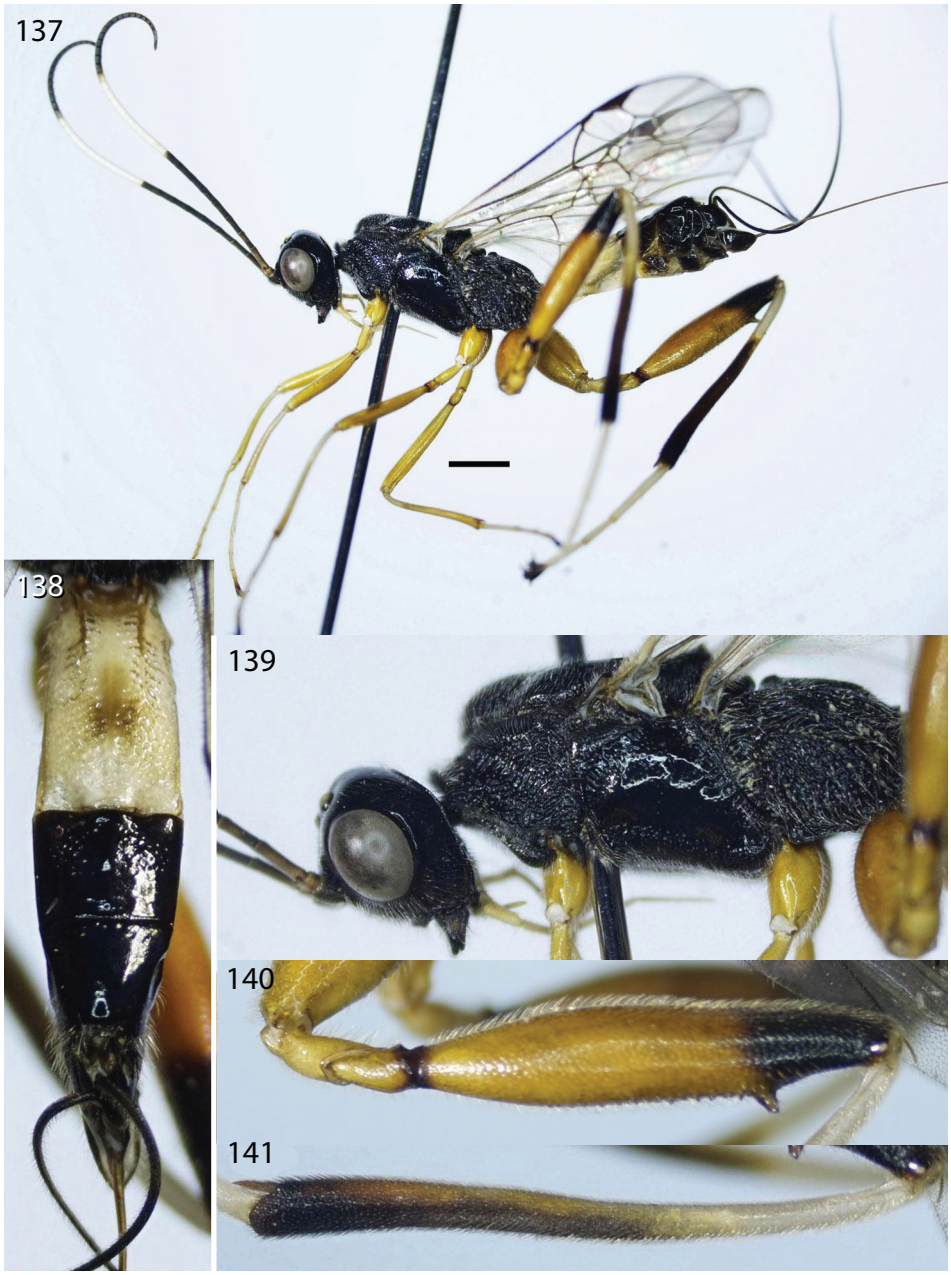
Wroughtonia varifemora Yan and Chen, 2017

Material Examined: 4♀, "Hel.050" (IEBR), "Hel.051" (AMNH), NC Vietnam: Ha Tinh, Huong Son, 18°22′N 106°13′E, 450 m, April 20–28, 1998, Malaise trap, AMNH, K. Long; "Hel.052" (IEBR), same place, but May 5, 1998, Malaise trap, AMNH, K. Long; "Hel.053" (AMNH), NC Vietnam: Ha Tinh, Huong Son, Kim Son, Rao An, forest path, 20.iv.1998, sweeping, K.D. Long.

Distribution: NC Vietnam: Ha Tinh (Huong Son).

Biology: Unknown.

Diagnosis: *Female:* body length 12.4–13.3 mm; forewing 10.7–11.0 mm; ovipositor sheath 13.0–13.5 mm; antenna pale yellow basally and with 39 segments; hind wing with 4 hamuli.



FIGURES 137–141. *Wroughtonia cornuta* Cameron, 1899, female. **137.** Habitus (lateral). **138.** Metasoma. **139.** Head (lateral) and mesopleuron. **140.** Hind femur, lateral. **141.** Hind tibia, lateral.

Wroughtonia unicornis (Turner, 1918) (already recorded by Long and Belokobylskij, 2003)

Material Examined: 1♀, "Hel.005" (IEBR), S Vietnam: Lam Dong, Bi Doup NP, 01.iv.2008, N.D. Hiep.

Distribution: S Vietnam: Lam Dong (Bi Doup NP).

Biology: Unknown.

Diagnosis: *Female:* body length 9.0 mm; forewing length 7.5 mm; ovipositor sheath 8.6 mm; antenna with 36 segments and segments 12–19 cream white; hind wind with 4 hamuli. Frontal protuberance single; length of forewing 3.4× its maximum width; vein 3-SR 1.4× as long as vein r; long base of second submarginal cell nearly 2.0× as long as short base; hind wing vein 1-M 0.8× vein 1r-m; hind wing with 4 hamuli; foretarsus 1.45× longer than foretibia; hind femur slender, with ventral serrations and stout tooth-shaped protuberance; length of hind femur (without tooth and serrations) 4.0× longer than its maximum width; first metasomal tergite 1.5× longer than its apical width; dorsal carinae in basal 0.9 of tergite; first tergite largely smooth basally and apically and remainder largely foveate-reticulate; median length of second tergite 0.55× its basal width, and 1.1× third tergite; second suture indistinct medially; second and third tergites smooth.

KEY TO VIETNAMESE SPECIES OF THE GENUS *WROUGHTONIA* CAMERON

(based on females)

1. Mandible bent ventrally (fig. 3); malar suture almost absent; occipital carina faint mediodorsally (fig. 2); vein 2-SC+R hind wing vertical (fig. 13); subgenus *Neowroughtonia,* . . . . . *W. angularis*
– Mandible evenly curved ventrally (figs. 16, 40, 50, 61); malar suture present; occipital carina complete mediodorsally; vein 2-SC+R of hind wing horizontal (figs. 22, 37, 125), but vertical in *W. vietnamica* (fig. 135); subgenus *Wroughtonia* Cameron 2
2. Frontal protuberance between antennal sockets with distinct ledge halfway and blunt dorsally (fig. 127) 3
– Frontal protuberance between antennal sockets lamelliform, acute dorsally, without ledge (figs. 41, 66) 10
3. Hind femur comparatively short and robust, 3.2–3.8× as long as its maximum width (measured without tooth or serrations), and rugose-punctate dorsolaterally (figs. 36, 133) . . . 4
– Hind femur longer and slenderer, 4.5–5.0× as long as its maximum width (measured without tooth or serrations), and finely punctate dorsolaterally (figs. 140) 6
4. Hind femur without ventral tooth-shaped protuberance (fig. 36); second metasomal tergite sculptured (fig. 34) . . . . . *W. coffeana*
– Hind femur with ventral tooth-shaped protuberance (figs. 79, 133); second metasomal tergite smooth (figs. 81, 132). 5
5. Ventral tooth-shaped protuberance of hind femur blunt (fig. 133); hind femur 3.2× longer than its maximum width (measured without tooth); medially second tergite distinctly

shorter than third tergite (fig. 132); vein 2-SC+R of hind wing vertical (fig. 135); antennal segments 10–24 cream white. Body length 8.6 mm. Vietnam . *W. vietnamica*

– Ventral tooth-shaped protuberance of hind femur acute (fig. 79); hind femur 3.8× longer than its maximum width (measured without tooth); median length of second tergite slightly longer third tergite (fig. 81); vein 2-SC+R of hind wing transverse (horizontal); antennal segments 13–19 cream white. Body length 7.8 mm. Vietnam . . . . . *W. plana*

6. Scutellum with distinct subposterior crest and protruding dorsally (fig. 139); hind femur long, hind femur 5.0× longer than its maximum width (measured without tooth or serrations); first metasomal tergite pale yellow (fig. 138); antennal segments 11–20 cream white. Body length 8.8–8.9 mm. India, Vietnam . . . . . .*W. cornuta* Cameron

– Scutellum without subposterior crest; hind femur shorter, hind femur 4.0–4.5× longer than its maximum width (measured without tooth or serrations) (but 4.7× in *elongata*); first metasomal tergite dark brown or yellowish brown; antennal segments 12–23 cream white. 7

7. First metasomal tergite distinctly narrowed apically (fig. 46); second metasomal tergite parallel-sided, smooth (fig. 46), medially tergite 1.5× longer than its basal width; vein 1-M of hind wing 1.2× as long as 1r-m. Body length 13.5 mm. Vietnam. . *W. elongata*

–First metasomal tergite widened apically (figs. 68, 90; Yan et al., 2017: fig. 24D); second metasomal tergite more or less widened posteriorly, with sparse punctures at least basolaterally, medially tergite 0.7–0.8× longer than its basal width; vein 1-M of hind wing 0.4–0.6× as long as 1r-m 8

8. In dorsal view eye 1.5× longer than temple; propodeum without basal carina and areola, largely areolate-rugose (fig. 89); vein 3-SR of forewing 2.0× longer than vein r (fig. 91); second tergite almost smooth, only with scattered fine punctures (fig. 90). Body length 11.0 mm. Vietnam . . . . . *W. similis*

– In dorsal view eye 1.8–2.0× longer than temple; propodeum with basal carina and areola (fig. 67; Yan et al., 2017: fig. 24C); vein 3-SR of forewing 1.2–1.5× longer than vein r; second tergite punctate baso-laterally (fig. 68) or medially (Yan et al., 2017: fig. 24D). 9

9. Hind femur finely punctate (Yan et al., 2017: fig. 24E) and its ventral tooth-shaped protuberance acute; first metasomal tergite punctate-reticulate subapically. Body length 8.8 mm. China, Vietnam. . . . . *W. unicornis* (Turner)

– Hind femur rugose-punctate (fig. 66) and with blunt ventral tooth-shaped protuberance (fig. 66); first metasomal tergite nearly smooth subapically (fig. 68). Body length 8.4 mm. Vietnam . . . . . *W. laevis*

10. Median length of first tergite 1.3–1.5× its apical width (figs. 100, 124) 11

– Median length of tergite 1.0–1.1× its apical width (figs. 23, 55, 112). 13

11. Hind femur without tooth-shaped protuberance and area behind it distinctly concave (fig. 101) . . . . . *W. simulata*

– Hind femur with tooth-shaped protuberance and area behind it slightly concave (fig. 122; Yan et al., 2017: fig. 25D) 12

12. Vein SR of hind wing sinuate (fig. 125); vein 1-M of hind wing 0.3× as long as 1r-m (fig. 125); ventral tooth-shaped protuberance of hind femur blunt and situated distal from middle of femur (fig. 122); second metasomal tergite smooth ..... *W. undulata*
– Vein SR of hind wing slightly curved; vein 1-M of hind wing 0.7× as long as r-m; ventral tooth-shaped protuberance of hind femur acute and situated near middle of femur (fig. 25D in Yan et al. 2017); second metasomal tergite with convergent striae (Yan et al., 2017: fig. 25C)..... ..... *W. varifemora* Yan and Chen
13. Hind femur with tooth-shaped protuberance ventrally (fig. 54) ..... *W. hatinhensis*
– Hind femur without tooth-shaped protuberance ventrally (figs. 25, 101) 14
14. Hind femur without distinct ventral serrations; dorsal carinae of first tergite almost up to apex of tergite (fig. 17C in Yan et al. 2017); third metasomal tergite narrowly rugose-punctate in basal 0.7 of tergite; antenna pale yellow basally, without cream white band. Body length 6.3 mm. China, India, Vietnam ..... *W. indica* (Singh et al.)
– Hind femur with distinct ventral serrations (figs. 25, 101, 111); dorsal carinae of first tergite in basal 0.6–0.7 of tergite; third metasomal tergite smooth (figs. 23, 100, 112); antenna brown, with cream white band 15
15. Frontal protuberance bifurcate dorsally 16
– Frontal protuberance single and acute (figs. 15, 105) 17
16. Vein r of forewing distinctly longer than vein 3-SR; hind femur densely punctate dorsolaterally (Yan et al., 2017: fig. 10E); first metasomal tergite evenly punctate; antenna of female yellowish brown basally, with 11 white segments submedially. Body length 7.2 mm. China, Vietnam ..... *W. bifurcata* Yan and van Achterberg
– Vein r of forewing shorter or subequal to vein 3-SR; hind femur largely rugose-punctate dorsolaterally (Yan et al., 2017: fig. 13E); first metasomal tergite foveolate medially; antenna of male yellowish brown basally and without white band submedially; antenna of female with segments 12–14 white submedially (some Vietnamese female specimens have only antennal segments 17 and 18 white). Body length 7.0–8.0 mm. China, Vietnam .... *W. brevicarinata* Yan and Chen
17. Frontal protuberance nearly triangular; propodeum with emarginate areola (fig. 110); frons and temple shiny, smooth (figs. 105, 107); dorsal carinae of first tergite in basal 0.3 of tergite; vein 3-SR of forewing 1.1× as long as vein r (fig. 114); first tergite pale yellow. Body length 6.0–7.8 mm. Vietnam ..... *W. sonla*
– Frontal protuberance wide triangular or acute; propodeum without areola, coarsely rugose (fig. 21); frons laterally and temple ventrally rugose (figs. 15, 17); dorsal carinae of first tergite in basal 0.6–0.7 of tergite; vein 3-SR of forewing 0.6× as long as vein r (fig. 20); first tergite brown. Body length 11.4 mm. Vietnam ..... *W. aspera*

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