

# Four new species of *Rhogadopsis* Brèthes from NW China (Hymenoptera, Braconidae, Opiinae)

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## Abstract

Four new species of the genus *Rhogadopsis* Brèthes, 1913 (Hymenoptera, Braconidae, Opiinae) are reported from Shaanxi province (NW China). The new species (*R. aciculifera* **sp. n.**, *R. cracentata* **sp. n.**, *R. longivena* **sp. n.**, and *R. moniliata* **sp. n.**) and two newly recorded species for Shaanxi and Ningxia provinces (*R. mediocarinata* (Fischer, 1963) and *R. pratellae* (Weng & Chen, 2005), respectively) are keyed and fully illustrated. *Rhogadopsis mediocarinata* (Fischer, 1963) is a new combination.

## Keywords

*Rhogadopsis*, new species, new record, new combination, Shaanxi, Ningxia, key

## Introduction

The large subfamily Opiinae (Braconidae), with nearly 2,000 valid species according to Yu et al. (2012), is a common group containing generally small (2–5 mm) parasitoid wasps of mainly mining or fruit-infesting dipterous larvae. It has a worldwide distribution and the world fauna has been reviewed by Fischer (1972, 1977, 1986, 1987).

Li et al. (2013) supplied a key to the genera of Opiinae in China, including *Rhogadopsis* Brèthes, and listed six species mainly for Hunan province. In the review of the Opiinae of China (Chen and Weng 2005) the genus was not recognized and the examination of the types by the second author was necessary to list the *Rhogadopsis* species among the newly described species in *Opius* Wesmael, 1835 s.l. Despite the general scope of the latter review there have been no species of *Rhogadopsis* found in NW China. Recent collecting in Shaanxi (especially the Qinling Mountains) and Ningxia resulted in a large collection of Opiinae and included several species of *Rhogadopsis*. In this paper we give the first results of the survey.

## Material and methods

The specimens were either collected by Malaise trap or by using a sweep net and directly preserved in 70% alcohol. The specimens were chemically treated with a mixture of xylene + alcohol 96% and amylacetate, respectively (AXA-method; van Achterberg 2009; van Achterberg et al. 2010). For identification of the subfamily Opiinae, see van Achterberg (1990, 1993); for identification of the Chinese genera, see Li et al. (2013); for references to the Opiinae, see Yu et al. (2012).

Morphological terminology follows van Achterberg (1988, 1993), including the abbreviations for wing venation. Measurements are taken as indicated by van Achterberg (1988): for the length and the width of a body part the maximum length and width is taken, unless otherwise indicated. The length of the mesosoma is measured from the anterior border of the mesoscutum to the apex of the propodeum and of the first tergite from the posterior border of the adductor to the medio-posterior margin of the tergite.

Observations and descriptions were made with an Olympus SZX11 stereomicroscope and fluorescent lamps. Photographic images were made with the Keyence VHX-5000 digital microscope. The specimens are deposited in the collections of the Northwest University (NWUX) at Xi'an and of the Naturalis Biodiversity Center (RMNH) at Leiden.

## Taxonomy

### *Rhogadopsis* Brèthes, 1913

Figs 1–62

*Rhogadopsis* Brèthes, 1913: 44; Shenefelt, 1975: 1212; Wharton, 1987: 66 (synonymy with subgenus *Lissosema*); Li et al., 2013: 147 (as valid genus). Type species (by monotypy): *Rhogadopsis miniacea* Brèthes, 1913 [examined].

*Lissosema* Fischer, 1972: 359. Type species (by original designation): *Opius parvungula* Thomson, 1895 [examined].

**Diagnosis.** Propodeum with a medio-longitudinal carina anteriorly (Figs 4, 14, 26, 36); vein m-cu of fore wing gradually merging into 2-CU1 and linear with vein 2-M, rarely angulate; vein 1r-m of hind wing less oblique and 0.7–1.0 times as long as vein 1-M; mandible triangular and with narrow ventral carina; occipital carina remaining separate from hypostomal carina ventrally; precoxal sulcus usually present and crenulate; anterior groove of metapleuron nearly always crenulate; veins CU1b and 1-SR of fore wing medium-sized; dorsope absent.

**Biology.** Parasitoids of Agromyzidae.

### Key to species of *Rhogadopsis* from NW China

- 1 Medio-posterior depression of mesoscutum absent (Figs 26, 36); ventral half of posterior groove of pronotal side sometimes smooth (Fig. 35) ..... **2**
- Medio-posterior depression of mesoscutum present (Figs 4, 14, 46), but sometimes only point-like impressed; ventral half of posterior groove of pronotal side crenulate (Figs 13, 45) ..... **3**
- 2 Vein r of fore wing long and slender, at least 5 times longer than wide medially (Fig. 24); pronotum coarsely and densely crenulate posteriorly (Fig. 25); first tergite without long median carina (Fig. 27); [face strongly punctate and tricoloured laterally; clypeus about twice as wide as high hardly protruding ventrally; first metasomal tergite parallel-sided; vein m-cu rather angled with 2-CU1] ..... ***R. longivena* sp. n.**
- Vein r of fore wing short and at most about twice as long as wide (Fig. 34); posterior groove of pronotum smooth or finely and sparsely crenulate (Fig. 35); first tergite with long median carina (Fig. 37); [propodeum largely smooth; setose part of ovipositor sheath about 0.7 times length of first tergite; clypeus about twice as wide as high, thin apically and evenly protruding; head brownish yellow anteriorly; posterior groove of pronotal side at least dorsally smooth] ..... ***R. mediocarinata* (Fischer, 1963)**
- 3 Mesoscutum of ♀ brownish yellow (Figs 55–56), of ♂ with brownish yellow or brown stripes; vein r of fore wing slender and about 3 times longer than its medial width (Fig. 54); area in front of notauli rugose (Fig. 55); metasoma of ♀ with yellow bands (Fig. 53; of ♂ mainly dark brown); vein 1-SR of fore wing 0.4–0.5 times as long as vein 1-M (Fig. 54); vein 3-SR 1.5–1.6 times as long as vein 2-SR; first metasomal tergite distinctly widened apically (Fig. 57); [apical half of parameres yellow; setose part of ovipositor sheath 0.6–0.7 times hind tibia and about 2.5 times as long as hind basitarsus (entire exerted sheath about 4 times (= equal to hind tibia)); vein 1r-m of hind wing 0.8–1.0 times as long as vein 1-M; ovipositor sheath lamelliform basally and glabrous] ..... ***R. pratellae* (Weng & Chen, 2005)**
- Mesoscutum black or dark chestnut brown (Figs 4, 14, 46); vein r of fore wing wider and about twice as long as its medial width or less (Figs 12, 44); area in front of notauli smooth or punctate (Figs 13, 45); metasoma of ♀

- without distinct yellow bands (Figs 11, 43); vein 1-SR of fore wing 0.3–0.4 times as long as vein 1-M (Figs 2, 12, 44); [apical half of parameres dark brown, brown or yellowish; length of eye 3.2–3.3 times temple in dorsal view] ..... **4**
- 4 Medially second and third tergites longitudinally rugulose-striate or aciculate (Fig. 5); vein r of fore wing about twice as long as wide (Fig. 2); first metasomal tergite distinctly widened apically (Fig. 5) ..... ***R. aciculifera* sp. n.**
- Medially second and third tergites smooth (Figs 15, 47); vein r of fore wing about as long as wide (Figs 12, 44); first tergite less widened apically (Figs 15, 47); [vein 3-SR 1.7–2.0 times as long as vein 2-SR] ..... **5**
- 5 Setose part of ovipositor sheath 0.2 times hind tibia and slightly shorter than hind basitarsus (Fig. 21); third and fourth antennal segments of ♀ rather slender (Fig. 16); first metasomal tergite elongate, 1.7–1.9 times longer than its apical width (Fig. 15); hind femur slenderer, 4.5–4.7 times as long as wide (Fig. 21); vein m-cu of fore wing gradually merging into vein 2-CU1 (Fig. 12) ..... ***R. cracentata* sp. n.**
- Setose part of ovipositor sheath 0.5–0.7 times hind tibia and about twice as long as hind basitarsus (Fig. 44); third and fourth antennal segments of ♀ robust (Fig. 52); first metasomal tergite rather stout, 1.2–1.4 times longer than its apical width (Fig. 47); hind femur wider, about 3.7 times as long as wide (Fig. 50); vein m-cu of fore wing rather angled with vein 2-CU1 ..... ***R. moniliata* sp. n.**

***Rhogadopsis aciculifera* Chen & van Achterberg, sp. n.**

<http://zoobank.org/81C62748-36DC-49BD-ADD6-78BF0030A075>

Figs 1–10

**Type material.** Holotype, ♀ (NWUX), “NW China: Shaanxi, Liping Nat. For. P., MT1+2, c. 1495 m, 22.vi.–4.ix.2015, 32°47'33"N, 106°39'52"E, JL. Tan & C. v. Achterberg”.

**Diagnosis.** Among the Chinese species of *Rhogadopsis* with the second and third metasomal tergites striate or aciculate the new species can be separated as follows: from *R. dimidia* (Chen & Weng, 2005) by having a medio-posterior depression of the mesoscutum (absent in *R. dimidia*), length of eye about 2.5 times temple in dorsal view (about 7 times) and basal half of notauli largely smooth (crenulate). *Rhogadopsis sculpta* (Chen & Weng, 2005) has the second and third tergites partly superficially striate, a medio-posterior depression of the mesoscutum and the anterior half of the notauli present on the mesoscutal disc, but has vein 2-SR+M of fore wing slightly shorter than vein m-cu or subequal (distinctly shorter than vein m-cu in *R. aciculifera*). *Rhogadopsis tabidula* (Weng & Chen, 2005) and *R. sculpturator* Li & van Achterberg, 2013, are similar but the new species has the anterior half of the notauli impressed (absent or as a shallow impression on mesoscutal disc in both species), hind femur and tibia similarly





**Figure 1.** *Rhogadopsis aciculifera* sp. n., female, holotype, habitus lateral.

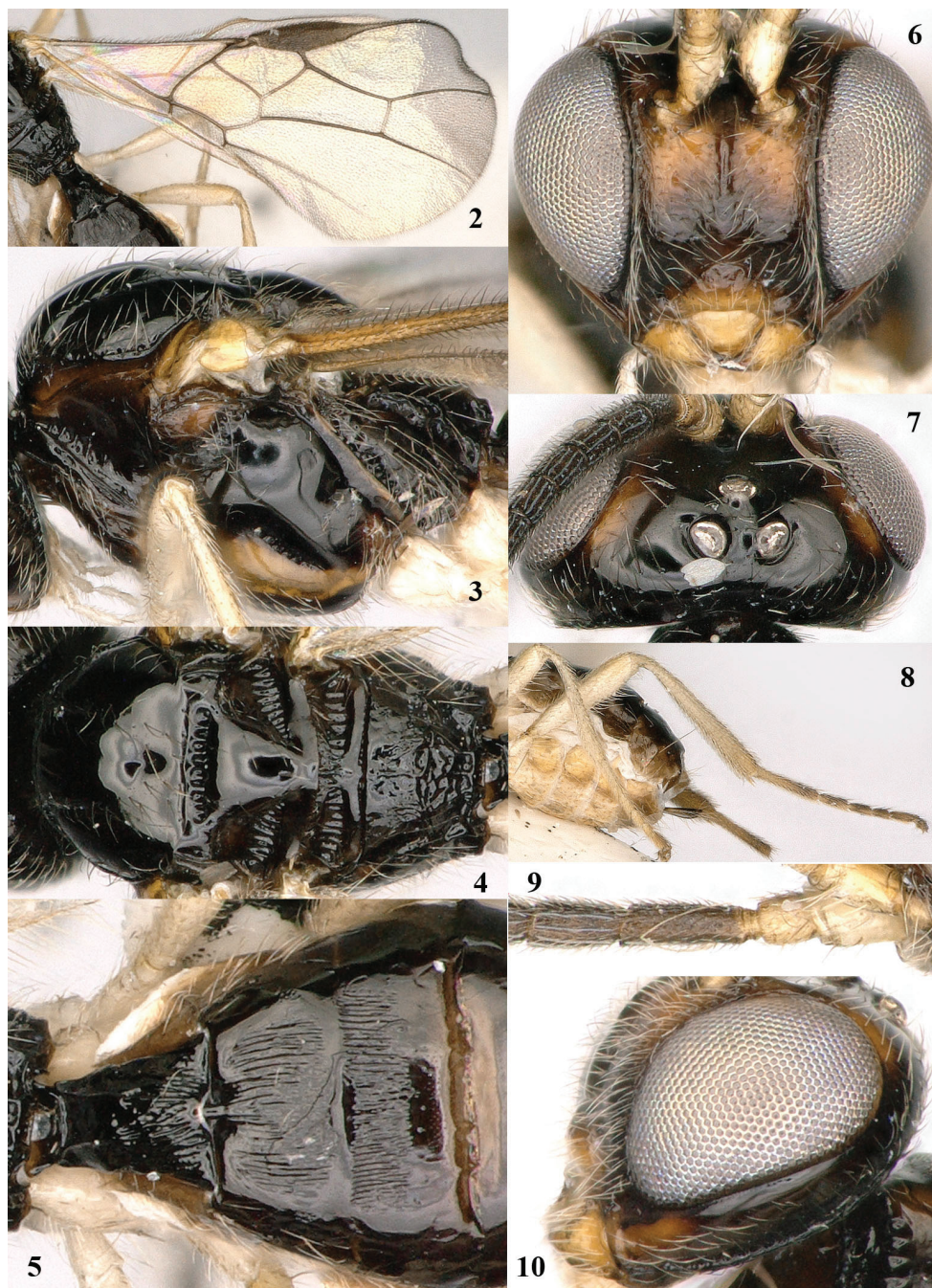
ivory as the hind coxa (hind femur and tibia yellow, different from pale hind coxa), vein r of fore wing about twice as long as wide (about as long as wide) and the propodeum without distinct costulae (with distinct costulae).

**Description.** Holotype, ♀, length of body 3.1 mm, of fore wing 3.4 mm.

**Head.** Antenna incomplete, with 16 segments remaining; third segment 1.6 times as long as fourth segment, length of third and fourth segments 3.6 and 2 times their width, respectively (Fig. 9); maxillary palp as long as height of head, labial palp segments slender; occipital carina rather far separated from hypostomal carina and dorsally absent; hypostomal carina narrow; length of eye in dorsal view 2.6 times temple; frons shallowly depressed, smooth and setose; face setose, with weak medial elevation, remotely and finally punctate (Fig. 6); width of clypeus 2.1 times its maximum height and 0.5 times width of face; clypeus rather flat, straight and thin ventrally (Figs 6, 10); hypoclypeal depression medium-sized (Fig. 6); malar suture wide; length of malar space 0.7 times as long as basal width of mandible; mandible triangular and with long carina (Fig. 10).

**Mesosoma.** Length of mesosoma 1.4 times its height; dorsal pronope large, deep and nearly round; pronotal side glabrous, mainly smooth and only medio-anteriorly crenulate; epicnemial area finely crenulate; precoxal sulcus medium-sized and crenulate (Fig. 3), remain removed from anterior and posterior margins of mesopleuron; remainder of mesopleuron smooth; pleural sulcus smooth; anterior groove of metapleuron crenulate; anterior half of notauli present on disc and smooth; mesoscutum largely glabrous, but setose along notaulic courses and laterally; medio-posterior depression of mesoscutum large and round (Fig. 4); scutellar sulcus wide and crenulate; scutellum slightly convex medially, smooth and glabrous; anterior half of propodeum with medio-longitudinal carina and smooth anteriorly, sparsely rugose medially and posteriorly (Fig. 4).

**Wings.** Fore wing (Fig. 2): pterostigma elliptical; 1-R1 ending at wing apex and 1.4 times as long as pterostigma;  $r:3-SR:SR1 = 8:58:92$ ;  $2-SR:3-SR:r-m = 30:49:19$ ; r



**Figures 2–10.** *Rhogadopsis aciculifera* sp. n., female, holotype. **2** wings **3** mesosoma lateral **4** mesosoma dorsal **5** first-third metasomal tergites dorsal **6** head anterior **7** head dorsal **8** hind leg **9** base of antenna **10** head lateral.

widened; 1-M and SR1 slightly curved; m-cu and cu-a far postfurcal; 1-SR 0.35 times as long as 1-M; first subdiscal cell closed, CU1b medium-sized; apical 0.3 of M+CU sclerotized. Hind wing (Fig. 2): M+CU:1-M:1r-m = 39:20:19; cu-a slightly curved; m-cu vaguely indicated.

*Legs.* Length of femur, tibia and basitarsus of hind leg 4.4, 8.4 and 7.5 times as long as wide, respectively; especially hind femur with long setae (Fig. 8).

*Metasoma.* Length of first tergite 1.3 times its apical width, its surface moderately convex and striate, medially with some grooves and minute punctures, dorsal carinae united subbasally (Fig. 5); second (as third) tergite largely striate, with pair of large basal depressions; following tergites smooth; length of setose part of ovipositor sheath 0.05 times fore wing and 0.2 times hind tibia, entire visible sheath 0.09 times fore wing (Fig. 8).

*Colour.* Black; palpi, metasoma ventrally and legs except dark brown hind tarsus (but basal half of basitarsus yellow) pale yellow or ivory; clypeus and face dorsally orange brown (Fig. 7); mandible (except black teeth), tegulae and veins at base of wings yellow; pterostigma and veins (except basal veins) dark brown; wing membrane subhyaline.

**Distribution.** China (Shaanxi).

**Biology.** Unknown.

**Etymology.** From “acicula” (Latin for “small pin”), because of the longitudinally rugulose-striate or aciculate second and third metasomal tergites (similar to the fine grooves made with a small pin), and “fera” (Latin for “carry, bear”).

### *Rhogadopsis cracentata* Tan & van Achterberg, sp. n.

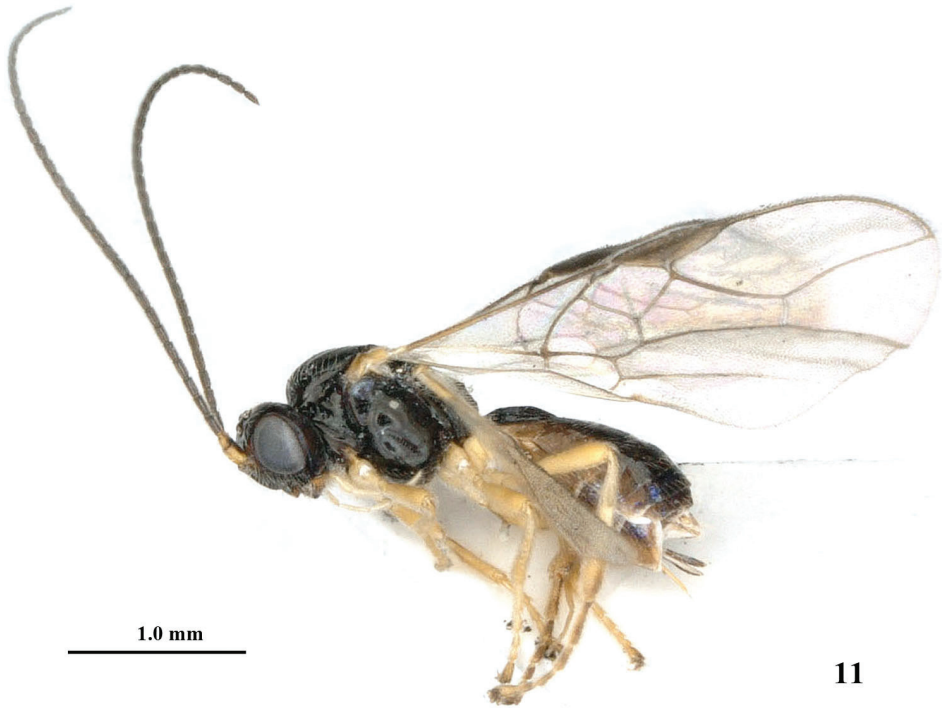
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Figs 11–22

**Type material.** Holotype, ♀ (NWUX), “NW. China: Shaanxi, Xunyangba, Ning-shan, c. 1300 m, 24.vi.2014, 33°33'N 108°32'E, Jiangli Tan, NWUX”. Paratypes: 1♂ (NWUX), same data as holotype; 1♀ (RMNH), id., but 2.vi.2014; 1♀ (NWUX), “NW China: Shaanxi, Liping Nat. For. P., c. 1500 m, 16.vi.2011, 32°50'N 106°31'E, Jiangli Tan”; 1♂ (RMNH), “NW China: Shaanxi, Baolongyu, Qin[ling] Mt[s], c. 1000 m, 10.vi.2015, 34°03'N 108°09'E, Jiangli Tan, NWUX”; 1♀ (NWUX), “NW China: Shaanxi, along the road from Huangbaiyuan to Taibai, 33°49'8.56"N, 107°39'38.64"E, 17.vii.2015, Jiangli Tan & Qingqing Tan”; 1♀ (NWUX), “NW China: Shaanxi, Nan-gong Mt. N.G., 32°14'52"N, 109°4'10"E, c. 2250 m, 10.vi.2016, Qingqing Tan”.

**Diagnosis.** The new species is close to *R. moniliata* sp. n., for the differences see the diagnosis of this species. It shares with *R. infernalis* (Fischer, 1966) from the Philippines the first tergite about 1.5 times as long as wide apically, antenna of ♂ with 35–37 segments and a rather short temple (eye 3.2–4.0 times as long as temple in dorsal view, not twice, as is mentioned in the original description, in the paratype examined). *Rhogadopsis infernalis* has the third antennal segment about twice as long as





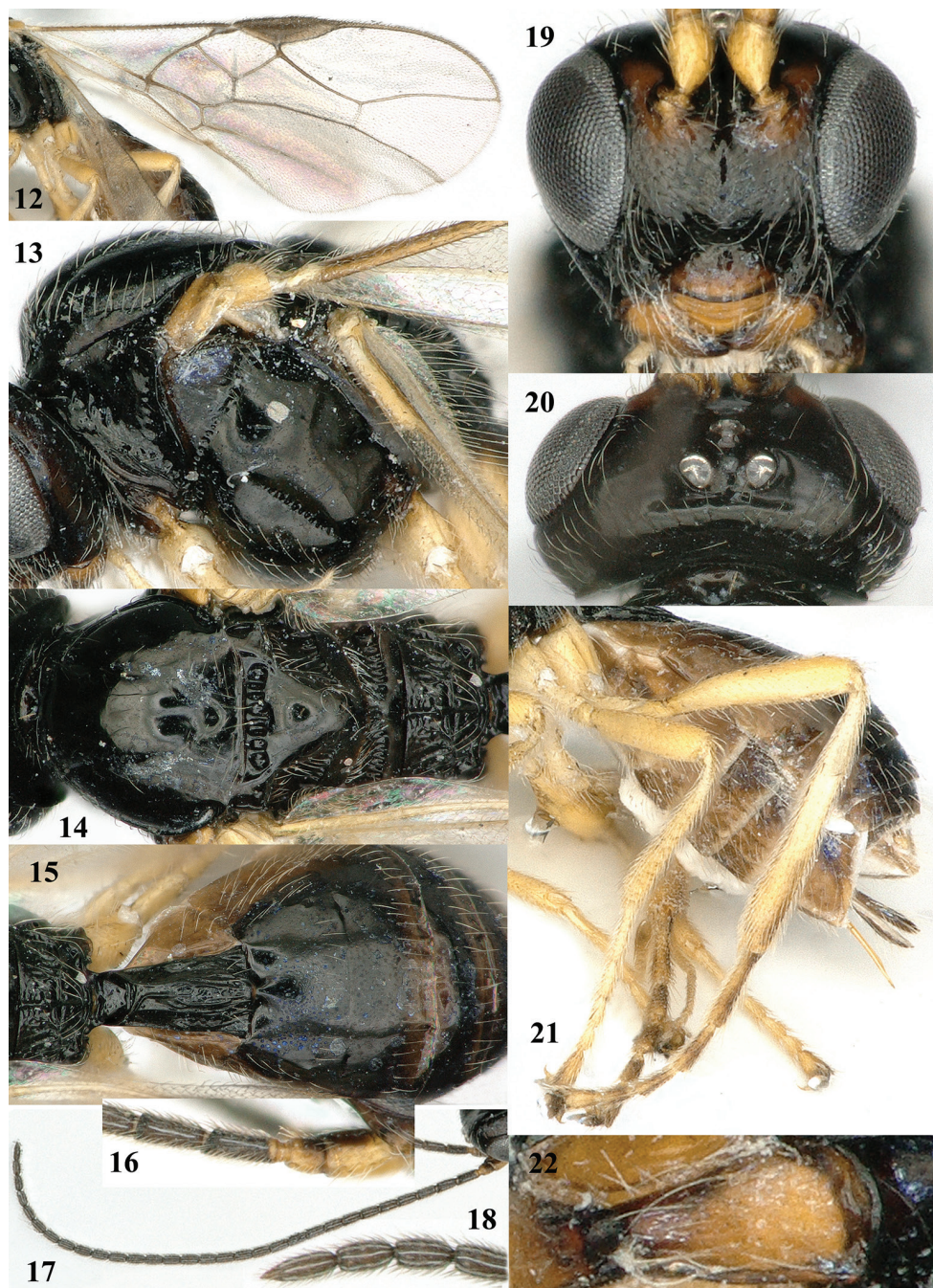
**Figure 11.** *Rhogadopsis cracentata* sp. n., female, holotype, habitus lateral.

wide (about 3 times in *R. moniliata*), the propodeum with some superficial rugae (with complete median carina and costulae), the precoxal sulcus short (long) and the hind femur 3 times as long as wide (about 4.5 times). The length of the ovipositor sheath of *R. infernalis* is unknown because the type series consists of only males.

**Description.** ♀, length of body 3.1 mm, of fore wing 3.6 mm.

*Head.* Antenna with 32 segments and 1.1 times as long as fore wing; third segment 1.2 times as long as fourth segment, length of third, fourth and penultimate segments 3.0, 2.6 and 2.0 times their width, respectively (Figs 16, 18); maxillary palp as long as height of head, labial palp segments slender; occipital carina separated from hypostomal carina and dorsally absent; hypostomal carina wide; length of eye in dorsal view 3.7 times temple; frons shallowly depressed, smooth and glabrous, laterally somewhat elevated; face smooth except punctulation, medially slightly elevated (Fig. 19); width of clypeus 1.7 times its maximum height and 0.5 times width of face; clypeus convex, punctate and protruding, slightly curved and thin ventrally (Fig. 19); hypoclypeal depression medium-sized (Fig. 19); malar suture present; length of malar space as long as basal width of mandible; mandible triangular and with narrow ventral carina (Fig. 22).

*Mesosoma.* Length of mesosoma 1.4 times its height; dorsal pronope large and wide elliptical; pronotal side glabrous, mainly smooth and only crenulate posteriorly and medio-anteriorly; epicnemial area crenulate; precoxal sulcus narrow and mainly



**Figures 12–22.** *Rhogadopsis cracentata* sp. n., female, holotype. **12** wings **13** mesosoma lateral **14** mesosoma dorsal **15** first-third metasomal tergites dorsal **16** base of antenna **17** antenna **18** apex of antenna **19** head anterior **20** head dorsal **21** hind leg **22** mandible lateral.

crenulate (Fig. 13), remain removed from anterior and posterior margins of mesopleuron; remainder of mesopleuron smooth; pleural sulcus smooth; anterior groove of metapleuron crenulate; notauli present on disc as shallowly depression; mesoscutum largely glabrous, but sparsely setose posteriorly and along notauli; medio-posterior depression of mesoscutum rather deep and round (Fig. 14); scutellar sulcus medium-sized and crenulate; scutellum slightly convex medially, smooth and glabrous, but setose posteriorly and laterally; propodeum with complete medio-longitudinal carina and smooth anteriorly and medially (Fig. 14).

**Wings.** Fore wing (Fig. 12): pterostigma wide elliptical; r widened and short; 1-R1 ending at wing apex and 1.5 times as long as pterostigma; r:3-SR:SR1 = 5: 69: 100; 2-SR:3-SR:r-m = 18:34:10; 1-M and SR1 slightly curved; cu-a postfurcal; first subdiscal cell closed, CU1b short; apical 0.3 of M+CU sclerotized. Hind wing: M+CU:1-M:1r-m = 10:10:6; cu-a straight; m-cu nearly absent.

**Legs.** Length of femur, tibia and basitarsus of hind leg 4.6, 8.0, 4.7 times as long as wide, respectively; especially hind femur with long setae (Fig. 21).

**Metasoma.** Length of first tergite 1.7 times its apical width, its surface moderately convex medially, finely rugose, dorsal carinae united and with short median carina (Fig. 15); second tergite smooth, with pair of large basal depressions; following tergites smooth; length of setose part of ovipositor sheath 0.06 times fore wing and 0.2 times hind tibia, entire visible sheath 0.07 times fore wing (Fig. 21).

**Colour.** Black; clypeus, scapus and pedicellus (except dark brown dorsal side), legs (but hind tarsus and apex of hind tibia brown dorsally), tegulae and veins of base of wing yellow; mandible yellowish brown (except its blackish teeth); palpi ivory; metasoma and ventrally mainly brown; ovipositor sheath, pterostigma and veins (except basal veins) dark brown; wing membrane subhyaline.

**Variation.** Length of body 2.7–3.3 mm, of fore wing 3.1–3.7 mm; antennal segments of ♀ 31(3) or 32(2) and of ♂ 35(1) or 37(1), length of hind femur 4.5–4.7 times its width; length of first tergite 1.7–1.9 times its apical width, length of setose part of ovipositor sheath 0.06 times fore wing and its visible part 0.07–0.10 times fore wing. Parameres of ♂ brown or apical half yellowish.

**Distribution.** China (Shaanxi).

**Biology.** Unknown.

**Etymology.** From “cracentis” (Latin for “slender”) because of the slender first metasomal tergite.

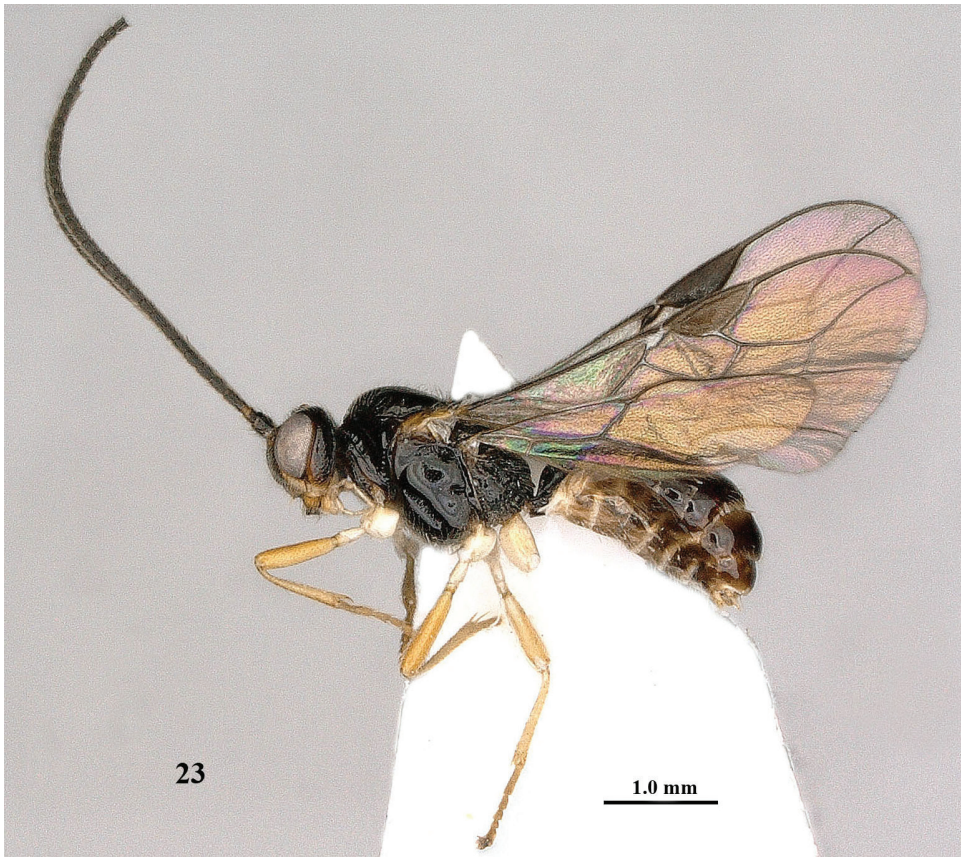
***Rhogadopsis longivena* Chen & van Achterberg, sp. n.**

<http://zoobank.org/BBCD7F03-B6CC-45FA-A018-D543BEA6F3CF>

Figs 23–32

**Type material.** Holotype, ♂ (NWUX), “NW China: Shaanxi, Liping Nat. For. P., MT1+2, c. 1495 m, 22.vi.-4.ix.2015, 32°47'33"N, 106°39'52"E, J.L. Tan & C. v. Achterberg”.





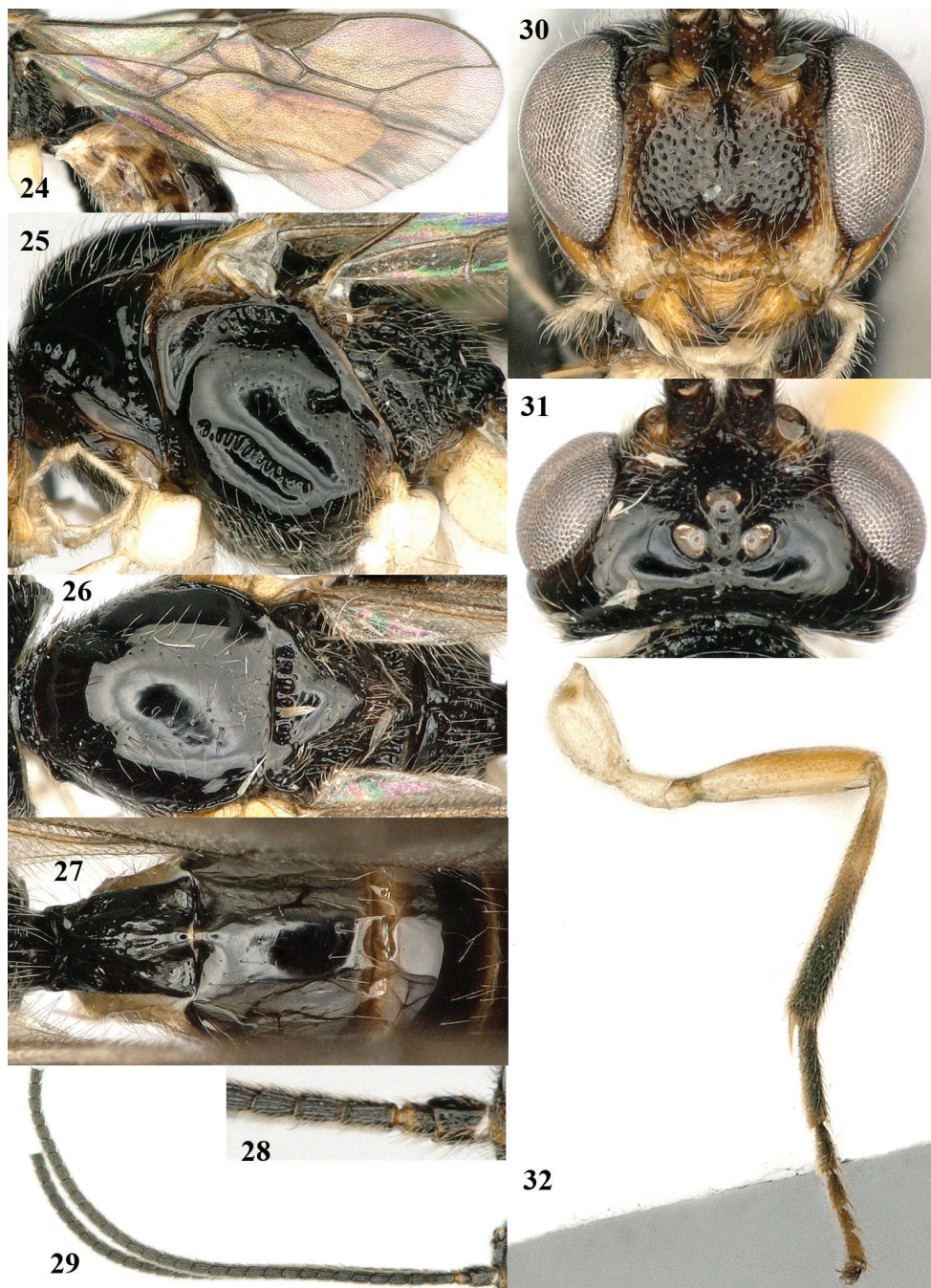
**Figures 23.** *Rhogadopsis longivena* sp. n., female, holotype.

**Diagnosis.** The combination of an absence of the medio-posterior depression of the mesoscutum (Fig. 26), the first metasomal tergite without a long median carina (Fig. 27) and vein r of the fore wing long and slender (at least 5 times longer than wide; Fig. 23) makes this species easy to separate from other known species.

**Description.** Holotype, ♂, length of body 4.4 mm, and of fore wing 4.2 mm.

**Head.** Antenna incomplete, 34 segments remaining, third segment 1.3 times as long as fourth segment, length of third, fourth and penultimate segments 2.0, 1.9 and 1.8 times their width, respectively (Figs 28–29); maxillary palp 1.3 times as long as height of head; labial palp segments slender; occipital carina rather far separated from hypostomal carina and carina dorsally absent; hypostomal carina narrow; length of eye in dorsal view 3.1 times temple; frons shallowly depressed, smooth and setose, laterally punctate and setose; face setose, with weak medial elevation, medially remotely and laterally densely punctate (Fig. 30); width of clypeus 2.1 times its maximum height and 0.5 times width of face, clypeus moderately convex, straight and thin ventrally (Fig. 30); hypoclypeal depression medium-sized (Fig. 30); malar suture present; length of malar space 1.1 times basal width of mandible; mandible triangular and with long carina.





**Figures 24–32.** *Rhogadopsis longivena* sp. n., female, holotype. **24** wings **25** mesosoma lateral **26** mesosoma dorsal **27** first-fourth metasomal tergites dorsal **28** base of antenna **29** antenna **30** head anterior **31** head dorsal **32** hind leg.

*Mesosoma.* Length of mesosoma 1.4 times its height; dorsal pronope absent; pronotal side glabrous, mainly smooth and only medio-anteriorly and posteriorly crenulate; epicnemial area smooth; precoxal sulcus medium-sized and crenulate, remain removed from anterior and posterior margins of mesopleuron; remainder of mesopleuron smooth; pleural sulcus smooth; anterior groove of metapleuron crenulate; notauli absent on disc; mesoscutum largely glabrous, but setose along notauli courses; medio-posterior depression of mesoscutum absent; scutellar sulcus rather narrow and crenulate; scutellum slightly convex medially; smooth and setose; propodeum with nearly complete medio-longitudinal carina and partly smooth anteriorly, sparsely rugose medially and with some crenulae posteriorly (Fig. 26).

*Wings.* Fore wing (Fig. 24): pterostigma triangular; 1-R1 ending at wing apex and 1.5 times as long as pterostigma;  $r:3-SR:SR1 = 10:31:52$ ;  $2-SR:3-SR:r-m = 20:31:14$ ;  $r$  slender and about 5 times longer than wide (Figs 23–24); 1-M and SR1 slightly curved; m-cu antefurcal; cu-a oblique and far postfurcal; first subdiscal cell closed and CU1b short; apical 0.2 of M+CU1 sclerotized. Hind wing (Fig. 24): M+CU:1-M:1r-m =  $14:19:12$ ; cu-a straight; m-cu completely absent.

*Legs.* Length of femur, tibia and basitarsus of hind leg 4.1, 7.8 and 5.2 times as long as wide, respectively; hind femur and tibia with long setae.

*Metasoma.* Length of first tergite 1.5 times its apical width, its surface moderately convex medially, some grooves and minute punctures, dorsal carinae united and with long median carina; second tergite smooth, with pair of rather large basal depressions; following tergites smooth.

*Colour.* Black, legs, clypeus and mandible brownish yellow (but teeth black); palpi, coxae, trochanters and trochantelli ivory; hind tarsus and apical half of tibia dark brown; malar space ivory; wing membrane subhyaline; metasoma largely (except T1) and pterostigma dark brown.

**Distribution.** China (Shaanxi).

**Biology.** Unknown.

**Etymology.** From “longus” (Latin for “long”) and “vena” (Latin for “vein”) because of the long vein  $r$  of the fore wing.

### *Rhogadopsis mediocarinata* (Fischer, 1963), **comb. n.**

Figs 33–42

*Opius mediocarinatus* Fischer, 1963: 297 (examined).

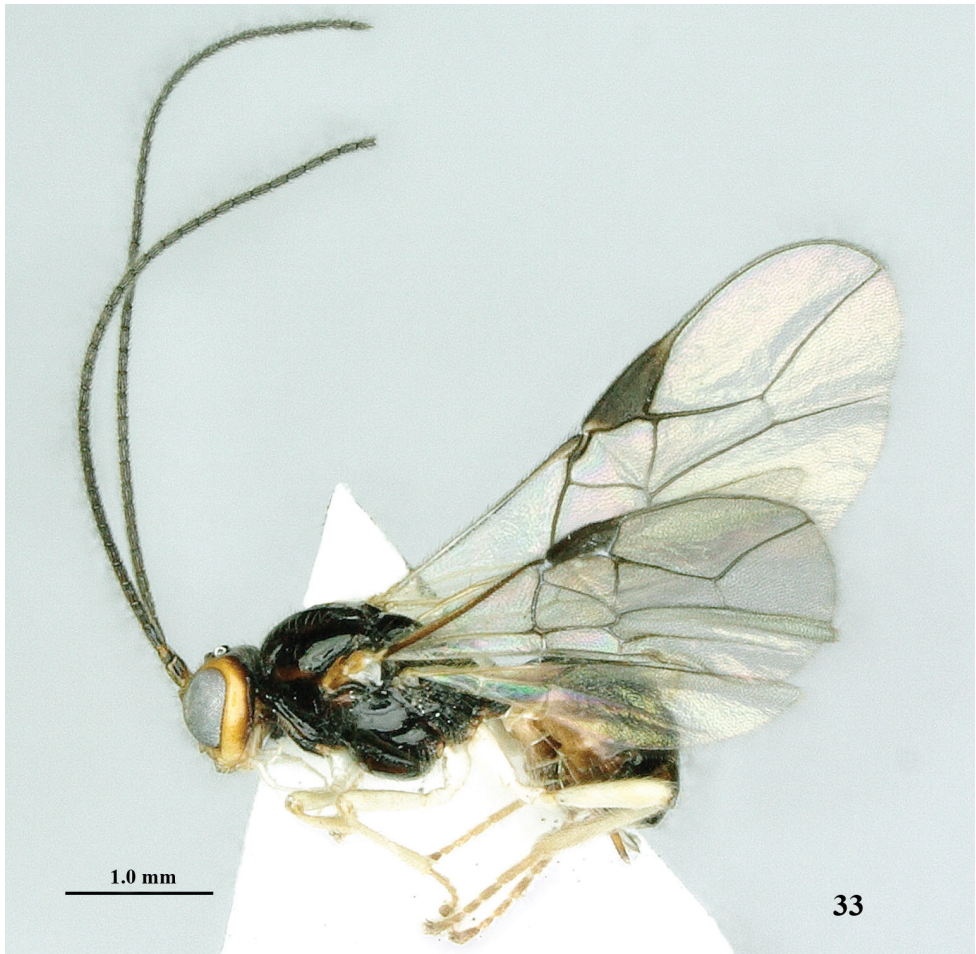
*Opius* (*Lissosema*) *mediocarinatus*; Fischer, 1972: 360–361.

*Opius* (*Psytalia*) *mediocarinatus*; Tobias, 1998: 611.

*Psytalia mediocarinata*; Tobias, 2000: 12.

**Type material.** Paratype of *O. mediocarinatus*, ♀ (Hungarian Natural History Museum, Budapest) from **Japan** (Honshu: Kamikochi) examined.





**Figure 33.** *Rhogadopsis mediocarinata* (Fischer), female, China, Liuba, habitus lateral.

**Additional material.** 1♀ (NWUX), “NW China: Shaanxi, Liuba, Hanzhong Zibai Mt. Nat. Res., N33.66° E106.78°, 5.ix.2015, c. 1627 m, Jiangli Tan, NWUX”; 1♀, “NW China: Shaanxi, Liping Nat. For. P., MT1+2, c. 1495 m, 22.vi-4.ix.2015, 32°47'33"N, 106°39'52 "E, JL Tan & C. v. Achterberg”; 1 ♀, “NW China: Shaanxi, Liping Nat. For. P., betw[een] Hongchenxia-Shicheng, c. 1490 m, 21.vi.2015, 32°47'N 106°40'E, JL Tan”.

**Diagnosis.** The combination of lacking a medio-posterior depression of the meso-scutum and the slender first metasomal tergite with a long median carina makes this species easy to separate from all other species in China.

**Description.** Female from Liuba, length of body 3.7 mm, of fore wing 4.1 mm.

**Head.** Antenna with 39 segments and 1.3 times as long as fore wing; third segment 1.2 times as long as fourth segment, length of third, fourth and penultimate segments 3.0, 2.4 and 1.3 times their width, respectively (Fig. 42); length of maxillary palp

1.3 times height of head; labial palp segments slender; occipital carina far separated from hypostomal carina and carina dorsally absent; hypostomal carina wide; length of eye in dorsal view 3.0 times temple; frons shallowly depressed, with oblique striae and glabrous, laterally punctate and setose; face punctate, medially elevated (Fig. 39); width of clypeus 3.0 times its maximum height and 0.6 times width of face; clypeus moderately convex, punctate and protruding, straight and thin ventrally (Figs 33, 38); hypoclypeal depression medium-sized (Fig. 39); malar suture absent; length of malar space 0.5 times basal width of mandible; mandible triangular and with narrow ventral carina (Fig. 38).

*Mesosoma.* Length of mesosoma 1.2 times its height; pronope absent; pronotal side smooth, only anteriorly and postero-ventrally crenulate; epicnemial area crenulate; precoxal sulcus wide and mainly punctate (Fig. 35), nearly up to anterior margin of mesopleuron; remainder of mesopleuron smooth; pleural sulcus smooth; anterior groove of metapleuron crenulate; notauli absent on disc, only anteriorly with pair of largely narrow and short smooth impressions (Fig. 36); mesoscutum largely glabrous; medio-posterior depression of mesoscutum absent; scutellar sulcus rather wide and crenulate; scutellum slightly convex medially, smooth and glabrous; propodeum with nearly complete irregular medio-longitudinal carina with crenulae and remainder smooth (Figs 36–37).

*Wings.* Fore wing (Fig. 34): pterostigma triangular; 1-R1 ending at wing apex and 1.6 times as long as pterostigma;  $r:3-SR:SR1 = 3:39:60$ ;  $2-SR:3-SR:r-m = 23:40:11$ ;  $r$  widened; 1-M nearly straight; SR1 slightly curved;  $m-cu$  and  $cu-a$  postfurcal; first subdiscal cell closed, CU1b short; apical 0.2 of  $M+CU1$  sclerotized. Hind wing (Fig. 34):  $M+CU:1-M:1r-m = 22:20:13$ ;  $cu-a$  straight;  $m-cu$  completely absent.

*Legs.* Length of femur, tibia and basitarsus of hind leg 5.0, 10.0 and 5.0 times as long as wide, respectively; hind femur and tibia with long setae (Fig. 41).

*Metasoma.* Length of first tergite 1.5 times its apical width, its surface rather slightly convex medially, finely rugulose, with median carina and with dorsal carinae remaining separated (Fig. 37); second tergite smooth, with pair of large basal depressions; following tergites smooth; length of setose part of ovipositor sheath 0.07 times fore wing and 0.2 times hind tibia (Fig. 41).

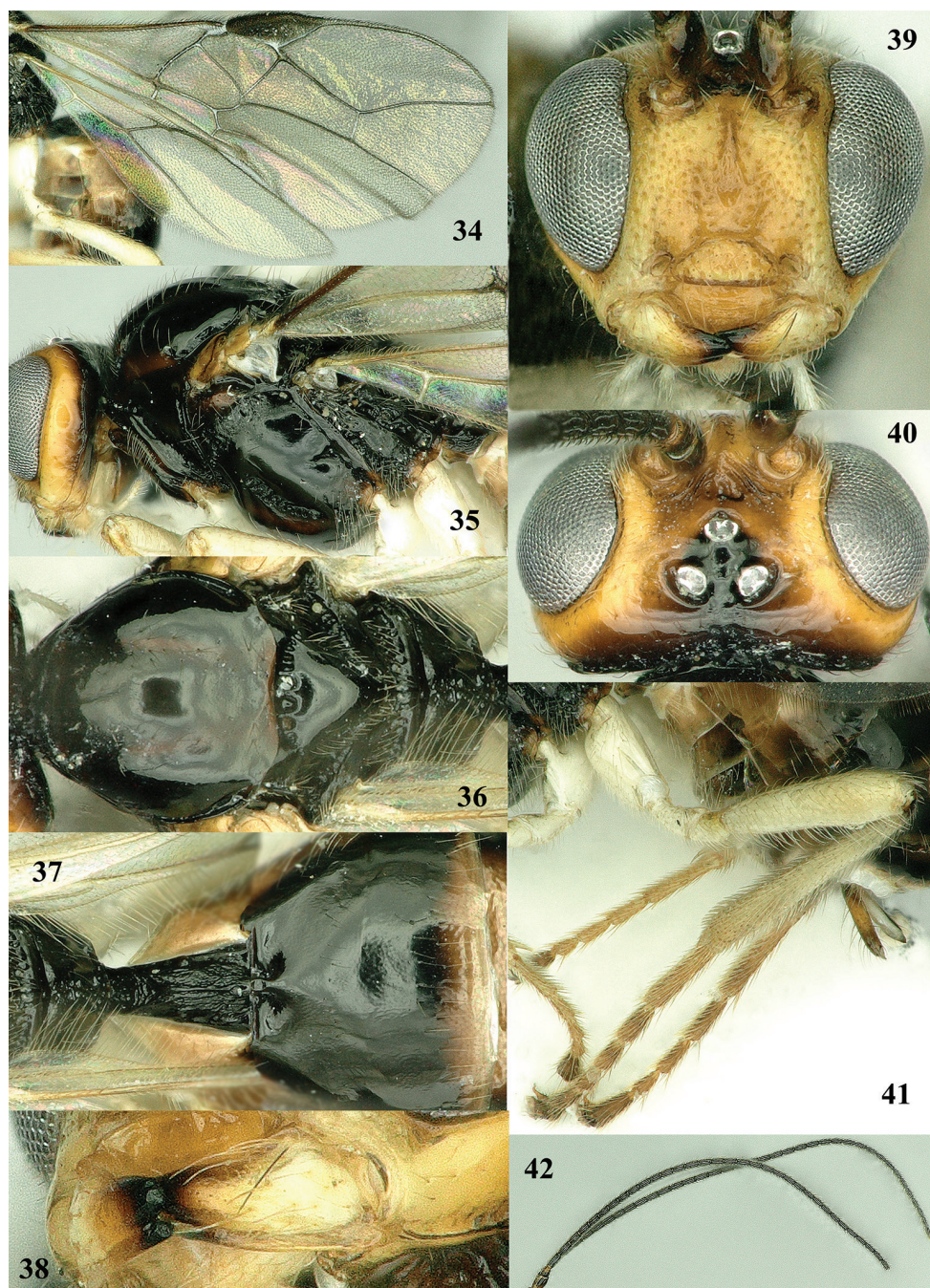
*Colour.* Black; palpi and legs (but tarsi brown) ivory or white; scapus and pedicellus ventrally, mandible (except black teeth), tegulae and head (except dark brown stemmaticum and posterior part of head yellow, but frons and face brownish medially (Fig. 39); wing membrane subhyaline; base and apex of ovipositor sheath dark brown; intermediate part of ovipositor sheath and veins of basal half of wing brown; pterostigma and remainder of veins dark brown.

**Variation.** Length of body 2.9–3.7 mm, of fore wing 3.1–4.1 mm; antennal segments of ♀ 35(1) or 39(1), length of first tergite 1.4–1.5 times its apical width, length of setose part of ovipositor sheath 0.07–0.10 times fore wing and 0.2–0.3 times hind tibia.

**Distribution.** China (Fujian, Hunan, \*Shaanxi), Far East Russia, Japan, Korea. The record from Spain (Avinent and Jiménez 1987) needs reconfirmation.

**Biology.** Unknown.





**Figures 34–42.** *Rhogadopsis mediocarinata* (Fischer), female, China, Liuba. **34** wings **35** mesosoma lateral **36** mesosoma dorsal **37** first-third metasomal tergites dorsal **38** mandible lateral **39** head anterior **40** head dorsal **41** hind leg **42** antenna.

***Rhogadopsis moniliata* Tan & van Achterberg, sp. n.**

<http://zoobank.org/D3CB76D7-9C18-4E6D-8AF0-882E1DC64631>

Figs 43–52

**Type material.** Holotype, ♀ (NWUX), “NW China: Shaanxi, Huanghualing Zhashui, 33.76°N, 108.85°E, 24.vii.2015, c 1377 m, Jiangli Tan, NWUX”. Paratypes: 1 ♀ (RMNH), same label data as holotype; 4♀1♂ (NWUX, RMNH), “NW China: Shaanxi, Liping Nat. For. P., MT1+2, c. 1495 m, 22.vi-4.ix.2015, 32°47'33"N, 106°39'52"E, JL Tan & C. v. Achterberg”; 1 ♀ (NWUX), “NW China: Shaanxi, Baolongyu, Qin[ling] Mt[s], c 1000 m, 10.vi.2015, 34°03'N 108°09'E, Jiangli Tan, NWUX”; 1♀ (NWUX) “NW China: Shaanxi, Qinling Mts, Foping, near Biol[ogical] Stat[ion], Mal[aise] trap, 33°39'29"N, 107°48'25"E, 29.v.-19.vi.2016, c 1710 m, JL. Tan & C. v. Achterberg, NWUX”.

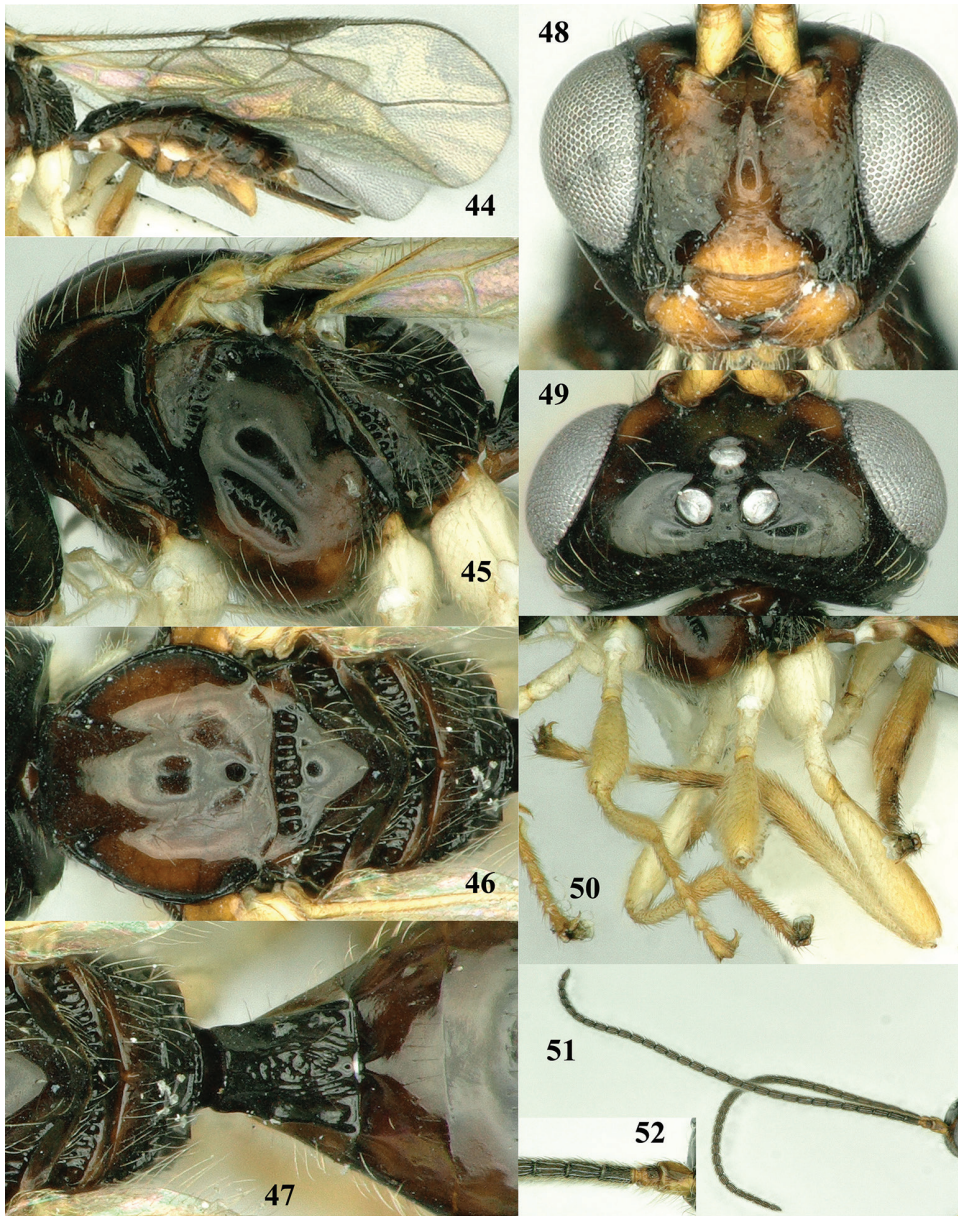
**Diagnosis.** The new species is similar to *R. cracentata* but the setose part of the ovipositor sheath is longer (0.5–0.7 times hind tibia and about twice as long as hind basitarsus versus 0.2 times hind tibia and slightly shorter than hind basitarsus in *R. cracentata*), the third and fourth antennal segments of the ♀ are robust (Fig. 52; slenderer in *R. cracentata*), the first metasomal tergite is rather stout (1.2–1.4 times longer than its apical width versus 1.5–1.9 times) and the hind femur is wider (about 3.7 times as long as wide versus 4.5–4.7 times).

It shares with *R. infernalis* (Fischer, 1966) from the Philippines the robust third antennal segment (being about twice as long as wide), the rather short temple (eye 3.2–4.0 times as long as temple in dorsal view) and the robust hind femur. *Rhogadopsis infernalis*



**Figure 43.** *Rhogadopsis moniliata* sp. n., female, holotype, habitus lateral.





**Figures 44–52.** *Rhogadopsis moniliata* sp. n., female, holotype. **44** wings **45** mesosoma lateral **46** mesosoma dorsal **47** propodeum and first-third metasomal tergites dorsal **48** head anterior **49** head dorsal **50** hind leg **51** head lateral **52** base of antenna.

has the propodeum with some superficial rugae (with complete median carina and costulae in *R. cracentata*), the precoxal sulcus short (long) and the antenna has about 37 segments (30–34 segments). The length of the ovipositor sheath of *R. infernalis* is unknown because the type series consists of only males.



**Description.** Holotype, ♀, length of body 3.1 mm, of fore wing 3.3 mm.

*Head.* Antenna with 33 segments and 1.1 times as long as fore wing; third segment 1.1 times as long as fourth segment, length of third, fourth and penultimate segments 2.3, 2.1 and 2.0 times their width, respectively (Fig. 52), maxillary palp as long as height of head; labial palp segments slender; occipital carina rather far separated from hypostomal carina and carina dorsally absent; hypostomal carina wide; length of eye in dorsal view 2.6 times temple; frons shallowly depressed, striae absent, with weak medial elevation and punctulate setose; face punctulate, medially elevated (Fig. 48); width of clypeus 2.4 times its maximum height and 0.55 times width of face, clypeus moderately convex, protruding, straight and thin ventrally (Fig. 48); hypoclypeal depression large (Fig. 48); malar suture present; length of malar space 0.8 times basal width of mandible; mandible triangular and with narrow ventral carina.

*Mesosoma.* Length of mesosoma 1.3 times its height; dorsal pronope absent; pronotal side smooth, only anteriorly and postero-ventrally crenulate; epicnemial area crenulate; precoxal sulcus narrow and crenulate (Fig. 45), absent anteriorly and posteriorly; remainder of mesopleuron smooth; pleural sulcus smooth; anterior groove of metapleuron crenulate; notauli narrow anteriorly, on disc shallowly impressed and smooth (Fig. 46); mesoscutum largely glabrous; medio-posterior depression of mesoscutum round and deep (Fig. 46); scutellar sulcus medium-sized and crenulate; scutellum slightly convex medially; smooth and glabrous medially but laterally with long setae; propodeum with complete regular medio-longitudinal carina and with some crenulae (Fig. 47).

*Wings.* Fore wing (Fig. 44): pterostigma triangular; 1-R1 ending at wing apex and 1.7 times as long as pterostigma;  $r:3-SR:SR1 = 2:17:24$ ;  $2-SR:3-SR:r-m = 13:24:11$ ;  $r$  short and widened; 1-M curved; SR1 slightly curved; m-cu postfurcal; first subdiscal cell closed; CU1b medium-sized; apical 0.2 of M+CU1 sclerotized; m-cu rather angled with 2-CU1. Hind wing (Fig. 44): M+CU:1-M:1r-m =  $24:20:15$ ; cu-a curved; m-cu vaguely indicated.

*Legs.* Length of femur, tibia and basitarsus of hind leg 3.7, 7.8 and 4.5 times as long as wide, respectively; hind femur and tibia with rather long setae.

*Metasoma.* Length of first tergite 1.4 times its apical width, its surface moderately convex medially, finely rugulose, dorsal carinae united and with short median carina (Fig. 47); second tergite with pair of large basal depressions; second and following tergites smooth; length of setose part of ovipositor sheath 0.16 times fore wing and 0.5 times hind tibia, entire visible sheath 0.23 times fore wing (Fig. 44).

*Colour.* Brownish black or black, face brown dorso-laterally and medio-ventrally; clypeus and mandible brownish yellow; scapus and pedicellus (but outer side partly dark brown), legs (but coxae and trochanters white and apex of hind tibia and hind tarsus dark brown dorsally), tegulae, base of wings and sternites laterally yellow; palpi white; sternites medially brown, pterostigma and veins (except base of wings) dark brown; wing membrane subhyaline.

**Variation.** Body length of 3.0–3.5 mm and of fore wing 3.3–3.7 mm; antenna of ♀ with 30(1), 31(3), 32(1) or 33(2) segments, antenna of ♂ with 34(1) segments

and third segment 2.2 times as long as wide; first tergite 1.2–1.4 times as long as its apical width; length of setose part of ovipositor sheath 0.16–0.20 times fore wing and 0.5–0.7 times hind tibia, entire visible sheath 0.18–0.23 times fore wing; anterior half of notauli hardly or not impressed but present in female from Foping; parameres dark brown; mesosoma partly dark brown or entirely black.

**Distribution.** China (Shaanxi).

**Biology.** Unknown.

**Etymology.** From “monile” (Latin for “necklace”) because of the rather necklace-like short antennal segments of the female.

### *Rhogadopsis pratellae* (Weng & Chen, 2005)

Figs 53–62

*Opius* (*Apodesmia*) *pratellae* Weng & Chen in Chen & Weng, 2005: 60–61, 189 (examined). *Rhogadopsis pratellae*; Li et al., 2013: 150.

**Type material.** Holotype, ♀ (FAFU), “[China:] **Fujian**, Mt. Wuyi, 2.viii.1988, Jinhua Ge”.

**Additional material.** 2♀4♂ (NWUX, RMNH), “NW **China: Ningxia**, Liupan Mt, Jingyuan Dongshanpo For. Farm, N35°23'26" E106°20'34.27", 4.viii.2015, c 1800 m, Jiangli Tan, NWUX”.

**Diagnosis.** *Rhogadopsis pratellae* shares with *R. maculosa* Li & van Achterberg, 2013, the longer vein 1-SR of the fore wing (0.5 times as long as vein 1-M), vein 3-SR of fore wing about 1.5 times as long as vein 2-SR and first metasomal tergite distinctly widened apically. It differs by having the first metasomal tergite about 1.3 times as long as wide apically (about as long as wide in *R. maculosa*), the propodeum mainly smooth except for carination (coarsely reticulate), the medio-posterior depression of the mesoscutum short elliptical or droplet-shaped (elongate), antenna with 29–34 segments (antenna with about 43 segments), area below the pterostigma subhyaline (slightly infusate) and the anterior half of the notauli developed on the mesoscutal disc (largely absent).

**Description.** ♀ from Liupan Mt., length of body and of fore wing 3.5 mm.

**Head.** Antenna with 33 segments and 1.1 times as long as fore wing; third segment 1.3 times as long as fourth segment, length of third, fourth and penultimate segments 2.2, 1.8 and 1.8 times their width, respectively (Figs 58, 62); maxillary palp as long as height of head, labial palp segments slender; occipital carina far separated from hypostomal carina and dorsally absent; hypostomal carina wide; length of eye in dorsal view 2.8 times temple; frons shallowly depressed, smooth and glabrous, laterally punctate and setose; face smooth except punctulation, medially elevated (Fig. 59); width of clypeus 2.3 times its maximum height and 0.7 times width of face; clypeus slightly convex, punctate and protruding, straight and thin ventrally (Fig. 59); hypoclypeal depression medium-sized (Fig. 59); malar suture absent, but with a short depression;



**Figure 53.** *Rhogadopsis pratellae* (Weng & Chen), female, China, Liupan Mt., habitus lateral.

length of malar space 0.8 times basal width of mandible; mandible triangular and with narrow ventral carina (Fig. 53).

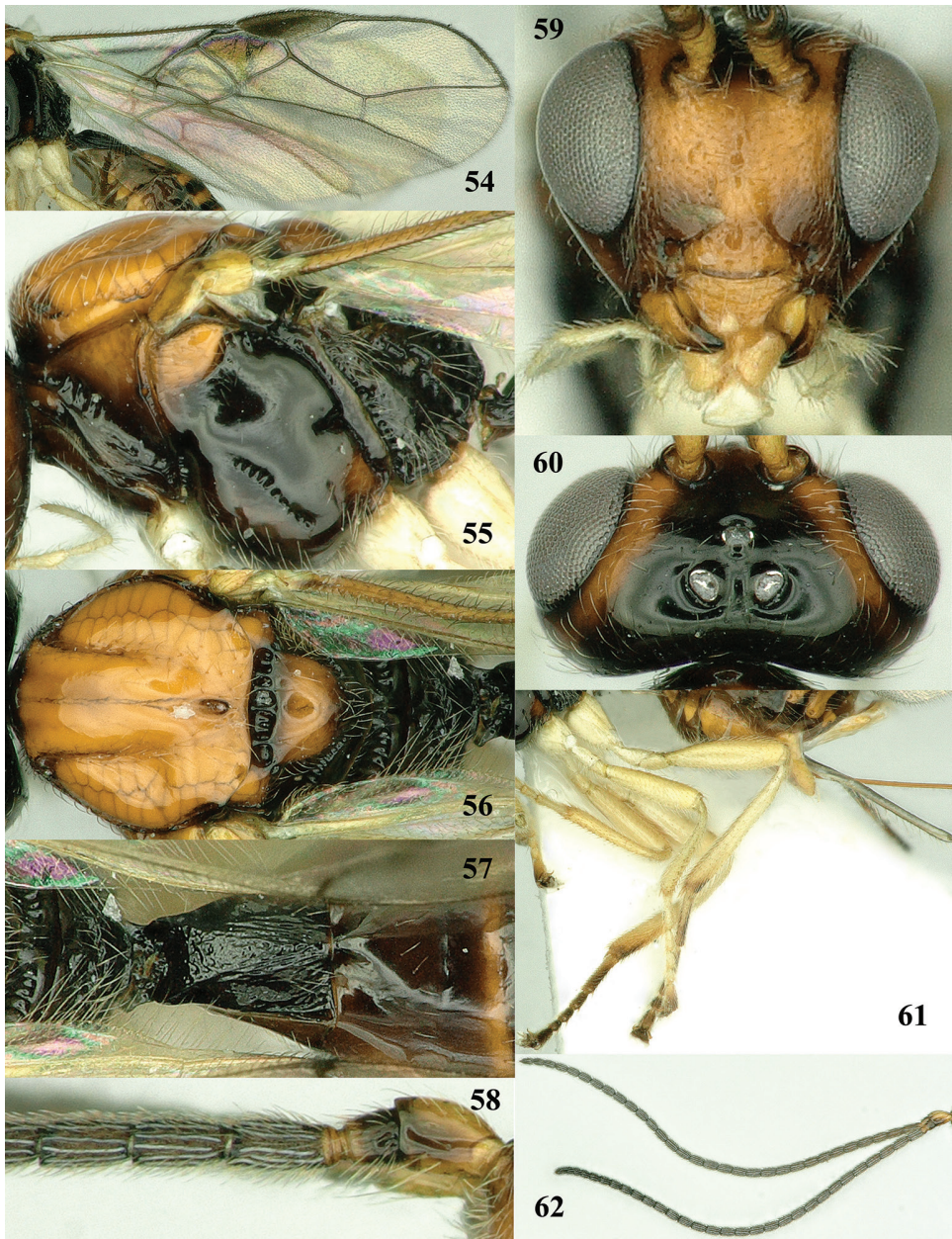
*Mesosoma.* Length of mesosoma 1.3 times its height; pronope large and round; pronotal side setose, mainly smooth and only crenulate medio-anteriorly; epicnemial area smooth; precoxal sulcus rather narrow and mainly crenulate (Fig. 55), remaining removed from anterior and posterior margins of mesopleuron; remainder of mesopleuron smooth; pleural sulcus smooth; anterior groove of metapleuron crenulate; notauli largely present on disc, smooth and only posteriorly absent (Fig. 56); mesoscutum largely glabrous, but sparsely setose posteriorly; medio-posterior depression of mesoscutum present, droplet-shaped (Fig. 56); scutellar sulcus rather wide and crenulate; scutellum slightly convex medially, smooth and glabrous, but setose posteriorly; propodeum with nearly complete medio-longitudinal carina and smooth anteriorly, rugose medially and with some crenulae posteriorly (Fig. 57).

*Wings.* Fore wing (Fig. 54): pterostigma triangular; 1-R1 ending at wing apex and 1.5 times as long as pterostigma;  $r:3-SR:SR1 = 5:32:54$ ;  $2-SR:3-SR:r-m = 21:30:8$ ;  $r$  rather short and widened; 1-M and SR1 slightly curved; m-cu and cu-a postfurcal; first subdiscal cell closed, CU1b short; apical 0.3 of M+CU1 sclerotized. Hind wing (Fig. 54):  $M+CU:1-M:1r-m = 20:17:15$ ; cu-a straight; m-cu nearly absent.

*Legs.* Length of femur, tibia and basitarsus of hind leg 4.2, 8.6 and 6.4 times as long as wide, respectively; hind femur and tibia with long setae (Fig. 61).

*Metasoma.* Length of first tergite 1.3 times its apical width, its surface evenly convex medially, finely striate but medially (except apically) largely rugulose (Fig. 57), without median carina and with dorsal carinae remaining separated, present on basal third of





**Figures 54–62.** *Rhogadopsis pratellae* (Weng & Chen), female, China, Liupan Mt. **54** wings **55** mesosoma lateral **56** mesosoma dorsal **57** propodeum and first-third metasomal tergites dorsal **58** base of antenna **59** head anterior **60** head dorsal **61** hind leg **62** antenna.

tergite; second tergite with pair of large triangular basal depressions; second and following tergites smooth; length of setose part of ovipositor sheath 0.22 times fore wing and 0.7 times hind tibia (Fig. 53); entire exposed sheath 0.28 times fore wing.

**Colour.** Black or blackish brown; palpi and legs (but telotarsi apically, hind tarsus largely and apical patch of hind tibia dark brown) ivory or pale yellowish; scapus (except dark brown outer side), mandible (except dark brown teeth) and tegulae yellow; remainder of antenna and ovipositor sheath dark brown; head (but dorsal part of head black except near eyes and face latero-ventrally and temple chestnut brown), mesoscutum, scutellum (except posteriorly), pronotum postero-dorsally, mesopleuron antero-dorsally, narrow dorsal transverse stripes of third-fifth tergites, lateral patches of second-seventh tergites and metasoma ventrally (except basally) yellowish brown (Fig. 53); veins of basal third of wings pale brown (except dark brown C+SC+R); pterostigma and remainder of veins dark brown; wing membrane subhyaline.

**Variation.** Length of body 2.6–3.5 mm, of fore wing 3.0–3.8 mm; antennal segments of ♀ 33(1) or 34(1), of ♂ 30(1), 31(2) or 32(1), length of first tergite 1.2–1.3 times its apical width, length of setose part of ovipositor sheath 0.20–0.22 times fore wing and 0.6–0.7 times hind tibia; males have mesoscutum and scutellum dark brown except more or less yellowish notaulic area, sometimes mesopleuron partly chestnut brown; males have first tergite similarly sculptured as female or rarely entirely smooth; metasoma of males (except first tergite) more or less dark brown; parameres (except basally) yellow.

**Distribution.** China (Fujian, \*Ningxia).

**Biology.** Unknown.

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