

# Five new species of *Spinaria* Brullé (Hymenoptera: Braconidae: Rogadinae) from Vietnam

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Key words: Braconidae; Rogadinae; *Spinaria*; new species; Vietnam.

Five new species of the genus *Spinaria* Brullé (Hymenoptera: Braconidae: Rogadinae) from Vietnam are described and illustrated: *Spinaria bachmana* spec. nov., *S. fulvicornis* spec. nov., *S. similis* spec. nov., *S. truongsonensis* spec. nov. and *S. vietnamica* spec. nov. Two species are newly recorded for Vietnam: *S. albitiventris* Cameron and *S. spinator* (Guérin-Méneville). A key to the species of the genus *Spinaria* from Vietnam is included.

## Introduction

The genus *Spinaria* Brullé, 1846 (Braconidae: Rogadinae: Rogadini: Spinariina) is a small genus restricted to the East Palaearctic, Oriental and Australian regions. Individuals are medium-sized and conspicuous because of the spines on both the metasomal tergites and the pronotum (figs 2, 5) and their colouration. As far as known, the species are solitary endoparasitoids of Limacodidae with pupation inside the mummified caterpillar. The genus has never been revised; only an overview exists with some suggestions for synonymy by Watanabe (1937) and some local keys have been published (e.g., Chen & He (1997) for China). In this paper the species from Vietnam are revised and in the accompanying paper by van Achterberg (2007) a key to all known species is presented for the first time. The total number of recognized described species is twelve (van Achterberg, 2007) and in this paper five new species are described from Vietnam, thus resulting in a total of 17 known species.

For recognition of the subfamily Rogadinae, see van Achterberg (1990, 1993, 1997). For recognition of the tribe and subtribe, see Chen & He (1997). For the terminology used in this paper, see van Achterberg (1988) and for the references to the original descriptions and the distribution outside Vietnam, see van Achterberg (2007). The scale-line in the plates indicates 1 mm.

## Taxonomy

### Key to species of the genus *Spinaria* Brullé from Vietnam

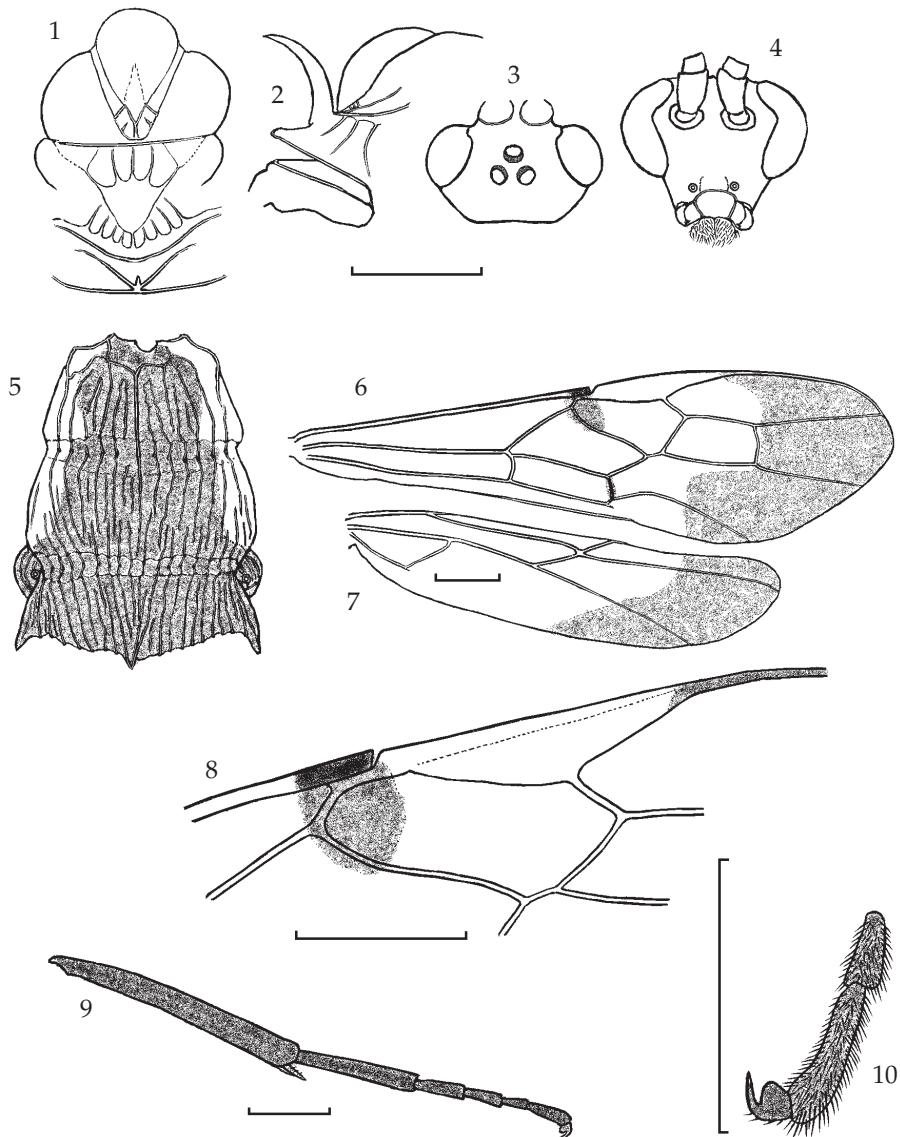
1. Metasoma pale yellowish to yellowish-brown dorsally (fig. 42); apical third of pterostigma more or less infuscate, sometimes most of pterostigma infuscate and only its base yellow (figs 40, 48); medio-posterior tubercle of fourth tergite hardly protruding posteriorly (fig. 42) ..... *S. spinator* (Guérin-Méneville, 1830)

- Metasoma at least partly dark brown or black dorsally (figs 5, 30, 49, 57, 64); apical third of pterostigma usually yellow (figs 6, 11); shape of medio-posterior tubercle of fourth tergite variable (figs 5, 17, 64, 65) ..... 2
- 2. First metasomal tergite completely yellowish-brown (fig. 17); hind femur and tibia yellowish; second and third tergites light or dirty brown medially (fig. 35) ..... 3
- First tergite with blackish patch (fig. 5); if patch is reduced or absent then hind femur and tibia largely dark brown; second and third tergites blackish medially (fig. 30) ..... 5
- 3. Precoxal sulcus without crenulae and only densely punctate (figs 34, 37); basal half of vein 3-CU1 of fore wing yellow; hind telotarsus comparatively slender (fig. 38); apical third of fore wing pale yellowish ..... *S. similis* spec. nov.
- Precoxal sulcus distinctly crenulate dorsally and punctate ventrally (fig. 53); basal half of vein 3-CU1 of fore wing dark brown; hind telotarsus less slender (figs 19, 54); colour of apical third of fore wing variable ..... 4
- 4. Apical third of fore wing largely dark brown (fig. 50); latero-basal areas of propodeum largely smooth; propodeum brownish-yellow ... *S. truongsonensis* spec. nov.
- Apical third of fore wing pale yellowish (fig. 11); latero-basal areas of propodeum coarsely granulate; propodeum more or less dark brown .... *S. bachmana* spec. nov.
- 5. Antenna yellowish-brown; membrane of fore wing yellowish apically (fig. 21); parastigma, vein 1-SR and apex of vein 3-CU1 of fore wing brownish and parastigmal spot indistinct (fig. 21) ..... *S. fulvicornis* spec. nov.
- Antenna largely black or nearly so; membrane of fore wing infuscate apically (figs 6, 60, 67); parastigma, vein 1-SR and apex of vein 3-CU1 of fore wing dark brown and parastigmal spot distinct (figs 6, 67, 68) ..... 6
- 6. Dark patch of second metasomal tergite parallel-sided or nearly so (fig. 5); third tergite beside median tubercle with shallow transverse depression; hind tarsus brown ..... *S. albiventris* Cameron, 1899
- Dark patch of second tergite distinctly narrowed posteriorly (figs 57, 64, 65), sometimes tergite pale yellowish posteriorly (fig. 64); third tergite beside median tubercle flat or nearly so; hind tarsus black or blackish ..... *S. vietnamica* spec. nov.

### Descriptions

*Spinaria albiventris* Cameron, 1899  
(figs 1-10)

Material.— 27 ♀ ♀ (IEBR, RMNH), “[Vietnam], Hoa Binh, Yen Thuy, Da Phuc 27.vii.2000, K.D. Long, Rog. 012”; “Ha Tay, Ba Vi, Van Hoa, 03.vi.2001, P. Th. Nhi, Rog. 008”; “Hoa Binh (Yen Thuy), scrubs, 5.ix.2002, K.D. Long, Rog. 227”; “Hoa Binh (Cuc Phuong N.P.), scrubs, 7-9.v.2002, K.D. Long, Rog. 002”; “Hoa Binh, Yen Thuy, Da Phuc, sugarcane, 5.ix.2002, K.D. Long, Rog. 226”; Ha Tinh (Huong Son), forest, 25-27.v.2004, Tr.X. Lam, Rog. 294; Nghe An (Pu Mat N.P.), 27.vii.2004, Tr.X. Lam, Rog. 313; (2 ♀ ♀) Ha Tinh (Huong Son), forest, 24.iv.2004, Tr.X. Lam, Rog. 288, 289; 2 ♀ ♀, id., but 5-8.v.2004, Rog. 307, 308; 3 ♀ ♀, id., but 25.v.2004, Rog. 385, 387, 390; 1 ♀, id., but 27.v.2004, Rog. 309; Nghe An (Con Cuong, Pu Mat NP), 5-8.v.2004, Tr.X. Lam, Rog. 312; Hoa Binh, Mai Chau, Pa Co, 7.viii.2004, Tr.X. Lam, Rog. 315; Nghe An (Con Cuong, Pu Mat N.P.), 21.vii.2004, N.Th.P. Lien, Rog. 316; 2 ♀ ♀, id., but 25.iv.2006, P.Th.Nhi, Rog. 409, 416; 1 ♀, id., but 17.iv.2006, Rog. 415; 1 ♀, id., but 23.iv.2006, Rog. 413; 1 ♀, id., but 27.iv.2006, Rog. 417; Kon Tum, Daklay, Lo Xo Pass, 25.vii.2004, Phong He thong hoc, Rog.



Figs 1-10, *Spinaria albiventris* Cameron, ♀, Vietnam. 1, mesoscutum and scutellum, dorsal aspect; 2, pronotal tooth, lateral aspect; 3, head, dorsal aspect; 4, head, anterior aspect; 5, first-third metasomal tergites, dorsal aspect; 6, fore wing; 7, hind wing; 8, pterostigma; 9, hind tibia and tarsus; 10, hind tarsal claw.

374; Hoa Binh, Yen Thuy, Bao Hieu, sugarcane, 20.iv.2004, K.D. Long, Rog. 394; Phu Tho (Xuan Son N.P.), scrubs + tea, 7.v.2005, P.Th. Nhi, Rog. 372; Nghe An (Tuong Duong, Pu Mat NP), 19.iv.2006. P.Th. Nhi, Rog. 412.

Notes.—The most commonly collected species of the genus *Spinaria* in Vietnam.

*Spinaria bachmana* spec. nov.  
(figs 11-20)

Material.— Holotype, ♀ (IEBR), “[Vietnam], Thua Thien-Hue (Bach Ma N.P.), 31.v.2001, K.D. Long, Rog. 003”.

Holotype, ♀, length of body 9.2 mm, of fore wing 8.5 mm, ovipositor sheath 1.0 mm.

Head.— Antenna broken, length of scapus equal to its maximal width, 1.4 times first antennal segment; ocelli medium-sized, diameter of lateral ocellus (OD) about 1.7 times POL and 0.7 times OOL; diameter of antennal sockets 1.7 times distance between them and twice distance from sockets to eye margin; distance between tentorial pits 1.6 times distance from pit to eye margin; malar space about 0.4 times height of eye and 1.1 times basal width of mandible; width of face equal to height of eye and 1.2 times height of face and clypeus combined.

Mesoma.— Spine on pronotum weakly curved (fig. 16); notauli deep and smooth anteriorly, widened posteriorly and with a Y-shaped carina; scutellar sulcus 0.6 times length of scutellum; scutellum smooth, with sparse setae; mesopleuron polished and smooth; precoxal sulcus wide and rugose crenulate; metapleuron smooth with sparse sharp pits; baso-lateral areas of propodeum roughly granulate; two thirds of apical half of propodeum with coarse carinae, posteriorly with two carinae which are united anteriorly.

Wings.— Fore wing: vein 2-SR 1.3 times as long as vein r, 0.4 times 3-SR and about 0.2 times vein SR1; vein cu-a 2.0 times vein 1-CU1. Hind wing with vein 2-SC+R quadrate; vein M+CU subequal to vein 1-M.

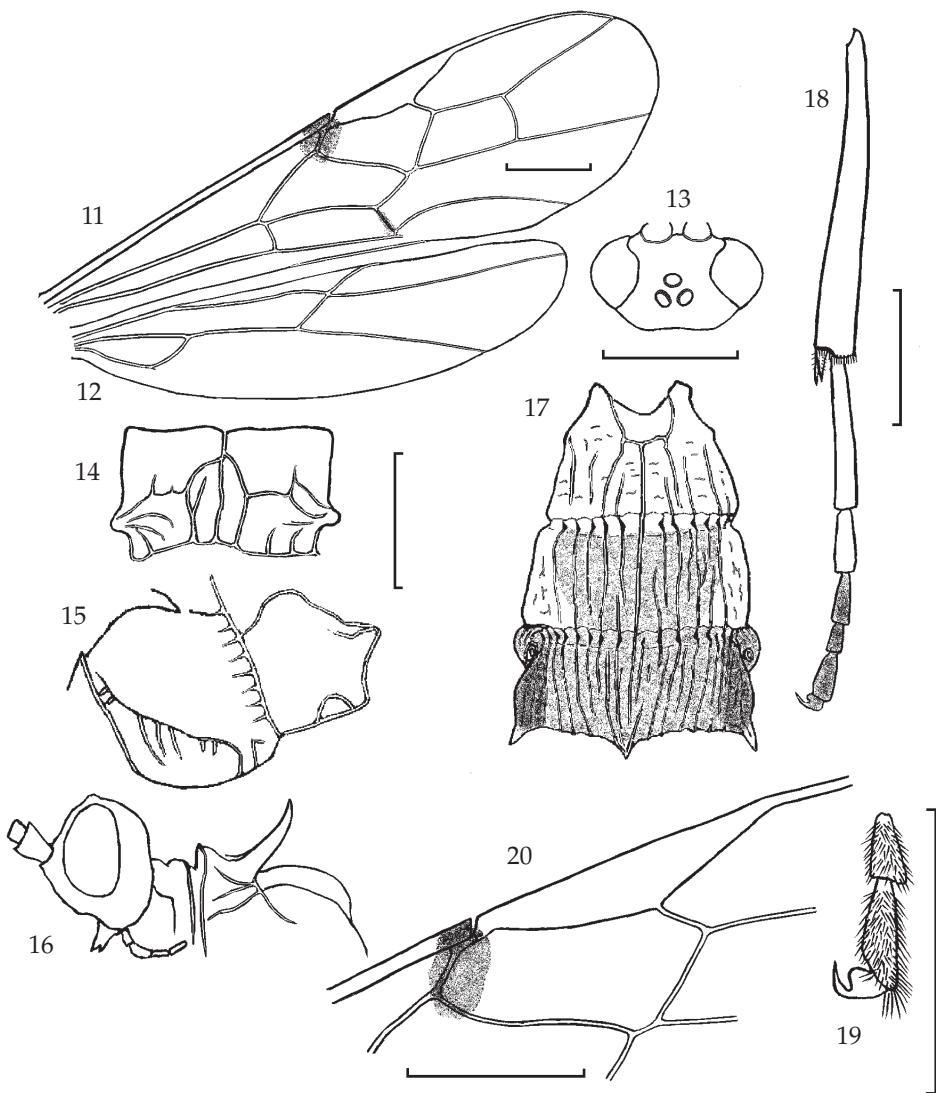
Legs.— Hind femur 4.7 times longer than wide, hind tibia 1.3 and 1.1 times hind femur and hind tarsus, respectively; hind basitarsus 0.85 times remainder of tarsus; second hind tarsal segment 0.45 times as long as basitarsus, 2.0 and 2.8 times fourth and telotarsal segments, respectively.

Metasoma.— Length of dorsal surface of first tergite 0.4 times its apical width and 0.8 times length of second tergite; dorsal surface of first tergite with sparse coarse carinae, diverging posteriorly, between carinae dully rugose-granulate; surface of second and third tergites with dense rugose carinae, between carinae rugose-granulate.

Colour.— Yellow; antenna blackish brown, but basal third of scapus yellow; legs yellow, but hind coxa and trochanter light brown; hind trochantellus, hind femur, hind tibia and basitarsus and second tarsal segment yellow; third-fifth hind tarsal segments infuscate; fifth metasomal tergite white; second tergite medially, third and fourth tergites light brown or infuscate; parastigma, vein 1-SR, basal third of vein 1-SR+M and vein 3-CU1 entirely blackish brown; wing membrane pale yellowish.

*Spinaria fulvicornis* spec. nov.  
(figs 21-30)

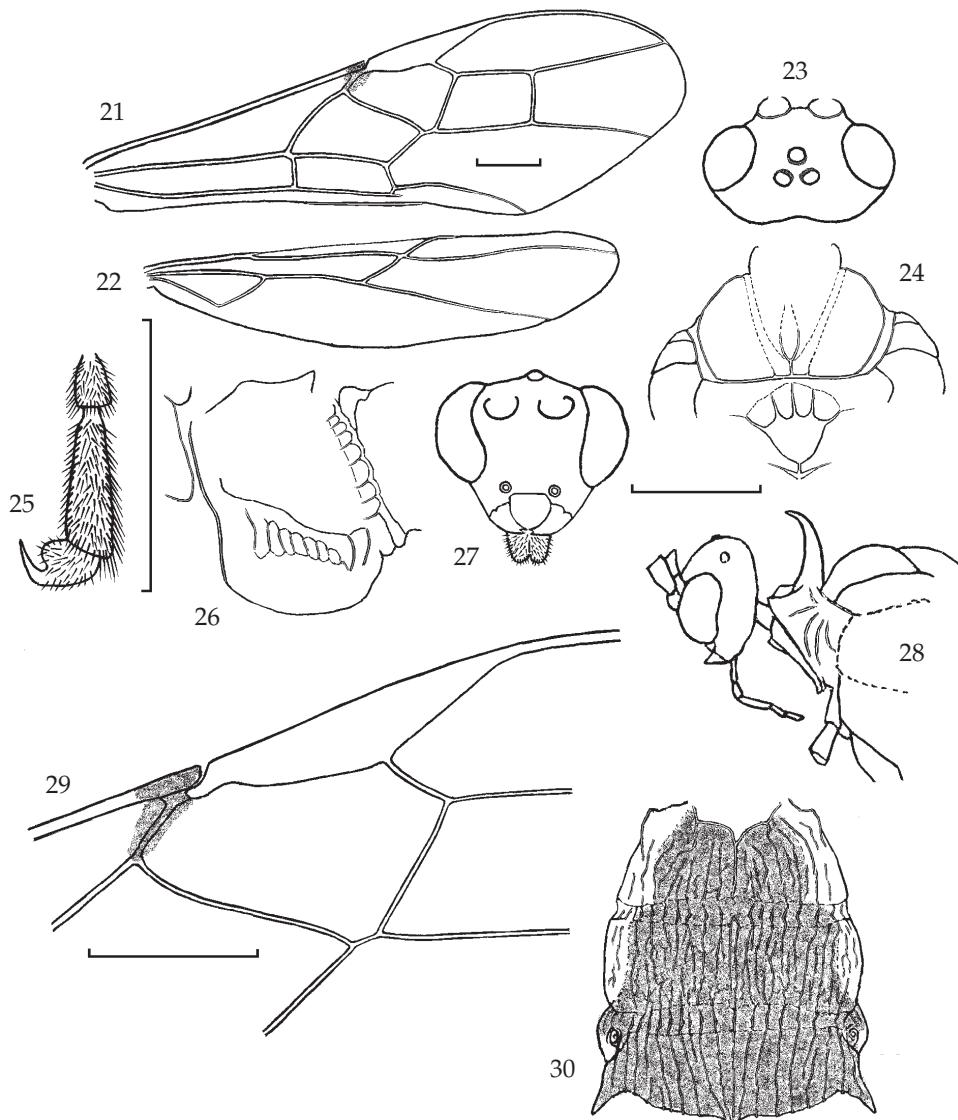
Material.— Holotype, ♀ (IEBR), “[Vietnam], Hoa Binh (Yen Thuy, Da Phuc), scrubs, 5.vii.2000, K.D. Long, Rog. 001”.



Figs 11-20, *Spinaria bachmana* spec. nov., ♀, holotype. 11, fore wing; 12, hind wing; 13, head, dorsal aspect; 14, propodeum, dorsal aspect; 15, meso- and metapleuron; 16, head and pronotal tooth, lateral aspect; 17, first-third metasomal tergites, dorsal aspect; 18, hind tibia and tarsus; 19, hind tarsal claw; 20, pterostigma.

Holotype, ♀, length of body 10.7 mm, of fore wing 12.4 mm, antenna 13.8 mm.

**Head.**—Length of scapus almost 1.4 times its maximum width, 1.5 times as long as third antennal segment and subequal to fourth segment; penultimate segment equal to third segment and 0.6 times apical segment, apical segment acute apically. Temple directly narrowed; diameter of lateral ocellus (OD) about 1.5 times POL and 0.6 times OOL; diameter of antennal sockets 1.1 times distance between sockets and 2.0 times



Figs 21-30, *Spinaria fulvicornis* spec. nov., ♀, holotype. 21, fore wing; 22, hind wing; 23, head, dorsal aspect; 24, mesoscutum and scutellum, dorsal aspect; 25, hind tarsal claw; 26, mesopleuron; 27, head, anterior aspect; 28, head and pronotal tooth, lateral aspect; 29, pterostigma; 30, first-third metasomal tergites, dorsal aspect.

distance from sockets to eye margin; distance between tentorial pits about 1.6 times distance from pit to eye; malar space about 0.8 times height of eye and 1.1 times basal width of mandible; width of face equal to height of eye and about 1.3 times height of face and clypeus combined.

**Mesoma.**— Spine on pronotum robust and strongly curved (fig. 28); notauli deep

and smooth anteriorly, wide and shallow posteriorly and with a Y shaped carina anteriorly with two long branches enclosing a posterior depression on mesoscutum (fig. 24); scutellar sulcus 0.6 times length of scutellum; mesopleuron polished and smooth; pre-coxal sulcus rather wide with rugose crenulae; metapleuron smooth with fine granulation; baso-lateral areas of propodeum smooth with strong granulation and large middle and apical areas with coarse rugose carinae.

**Wings.**— Fore wing: vein 2-SR about 2.4 times vein r, 0.8 times 3-SR and 0.4 times SR1; vein cu-a 3.6 times as long as vein 1-CU1. Hind wing with vein 2-SC+R quadrate; vein M+CU subequal to vein 1-M. Wing membrane densely and short setose.

**Legs.**— Hind femur 4.5 times as long as its maximum width; hind tibia 1.4 and 0.9 times hind femur and hind tarsus, respectively; hind basitarsus 0.8 times as long as remainder of tarsus; second tarsal segment 0.45 times as long as basitarsus, 1.8 and 1.3 times fourth and telotarsal segments, respectively.

**Metasoma.**— Dorsal face of first tergite about 0.4 times its apical width and 0.8 times length of third tergite; dorsal surface of first tergite with sparse longitudinal carinae, between carinae coarsely granulate; dorsal surface of second tergite with longitudinal carinae more or less connected, with dense rugosities and rugose granulation apically.

**Colour.**— Body reddish yellow; antenna (including scapus and pedicellus) yellow; hind coxa and trochanter brown; hind trochantellus yellow; hind femur infuscate basally and distinctly darkened dorsally and ventrally; hind tibia yellow; first-fourth hind tarsal segments light brown; hind telotarsus and tarsal lobe blackish brown; propodeum reddish yellow but reddish brown laterally; first tergite yellow basally; large middle areas of first and second tergites black; lateral areas of first and second tergites yellow; third and fourth tergites black, except for yellow basal corners of fourth tergite; fifth tergite white or whitish yellow; parastigma and vein 1-SR yellowish brown; vein 3-CU1 dark brown; wing membrane yellowish, but becoming paler basally.

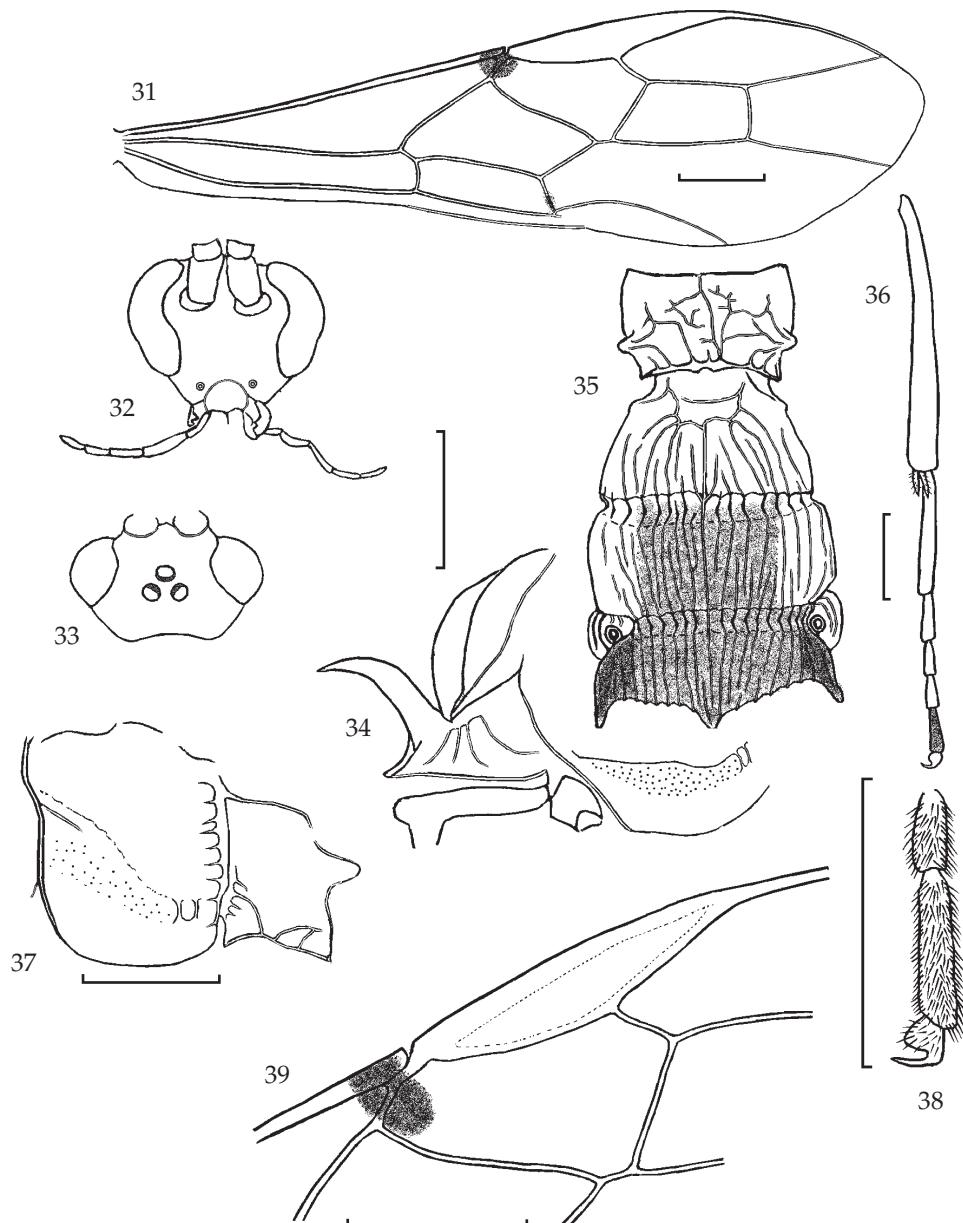
*Spinaria similis* spec. nov.  
(figs 31-39)

**Material.**— Holotype, ♀ (IEBR), “[Vietnam], Thua Thien-Hue (Bach Ma N.P.), 30.v.2001, K.D. Long, Rog. 006”.

Holotype, ♀, length of body 12.6 mm, of fore wing 9.7 mm, ovipositor 1.2 mm.

**Head.**— Antenna broken; length of scapus almost 1.2 times its maximum width, about 1.6 times third antennal segment, third antennal segment 1.1 times as long as fourth segment; diameter of lateral ocellus (OD) about 1.5 times POL and 0.75 times OOL; diameter of antennal sockets about 1.4 times distance between them and 1.8 times distance from sockets to eye margin; tentorial pits large, distance between tentorial pits 1.7 times distance from pit to eye margin; malar space 0.4 times height of eyes and about 1.2 times basal width of mandible; face width equal to height of eye and 1.4 times height of face and clypeus combined.

**Mesoma.**— Spine on pronotum robust and strongly curved (fig. 34); notaular deep anteriorly, wide and shallow posteriorly and with a median carina; scutellar sulcus about 0.6 times as long as scutellum; scutellum smooth, with sparse setae; mesopleuron polished and smooth; pre-coxal sulcus wide and shallow, with dense sharp punc-



Figs 31-39, *Spinaria similis* spec. nov., ♀, holotype. 31, fore wing; 32, head, anterior aspect; 33, head, dorsal aspect; 34, pronotal tooth, lateral aspect; 35, first-third metasomal tergites, dorsal aspect; 36, hind tibia and tarsus; 37, meso- and metapleuron; 38, hind tarsal claw; 39, pterostigma.

tures; metapleuron smooth with sparse punctures; basal third of propodeum with median carina; baso-lateral areas of propodeum smooth, large middle and apical areas roughly rugose.

**Wings.**— Fore wing: vein 2-SR 1.9 times as long as vein r, 0.8 times 3-SR and about 0.4 times SR1; vein cu-a about 2.4 times 1-CU1. Hind wing with vein 2-SC+R quadrate; vein M+CU 1.1 times as long as vein 1-M.

**Legs.**— Hind tibia about 1.4 times as long as hind femur and equal to hind tarsus; hind basitarsus 0.4 times as long as remainder of tarsus; second tarsal segment 0.4 times as long as hind basitarsus; fourth hind tarsal segment 0.5 times hind telotarsus.

**Metasoma.**— Dorsally first tergite 0.3 times as long as its apical width and 0.8 times length of second tergite; first-third tergites with coarse longitudinal carinae, between carinae densely rugose granulate; first metasomal suture deep and wide, medially with coarse carinae; suture of second and third tergites shallower than first metasomal suture.

**Colour.**— Yellow; scapus reddish yellow basally; pedicellus and flagellum blackish brown; hind coxa and trochanter brown; hind trochantellus, femur, tibia and tarsus (except telotarsus) yellow; hind telotarsus brown; propodeum reddish yellow, but dark brown laterally; first tergite and lateral areas of second tergite yellow; second tergite medially, third and fourth tergites light brown; lateral spines of second and third tergites pale yellow; fifth tergite white; parastigma, veins 1-SR and apical third of vein 3-CU1 brown; small parastigmal spot dark brown (fig. 31); wing membrane pale yellowish; ovipositor sheath white basally.

*Spinaria spinator* (Guérin-Méneville, 1830)  
(figs 40-48)

**Material.**— 1 ♀ (IEBR), “[Vietnam], Hoa Binh (Yen Thuy), scrubs + sugarcane, 2.x.2002, K.D. Long, Rog. 230”; 2 ♀ ♀ (IEBR, RMNH), “Phu Tho (Xuan Son N.P.), scrubs + tea, 6.xii.2003, Tr.X. Lam, Rog. 285, Rog. 286”.

**Notes.**— Widespread species (van Achterberg, 2007).

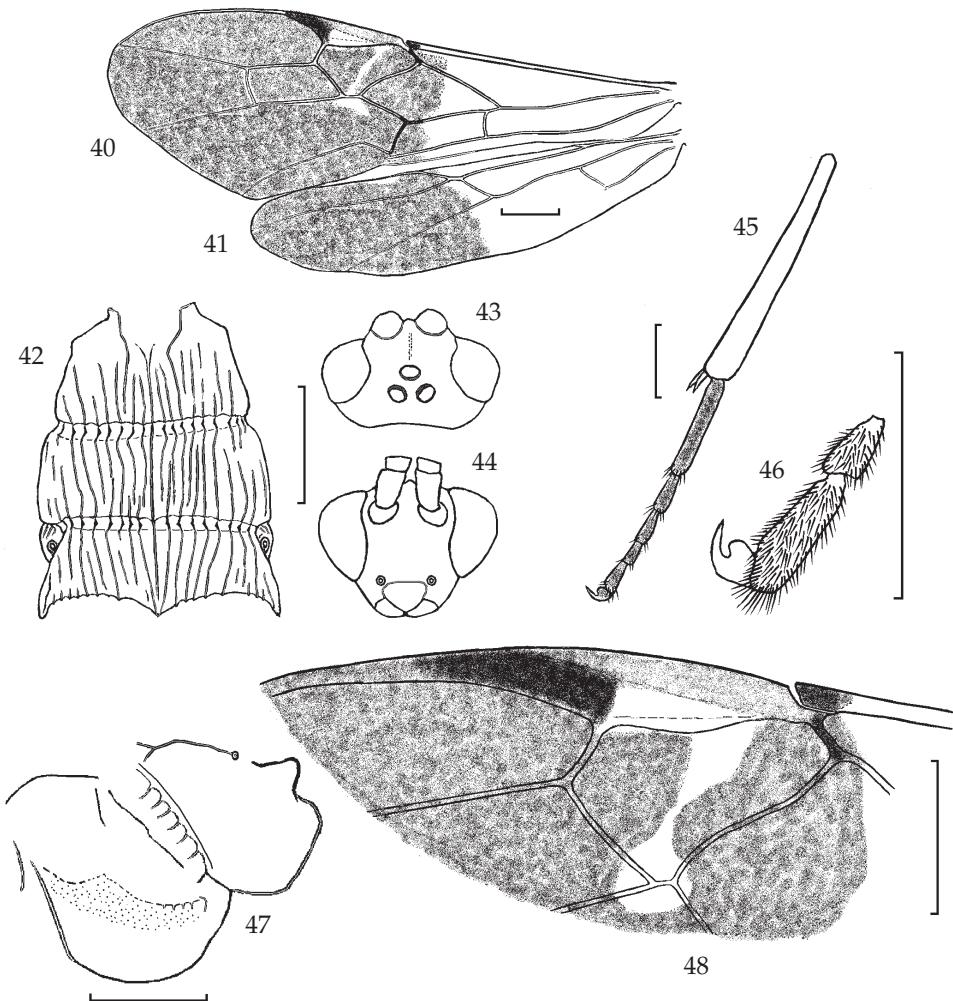
*Spinaria truongsonensis* spec. nov.  
(figs 49-54)

**Material.**— Holotype, ♀ (IEBR), “[Vietnam], Nghe An (Con Cuong, Pu Mat N.P.), forest, 22.vii.2004, N.Th.P. Lien, Rog. 317”. Paratype, ♀ (RMNH), “Ha Tinh (Huong Son), forest, 5-8.v.2004, Tr.X. Lam, Rog. 310”.

Holotype, ♀, length of body 12.3 mm, of fore wing 10.4 mm.

**Head.**— Length of scapus about 1.4 times its maximum width and about 1.7 times as long as third antennal segment; third antennal segment 1.1 times as long as fourth segment; temple rather roundly narrowed; diameter of lateral ocellus (OD) 1.75 times POL and subequal to OOL; diameter of antennal sockets about 1.7 times distance between them and 2.0 times distance from sockets to eye margin; tentorial pits large, distance between tentorial pit 2.1 times distance from pit to eye margin; length of malar space 0.4 times height of eye and 1.3 times basal width of mandible; width of face equal to height of eye and 1.2 times height of face and clypeus combined.

**Mesosoma.**— Spine on pronotum robust and strongly curved; notauli deep anteriorly, wide and shallow, posteriorly with a median carina; scutellar sulcus about 0.6

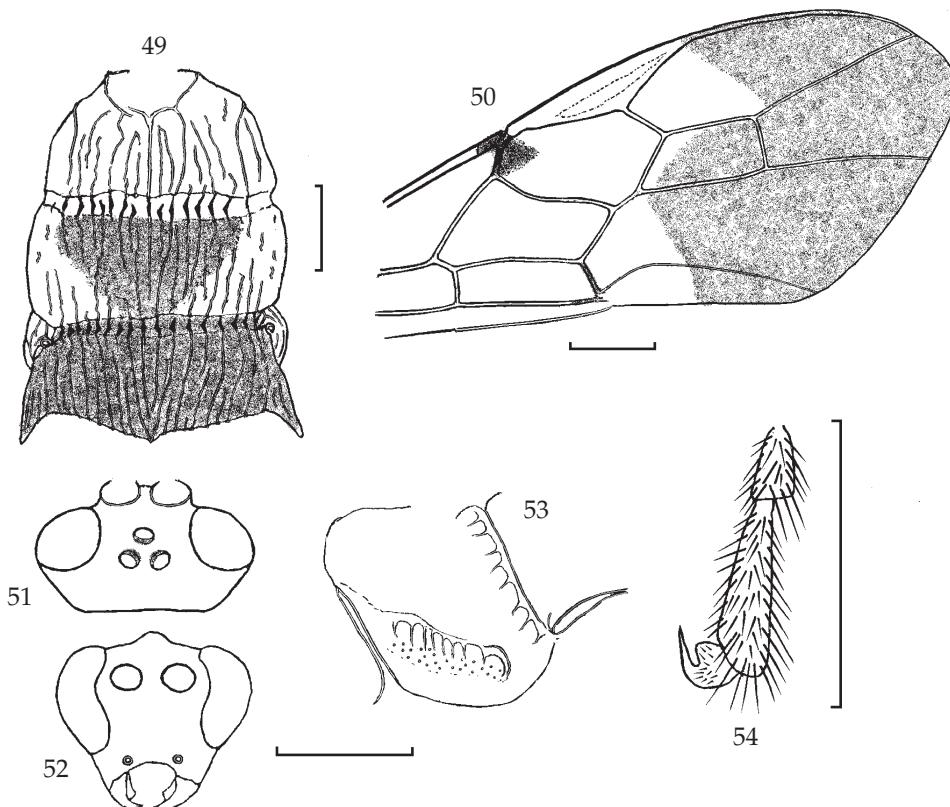


Figs 40-48, *Spinaria spinator* (Guérin-Méneville), ♀, Vietnam. 40, fore wing; 41, hind wing; 42, first-third metasomal tergites, dorsal aspect; 43, head, dorsal aspect; 44, head, anterior aspect; 45, hind tibia and tarsus; 46, hind tarsal claw; 47, meso- and metapleuron; 48, pterostigma.

times as long as scutellum; mesopleuron polished and smooth, with sparse sharp punctures; precoxal sulcus wide, shallow and crenulate; metapleuron smooth with sparse punctures as in mesopleuron; baso-lateral areas of propodeum smooth and with a short median carina apically; median and apical areas of popodeum coarsely rugose.

**Wings.**—Fore wing: vein 2-SR 1.75 times vein r, 0.8 times 3-SR and about 1.6 times SR1; vein r-m straight; vein cu-a 3.6 times vein 1-CU1. Hind wing: vein 2-SC+R quadrate; vein M+CU subequal to vein 1-M.

**Legs.**—Hind tibia 1.5 times as long as hind femur and 1.5 times hind tarsus; hind basitarsus 0.7 times as long as remainder of tarsus; second hind tarsal segment 0.4 times hind basitarsus; hind fourth tarsal segment 0.5 times as long as hind telotarsus.



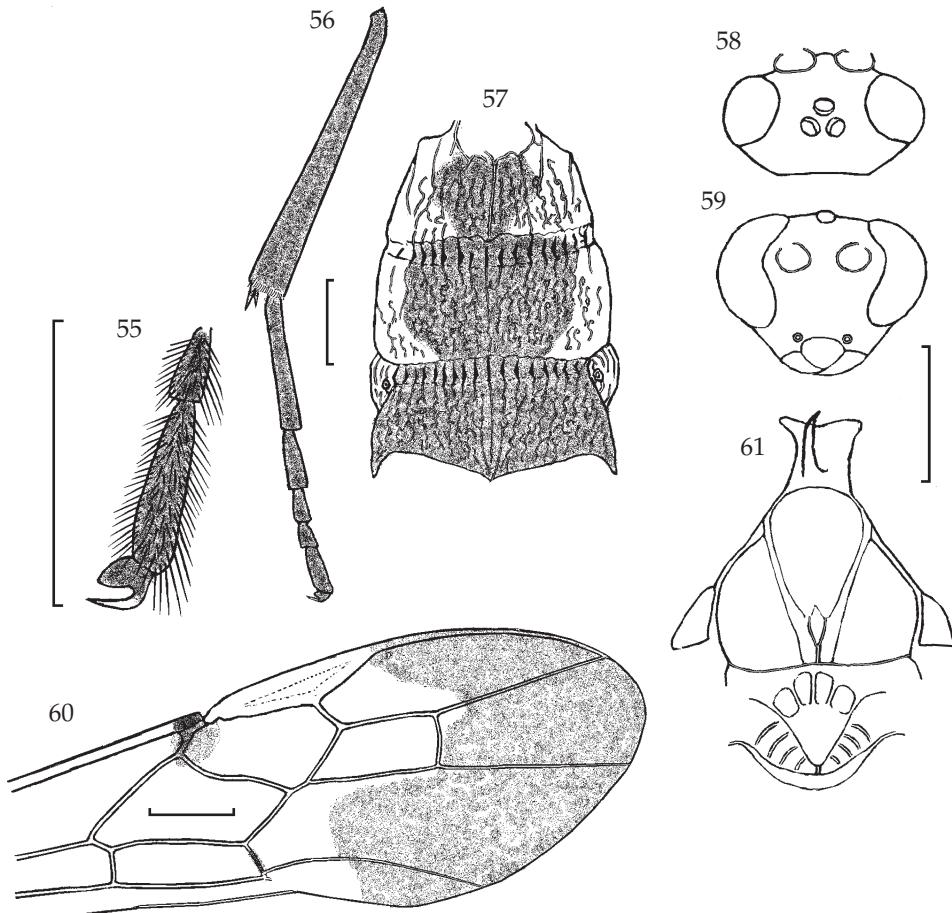
Figs 49-54, *Spinaria truongsonensis* spec. nov., ♀, holotype. 49, first-third metasomal tergites, dorsal aspect; 50, fore wing; 51, head, dorsal aspect; 52, head, anterior aspect; 53, mesopleuron; 54, hind tarsal claw.

**Metasoma.**—Dorsal face of first tergite 0.5 times as long as its apical width and 0.8 times length of second tergite; dorsally first tergite with sparse coarse carinae; dorsally second-fourth tergites with dense carinae and between carinae rugose.

**Colour.**—Yellow; scapus dark brown, reddish yellow basally; remainder of antenna blackish brown; hind coxa dark brown; hind trochanter and trochantellus yellowish brown; hind femur and tibia yellow; baso-ventrally hind femur infuscate; propodeum and first tergite entirely reddish yellow; medially second tergite with dirty brown and apically narrowed spot (fig. 49); rather small parastigmal spot blackish; veins 1-SR and 3-CU1 of fore wing entirely black; apical third of wing membrane largely dark brown (fig. 50) and remainder pale yellowish.

*Spinaria vietnamica* spec. nov.  
(figs 55-68)

**Material.**—Holotype, ♀ (IEBR), “[Vietnam], Ninh Binh (Cuc Phuong N.P.), 8.v.2002, K.D. Long, Rog. 007”. Paratypes: (15 ♀♀; IEBR, RMNH): 1 ♀, “Vinh Phuc (Me Linh), scrubs, 27.v.2000, N.Th.P. Lien, Rog. 004”; 1 ♀, “Hoa Binh, (Yen Thuy, Da Phuc) scrubs, 5.vii.2000, K.D. Long, Rog. 009”; 1 ♀, same locality,

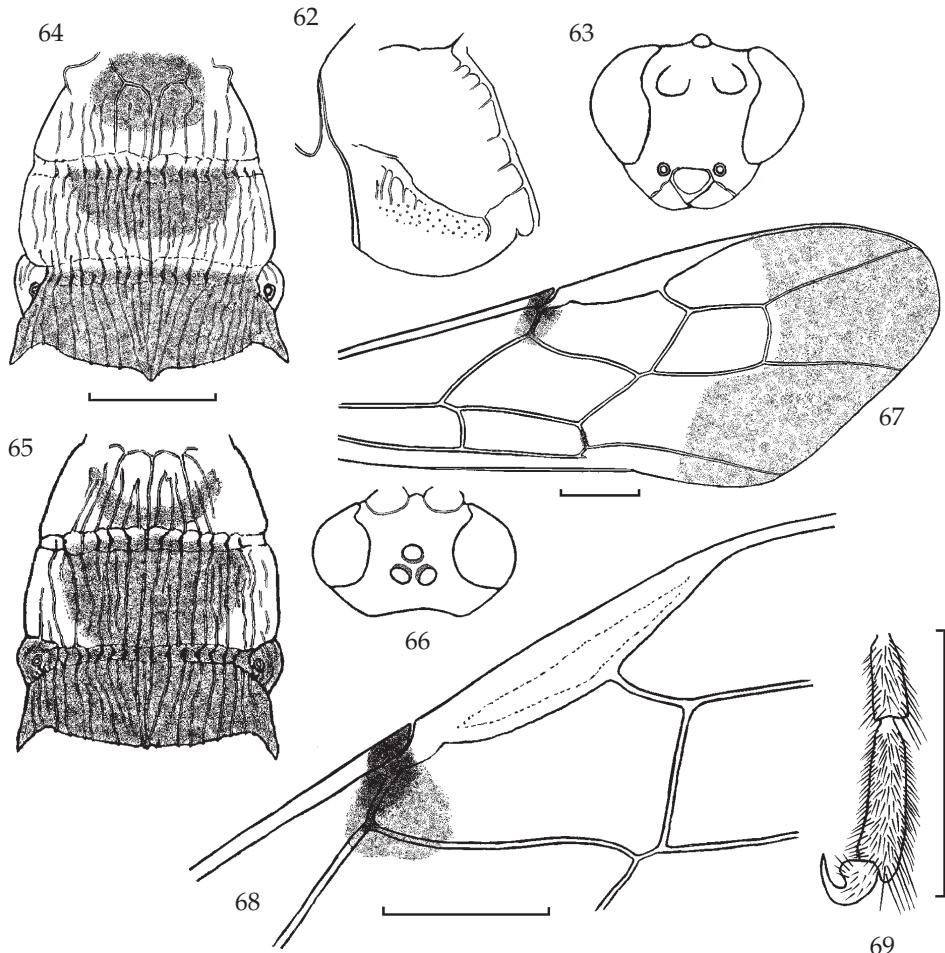


Figs 55-61, *Spinaria vietnamica* spec. nov., ♀, holotype. 55, hind tarsal claw; 56, hind tibia and tarsus; 57, first-third metasomal tergites, dorsal aspect; 58, head, dorsal aspect; 59, head, anterior aspect; 60, fore wing; 61, mesoscutum and scutellum, dorsal aspect.

5.ix.2002, K.D. Long, Rog. 225"; 1 ♀, "Ha Tinh (Huong Son), forest, 27.v.2004, Tr.X. Lam, Rog. 306"; 1 ♀, "Vinh Phuc (Tam Dao N.P.), 28.viii.2004, N.D. Hiep, Rog. 314"; 1 ♀, Phu Tho (Xuan Son N.P.), scrubs + tea, 7.v.2005, P.Th. Nhi, Rog. 373"; 1 ♀, same locality, 9.v.2005, P.Th. Nhi, Rog. 371; 1 ♀, "Nghe An (Con Cuong, Pu Mat N.P.), forest, 250 m, 12.ix.2005, P.Th. Nhi, Rog. 435"; 1 ♀, "Nghe An (Con Cuong, Pu Mat N.P., khe Bu), 17.iv.2006, P.Th. Nhi, Rog. 414"; 1 ♀, same locality, 9.v.2006, P.Th. Nhi, Rog. 410"; 2 ♀ ♀ (IEBR, RMNH), "N. Vietnam: Ninh Binh, Cuc Phuong N.P., nr entrance, c. 225 m, 1-15.v.2000, Mal. trap II, Mai Phu Quy, RMNH'00"; 2 ♀ ♀ (RMNH), id., but 15.iv-1.v.2000; 1 ♀ (RMNH), id., but 29.vi-18.vii.2000 and near centre (= Malaise trap I)".

Holotype, ♀, length of body 12.8 mm, of fore wing 10.4 mm, ovipositor 1.2 mm.

Head.—Length of scapus 1.5 times its maximum width, 2.1 times as long as third antennal segment; third and fourth antennal segments of equal length; diameter of lateral ocellus (OD) 1.25 times POL and about 0.6 times OOL; diameter of antennal sockets



Figs 62-69, *Spinaria vietnamica* spec. nov., ♀, paratypes. 62, mesopleuron, lateral aspect; 63, head, anterior aspect; 64, 65, first-third metasomal tergites, dorsal aspect; 66, head, dorsal aspect; 67, fore wing; 68, pterostigma; 69, hind tarsal claw.

about 1.4 times distance between them and 1.8 times distance from socket to eye margin; distance between tentorial pits 1.4 times distance from pit to eye margin; malar space 0.4 times height of eyes and 1.4 times basal width of mandible; width of face equal to height of eye and 1.4 times height of face and clypeus combined.

**Mesosoma.**—Spine on pronotum slender and strongly curved; notauli deep anteriorly, wide and shallow posteriorly with Y-shaped carina; scutellar sulcus about 0.75 times length of scutellum; mesopleuron polished and smooth; precoxal sulcus wide, shallow, with 3-4 crenulae anteriorly, polished posteriorly and with some punctures; metapleuron smooth with a few punctures; basal half of propodeum with median carina, baso-lateral areas of propodeum smooth and its apical half rugose medially.

**Wings.**—Fore wing: vein 2-SR 2.8 times as long as vein  $r$ , 1.3 times 3-SR and about 0.6 times SR1; vein  $r$ - $m$  straight; vein  $cu$ - $a$  about 2.3-2.5 times 1-CU1. Hind wing with

vein 2-SC+R quadrate; vein M+CU subequal vein 1-M.

Legs.— Hind femur 5.3 times as long as its maximum width; hind tibia 1.3 times as long as hind femur and as long as hind tarsus; hind basitarsus 0.7 times as long as hind tarsus; second hind tarsal segment 0.45 times as long as basitarsus; fourth tarsal segment 0.75 times as long as hind telotarsus.

Metasoma.— Dorsal face of first tergite 0.6 times as long as its apical width and 0.8 times as long as second tergite; dorsally first tergite with a median carina; first-third tergites with dense rugosity and coarse granulation.

Colour.— Yellow; antennae blackish brown, but scapus and pedicellus yellowish brown; middle telotarsus dark brown; hind leg entirely black except for light brown trochantellus; parastigma, and veins 1-SR and 1-SR+M basally, black; apical third of wing membrane dark brown; large round median patch on first and second tergites dark brown, dark patch on second tergite narrowed posteriorly, second tergite whitish yellow laterally; third and fourth tergites black; fifth tergite white.

Variation.— Some specimens have the fourth and fifth metasomal tergites white or the first tergite dirty brown apically.

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