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Research article

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The genus *Synaldis* Foerster, 1863 (Hymenoptera: Braconidae: Alysiinae) in the Neotropical region: first record, descriptions of new species and a key to the New World taxa

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Abstract. The genus *Synaldis* Foerster, 1863 is recorded in the Neotropical region for the first time. Five new Neotropical species, *S. brasiliense* Peris-Felipo, sp. nov., *S. fritzi* Peris-Felipo, sp. nov., *S. longiflagellaris* Peris-Felipo, sp. nov., *S. magnioculis* Peris-Felipo, sp. nov., and *S. novateutoniae* Peris-Felipo, sp. nov., are described and illustrated. The original combination for *Synaldis ulmicola* Ashmead, 1889 stat. rev. is proposed. A key for the determination of the all New World *Synaldis* species is provided.

Key words. Braconidae, Alysiinae, *Synaldis*, Nearctic and Neotropical regions, new species, key.

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Introduction

The status of the Alysiinae genus *Synaldis* Foerster, 1863 has been uncertain for a long time. Van Achterberg (1988) revised the *Aspilota* genera group and synonymized this genus with the re-established genus *Dinotrema* Foerster, 1863 on the basis of the plesiomorphic state of the unenlarged paraclypeal pits. As a result, he distributed the former species of *Synaldis* among the genera *Aspilota* Foerster, 1863 and *Dinotrema* according to the new diagnostic feature, the size of the paraclypeal areas. However, such a synonymy of *Synaldis* was not supported by several experts working on alysiine taxa (Fischer 1993a, 1993b; Papp 2000; Belokobylskij 2002). It is necessary to underline that such an apomorphic feature, as the complete reduction of vein 2-SR, is an evolutionary event which was also accompanied by the disappearance of the break (corner) between veins r and 3-SR, this part of the veins is only gently and relatively widely curved. Such an apomorphic state of the wing venation represents an important qualitative transformation and can reliably support the generic status of *Synaldis* (Belokobylskij 2002)

in spite of the rare present reduction of vein 2-SR in some specimens of a few species of *Dinotrema*. For that reason, we prefer to keep the generic status for *Synaldis* until any results of a molecular phylogenetic study of taxa of Alysiniinae. Rather recently, Fischer (2003) established the genus *Adelphenaldis*, whose species differ from *Synaldis* only by the length of the paraclypeal fovea, which reaches the margin of the eye in *Adelphenaldis*, and is thus equivalent to the species of ‘*Synaldis*’ that Van Achterberg (1988) placed in *Aspilota*. Peris-Felipo & Belokobylskij (2016) published a key for the identification of these four related genera.

The genus *Synaldis* comprises about a hundred species described in the Afrotropical, Oriental, Australasian, Oceanic, Nearctic and Palaearctic regions (Fischer 1962, 1967a, 1967b, 1971, 1993a, 1993b, 2003; Belokobylskij 2002, 2004a, 2004b; Belokobylskij & Tobias 2007; Peris-Felipo *et al.* 2014b). The genus, however, had not been discovered in the Neotropical region until the present work.

Members of the genus *Synaldis* are often reared from agaric mushrooms and recorded as parasitoids of the larvae and puparia of the dipterous families Phoridae (mainly) and Drosophilidae (doubtfully) (Hussey 1960; Fischer 2005; Yu *et al.* 2012).

In this paper, the genus *Synaldis* is recorded for the first time from the Neotropical region. Five new Neotropical species, *S. brasiliense* Peris-Felipo, sp. nov., *S. fritzi* Peris-Felipo, sp. nov., *S. longiflagellaris* Peris-Felipo, sp. nov., *S. novateutoniae* Peris-Felipo, sp. nov. and *S. magniocularis* Peris-Felipo, sp. nov., are described and illustrated. The combination, *Synaldis ulmicola* Ashmead, 1889 stat. rev., is also proposed after type revision. The records of the Nearctic species *S. cabinica* Fischer, 1967 in Korea and Russia (Far East) (Papp 1996; Belokobylskij 2002) and *S. exitiosae* Fischer, 1967 in Turkey (Beyarslan & Inanç 1992) are very doubtful and we exclude these regions in the distributions in our key.

Materials and methods

For the terminology of morphological features, sculpture and measurements see Peris-Felipo *et al.* (2014a); for wing venation nomenclature see Van Achterberg (1993); for measurements of the marginal cell see Fig. 1.

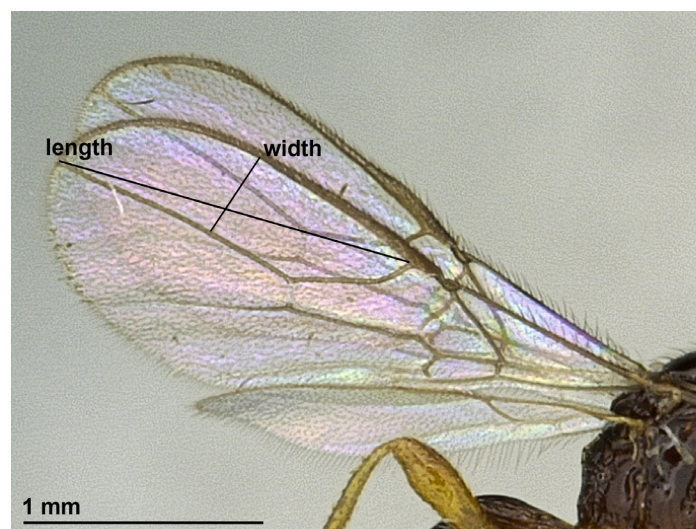


Fig. 1. Marginal cell of fore wing, measurements.

Table 1. A list of studied type material of the previously described New World species and place of their preservation. * This species was originally described as *Synaldis ulmicola* by Ashmead (1889), however Fischer (1967b) placed it in the genus *Aspilota* as *Aspilota ulmicola*. After revision of the holotype we consider it to belong within the genus *Synaldis* by the absence of vein 2-SR.

Studied species	Status of type	Sex	Place of preservation
<i>Synaldis acutidens</i> Fischer, 1967	Paratype	♀	NHMW
<i>Synaldis alfalfae</i> Fischer, 1967	Paratype	♂	NHMW
<i>Synaldis altera</i> Fischer, 1967	Paratype	♂	NHMW
<i>Synaldis blantoni</i> Fischer, 1967	Holotype	♂	NMNH
<i>Synaldis cabinica</i> Fischer, 1967	Paratype	♀	NHMW
<i>Synaldis difficilis</i> Fischer, 1967	Paratype	♂	NHMW
<i>Synaldis exitiosae</i> Fischer, 1967	Paratype	♀, ♂	NHMW
<i>Synaldis glabrifovea</i> Fischer, 1967	Paratype	♀	NHMW
<i>Synaldis incisa</i> Gahan, 1912	Paratype	♀	NHMW
<i>Synaldis liliputana</i> Fischer, 1967	Holotype	♂	NMNH
<i>Synaldis megaseliae</i> Fischer, 1967	Paratype	♀	NHMW
<i>Synaldis numerosa</i> Fischer, 1967	Paratype	♀	NHMW
<i>Synaldis painteri</i> Fischer, 1967	Paratype	♀, ♂	NHMW
<i>Synaldis pygmaea</i> Viereck, 1917	Holotype	♂	NMNH
<i>Synaldis quinnipiacorum</i> Viereck, 1917	Holotype	♀	NMNH
<i>Synaldis rotudidens</i> Fischer, 1967	Paratype	♂	NHMW
<i>Synaldis segmentata</i> Fischer, 1967	Holotype	♀	NMNH
<i>Synaldis spiraculosa</i> Fischer, 1967	Holotype	♀	NMNH
<i>Synaldis ulmicola</i> Ashmead, 1889*	Holotype	♀	NMNH

Material was imaged using a Digital Microscope Keyence® VHX-2000 and Adobe Photoshop® imaging system. The types of described and studied species are deposited in the collections listed below and in Table 1:

BMNH = Natural History Museum (London, UK)

NHMW = Naturhistorisches Museum Wien (Austria)

NMNH = Smithsonian National Museum of Natural History (USA)

ZISP = Zoological Institute of the Russian Academy of Sciences (St Petersburg, Russia)

Results

Taxonomic treatment

Five new Neotropical species of the genus *Synaldis* are described and illustrated: *S. brasiliense* Peris-Felipo, sp. nov., *S. fritzi* Peris-Felipo, sp. nov., *S. longiflagellaris* Peris-Felipo, sp. nov., *S. magniocularis* Peris-Felipo, sp. nov. and *S. novateutoniae* Peris-Felipo, sp. nov. *S. magniocularis* Peris-Felipo, sp. nov. The type material of the Nearctic species deposited in the Smithsonian Institution (Washington, USA; NMNH) and the Naturhistorisches Museum (Wien, Austria; NHMW) were revised; a new combination for previously member of *Aspilota* genus, *Synaldis ulmicola* Ashmead, 1889 stat. rev. is suggested.

Class Hexapoda Blainville, 1816
Order Hymenoptera Linnaeus, 1758
Family Braconidae Nees, 1811
Subfamily Alysiinae Leach, 1815
Tribe Alysiini Leach, 1815

Genus *Synaldis* Foerster, 1863

Diagnosis

Mandibles tridentate, teeth of differing shape and length. Paraclypeal fovea short, far from reaching ventral margin of eye. Mesoscutal pit present or absent. Precoxal sulcus always present, usually not reaching anterior and posterior margins of mesopleuron. Pterostigma very long and narrow. Vein 2-SR always absent; break between veins r and 3-SR absent and abscissae here only gently and rather widely curved. Veins m-cu and cu-a always postfurcal.

Hosts

Diptera larvae, mainly of the family Phoridae and possibly Drosophilidae.

Synaldis brasiliense Peris-Felipo, sp. nov.

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Figs 2–3

Diagnosis

This new species is similar to *S. glabrifovea* Fischer, 1967 (USA), but differs from it in having the prescutellar pit present (absent in *S. glabrifovea*), face 2.1 times as long as high (3.0 times in *S. glabrifovea*), mandible 1.8 times as long as its maximum width (1.5 times in *S. glabrifovea*), and the first metasomal tergite 2.4 times as long as its apical width (2.1 times in *S. glabrifovea*).

Etymology

The specific epithet refers to “Brazil”, after the country where this species was found.

Material examined

Holotype

BRAZIL: ♀, Nova Teutonia, 27°11' S, 52°23' E, 10 May 1938, F. Plaumann leg. (BMNH: B.M. 1938–682).

Paratypes

BRAZIL: 1 ♀, 1 ♂, same locality, but 27° S, 52–58° E, 28 May and 1 Jun. 1938, F. Plaumann leg. (BMNH: B.M. 1938–458).

Description

Female (holotype)

LENGTH. Body 1.7 mm, fore wing 2.1 mm, hind wing 1.4 mm.

COLOUR. Body, pterostigma and flagellar segments of antenna brown, scape and pedicel brownish yellow. Basal part of pronotal sides and propleuron yellow. First metasomal tergite similar colour to second and third tergites. Legs yellow. Wings hyaline.

HEAD. In dorsal view, 1.8 times as wide as long, 1.5 times as wide as mesoscutum, smooth, with temple rounded behind eyes. Eye in lateral view 1.5 times as high as wide and 1.4 times as wide as temple medially. POL 1.3 times as long as OD; OOL 3.2 times OD. Face 2.1 times as wide as high; inner margins of eyes subparallel. Clypeus 3.0 times as wide as high, slightly concave ventrally. Paraclypeal fovea reaching half of distance between clypeus and eye. Mandible narrow, not widened towards apex, 1.8 times as long as its maximum width. Upper tooth very small, distinctly shorter than middle tooth; middle tooth small, pointed apically; lower tooth short, as long as upper tooth, rounded. Antennae 20-segmented, 1.2 times as long as body. Scape 1.5 times as long as pedicel. First flagellar segment 3.6

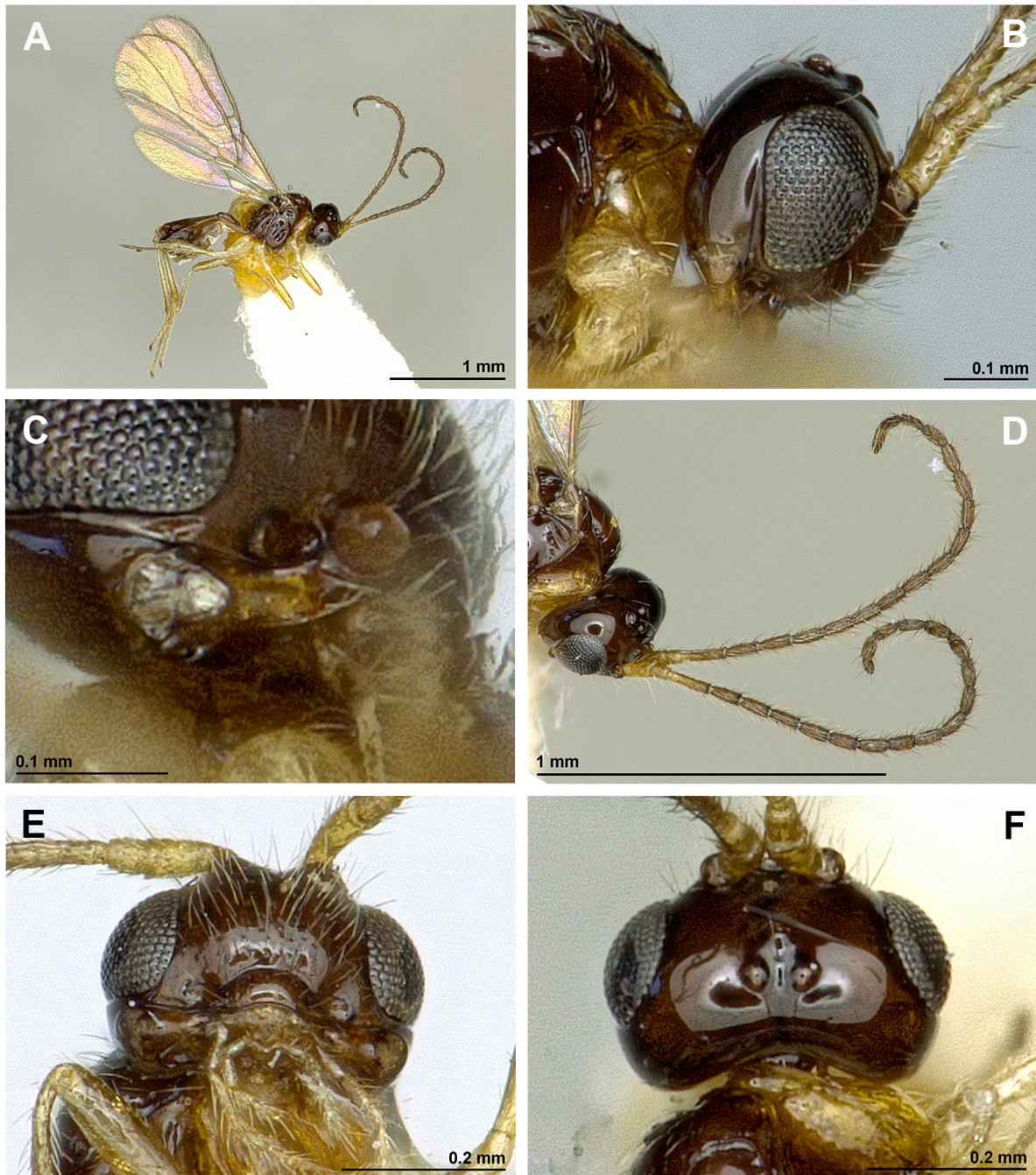


Fig. 2. *Synaldis brasiliense* Peris-Felipo, sp. nov., ♀. **A.** Habitus, lateral view. **B.** Head, lateral view. **C.** Mandible. **D.** Antenna. **E.** Face, front view. **F.** Head, dorsal view.

times as long as its apical width, 1.2 times as long as second segment. Second to 4th segments 2.7 times, 5th to seventh segments 2.2 times, 9th to 15th segments 2.1 times, 16th segment 2.0 times, 17th segment 1.8 times and 18th (apical) segment 2.3 times as long as their maximum width.

MESOSOMA. In lateral view 1.2 times as long as high. Mesoscutum (dorsal view) 0.9 times as long as its maximum width, with sparse setae arranged as single line along notaulus line. Notauli mainly absent on horizontal surface of mesoscutum. Mesoscutal pit present and elongate. Prescutellar depression smooth,

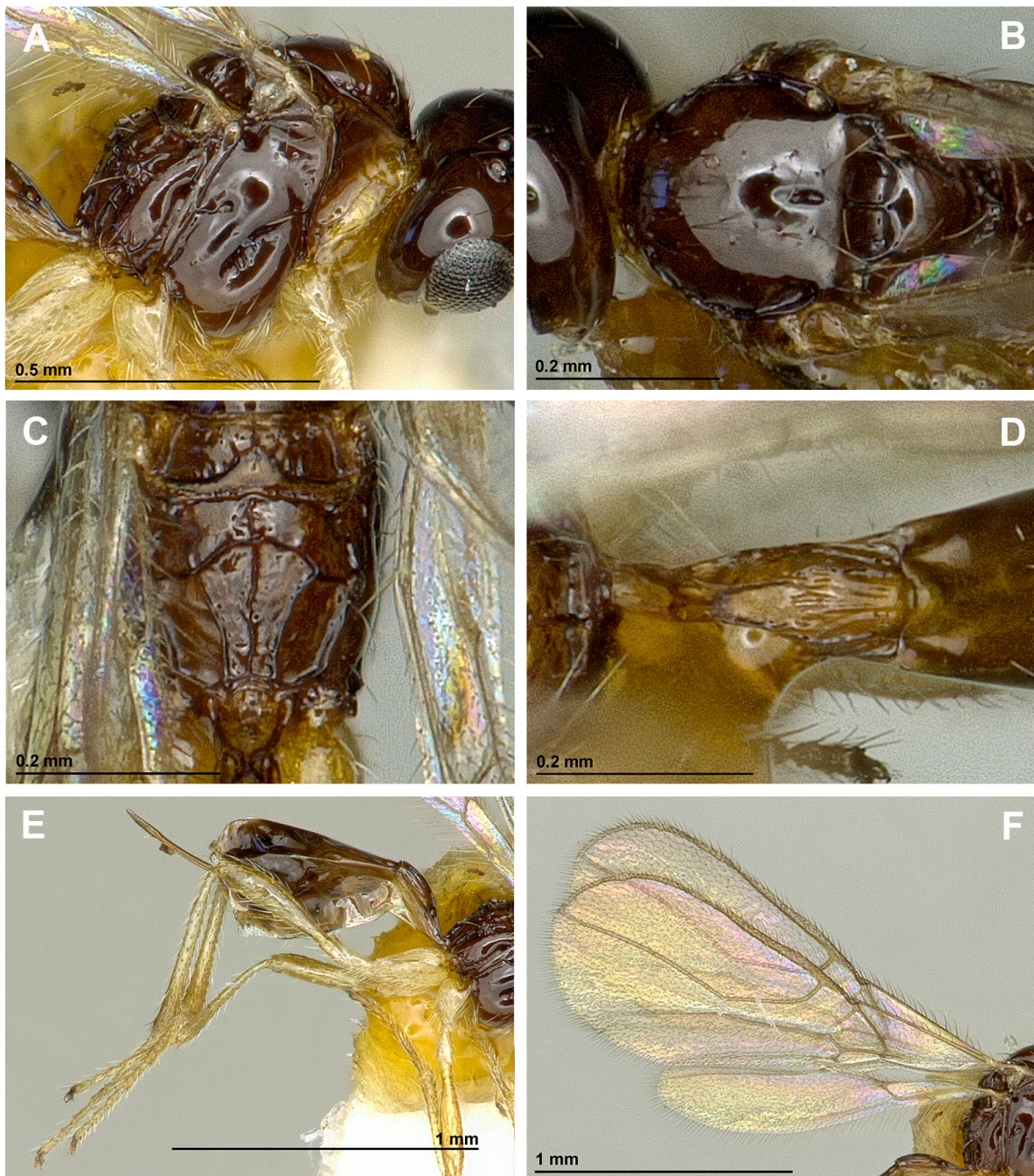


Fig. 3. *Synaldis brasiliense* Peris-Felipo, sp. nov., ♀. **A.** Mesosoma, lateral view. **B.** Mesonotum, dorsal view. **C.** Propodeum. **D.** First metasomal tergite. **E.** Legs, metasoma and ovipositor, lateral view. **F.** Fore and hind wings.

without lateral carinae, 1.1 times as long as its maximum width. Precoxal sulcus present, crenulate, not reaching anterior and posterior margins of mesopleuron. Posterior mesopleural furrow smooth. Propodeum with pentagonal areola crossed by complete and distinct median longitudinal carina from its base to apex. Propodeal spiracles relatively small, its diameter 0.2 times as wide as the distance from spiracle to anterior margin of propodeum.

WINGS. Length of fore wing 2.8 times its maximum width. Marginal cell ending on apex of wing, 4.0 times as long as its maximum width. Vein SR1 2.5 times as long as vein 3-SR. Vein 3-SR 3.0 times as long as vein r. Vein cu-a distinctly postfurcal. First subdiscal cell closed distally, 3.0 times as long as its maximum width. Hind wing 5.7 times as long as its maximum width.

LEGS. Hind femur 4.1 times as long as its maximum width. Hind tibia weakly widened to apex, 8.4 times as long as its maximum subapical width, about as long as hind tarsus. First segment of hind tarsus 1.5 times as long as second segment.

METASOMA. First tergite weakly widened towards apex, 2.4 times as long as its apical width, weakly striate in apical half. Ovipositor 1.3 times as long as first tergite, 0.4 times as long as metasoma, 0.8 times as long as hind femur.

VARIATION. Body 1.5–1.7 mm; fore wing 2.0–2.2 mm; hind wing 1.3–1.5 mm. Hind femur 4.0–4.2 times as long as its maximum width. First flagellar segment 3.6–3.7 times as long as its apical width, and second segment 2.2–2.3 times.

Male

Body length 1.6 mm, fore wing 1.9 mm, hind wing 1.3 mm. Antenna 21-segmented, 1.3 times as long as body. Second flagellar segment 3.2 times as long as its maximum width and 6th segment 2.3 times. Hind femur 4.4 times as long as its maximum width. Otherwise similar to female.

Synaldis fritzi Peris-Felipo, sp. nov.

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Figs 4–5

Diagnosis

This new species is similar to *S. magniocularis* sp. nov. but differs from it in having the eye in lateral view 1.5 times as long as temple medially (1.7 times in *S. magniocularis* sp. nov.), face 1.8 times as long as high (1.2 times in *S. magniocularis* sp. nov.), second flagellar segment 2.2 times as long as its maximum width (2.7 times in *S. magniocularis* sp. nov.); sixth segment 1.8 times (2.5 times in *S. magniocularis* sp. nov.), and hind femur 3.5 times as long as its maximum width (3.9 times in *S. magniocularis* sp. nov.).

Etymology

Named after Fritz Plaumann, collector of the type material of this new species.

Material examined

Holotype

BRAZIL: ♀, Nova Teutonia, 27°11' S, 52°23' E, 20 Aug. 1937, F. Plaumann leg. (BMNH: B.M. 1937–748).

Paratypes

BRAZIL: 3 ♀♀, 1 ♂, same locality as holotype, but 19 Mar., 5 Jul., 31 Aug. 1937 and 2 Jun. 1938 (BMNH, ZISP: B.M. 1937–424; 1937–656; 1937–748; 1938–458).

Description

Female (holotype)

LENGTH. Body 2.7 mm, fore wing 2.7 mm, hind wing 1.8 mm.

COLOUR. Body, flagellar segments of antenna and pterostigma brown. Legs brownish yellow. First metasomal tergite similar colour to second and third tergites. Wings hyaline.

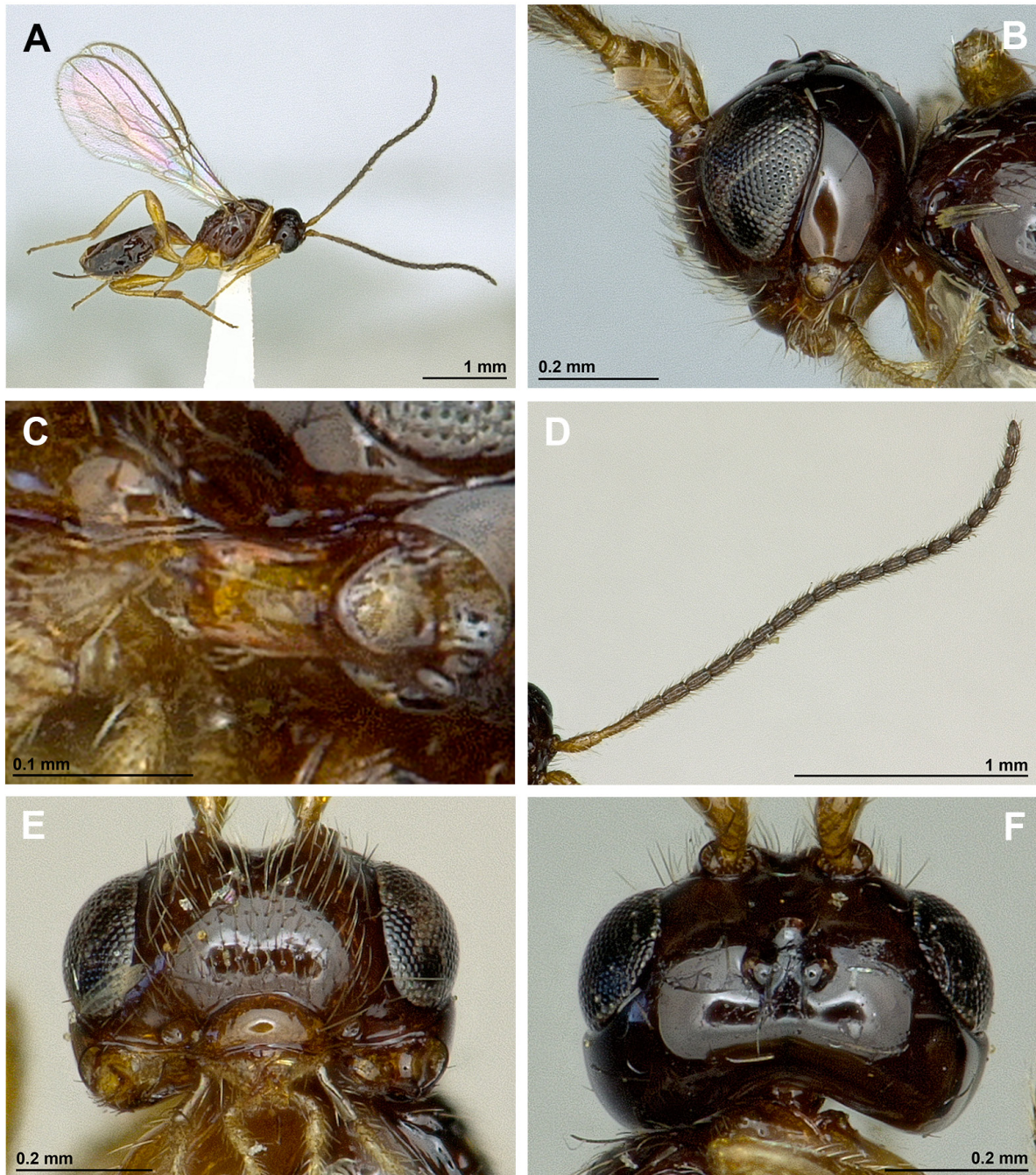


Fig. 4. *Synaldis fritzi* Peris-Felipo, sp. nov., ♀. **A.** Habitus, lateral view. **B.** Head, lateral view. **C.** Mandible. **D.** Antenna. **E.** Face, front view. **F.** Head, dorsal view.

HEAD. In dorsal view, 1.9 times as wide as long, 1.5 times as wide as mesoscutum, smooth, with temple rounded behind eyes. Eye in lateral view 1.6 times as high as wide and 1.1 times as wide as temple medially. POL 1.0 times as long as OD; OOL 2.7 times OD. Face 1.8 times as wide as high, completely covered by numerous setae; inner margins of eyes subparallel. Clypeus 2.5 times as wide as high, slightly concave ventrally. Paraclypeal fovea short, reaching 0.4 times distance between clypeus and eye. Mandible weakly widened towards apex, 1.5 times as long as its maximum width. Upper tooth very small, shorter than lower and middle teeth; middle tooth short, wide basally and pointed apically; lower tooth short, rounded. Antennae 23-segmented, 1.1 times as long as body. Scape 2.5 times as long

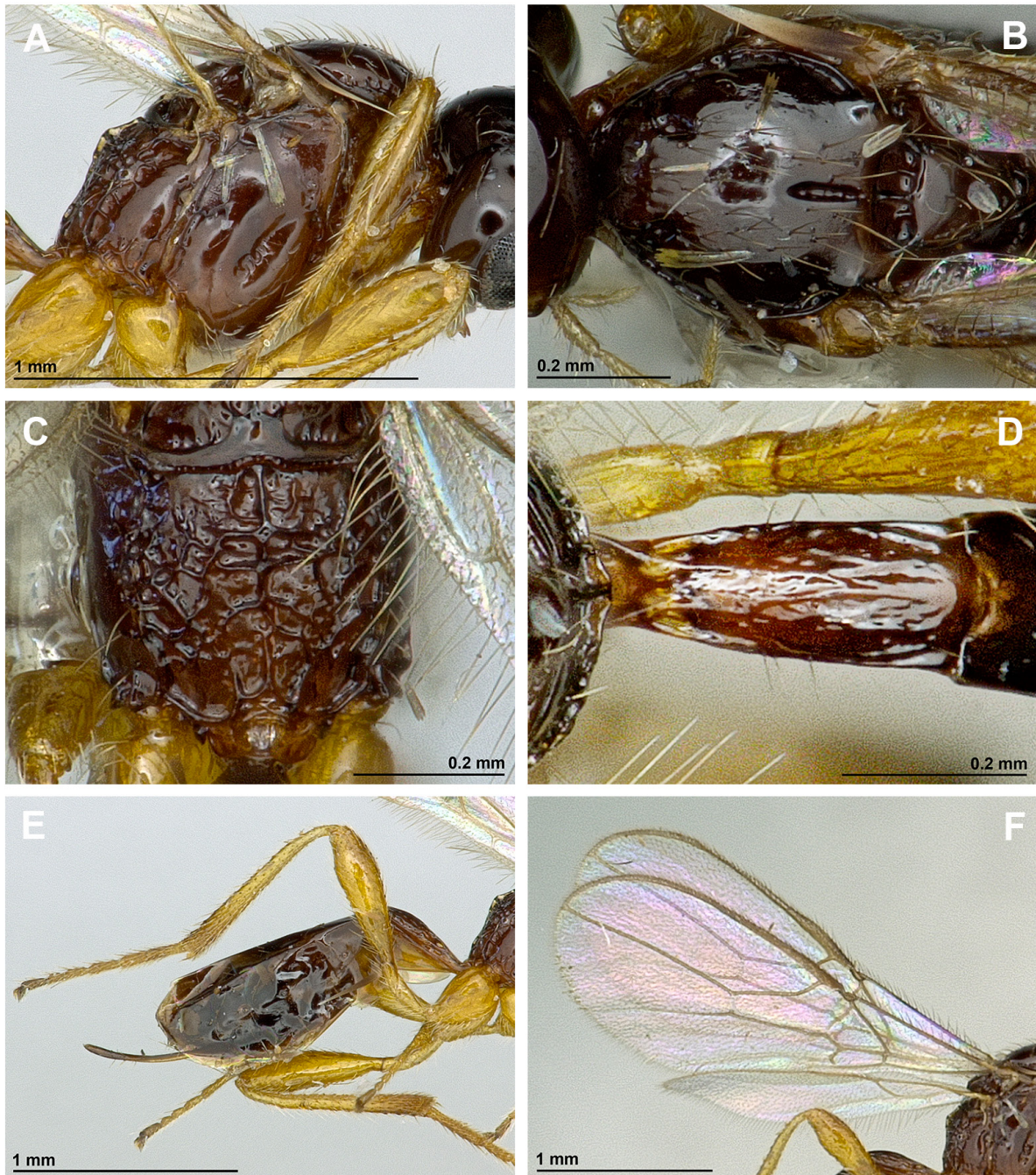


Fig. 5. *Synaldis fritzi* Peris-Felipo, sp. nov., ♀. **A.** Mesosoma, lateral view. **B.** Mesonotum, dorsal view. **C.** Propodeum. **D.** First metasomal tergite. **E.** Legs, metasoma and ovipositor, lateral view. **F.** Fore and hind wings.

as pedicel. First flagellar segment 3.6 times as long as its apical width, 1.4 times as long as 2nd segment. Second and 3rd flagellar segments 2.0 times, 4th to 8th segments 1.8 times, 9th to 18th segments 2.0 times, 19th and 20th segments 1.8 times, and 21st (apical) segment 2.2 times as long as their maximum width.

MESOSOMA. In lateral view 1.3 times as long as high. Mesoscutum (dorsal view) as long as its maximum width, with numerous setae arranged in middle part of mesoscutum. Notauli mainly absent on horizontal surface of mesoscutum. Mesoscutal pit present and elongate. Prescutellar depression smooth, without lateral carinae, twice as long as its maximum width. Precoxal sulcus present, crenulate, not reaching anterior and posterior margins of mesopleuron. Posterior mesopleural furrow smooth. Propodeum sculptured, with complete and distinct median longitudinal carina from its base to apex and with several transverse carinae reaching sides of propodeum. Propodeal spiracles small, its diameter 0.1 times as wide as the distance from spiracle to anterior margin of propodeum.

WINGS. Length of fore wing 2.8 times its maximum width. Marginal cell ending on apex of wing, 4.2 times as long as its maximum width. Vein SR1 2.8 times as long as vein 3-SR. Vein 3-SR 2.6 times as long as vein r. Vein cu-a distinctly postfurcal. First subdiscal cell closed distally, 2.8 times as long as its maximum width. Hind wing 5.8 times as long as its maximum width.

LEGS. Hind femur 3.8 times as long as its maximum width. Hind tibia weakly widened to apex, 8.8 times as long as its maximum subapical width, 1.1 times as long as hind tarsus. First segment of hind tarsus twice as long as second segment.

METASOMA. First tergite weakly widened towards apex, 2.7 times as long as its apical width, weakly striate. Ovipositor as long as first tergite, 0.3 times as long as metasoma, 0.7 times as long as hind femur.

VARIATION. Body 2.4–2.7 mm, fore wing 2.5–2.7 mm, hind wing 1.7–1.8 mm. First flagellar segment 3.6–3.8 times as long as its maximum width. Hind femur 3.8–4.0 times as long as its maximum width.

Male

Body length 2.4 mm, fore wing 2.5 mm, hind wing 1.8 mm. Antenna 25-segmented. First flagellar segment 3.4 times as long as its maximum width; second segment 2.7 times, and sixth segment 2.4 times as long as its maximum width. Otherwise similar to female.

Synaldis longiflagellaris Peris-Felipo, sp. nov.

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Figs 6–7

Diagnosis

This new species is similar to *Synaldis novateutoniae* sp. nov. and *S. segmentata* Fischer, 1967. *Synaldis longiflagellaris* sp. nov. differs from *Synaldis novateutoniae* sp. nov. in having the first flagellar segment 4.0 times as long as its maximum width (3.5 times in *S. novateutoniae* sp. nov.), second segment 3.2–3.3 times (2.3 times in *S. novateutoniae* sp. nov.) and middle segments 2.5–2.9 times (1.8–2.0 times in *S. novateutoniae* sp. nov.) as long as their maximum width, face 1.6 times as long as high (1.8 times in *S. novateutoniae* sp. nov.), and vein SR1 3.0 times as long as vein 3-SR (2.6 times in *S. novateutoniae* sp. nov.). *Synaldis longiflagellaris* sp. nov. differs from *S. segmentata* in having the first flagellar segment 4.0 times as long as its maximum width (3.0 times in *S. segmentata*), second segment 3.2–3.3 times (2.0 times in *S. segmentata*) and middle segments 2.5–2.9 times (1.5 times in *S. segmentata*) as long as their maximum width, mandible 1.6 times as long as wide (1.3 times in *S. segmentata*), marginal cell 4.0 times as long as its maximum width (3.5 times in *S. segmentata*), and vein SR1 3.0 times as long as vein 3-SR (1.8 times in *S. segmentata*).

Etymology

The name is referring to the long size of the flagellar segments of antennae.

Material examined

Holotype

BRAZIL: ♀, Nova Teutonia, 27°11' S, 52°23' E, 4 May 1938, F. Plaumann leg. (BMNH: B.M. 1938–682).



Fig. 6. *Synaldis longiflagellaris* Peris-Felipo, sp. nov., ♀. **A.** Habitus, lateral view. **B.** Antenna. **C.** Mandible. **D.** Face, front view. **E.** Head and mesosoma, lateral view. **F.** Head and mesonotum, dorsal view.

Paratypes

BRAZIL: 3 ♀♀, 4 ♂♂, same locality as holotype, but 14–15 and 18 Mar. 1937 (B.M. 1937–424), 20, 24 and 30 Apr. 1938 (B.M. 1938–682) and 4 Jun. 1952 (B.M. 1957–341) (BMNH, ZISP).

Description

Female (holotype)

LENGTH. Body 1.6 mm, fore wing 1.8 mm, hind wing 1.3 mm.

COLOUR. Body, pterostigma and flagellar segments of antenna brown; legs, scape and pedicel of antenna brownish yellow. Lower part of pronotal side and propleuron yellow. Wings hyaline.

HEAD. In dorsal view, 1.8 times as wide as long, 1.5 times as wide as mesoscutum, smooth, with temple rounded behind eyes. Eye in lateral view 1.3 times as high as wide and 1.4 times as wide as temple medially. POL 1.1 times as long as OD; OOL 2.5 times OD. Face 1.6 times as wide as high, completely covered by numerous setae; inner margins of eyes subparallel. Clypeus 2.3 times as wide as high, slightly concave ventrally. Paraclypeal fovea reaching half of distance between clypeus and eye. Mandible weakly widened towards apex, 1.6 times as long as its maximum width. Upper tooth small, slightly shorter than middle tooth; middle tooth short, wide basally and pointed apically; lower tooth short, wide, rounded. Antenna 18-segmented, 1.1 times as long as body. Scape 1.5 times as long as pedicel. First flagellar segment 4.0 times as long as its apical width, about as long as second segment.



Fig. 7. *Synaldis longiflagellaris* Peris-Felipo, sp. nov., ♀. **A.** Propodeum. **B.** First metasomal tergite. **C.** Legs, metasoma and ovipositor, lateral view. **D.** Fore and hind wings.

Second flagellar segment 3.2 times as long as its maximum width, third to sixth segments 2.9 times, seventh to 13th segments 2.5 times, and 14th to 16th (apical) segments 2.9 times as long as their width.

MESOSOMA. In lateral view 1.1 times as long as high. Mesoscutum (dorsal view) about as long as its maximum width, with sparse double setae arranged along notaulus line. Notauli mainly absent on horizontal surface of mesoscutum. Mesoscutal pit present and elongate. Prescutellar depression smooth, without lateral carinae. Precoxal sulcus present, crenulate, not reaching anterior and posterior margins of mesopleuron. Posterior mesopleural furrow smooth. Propodeum sculptured, with complete and distinct median longitudinal carina from its base to apex, with long transverse carinae not reaching sides of propodeum. Propodeal spiracles small, its diameter about 0.1 times as large as distance from spiracle to anterior margin of propodeum.

WINGS. Length of fore wing 3.0 times its maximum width. Marginal cell ending on apex of wing, 4.0 times as long as its maximum width. Vein SR1 3.0 times as long as vein 3-SR. Vein 3-SR 2.8 times as long as vein r. Vein cu-a distinctly postfurcal. First subdiscal cell closed distally, 3.8 times as long as its maximum width. Hind wing 6.5 times as long as its maximum width.

LEGS. Hind femur 4.6 times as long as its maximum width. Hind tibia weakly widened to apex, 8.2 times as long as its maximum subapical width, 1.1 times as long as hind tarsus. First segment of hind tarsus 1.7 times as long as second segment.

METASOMA. First tergite weakly widened towards apex, 2.1 times as long as its apical width, entirely striate. Ovipositor 1.6 times as long as first tergite, 0.7 times as long as metasoma, 1.1 times as long as hind femur.

VARIATION. Body 1.6–1.8 mm; fore wing 2.0–2.2 mm; hind wing 1.3–1.5 mm. Hind femur 4.4–4.5 times as long as its maximum width.

Male

Body length 1.5–1.7 mm, fore wing 1.4–1.6 mm, hind wing 1.2–1.3 mm. Antenna 21–22-segmented. Middle flagellar segments (seventh to 13th) 2.9 times as long as their maximum width. Otherwise similar to female.

Synaldis magniocularis Peris-Felipo, sp. nov.

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Figs 8–9

Diagnosis

This new species is similar to *Synaldis fritzi* sp. nov.; differences between both species are described under the latter species.

Etymology

The specific epithet is derived from the Latin “magnus”, meaning “big”, and “oculus”, meaning “eye” because of the large eye in lateral view.

Material examined

Holotype

BRAZIL: ♀, Nova Teutonia, 27°11' S, 52°23' E, 30 Apr. 1938, F. Plaumann leg. (BMNH: B.M. 1938–682).

Paratypes

BRAZIL: 1 ♀, same data as holotype (BMNH).

Description

Female (holotype)

LENGTH. Body 1.7 mm, fore wing 1.8 mm, hind wing 1.4 mm.

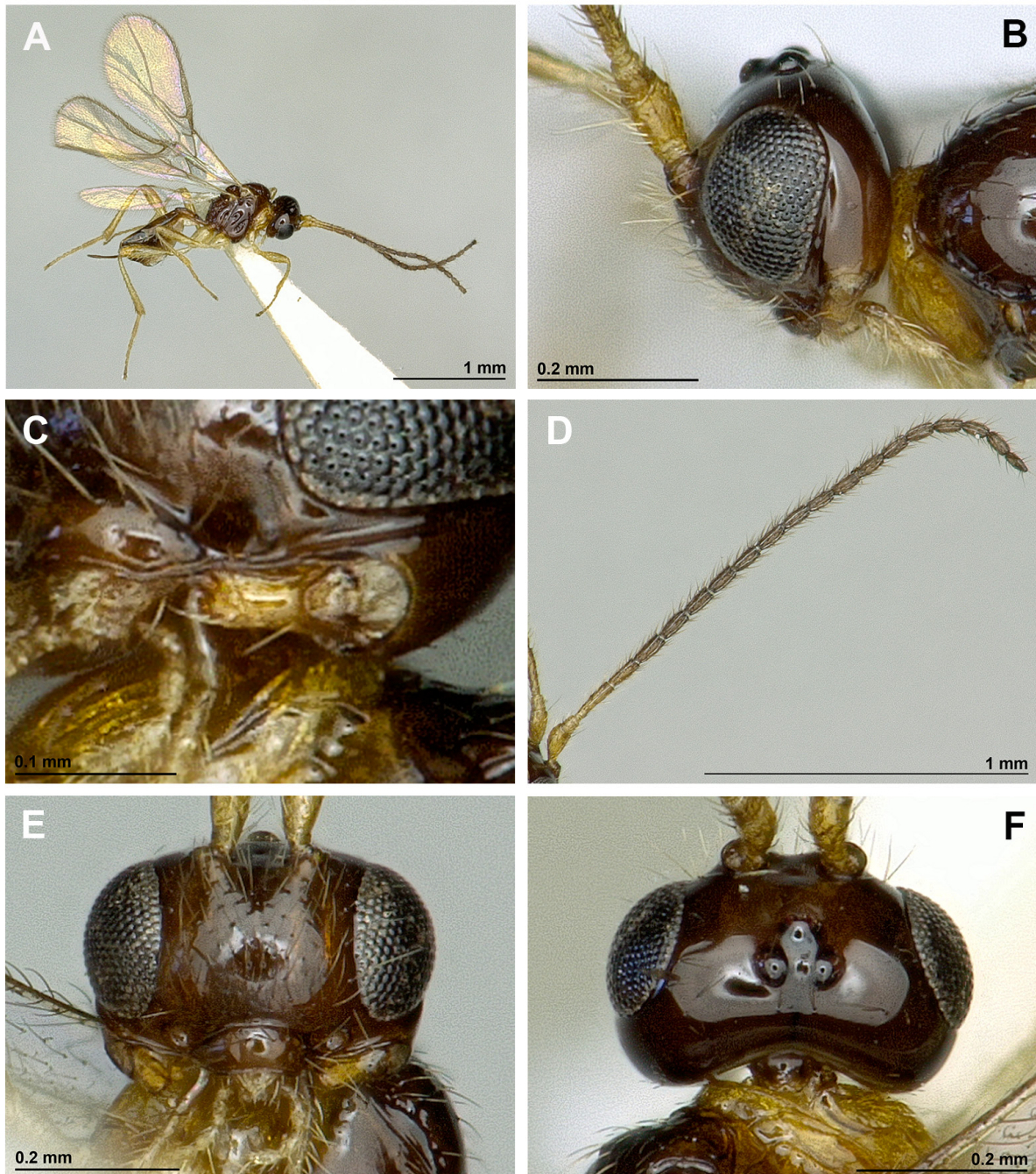


Fig. 8. *Synaldis magniocularis* Peris-Felipo, sp. nov., ♀. **A.** Habitus, lateral view. **B.** Head, lateral view. **C.** Mandible. **D.** Antenna. **E.** Face, front view. **F.** Head, dorsal view.

COLOUR. Body, pterostigma and flagellar segments of antenna brown, scape and pedicel of antenna brownish yellow. Lower part of pronotal side and propleuron yellow. Legs yellow. First metasomal tergite similar colour to second and third tergites. Wings hyaline.

HEAD. In dorsal view, 1.7 times as wide as long, 1.4 times as wide as mesoscutum, smooth, with temple rounded behind eyes. Eye in lateral view 1.5 times as high as wide and 1.7 times as wide as temple medially. POL 0.9 times as long as OD; OOL 2.4 times OD. Face 1.2 times as wide as high, with numerous setae; inner margins of eyes subparallel. Clypeus 2.5 times as wide as high, slightly concave



Fig. 9. *Synaldis magniocularis* Peris-Felipo, sp. nov., ♀. **A.** Mesonotum, dorsal view. **B.** Propodeum. **C.** First metasomal tergite. **D.** Legs, metasoma and ovipositor, lateral view. **E.** Fore wing.

ventrally. Paraclypeal fovea reaching half distance between clypeus and eye. Mandible not widened towards apex, 1.9 times as long as its maximum width. Upper tooth very small, shorter than middle tooth; middle tooth small, wide basally and pointed apically; lower tooth short, as long as upper tooth, rounded. Antennae 20-segmented, 1.1 times as long as body. Scape 2.0 times as long as pedicel. First flagellar segment 3.5 times as long as its apical width, 1.4 times as long as 2nd segment. Second flagellar segment 2.5 times, 3rd to 5th segments 2.1 times, 6th to 8th segments 2.5 times, 9th to 17th segments 2.2 times, and 18th (apical) segment 2.4 times as long as their maximum width.

MESOSOMA. In lateral view 1.2 times as long as high. Mesoscutum (dorsal view) as long as its maximum width, with sparse single setae arranged along notaulus line. Notauli mainly absent on horizontal surface of mesoscutum. Mesoscutal pit present and elongate. Prescutellar depression smooth, without lateral carinae. Precoxal sulcus present, crenulate, not reaching anterior and posterior margins of mesopleuron. Posterior mesopleural furrow smooth. Propodeum sculptured, with complete and distinct median longitudinal carina from its base to apex, with one transverse carina reaching both sides of propodeum. Propodeal spiracles relatively small, its diameter 0.2 times as wide as the distance from spiracle to anterior margin of propodeum.

WINGS. Length of fore wing 2.7 times its maximum width. Marginal cell ending on apex of wing, 3.8 times as long as its maximum width. Vein SR1 2.6 times as long as vein 3-SR. Vein 3-SR 1.8 times as long as vein r. Vein cu-a distinctly postfurcal. First subdiscal cell closed distally, 4.0 times as long as its maximum width. Hind wing 5.7 times as long as its maximum width.

LEGS. Hind femur 3.9 times as long as its maximum width. Hind tibia weakly widened to apex, 9.6 times as long as its maximum subapical width, as long as hind tarsus. First segment of hind tarsus 1.7 times as long as second segment.

METASOMA. First tergite weakly widened towards apex, 2.7 times as long as its apical width, striate. Ovipositor 1.2 times as long as first tergite, 0.4 times as long as metasoma, 0.8 times as long as hind femur.

VARIATION. Hind femur 3.8–4.0 times as long as its maximum width.

Male

Unknown.

Synaldis novateutoniae Peris-Felipo, sp. nov.

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Figs 10–11

Diagnosis

This new species is similar to *Synaldis longiflagellaris* sp. nov. and *S. segmentata* Fischer, 1967. Differences between *S. novateutoniae* sp. nov. and *S. longiflagellaris* sp. nov. are described after the description of *S. longiflagellaris* sp. nov. *Synaldis novateutoniae* sp. nov. differs from *S. segmentata* in having the first flagellar segment 3.5 times as long as its maximum width (3.0 times in *S. segmentata*), second segment 2.3 times (2.0 times in *S. segmentata*) and middle segments 1.8–2.0 times (1.5 times in *S. segmentata*) as long as their maximum width; mandible 1.8 times as long as wide (1.3 times in *S. segmentata*), marginal cell 4.0 times as long as its maximum width (3.5 times in *S. segmentata*), and vein SR1 2.6 times as long as vein 3-SR (1.8 times in *S. segmentata*).

Etymology

The specific epithet refers to Teutônia (“Nova Teutonia”), the type locality of the species.

Material examined

Holotype

BRAZIL: ♀, Nova Teutonia, 27°11' S, 52°23' E, 27 Apr. 1938, F. Plaumann leg. (BMNH: B.M. 1938–682).



Fig. 10. *Synaldis novateutoniae* Peris-Felipo, sp. nov., ♀. **A.** Habitus, lateral view. **B.** Head, lateral view. **C.** Mandible. **D.** Antenna. **E.** Face, front view. **F.** Head, dorsal view.

Paratypes

BRAZIL: 3 ♀♀, 2 ♂♂, same locality as holotype, but 8 Aug., 7 Sep. 1935 and 8 Sep. 1937 (1937–656), and 9 May 1952 (1957–341) (BMNH, ZISP).

Description

Female (holotype)

LENGTH. Body 1.9 mm, fore wing 2.1 mm, hind wing 1.6 mm.

COLOUR. Body, pterostigma and flagellar segments of antenna brown; legs, scape and pedicel of antenna brownish yellow. Lower part of pronotal side and propleuron yellow. Wings hyaline.

HEAD. In dorsal view, 1.9 times as wide as long, 1.4 times as wide as mesoscutum, smooth, with temple rounded behind eyes. Eye in lateral view 1.5 times as high as wide and 1.4 times as wide as temple medially. POL 1.0 times as long as OD; OOL 2.7 times OD. Face 1.8 times as wide as high, completely covered by numerous setae; inner margins of eyes subparallel. Clypeus 2.5 times as wide as high, slightly concave ventrally. Paraclypeal fovea reaching half distance between clypeus and eye. Mandible weakly widened towards apex, 1.8 times as long as its maximum width. Upper tooth small, shorter than lower teeth; middle tooth small, slightly longer than upper tooth, wide basally and pointed apically; lower tooth short, wide, rounded. Antennae 22-segmented, 1.1 times as long as body. Scape 1.8 times as long as pedicel. First flagellar segment 3.5 times as long as its apical width, 1.3 times as long as second segment. Second flagellar segment 2.3 times, third to sixth segments 1.8 times; seventh to 17th segments about 2.0 times, 18th and 19th segments 2.2 times, and 20th (apical) segment 2.8 times as long as their maximum width.

MESOSOMA. In lateral view 1.1 times as long as high. Mesoscutum (dorsal view) as long as its maximum width, with sparse single setae arranged along notaulus line. Notauli mainly absent on horizontal surface of mesoscutum. Mesoscutal pit present and elongate. Prescutellar depression smooth, without lateral carinae. Precoxal sulcus present, not reaching anterior and posterior margins of mesopleuron. Posterior mesopleural furrow smooth. Propodeum sculptured, with complete and distinct median longitudinal carina from its base to apex, with very short transverse carinae far from reaching sides of propodeum. Propodeal spiracles small, its diameter 0.4 times as wide as the distance from spiracle to anterior margin of propodeum.

WINGS. Length of fore wing 2.8 times its maximum width. Marginal cell ending on apex of wing, 4.0 times as long as its maximum width. Vein SR1 2.6 times as long as vein 3-SR. Vein 3-SR 3.4 times as long as vein r. Vein cu-a distinctly postfurcal. First subdiscal cell closed distally, 4.0 times as long as its maximum width. Hind wing 5.7 times as long as its maximum width.

LEGS. Hind femur 4.4 times as long as its maximum width. Hind tibia weakly widened to apex, 7.5 times as long as its maximum subapical width, as long as hind tarsus. First segment of hind tarsus 1.9 times as long as second segment.

METASOMA. First tergite weakly widened towards apex, 2.2 times as long as its apical width, weakly striate. Ovipositor 1.7 times as long as first tergite, 0.5 times as long as metasoma, 1.1 times as long as hind femur.

VARIATION. Body 1.8–2.0 mm, fore wing 2.0–2.2 mm, hind wing 1.3–1.5 mm. Antenna 19–22-segmented. Middle flagellar segments 1.8–2.0 times as long as their maximum width. First metasomal tergite 2.0–2.2 times as long as its apical width.

Male

Body length 1.7–1.8 mm, fore wing 1.8–2.0 mm, hind wing 1.3–1.5 mm. Antenna 25–26-segmented. Otherwise similar to female.

Key to the Nearctic and Neotropical species of *Synaldis*

1. Propodeum smooth, without or with short transverse carinae ending far from sides (Figs 7A, 11C) ...2
 - Propodeum sculptured, always with transverse carinae reaching its lateral sides (Figs 3C, 5C, 9B) ...9
2. Prescutellar pit absent [Antenna 20-segmented. Body length 1.7 mm. USA]*S. cabinica* Fischer, 1967
 - Prescutellar pit present3
3. Eye in lateral view 0.8–1.0 times as long as temple medially4
 - Eye in lateral view 1.3–1.5 times as long as temple medially6
4. First flagellar segment 1.6 times, second segment 1.4 times, and sixth segment 1.4 times as long as their maximum width. Mandible 1.3 times as long as its maximum width (Fig. 12A) [Antenna 18-segmented. Body length 1.7 mm. USA]*S. acutidens* Fischer, 1967
 - First flagellar segment 2.6–3.3 times, second segment 2.1–2.4 times, and sixth segment 1.9 times as long as their maximum width. Mandible as long as its maximum width (Fig. 12B)5
5. First flagellar segment 2.6 times as long as its maximum width. Marginal cell 4.2 times as long as its maximum width. Vein SR1 2.9 times as long as 3-SR. Head in dorsal view 1.5 times as long as its median length. Clypeus 2.2 times as long as its maximum width. [Antenna 19-segmented. Body length 1.4 mm. USA]*S. pygmaea* Viereck, 1917
 - First flagellar segment 3.3 times as long as its maximum width. Marginal cell 4.7 times as long as its maximum width. Vein SR1 3.8 times as long as 3-SR. Head in dorsal view 1.8 times as long as its median length. Clypeus 2.7 times as long as its maximum width. [Antenna 16-segmented (apical segments broken). Body length 1.6 mm. USA]*S. blantoni* Fischer, 1967
6. Hind femur 4.0 times as long as its maximum width. First metasomal tergite 1.6 times as long as its apical width. Face 2.2–2.4 times as wide as high (Fig. 12C). Vein SR1 3.6 times as long as vein 3-SR. [Antenna 12-segmented (apical segments broken). Body length 1.9 mm. USA] ...*S. rotundidens* Fischer, 1967
 - Hind femur 4.4–4.6 times as long as its maximum width. First metasomal tergite 2.0–2.2 times as long as its apical width. Face 1.6–1.8 times as wide as high (Fig. 12D). Vein SR1 1.8–3.0 times as long as vein 3-SR7
7. Mandible 1.3 times as long as its maximum width. First flagellar segment 3.0 times and sixth segment 1.5 times as long as their maximum width. Marginal cell 3.5 times as long as its maximum width. Vein SR1 1.8 times as long as vein 3-SR [Antenna 24-segmented. Body length 2.4 mm. USA]*S. segmentata* Fischer, 1967
 - Mandible 1.6–1.8 times as long as its maximum width (Figs 6C, 10C). First flagellar segment 3.5–4.0 times and sixth segment 1.8–2.9 times as long as their maximum width (Figs 6B, 10D). Marginal cell 4.0 times as long as its maximum width (Figs 7D, 11F). Vein SR1 2.6–3.0 times as long as vein 3-SR (Figs 7D, 11F)8
8. First flagellar segment 3.5 times, second segment 2.3 times and middle segments 1.8–2.0 times as long as their maximum width. First flagellar segment 1.3 times as long as second segment. Scape 1.8 times as long as pedicel (Fig. 10B). Vein SR1 2.6 times as long as vein 3-SR (Fig. 11F) [Antenna 19–26-segmented. Body length 1.8–2.0 mm. Brazil]*S. novateutoniae* Peris-Felipo, sp. nov.
 - First flagellar segment 4.0 times, second segment 3.2–3.3 times and middle segments 2.5–2.9 times as long as their maximum width. First flagellar segment about as long as second segment. Scape

1.5 times as long as pedicel (Fig. 6E). Vein SR1 3.0 times as long as vein 3-SR (Fig. 7D) [Antenna 18–21-segmented. Body length 1.5–1.7 mm. Brazil] *S. longiflagellaris* Peris-Felipo, sp. nov.

9. Propodeum with pentagonal areola well defined (Figs 3C, 12E) 10
 – Propodeum without pentagonal areola (Figs 5C, 13A) 11

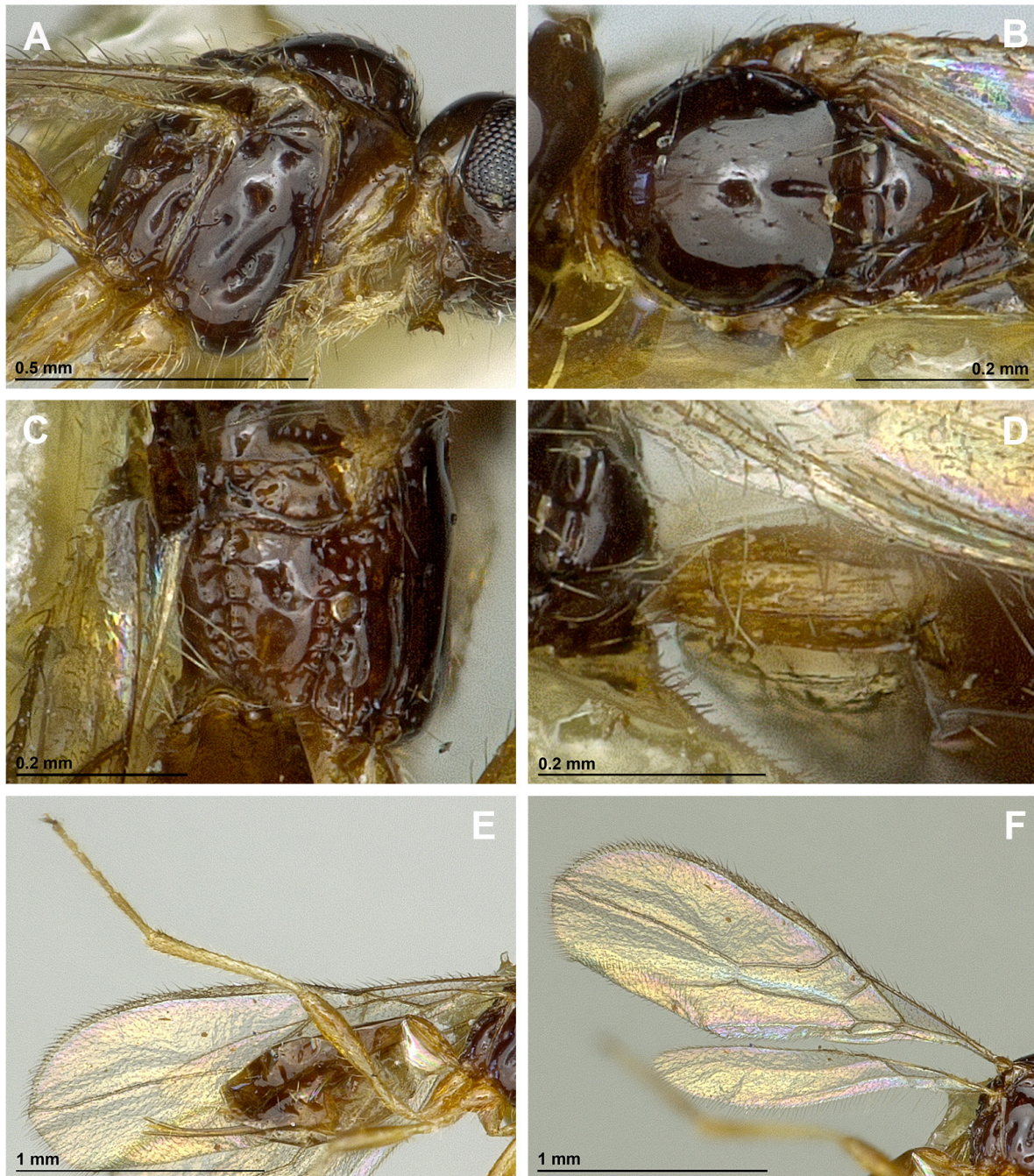


Fig. 11. *Synaldis novateutoniae* Peris-Felipo, sp. nov., ♀. **A.** Mesosoma, lateral view. **B.** Mesonotum, dorsal view. **C.** Propodeum. **D.** First metasomal tergite. **E.** Legs, metasoma and ovipositor, lateral view. **F.** Fore and hind wings.

10. Prescutellar pit absent. Mandible 1.5 times as long as its maximum width. First metasomal tergite 2.1 times as long as its apical width [Antenna 25-segmented. Body length 2.6 mm. USA]
*S. glabrifovea* Fischer, 1967
 – Prescutellar pit present (Fig. 3B). Mandible 1.8 times as long as its maximum width (Fig. 2C). First metasomal tergite 2.4 times as long as its apical width (Fig. 2D) [Antenna 20–21-segmented. Body length 1.5–1.7 mm. Brazil]*S. brasiliense* Peris-Felipo, sp. nov.
11. Prescutellar pit absent [Antenna 15-segmented]12
 – Prescutellar pit present14

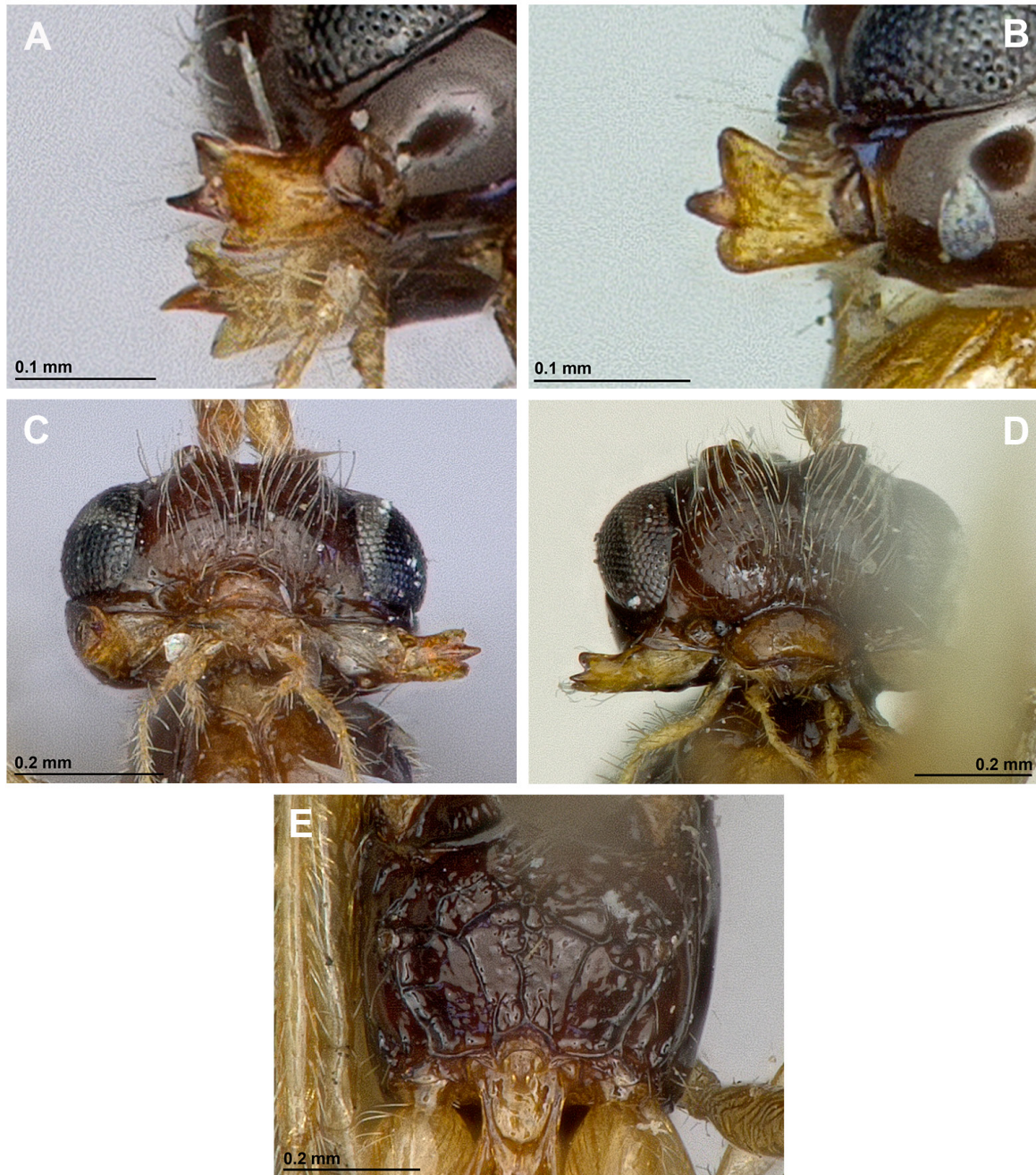


Fig. 12. A. Mandible of *Synaldis acutidens* Fischer, 1967. B. Mandible of *S. pygmaea* Viereck, 1917. C. Face of *S. rotundidens* Fischer, 1967, front view. D. Face of *S. segmentata* Fischer, 1967, front view. E. Propodeum of *S. glabrifovea* Fischer, 1967, dorsal view.

12. First flagellar segment 2.6 times as long as its maximum width. Apical flagellar segment 2.1 times as long as its maximum width. Face 1.6 times as wide as high. Clypeus 3.2 times as long as high. Mandible 1.4 times as long as its maximum width. [Antenna 15-segmented. Body length 1.6 mm. USA]*S. ulmicola* Ashmead, 1889 stat rev.

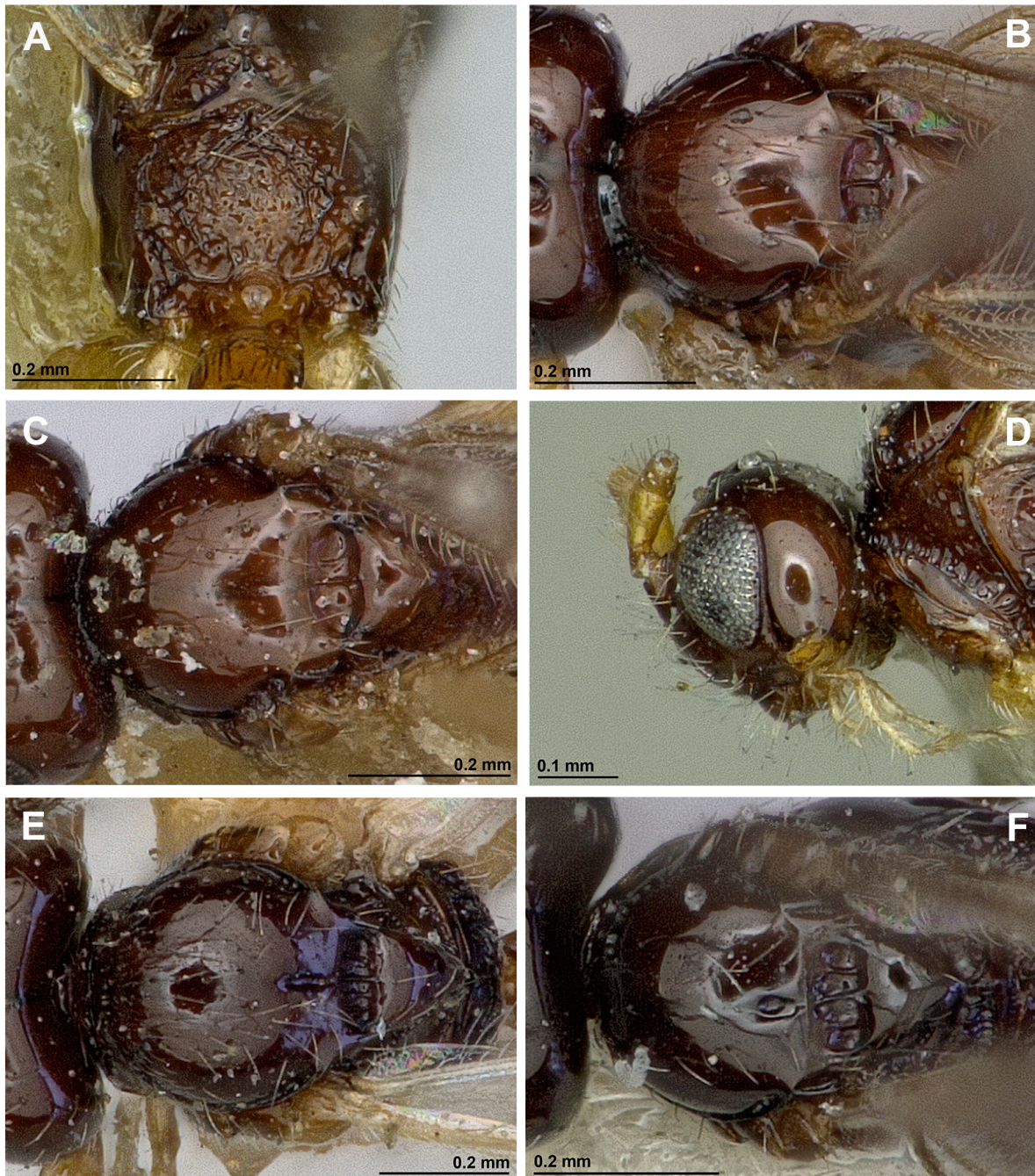


Fig. 13. A. Propodeum of *Synaldis ulmicola* Ashmead, 1889, dorsal view. B. Mesonotum of *S. exitiosae* Fischer, 1967, dorsal view. C. Mesonotum of *S. painteri* Fischer, 1967, dorsal view. D. Head of *S. quinnipiacorum* Viereck, 1917, lateral view. E. Mesonotum of *S. incisa* Gahan, 1912, dorsal view. F. Mesonotum of *S. alfalfae* Fischer, 1967, dorsal view.

- First flagellar segment 1.8–2.2 times as long as its maximum width. Apical flagellar segment 1.8 times as long as its maximum width. Face 1.9–2.0 times as wide as high. Clypeus 2.8 times as long as high. Mandible 1.0–1.2 times as long as its maximum width13
- 13. Eye in lateral view 1.3 times as long as its temple medially. First flagellar segment 1.8 times as long as its maximum width. Scape of antenna 2.3 times as long as pedicel. Prescutellar depression as long as its maximum width (Fig. 13B). Marginal cell 4.1 times as long as its maximum width [Antenna 15-segmented. Body length 1.7 mm. USA]*S. exitiosae* Fischer, 1967
- Eye in lateral view 1.6 times as long as its temple medially. First flagellar segment 2.2 times as long as its maximum width. Scape of antenna 1.8 times as long as pedicel. Prescutellar depression 1.5 times as long as its maximum width (Fig. 13C). Marginal cell 4.5 times as long as its maximum width [Antenna 15-segmented. Body length 1.8 mm. USA]*S. painteri* Fischer, 1967
- 14. Eye in lateral view 0.7–0.8 times as long as temple medially (Fig. 13D)15
- Eye in lateral view 1.0–1.7 times as long as temple medially (Fig. 4B)17
- 15. Precoxal sulcus reaching anterior margin of mesopleuron. Hind femur 3.5 times as long as its maximum width [Antenna broken. Body length 1.7 mm. USA] ...*S. quinnipiacorum* Viereck, 1917
- Precoxal sulcus not reaching anterior margin of mesopleuron. Hind femur 4.0 times as long as its maximum width16
- 16. First metasomal tergite 1.3 times as long as its apical width. Second flagellar segment 1.6 times and sixth segment 1.1 times as long as their maximum width. Mandible as long as its maximum width. Prescutellar pit elongate (Fig. 13E). [Antenna 17-segmented. Body length 2.1 mm. USA]*S. incisa* Gahan, 1912
- First metasomal tergite 2.0 times as long as its apical width. Second flagellar segment 2.0 times and sixth segment 1.7 times as long as their maximum width. Mandible 1.2 times as long as its maximum width. Prescutellar pit oval (Fig. 13F). [Antenna 19-segmented. Body length 1.6 mm. Canada, USA] ...*S. alfalfae* Fischer, 1967
- 17. Precoxal sulcus reaching anterior margin of mesopleuron18
- Precoxal sulcus not reaching anterior margin of mesopleuron19
- 18. Propodeal spiracles large, length of spiracle 1.3 times as long as the distance between spiracle and anterior border of propodeum (Fig. 14A). Mandible 1.4 times as long as its maximum width. Subdiscal cell 4.0 times as long as its maximum width. [Antenna 18-segmented. Body length 2.5 mm. USA]*S. spiraculosa* Fischer, 1967
- Propodeal spiracles relatively small, length of spiracle 3.0 times as long as the distance between spiracle and anterior border of propodeum (Fig. 14B). Mandible 1.2 times as long as its maximum width. Subdiscal cell 2.7 times as long as its maximum width. [Antenna 19-segmented (apical segments broken. Body length 2.1 mm. USA]*S. sensillosa* Fischer, 1967
- 19. First metasomal tergite 1.4–1.9 times as long as its apical width (Figs 14C, 14D)20
- First metasomal tergite 2.7 times as long as its apical width (Figs 5D, 9C)24
- 20. First metasomal tergite 1.4 times as long as its apical width. Hind femur 3.3 times as long as its maximum width. Hind tibia 7.0 times as long as its maximum width. [Antenna 15-segmented. Body length 1.6 mm. USA]*S. megaseliae* Fischer, 1967
- First metasomal tergite 1.7–1.9 times as long as its apical width. Hind femur 3.6–4.0 times as long as its maximum width. Hind tibia 7.6–8.3 times as long as its maximum width.21
- 21. First flagellar segment 3.7 times, second segment 2.4 times and sixth segment 2.3 times as long as their maximum width. Eye in lateral view 1.5 times as long as temple medially. Clypeus 2.3 times

- as wide as high (Fig. 14E). First metasomal tergite paler than second and third tergites. [Antenna 21-segmented. Body length 1.3 mm. USA]*S. liliputana* Fischer, 1967
- First flagellar segment 2.1–2.5 times, second segment 1.3–1.7 times and sixth segment 1.3–1.6 times as long as their maximum width. Eye in lateral view 1.0–1.3 times as long as temple medially. Clypeus 2.6–2.9 times as wide as high (Fig. 14F). First metasomal tergite similar colour as second and third tergites22

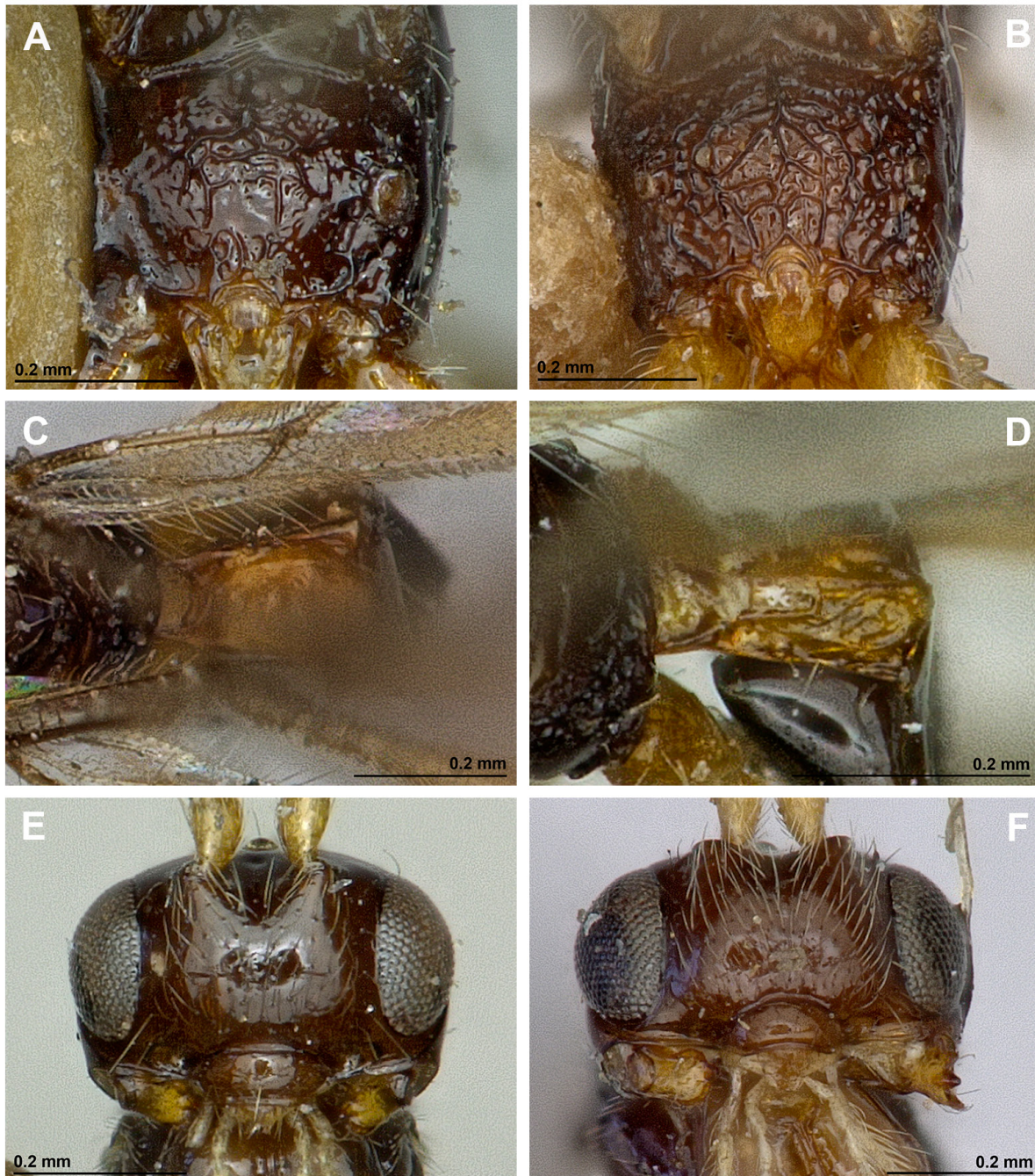


Fig. 14. A. Propodeum of *Synaldis spiraculosa* Fischer, 1967, dorsal view. B. Mesonotum of *S. sensillosa* Fischer, 1967, dorsal view. C. First metasomal tergite of *S. megaseliae* Fischer, 1967, dorsal view. D. First metasomal tergite of *S. liliputana* Fischer, 1967, dorsal view. E. Head of *S. liliputana* Fischer, 1967, front view. F. Head of *S. altera* Fischer, 1967, front view.

22. Propodeal spiracles large, length of spiracle 1.5 times as long as the distance between spiracle and anterior border of propodeum (Fig. 15A). Subdiscal cell 3.7 times as long as its maximum width. [Antenna 23-segmented (apical segments broken). Body length 2.3 mm. USA] ... *S. altera* Fischer, 1967
- Propodeal spiracles relatively small, length of spiracle 3.0–3.6 times as long as the distance between spiracle and anterior border of propodeum (Fig. 15B). Subdiscal cell 2.4–3.0 times as long as its maximum width. [Antennae 17-segmented] 23
23. Face 2.0 times as wide as high. First flagellar segment 2.1 times as long as its maximum width. Mesoscutal pit round (Fig. 15C). Subdiscal cell 3.8 times as long as its maximum width. [Body length 1.8 mm. USA] *S. difficilis* Fischer, 1967
- Face 1.5 times as wide as high. First flagellar segment 2.5 times as long as its maximum width. Mesoscutal pit elongate (Fig. 15D). Subdiscal cell 5.0 times as long as its maximum width. [Body length 2.1 mm. USA] *S. numerosa* Fischer, 1967
24. Face 1.8 times as wide as high (Fig. 4E). Second flagellar segment 2.2 times and sixth segment 1.8 times as long as their maximum width (Fig. 4D). Hind femur 3.5 times as long as its maximum width (Fig. 5E). [Antenna 23–25-segmented. Body length 2.4–2.7 mm. Brazil] *S. fritzi* Peris-Felipo, sp. nov.
- Face 1.2 times as wide as high (Fig. 8E). Second flagellar segment 2.7 times and sixth segment 2.5 times as long as their maximum width (Fig. 8D). Hind femur 3.9 times as long as its maximum width (Fig. 9D). [Antenna 20-segmented. Body length 1.7 mm. Brazil] ... *S. magniocularis* Peris-Felipo, sp. nov.

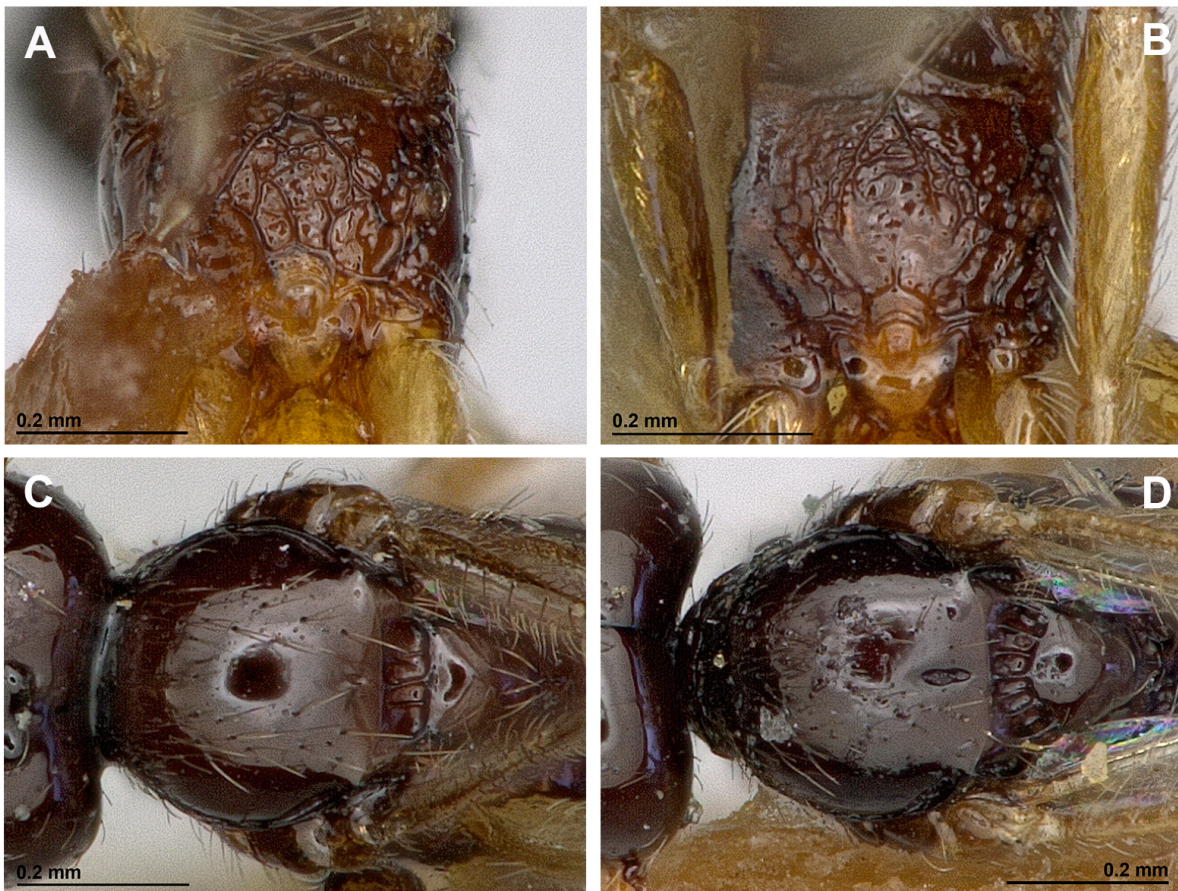


Fig. 15. A. Propodeum of *Synaldis altera* Fischer, 1967, dorsal view. B. Propodeum of *S. difficilis* Fischer, 1967, dorsal view. C. Mesonotum of *S. difficilis* Fischer, 1967, dorsal view. D. Mesonotum of *S. numerosa* Fischer, 1967, dorsal view.

Discussion

Species of the genus *Synaldis* are parasitoids of Diptera, ovipositing into larvae and emerging from puparia, and have already been recorded in many zoogeographical regions of the world (Afrotropical, Australasian, Holarctic and Oriental). However, information about this group in the Neotropical region began to appear only recently (see, e.g., Peris-Felipo & Belokobylskij 2016). The discovery of the genus *Synaldis* in South America is more evidence for the wide global distribution of this genus.

Despite a rather limited number of morphological characters used for species diagnoses in the *Aspilota* group, their combination allows a reliable discrimination of species in each region, including a highly diverse and species-rich territory such as Brazil. It is important to underline that, even in the Neotropics, members of the *Aspilota* group (including *Synaldis*) morphologically do not strongly deviate from the main and well-known diagnostic structures. This is also demonstrated for the five Neotropical *Synaldis* species described here: *S. brasiliense* sp. nov., *S. fritzi* sp. nov., *S. longiflagellaris* sp. nov., *S. novateutoniae* sp. nov., and *S. magniocularis* sp. nov. have a predominantly black body with pale legs, one of the four known types of propodeum sculpture, a similar type of wing venation, and a short and upcurved ovipositor.

The first original key for determination of all New World *Synaldis* species published in this paper is a very important step for a future deeper study of the biodiversity of this group of Alysiinae in the Neotropical region.

Finally, it is important to remark that the limited number of known Alysiinae taxa in the Neotropical region is a reflection of the very limited research carried out on this group to date. Further investigation both on the fauna and host associations of the Neotropical Alysiinae will be necessary to provide real information about the biodiversity of one of the world's most important regions of biota.

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