



## Article

### New species of *Prototilla* Schuster, 1949 from Argentina and diagnoses of the genus based on male and female (Hymenoptera: Bradynobaenidae: Typhoctinae: Eotillini)

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#### Abstract

Diagnoses for the genus *Prototilla* Schuster, 1949 based on males and females, new generic and specific characters, and descriptions of four new species (*Prototilla nigra* Torrén, Fidalgo, Roig-Alsina & Brothers, **sp. nov.** and *P. intercalata* Torrén, Fidalgo, Roig-Alsina & Brothers, **sp. nov.** based on males, and *P. striata* Torrén, Fidalgo, Roig-Alsina & Brothers, **sp. nov.** and *P. telteca* Torrén, Fidalgo, Roig-Alsina & Brothers, **sp. nov.** based on females) are provided. *Prototilla typhoctoides* (Martinez & Fritz, 1974), **comb. nov.** is transferred from *Eotilla*. A comparative table between the two genera of the tribe Eotillini and a key to the species of *Prototilla* are presented.

**Key words:** *Prototilla*, *Eotilla*, diagnosis, key to species

#### Introduction

Schuster (1949) described *Prototilla* and *Eotilla* and placed them in a new subfamily (Eotillinae) within the family Mutillidae, along with four other subfamilies (Typhoctinae, Apterogyninae, Sphaerophthalminae and Mutillinae) found in the Neotropical region. The type species of *Prototilla* (*P. anomala* Schuster, 1949), based on the male, remains the only known representative of the genus to the present.

In phylogenetic studies and classification of Hymenoptera Aculeata, Brothers (1975, 1999) and Brothers and Carpenter (1993) placed Eotillini and Typhoctini as tribes of Typhoctinae, but distant from Mutillidae and relocated within Bradynobaenidae (with Chyphotinae, Apterogyninae and Bradynobaeninae). Genise (1986) treated the four subfamilies mentioned above as separate families within a superfamily Bradynobaenoidea; his rank elevation of aculeate taxa has not been adopted.

Recent molecular phylogenetic studies of the superfamily Vespoidea by Pilgrim *et al.* (2008) indicate that the family Bradynobaenidae — according to the concept of Brothers (1975) — is paraphyletic; they placed Apterogyninae and Bradynobaeninae in Bradynobaenidae within a superfamily Scolioidea, and Chyphotinae and Typhoctinae in Chyphotidae within a superfamily Thynnoidea. This mainly molecular analysis has, however, not yet been properly evaluated or tested by other analyses, so we retain the generally used classification. Heraty *et al.* (2011) in their study of the phylogeny of Hymenoptera, although including only a small number of genera of Vespoidea (and only *Chyphotes* Blake, 1886 for Bradynobaenidae), confirmed the lack of a close relationship between Mutillidae and *Chyphotes*, and showed a close relationship between *Chyphotes* and *Colocistis* Krombein, 1942 (their only representative of Tiphiidae).

At present, the Typhoctinae contains two tribes: Typhoctini with *Typhoctes* Ashmead, 1899 (North and Central America) and *Typhoctoides* Brothers, 1974 (Chile and Argentina) and Eotillini with *Eotilla* (Chile and Argentina)

and *Prototilla* (Argentina). With respect to the biology of Typhoctinae, nothing is known except two instances of *Typhoctes* larvae found on immature solifugae, and an associated cocoon with a pupa (Brothers 2006); about Chyphotinae, nothing is known except that they are nocturnal, while Typhoctinae are diurnal (Brothers 2006). Bradynobaeninae are apparently diurnal and so are most Apterogyninae (although some are nocturnal); nothing is known about the hosts of these subfamilies either.

In this paper, the differences between *Prototilla* and *Eotilla* are elaborated, diagnoses of *Prototilla* based on males and females are presented, and new generic and specific characters are added; four new species of *Prototilla*, all from Argentina, are described: *P. nigra* **sp. nov.** and *P. intercalata* **sp. nov.** based on males, and *P. striata* **sp. nov.** and *P. telteca* **sp. nov.**, based on females (described separately because of the difficulty in associating the sexes caused by the extreme sexual dimorphism). *Eotilla typhoctoides* Martinez & Fritz, 1974 is transferred to *Prototilla*, establishing a new combination. A key to the species concerned is provided.

## Materials and methods

JT and PF collected males and females using yellow pan traps containing water and a few drops of detergent buried to soil level and cleared daily; in addition, females were collected with pitfall traps containing propylene glycol and covered to prevent the entry of sand and larger animals. Some males were collected in Malaise traps.

Images were obtained using Leica QWin software operating on a Leica M420 Macroscope linked to a Sony PowerHad DXC-950P digital video camera; and Leica Application Suite (version 3.5.0) software operating on a Leica MZ12 stereomicroscope linked to a Leica DFC295 digital video camera. Images were enhanced with COREL PHOTOPAINT and COREL DRAW (version 15); and some images were processed with the computer program DEEP FOCUS by Stuart Ball. Images of the holotype of *P. anomala* were obtained using a Canon Powershot G10 camera adapted to a stereomicroscope and processed with CombineZP by Alan Hadley.

Specimens studied are deposited in the Museo Argentino de Ciencias Naturales “Bernardino Rivadavia”, Buenos Aires, Argentina (MACN), Instituto Fundación Miguel Lillo, Tucumán, Argentina (IFML), Instituto Argentino de Investigación de Zonas Áridas, Mendoza, Argentina (IADIZA), Natural History Museum, London, UK (BMNH), Museum national d’Histoire naturelle, Paris, France (MNHN), the collection of Denis J. Brothers, Pietermaritzburg, South Africa (DJBC) which will be transferred to the Iziko South African Museum, Cape Town, South Africa (SAMC) in due course, and the collection of Guido Pagliano, Turin, Italy (PAGL).

Morphological terms are from Brothers (1975) and Reid (1941), with details on sculpture from Eady (1968) and Harris (1979). The abbreviations F, S and T refer to numbered flagellomeres, metasomal sterna and metasomal terga, respectively; LOL = lateral ocellar line, OOL = ocellular line and POL = postocellar line. Mesosomal length was measured between its extremities (excluding the anterior pronotal collar) in dorsal view. Metasomal length was measured from the anterior extremity of the dorsal surface of T1 to the apex of T7, in dorsal view.

## Tribe Eotillini Schuster, 1949

Eotillinae Schuster 1949: 62–67.

Sexual dimorphism grossly complicates the assignment of the females to *Eotilla* or the very similar *Prototilla*; however, from the material collected it was observed that males of both genera have not been found in the same place. Males of a new species of *Eotilla* from Argentina (Jujuy) which were collected at two sites and in two different years were found together with females which are very similar to one assigned to the type species of *Eotilla* (*E. mickeli* Schuster, 1949) by Mickel (1968); also, males of *Eotilla* and similar females from Chile (National Museum of Natural History in Chile), confirmed the association (paper in preparation). This evidence suggests that the females similarly found with males of *Prototilla* should be placed in that genus, and the morphological differences between these sets of females are the basis for the differentiation below; molecular studies may clarify this situation, however.

Both males and females have four types of setae on the body: simple, scale-like (plumose setae according to Schuster 1949, Fig. 1), plumose (subplumose setae according to Schuster 1949, Fig. 2) and small (mushroom-like). For descriptions we rely on the distribution of scale-like and plumose setae (see Figs 1–2 in Schuster 1949), those that are the most visible and important for the differentiation of species.

A feature in the descriptions provided by Schuster (1949) and subsequent authors is the presence of a small humeral tubercle or epaulet on the anterior dorso-lateral angle of the pronotum; this is found in both sexes and is often similar to the “felt-line” of *T2* but smaller. Within Bradynobaenidae, it is present only in members of the subfamily Typhoctinae (although less definite and difficult to see in Typhoctini because of their denser body setae). In the fore wing of the male the cells, especially the third submarginal, vary in form, sometimes even in the same individual; they were therefore not considered for the differentiation of species.

The two genera of Eotillini (*Prototilla* and *Eotilla*) may be differentiated as follows:

<i>Prototilla</i>	<i>Eotilla</i>
<i>Males</i>	
Antennal scape without ventral carina.	Antennal scape with a ventral longitudinal carina (see Fig. 6 in Schuster 1949).
Fore wing with three submarginal cells. Hind wing with vein <i>IRS</i> proclinate, median cell apically produced, extending beyond origin of distal hamuli-group; median cell with three veins arising from it ( <i>RS</i> , <i>M</i> and <i>Cu</i> ) (Fig. 32; see Fig. 9 in Schuster 1949).	Fore wing with two submarginal cells. Hind wing with median cell obliquely truncate at apex, not reaching level of origin of distal hamuli-group; median cell with two veins arising from it ( <i>RS</i> and <i>Cu</i> ) (see Fig. 8 in Schuster 1949).
Tarsal claws each with ventral tooth (see Fig. 13 in Schuster 1949).	Tarsal claws smooth, without ventral tooth (see Fig. 11 in Schuster 1949).
Surface of T7 convex.	Surface of T7 with an inverted-V-shaped depression (Argentinian species) or convex (Chilean species).
Horizontal face of prosternum strongly projecting anteriorly, with a small semicircular projection posteriorly.	Horizontal face of prosternum weakly projecting anteriorly, without a projection posteriorly.
Genitalia with basal ring anteroventrally narrowly and acutely emarginate (Fig. 16).	Genitalia with basal ring anteroventrally broadly emarginate (see Fig. 17 in Schuster 1949).
<i>Females</i>	
Pronotum sub-rectangular, with sides slightly convergent to posterior margin; humeral tubercle pronounced and well defined.	Pronotum trapezoidal, with sides strongly convergent to posterior margin; humeral tubercle scarcely developed.
Mesopleural carina extending from anterior margin to posterior margin of sclerite.	Mesopleural carina restricted to anterior half of sclerite.
S6 with latero-posterior margin smooth.	S6 with latero-posterior margin with distinct denticles, although sometimes weak.

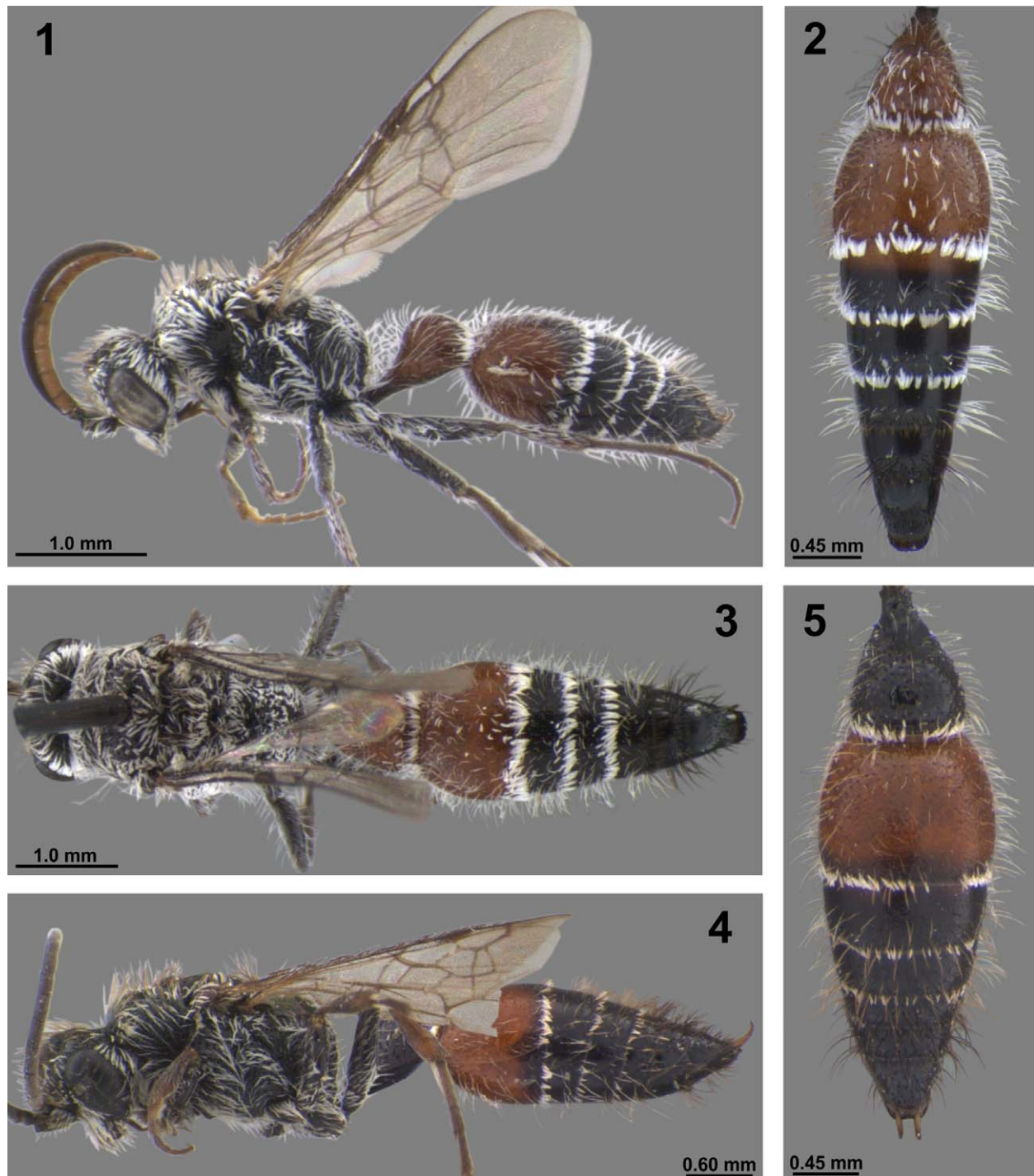
### ***Prototilla* Schuster, 1949**

*Prototilla* Schuster 1949: 69–70. Additional citations: Mickel 1968 (mention); Brothers 1970, 1974 (mention); Martinez & Fritz 1974 (mention); Fernandez 2000, 2001, 2002 (list); Brothers 2006 (key); Torr  ns & Roig-Alsina 2009 (mention).

Type species: *Prototilla anomala* Schuster, 1949 by original designation and monotypy.

**Diagnosis.** *Male*. Head with ocelli. Antennal scape smooth, without ventral longitudinal carina. Horizontal face of prosternum strongly projecting anteriorly, with a small semicircular projection posteriorly. Mid coxae moderately separated by a distance equal to half maximum width of femur. Fore wing with three submarginal cells (Figs 6, 7, 10). Hind wing with vein *IRS* proclinate, median cell apically produced, extending beyond origin of distal hamuli-group; median cell with three veins arising from it (*RS*, *M* and *Cu*) (Fig. 32; see Fig. 9 in Schuster 1949). Tarsal claws each with ventral tooth (see Fig. 13 in Schuster 1949). T7 with surface convex (Figs 2, 5, 12). Genitalia with basal ring anteroventrally acutely emarginate (Fig. 16).

*Female*. Head without ocelli. Pronotum rectangular with humeral tubercle pronounced and well defined (Fig. 22). Mesopleural carina extending from anterior margin to posterior margin of sclerite (Figs 25, 27). Mid coxae widely separated by a distance of  $1.3 \times$  maximum width of mid femur. Tarsal claws smooth, without teeth. S6 with latero-posterior margin smooth, without denticles.



**FIGURES 1–5.** *Prototilla* spp. 1–3, *P. anomala*, ♂ (Santa Teresita, La Rioja): 1, habitus (lateral); 2, metasoma (dorsal); 3, habitus (dorsal). 4, 5, *P. intercalata* **sp. nov.**, holotype ♂ (Los Tigres, Santiago del Estero): 4, habitus (lateral); 5, metasoma (dorsal).

### Key to species of *Prototilla*

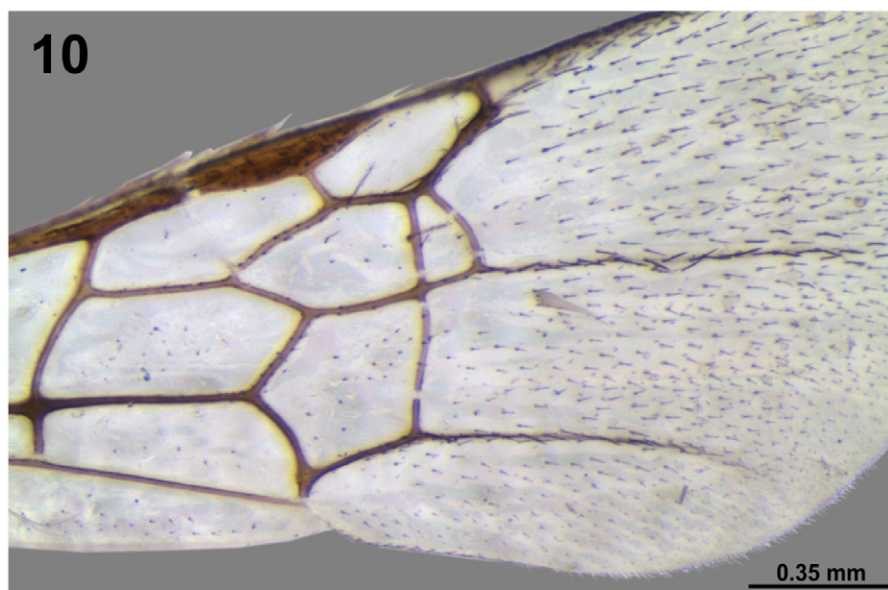
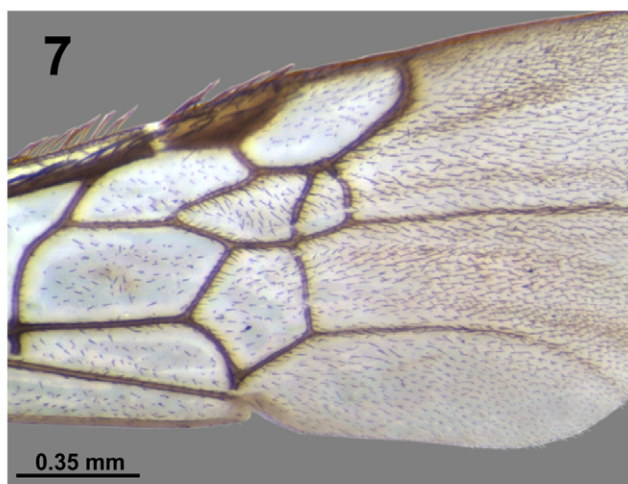
#### Males

1. T1 and T2 black (Figs 11–13). Scale-like setae covering posterior half of T1 and centre of T2 (Fig. 12). . . . . *P. nigra* **sp. nov.**
- T1 black or reddish, T2 reddish. Scale-like setae restricted to posterior margins on T1 and T2 . . . . . 2
2. T1 reddish (Figs 1–3). Spiracle of T1 located on a small protuberance . . . . . *P. anomala* Schuster
- T1 black (Figs 4, 5, 8, 9). Spiracle of T1 not located on a protuberance . . . . . *P. intercalata* **sp. nov.**



# Females

1. General body color light brown to orange, except T3–T6 dark brown to black (Figs 21, 22, 27, 28) ..... *P. typhoctoides* (Martinez & Fritz)
- General body color dark reddish brown to black ..... 2
2. General body color dark brown to black, except for lighter antennae, legs and apex of metasoma (Figs 17, 18, 23, 24). Humeral tubercle blunt (Fig. 18). Metapleuron smooth (Fig. 23). Posterior surface of propodeum flat to weakly convex, not delimited laterally ..... *P. telteca* **sp. nov**
- General body color reddish brown to dark brown, except for lighter pronotum, antennae and legs (Figs 19, 20, 25, 26). Humeral tubercle acute (Fig. 20). Metapleuron striated (Fig. 25). Posterior surface of propodeum concave, delimited by a carina laterally ..... *P. striata* **sp. nov.**



**FIGURES 6–10.** *Prototilla* spp. 6, *P. anomala*, ♂ (Santa Teresita, La Rioja), fore wing (lateral). 7–9, *P. intercalata* **sp. nov.**, holotype ♂ (Los Tigres, Santiago del Estero): 7, fore wing (lateral); 8, habitus (dorsal); 9, metasoma (lateral). 10, *P. nigra* **sp. nov.**, ♂ (Santa Teresita, La Rioja), fore wing (lateral).

***Prototilla anomala* Schuster, 1949**

(Figs 1–3, 6, 29–32)

*Prototilla anomala* Schuster, 1949: 71–75.

**Diagnosis.** *Male*. First and second segments of metasoma reddish, the rest black (Figs 1, 3, 29, 30). T1 and T2 with plumose setae across their surfaces, scale-like setae only on their posterior margins (Fig. 2). T1 spiracle located on a small protuberance. Fore wing moderately setose (Figs 6, 32). *Female*. Unknown.

**Description** and characterization provided by Schuster (1949).

**Variation.** T3 may be entirely reddish like T1 and T2 (and then T4 may be reddish basally), or reddish only basally, rather than entirely black.

**Discussion.** Schuster based his description on a specimen deposited in the Paris Museum (André Collection) from “Argentina (no further data)”. In fact, the holotype bears a second label “Mendoza” (Fig. 31), which narrows down the type locality. The additional specimens examined here extend the known distribution several hundred kilometers north-north-east of the type locality.

While the detailed description by Schuster (1949) is correct, a few additional characters useful to differentiate this species from others are given in the diagnosis above. Although Schuster indicated the length as “5–6 mm”, which would indicate that he had more than one specimen, he stated (1949: 67, footnote) that *Prototilla* was represented by “the unique type” and listed only the holotype, so the length was an estimate, perhaps because the metasomal segments are somewhat telescopically extended (Figs 29, 30).

**Distribution.** Argentina: La Rioja, Mendoza.

**Material examined.** Holotype ♂: ARGENTINA: Mendoza (no further data) (MNHN). Other material, 6 ♂: La Rioja, Santa Teresita [28°35'57"S 66°33'32"W], 28/IX/2006, J. Torrén, G. Fidalgo, P. Fidalgo, MT (1♂, IFML); same location, 28/X/2006, G. y P. Fidalgo y J. Torrén, MT (1♂, MACN); same location, III/2005, MT, P. Fidalgo, G. Fidalgo y J. Torrén (1♂, MACN); 5 km N Carrizal, 490 m., malaise, 28°57.16'S 66°37.75'W, 2/16.ix.1999, ME Irwin, FD Parker (1♂, DJBC; 1♂, PAGL); Sierra de Argañaraz, 28 km N Chepes, Higuerita, malaise, 31°11.35'S 66°41.39'W, 2/16.ix.1999, 930 m, ME Irwin, FD Parker (1♂, PAGL).

***Prototilla intercalata* Torrén, Fidalgo, Roig-Alsina & Brothers, sp. nov.**

(Figs 4, 5, 7–9)

**Diagnosis.** *Male*. General body color black, except T2 reddish (Figs 4, 8). Spiracle on T1 not located on a protuberance. Fore wing densely setose (Fig. 7). *Female*. Unknown.

**Description.** *Male*. Length 6.0 mm. General body color black, except T2 reddish; coxae, trochanters, femora, mandible and antenna, except last 4 segments of flagellum, dark brown; tibiae, tarsi and other flagellomeres lighter (Figs 4, 8).

Head oval,  $1.4 \times$  as broad as high and  $1.1 \times$  as broad as mesosoma, with numerous scale-like setae covering almost entire head, except vertex; plumose setae long, dark brown and scattered over vertex and frons almost reaching toruli; vertex with spaced punctation. POL  $1.3 \times$  as long as OOL, POL  $1.7 \times$  as long as LOL; eyes ovoid, separated by  $1.2 \times$  their height, malar space  $0.2 \times$  eye height. Palpal formula 6-4. Antenna of 13 segments; radicle as long as broad; scape covered with reddish scale-like and plumose setae, except glabrous ventrally; scape  $1.8 \times$  as long as broad,  $2.0 \times$  as long as pedicel; flagellomeres cylindrical, F1  $0.7 \times$  length of scape and  $0.7 \times$  length of F2, F2–F6 approximately same length, F7–F10 gradually decreasing in length, F11 elongated with rounded apex.

Mesosoma elongate,  $1.7 \times$  as long as broad; punctation well marked, similar to that on head, punctures spaced on dorsum and more contiguous on pleura and propodeum; covered with scale-like and plumose setae (Figs 4, 8). Pronotum transverse, with scattered punctation on dorsum and contiguous elsewhere, anterior collar with small plumose setae, elsewhere with scale-like and reddish plumose setae, lateral surface with scattered setae; humeral angle well marked. Mesonotum moderately punctate, with a predominance of reddish plumose setae and scattered scale-like setae; tegula convex, smooth and with a few scale-like setae; scutellum with well-

scattered punctation and predominance of reddish long plumose setae, except medially smooth and without setae. Metanotum transverse, short, with scale-like and plumose setae; punctate, except lateral part striate and medially smooth and glabrous. Propodeum in dorsal view with small depression at posterior extremity, posterior surface slightly concave near propodeal foramen, with strong punctation except striated near insertions of hind coxa and metasoma; with moderately dense scale-like setae on dorsum and predominance of plumose setae elsewhere, with a few scale-like setae near insertion of hind coxa. Propleuron heavily punctate, almost completely covered with scale-like setae; mesopleuron convex, punctate, densely covered by scale-like and plumose setae, mesepisternum heavily punctate anteriorly and sparsely punctate posteriorly; metapleuron rugose-punctate, apparently striate, with scattered scale-like and plumose setae, denser toward insertion of hind wing.

Wing venation as for genus. Fore wing  $3.3 \times$  as long as broad, densely setose (Fig. 7), hyaline, venation dark brown, with brown and thick plumose setae at base and on veins *C* and *M+Cu*.

Legs slender; anterior surface of coxae, trochanters, and fore and mid femora almost covered by scale-like setae, rest of their surfaces and hind femur with scattered scale-like setae; tibiae and tarsi without scale-like setae; legs generally with scattered plumose setae, becoming denser where scale-like setae lacking; mid and hind tibiae each with two long white spurs; claws toothed.

Metasoma  $2.6 \times$  as long as broad; terga with small, indefinite and contiguous punctation; T1 with punctation coarser, well defined and dispersed, becoming smooth with some striae anteriorly (Figs 5, 9). T1–T4 with small scale-like setae at posterior margins; T5–T6 with very small plumose setae at posterior margins; T1–T3 and part of T4 with scattered white plumose setae; dorsum of T4, T5–T7 with scattered dark brown plumose setae; T7 with convex surface; sterna with sculpture and distribution of setae similar to that of corresponding terga. (Genitalia not examined.)

*Female.* Unknown.

**Etymology.** From Latin *intercalatus* -a -um which means “intercalated”, referring to the coloration of the metasoma that is between that of *P. anomala* and *P. nigra*.

**Distribution.** Argentina: Santiago del Estero.

**Material examined.** Holotype ♂ : ARGENTINA: Santiago del Estero, Los Tigres [25°54'21"S 62°35'32"W], 11-16/I/1970, R. Golbach (IFML).

### ***Prototilla nigra* Torrén, Fidalgo, Roig-Alsina & Brothers, sp. nov.**

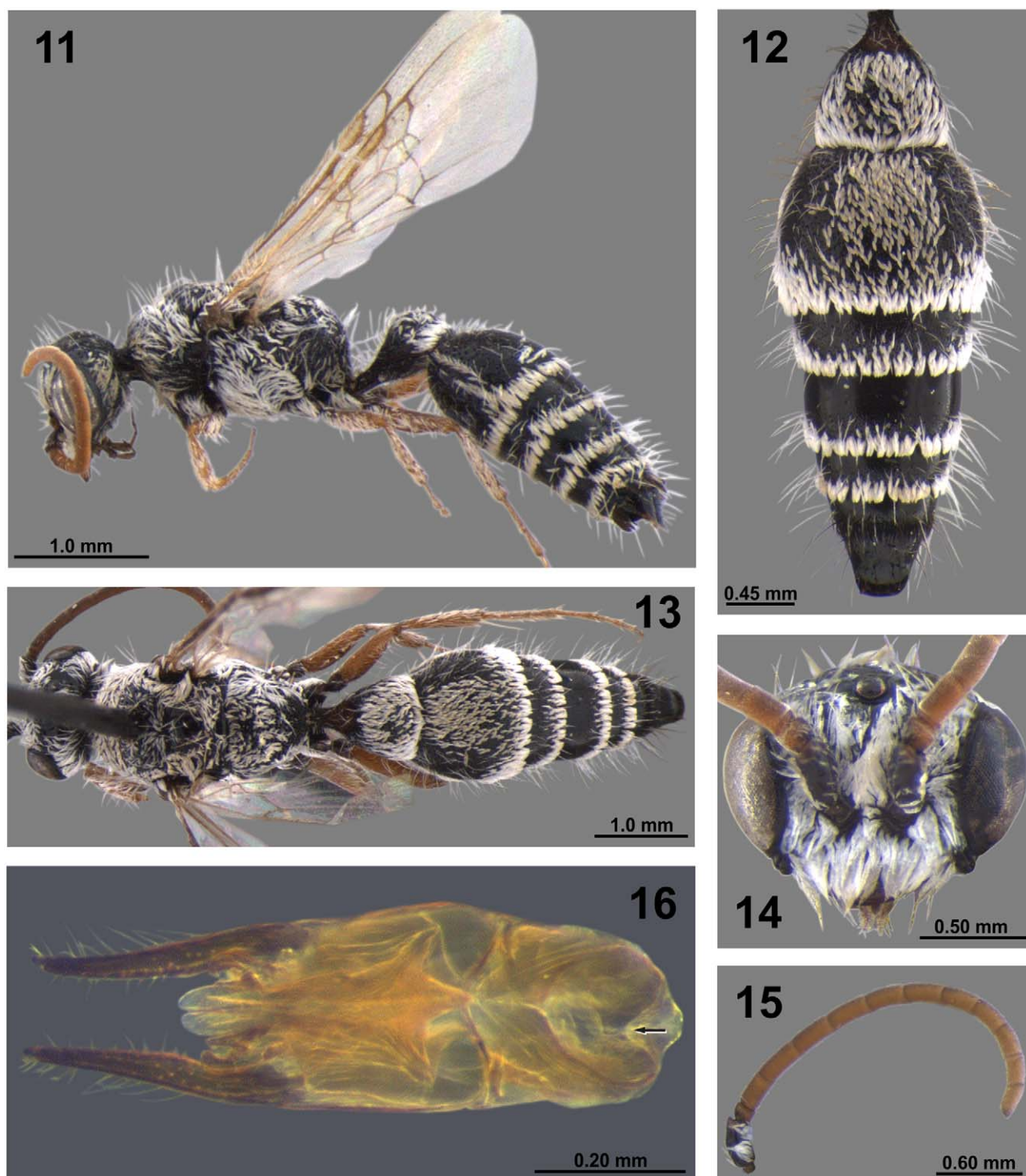
(Figs 10–16)

**Diagnosis.** *Male.* General body color black (Figs 11, 13). Scale-like setae covering posterior half of T1 and center of T2 (Fig. 12). Fore wing barely setose (Fig. 10). *Female.* Unknown.

**Description.** *Male.* Length 5.0–6.7 mm. General body color black. Scape, pedicel, trochanters and mandible dark brown; rest of legs and antennae light brown; last 4 segments of flagellum lighter than the rest (Figs 11, 13, 14, 15).

Head oval,  $1.3\text{--}1.4 \times$  as broad as high and  $1.1\text{--}1.2 \times$  as broad as mesosoma, with numerous scale-like setae covering almost entire head, vertex without or with a few scattered scale-like setae; plumose setae long, white and scattered over vertex and frons almost reaching toruli; vertex with spaced punctation (Fig. 14). POL  $1.0\text{--}1.1 \times$  as long as OOL, POL  $1.5\text{--}1.9 \times$  as long as LOL; eyes ovoid, separated by  $1.2\text{--}1.3 \times$  their height, malar space  $0.1\text{--}0.2 \times$  eye height. Mandible arched, simple, with a small preapical denticle on inner edge; palpal formula 6-4. Antenna of 13 segments; radicle as long as broad; scape with scale-like and plumose scattered setae, except ventrally glabrous, scale-like setae denser on external surface; scape  $1.8\text{--}2.2 \times$  as long as broad and  $2.2\text{--}2.6 \times$  as long as pedicel; flagellomeres cylindrical, F1  $0.7\text{--}0.8 \times$  length of scape and  $0.8\text{--}0.9 \times$  length of F2, F2–F6 approximately same length, F7–F10 gradually decreasing in length, F11 elongated with rounded apex (Fig. 15).





**FIGURES 11–16.** *Prototilla nigra* sp. nov., holotype ♂ (Lavalle, Mendoza): 11, habitus (lateral); 12, metasoma (dorsal); 13, habitus (dorsal); 14, head (anterior); 15, antenna (lateral); 16, genitalia (ventral; genital foramen projection indicated).

Mesosoma elongate,  $1.4\text{--}1.7 \times$  as long as broad; punctation well marked, similar to that of head, spaced on dorsum and more contiguous on pleura and propodeum which becomes rugose toward insertion of metasoma; covered with scale-like and plumose setae (Figs 11, 13). Pronotum transverse, anteriorly forming a collar with small plumose setae, rest with scale-like and white plumose setae, lateral surface with scattered setae and spaced punctation; humeral angle well marked but not acute. Mesonotum moderately punctate, with scattered scale-like and white plumose setae; tegula convex, smooth and with a few scale-like setae dorsally; scutellum with well-scattered punctation and with scale-like and plumose setae, except medially smooth and without setae. Metanotum



transverse, narrow, with scale-like and plumose setae; punctate except medially smooth and without setae. Propodeum in dorsal view with spaced punctation and moderately dense scale-like setae, punctation becoming contiguous, deeper and wider on vertical surfaces, and with predominance of plumose setae; a group of scale-like setae at insertion of hind coxa. Propleuron heavily punctate, covered almost completely with scale-like setae; mesopleuron convex, punctate, densely covered by scale-like and plumose setae; metapleuron with punctation contiguous, covered with scale-like setae.

Wing venation as for genus. Fore wing  $3.3 \times$  as long as broad, barely setose (Fig. 10), hyaline, venation light brown, with white and thick plumose setae at base, becoming light brown on veins *C* and *M+Cu*.

Legs slender; anterior surface of coxae, trochanters, femora and tibiae almost covered by scale-like setae, rest of their surfaces with or without scattered scale-like setae; plumose setae scattered across surfaces of legs, becoming denser where no scale-like setae; mid and hind tibiae each with two long white spurs, claws toothed.

Metasoma  $2.6\text{--}2.7 \times$  as long as broad; terga with well-marked punctation slightly spaced on T1 and T2, remaining terga with punctation less marked and contiguous (Fig. 12). Posterior margins of T1–T5 with scale-like setae; T1 covered with plumose setae, except covered by scale-like setae on posterior half; T2 with plumose setae covering all surfaces, denser laterally and scattered on dorsal surface at median group of scale-like setae; rest of terga with scattered plumose setae; posterior margin of T6 with dark brown, thick and apically truncate setae; T7 with surface convex; sterna with sculpture and distribution of setae similar to corresponding terga. Genitalia with paramere slender and curved upwards, with long setae along surface and small setae towards apex; volsella well developed, digitus swollen towards apex and cuspis thin, both with few long setae on surface and very small setae distally; aedeagus bipartite; basal ring anteroventrally narrowly and acutely emarginate (Fig. 16).

*Female.* Unknown.

**Variation.** The antennae and legs are sometimes darker, and the femora may be almost completely dark brown; the predominance of scale-like setae on the mesosoma is higher in some specimens, especially on the metapleuron; on T2 the scale-like setae may cover almost the entire dorsal region.

**Etymology.** From Latin *niger -gra -grum* which means “black”, referring to the general body color that is mostly black to dark brown.

**Distribution.** Argentina: La Rioja, Mendoza.

**Material examined.** Holotype ♂ : ARGENTINA: Mendoza, Lavalle, Reserva Telteca [32°23'6"S 68°3'0"W], 15/XII/1994–03/II/1995, G. Flores and S. Roig (IADIZA). Paratypes, 2♂: La Rioja, Santa Teresita [28°35'57"S 66°33'32"W], XI/2005, J. Torr  ns, G. Fidalgo and P. Fidalgo, TM (1♂, IFML; 1♂, MACN).

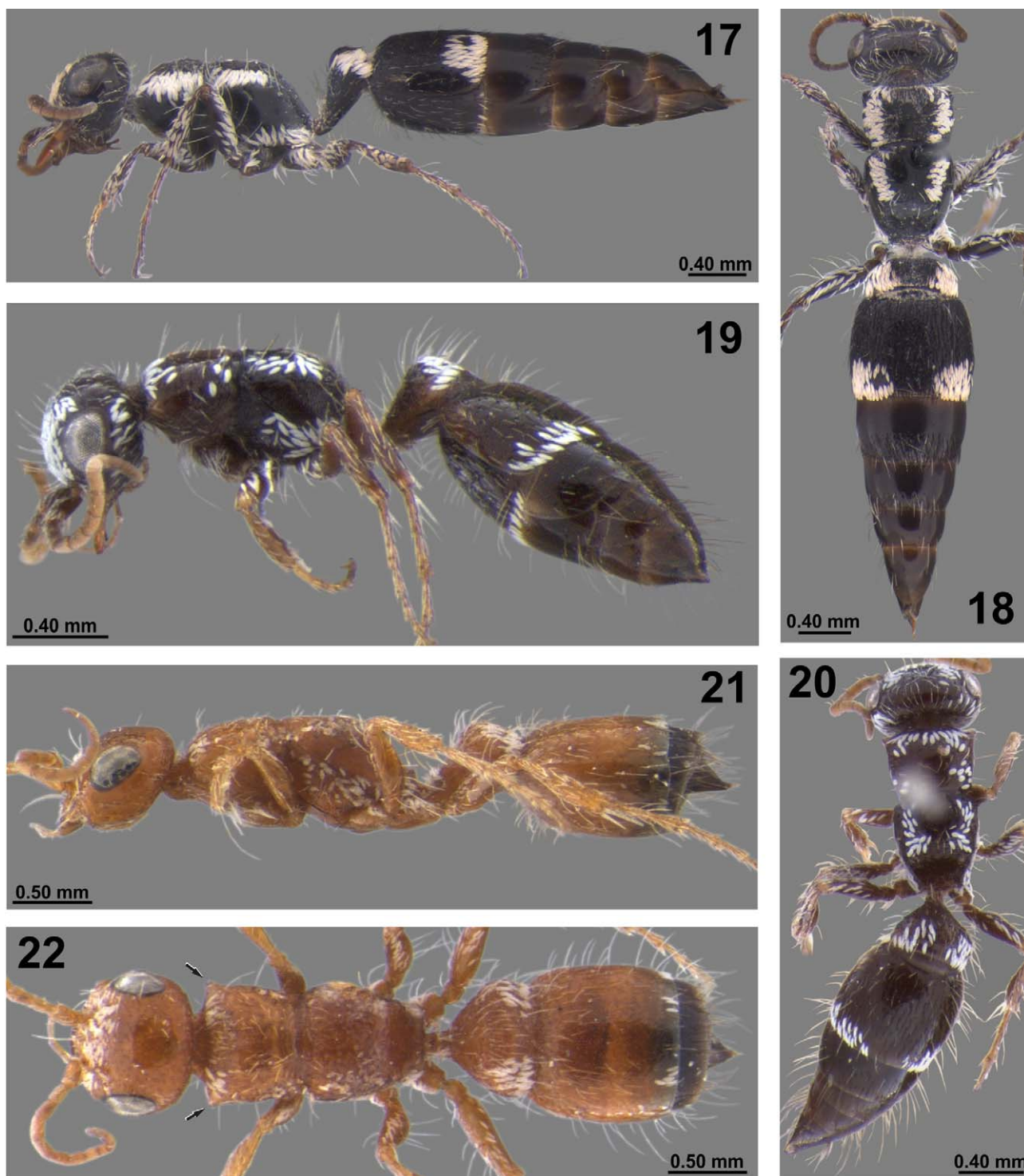
### ***Prototilla telteca* Torr  ns, Fidalgo, Roig-Alsina & Brothers, sp. nov.**

(Figs 17, 18, 23, 24)

**Diagnosis.** *Female.* General body color dark brown to black, except antennae, legs and apex of metasoma lighter (Figs 17, 18). Metapleuron smooth (Fig. 23). Posterior face of propodeum flat mesally and undelimited laterally. *Male.* Unknown.

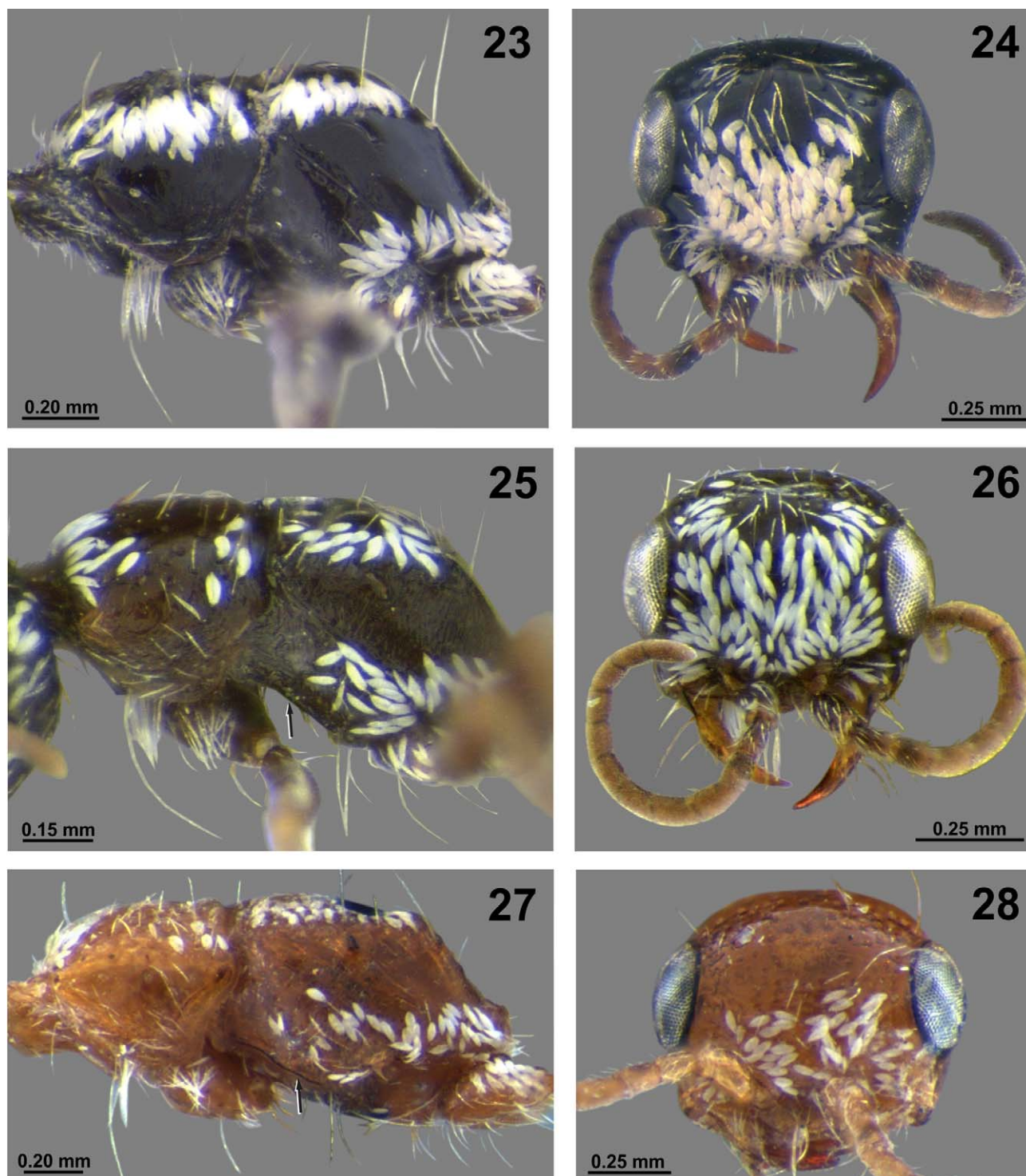
**Description.** *Female.* Length 4.0–4.5 mm. General body coloration dark brown to black; antenna dark brown, with basal 3/4 of F1 black; coxae, femora, tibiae and apical segments of metasoma slightly lighter than rest of body; mandible and tarsi light brown (Figs 17, 18, 24).

Head  $1.2\text{--}1.5 \times$  as broad as high and  $1.2\text{--}1.3 \times$  as broad as mesosoma; with dense scale-like setae covering frons from base of mandible to half eye height, a few scattered scale-like setae reaching top of eye and behind head; plumose setae distributed throughout head; vertex with spaced punctation and thick dark plumose setae medially (Fig. 24). Eyes separated by  $1.6\text{--}1.8 \times$  their height, malar space  $0.4\text{--}0.6 \times$  eye height. Clypeus short and broad, slightly convex; mandible arched, simple, with small preapical denticle on inner edge; palpal formula 6-4. Postgenal bridge approximately as long as diameter of foramen magnum, with smooth transverse striae across its surface. Antenna 12-segmented; radicle as long as broad; scape with scattered scale-like and plumose setae on dorsal and inner surfaces, with long plumose setae on ventral surface near insertion of pedicel, scape  $1.9\text{--}2.6 \times$  as long as broad and  $1.4\text{--}2.0 \times$  as long as pedicel; pedicel  $1.7\text{--}2.2 \times$  as long as broad and slightly longer than F1; flagellomeres cylindrical, F1  $0.5\text{--}0.7 \times$  length of scape and  $0.8\text{--}1.0 \times$  as long as F2; remaining flagellomeres approximately same length except F7–F9 gradually decreasing in length, F10 elongated with rounded apex.



**FIGURES 17–22.** *Prototilla* spp. 17, 18, *P. telteca* **sp. nov.**, paratype ♀ (Lavalle, Mendoza): 17, habitus (lateral); 18, habitus (dorsal). 19, 20, *P. striata* **sp. nov.**, paratype ♀ (Lavalle, Mendoza): 19, habitus (lateral); 20, habitus (dorsal). 21, 22, *P. typhoctoides*, paratype ♀ (Guanaco Muerto, Córdoba): 21, habitus (lateral); 22, habitus (dorsal; anterolateral angles of pronotum indicated).





**FIGURES 23–28.** *Prototilla* spp. 23, 24, *P. telteca* **sp. nov.**, paratype ♀ (Lavalle, Mendoza): 23, mesosoma (lateral); 24, head (anterior). 25, 26, *P. striata* **sp. nov.**, paratype ♀ (Lavalle, Mendoza): 25, mesosoma (lateral; longitudinal carina of mesopleuron indicated); 26, head (anterior). 27, 28, *P. typhoctoides*, paratype ♀ (Guanaco Muerto, Córdoba): 27, mesosoma (lateral; longitudinal carina of mesopleuron indicated); 28, head (anterior).

Mesosoma elongate,  $1.6\text{--}2.1 \times$  as long as broad (Figs 17, 18, 23). Pronotum  $1.4\text{--}1.7 \times$  as broad as long (width taken across humeral tubercles), forming a collar anteriorly; humeral tubercle poorly developed; dorsum with well-marked and contiguous punctation, a dense longitudinal band of scale-like setae laterally and scattered plumose setae throughout, setae longer laterad; lateral face weakly rugose with a few plumose setae near insertion of fore coxa. Mesonotum smooth, short and transverse, appearing as a constriction at midlength of mesosoma. Metanotum



and propodeum fused, dorsal surface with scattered and well-marked punctation, becoming smooth medially, with dense longitudinal band of scale-like setae laterally and scattered plumose setae which longer laterad; vertical surfaces smooth with few scattered punctures bearing small plumose setae, transverse striae near propodeal foramen; a pair of small antero-lateral denticles on each side, each bearing a long seta. Propleuron smoothish, microsculpture difficult to observe, with plumose setae laterally and anteriorly, long plumose setae near insertion of fore coxa; mesopleuron weakly rugose to smooth with a longitudinal carina at level of ventral limit of pronotum, scale-like setae above mid coxa and a few plumose setae on carina and at insertion of mid coxa; metapleural-propodeal suture indistinguishable, metapleuron and propodeum fused, surface completely smooth (Fig. 23), a longitudinal band of scale-like setae above hind coxa continuous with that on mesopleuron, reaching propodeal foramen.

Legs slender; fore coxa with a group of long plumose setae on upper outer surface and distributed at random near insertion of trochanter and on inner surface, shorter plumose setae on outer surface, very few small scale-like setae on outer and posterior surfaces and near insertion of trochanter; mid and hind coxae, trochanters, femora and tibiae covered with scale-like and plumose setae, except no scale-like setae on ventral surfaces; spur formula 1-2-2.

Metasoma 2.0–3.0 × as long as broad (Figs 17, 18); with well-marked contiguous punctation on T1 and T2, except vertical surface of T1 smooth; T3–T5 with punctation less marked and dispersed; T6 completely alutaceous. T1 with dense group of scale-like setae laterally on dorsal surface, scattered long plumose setae except medially on vertical surface, and short plumose setae on dorsal surface; T2 with dense group of scale-like setae postero-laterally, scattered long plumose setae laterally and short plumose setae across surface; T3–T5 with scattered plumose setae; T6 with pair of long setae laterally on anterior margin; sterna with sculpture and distribution of setae similar to that of corresponding terga, except S1 and S2 with very few scattered scale-like setae on posterior margins.

*Male.* Unknown.

**Variation.** In some specimens the mandibular preapical denticle is represented by an incision or a small elevation; the sculpture of the mesosomal pleura and the lateral face of the pronotum is sometimes very weak, giving a smooth appearance; the scale-like and plumose setae on the head, mesosoma and metasoma show variation in density but not in disposition.

**Discussion.** The association between males and females is very difficult to make because of extreme sexual dimorphism. However, some morphological and coloration aspects suggest that these females may be those of *P. nigra* sp. nov. Molecular studies will be undertaken which may clarify this situation.

**Etymology.** The specific name refers to the place where the specimens were collected (Telteca Reserve, Laval, Mendoza); it is a noun in apposition.

**Distribution.** Argentina: Mendoza.

**Material examined.** Holotype ♀: ARGENTINA: Mendoza, Laval, Reserva Telteca [32°23'6"S 68°3'0"W], 15-XII-1994-14/III-1995, G. Flores and S. Roig, pit-fall (IADIZA). Paratypes, 9♀: Mendoza, Laval, Reserva Telteca, 15/XII-1994-03/II-1995, G. Flores and S. Roig; (1♀, MACN); same location, 15/XII-1994-14/III-1995, G. Flores and S. Roig, pit-fall (4♀, IADIZA); same location, 1-24/XI-1995, Flores and Roig (2♀, MACN); same location, 25/IX-5/XI-1996, Flores and Roig (1♀, DJBC); same location, 25/XII-1995-14/II-1996, Flores and Roig (1♀, DJBC).

### *Prototilla striata* Torrén, Fidalgo, Roig-Alsina & Brothers, sp. nov.

(Figs 19, 20, 25, 26)

**Diagnosis.** *Female.* Body coloration mostly reddish brown to dark brown, becoming lighter on pronotum, antennae and legs (Figs 19, 20). Metapleuron striate (Fig. 25). Posterior face of propodeum concave and delimited by a carina laterally. *Male.* Unknown.

**Description.** *Female.* Length 3.0–4.5 mm. General body coloration reddish brown to dark brown; pronotum lighter than rest of mesosoma and becoming lighter toward anterolateral angles; flagellomeres, except for basal 3/4 of F1, tibiae and tarsi light brown; rest of antennae and legs dark brown (Figs 19, 20, 26).

Head 1.2–1.4 × as broad as high and 1.1–1.2 × as broad as mesosoma; with dense scale-like setae covering frons from base of mandible to beyond top of eye, a few scattered scale-like setae behind head; plumose setae distributed throughout head; vertex with spaced punctation but smooth medially (Fig. 26). Eyes separated by 1.5–2.1 × their

height; malar space  $0.3\text{--}0.6 \times$  eye height. Clypeus short and broad, slightly convex; mandible arched, simple, with small preapical denticle on inner edge; palpal formula 6-4. Postgenal bridge approximately as long as diameter of foramen magnum. Antenna 12-segmented; radicle as long as broad; scape with scattered plumose setae throughout and a few scale-like setae on outer surface near insertion of pedicel, long plumose setae on ventral surface near insertion of pedicel, scape  $1.9\text{--}3.0 \times$  as long as broad and  $1.6\text{--}2.4 \times$  as long as pedicel; pedicel  $1.6\text{--}2.4 \times$  as long as broad; flagellomeres cylindrical, F1  $0.4\text{--}0.7 \times$  length of scape and  $0.9\text{--}1.1 \times$  as long as F2; rest of flagellomeres approximately same length, except F7-9 gradually decreasing in length, F10 elongated with rounded apex.

Mesosoma elongate,  $1.3\text{--}1.6 \times$  as long as broad (Figs 19, 20, 25). Pronotum  $1.4\text{--}1.6 \times$  as broad as long (width taken across humeral tubercles) forming a collar anteriorly, dorsum with well-marked and very spaced punctation, scattered scale-like setae laterally and anteriorly, and scattered plumose setae throughout which longer laterad; lateral surface punctate-rugose with scattered plumose setae throughout; humeral tubercle acutely and strongly projecting. Mesonotum smooth, short and transverse, appearing as a constriction at midlength of mesosoma. Metanotum and propodeum fused, dorsal surface with well-marked spaced punctation, becoming smooth medially and rugose laterally and on edge of posterior surface, with scale-like setae laterally extending almost to midline posteriorly; with scattered plumose setae which longer laterad; posterior surface concave and delimited laterally by a carina, surface smooth on upper half and rugose and striate on lower half, striae transverse near propodeal foramen and vertical laterally; with a pair of small antero-lateral denticles on each side, each bearing a long seta. Propleuron rugulose, microsculpture marked but difficult to observe, with plumose setae laterally and anteriorly, long plumose setae near insertion of fore coxa; mesopleuron rugose, with a longitudinal carina at level of ventral limit of pronotum, scale-like setae on ventral half and a few plumose setae on carina and at insertion of mid coxa; metapleural-propodeal suture indistinguishable, metapleuron and propodeum fused, surface with transverse striae (Fig. 25), a band of scale-like setae above hind coxa continuous with that on mesopleuron and reaching propodeal foramen.

Legs slender; fore coxa with a group of long plumose setae on upper half of outer surface and distributed at random near insertion of trochanter and on inner surface; mid and hind coxae, trochanters and femora with scattered scale-like and plumose setae; tibiae and rest of legs with plumose setae; ventral surfaces of legs without scale-like setae; spur formula 1-2-2.

Metasoma  $1.9\text{--}2.6 \times$  as long as broad (Figs 19, 20); spaced punctation on T1 and T2, T3-T5 with punctation less marked and more dispersed, T6 completely alutaceous. T1 covered with scale-like setae on dorsal surface, except for a small median area; scattered and long plumose setae throughout and short plumose setae medially on dorsal surface and near base; T2 with a band of scale-like setae posterolaterally and scattered short and long plumose setae throughout; T3-T5 with scattered plumose setae; T6 with long setae laterally on anterior margin; sterna with sculpture and distribution of setae similar to that of corresponding terga, except S2 with scale-like setae along posterior margin.

*Male.* Unknown.

**Variation.** The scale-like setae on the head vary in density, and sometimes completely cover the frons to the vertex; the sculpture of the lateral surface of the pronotum is sometimes very weak, appearing smooth; the scale-like and plumose setae on the mesosoma and metasoma show variation in density but not in disposition.

**Discussion.** Molecular studies will be undertaken which may clarify the sex association and status of this species.

**Etymology.** From Latin *striatus* -a -um, referring to the characteristic striated sculpture on some parts of the body.

**Distribution.** Argentina: Mendoza.

**Material examined.** Holotype ♀: ARGENTINA: Mendoza, Lavallo, Reserva Telteca [ $32^{\circ}23'6''\text{S}$   $68^{\circ}3'0''\text{W}$ ], 15-XII-1994-14/III/14-III-1995, G. Flores and S. Roig, pit-fall (IADIZA). Paratypes, 10♀: Mendoza, Lavallo, Reserva Telteca, 25/IX-05/XI/1996, [ $32^{\circ}23'6''\text{S}$   $68^{\circ}3'0''\text{W}$ ], G. Flores and S. Roig (5♀ IADIZA); same location, 06/XI-03/XII/1996, G. Flores and S. Roig (2♀, MACN); same location, 03/XII/1996-06/I/1997, G. Flores and S. Roig (2♀, DJBC); same location, 25/XII/1995-14/II/1996, Flores and Roig (1♀ MACN).

### ***Prototilla typhoctoides* (Martinez & Fritz, 1974), comb. nov.**

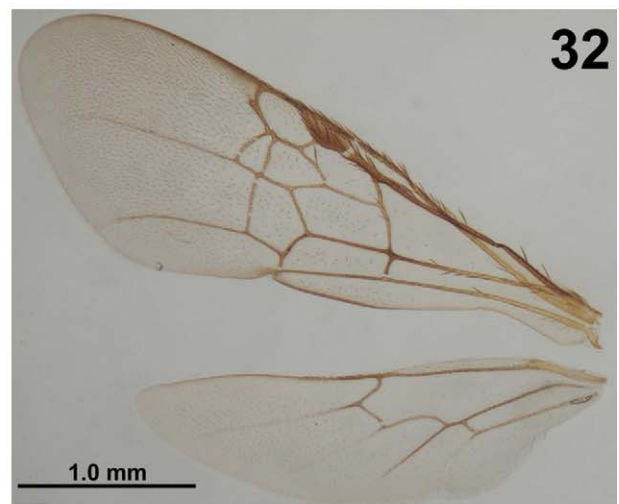
(Figs 21, 22, 27, 28, 33-35)

*Eotilla typhoctoides* Martinez & Fritz, 1974: 23-26.

**Diagnosis. Female.** General body color reddish brown, except T3-T6 dark brown to black (Figs 21, 22, 33, 34).

*Male.* Unknown.

**Description** and characterization provided by Martinez & Fritz (1974). Amplified and corrected as follows: *Female*. Plumose setae present on head, mesosoma and metasoma (Figs 21, 22, 28, 33, 34); pronotum with humeral tubercle forming acute and pronounced projection (Figs 22, 33); mesopleuron with longitudinal carina at level of ventral limit of pronotum (Fig. 27); propodeum with pair of small antero-lateral denticles on each side, each bearing a long seta; postgenal bridge approximately as long as diameter of foramen magnum, with smooth transverse carinae near foramen.



**FIGURES 29–35.** *Prototilla* spp. 29–32, *P. anomala*, holotype ♂ (Mendoza): 29, habitus (lateral); 30, habitus (dorsal); 31, wings and labels; 32, fore and hind wings. 33–35, *P. typhoctoides*, holotype ♀ (Guanaco Muerto, Córdoba): 33, habitus (dorsal); 34, habitus (lateral); 35, labels.



*Male*. Unknown.

**Discussion.** Martinez and Fritz (1974) included this species within Eotillinae based in the presence of scale-like setae, and in *Eotilla* based on comparison with the description of the putative female of *E. mickeli* Schuster, 1949 by Mickel (1968). Our observations and differentiation of females collected at localities where males of one or other of the genera of Eotillini were collected, as well as of the female assigned to *E. mickeli*, have shown that the species of Martinez & Fritz shares the diagnostic features of the two species described here in *Prototilla*. Based on those similarities we propose this new combination.

**Distribution.** Argentina: Córdoba.

**Material examined.** Holotype ♀: ARGENTINA: Córdoba, Guanaco Muerto [30°18'3"S 65°13'26"W], Cichero, [no dates] (MACN). Paratypes, 6♀: Córdoba, Guanaco Muerto, XII/1969, Martinez; (5♀, MACN); Guanaco Muerto, borde salinas grandes, Cichero [no date] (1♀, BMNH).

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