

On the Subfamily Astatinae. Part IV. The South American Species in the Genus *Astata* Latreille^{1,2}

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ABSTRACT

Ten South American species of *Astata* are keyed; all are described, discussed, and their relationships evaluated. *A. alpaca*, *A. cosquin*, *A. bola*, and *A. vaquero* are new

to science. *A. dimidiata* Taschenberg and *A. dispar* Reed are synonymized under *A. chilensis* Saussure, and *A. strigosa* Kohl is synonymized under *A. gigas* Taschenberg.

The South American species in the genus *Astata* are poorly known. The named species are inadequately described, keys to the species are lacking, synonymy is common, and earlier workers have

added little but confusion to the classification of the species.

Spinola (1851) was the first to record the genus from the southern continent, but he mistook his Chilean material for the European species *A. abdominalis* Latreille. Apparently Saussure (1854) assumed that Spinola named the Chilean species "*abdominalis*,"

¹ Hymenoptera: Sphecidae.

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which would have created a homonym, and to replace Spinola's "*abdominalis*," Saussure proposed the name *spinolae*. Upon examining Saussure's type of *spinolae*, I have observed that Saussure's *spinolae* and Spinola's "*abdominalis*" are not the same. Also, in the same paper, Saussure described *chilensis*, which is Spinola's wrongly identified "*abdominalis*."

Other authors who described species of *Astata* from South America were Taschenberg, Kohl, and Reed. Taschenberg (1870, 1880) proposed 3 names: *lugens*, *gigas*, and *dimidiata*. Two of these names are valid. Kohl (1892) described *glabra*, and Reed (1894) proposed the name *dispar* (for *chilensis* Saussure) because he apparently could not identify Saussure's species. Parker (1964) described *A. westcotti* from Mexico; the distribution of this species has been extended to South America.

In this work I have not attempted to describe all the species at hand because of the paucity of specimens of some of them. Like other aculeate groups from South America, little material is housed in museum collections, and I could locate only a few specimens other than those of the common *chilensis* Saussure. Therefore, at this time I believe it is best to describe as new only the species for which I have males, because male specimens have more differentiating characters.

KEY TO THE SOUTH AMERICAN *ASTATA*

Males

1. Abdomen marked with red; mandible nearly touching lower part of compound eye 2
Abdomen black; mandible separated from lower part of compound eye by at least the diameter of median ocellus (Fig. 5) *lugens* Taschenberg
2. Sternite IV with median peglike structures on apical margin (Fig. 15) 3
Sternite IV without peglike structures 4
3. Flagellomeres VII-IX enlarged medially; coxal flanges enlarged (Fig. 14) *chilensis* Saussure
Flagellomeres VII-IX not enlarged medially; coxae rounded, slightly flattened *alpaca*, n. sp.
4. Flagellomeres IX and X with tyloides 5
Flagellomeres IX and X without tyloides 8
5. Apical margin of sternite V with deep emargination; coxae flattened, flanged 6
Apical margin of sternite V entire; coxae rounded, not flattened *spinolae* Saussure
6. Flagellomere IX and X not enlarged; mesopleuron spiculate; median clypeal lobe produced, not incised laterally (Fig. 4) 7
Flagellomeres IX and X enlarged (Fig. 30); punctation of mesopleuron coarse; median clypeal lobe laterally incised (Fig. 1) *cosquin*, n. sp.
7. Midfemur angulate on inner basal margin (Fig. 12); clypeal outline as in Fig. 10; tangential line between compound eyes shorter than flagellomere I; longitudinal propodeal carinae parallel to median carina *glabra* Kohl
Midfemur smoothly curved on inner basal margin (Fig. 11); clypeal outline as in Fig. 4; tangential line between compound eyes as long as flagellomere I; longitudinal propodeal carinae radiating away from median carina *bola*, n. sp.
8. Median clypeal lobe short, flat (Fig. 6); sternite IV with narrow U-shaped median emargination *westcotti* Parker
Median clypeal lobe produced (Fig. 2); sternite IV not emarginate, V with V-shaped notch, lateral margins raised *vaquero*, n. sp.

Females

1. Abdomen black 2
Abdomen marked with red 3
2. Wings uniformly dark brown, violaceous; length more than 12 mm *gigas* Taschenberg
Wings with brown cloud in cellular area; length less than 11 mm *lugens* Taschenberg
3. Flagellomere II twice as long as broad (Fig. 32) 4
Flagellomere II three times as long as broad (Fig. 24) 5
4. Vertex, scutum heavily punctured; interocellar area with more than 50 punctures *westcotti* Parker
Vertex, scutum sparsely pitted; interocellar area with less than 20 pits (Fig. 3) *vaquero*, n. sp.
5. Pubescence on sternum and abdominal sternites white 6
Pubescence on sternum and abdominal sternites black *chilensis* Saussure
6. Interocellar area with more than 35 pits (Fig. 8) 7
Interocellar area with less than 30 pits (Fig. 7, 9) 8
7. Scutum, mesopleura mostly impunctate, with few scattered macropunctures; propodeal enclosure with uniform low, small reticules; longitudinal carinae not prominent *glabra* Kohl
Scutum coarsely pitted anteriorly; pleura spiculate, with fine microstriae oriented obliquely toward notum; propodeal enclosure with distinct longitudinal carinae that radiate laterally from median carina *alpaca*, n. sp.
8. Mesopleuron coarsely pitted, setae as long as trochanter; propodeal enclosure with transverse reticules medioapically *bola*, n. sp.
Mesopleuron spiculate, setae not longer than trochanter; propodeal enclosure with reticules that radiate uniformly from metanotum *cosquin*, n. sp.

Astata glabra Kohl

(Fig. 8, 10, 12, 19)

Astata glaber Kohl, 1892, p. 230. (Paratype female, "Rio Grande, Brazil" Vienna, Austria.)

PARATYPE FEMALE.—Black; abdomen red; forewing apically stained brown. Pubescence silvery-white; head abundantly clothed, rather sparse on rest of body; sternum mostly shiny with scattered setae. Punctation not uniform, face and interocellar area coarsely pitted; vertex shiny, hardly pitted; scutum pitted anteriorly, summit and scutellum impunctate; pleuron and sternum shiny with few scattered pits; propodeal enclosure finely reticulostriate, reticules irregular, median carina present; abdomen mostly impunctate. Median clypeal lobe truncate; flagellomere I longer than II; midcoxa bare, with short blunt spine; midfemur as in Fig. 12. Length 11 mm.

MALE.—Black; abdomen red medially; wings light brown in cellular area. Pubescence silvery-white, abundant over most of body; sternite V and VI with median hair brush; sternite V laterally, and apically with long dark setae. Punctation moderate; head and thorax spiculate; propodeal enclosure with prominent longitudinal striae, parallel to median carina. Median clypeal lobe as in Fig. 10; flagellomeres III-X with linelike tyloides, those on III and X not entire; in profile median frontal bulge not protruding below median ocellus; tangential line between compound eyes shorter than flagellomere I; mid femur swollen on inner basal margin; midcoxa with enlarged flange on inner margin; hindcoxa ventrally depressed, flanged on inner margin; in profile, sternite II broadly rounded; sternite V and VI with shallow U-shaped

medioapical notch; sternite VII cleft medioapically; genitalia, see Fig. 19. Length 10 mm.

Types.—Paratype female, Rio Grande, Brazil, 188- (Ihering). Det. by Kohl as *glabratus*.

Systematics.—Dr. Max Fischer (personal communication) of the Vienna museum informed me that

the type of *glabra* was destroyed. Kohl (1892) did not state how many specimens of this species he examined, but since the specimen in the Vienna museum is topotypical, I have assumed that it is a paratype, and I have used it for the diagnosis.

The species is related to *cosquin*, n.sp., but can be

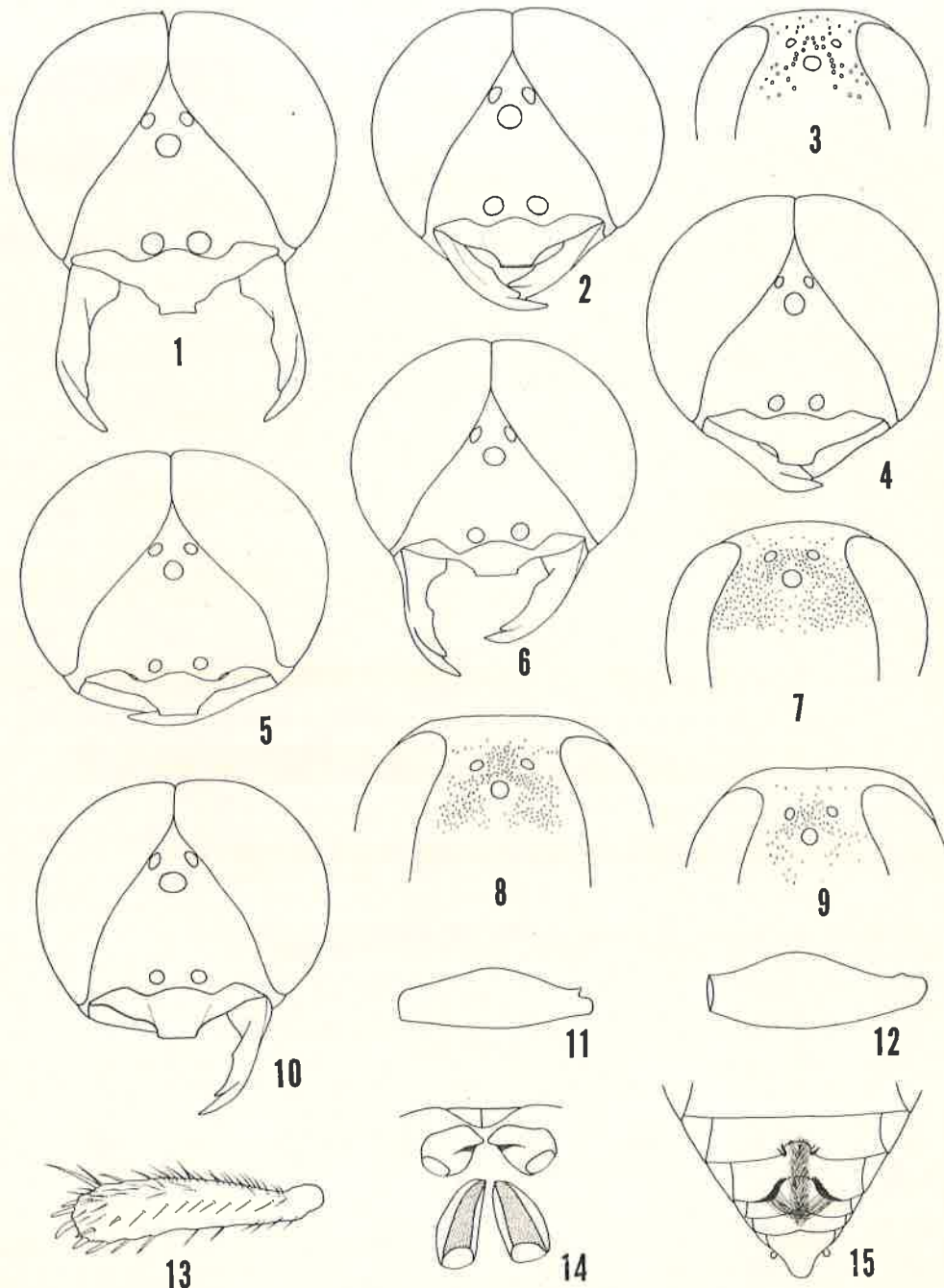


FIG. 1, 2.—Heads of male *Astata*. 1, *cosquin*; 2, *vaquero*. FIG. 3.—Interocellar area of female *A. vaquero*. FIG. 4-6.—Heads of male *Astata*. 4, *bola*; 5, *lugens*; 6, *westcotti*. FIG. 7-9.—Interocellar areas of female *Astata*. 7, *cosquin*; 8, *glabra*; 9, *bola*. FIG. 10.—Head of male *A. glabra*. FIG. 11, 12.—Midfemora of male *Astata*. 11, *bola*; 12, *glabra*. FIG. 13.—Midfemur of female *A. gigas*. FIG. 14.—Ventral view of mid- and hind coxae of male *A. chilensis*. FIG. 15.—Distal abdominal sternites of male *A. chilensis*.

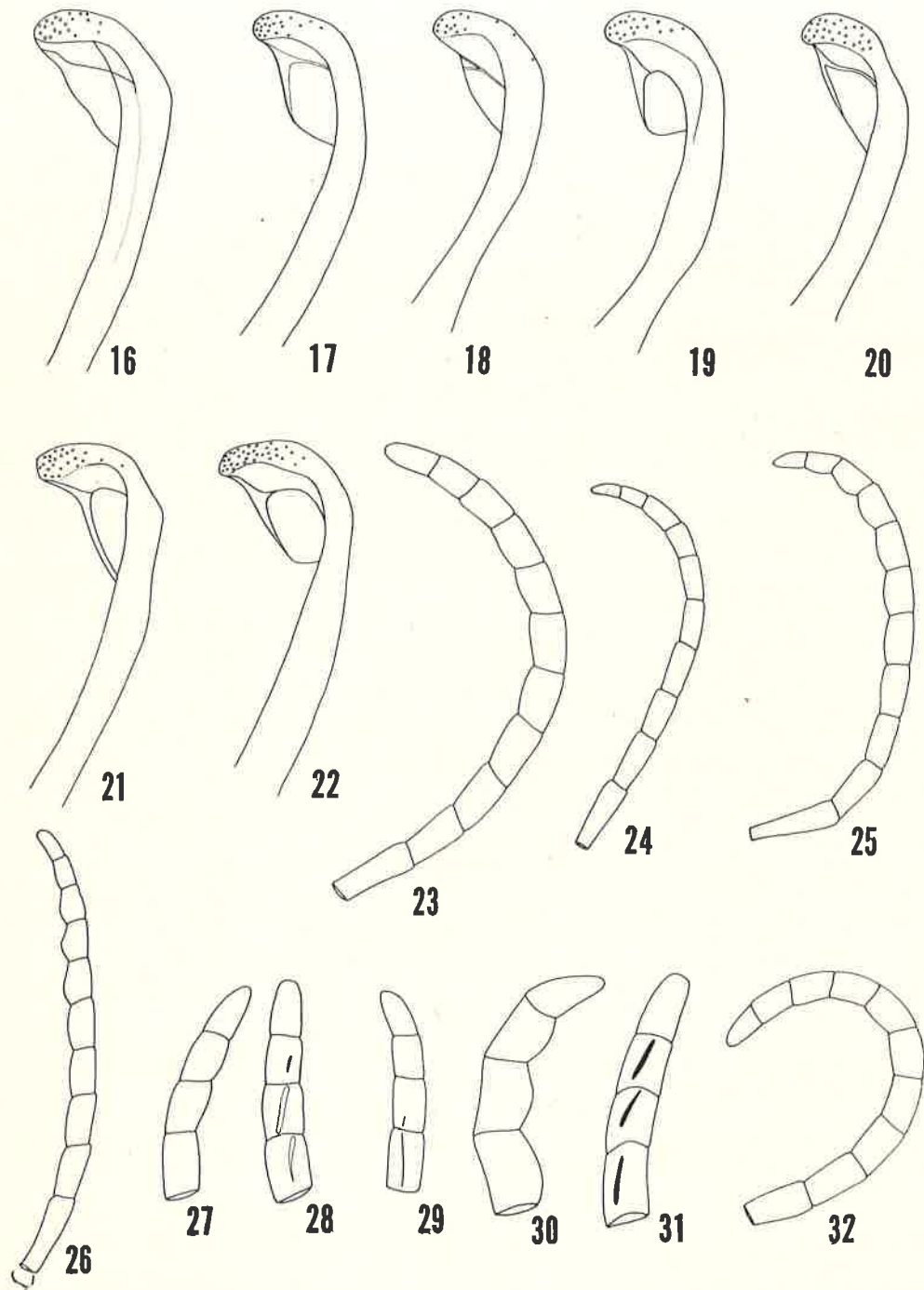


FIG. 16-22.—Distal part of male aedeagus. 16, *chilensis*; 17, *bola*; 18, *lugens*; 19, *glabra*; 20, *alpaca*; 21, *cosquin*; 22, *vaquero*. FIG. 23-26.—Flagellomeres of *Astata*. 23, *vaquero* male; 24, *cosquin* female; 25, *cosquin* male; 26, *chilensis* male. FIG. 27-31.—Distal part of male flagellum. 27, 28, side and ventral view of *bola*; 29, ventral view of *vaquero*; 30, 31, side and ventral view of *cosquin*. FIG. 32.—Flagellum of female *A. vaquero*.

distinguished from it by the more punctate interocellar area (Fig. 8) and the forewing without violaceous reflections and not uniformly stained. The apparent *glabra* male has an enlarged midfemur (Fig. 12).

Material Examined.—2 ♂ from VENEZUELA: Guarico, La Cruz Ruviera, XII-1925 (M. Grisol); Barinas (P. Anduze).

Astata spinolae Saussure

Astata spinolae Saussure, 1854, p. 22. (Holotype male Chile," Mus. Nat. Hist. Geneva.)

HOLOTYPE MALE.—Black; abdomen basally red; tarsi reddish brown; wings hyaline. Pubescence silvery-white; median hair brush on sternites III–VII. Punctuation moderate, close; summits of scutum and scutellum shiny, sparsely pitted; pleura shiny but with close, shallow punctures; dorsal propodeal enclosure with distinct median carina; longitudinal carinae more prominent than lateral carina. Median clypeal lobe short, wide, medially indented (deformed?); flagellomeres III–IX with tyloides, swellings larger at apex of each flagellomere; X with buttonlike swelling; in profile view, frontal bulge protruding below median ocellus; scutum humped medially; coxae normal; sternite II not humped medially; apical margin of sternites entire. Length 9 mm.

FEMALE.—Unknown.

Systematics.—The taxonomy of the species was made confusing by errors of 2 earlier authors. Spinola (1851) stated that a Chilean species was the same as the European *abdominalis* Latreille (he gave a lengthy explanation of the occurrence of the species in the 2 diverse zoogeographic regions). This was a wrong identification. Saussure (1854) incorrectly surmised that Spinola had created a homonym when he used the name *abdominalis*. Evidently Saussure did not read Spinola's paper because Spinola never treated his material as a new species. He attributed the name to Latreille.

I doubt that Saussure examined Spinola's specimens because Saussure, in his 1854 paper, described a second species, *chilensis*, which is the species Spinola wrongly identified.

To add to the confusion, Reed (1894) used a new name, *dispar*, for specimens he identified as ? *spinolae*; in reality his specimens were *chilensis*.

A. spinolae is known from only the type-specimen. It differs from other red-marked South American *Astata* in the following characters: apical margin of sternites entire; coxae rounded, not flattened; and sternite II not humped.

Astata chilensis Saussure

(Fig. 14–16, 26)

Astata chilensis Saussure, 1854, p. 23. (Lectotype female "no data," Mus. Nat. Hist. Geneva, *present designation*.)

Astata dimidiata Taschenberg, 1880, p. 779. (Lectotype ♀, "Peru." Martin-Luther-Universität, Halle, Germany, *present designation*.) **NEW SYNONYMY.**

Astata dispar Reed, 1894, p. 22. **NEW SYNONYMY.**

MALE.—Black; forewing light brown in cellular area, apically hyaline (stained in some specimens); hindwing uniformly brown; abdomen red except on sternite I and apically on segments V–VII. Pubescence silvery-white, of uniform length and thickness over most of body; black setae medially on frons and clypeus, and patch on sternite II and apical margin of each abdominal segment; sternite V with long, brown, inwardly curved setae bordering median emargination. Punctuation close, coarse; pits on shiny summits of scutum and scutellum sparse, those on pleura dense, obliquely oriented toward notum, like fine striae; dorsal propodeal enclosure closely reticulostriate, striae radiating from metanotum; propodeum densely punctured laterally, without reticules; abdomen finely micropunctured, with scattered macropunctures; pygidium rugose, with deep irregular pits. Lateral margin of truncate median clypeal lobe angulate. Flagellomeres II–X with linelike tyloides, those on V–X basally swollen, swellings progressively larger towards apex of flagellum (Fig. 26); frons with moderate bulge, in profile, swelling in line with median ocellus; tangential line of compound eyes short; about as long as length of flagellomere VII; midcoxa with enlarged ventral flange; hindcoxa flattened depressed ventrally, flanged apically; femora swollen, ventral surface carinate, depressed in some specimens; sternite II in profile slightly humped; IV medially emarginate with short peglike lateral structures; V deeply emarginate, cleft with lateral margins raised, thickened (Fig. 15); VI with V-shaped median notch; genitalia, see Fig. 16. Length 9–12 mm.

FEMALE.—About as in male except as follows: abdomen all red, pygidium of some specimens with black tip; wings dark brown, violaceous; midcoxa bare; punctuation similar except propodeal enclosure of some specimens more reticulate; interocellar area with 27–38 pits; vertex, scutum, and scutellum sparsely pitted, pubescence black; median clypeal lobe truncate, apically thickened, upturned; flagellomere I but slightly longer than II; midfemur bulbous, not carinate.

Variation.—A single male from El Bolsón, Rio Negro, Argentina, has the peglike structures on sternites III and IV.

Systematics.—The species can be distinguished from other known South American species by the following combination of characters: male—sternite IV with lateral peglike structure, flagellomeres IX and X angulate (Fig. 26), and midcoxa with enlarged flange; female—pubescence black; wings dark brown, violaceous.

A rather involved discussion of the taxonomy of the species is included in the section under *spinolae*. The Paris Museum has specimens of *chilensis* that were collected in the 1800's by Gay. Undoubtedly these are the specimens that Spinola misidentified as "*abdominalis*."

Material Examined.—131 ♂, 210 ♀, collected from November to March in the following countries: CHILE. *Santiago*: Leyda, Santiago, Quilicura, Guayaacán, El Puemo, Pudahuel, Maipú, El Canelo; *Co-*

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quimbo: Tongoy. *Lonquimay*: Las Fiesta, Lago Galletue; *Linares*: Villega, Fundo Malcho; *Aysén*: Chico; *Arauco*: Pillem Pilli; *Malleco*: Curacautin, Lonquimay, Licicura, Icalma, El Canelo; *Ñuble*: Cobquecura; *Aconcagua*: Piscicultura, Guardia Vieja, Valle Pinguenes; *Osorno*: Osorno; *Concepción*: Concepción; *Valparaíso*: Valparaíso, Viña del Mar. ARGENTINA. *Riô Negro*: El Bolsón, El Tronador; *Neuquén*: Pucura, Hua-Hum, Lago Huechulafquen, Los Helachos Lanin; *N. W. Patagonia*; *Chubut*: Esquel Zo; *Córdoba*: Córdoba; *Jujuy*: Gran Brete; *Mendoza*: Vspallata, San Juan Leoncito. PERU. *Cuzco*: Cuzco.

Astata lugens Taschenberg

(Fig. 5, 18)

Astata lugens Taschenberg, 1870, p. 16. (Lectotype male "Mendoza," Martin-Luther-Universität, Halle, Germany, present designation.)

MALE.—Black; forewing clear except light brown band in area of marginal cell; hindwing hyaline. Pubescence off-white, of moderate length and thickness; sternite II abundantly clothed with long, erect hairs; sternites IV–VI with median hair brush, setae short, projecting posteriorly; sternite VI with long setae bordering median emargination. Punctuation of face, scutum, and epimeron coarse; pleura spiculate; abdomen finely micropunctate; propodeal enclosure reticulostriate, reticules open, irregular. Median clypeal lobe truncate, slightly upturned at apex; flagellomeres V–IX with line-like smooth tyloides, those on III and IV partially complete; frons with median swelling; malar space as wide as diameter of lateral ocellus; coxae normal; femora not bulbous; hindfemur with linear ventral depression; in profile, sternite II sharply humped; genitalia, see Fig. 18. Length 10–11 mm.

FEMALE.—About as in male except as follows: body more sparsely pitted; interocellar area with 34–60 pits; notum and pleuron spiculate, shiny; sternum, coxa, and sternite II densely clothed with off-white hair; midfemur bulbous; sternite II slightly humped medially. Length 9–11 mm.

Systematics.—The long malar space distinguishes males of *lugens* from other South American species. Its relationship to *gigas* is uncertain because males of the latter are unknown. The coarsely punctured interocellar area and black body separate females of *lugens* from other black species.

Material Examined.—Five ♂, 9 ♀, from the following localities: PARAGUAY. *Guaira*: Villarrica, XII (F. Schade). ARGENTINA. *Buenos Aires*: Buenos Aires; *Córdoba*: Cosquín, III-1-9-20 (Cornell Univ. Exped.); Córdoba, (W. M. Davis); *Cariós Paz*, II-26-66 (Willink, Stange, Weyrauch); *Mendoza*: El Orden, (A. J. Gjai); *San Juan*: San Juan, (C. S. Reed). BRAZIL. *Santa Catarina*: Nova Teutonia, XII-28-38, III-48, XII-12-51 (F. Plaumann); *W. Mato Grosso*: Urucum, XII-23-20-19 (Cornell Univ. Exped.).

Astata gigas Taschenberg

(Fig. 13)

Astata gigas Taschenberg, 1870, p. 17. (Holotype "Nov. Frib.," Martin-Luther-Universität, Halle, Germany.) *Astata strigosa* Kohl, 1888, p. 147. (Holotype? "Orizaba, Mexico, Bilimek." Mus. Nat. Hist. Geneva.) NEW SYNONYMY.

FEMALE.—Black; wings uniformly dark brown, violaceous. Pubescence long, shaggy, off-white with yellowish reflection; sternum clothed with long, thick, posteriorly directed hairs. Punctuation sparse; pits scattered, body mostly shiny, spiculate; interocellar area with 28–39 pits; propodeal enclosure openly reticulostriate; spination of midtibia as in Fig. 13. Median clypeal lobe truncate, apical margin reflexed; flagellomere II three times as long as broad; bulge on frons low, as seen from vertex, humped medially; sternite II broadly rounded in profile. Length 12–14 mm.

MALE.—Unknown.

Variation.—Mexican and Central American specimens differ from the South American in that the latter are larger and the interocellar area is more heavily punctured (37–43:28–39). However, other structural features do not appear to be geographically significant.

Systematics.—The large size, all black body with dark violaceous wings, and the striate propodeal enclosure distinguish female *gigas* from other black South America species. The specimen of that nominal species is probably the holotype of that nominal species. The locality data are the same as that given by Kohl (1888) and the specimen fits his description.

Material Examined.—Six ♀ from the following localities: ARGENTINA. *Salta*: Finca el Rey, II-953 (Kusnezou); *Tucumán*: Trancas Tacanas, II-53 (J. M. Arnau). BRAZIL. *Rio de Janeiro*: Rio de Janeiro, V-12-17 (G. E. Bryant); *Santa Catarina*: Nova Teutonia, I-54 (F. Plaumann) IV-57. COLOMBIA. *Cauca*: El Tambo, IV-56 (K. Von Sneider). GUATEMALA. *Suchiatepequez*: Moca. EL SALVADOR. *La Libertad*: La Libertad, Quezaltepeque. PANAMA. Barro Colorado Island, Panama Canal Zone, VII-23-63 (Cavagnaro, Irwin). COSTA RICA. *San Jose*: San Jose, VII-23-63 (Michener, Kerfoot).

Astata cosquin, n. sp.

(Fig. 1, 7, 21, 24, 25, 30, 31)

HOLOTYPE MALE.—Black; abdomen red medially; wings light brown in cellular area, apically hyaline. Pubescence silvery-white, of usual thickness and length; median hairbrush on sternites IV and V; setae short, projecting posteriorly; sternite V with long, lateral, inwardly curved, whitish setae bordering median emargination. Punctuation close, coarse; pits shallow, separate; integument shiny; punctures on mesopleuron oval, oriented toward notum; propodeal enclosure reticulate, reticules evenly spaced, small, radiating from metanotum. Median clypeal lobe truncate, produced apically, sides narrowly emarginate; flagellomeres III–X bowed with linelike tylo-

ides, (Fig. 24); frontal bulge prominent, protruding below median ocellus; tangential line of compound eyes as long as length of flagellomeres X and XI; mid- and hindcoxae with flange on inner margin; in profile, sternite II sharply humped; sternite V with V-shaped median emargination, sides of emargination thickened, raised; sternite VI with V-shaped median emargination; genitalia, see Fig. 21. Length 12 mm.

FEMALE.—About as in male except as follows: mandibles reddish brown; wings dark brown with violaceous reflections; flagellomere II three times as long as broad; body shiny, punctures few, scattered; pleura and notum mostly impunctate; interocellar area with 24–29 pits; midcoxa bare ventrally, with short, thick spine at inner margin.

Types.—Holotype ♂ and 4 paratypes, Cosquín, Sierra de Córdoba, Argentina, III–19–1920 (Cornell Univ. Exped.). Holotype and 2 paratypes deposited in the collection at Cornell University. Metatypes, six from the following localities: ARGENTINA. *N. W. Patagonia*: XII–1919 (H. E. Box) (BMNH); *Salta*: Ruiz de los Llanos, II–1947 (R. Golbach) (FML); *Córdoba*: Carios Paz, II–26–66 (Willink, Stange, Weyrauch) (FML); *Cuesta de Pocho*, Ruta 20, II–24–66 (A. Willink); *Santiago del Estero*: Frías, II–1947 (Martiaica); *Buenos Aires*: San Pedro, I–56 (M. A. Fritz). BRAZIL. *W. Minas Gerais*: Uberlândia, M. Ge. IV–5–1956 (F. S. Truxal) (LACM).

Systematics.—The apically thickened flagellomeres and coarsely punctured body distinguish the males of *cosquin*. The females are separated by their large size (10–12 mm), dark wings, and moderately punctured interocellar area (Fig. 7).

Variation.—Males are uniform in observed characters, but some features of females are not constant. The number of interocellar pits varies; specimens from the southern part of South America have more punctures than those from the northern part. The wing color is either uniformly dark brown or brown apically.

Astata vaquero, n. sp.

(Fig. 2, 3, 22, 23, 29, 32)

HOLOTYPE MALE.—Black; abdomen red medially; wings uniformly light brown. Pubescence silvery-white; median hairbrush on sternites IV and V; setae short, yellowish, projecting posteriorly; sternite V with long, inwardly curved, yellowish setae. Punctuation coarse, integument shiny, spiculate; propodeal enclosure closely, finely reticulostriate, striae radiating from metanotum. Median clypeal lobe moderately produced, truncate apically; flagellomeres III–VIII with linelike ventral tyloides; frontal bulge low; tangential line of compound eyes as long as length of flagellomere I; midcoxa flattened ventrally, with flange along inner margin; sternite II slightly humped in profile; sternite V with broad U-shaped median emargination; sternite VI with deep V-shaped median emargination; genitalia, see Fig. 22. Length 8 mm.

FEMALE.—About as in male except as follows: mandibles red medially; abdomen all red; body shiny, sparsely pitted; flagellomere II twice as long as broad; interocellar area with 11–15 pits; midcoxa bare ventrally with short thick spine at inner margin.

Types.—Holotype ♂ and 5 paratypes, Proviencia de Santiago, Del Estero, Bords de Rio Salado, Environs D'icano, 1909 (E. R. Wagner). Holotype and 2 paratypes deposited in the collection of the Paris Museum. Metatypes, 21 from the following countries: ARGENTINA. *La Rioja*: *La Rioja*, (E. Giacomelli); *Santiago del Estero*: Rio Salado, 1919 (J. DeGaulle); Buenos Aires, San Clemente del Tuyu, II–III, 1951 (N. Kormilev); *Jujuy*: La Quiaca, I–1947 (F. Monros); Luján, III–54; San Fernando, I–25–1951; *Mendoza*: Potrerillos, III–20–1920 (R. G. Harris), I–20–1947 (Willink); Lavalle, I–1946 (A. Willink); *S. Juan*: Jujuy, II–27–1920 (Cornell Univ. Exped.); Estancia la Noria, Rio San Javier; *Sante Fe*: XII–19–1911 (G. E. Bryant); *Córdoba*: Arguello, XI–14–1955 (A. Giogetta). BOLIVIA. *Santa Cruz*: Santiago, XII–1959. URUGUAY. *Montevideo*: Montevideo, I–21–23–1927.

Systematics.—The species is easily separated from other South American *Astata* by the following combination of characters: male—flagellomeres IX–XI without entire tyloides (Fig. 29), median clypeal lobe moderately produced, sternite IV not emarginate nor with tubercles; females—body sparsely punctured, interocellar area with 11–15 pits. It is remarkable that *vaquero* is nearly identical to the nearctic *nevadica* Cresson. Both share many taxonomic characters such as similar tyloides, flanged coxae, and pattern of punctuation. However, they differ in the nature of the sternal emarginations: *nevadica* has an emarginate sternite IV, but in *vaquero* the sternite is entire.

Astata alpaca, n. sp.

(Fig. 20)

HOLOTYPE MALE.—Black; red on tergites I–III, and on sternites II, III, and basally on IV; wings light brown, darker along marginal cell. Pubescence silvery-white; median hairbrush on sternites IV–VI, setae short, projecting posteriorly; V with lateral, long, inwardly curved, gold hairs. Punctuation close, coarse; pits small, shallow; integument between macropunctures micropunctate, especially on pleura; propodeal enclosure finely, uniformly reticulate; striae radiating from metanotum. Median clypeal lobe short, truncate; frontal bulge hardly protruding below median ocellus in lateral view; flagellomeres II–XI with linelike ventral tyloides; tangential line between compound eyes as long as length of flagellomere II; midcoxa flat, angulate on inner, ventral margin; hindcoxa flat, without flange or depression; sternite II humped medially; sternite IV with small median notch, short peglike structures bordering emargination; sternite V with deep U-shaped median notch, side of emargination thickened, raised; sternite VI with shallow V-shaped median emargination; genitalia, see Fig. 20. Length 10 mm.

FEMALE.—About as in male except as follows: abdomen all red; legs reddish brown; wings uniformly light brown; punctation on pleura more striate; flagellomere I longer than II; interocellar area with 39 pits; midcoxa ventrally with few hairs, short thick spine medially.

Types.—Holotype ♂ and 1 paratype. Lima, Peru, I-1961 (W. Weyrauch) "WKW 5101-A". Holotype and 1 paratype deposited in the collection of Instituto Miguel Lillo, Tucumán, Argentina. Paratype, 1, Canete, Peru (E. J. Hambleton).

Systematics.—The species appears to be closely related to *chilensis*. Males of both species have the peg-like structures on the sternites. However, they are easily separated by the shape of the apical flagellomeres and the configuration of the midcoxae. The females are different in punctation and color of pubescence.

Astata bola, n. sp.

(Fig. 4, 9, 11, 17, 27, 28)

HOLOTYPE MALE.—Black; abdomen red medially; wings stained light brown. Pubescence off-white, abundant over most of body. Punctation moderate; head and thorax spiculate; scutum densely pitted anteriorly; propodeal enclosure reticulostriate; longitudinal striae uniform, distinct, radiating from metanotum; abdomen with sparse pubescence; sternite V with median hairbrush; lateral, inwardly curved setae bordering median emargination; sternite VI with median hairbrush. Median clypeal lobe truncate, clypeus laterally sinuate (Fig. 4); flagellomeres III-X with linelike tyloides, those of III and X not entire; flagellomeres V-XI not enlarged (Fig. 27); in profile, median frontal bulge prominent, protruding below median ocellus; tangential line between compound eyes as long as length of flagellomere II; midcoxa flanged on inner margin; hindcoxa flattened ventrally, flanged on inner margin; midfemur not enlarged apically; genitalia, see Fig. 17. Length 9 mm.

FEMALE.—About as in male except as follows: mandibles medially and abdomen entirely red; wings dark brown apically; frons shagreened with scattered macropunctures; interocellar area with 19 pits; flagellomere I three times as long as broad, II twice as long as broad; scutum with sparse pits anteriorly and posteriorly; pleura with few scattered pits; propodeal enclosure with uniform raised reticules; midcoxa ventrally bare, with short median spine.

Types.—Holotype ♂ and 1 paratype, Salta, Gueemes, Argentina, II-1945 (Martinez). Holotype and 1 paratype deposited in the collection at Instituto Miguel Lillo, Tucumán, Argentina. Metatypes, six, from the following localities: ARGENTINA. *San Luis*: San Luis, III-1946 (Martinez); *Tucumán*: San Pedro de Colalao, II-1957 (A. Teran).

Systematics.—The species is closely related to both *cosquin* and *glabra*. The male can be separated from them by its clypeal outline (Fig. 4), smooth inner margin of midcoxa (Fig. 11), and the short tyloides on flagellomere X (Fig. 28). The females of *bola*

can be distinguished from *cosquin* females by their shagreened frons and their coarse propodeal reticulation; and they can be distinguished from *glabra* females by the less punctured interocellar area (Fig. 9).

Astata westcotti Parker

(Fig. 6)

Astata westcotti Parker, 1964, p. 558.

MALE.—Black; abdomen partly, mandibles medially red, tarsi reddish brown; forewing light brown in cellular area, apically hyaline; hindwing hyaline. Pubescence silvery-white; sternites IV-VI with dense, median hairbrush, setae directed posteriorly, with yellowish reflection, filling median emargination. Punctation uniform over most of body, pits close, shallow; those on mesopleuron obliquely oriented towards scutellum; propodeal enclosure openly reticulate, reticules large, median carina prominent. Median clypeal lobe short, broad (Fig. 6); flagellomeres IV-VIII with linelike tyloides, only partly developed apically on III; frontal bulge prominent in profile, protruding below median ocellus; tangential line between compound eyes as long as length of flagellomere I; mid- and hindcoxae flat, without setae; sternite II humped in profile; sternites IV and V with median, deep U-shaped emargination; sternite VI with V-shaped, shallow notch. Length 9 mm.

FEMALE.—About as in male except as follows: abdomen entirely red, occasionally bicolored; hindwings stained posteriorly; frons with many small pits; interocellar area with about 150 pits; vertex heavily punctured; scutum entirely pitted; pleura shiny, with distinct punctures; midcoxa with nipplelike tubercle on inner ventral surface. Length 7.5-9.5 mm.

Material Examined.—Two ♂, VENEZUELA. *Guarico*: La Cruz River, XII, 1925 (M. Grisol).

Systematics.—The flattened clypeus of *westcotti* males easily distinguishes them from other South American species. The females are separated by coarse punctation on the interocellar area, vertex, and scutum. This species was described from specimens collected in Mexico and Central America; its distribution is now extended to the northern part of South America.

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REFERENCES CITED

- Kohl, F. F.** 1888. Neue Hymenopteren in den Sammlungen des k.-k. Naturhistorischen Hofmuseums. III. Verhandl. Zool.-Bot. Ges. Wien 38: 133-56.
1892. Neue Hymenopterenformen. Ann. k.-k. Naturhist. Hofmus. 7: 197-234.
- Parker, F. D.** 1964. On the subfamily Astatinae. Part II. A review of the genus *Astata* from Mexico and Central America. Ann. Entomol. Soc. Amer. 57: 552-9.
- Reed, E. C.** 1894. Entomologia Chilena. Ann. Univ. Chile 85: 628-9.
- Saussure, H. de.** 1854. Melanges Hymenopterlogiques. Soc. Phy. Hist. Natur. Geneve 14: 22-23.
- Spinola, M. M.** 1851. In Gay. Historia fisica y politica de Chile. Zool. 24: 1-572 (321-2).
- Taschenberg, E. L.** 1870. Die Larridae und Bembecidae des zoologischen Museums der hiesigen Universität. Z. Ges. Natur. 36: 1-27.
1880. Hymenopterologische Ergarungen zu fruheren Arbeiter in dieser Zeitschrift. Ibid. 53: 769-833.

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