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## *PSEUDODYNERUS*, A NEOTROPICAL COMPLEX OF EUMENINE WASPS (HYMENOPTERA, VESPIDAE)

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In 1855, H. de Saussure described briefly and figured a wasp from Colombia, superficially resembling the North American *Pseudodynerus quadrisectus* (Say), and regarded it as a variety of that species. Later he thought he was mistaken and, in 1875, proposed the name "*Monobia maxillaris*" for this Colombian wasp. Zavattari (1912) recognized that this was the species described in 1906 by Brèthes as *Odynerus* (*Stenodynerus*) *anisitsii*. A recent attempt to elucidate the status of a number of American wasps homeochromic with *P. quadrisectus*, led me to the present revision of the group.

I have seen material of The American Museum of Natural History, the Museum of Comparative Zoölogy (Cambridge, Mass.), the United States National Museum, the Philadelphia Academy of Natural Sciences, the Carnegie Museum and some private collectors.

### PSEUDODYNERUS DE SAUSSURE

*Odynerus* subg. *Ancistrocerus* Division *Pseudodynerus* H. DE SAUSSURE, 1855, Et. Fam. Vesp., III, p. 220 (monotypic for *Odynerus luctuosus* de Saussure, 1855).

Dorsal areas of propodeum extending medially to form a horizontal area between the post-scutellum and the concavity; the horizontal area more or less fissurate or grooved medially and separated from the concavity by a crest. Mesonotum without notauli (parapsidal furrows of most authors). Vertical face of pronotum smooth, without pits or depressions. Vertex of female with a large, semi-elliptical, flat or slightly depressed area bearing two dense patches of hairs in pits or grooves. Antenna of male 13-segmented, the last segment folded back as a hook. Labial palpi 4-segmented; maxillary palpi 6-segmented. Second abdominal sternite without a longitudinal basal furrow.

As defined above, *Pseudodynerus* cor-

responds to Zavattari's group of the same name (1912, Arch. f. Naturgesch. LXXVIII, Abt. A, Heft 4, p. 237; as a "Division" of the subgenus *Leionotus* of *Odynerus*). While it may appear more "natural" than most of the other "genera" or "subgenera" that have been split from *Odynerus* in the old sense, it actually consists of two unrelated lines of descent. (a) Species with the horizontal area of the first tergite rectangular and separated from the anterior slope by a blunt, rudimentary carina (particularly marked on the sides): *P. quadrisectus* and *P. maxillaris* (= *anisitsii*). (b) Species with a cup- or dome-shaped first tergite, without even a trace of transverse carina: *P. luctuosus*, *P. migonei*, *P. hallinani*, *P. subapicalis* and *P. serratus*. The first group is clearly transitional to (and perhaps derived from) *Ancistrocerus*, but the second is not.

The relationships of the American *Pseudodynerus* to the *Odynerus*-like wasps with a propodeal dorsal median area of other parts of the world remain to be worked out. It may not be possible to separate them consistently from *Stenodynerus* de Saussure (1863, Mém. Soc. Phys. Hist. Nat. Genève, XVII, pt. 1, p. 228; type by present designation: *Odynerus angustus* de Saussure, 1863). *Pseudodynerus* appears to be even more closely related to the Oriental species which de Saussure (1862, Stettin, Ent. Zeitg., XXIII, p. 184) placed in *Prorhynchium*.<sup>2</sup> In this con-

<sup>2</sup> *Prorhynchium* de Saussure (1855, Et. Fam. Vesp., III, p. 174) was originally monotypic for *Rhynchium smithii* de Saussure (1855), a species with a sharp transverse suture on the first tergite (as in *Ancistrocerus*). *Prorhynchium* is therefore not separable from *Pararrhynchium* de Saussure (1855, loc. cit., p. 193; also monotypic for *Ancistrocerus ornatus* F. Smith, 1852). No name appears to be available for the Oriental *Odynerus* with propodeum extending medially beyond the postscutellum, but without or with a rudimentary transverse suture on the first tergite; unless one wishes to include them in *Pseudodynerus*.

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nection it is interesting to note that, while de Saussure recognized that the maxillary palpi of *Pseudodynerus luctuosus* approached the *Rygchium* type, he refused to place it in his "genus" *Rygchium* (1875, *Smithson. Miscell. Coll.*, No. 254, p. 143).

#### KEY TO SPECIES

- 1.—Horizontal area of first tergite separated from the anterior slope by a strong edge bearing a rudimentary, blunt transverse ridge (particularly on the sides).....2.  
Horizontal area of first tergite either evenly rounded off into the anterior slope or bluntly angular, but never with any trace of transverse ridge.....3.
- 2.—Mesonotum densely and fairly uniformly punctate, most of the punctures at least as large as their intervals. Sides of pronotum broad, seen from above forming an obtuse angle with the humeral margin. (First and second tergites with creamy-white preapical margins; postscutellum creamy-white).....*P. quadrisectus*.  
Mesonotum rather sparsely punctate and with a median impunctate area, the punctures much smaller than their intervals. Sides of pronotum narrow, seen from above forming a nearly square angle with the humeral margin. (Tergites with lateral, widely separated, creamy-white spots; postscutellum black).....*P. maxillaris*.
- 3.—Most of head and thorax very strongly punctate and coarsely striate, particularly on mesonotum. Concavity of propodeum strongly transversely striate. Second tergite humped or obtusely tuberculate near the middle.....*P. luctuosus*.  
Head and thorax more weakly punctate and not striate. Concavity of propodeum mostly smooth and shiny, sometimes partly striolate.....4.
- 4.—Second abdominal tergite longitudinally raised near the middle into a hump or obtuse, low ridge.....5.  
Second abdominal tergite not raised medially into a hump or obtuse ridge.....6.
- 5.—Wings violaceous-black in basal two-thirds, milky-white and with pale nervures in apical third. Thorax and abdomen black. Both occipital and humeral margins distinctly curved inward. Clypeus of female distinctly longer than wide. Male: clypeus deeply, triangularly excised at apex; mid-femora deformed, flattened beneath and with a broad oblique depression over basal half.....*P. subapicalis*.  
Wings strongly infusate basally and anteriorly, gradually clearer apically, not divided into black basal and milky-white apical areas. Thorax either black or more or less yellowish at the crest and lower ridges of propodeum; sometimes with spots on postscutellum and mid and hind coxae. Abdomen black or with apical yellow or orange fasciae on some segments. Occipital and humeral margins nearly straight. Clypeus of female about as long as greatest width. Male: clypeus with a very even and shallow inward curve at apex; mid-femora not deformed, merely flattened beneath.....*P. serratus*.
- 6.—First tergite distinctly angular in profile between the posterior horizontal area and the anterior slope, and slightly raised medially. Lateral angles of propodeum broadly rounded off, scarcely marked. Black, with a few ferruginous-orange markings on head, thorax and legs. Wings mostly and fairly uniformly violaceous-black.....*P. hallinani*.  
First tergite very evenly rounded off in profile, not raised in the middle. Lateral angles of propodeum prominent, more or less raised into sharp teeth.....7.
- 7.—Second tergite with a preapical zone of very coarse punctures extending forward in the middle; the remainder much more finely punctate. Crests of superior ridges of propodeum rather low and broadly separated in the middle. Smaller (wing 9 to 11 mm. long); black with very reduced yellowish markings on clypeus, postscutellum, superior and inferior ridges of propodeum, and legs. Wings strongly infusate basally and anteriorly, gradually clearer apically and behind.....*P. griseolus*.  
Second tergite fairly uniformly covered with scattered, medium-sized punctures. Crests of superior ridges of propodeum very strong and narrowly separated in the middle. Larger (wing 13 mm. long); black with the propodeum yellow over most of the dorsal areas and along the lateral and inferior ridges; postscutellum partly yellow; a pair of small yellow medio-lateral spots on first tergite. Wings mostly and fairly uniformly violaceous-black.....*P. migonei*.

#### *Pseudodynerus quadrisectus* (Say)

A careful comparison of females of North American *quadrisectus* and Mexican *aztecus* fails to disclose differences either in structure or in sculpture. I do not hesitate to regard them as color forms of one species.

- 1.—More extensively marked with creamy-white: humeral margin broad; spots of propodeum large, often covering most of the dorsal areas; preapical bands of first and second tergites broad; lateral spots of first tergite large and more or less extended medially (though never united), so that the horizontal area is often creamy-yellow with a black diamond-shaped spot. (North American).... typical *quadrisectus*.

Creamy-white markings less extensive: humeral margin narrow; propodeum with six small spots or dots; preapical bands of first and second tergites narrow; lateral spots of first tergite small, not produced medially. (Mexican).....var. *aztecus*.

#### **P. quadrisectus, typical form**

*Odynerus quadrisectus* ["Say" HARRIS, 1833, in Hitchcock, Report on Geology, Mineralogy, Botany and Zoology of Massachusetts, 1st Edition, p. 589 (*nomen nudum*)].—SAY, 1837, Boston Jl. Nat. Hist., I, pt. 4, p. 385 (♀ ♂; United States, without more definite locality).

*Odynerus (Ancistrocerus) quadrisectus* H. DE SAUSSURE, 1855, Et. Fam. Vesp., III, p. 206 (not the variety, nor the figure).

*Odynerus (Ancistrocerus, Stenancistrocerus) quadrisectus* H. DE SAUSSURE, 1875, Smithsonian. Miscell. Coll., No. 254, p. 193 (♀ ♂).

*Ancistrocerus (Pseudodynerus) quadrisectus* J. BEQUAERT, 1925, Trans. Amer. Ent. Soc., LI, pp. 69 and 77 (♀ ♂).

*Odynerus bellone* LEPELETIER DE ST. FARGEAU, 1841, Hist. Nat. Ins. Hym., II, p. 660 (♀ ♂; Carolina, North America).

*Odynerus (Ancistrocerus) bellone* H. DE SAUSSURE, 1853, Et. Fam. Vesp., I, p. 146 (♀ ♂).

No complete bibliography of this North American wasp is here given. It occurs over most of the eastern United States (east of the 100th Meridian), as far north as northern New Jersey. I have seen it from the following States: New Jersey (Englewood, opposite New York City, northernmost locality known), Pennsylvania (Pittsburgh; Ingram; West View; Aspinwall; Westmoreland Co.; Allegheny Co.; Washington Co.; Rockview; Huntingdon), Delaware (New Castle Co.), Maryland, District of Columbia, West Virginia (French Oak), Virginia (Dismal Swamp), North Carolina (Cape Henry; Ashford; Southern Pines; Valley of Black Mts.; Dillesboro), South Carolina (Horry Co.; Greenville), Georgia (Tifton; Savannah), Florida (Indian River; Driflon, Jefferson Co.; Paradise Key, Dade Co.; Miami; Fort Lauderdale; Anclote River, Elfers; Coconut Grove; Monticello; Pine Crest, Collier Co.; Crescent City; Gainesville; Royal Palm Park; Clearwater; Fort Myers; Enterprise; Deep Lake; Lake Worth; Flamingo; Biscayne Bay), Louisiana, eastern Texas (Brazos Co.; Bastrop Co.; Fedor; McDade; Dickinson), Oklahoma (Osage Co.; Grove), eastern Kansas (Baldwin), Missouri, Arkansas (Cottes),

Kentucky, Tennessee (Roan Mt. Sta., Carter Co.), Illinois (Hilliary, 6 miles west of Danville, Vermilion Co.; Alto Pass, Union Co.; Aldridge, Union Co.; Fountain Bluff, Jackson Co.; Du Bois, Washington Co.; Havana, Mason Co.; Homer Park, Champaign Co.; Oakwood, Vermilion Co.) and Ohio (Ashland Co.; Sandusky Co.; Jug Run; Smithfield, Jefferson Co.; Columbus; Big Darby, Franklin Co.; Buckeye Lake; Marietta, Highland Co.; Lawrence Co.). There is as yet no record from New York State or from New England.<sup>1</sup>

*P. quadrisectus* is clearly a Neotropical element in the Nearctic fauna, together with *Monobia quadridens* (Linnaeus), *Rygchium bidens* (de Saussure), *Pachymenes symmorphus* de Saussure, and the species of *Pachodynerus* and *Mischocyttarus*.

An unusual feature of this species is the color of the clypeus. In the female, this is black with two curved creamy-white lateral spots in the upper half, close to the inner orbits. In the male, it is black with or without the lateral spots of the female (usually much reduced when present) and with or without a median pair of elongate creamy-white spots on the preapical carinae; exceptionally the clypeus is more extensively yellow, leaving only a black spearhead-shaped median area. Moreover, the extent of the creamy-white markings varies considerably, even in the same locality. Tegulae and scutellum are generally black, exceptionally with spots (in one female, the spots of the scutellum form a medially interrupted band). In two males there is a small lateral dot on each side near the base of the second tergite and one of these bears small lateral streaks on the third tergite. The most northern female I have seen (from Englewood, New Jersey) is richly marked, having spotted tegulae and scutellum.

This wasp varies much in size. The fore wing measures from 12 to 16 mm. in length in the female, and from 10.5 to 13 mm. in the male.

Thaddeus William Harris, in 1833, first

<sup>1</sup> With the exception of Englewood, the localities here listed are additional to those given in my 1925 paper.

published the name "*Odynerus quadrisectus* Say," without description, but with the locality "North Carolina" ("N. C."). In the Harris Collection, now at the New England Museum of Natural History (Boston), there is a female of *quadrisectus* named by Say himself and no doubt the specimen recorded by Harris in 1833. As this was four years before Say published his description, the specimen is obviously one of the original types and, so far as known, the only one now in existence. I have examined this wasp and it is of the species now called *quadrisectus*. The type of Lepeletier's *bellone* is probably at the Paris Museum.

**P. quadrisectus** var. **aztecus** (de Saussure)

*Odynerus (Odynerus) aztecus* H. DE SAUSSURE, 1857, Rev. Mag. Zool., (2) IX, p. 275 (♀ ♂; Tampico, Mexico).

*Odynerus (Ancistrocerus, Stenancistrocerus) aztecus* H. DE SAUSSURE, 1875, Smithson. Miscell. Coll., No. 254, p. 192 (♀ ♂).

*Odynerus aztecus* DALLA TORRE, 1894, Cat. Hym., IX, p. 55.

*Odynerus (Ancistrocerus) aztecus* DALLA TORRE, 1904, Gen. Insect., Vesp., p. 40.

**SPECIMENS EXAMINED.**—Mexico: Chichen Itza, Yucatan, 3 females, June, 1929 (J. Bequaert); San Rafael, Jicoltepec, State of Vera Cruz, 3 males.

These six specimens agree almost to the letter with de Saussure's detailed description (1875), except that the mid and hind coxae are streaked with creamy-white. The submarginal border of the second tergite is continuous in all. The size of the spots on the propodeum varies. In the female, the clypeus is black with broad upper lateral yellow margins and two pre-apical yellow streaks; in the male, it is entirely yellow. The size varies: fore wing 13 to 15 mm. long in female, 10.5 to 12 mm. in male.

It is remarkable that the more tropical form of this species should show a reduction in the extent of the pale markings.

H. de Saussure's types are probably in Geneva.

**Pseudodynerus maxillaris** (de Saussure)

Zavattari recognized that *O. anisitsii* Brèthes was the wasp from Colombia which

de Saussure originally regarded as a variety of *O. quadrisectus*, but later named *Monobia maxillaris*. He preferred, however, to use Brèthes' later name. I cannot agree with his statement that *M. maxillaris* was never described. In fact it was based on a published figure, which itself was accompanied by a description.

The only reliable structural differences I can find between *P. quadrisectus* and *P. maxillaris* are those given in the key. Bertoni (1918) states that in *P. quadrisectus* the lateral angles of the propodeum are not sharply projecting, as in *P. maxillaris*. But the shape of the lateral angles varies considerably in my large series of *quadrisectus*, being either completely rounded off or more or less produced; and in some cases they are exactly as in *maxillaris*.

Two color forms may be recognized.

- 1.—Tergites 1 and 2 only with lateral spots (exceptionally the third also with a small spot) . . . . . typical *maxillaris*.  
Tergites 1, 2, 3, and 4 with large lateral spots . . . . . var. *garleppi*.

**P. maxillaris**, typical form

*Odynerus (Ancistrocerus) quadrisectus* var. H. DE SAUSSURE, 1855, Et. Fam. Vesp., III, p. 206, Pl. IX, fig. 9 (♀; Santa Marta, Colombia).

*Monobia maxillaris* H. DE SAUSSURE, 1875, Smithson. Miscell. Coll., No. 254, p. 193, footnote (♀; with reference to his Pl. IX, fig. 9 of 1855).

*Odynerus (Stenodynerus) anisitsii* BRÈTHES, 1906, An. Mus. Nac. Buenos Aires, (3) VI, p. 366 (♀; Villa Morra, Paraguay).—A. DE WINKELRIED BERTONI, 1918, An. Cient. Paraguayos, (2) No. 3, pp. 200 and 207.

*Odynerus (Leionotus, Pseudodynerus) anisitsii* ZAVATTARI, 1912, Arch. f. Naturg., LXXXVIII, Abt. A, Heft 4, pp. 238 and 239.

**SPECIMENS EXAMINED.**—Costa Rica: Without more definite locality, one female (Schild and Burgdorf).—Colombia: Cagualito, 20 miles E. of Santa Marta, 1500 ft., two females (Herbert H. Smith); Muzo, Dept. Boyacá, 900 m., one female (J. Bequaert).—Bolivia: Las Juntas, two males (Steinbach); Cuatro Ojos, one male (Steinbach); Sa. Cruz de la Sierra, one female (Steinbach); Prov. Sara, one female (Steinbach); Buenavista, Dept. Sa. Cruz, 450 m., one female.—Paraguay: Sapucay, one female (W. T. Foster); Villarrica, two females (F. Schade).

The typical form is also reported from southern Brazil (São Paulo; Espirito Santo). In Colombia it occurs only in the Tierra Caliente, Zavattari's record from "Bogotá" being based on an error in labeling.<sup>1</sup>

Of the seven females seen, six are marked exactly as figured by de Saussure and described by Brèthes. The female from Buenavista, Bolivia, however, has in addition to the spots on tergites 1 and 2, a transverse preapical spot on each side of tergite 3, being therefore transitional to var. *garleppi*.

H. de Saussure's type of *maxillaris* is probably in Geneva. Brèthes type of *anisitsii* was described from the collection of the "Escuela Normal de Señoritas No. 1" of Buenos Aires.

#### **P. maxillaris** var. *garleppi* Schrottky

*Stenodynerus anisitsii* subsp. *garleppi* SCHROTTKY, 1911, Ent. Rundschau, XXVIII, p. 11 (♀; Cuzco, Peru).

This differs from typical *maxillaris* only "durch gelbe Seitenflecken auf den Tergiten 3 und 4." I have taken at Restrepo, Int. Meta, 500 m., Colombia, a female of this variety, which is scarcely worth recognizing by name.

#### **Pseudodynerus luctuosus** (de Saussure)

I have reached the conclusion that *O. mina-palumboi* Gribodo and *O. beelzebub* Zavattari are merely color variations of *P. luctuosus*. So few specimens are known that one cannot decide whether or not these forms should be recognized by name.

<sup>1</sup> In his 1912 paper Zavattari lists from "Bogotá" forty solitary Vespidae belonging to *Zethus*, *Pachymenes*, *Eumenes*, *Montezumia*, *Ancistrocerus*, *Pseudodynerus*, *Pachodynerus*, *Odynerus*, and *Alastor*. Twenty of these are described as new, "Bogotá" being given as the type locality. These "Bogotá" wasps were all of the Berlin Museum, Lindig being given as the collector. In 1936 I collected several days at Bogotá and environs, particularly in order to obtain Zavattari's species. I was surprised to find, however, that the Vespidae fauna was extremely poor. No social species were seen and only two solitary species taken: *Pachymenes ventricosus* de Saussure and *Odynerus romandinus* de Saussure. I was also able to go over the collections of Hymenoptera made over a number of years by Hermano Apolinar-Maria, at the Instituto LaSalle. These contained from Bogotá only *Pseudodynerus luctuosus* in addition to the two species mentioned above. While a few more species may eventually be found in the vicinity of Bogotá, I feel quite certain that most of Zavattari's records were based on specimens "shipped" from Bogotá, but collected elsewhere and mostly in the warmer parts of Colombia.

From the published descriptions they may be separated as follows:

- 1.—Thorax and abdomen entirely black. Wings slightly subhyaline in the fourth submarginal cell.....var. *beelzebub*.  
Thorax and abdomen not both entirely black. Wings entirely violaceous-black.....2.
- 2.—Thorax with creamy-white or pale yellow spots on pronotum and dorsal areas of propodeum. Abdomen with two rounded pale yellow spots at the base of the second tergite.....var. *mina-palumboi*.  
Thorax black, without spots. Abdomen with two rounded creamy-yellow spots near the base of second tergite.....  
.....typical *luctuosus*.

#### **P. luctuosus**, typical form

*Odynerus (Ancistrocerus, Pseudodynerus) luctuosus* H. DE SAUSSURE, 1855, Et. Fam. Vesp., III, p. 220 (♀; "L'Amérique. Probablement la Caroline du Sud").

*Odynerus luctuosus* F. SMITH, 1857, Cat. Hym. Brit. Mus., V, p. 83.—DALLA TORRE, 1894, Cat. Hym., IX, p. 76.

*Odynerus (Odynerus, Stenodynerus) luctuosus* H. DE SAUSSURE, 1875, Smithsonian. Miscell. Coll., No. 254, p. 311 (♀).

*Odynerus (Lionotus) luctuosus* DALLA TORRE, 1904, Gen. Insect., Vesp., p. 48.

*Odynerus (Lionotus, Pseudodynerus) luctuosus* ZAVATTARI, 1912, Arch. f. Naturg., LXXVIII, Abt. A, Heft 4, p. 238 (♀).

As Zavattari recognized, this is a South American wasp, known with certainty thus far from Colombia only. Zavattari records it from Bogotá and Hermano Apolinar-Maria has sent a female taken in that locality. It was observed in the "savanna" or highland plain by Mr. Luis Maria Murillo, who found it nesting in the hollow stalks of reeds. (Altitude approximately 2,600 m.)

H. de Saussure's type should be in Geneva. There is no evidence whatsoever that this wasp occurs in the United States.

#### **P. luctuosus** var. *mina-palumboi* (Gribodo)

*Monobia mina-palumboi* GRIBODO, 1891, Boll. Soc. Ent. Italiana, XXIII, p. 270 (♀; Muzo, Colombia).—DALLA TORRE, 1894, Cat. Hym., IX, p. 41; 1904, Gen. Insect., Vesp., p. 29.—DÜCKE, 1911, Revue d'Entom., XXVIII, p. 180.

*Odynerus (Lionotus, Pseudodynerus) mina-palumboi* ZAVATTARI, 1912, Arch. f. Naturg., LXXVIII, Abt. A, Heft 4, p. 238 (♀).

This variety is known only from Colom-

bia. Zavattari, who saw the type at Turin, recognized that it was not a *Monobia*, but a close relative of *O. luctuosus*. He also records it from Bogotá.

***P. luctuosus* var. *beelzebub* (Zavattari)**

*Odynerus* (*Leionotus*, *Pseudodynerus*) *beelzebub* ZAVATTARI, 1912, Arch. f. Naturg., LXXVIII, Abt. A, Heft 4, pp. 237 and 239 (♀; Appula, Venezuela).

This variety is known only from the type at the Berlin Museum.

***Pseudodynerus subapicalis* (Fox)**

*Odynerus* (*Stenodynerus*) *subapicalis* FOX, 1902, Proc. Ac. Nat. Sci. Philadelphia, pp. 67 and 69 (♀ ♂; Mararu; Chapada; Rio de Janeiro; Santarem; all in Brazil).

*Odynerus* (*Leionotus*) *subapicalis* DALLA TORRE, 1904, Gen. Insect., Vesp., p. 55.

*Stenodynerus subapicalis* A. DE WINKELRIED BERTONI, 1918, An. Cient. Paraguayos, (2) No. 3, pp. 202 and 207.

SPECIMENS EXAMINED.—Peru: El Campamento, Col. Perene, June 19, 1920, one female (J. C. Bradley).—Colombia: Restrepo, Int. Meta, 500 m., one female and two males, at flowers of *Mikania scandens* (J. Bequaert); Cacagualito, 20 miles east of Santa Marta, 1,500 ft., Dept. Magdalena, one female (Herbert H. Smith).

I have also seen Fox' types at the Carnegie Museum in Pittsburgh. The species is now known from Brazil, Paraguay, Peru, and Colombia.

The female type has two brushes of hairs on the vertex behind the ocelli, as in other species of *Pseudodynerus*. Although this species agrees with *P. serratus* in the humped second tergite, it is readily separated structurally by the characters given in the key.

***Pseudodynerus serratus* (Fox)**

*O. serratus* Fox, *O. griseus* Fox, *O. penicillatus* Zavattari, *O. crinitus* Zavattari, and *S. mondaiensis* Bertoni are probably all color variants of one structural species, but my material is insufficient either to settle the matter or to decide how many of the forms deserve recognition in nomenclature. All specimens I have seen are either typical *serratus* (with well-marked, broad, bright yellow apical fasciae on tergites 2 to 5) or the var. *griseus* (with the

abdomen black or very slightly testaceous along the apical margins of tergites 2 to 5). It should be noted that the female type of *griseus* bears two brushes of black hairs on the vertex (not mentioned by Fox); while the male type of *serratus* has the first abdominal tergite *not* transversely carinate or furrowed (the "not" was accidentally omitted from the text of the original description; but in the "key," on pp. 67–69, the species is placed correctly in the group with "first abdominal segment *not* carinated").

So far as may be judged from the descriptions, *O. crinitus* is not separable from *P. serratus* var. *griseus*; *O. mondaiensis* appears to be identical with typical *P. serratus*; but *O. penicillatus* may be a distinct color form.

Fox states of the male type of *O. serratus*: "The first segment bears above close to apical margin a tooth-like projection, which may be a malformation. Other specimens are needed to verify this." While in the type this structure appears perfectly normal, it nevertheless must be an abnormality, since none of the other specimens of *O. serratus* seen, of either sex, show a trace of it, although they agree in every other respect with Fox' type.

***P. serratus*, typical form**

*Odynerus* (*Stenodynerus*) *serratus* FOX, 1902, Proc. Ac. Nat. Sci. Philadelphia, pp. 65 and 69 (♂; Corumbá, Brazil).

*Odynerus* (*Ancistrocerus*) *serratus* DALLA TORRE, 1904, Gen. Insect., Vesp., p. 54.

*Stenodynerus serratus* A. DE WINKELRIED BERTONI, 1918, An. Cient. Paraguayos, (2) No. 3, pp. 192, 202, and 207 (on p. 208, also as *Odynerus* (*Stenancistrocerus*) *serratus*).

SPECIMENS EXAMINED.—Paraguay: Villarrica, one female (allotype) and one male (F. Schade). Allotype at Mus. Comp. Zool., Cambridge, Mass.

I have compared these specimens with the type at the Carnegie Museum.

Most probably *mondaiensis* Bertoni is identical with the typical form of *P. serratus* (see below).

FEMALE (undescribed).—Very similar to the male in structure and color markings. Clypeus entirely black, broadly pear-shaped, about as high as wide; apical margin slightly less than one-third of greatest width, with a distinct,

though slight inward curve, and short, sharp lateral angles. Vertex with the usual two brushes of erect hairs.

Length (h. + th. + t. 1 + 2): 10.5 mm.; of fore wing, 10 mm.

**P. serratus** var. **mondaiensis** (Bertoni)

*Stenodynerus mondaiensis* A. DE WINKELRIED BERTONI, 1918, An. Cient. Paraguayos, (2) No. 3, pp. 200 and 207 (♀ ♂; Puerto Bertoni, Paraguay).

I have not seen this form, the description of which is reproduced below. I am unable to see how it is to be separated from typical *P. serratus*. The type of *P. serratus* agrees well with Bertoni's account, the author himself pointing out that the color is rather variable.

"*Faem. S. serrato* Foxi similimus; sed griseo-puberulus, alis fusco-hyalinis, segmento mediario flavo ornato abdominisque segmentorum 2-5 apicibus crasse punctatis. Niger; mandibularum basi, oculorum margine contra antennis, clypei margine utrinque lineolisque duobus apicalibus, scapo subtus, punctis duobus inter antennis, femoris 1<sup>i</sup> linea antica, metanoti crista et punctulo utrinque abdominisque segmentorum 2-6 apice (late), flavis; abdominis segmento 1<sup>o</sup> utrinque ferrugineo-limbato; tegulis testaceo-unimaculatis; flagello subtus, tarsisque apice, ferrugineis. Abdominis segmento primo haud transverse carinato. Clypeo crasse rugoso-punctato, subtiliter granuloso, apice trianguliter emarginato, bidentato, sat bicarinato; metanoti foveola postica sparsissime punctata, inferne transversaliter striata. Long. corp. 13 mm.; al. 10.—*Var. a:* carina inter antennis basi flava; *b:* clypeo, scapo et carina inter antennis, nigris; *c:* clypeo apice nigro; mandibulis plus minusve nigris, abdominis segmentis 2-6 anguste ochraceo-limbatis, sternitis limbis fere nullis.—El color de las alas también es un tanto variable. El macho no ofrece diferencias notables; el clípeo con igual diseño y escodatura, parece más corto que en la hembra."

**P. serratus** var. **griseus** (Fox)

*Odynerus (Stenodynerus) griseus* Fox, 1902, Proc. Ac. Nat. Sci. Philadelphia, pp. 66 and 69 (♀ ♂; Chapada and Corumbá, Brazil).

*Odynerus (Symmorphus) griseus* DALLA TORRE, 1904, Gen. Insect., Vesp., p. 46.

*Stenodynerus griseus* A. DE WINKELRIED BERTONI, 1918, An. Cient. Paraguayos, (2) No. 3, pp. 202 and 207.

*Odynerus (Leionotus, Pseudodynerus) crinitus* ZAVATTARI, 1912, Arch. f. Naturg., LXXVIII, Abt. A, Heft 4, pp. 238 and 241 (♀; São João del Rei, Brazil).

I have seen the types and paratypes of *O. griseus* and I am unable to find a reliable structural character to separate

them from typical *serratus*. These types are colored like Zavattari's female *crinitus*, which no doubt is the same form. In particular they have the scape black or somewhat ferruginous beneath and the mid and hind coxae spotted with yellow.

**P. serratus** var. **penicillatus** (Zavattari)

*Odynerus (Leionotus, Pseudodynerus) penicillatus* ZAVATTARI, 1912, Arch. f. Naturg., LXXVIII, Abt. A, Heft 4, pp. 238 and 240 (♀; Cayenne, French Guiana).

I have not seen this form, but from the description it would seem to be a color form of *P. serratus*. Zavattari separates it from his *crinitus* (= *serratus* var. *griseus*) by the different punctation (coarser and denser on the thorax in *penicillatus*), the color of the scape (with a yellow line beneath), of the mid and hind coxae (without yellow spots) and of the wings ("alis hyalinis paulum flavescentibus ad costam aliquantulo infumatis, nervis et stigmatibus piceis").

**Pseudodynerus auratoides** (Bertoni)

*Stenodynerus auratoides* A. DE WINKELRIED BERTONI, 1918, An. Cient. Paraguayos, (2) No. 3, pp. 201 and 207 (♀ ♂; Puerto Bertoni, Paraguay).

I have not seen this species, the description of which is reproduced below. It is evidently very closely related to *P. serratus* and *P. subapicalis* owing to the humped second tergite. In some respects it agrees better with my specimens of *P. subapicalis* than with *P. serratus*, although the color is practically that of typical *serratus*. The shape of the mid-femora of the male is not mentioned.<sup>1</sup>

"*O. (St.) serrato* similis; sed major, clypeo magis flavo, metanoto pone post-scutellum minus producto abdominisque segmento primo haud transverse impresso.—*Faem.* Atra, dense aureo-sericea; mandibulis longitudinaliter, marginibus lateralibus clypei, frontis punctis 2 vix contiguis et fascia transversa prope clypeum, scapo subtus, margine oculorum contra antennis, tibiis anticis intus, spina mesonoti, metanoti canthis, abdominis segmentorum 2<sup>i</sup>—5<sup>i</sup> apice 6<sup>o</sup>—que segmento in medio, flavis; labro ex flavo-ferrugineo; pedibus anticis fere obscure-ferrugineis, aureo-hirtis. Alis ferrugineis, apice

<sup>1</sup> A female of *P. auratoides*, from Nova Teutonia, Est. Sa Catharina, Brazil, recently received from Mr. F. Plaumann, shows that this is a distinct species, readily separated from *P. serratus* by the shape of the postscutellum.

fusco hyalinis. Capite dense irregulariterque punctato, sparsim tomentoso, vertice cirris 2 pilorum fuscum instructo; carina interantennalia sursum versus lineato-impressa; clypeo subcordiformi, striato-punctato et minute granuloso, apice biangulato, paullum triangulariter emarginato; mandibulis 3-striatis. Thorace elongato sat punctato punctulatoque; pronoto antice cristato, angulato, utrinque cum pleuris rotundato-congruente; mesonoto dense tomentoso, paullum convexo, lineis nullis, prope tegulas vix impunctato; tegulis sericeis, fere impunctatis; scutello transverso, longitudinaliter paullo carinato, sparsim punctato et punctulato; postscutello integro, comfertim et grosse punctato, postice depresso; metanoto in medio supra quam post-scutellum sat brevius, grosse crebreque punctato, cristato-serrato ut in *O. serrato* Foxi; foveola postica sat concava, puberula, punctis fere nullis, verticaliter excisa, utrinque acute unidentata, inferne transverse bistrata; mesopleuris crebre punctatis, metapleuris oblique strigatis. Abdomine densissime sericeo, ovato-oblongo, modice punctato; segmento 1° antice truncato, magis lato quam longo, supra cupuliformi, in medio paullo impresso, subtus carina transversa laevigata; segmento 2° magis lato quam longo, cupuliformi, supra in tuberculum tumescentem productum; 5°-6° fere laevigatis. Long. corp. 14-17 mm., al. 11-12.—*Mas.* Clypeo magis flavo, elongato, valde emarginato, sparse punctato; labro flavo; mandibulis longitudinaliter sulphureis; tegulis nigris; abdominis tuberculo fere nullo; unco antennarum gracili, ferrugineo, subcylindrico, usque ad apicem art. 10<sup>mi</sup> attingente. Long. 12-13 mm."

### *Pseudodynerus griseolus* (Brèthes)

*Odynerus* (*Stenodynerus*) *griseolus* BRÈTHES, 1909, An. Mus. Nac. Buenos Aires, (3) XII, p. 58 (♂; Tucuman, Argentina).

SPECIMENS EXAMINED.—Brazil: Corumbá, State of Matto Grosso, one female (allotype) and one male, December, 1919 (J. C. Bradley). Allotype at Mus. Comp. Zoöl., Cambridge, Mass.

The male of this pair agrees perfectly with Brèthes' description. The species resembles certain forms of *P. serratus*, the main difference being the lack of even a trace of hump on the second tergite; in addition, the median portion of the propodeum is shorter and more openly grooved than in *serratus*, with the crests of the upper ridges much shorter and farther apart, and both occipital and humeral margins are deeply curved inward.

FEMALE (undescribed).—Similar in structure and color markings to the male. Clypeus very broadly pear-shaped, about as wide as long; apical margin about one-third of greatest width,

with a deep, semi-elliptical emargination, the lateral angles forming long and sharp, flat, triangular teeth. Clypeus black, with upper lateral margins and two small spots in lower third yellow.

Length (h. + th. + t. 1 + 2): 11.5 mm.; of fore wing, 11.5 mm.

### *Pseudodynerus migonei* (Bertoni)

*Odynerus* (*Stenodynerus*) *migonei* A. DE WINKELRIED BERTONI, 1926, Rev. Soc. Cient. Paraguay, II, 1 (1925) p. 77 (♀; Cordillera Amambai, 56° W., 23° 30' S., Paraguay).

SPECIMEN EXAMINED.—Brazil: Maracajú, Est. Matto Grosso, April-May, 1937, one female (G. Fairchild).

This female agrees in every detail with Bertoni's description, which is here reproduced: "*Faem.* Atra; postscutelli linea transversa, metanoto maxima parte (foveola nigra) abdominalis segmento 1° puncto utrinque, luteis. Alis nigrocyaneis. Clypeo cordiformi, valde punctato, semicirculariter emarginato. Capite thoraceque dense punctatis; vertice cirris 2 pilorum instructo, semicirculariter impresso; metanoto pone postscutellum productum, serrato-cristato; foveola rotundata margine utrinque unidentata. Abdomine modice punctato, griseo sericeo; 1° segmento antice rotundato, magis lato quam longo, in medio supra longitudinaliter impresso. Long. corp. 15 mm., al. 13."

### *Pseudodynerus hallinani*, new species

Medium-sized; black with a few ferruginous-orange markings on head, thorax and legs; wings violaceous-black. First tergite angular in profile and slightly raised medially; second tergite not humped, uniformly punctate. Propodeum with lateral angles broadly rounded off; superior ridges crested over upper horizontal portion only.

Length (h. + th. + t. 1 + 2): 12.5 mm.; of fore wing, 12 mm.

FEMALE.—Head (Fig. 1B) subcircular seen in front, nearly as high as wide; seen from above, transverse, about one and a half times as wide as long; occipital margin nearly straight. Vertex and cheeks margined throughout by a sharp carina, which is stronger on the cheeks than at the occiput. Cheeks very wide and distinctly swollen in the upper two-thirds, as wide at the occiput as the upper part of the eye in profile, gradually narrowed to the lower third and thence more rapidly to the base of the mandible; marginal carina evenly curved, convex, separated only by a narrow groove from the eye near the mandible. Inner orbits farther apart on the vertex than at the clypeus; upper half of frons scarcely swollen. Ocelli in a flattened triangle; posterior pair about as far apart as from the eyes and more than twice as far from the occipital margin. Interocellar area and vertex slightly flattened; the two tufts of brownish hairs of the vertex unusually large, long and dense, narrowly



divided medially. Antennal sockets about twice as far apart as from the eyes; area between them slightly raised and with a low, blunt, median, even keel. Clypeus elongate pear-shaped, slightly longer than wide, scarcely convex; disk flattened medially in upper half, depressed or somewhat excavated in lower part; apical, free portion longer than basal, interocular part; apical margin about one-third of the greatest width of the clypeus, with a very slight inward curve; the lateral angles broadly triangular, rounded off, each bearing a blunt carina which extends over the lower third of the clypeus (the two carinae slightly diverging above). Antenna: scape slender; flagellum almost uni-

carina, narrowly interrupted in the middle; the carina much stronger on the sides, below the humeral angles, which are square, not prominent, blunt; sides of pronotum slightly shouldered, but not ridged between the dorsal and lateral areas. Mesonotum longer than wide; notauli absent. Tegula short and broad, normal; posttegula distinct, broad. Scutellum rectangular, nearly twice as wide as long, flat, not depressed medially. Postscutellum very broadly triangular, about half as long as scutellum, from which it is separated by a deep, smooth suture; nearly horizontal, slightly swollen transversely over anterior half. Mesepisternal suture complete; a strong prepectal suture from the mese-

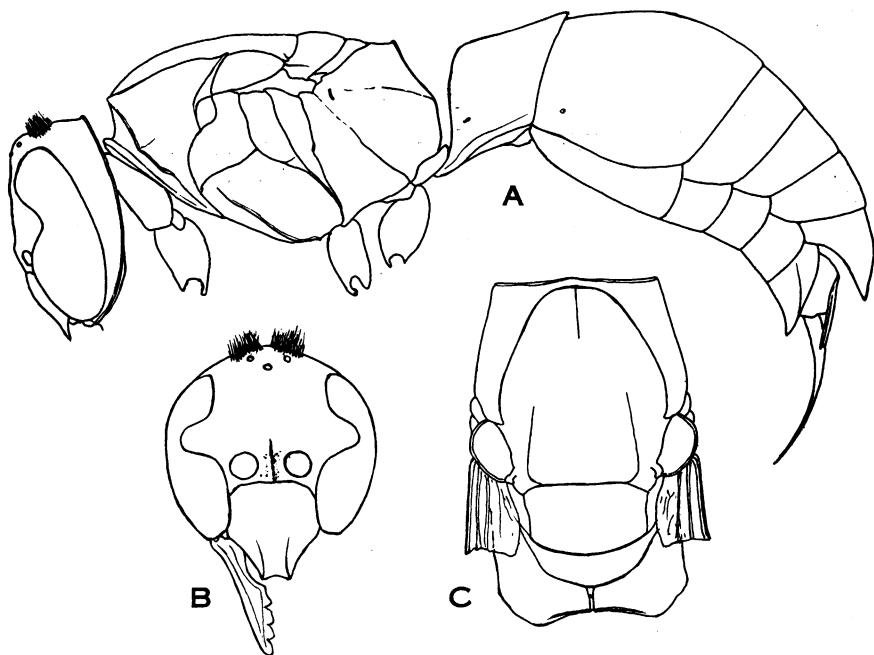


Fig. 1. *Pseudodynerus hallini* J. Bequaert, female holotype: A, body in profile; B, head seen in front; C, thorax from above.

formly thick throughout. Mandible slightly shorter than the height of the eye, straight, rather narrow; apex bluntly pointed, slightly curved; inner cutting edge with three long, low teeth. Maxillary palpi of six segments, which decrease gradually in length from the first to the fifth, the sixth distinctly longer than the fifth. Labial palpi of four segments, the last about half the length of the third.

Thorax (Fig. 1A and C) rectangular from above, slightly narrower anteriorly than posteriorly, about one and one-third times as long as wide across the tegulae. Pronotum distinctly but gradually narrowed toward the humeral margin, which is straight and bears a low, fine

pisternal suture to the middle of the mesosternum. Propodeum long, vertically truncate behind, moderately swollen on the sides; dorsal areas touching each other broadly; the median horizontal area only slightly shorter than the postscutellum, divided by a narrow furrow; concavity very wide, moderately depressed; superior ridges with a sharp, slightly curved crest in upper horizontal portion only, the edge of the crest translucent and somewhat jagged; the two crests broadly separated by the median notch; lateral ridges very weak, blunt; inferior ridges rounded off; lateral angles not at all marked, very broadly rounded off; no teeth near articular valvulae.

Abdomen (Fig. 1A) moderately stubby and rather evenly narrowed anteriorly and posteriorly, slightly depressed. First tergite short, transverse, nearly rectangular seen from above; its horizontal portion about one and a half times as wide as long in the middle, slightly narrower than the second; in profile about half the length of the second tergite, very abruptly sloping anteriorly; the transition between the slope and the horizontal area bluntly angular, slightly raised or almost tuberculate medially; dorsally with a shallow longitudinal depression. Apical margins of all tergites normal, not thickened nor raised, very narrowly translucent. Second tergite evenly convex, not humped; second sternite very evenly convex basally; the postarticular transverse groove smooth, not ribbed nor foveolate. Legs normal. Venation as usual.

Head and thorax mostly covered with coarse punctures, somewhat finer on scutellum, very weak on sides and apex of clypeus and on post-scutellum; the space between the larger punctures of the thorax with minute punctures; concavity of propodeum and tegulae impunctate, smooth. Abdomen with medium-sized, distant, evenly scattered punctures; those of the basal

half of the second tergite much finer, but gradually merging into the coarser apical punctation. Erect pilosity sparse, gray.

Black, with the following ferruginous or orange-ferruginous markings: most of mandibles; scape; under side of flagellum (extending over most of the basal segments); a streak on upper cheeks; anterior half, hind margin and lateral lobes of pronotum; tegulae; posttegulae; a small spot on upper mesopleura; two transverse spots on postscutellum; crests of superior ridges and lateral angles of propodeum; articular valvulae; very narrow apical margins of first tergite; and most of legs (coxae, mid and hind femora, and outer side of mid and hind tibiae black or brownish-black). Upper and lateral margins and apical carinae of clypeus, narrow lower inner orbits, supra-antennal frontal spot, and middle of mandibles, yellow, edged with ferruginous. Wings uniformly purplish black.

Canal Zone of Panama: *Culebra*-Arrijan Trail, female holotype, November 26, 1914 (T. Hallinan). American Museum of Natural History.