

American Museum Novitates

PUBLISHED BY THE AMERICAN MUSEUM OF NATURAL HISTORY
CENTRAL PARK WEST AT 79TH STREET, NEW YORK, N. Y. 10024

NUMBER 2298

AUGUST 18, 1967

New Species of *Pseudopanurgus* from Arizona (Hymenoptera, Apoidea)

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Descriptions of seven new species of *Pseudopanurgus* are presented here to provide names for life-history studies.

Apparently all North American species now placed in *Pseudopanurgus*, except two, fall into three distinctive and rather easily recognized groups, viz., the typical subgenus *Pseudopanurgus* Cockerell, *Heterosarus* Robertson, and a new subgenus described herein as *Pterosarus*.

SUBGENUS *PSEUDOPANURGUS* COCKERELL

Pseudopanurgus COCKERELL, 1897, p. 290. Type, *Panurgus aethiops* Cresson.

The members of this group almost invariably have a coarse sculpture and fuliginous wings. Other characters are the robust form, with the mesopleura (mesepisterna) truncated anteriorly to form an abruptly inflexed face, the base of the propodeum with a costate furrow, and the head slightly wider than long, but not so wide as the thorax. The female has the facial foveae well impressed, free of pubescence and diverging above from the margin of the eyes, the tibial scopa rather short, compact, and finely plumose, and the front coxae armed behind with a hairy process, in some cases much longer than the front trochanters and reaching back to the middle coxae. The males lack the process on the

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front coxae, or it is present in a rudimentary condition. The subgenital plate (sternite 8) is invariably slender, with a beveled, more or less ovate apex, which is more or less densely hairy beneath. The parameral lobes of the genital armature are simple, tapering, and densely hairy beneath on the apical part, and the sagittae are fused, depressed, about as long as the parameral lobes and moderately wider than the apical part of those lobes.

The coarse sculpture does not always hold for this group, and several species, including *P. pectiphilus* (Cockerell), are more or less finely and densely punctured, but the females have the spurred front coxae and the males have the characteristic terminalia.

***Pseudopanurgus verticalis*, new species**

Pseudopanurgus sp. B: ROZEN, 1966, p. 9.

Although originally collected at flowers of *Verbesina*, subsequent records indicate that *verticalis* is more partial to flowers of *Pectis papposa*. The female is distinguished by the smooth swelling surrounding the anterior ocellus, by the rather fine and close punctures of the mesoscutum, with appressed white pubescence, and by the fine, but strong, close puncturation of the abdomen. The male has the face below the level of the antennae yellowish white and the sculpture somewhat coarser than in the female.

FEMALE: Black, with apical depression of tergites testaceous brown. Legs slightly reddened, small spot at base of front and middle tibiae white, and tibial spurs pale testaceous. Antennae blackish. Mandibles dark, more reddened at middle than at apex. Tegulae amber color, darker at base. Wings pale fuliginous, nervures testaceous, stigma and subcosta more infuscated.

Head broader than long but less broad than thorax; cheeks about two-thirds as wide as eyes. Lateral ocelli about their distance apart from occipital margin and nearly twice as far from nearest eye. Facial foveae slender, hardly widened above and strongly divergent from margin of eyes. Inner orbits of eye moderately divergent above. Antennae inserted just above middle of face. Face below level of antennae evenly convex. Process of labrum broader than long and truncate at apex. Mandibles stout, broad at base, and tapering to acute apex. Proboscis moderately short, galeae much shorter than stipites. Anterior margin of pronotal collar finely carinate on each side and depressed across middle. Spur of front coxae densely hairy and about two-thirds as long as trochanters. Tarsal claws simple. Pterostigma slightly more than half as wide as first submarginal cell; second submarginal cell receiving first recurrent nervure

a short distance before middle. Pygidial plate as long as wide at base and narrowed to ogival apex. Sculpture moderately fine and dense. Punctures of face finer and denser on frons between foveae and much coarser and well separated on vertex and temples. Middle of vertex swollen, and mostly impunctate, the swelling enclosing anterior ocellus and separating posterior pair on outer slopes of swelling. Punctures of mesoscutum small but strong and mostly about one puncture width apart although in some cases partly more separated; punctures of scutellum and mesopleura coarser, with some interspaces equaling or greater than a puncture width. Basal groove of propodeum narrow, but gradually widened toward middle, strongly plicate and followed by broad smooth space; posterior face of propodeum finely and densely punctured. Flanks of propodeum and metapleura finely roughened and dull. Abdomen finely and densely punctured, with punctured area of tergite 1 not invading basal declivity, and punctures on disk of middle segments, especially on tergite 4, coarser and more separated. Apical depression of tergites smooth and moderately wide, that on tergite 2 only slightly more than one-fourth of median length of segment. Pubescence short, appressed, whitish, thin and inconspicuous on face, and most evident on mesoscutum. Tomentum dense and white on collar of pronotum and nearly covering tubercles. Apical fimbria short, dense, and ochreous. Scopal hair of hind tibiae long, rather dense, and finely plumose. Length, about 7 mm.; anterior wing, 5.1 mm.

MALE: Similar to female, but face below level of antennae, scape of antennae broadly beneath, apex of femora, all tibiae except beneath at apex of front pair and except dark ring more or less encircling apical fourth or third of middle and hind pair, and all tarsi creamy white. Flagellum more brownish beneath than in female.

Head distinctly broader than long, well rounded on each side; cheeks about half as wide as eyes. Posterior ocelli more than their distance apart from occipital margin and nearest eye. Facial foveae very narrow and close to margin of eyes. Antennae inserted distinctly above level of middle of eyes, but scapes not reaching anterior ocellus; flagellum rather thick, with middle joints as broad as long. Face below level of antennae gently convex; supraclypeal area measured to level of antennal sockets a little higher than wide. Process of labrum smaller than in female, as broad as long, and emarginate at apex. Front coxae unarmed. Sculpture and pubescence much as in female. Swelling on vertex more triangular than in female and divided into three bosses by median impression on broad posterior part; impression set with two or three short plumose hairs, which are longer than other hairs on vertex. Punctures on posterior

face of propodeum and on abdomen coarser than in female, sculpture of abdomen appearing more rugose. Base of tergites 2 to 4 well impressed and more finely sculptured than disks and invested with appressed, whitish plumose hair, becoming more evident when viewed from side. Apical fimbria of abdomen poorly developed. Sternite 6 with rather small and shallow median emargination. Subgenital plate parallel-sided, but slightly widened on the oval obliquely truncate apical part, which appears to be turned slightly downward, and is smooth and bare above and finely and densely hairy beneath. Parameral lobes of genital armature slender, obliquely narrowed on outer margins, and densely hairy beneath at apex; sagittae moderately wide, depressed, subacute at apex, and ending level with apex of parameral lobes. Length, about 6 mm.; anterior wing, 4.8–5 mm.

TYPE MATERIAL: Holotype, female, Salome, Yuma County, Arizona, on *Pectis papposa*, September 11, 1957; allotype, 2.3 miles west of Salome, on *Pectis*, September 14, 1953 (Timberlake). Paratypes: Arizona: Yuma County: One female, 4 miles west of Hope, on *Pectis*, September 27, 1962 (Timberlake). Pima County: Four males, 10 miles south of Tucson, on *Verbesina encelioides*, August 7, 1940 (Timberlake), and one male (E. S. Ross); one male, Tucson, August 17, 1955 (G. E. Bohart); one male, Ajo, July 23, 1938 (R. I. Sailer). Pinal County: One female, 2 miles east of Oracle, July 24, 1924 (E. P. Van Duzee); five females, 3.1 miles south of Florence Junction, on *Pectis*, September 13, 1961 (P. D. Hurd, Jr.). California: Riverside County: One female, 1.5 miles west of Hopkins Well, on *Pectis*, October 17, 1951 (Timberlake). New Mexico: Hidalgo County: Ten females, two males, 1 mile north of Rodeo (six females from burrows, two females, one male on *Pectis*), August 22, 1964 (J. G. and B. L. Rozen); one male, 7 miles southwest of Rodeo, August 20, 1964 (Rozen); six females, three males, Rodeo, on *Pectis*, August 18, 1964 (C. D. Michener); one male, 4.5 miles north of Rodeo, on *Kallstremia grandiflora*, August 16, 1964 (Michener); one female, 13 miles north of Rodeo, on *Bahia absinthifolia*, August 16, 1964 (Michener). Mexico: Sonora: one female, one male, 19.4 miles south of Estacion Llano, August 25, 1964 (P. R. Rauch).

The holotype and allotype are in collection of the University of California, Riverside. The paratypes are in the collections of the American Museum of Natural History, the California Academy of Sciences, the University of California, Berkeley and Riverside, and the University of Kansas, Lawrence.

The name *verticalis* has reference to the peculiar vertex of this species.

***Pseudopanurgus perarmatus*, new species**

This is a rugosely punctured species, without bosses on the vertex and similar to *P. pectidellus* Cockerell, but differing in the long slender coxal spines of the female, which reach back to the middle coxae.

FEMALE: Black, small spot at base of front and middle tibiae pale yellow. Apical half of mandibles and flagellum of antennae beneath somewhat reddened; apical depression of tergites slightly reddened, and reflexed sides of tergite 1 more strongly colored. Intersegmental regions of venter more or less rufotestaceous. Tibial spurs testaceous. Tegulae brownish testaceous, base piceous. Wings fuliginous, about as dark as in *P. aethiops* (Cresson), nervures and stigma brownish fuscous, subcosta more nearly black.

Head as wide as long, cheeks but little more than half as wide as eyes. Lateral ocelli nearly twice their diameter from occipital margins and much farther from margin of eyes. Process of labrum a little broader than long, broadly rounded at apex, with close fine wrinkles on each side of basal half converging toward base. Antennae inserted at middle of face and reaching slightly beyond middle of mesoscutum, with first joint of flagellum as long as next two joints combined. Face below level of antennae evenly convex, with subantennal sutures much obscured by sculpture. Proboscis moderately long, galeae nearly as long as stipites. Facial foveae linear, diverging above from margin of eyes. Wings ample; pterostigma about three-fourths as wide as first submarginal cell; second submarginal cell receiving first recurrent nervure a short distance before middle, and the second close to apex. Process of front coxae a long slender spine densely clothed with long hair and almost reaching middle coxae. Pygidial plate longer than wide, with sides converging to rounded apex and disk of apical part convex. Head and thorax coarsely, more or less confluent punctured, punctures coarser on mesoscutum, and mostly less than a puncture width apart. Disk of pronotum very finely, shallowly, and densely punctured, with anterior margin of collar finely carinate on each side. Flanks of propodeum and metapleura finely and densely rugulose and dull. Basal groove of propodeum narrow, but widened in middle, and coarsely costate, and followed by equally narrow smooth space, generally enclosing a few punctures. Posterior face of propodeum densely punctured. Abdomen with strong close punctures, about the size of those on posterior face of propodeum and a puncture width or slightly more apart; basal declivity of tergite 1 more finely and more sparsely punctured, and punctured area on all segments reaching apical depression. Base of tergites 2 and 3 rather deeply but narrowly

impressed; apical depressions of tergites moderately wide, smooth, shining, those on tergites 2 and 3 involving about one-third of median length of segments. Pubescence sparse and whitish; mesonotum and metanotum and propodeum bare, under side of head and thorax with rather short, finely plumose hair, and face with thin, very short, subappressed hair. Collar of pronotum and margins of tubercles with moderately dense tomentum. Abdomen with whitish hair along each side except at base; apical fimbria dense and becoming fulvous at apex. Length, 7-7.5 mm.; anterior wing, 5.4-5.7 mm.

MALE: Black, face nearly all yellow below level of antennae; subantennal marks twice as long as wide and reaching level of antennal sockets; other marks terminating slightly below that level, with supraclypeal mark distinctly broader than high. Anterior margin of clypeus narrowly testaceous brown across middle and more broadly black on reflexed sides. Apex of femora, tibiae in large part, and tarsi yellow; front tibiae fuscous beneath, more broadly toward apex; middle tibiae dark except broadly yellow on basal half of outer side, then narrowly yellow to apex; hind tibiae with incomplete dark annulus extending from apex to middle on anterior side and much shorter on posterior side. Antennae blackish. Mandibles, tegulae, and wings like those in female.

Head broader than long, cheeks about two-thirds as wide as eyes. Inner orbits of eyes strongly divergent above. Posterior ocelli about their distance apart from occipital margin and considerably farther from nearest eye. Facial foveae close to margin of eyes, obscured by sculpture and about as long as space between posterior ocelli. Antennae inserted a little above middle of face, scapes not reaching anterior ocellus, flagellum thickly cylindrical, with joints mostly broader than long. Summit of clypeus transverse and almost straight between subantennal plates. Process of labrum quadrate, slightly broader than long. Front coxae armed with small conical process about one-third as long as trochanters. Head and thorax rugosely punctured, punctures coarse, slightly separated for most part on face, and smooth ridges between punctures on mesonotum much narrower than in female. Abdomen strongly and densely punctured, punctures similar to those on cheeks and smaller than those on thorax except pronotum; tergite 1 densely punctured except for smooth area in middle of basal declivity; tergites 5 and 6 more sparsely punctured than preceding segments. Apical depressions of tergites smooth and very narrow, those on tergites 2 and 3 involving not more than one-eighth of postgradular length of segments in median line. Tergites 2 to 5 deeply and narrowly impressed at base without change in sculp-

ture. Pubescence whitish, thin and short; hair of cheeks and face very short and appressed, although slightly longer around bases of antennae; and hair on under side of thorax moderately long and dense; other parts of thorax mostly bare except for thin plumose hair on lateral ridges of propodeum, and thin tomentum on collar of pronotum. Abdomen nearly bare, except for thin hair in basal impression of tergites 5 and 6, thin hair overlying apical depression of tergites 5 and 6, and dense hair across apex of tergite 7. Venter with appressed hair, longer and rather dense on sternites 4 and 5 and fringing the margin especially of sternite 5. Sternite 6 very broadly and shallowly emarginate. Subgenital plate gradually and slightly narrowed before the beveled head, which is a little longer than wide, ogivally rounded at apex and hairy beneath. Parameral lobes of genital armature straight on inner margin, semi-ovally widened on apical third, acute at apex and densely hairy beneath; sagittae depressed, as long as parameral lobes, and somewhat less than twice as wide. Length, about 7 mm.; anterior wing, 5-5.1 mm.

TYPE MATERIAL: Holotype, female, Southwestern Research Station, 5 miles west of Portal, Cochise County, Arizona, on *Aplopappus gracilis*, September 8, 1958 (Timberlake); allotype, same locality, August 25, 1966 (J. G. and B. L. Rozen). Paratypes: Cochise County, at type locality: one male, August 22, 1958 (D. D. Linsdale), one female, on *Verbesina encelioides*, August 31, 1958 (Timberlake); two females, on *Verbesina*, September 12, 1962 (J. G. Rozen); 20 females, five males, August 25, 1966 (J. G. and B. L. Rozen); two females, August 31, 1958, and two females, September 6 (P. D. Hurd, Jr.); one female, on *Heterotheca subaxillaris*, August 26, 1958 (E. G. Linsley). One female, Sunnyside, Huachuca Mountains, August 17, 1940 (E. C. Van Dyke); one male, 6 miles west of Montezuma, Huachuca Mountains, August 19, 1940 (J. J. DuBois). Santa Cruz County: One female, 9 miles east of Lochiel, on *Zexmenia podoccephala*, September 7, 1955 (Butler and Werner). Mexico: Chihuahua: One female, 22 miles south of Minaca, August 23, 1950 (Ray F. Smith). Sonora: One male, mountain pass, about 6000 feet, 6 miles east of Cananea, August 15, 1959 (W. L. Nutting and Werner).

The type is in collection of the University of California, Riverside, and the allotype is in the collection of the American Museum of Natural History. Paratypes are in the collections of the American Museum of Natural History, the University of California, Berkeley and Riverside, University of Arizona, Tucson, and the California Academy of Sciences, San Francisco.

The name *perarmatus* has reference to the long hairy spines of the front coxae of the female.

***Pseudopanurgus dicksoni*, new species**

This species is finely punctured like *P. pectiphilus* (Cockerell), but belongs in the typical subgenus. The female has a small shining boss behind the summit of each eye and the front coxae armed with a short hairy process. The male has the face below the level of the antennae, scape beneath, and apex of femora, the tibiae and tarsi clear yellow. It differs from the same sex of *pectiphilus* in the yellow markings and in having the mesonotum much more finely and densely punctured.

FEMALE: Black, with apical depressions of tergites brown. Basal third of front and middle tibiae white on outer side; tarsi brownish, tarsal claws ferruginous. Tibial spurs pale testaceous, and basal plate of hind tibiae ferruginous. Mandibles broadly ferruginous before fuscous tips. Tegulae amber color, base fuscous. Wings pale fuliginous (tinged with brown), nervures and stigma pale ferruginous, subcosta fuscous.

Head as broad as long, but not so wide as thorax; cheeks rounded, two-thirds as wide as eyes. Posterior ocelli their distance apart from occipital margin, and about one and one-half times that distance from nearest eye. Facial foveae broadened above, no longer than width of space between posterior ocelli and divergent as usual from margin of eyes. Antennae inserted just above middle of face, scapes just reaching level of anterior ocellus. Face below level of antennae gently convex, but sides of clypeus strongly inflexed. Process of labrum about one and one-half times broader than long and truncate at apex. Mandibles stout, tapering, subacute. Proboscis moderately short, galeae reaching halfway to base of stipites. Carinate margin of pronotal collar moderately developed and much concealed by tomentum. Process of front coxae tapering from broad base and about one-half as long as front trochanters. Marginal cell no broader than second submarginal cell, which is narrowed one-half to radius and receives first recurrent nervures about one-third of its length from base. Pygidial plate about as long as wide at base and narrowed to rounded apex. Head and thorax finely and for the most part densely punctured, with punctures of vertex and temples a little coarser and more separated. Distinct, small, rounded boss behind summit of each eye. Metapleura and flanks of propodeum minutely shagreened, impunctate and moderately shining. Posterior face of propodeum minutely and densely punctured, and base with smooth transverse area, widened in middle, in place of usual costate groove. Abdomen dullish, densely and very finely punctured, except at base of tergite 1; apical depressions of tergites moderately narrow, with excessively fine punctotessellate sculpture. Pubescence whitish, short and dense for this

group; hair of face moderately thin and antrorse, except that it radiates around antennal bases; hair of under side of head and thorax longer and erect; collar of pronotum, tubercles, and upper third of mesopleura with dense tomentum, gradually changing to erect plumose hair on remainder of mesepimera; mesonotum with dense, very short, erect hair not obscuring surface; metanotum and lateral ridges of propodeum with plumose hair. Abdomen with very fine appressed hair, more abundant on sides of tergites, and with longer plumose hair thinly covering apical depression of tergites; apical fimbria dense, plumose, becoming fulvous at apex. Length, 5–6.5 mm.; anterior wing, 4.4–4.6 mm.

MALE: Black, apical depression of tergites, especially third and fourth, reddish brown. Mandibles except red tip, labrum, face below level of antennae, scape of antennae broadly beneath, spot at apex of pedicel, tubercles, apical third to half of femora, all tibiae and tarsi clear yellow. First nine joints of flagellum broadly orange-yellow on outer side (clear yellow on basal joint) and otherwise fuscous or blackish together with two apical joints. Tegulae bright amber color, base yellow, extreme base fuscous. Wings like those in female.

Head nearly hemispherical, about as broad as long; cheeks slightly more than half as wide as eyes; inner orbits of eyes diverging above. Ocelli positioned about as in female. Facial foveae faint, close to margin of eyes, broadened above and about half as long as antennal scape. Face strongly convex from oral to occipital margin. Antennae inserted near middle of face but well above middle of eyes, reaching nearly to base of scutellum, middle joints of flagellum slightly longer than wide. Supraclypeal area measured to lower level of antennal sockets, nearly twice as long as wide; outer suture of subantennal plates obsolete; disk of clypeus about as high as wide. Labrum and mandibles about like those in female. Densely hairy conical process of front coxae about half as long as trochanters. Boss on each side of vertex distinct, but smaller than in female. Sculpture and pubescence in general much as in female, but face dull, with punctures much smaller. Posterior face of propodeum with rather dense white pubescence. Abdomen with abundance of short, fine, whitish pubescence, conspicuous only in certain aspects, and with longer hairs overlying depressions of apical segments. Hair of venter fine and appressed, with long hair fringing apical margin of sternites 4 and 5. Apical notch of sternite 6 broad and angular. Subgenital plate much longer than wide, moderately narrowed before oval apex, which is obliquely beveled and smooth above, and with short hair beneath. Parameral lobes of genital armature slightly incurved and subacute at apex, and with long dense hair beneath; sagittae considerably shorter

than parameral lobes and somewhat wider. Length, 4–6.5 mm.; anterior wing, 3.3–4.5 mm.

TYPE MATERIAL: Holotype, female, 3.1 miles south of Florence Junction, Pinal County, Arizona, on *Pectis papposa*, September 3, 1961 (Timberlake); allotype, Salome, Yuma County, on *Pectis*, September 11, 1957 (Timberlake). Paratypes: Arizona: Pinal County: Six females, taken with holotype (Timberlake); three females on *Pectis* and two females on *Argemone intermedia*, same place and day (P. D. Hurd, Jr.). Pima County: One female, 3 miles west of Marana, September 13, 1962 (J. C. Bequaert); one male, Tucson, August 14, 1951 (R. S. Beal). New Mexico: Hidalgo County: One female, 8 miles northwest of Lordsburg, on *Pectis papposa*, September 15, 1959 (R. C. Dickson); one female, 4.5 miles north of Rodeo, August 21, 1962 (Rozen, Statham, and Hessel); one male, 4.8 miles north of Rodeo, on *Crotalaria pumila*, September 4, 1961 (Timberlake); one female, six males, 13 miles north of Rodeo, on *Pectis*, August 18, 1964 (J. G. and B. L. Rozen); one female, 1 mile north of Rodeo, at burrow, August 22, 1964 (Rozen); six females, one male, 5 miles north of Rodeo, August 24 to 28, 1966 (Rozen). Mexico: Sonora: One male, Aduana, on *Milleria quinqueflora*, September 18, 1957 (Timberlake). Baja California: One female, nine males, San Pedro, October 7, 1941 (Ross and Bohart); one male, 20 miles north of Comondú, October 3, 1941 (Ross and Bohart); one female, Canipole, October 2, 1941 (Ross and Bohart).

The holotype and allotype are in collection of the University of California, Riverside. The paratypes are in the collections of the American Museum of Natural History, the California Academy of Sciences, San Francisco, the University of California, Berkeley and Riverside, the University of Arizona, Tucson, and of G. E. Bohart.

This species is named for Robert C. Dickson, who collected the first specimen examined by the author.

SUBGENUS *HETEROSARUS* ROBERTSON

This group is composed of small species, with a more or less fine sculpture, or minute puncturation, and is restricted to species having the scopal hair of the female thin, short, and non-plumose. It is the only group of *Pseudopanurgus* that is known to have representatives in South America. I have already reviewed the North American species (1964).

PTEROSARUS, NEW SUBGENUS

TYPE OF SUBGENUS: *Calliopsis rudbeckiae* Robertson.

This group contains the majority of North American species of *Pseudo-*

panurgus and all those having a plumose scopa in the female sex but lacking a process on the front coxae.

The sculpture varies but in no instance is it of the coarse type found in typical *Pseudopanurgus*, nor the excessively minute style seen in *Heterosarus*. Usually the head and thorax are more or less shining and finely punctured; the base of the propodeum often has fine short plicae, but not distinctly grooved and costate; the mesepimera are less abruptly inflexed than in typical *Pseudopanurgus*; the front coxae are unarmed, and the tibial scopa is usually more or less loose and composed of long, more or less strongly plumose hairs. Males resemble the females in sculpture and in most other respects, but are more slender and differ by development of the yellow face marks. Sternite 6 is deeply and narrowly emarginate. Sternite 7 has two rather large and winglike plates (these very small in typical *Pseudopanurgus*). The subgenital plate (sternite 8) is usually about twice as long as wide, ridged beneath, plane above, and with apex variously modified and hairy. The parameral lobes of the genital armature are more or less slender, abruptly bent downward at apex into a sharp point, and with a tuft of hair above at the bend; the sagittae are usually much less fused than in typical *Pseudopanurgus*, depressed, more or less expanded and much broader than the parameral lobes.

A few species, including *P. albitarsis* (Cresson) and *P. atricornis* (Cresson), are included provisionally in *Pterosarus*. They differ in having the parameral lobes tapering and simple and the sagittae greatly dilated. In other respects they agree closely with the characters of *Pterosarus*.

***Pseudopanurgus vicinus*, new species**

Pseudopanurgus vicinus agrees more closely with *P. diderupa* (Cockerell) and *P. solidaginis* (Robertson) than with any other species. All three species have the mesoscutum shining and strongly punctured and the tibial scopa rather short. The new species differs from *diderupa* in the much closer punctures of the mesoscutum and from *solidaginis* in having the punctures more uniformly spaced. It also differs from both in having the posterior face of the propodeum distinctly and closely punctured instead of being dull and rugulose. There is also some similarity in both sexes to *P. albitarsis* (Cresson), but *vicinus* differs in many ways.

FEMALE: Black, base of front and middle tibiae with a small yellow spot. Mandibles more or less red except at base and apex. Legs nearly black, tarsi brownish, tibial spurs testaceous. Antennae black, joints 5 to 10 of flagellum reddened beneath. Tegulae dark amber color, base fuscous. Wings dusky hyaline, stigma and nervures brownish fuscous, but nervures except subcosta becoming ferruginous toward base of wing.

Head moderately wider than long; cheeks rounded and about two-thirds as wide as eyes. Posterior ocelli slightly less than their distance apart from occipital margin and about one-fourth more than that distance from nearest eye. Facial foveae moderately widened above and about two-thirds as long as width of space between posterior ocelli. Antennae inserted at middle of face; antennal sockets barely closer to nearest eye than their distance apart; middle joints of flagellum about as long as thick. Face below antennae gently convex, except sides of clypeus and anterior corners of face strongly inflexed. Disk of clypeus much broader than high and reaching about halfway to level of antennae. Process of labrum with length and width at truncate apex about equal, but width at base distinctly greater. Mandibles stout, acute, and nearly reaching far margin of labrum. Proboscis short, galeae about half as long as stipites. Anterior rim of pronotal collar weakly carinate. Second submarginal cell short, but wider than the first, receiving first recurrent nervure about one-fourth of its length from base. Pygidial plate triangular, obtusely rounded at apex, disk flat and margins elevated. Head and thorax strongly and closely punctured. Punctures of frons small, dense, becoming slightly less dense on vertex or about one puncture width apart, and those on face below antennae distinctly more separated, and coarser on clypeus. Punctures of mesoscutum about equal to those of vertex and varying from one to three or four puncture widths apart; those of mesopleura closer. Metapleura minutely rugosopunctate. Propodeum finely and densely punctured on posterior face; basal groove very narrow, closely plicatulate, followed by moderately wide impunctate space. Abdomen shining, minutely punctured; punctures well separated on disk of tergite 1, about one to two puncture widths apart on disk of tergites 2 and 3, more separated on tergite 4, and distinctly coarser and well separated on tergite 5; basal declivity of tergite 1 impunctate. Apical depressions of tergites smooth and moderately wide, that of tergite 2 involving about one-third of disk in median line. Basal impression of tergite 2 shallow, finely and transversely lineolate and involving less than one-third of disk in median line; impression of tergite 3 narrow, weak and with no change in sculpture. Pubescence on face and mesonotum whitish, fine, short, and erect, that on under side of head, and on sides and under parts of thorax, longer and more plumose. Tubercles and collar of pronotum with dense white tomentum. Abdomen thinly hairy, with long hairs overlying apical depression of tergite 4; apical fimbria short and dense. Tibial scopa moderately long and finely plumose. Length, about 5 mm.; anterior wing, 3.9 mm.

MALE: Black, with mandibles except reddish tips, labrum, and most

of face below level of antennae pale yellow; in some cases and in allotype supraclypeal mark becoming equilaterally triangular, with the black covering the upper two-thirds of subantennal plates and descending in an angle to margin of clypeus. Antennae and tubercles dark, but flagellum in some (one out of four specimens) yellowish brown beneath. Legs dark, all knees, anterior side of front tibiae, and all basitarsi creamy white. Tegulae dark amber color, base fuscous. Wings dusky hyaline, nervures and stigma brownish fuscous.

Head distinctly broader than long; cheeks about two-thirds as wide as eyes. Posterior ocelli their distance apart from occipital margin and somewhat farther from nearest eye. Facial foveae small, slightly longer than diameter of ocelli. Antennae inserted near middle of face and reaching nearly to apex of scutellum; joints of flagellum mostly about one and one-half times longer than thick. Face below level of antennae gently convex, except sides of clypeus broadly and strongly inflexed. Process of labrum about like that in female. Sculpture similar to that of female, but posterior face of propodeum dull, with crowded punctures and smooth space behind basal groove nearly obliterated. Punctures of abdomen similar to those of frons but less dense. Basal impression of tergites 2 to 4 very broad and transversely lineolate and dull, that on tergite 3 as broad in median line as following part of segment. Sternite 6 with narrow, deep median emargination. Subgenital plate slightly more than twice as long as wide at apex, dually ridged beneath, obliquely and triangularly truncated at apex, with dense fringe of hair on lateral margins. Parameral lobes of genital armature dilated on basal half, the dilation ending in a sharp point; apex of lobes bent downward in a sharp spine, and with large tuft of hair at bend; sagittae depressed but not dilated, conjointly narrowed to subacute apex and much wider than parameral lobes. Length, about 4.75 mm.; anterior wing, 3.7 mm.

TYPE MATERIAL: Holotype, female, and allotype, Southwestern Research Station, 5 miles west of Portal, Cochise County, Arizona, September 2, 1962 (M. Statham). Paratypes: Arizona: Cochise County, type locality: Three females taken with the types (Statham); one female, September 3, 1962 (Statham and Rozen); one male, September 6, 1952 (P. D. Hurd, Jr.); two males, on *Aplopappus gracilis*, September 8, 1958 (Timberlake); and two males, August 25, 1966 (J. G. and B. L. Rozen).

The holotype and allotype are in the collection of the American Museum of Natural History. The paratypes are in the collections of the American Museum of Natural History and the University of California, Berkeley and Riverside.

***Pseudopanurgus occiduus*, new species**

Pseudopanurgus sp. A: ROZEN, 1966, p. 7.

Both sexes of *occiduus* are similar to those of *P. nebrascensis* (Crawford) but are distinguishable by the characters given in the key below.

FEMALE: Black, tubercles and small spot at base of front and middle tibiae yellow. Mandibles more or less rufous or rufotestaceous at middle, the pale color in some cases extending to base on inner margin. Legs dark, tarsi brownish, hind pair more ferruginous; tibial spurs testaceous. Pygidial plate black, more or less reddened at base. Antennae black, joints 4 to 10 of flagellum yellowish brown beneath. Tegulae dark amber color, narrowly infuscated at base. Wings dusky, nervures and stigma brown, subcosta more infuscated.

Head broader than long; cheeks about two-thirds as wide as eyes. Posterior ocelli about their distance apart from occipital margin and more distant from nearest eye by one-half. Facial foveae slender, moderately widened above and about as long as width of space between antennal sockets. Antennae inserted near middle of face, equidistantly from each other and margin of eyes. Face below antennae gently convex; disk of clypeus much broader than high, with inflexed sides very broad. Process of labrum slightly broader at base than long, with apical margin broad and slightly rounded. Mandibles tapering and nearly reaching far margin of labrum. Proboscis short, galeae about half as long as stipites. Anterior rim of collar moderately carinate, carina extending to tubercles, but at most only weakly developed on tubercles. Second submarginal cell receiving first recurrent nervure usually about one-fourth (or in some cases two-fifths) of its length from base. Sculpture of head and thorax fine and rather dense. Frons and vertex dull; punctures of frons fine and dense, those of vertex somewhat sparser and coarser. Face below level of antennae shining, with well-separated, strong punctures, mostly at least twice as large as those of frons. Punctures of mesoscutum slightly longer than those of frons, mostly about one to two puncture widths apart, but denser on anterior border; mesopleura dullish and punctured about the same as sides of vertex. Propodeum dull; basal groove finely plicatulate and triangularly widened at middle; posterior face and lateral ridges densely and finely punctured, leaving only a small impunctate space on each side behind basal groove. Abdomen minutely punctured; punctures on disk of tergite 1 sparse, leaving basal declivity and broad area across apex impunctate. Punctures on following segments much closer, becoming extremely minute, dense, and dulling the surface on basal impressions. Apical depression of tergites smooth and broad,

that on tergite 2 involving apical third of segment. Base of tergites 2 to 4 weakly impressed. Pubescence whitish, short, erect, and abundant on mesonotum, sparser on face, and longer and more plumose on under parts. Collar of pronotum and tubercles with dense white tomentum. Abdomen thinly hairy, but with long hairs overlying apical depressions, especially on tergite 4; apical fimbria dense, tinged with fulvous. Tibial scopa white, moderately long, dense and plumose. Length, about 6–6.5 mm.; anterior wing, 4.3–4.5 mm.

MALE: Black, mandibles except red tips, labrum, face below level of antennae, scape of antennae broadly beneath, and tubercles yellow. Apex of femora, tibiae, and tarsi pale yellow; front tibiae with large fuscous blotch beneath, and middle and hind tibiae with broad but interrupted fuscous or brownish fuscous annulus, the yellow on outer margin reaching from base to apex; apical joint of tarsi ferruginous. Tegulae pale amber color. Wings uniformly pale fuliginous, nervures and stigma brown.

Head broader than long; inner orbits of eyes moderately divergent above; cheeks about one-half as wide as eyes. Posterior ocelli their distance apart from occipital margin and slightly more distant from nearest eye. Facial foveae small, about as long as width of antennal scape. Antennae inserted at middle of face and reaching base of scutellum; flagellum cylindrical, with middle joints somewhat longer than thick. Outer suture of subantennal plates obsolete. Mandibles, proboscis, collar of pronotum, and venation about as in female. Process of labrum distinctly broader than long and truncate at apex. Sculpture in general similar to that of female, but distinctly coarser. Punctures on each side of vertex rather coarse and one puncture width apart, and those on face below antennae about the same size but shallow and well separated. Punctures of mesoscutum fine, mostly about one puncture width apart, but finer and denser on anterior middle. Posterior face of propodeum dull, finely rugosopunctate. Disk of tergite 1 with closely punctured area, and elevated part of following tergites more densely punctured. Apical depressions of tergites moderately wide, that on tergite 2 covering less than apical fourth of disk. Basal impression of tergites broad, dull, transversely lineolate-granular, that on tergite 2 covering more than one-third of disk in median line. Pubescence much like that in female; hair of mesoscutum short, brownish, rather dense, but not concealing surface. Hair of abdomen thin, with long hairs overlying apical depression, that of venter abundant and fringing apical margin of sternite 4; sternite 5 with group of hairs on each side, directed inward toward middle of apical margin. Apical border of sternite 6 testaceous, with narrow, deep median notch.

Subgenital plate about twice longer than wide, with strong median ridge beneath, the broad truncate apex distinctly recurved and fringed with short dense hair. Parameral lobes of genital armature rather thick toward base and tapering toward apex, with usual abrupt bend and sharp point well developed; tuft of hair at bend long and spreading; sagittae depressed, much broader than parameral lobes, rods discrete in apical third but curving together at tip to form rounded apex; lateral margins of sagittae fringed as usual with short hair. Length, about 5–5.5 mm.; anterior wing, 3.7–3.9 mm.

TYPE MATERIAL: Holotype, female, and allotype, Prescott, Yavapai County, Arizona, on *Aplopappus gracilis*, September 1, 1930 (Timberlake). Paratypes: Arizona: Yavapai County: Three females, two males taken with the types, and one male on *Lotus*, type locality, August 31 (Timberlake). Coconino County: One female, 3 miles west of Hyde Park, on *Aplopappus gracilis*, September 21, 1964 (Timberlake); one male, Oak Creek Canyon, 6000 feet, August (F. E. Snow). Santa Cruz County: One female, Bog Springs, Madera Canyon, Santa Rita Mountains, on *Helianthus*, September 6, 1961 (Noller, Bequaert, Wargo, and Beard). Cochise County: Two females, 7 miles west of Onion Saddle, Chiricahua Mountains, on *Aplopappus gracilis*, September 10, 1954 (Timberlake); Southwestern Research Station, 5 miles west of Portal: One male, August 25, 1953 (M. Cazier); one male, September 6, 1959 (D. D. Linsdale); one female, two males, on *Heterotheca subaxillaris*, August 21, 1962 (J. G. Rozen); one male, August 26 (M. Statham); two females, August 28 (Rozen, Statham, and Hessel); five females, on *Heterotheca*, September 12 (Rozen); one female, on *Heterotheca*, September 13 (Rozen); five females, one male, on *Aplopappus*, September 13 (Rozen); two females, on *Aplopappus*, September 14 (Rozen); and six females, on *Heterotheca*, September 17, 1962 (Rozen); and one male, on *Verbesina encelioides*, June 20, 1966 (J. G. and B. L. Rozen).

The holotype and allotype are in the collection of the University of California, Riverside. The paratypes are in the collections of the American Museum of Natural History, the University of California, Berkeley and Riverside, the University of Kansas, Lawrence, and the University of Arizona, Tucson.

***Pseudopanurgus stathamae*, new species**

This remains an inadequately known species, as I have been privileged to examine only one female. In this sex it seems to be more similar to *P. boylei* (Cockerell) and *P. atricornis* (Cresson) than to any other species, but it differs from both in having the tubercles yellow and the disk of

tergites 1 to 4 minutely and densely punctured, as well as being much smaller.

FEMALE: Black, tubercles and small spot at base of front and middle tibiae pale yellow. Mandibles reddened at middle. Pygidial plate dark ferruginous. Antennae black, joints 3 to 10 of flagellum ferruginous beneath. Tibial spurs testaceous. Tegulae pale amber color, extreme base fuscous. Wings strongly dusky, nervures and stigma brownish fuscous, subcosta more blackish.

Head broader than long; inner orbits nearly parallel; cheeks rounded, about two-thirds as wide as eyes. Posterior ocelli their own distance apart from occipital margin and about one and one-half times that distance from nearest eye. Facial foveae slightly widened above and about as long as width of space between posterior ocelli. Antennae inserted just above middle of face; antennal sockets equidistant from each other and nearest eye. Process of labrum slightly broader than long, moderately narrowed to slightly rounded apex. Collar of pronotum very narrow, with anterior rim not carinate. Pygidial plate longer than wide, triangular, with apex slightly obtuse, disk almost plane and margins moderately elevated. Second submarginal cell narrowed about one-half above, and receiving first recurrent nervure a little less than one-fourth its length from base. Head and thorax shining, finely punctured. Punctures of frons very small, dense in middle, more separated toward each side, those on vertex slightly larger and closer, and those on face below antennae distinctly larger and well separated although uniformly spaced. Punctures of thorax minute, distinctly finer than those of vertex, dense across anterior border of mesoscutum but remotely scattered on most of disk, those of mesopleura stronger anteriorly and toward sternum. Disk of pronotum dullish from dense and extremely minute and shallow punctures, flanks more shining. Base of propodeum with shallow dullish area much broadened in middle, with faint costulae, followed on each side by a broad smooth space, with a few scattered minute punctures; posterior face of propodeum minutely and very densely punctured. Abdomen minutely and densely punctured; punctured area of tergite 1 almost reaching apical depression but leaving basal declivity impunctate; on tergite 5 punctures becoming considerably coarser and well separated. Apical depression of tergites broad and weakly tessellate, that on tergite 2 involving almost one-third of disk in median line. Basal impressions of tergites rather weak and moderately wide, those on tergites 2 and 3 with a minute lineolate sculpture. Pubescence whitish, moderately long and dense on under side of head and thorax, rather short and thin on face and very short and fine on mesonotum. Hair of abdomen thin,

short, but with long hairs overlying apical depressions of tergites 2 to 4; apical fimbria moderately dense and tinged with fulvous. Scopa of hind legs rather short and thin, the hairs weakly plumose. Length, 5.5 mm.; anterior wing, 3.7 mm.

TYPE MATERIAL: Holotype, female, Southwestern Research Station, 5 miles west of Portal, Cochise County, Arizona, September 2, 1962 (M. Statham).

The type is in the collection of the American Museum of Natural History.

The species is named for Marjorie Statham Favreau, the collector of the type.

***Pseudopanurgus illustris*, new species**

This species is closely similar to *P. perlaevis* (Cockerell), but it is more polished, more nearly impunctate, and has darker wings and darker nervures and stigma.

FEMALE: Shining black, a small yellow spot at base of front tibiae. Middle joints of flagellum moderately reddened beneath. Mandibles strongly reddened at apex nearly to middle. Tegulae fuscous, but reddish brown at apex. Wings strongly dusky (grayish), nervures and stigma fuscous.

Head about as wide as long; cheeks evenly rounded, about three-fourths as wide as eyes. Posterior ocelli their distance apart from occipital margin, and somewhat more distant from nearest eye. Antennae inserted near middle of face, scapes reaching posterior ocelli, and middle joints of flagellum as long as thick. Antennal sockets slightly closer together than distance to nearest eye. Face below level of antennae gently convex; disk of clypeus large, reaching more than halfway to level of antennae, and strongly and broadly inflexed at sides. Process of labrum narrowed a little less than one-half to slightly rounded apex, and with several oblique rugae on each side of base. Mandibles robust, tapering but rather blunt at apex. Proboscis moderately long, galeae nearly reaching base of stipites, maxillary palpi almost as long as galeae. Anterior rim of pronotal collar distinctly ridged and extending onto tubercles, but not sharply carinate. Second submarginal cell receiving first recurrent nervures about one-fourth of its length from base. Spur of middle tibiae with two distinct acute teeth close to apex, and very minute teeth toward base. Pygidial plate about as long as wide at base, sides converging to subacute apex, disk finely transversely striate. Head finely and densely punctured on frons, but punctures sparser on vertex

and much coarser and well separated on face below level of antennae. Mesonotum polished, scutum appearing almost impunctate on superficial examination, but with minute remote punctures, which become moderately close on posterior border of scutum and on scutellum. Mesepimera weakly and very sparsely punctured on upper part, but punctures becoming coarse and closer below and crowded on pectus. Posterior face of propodeum smooth and impunctate, with a deep, longitudinal, semi-oval impression on posterior half; lateral ridges minutely and closely punctured; base of propodeum with short and more or less strong plicae but not much impressed; flanks of propodeum shining and minutely, obscurely punctured. Abdomen shining, minutely punctured, punctures distinct and close on each side of tergites 2 and 3, and much weaker toward middle of segments; tergite 1 virtually impunctate, tergite 4 rather closely and obscurely punctured. Apical depression of tergites very broad and smooth, that on tergite 2 nearly covering apical half of segment in median line. Basal impressions of tergites weak, most distinct on tergite 2 but with little change in sculpture. Pubescence white, mostly short and erect; thin and subappressed on face, and comparatively dense on under side of head and thorax; mesonotum virtually bare, but four long bristles present on scutellum. Abdomen with thin white hair on lateral margins; apical fimbria dense and tinged with pale brown. Tibial scopa long, white, and distinctly plumose. Length, about 7 mm.; anterior wing, 5.7 mm.

TYPE MATERIAL: Holotype, female, Southwestern Research Station, 5 miles west of Portal, Arizona, Chiricahua Mountains, 5400 feet, at flowers of *Viguiera*, September 12, 1962 (J. G. Rozen, Jr.). Paratypes: Arizona: Cochise County: Three females from type locality, one, September 10, 1962 (Rozen), one on *Verbesina encelioides*, September 12, 1962 (Rozen), and one on *Verbesina*, September 9, 1958 (Timberlake); one female, Texas Canyon, October 8, 1927 (J. A. Kusche).

The holotype is in the collection of the American Museum of Natural History. Two paratypes are in the collection of the American Museum of Natural History, and two others are in the collections of the California Academy of Sciences, San Francisco, and the University of California, Riverside.

The name *illustris* signifies that this species is more shining than others.

The following key separates the new species of the subgenus *Pterosarus* and compares them with similar species.

- | | |
|------------------|----|
| 1. Females | 2 |
| Males | 12 |

2. Mesoscutum with comparatively strong punctures 3
- Mesoscutum with weak or minute punctures 4
3. Comparatively large; base of propodeum with rather broad and strongly plicatulate area; disk of tergite 1 minutely and very sparsely punctured; apical depressions of tergites broad, smooth, and shining; tibial scopa long and strongly plumose *albitarsis* (Cresson)
- About 5 mm. in length; basal impression of propodeum narrow and more weakly plicatulate; disk of tergite 1 with close, fine punctures; apical depressions of tergites moderately wide, tessellate, and less shining than preceding elevated part of disk; tibial scopa moderately long; nervures and stigma much darker than in western forms of *albitarsis* *vicinus*, new species
4. Mesoscutum more or less closely or densely punctured, at least on the anterior border 5
- Punctures of mesoscutum weaker and sparser, or, if more or less close on anterior border, they are very minute 6
5. Punctures of mesoscutum fine and mostly well separated on disk, but dense on anterior border; hair of mesonotum short, fine, and appressed; disk of tergite 1 with minute, very sparse punctures (almost impunctate); apical depression of tergites broad, that on tergite 2 covering a little more than one-third of segment in median line; anterior rim of pronotal collar strongly carinate, carina extending to outer margin of tubercles, which are dark *nebrascensis* (Crawford)
- Punctures of mesoscutum more uniformly spaced, dense on anterior border but those on middle of disk not more than two or three puncture widths apart; disk of tergite 1 with moderately close minute punctures; pubescence of mesoscutum similar but denser; anterior rim of collar much less strongly carinate; tubercles yellow, somewhat ridged but not carinate *occiduus*, new species
6. Posterior face of propodeum smooth and impunctate 7
- Posterior face of propodeum punctured 8
7. Punctures of mesoscutum minute and very sparse, short erect hair correspondingly thin; upper part of mesopleura sparsely and finely punctured, punctures becoming coarse below and crowded on mesopectus; tergite 1 impunctate; wings dusky, nervures and stigma dark . . . *illustris*, new species
- Mesoscutum with comparatively close punctures and thin erect plumose hair; punctures of mesopleura small and moderately close above and becoming closer and coarser toward mesopectus; wings slightly tinged with fulvous, nervures and stigma ferruginous . . . *perlaevis* (Cockerell)
8. Posterior corners of prosternum produced into more or less distinct conical process 9
- Posterior corners of prosternum normal 10
9. Process of posterior corners of prosternum slender, much longer than thick and directed downward; base of propodeum with narrow plicatulate impression, a little widened at middle and followed by broad, smooth, impunctate space, occupying nearly upper half of posterior face; nervures and stigma ferruginous *piercei* (Crawford)
- Process of prosternal corners smaller, less conical, hardly longer than wide at base; smooth impunctate space behind base of propodeum compara-

- tively narrow, punctured part of posterior face large with median impression small; wings more dusky, with stigma brownish fuscous
 *rudbeckiae* (Robertson)
10. Basal plicatulate area of propodeum narrow, only slightly widened at middle; front and middle tibiae with small yellow spot at base 11
 Basal plicatulate area of propodeum triangularly widened in middle and finely rugose; front and middle tibiae entirely dark; mesoscutum very finely and sparsely punctured and with long, erect, plumose white hair; disk of tergite 1 almost impunctate *atricornis* (Cresson)
11. Larger, about 7 mm. in length; mesoscutum polished, with sparse punctures becoming widely separated on posterior middle of disk; tergite 1 with rather sparse minute punctures, which leave a broad, almost impunctate space before apical depression; tubercles dark
 *boylei* (Cockerell)
- Length, about 5.5 mm.; punctures of mesoscutum sparser and weaker; basal impressions of propodeum weakly plicatulate in middle; tergite 1 minutely and closely punctured, punctured area nearly reaching apical depression; tibial scopa short, weakly plumose; tubercles yellow
 *stathamae*, new species
12. Face yellow below level of antennae 13
 Yellow supraclypeal mark small or absent, the black reaching clypeus on each side, or, if the yellow covers face below antennae, clypeus with a median impressed line 18
13. Punctures of mesoscutum almost uniformly close 14
 Punctures of mesoscutum more separated 16
14. Scape of antennae broadly beneath, tubercles and all tibiae in large part yellow 15
 Scape of antennae narrowly yellow beneath or entirely dark; hind tibiae with incomplete dark annulus; punctures of mesoscutum hardly more than one puncture width apart, but not crowded enough on anterior middle to dull surface; punctures of temples slightly coarser than those of mesoscutum and more separated *renimaculatus* (Cockerell)
15. Punctures on anterior middle of mesoscutum dense enough to dull surface; punctures of temples much coarser than those of mesoscutum and somewhat separated; lineolate basal impression of tergite 2 distinctly narrower in median line than punctured elevated part *nebrascensis* (Crawford)
- Punctures on anterior middle of mesoscutum less crowded; punctures of temples moderately coarse and close; lineolate basal impression of tergite 2 broader in median line than punctured elevated part
 *occiduus*, new species
16. Scape of antennae entirely black 17
 Scape of antennae yellow beneath; punctures of mesoscutum moderately fine and well separated on middle of disk; apical depression and basal impression of tergite 2 both broader in median line than punctured elevated part; front tarsi somewhat dilated, with thin plumose fringe behind; flagellum broadly ferruginous beneath except at apex
 *irregularis* (Cockerell)
17. Tubercles yellow; face yellow below level of antennae; punctures of mesoscutum moderately large and close, with some interspaces as broad as

- several puncture widths; punctures of abdomen fine and dense, with dull impressed part of tergite 2 broader in median line than punctured elevated part; tibiae entirely dark *boylei* (Cockerell)
- Tubercles dark; similar to *irregularis*, but smaller; face not completely yellow below level of antennae, supraclypeal mark in some triangular, and black in some extending narrowly to clypeus; punctures of mesoscutum comparatively coarse and sparse; punctures of abdomen also coarse; hind tibiae nearly all black; flagellum only slightly reddened beneath *vicinus*, new species
18. Posterior face of propodeum finely and densely rugose, or rugosopunctate 19
- Posterior face of propodeum smooth but not polished; mesoscutum with close strong punctures, a little more separated posteriorly; tubercles, clypeus, and large mark on sides of face yellow, and often a small yellow spot on supraclypeal area; flagellum bright ferruginous on joints 3 to 8; wings yellowish subhyaline, nervures ferruginous, stigma and subcosta brown *perlaevis* (Cockerell)
19. Spot on mandibles, labrum, and tubercles yellow; posterior corners of prosternum more acute than usual; clypeus smooth in middle, with a fine impressed line 20
- Mandibles and tubercles dark; posterior corners of prosternum blunt; clypeus without an impressed line; yellow of face entirely or mainly restricted to clypeus and lateral marks 21
20. Longer, about 7-8 mm. in length; face more nearly yellow to level of antennae, with black often extending triangularly toward clypeus; tibiae with considerable yellow, hind pair broadly yellow at base and narrowly yellow at apex; wings pale fuliginous, nervures ferruginous *piercei* (Crawford)
- Length, about 6 mm.; black of face extending more strongly to clypeus, supraclypeal mark in some cases small; middle and hind tibiae mainly dark, front tibiae yellow on anterior side; wings more fuliginous, nervures and almost dense *rudbeckiae* (Robertson)
21. Labrum and supraclypeal area entirely dark; lateral marks somewhat higher than wide, with the black extending slightly between them and clypeus; legs dark, but tarsi more or less ferruginous or pale yellow or whitish; wings comparatively clear *albitarsis* (Cresson)
- Process of labrum and small supraclypeal mark yellow; lateral marks triangular, covering area between clypeus and eyes; legs black, with small joints of tarsi more or less ferruginous; wings subfuliginous, nervures and stigma brown or fuscous *atricornis* (Cresson)

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