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CONTRIBUTIONS TOWARD A KNOWLEDGE OF THE
INSECT FAUNA OF LOWER CALIFORNIA

No. 9

HYMENOPTERA: EUMENINAE

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HENRI DE SAUSSURE (1875) described the first solitary Vespidae from Lower California. He recorded 4 species, all new, sent to him by John Xantus, who collected in the Cape Region from 1859 to 1861. A somewhat more extensive collection was made by Gustav Eisen in several expeditions from 1888 to 1894. Eisen's material was examined by W. J. Fox (1893, 1894) who described 3 new species from it, and recorded 11 species in all, 2 of which had previously been recorded by Saussure. A single species was collected by J. R. Slevin in 1919. In 1921 E. P. Van Duzee collected 9 species, including at least 4 not previously recorded. T. Craig added another species in 1928. A. E. Michelbacher and E. S. Ross collected 13 species in 1938, adding at least 8 to the list.

The present paper is based primarily on the fine collection made by G. E. Bohart and E. S. Ross in 1941, consisting of 27 species, 11 of which represented additions to the faunal list.

It is apparent that the Eumeninae of Lower California are as yet imperfectly known. A total of only 36 species and subspecies has been authoritatively recorded, a far smaller number than is known to occur in adjacent areas of similar size. Further collecting, particularly in the northern half of the peninsula, should augment the list considerably. Although most of the com-

moner North American genera are included, *Ancistrocerus* and *Symmorphus* are conspicuous by their absence. Minor genera not represented are *Dolichodynerus*, *Montezumia*, *Pseudodynerus*, and *Leptochiloides*, and these very likely will be found eventually.

Of the 36 species and subspecies, 9 are known only from Lower California; 18 are known to occur also in the area comprising roughly southern California, Arizona, New Mexico, western Texas, and northern Mexico; 7 occur over much of the western United States, and 2 are found over most of the United States and Mexico.

The prevailing fineness of puncturation is a remarkable structural peculiarity which distinguishes most Lower Californian Eumeninae. This circumstance is emphasized by the 11 species which are apparently endemic. These 11 species are distributed over 10 genera, yet 10 of the 11 have much finer puncturation than their close relatives in other parts of North America. Because of the divergent ancestry involved, this phenomenon must be laid to environmental conditions. A slight tendency in the same direction has been noted in species from Mexico proper and from Central America, particularly in the genus *Eumenes*. However, many species from these regions are more coarsely punctured than their more northerly relatives.

Records of Xantus and Eisen have been taken from the literature, those of Slevin, Van Duzee, Craig, Michelbacher-Ross, and Ross-G. Bohart are new. Holotypes and allotypes of the new species have been deposited in the California Academy of Sciences. Paratypes have been distributed as indicated under each species.

(1) *Eumenes iturbide pedalis* Fox

Eumenes pedalis Fox, 1894, Proc. Calif. Acad. Sci. (2), 4:109.

Eumenes crassicornis ISELY, 1917. Ann. Ent. Soc. Amer. 10:362.

Eumenes pachygaster ISELY, 1917. Ann. Ent. Soc. Amer. 10:362.

Eumenes crassicornis of BEQUAERT, 1944. Nat. Canad. 71:89.

The type series described by Fox contained 2 species, the other being *E. verticalis tricinatus* Isely. However, the original description clearly indicated an *iturbide*-like form. Specimens of both sexes in the Academy of Natural Sciences at Philadelphia are apparently the true types although they are labeled El Astarte instead of El Taste as originally given. The humped second tergite and all dark antennae characterize the species. This subspecies has the second tergite yellow-spotted.

Lectotype (by present designation), male, El Astarte (=El Taste), Lower California, 4200 ft. (G. Eisen), A.N.S.P.

Distribution: British Columbia, Montana, Wyoming, Idaho, Washington, Oregon, Utah, California and Lower California. The typical subspecies occurs in Colorado, New Mexico, Arizona, and Mexico.

(2) **Eumenes verticalis tricinctus** Isely

Eumenes tricinctus ISELY, 1917. Ann. Ent. Soc. Amer. 10:361.

This species has the male antennal hook thin and with fine hair beneath. The fine puncturation and extensive yellow markings define the race *tricinctus*.

Type locality: "Oregon."

Distribution: Alberta, Idaho, Oregon, Utah, Arizona and Lower California (El Taste, collected by G. Eisen).

(3) **Eumenes bollii** Cresson

Eumenes bollii CRESSON, 1872, Tr. Am. Ent. Soc., 4:232 (type, A.N.S.P.).

This species is distinguished by the fine puncturation of the first tergite, the red and yellow coloration, and the abundant abdominal pubescence.

Type locality: Texas.

Distribution: United States (common and widespread). Lower California: 10 mi. S. Cataviña (Michelbacher and Ross), Coyote Cove (Michelbacher and Ross) (Ross and G. Bohart), 10 mi. E. San Ignacio (Ross and G. Bohart).

(4) **Eumenes aureus** Isely

Eumenes belfragei aureus ISELY, 1917. Ann. Ent. Soc. Amer. 10:352 (type, U.S.N.M.).

This species is characterized by the coarse, even punctuation, the rather slender second abdominal segment, the short antennal hook in the male, and the extensive red and yellow markings. It has been confused with the somewhat darker *E. smithii belfragei* Cresson, but the latter has a hook-like projection beneath the tip of the aedeagus. The only Lower Californian specimen I have seen is almost entirely red and yellow with the scutum entirely red.

Type locality: Brewster Co., Texas.

Distribution: One male, Mexicali, Lower California, June 20, 1938 (E. S. Ross); Arizona, New Mexico, Mexico (Sonora), and western Texas.

(5) **Eumenes coyotae** R. Bohart, new species

Plate 12, figs. 1-3.

Male: Ferruginous, marked with yellow as follows: lower part of face including orbits and clypeus (reddish in some paratypes), scape in front, postocular line, front margin of prothorax, mesopleural spot, front margin of scutellum, postscutellum, legs partly, subapical bands on abdominal segments, that on second tergite $\frac{1}{4}$ as long as tergite at middle. Wings reddish stained. Antenna subapically, upper part of face and vertex, margins of mesonotum, spot beneath tegula, small basal marks on first two abdominal segments, line down center of first tergite, blackish. Puncturation of head and thorax moderate; clypeus and abdomen practically impunctured, except for posterior half of second tergite which is moderately coarse. Pubescence short, pale, and

appressed; that of abdomen minute and imparting a "dusty" appearance. Clypeus half again as long as broad, angularly incised at apex. Last antennal segment flattened, sharply pointed, reaching to base of eleventh segment. Second abdominal segment about as broad as high, second tergite evenly convex in lateral view. Length to apex of second tergite 12 mm.

Holotype, male (C.A.S. No. 5378), and 5 male *paratypes*, **Coyote Cove, Concepcion Bay, Lower California**, Oct. 1, 1941 (Ross and G. Bohart); 4 male *paratypes*, same locality as holotype, June 29, 1938 (Michelbacher and Ross); 1 male *paratype*, Espíritu Santo Island, Lower California, June 9, 1921 (E. P. Van Duzee). *Paratypes* in the collections of U. S. National Museum, J. Bequaert, and the writer.

This species is very similar to *E. aureus* Isely from which *coyotae* appears to differ only by its much finer clypeal and abdominal puncturation, and by its sparser, finer, and more appressed pubescence. The only other North American species which has the first tergite almost smooth is *bollii* Cresson. However, the latter has a more convex second tergite and abundant erect hair on the abdomen.

Genus **Pachymenes** Saussure

Only one species, *P. symmorphus*, and its subspecies have previously been known from North America. Specimens from La Paz, Lower California, appear to be a new species, described below. Both species have 6 segmented maxillary palpi and 4 segmented labial palpi. The first abdominal segment is hardly half as broad as the second, a characteristic of the subgenus *Paranortonia* Bertoni. For a discussion of the genus see Bequaert (1940).

(6) **Pachymenes impunctatus** R. Bohart, new species

Male: Largely reddish, mottled with black. Clypeus, base of antenna and flagellum beneath, interantennal spot, ocular margins, ocellar spots, post-ocular spots, pronotum and most of rest of thorax except mesonotum, legs, abdomen except at bases of first two segments, reddish. Wings stained with reddish. Puncturation very sparse and fine over entire body, which is practically impunctate. Pubescence abundant, erect, and particularly thick on sides of thorax and abdomen; length of that on first tergite about 2 ocellus diameters. Clypeus roughly hexagonal, apex nearly straight except for minute lateral teeth, apex slightly wider than length of fourth antennal segment. Mandible stout. Head somewhat swollen behind ocelli. Antennal hook large, reaching beyond base of eleventh segment, last segment nearly cylindrical and rounded apically. Humeral and propodeal angles broadly rounded. Second and third tergites with slightly reflexed apical translucent lamellae. Length to apex of second tergite 11.5 mm.

Holotype, male (C.A.S. No. 5379), and 1 male *paratype*, **10 mi. N. W. La Paz, Lower California**, Oct. 6, 1941 (Ross and G. Bohart). *Paratype* in the writer's collection.

In coloration and general structure this species resembles *P. symmorphus*

toltecus Saussure, which has, however, yellow face markings in the male, and a distinctly punctured head and thorax.

(7) **Monobia californica** Saussure

Monobia californica SAUSSURE, 1875, Smithsonian Misc. coll., 254:129.

This species is unknown to me, but according to the detailed original description of both sexes, it resembles *M. texana* (Cresson) except that the body is "smooth, satin-like, with glaucous reflections." It is known only from the type locality.

Type locality: Cape San Lucas, Lower California (J. Xantus).

(8) **Pterocheilus (Onchopterocheilus) pimorum** (Viereck)

Odynerus pimorum VIERECK, 1908, Tr. Am. Ent. Soc., 33:405 (type, U. K.).

Pterocheilus pimorum of R. BOHART, 1940, Ann. Ent. Soc. Amer., 33:197.

The extensive yellow markings, reduced puncturation, large shining yellow clypeus, five-toothed mandibles in the female, and antennal hook in the male make this an easily recognized species. The pendulous labial palpi of the female are a clear bright yellow.

Type locality: Bill Williams Fork, Arizona.

Distribution: one female, San Felipe, Lower California, June 8, 1938 (E. S. Ross); Arizona; southern California.

(9) **Pterocheilus (Onchopterocheilus) laticeps** Cresson

Pterochilus laticeps CRESSON, 1872, Tr. Am. Ent. Soc., 4:244 (type, A.N.S.P.).

Pterocheilus laticeps of R. BOHART, 1940, Am. Ent. Soc. Amer., 33:191.

Type locality: Texas.

Distribution: Texas; Arizona; Owens Valley and Coachella Valley, California; Pescadero, Lower California (Ross and G. Bohart).

(10) **Pterocheilus (Megapterocheilus) peninsularis** R. Bohart, new species

Male: Mostly reddish; clypeus, interantennal spot, inferior orbits, postocular line, postscutellum partly, apical margins of first six abdominal segments, yellowish; most of face and vertex, antenna toward apex, thorax sparingly, first four tergites and first two sternites at base, black. Puncturation moderate on head; punctures of clypeus and thorax distinct but well spaced, first two tergites punctured at apex only, first sparingly, second densely; tergites 3 and 4 coarsely punctured, remaining tergites and venter sparsely punctured. Pubescence golden, thick, short, erect, less than an ocellus length except on front; clypeus longer than broad, apex narrowly but not deeply incised; antenna 13-segmented, last segment flattened, curved, and longer than twelfth segment; middle femur flattened basally but not channeled or angled; lateral angle of propodeum rounded; second tergite as viewed from above about half again as broad as long. Length to apex of second tergite 13 mm.

Holotype, male (C.A.S. No. 5380), **Pescadero, Lower California**, Oct. 8, 1941 (Ross and G. Bohart).

This species runs between *arizonicus* Bohart and *linsleyi* Bohart in my key (Bohart, 1940a). It differs from the former in having the second tergite densely punctured apically. In most respects it is very close to *linsleyi*. The more restricted punctured zone of the second tergite, the narrower clypeus, and particularly the weak and narrow apical incision of the clypeus of *peninsularis* are sufficient for separation. Also, *peninsularis* has the middle femur flattened toward the base instead of shallowly excavated as in *linsleyi*.

(11) **Rygchium dorsale** (Fabricius)

Vespa dorsalis FABRICIUS, 1775, Syst. Entom., p. 367.

Rhygchium balteatum SAY, 1837, Bost. Jour. Nat. Hist., 1:384.

Rhygchium louisianum SAUSSURE, 1853, Et. Fam. Vespidae, 1:106.

Monobia sylvatica SAUSSURE, 1855, Et. Fam. Vespidae, 3:171.

Odynerus iturbide SAUSSURE, 1857, Rev. and Mag. Zool., 9:276.

Rhynchium dorsale of CRESSON, 1872, Tr. Amer. Ent. Soc. 4:233.

Odynerus designatus CRESSON, 1872, Tr. Am. Ent. Soc., 4:235.

Odynerus dorsalis of BEQUAERT, 1940, Canad. Ent., 62:52.

This is the largest eumenine wasp known from Lower California. The specimens I have seen have had the second tergite subreflexed and would fall under the name *iturbide* if that should be resurrected as a subspecies.

Type locality: America.

Distribution: Lower California: El Taste, September (G. Eisen); Big Canyon, Sierra Laguna, Oct. 13, 1941 (Ross and G. Bohart). I have seen specimens also from various parts of Canada, United States, and Mexico including Oaxaca, Cuernavaca, and Guadalajara.

(12) **Rygchium guerrero** (Saussure)

Odynerus guerrero SAUSSURE, 1857, Rev. and Mag. Zool., (2)9:227.

Odynerus guerreri SAUSSURE, 1875, Smithsonian Misc. Coll., 254:294.

This species resembles *annulatum* but *guerrero* is covered with a thick pile and has distinct interocellar tubercles.

Type locality: Temperate Mexico.

Distribution: Lower California: 10 mi. E. San Ignacio, Sept. 30, 1941 (Ross and G. Bohart). Other localities: Mex Titlan, Mechoacan, Cuautta, Mexico; Arizona; New Mexico; Texas (western).

(13) **Rygchium digiticornis** R. Bohart

Odynerus canaliculatus VIERECK, 1908, Tr. Am. Ent. Soc., 33:392 (nec. *O. canaliculatus* Saussure, 1855) (type, U.K.).

Rygchium digiticornis R. BOHART, 1945 (new name), Proc. Ent. Soc. Wash., 47:49.

R. digiticornis has many of the characters of *R. dorsale* (Fabr.) and *R. fusum* (Cr.). The terminal antennal segment in the male is long and finger-like as in the other two species. The second tergite is strongly reflexed as in

fusum and the clypeus is finely punctured as in *dorsale*. Diagnostic of *digiticornis* is the narrow, angularly incised clypeal apex. Only 3 specimens are known to me, the holotype male at the University of Kansas, the male specimen recorded below from Lower California, and a female in my collection from Sonora, Mexico.

Type locality: Oak Creek Canyon, Arizona.

Distribution: Oak Creek Canyon, Arizona, Aug., 1902 (F. H. Snow); 10 mi. E. San Ignacio, Lower California, Sept. 30, 1941 (Ross and G. Bohart); San Bernardo, Sonora, Mexico, Oct. 9, 1935.

(14) *Rygchium hidalgo* (Saussure)

Odynerus hidalgo SAUSSURE, 1857, Rev. and Mag. Zool., (2)9:275.

Odynerus ductus CRESSON, 1872, Tr. Am. Ent. Soc., 4:238.

Odynerus hidalgo SAUSSURE, 1875, Smithsonian Misc. Coll., 254:252.

Odynerus hidalgo of BEQUAERT, 1937, Pan-Pac. Ent., 13:10.

R. hidalgo is easily identified by the presence of membranous lamellae on the apices of tergites 2 and 3. Lower Californian specimens are extensively reddish and belong to the typical subspecies.

Type locality: Warm parts of Mexico.

Distribution: Lower California: Triunfo, July 7, 1938, and Coyote Cove, June 29, 1938 (Michelbacher and Ross). United States: widespread. Mexico: Cuautta, Cuernavaca, Tamaulipas, Chihuahua, Durango, Mexico City, Guad-alajara.

(15) *Rygchium pratense* (Saussure)

Odynerus pratensis SAUSSURE, 1870, Rev. and Mag. Zool., (2)22:61.

Odynerus clusinus CRESSON, 1872, Tr. Am. Ent. Soc., 4:234.

The perfectly smooth first and second tergite, except for an apical punctured band on the second tergite, are characteristic of this medium large, red and yellow species.

Type locality: Cape San Lucas, Lower California.

Distribution: Lower California: Cape San Lucas (J. Xantus); 10 mi. N.W. La Paz, Oct. 6, 1941, and Coyote Cove, Oct. 1, 1941 (Ross and G. Bohart). United States: Texas, Kansas, New Mexico, Arizona, Nevada, Utah, California, Oregon, Idaho, Washington (specimens from the last three states fall in the subspecies *brumale* Bequaert).

(16) *Rygchium annulatum* (Say)

Odynerus annulatus SAY, 1824, Keating's Narrat. Exped. II. App., p. 348.

Rhynchium annulatum of SAY, 1937, Bost. Jour. Nat. Hist., 1:384.

Odynerus bairdi SAUSSURE, 1858, Rev. and Mag. Zool., (2)10:169.

Specimens from Lower California of this common and widespread species are predominantly red and yellow but with some black on the mesonotum. They have the clypeus broader than in typical *annulatum* and probably should be referred to the subspecies *evectum* (Cr.).

Type locality : United States.

Distribution : Lower California : Las Animas, Sierra Laguna, Oct. 12, 1941 ; San Pedro, Oct. 7, 1941 ; Coyote Cove, Oct. 1, 1941 (all collected by Ross and G. Bohart). The species is distributed widely over North America and northern Mexico. Specimens with a broad clypeus are restricted mainly to the southern parts of California, Arizona, New Mexico, and Texas ; Sonora, Mexico ; and Lower California.

(17) **Rygchium boscii azotopum** (R. Bohart)

Odynerus boscii azotopus R. BOHART, 1939, Bull. Brooklyn Ent. Soc., 34:248 (holotype C.A.S.).

Characteristic of this subspecies is the almost entirely yellow and pale reddish coloration, with very little black.

Type locality : 5 mi. N. of Indio, California.

Distribution : Lower California : La Paz, June 3, 1921 (E. P. Van Duzee) ; Pond Island Bay, June 30, 1921 (E. P. Van Duzee) ; San Domingo, July 19, 1938 (Michelbacher and Ross). United States : Arizona, southern California.

(18) **Rygchium subannulatum** R. Bohart, new species

Male : Black, with the following whitish markings : mandible basally, clypeus, scape in front, interantennal triangular spot, ocular and small post-ocular spots, front margin of pronotum, two tegular spots, spot beneath, widely separated spots on scutellum, stripe across front of postscutellum, dorsolateral spots on propodeum, legs partly, apical bands on tergites 1 to 3 and sternites 2 to 5, those on tergite 3 and sternites 4 and 5 discontinuous. Mandible apically, wing veins basally, legs partly, reddish. Pubescence fairly sparse and inconspicuous. Puncturation of head and dorsum of thorax sparse ; head almost impunctate but with distinct but widely spaced punctures ; first two tergites almost entirely smooth except for subapical depressed band on second ; third and following tergites, and venter moderately punctured. Clypeus octagonal, almost straight apically ; last antennal segment long, curved, and flattened ; postscutellum rough above, propodeum subdentate ; middle femur slightly constricted toward base ; second tergite subapically depressed but not apically reflexed. Length to apex of second tergite 8 mm.

Female : Markings about as in male except as follows : clypeus with lunate basal white spot, scape black, third and following sternites entirely black, third tergite spotted laterally. Puncturation of clypeus, face, and dorsum of thorax moderate, that of vertex very sparse and fine, that of abdomen as in male. Clypeal apex straight, about as broad as length of antennal segment 3. Length to apex of second tergite 9.5 mm.

Holotype, male (C.A.S. No. 5381), *allotype*, female (C.A.S. No. 5382), and 9 female *paratypes*, **Las Animas, Sierra Laguna** ; 3 male *paratypes*, Pescadero ; 1 male *paratype*, Canipole ; 1 male *paratype*, Comondu. Above type material all collected by Ross and G. Bohart in Lower California, October, 1941. Also,

1 male *paratype*, San Ignacio, Lower California, June 26, 1938 (Michelbacher and Ross). *Paratypes* in collections of U. S. National Museum, J. Bequaert, and the writer.

This species is very close to *annulatum* but the puncturation is entirely different. In *annulatum* the prothorax in the male and the basal two-thirds of the second tergite are well punctured, whereas in *subannulatum* they are nearly impunctate. The black and white color pattern is quite different from that of any known subspecies of *annulatum*.

(19) **Maricopodynerus permandibularis** R. Bohart, new species

Female: Black, marked with ivory as follows: irregular transverse spot across middle of clypeus, ocular and postocular spots, narrow front margin of pronotum, tegula partly, spot beneath, two widely separated spots on scutellum, stripe across postscutellum, elongate spots on tibiae externally, posterior margin of first tergite, subapical and most of lateral margins of second tergite marked so as to form 4 connected triangular spots. The following parts are tinted with reddish: spots on mandible, antenna partly, posterior pronotal margin, tegula, basal wing veins, legs partly. Wings lightly brown-stained. Puncturation of head and thorax moderate, punctures of pronotum separated by less than a puncture diameter; abdomen very sparsely punctured, first two tergites with distinct punctures laterally and apically only, subapical depression at middle of second tergite faintly but distinctly punctured. Pubescence fine sparse, inconspicuously pollinose. Mandible greatly thickened and bluntly curved apically; clypeus much broader than long, moderately incised apically; interantennal carina prominent; propodeum not toothed or ridged; second tergite about 3 times as long as first tergite viewed from above; apical membrane of second tergite becoming inconspicuous at lateral middle of tergite. Length to apex of second tergite 9 mm.

Holotype, female (C.A.S. No. 5383), Willard's Point Bay, Tiburon Island, Gulf of California, July 3, 1921 (E. P. Van Duzee).

The peculiar heavy blunt mandibles easily separate this species in the female. If the male should prove to have simple mandibles, the puncturation especially in the subapical depression of the second tergite should differentiate it.

(20) **Maricopodynerus pulvipilus** R. Bohart, new species

Male: Black, the following parts yellow ivory: clypeus, scape in front, ocular and postocular spots, front margin of pronotum, tegula partly, spot beneath, two spots on scutellum, stripe across postscutellum, legs partly, wavy apical bands on first two tergites, that on second tergite in the form of 4 connected triangles. Mandible, antenna, legs, and wing veins partly reddish. Wings lightly brown-stained. Puncturation of head and thorax moderate, punctures of pronotum mostly separated by puncture diameters or more, first two tergites practically impunctured except laterally, subapical depression at middle of second tergite with microscopic punctures only. Clypeus and

sides of thorax somewhat silvered, abdomen covered with a dustlike pubescence. Clypeus moderately incised apically; antennal hook slender and pointed, reaching to base of eleventh segment. Apical membrane of second tergite gradually becoming inconspicuous at lateral middle. Second tergite about 3 times as long as first tergite viewed from above. Length to apex of second tergite 7 mm.

Female: Similar to male. Clypeus black with small lateral yellow spots, scape reddish and black, legs mostly red, first tergite faintly reddish at base. Mandible slender and sharply pointed apically. Length to apex of second tergite 8 mm.

Holotype, male (C.A.S. No. 5384), *allotype*, female (C.A.S. No. 5385), and 1 male *paratype*, **Tortuga Island, Gulf of California**, May 11, 1921 (E. P. Van Duzee). Two female *paratypes*, San Francisquito Bay, Lower California, June 23, 1921 (E. P. Van Duzee); 1 female *paratype*, 15 mi. N. San Ignacio, Lower California (Ross and G. Bohart). *Paratypes* in the collections of J. Bequaert and the writer.

The scanty puncturation and “dusty” pubescence of the abdomen distinguish this species from *maricoporum* (Viereck). The simple female mandibles and somewhat finer puncturation separate it from *permandibularis* R. Bohart.

(21) **Odynerus erythrogaster** R. Bohart

Monobia bicolor PROVANCHER, 1888, Add. Faune Hymen., Canada Suppl. p. 429 (nec *Odynerus bicolor* Saussure, 1856) (type, U.S.N.M.).
Odynerus erythrogaster R. BOHART, 1939 (new name), Pan-Pac. Ent. 15:81.

The prominent humeral angles together with the peculiar deep red and jet black markings of *erythrogaster* are diagnostic.

Type locality: Los Angeles Co., California.

Distribution: one female, San Vicente, Lower California, May 11, 1938 (W. E. Simonds); California (Inyo, Yolo, Fresno, Los Angeles, and Riverside counties).

Genus **Alastoroides**

Only two species of this genus have been seen by the writer. The generic characters are the petiolate second submarginal cell of the forewing, the transverse carina on the first tergite, the oblique carina connecting the humeral angle with the mesothorax (as in *Pachodynerus*), the flattened second sternite, the relatively long posterior processes of the tegulae, and the roundly hollowed propodeal concavity limited above by a sharp carina and separated from the postscutellum by a definite horizontal area.

KEY TO THE SPECIES OF *Alastoroides*

Front face of pronotum coarsely and fairly closely punctured; ocellar triangle placed about $\frac{3}{5}$ the distance from antennal sockets to occipital carina; first tergite crossed by a sharp carina; second tergite with a broadly impunctured apical margin; front femur of male with a basal tooth; male antenna hooked or sharply curled apically (Texas, Mexico, Canal Zone) *mexicanus* Sss.

Front face of pronotum shining and sparsely punctured; ocellar triangle about midway between antennal sockets and occipital carina; first tergite crossed by a dull ridge; second tergite moderately punctured toward apical margin; front femur of male without a basal tooth; male antenna merely curved apically (Arizona and Lower California) *slevini* sp. n.

(22) ***Alastoroides slevini*** R. Bohart, new species

Male: Brownish to black with the following whitish-ivory markings: basal $\frac{2}{3}$ of clypeus, front margin of pronotum, tegula partly, spot beneath, posterior $\frac{2}{5}$ of scutellum, tibiae externally, apical margins of first three tergites and second sternite. Wing veins reddish-brown, membrane slightly clouded dorsally. Puncturation of head and most of thorax coarse and close, that of front face of pronotum and clypeus fine and sparse, that of propodeal concavity and abdomen moderate but with the punctures well spaced. Pubescence very short and fine, pulverulent, clypeus appearing silvered in some lights. Mandible stout, with a large and stout subbasal tooth. Clypeus roughly hexagonal, weakly incised apically. Antenna slightly curved apically but not hooked, last segment stout and almost half as long as twelfth. Ocellar triangle placed midway between antennal sockets and occipital carina. Humeral angle sharp, carina along front of pronotum bending at humeral angle and extending obliquely back to mesopleuron. Scutellum, postscutellum, and a horizontal propodeal area which is twice as long as postscutellum, nearly flat. Propodeal concavity roundly hollowed, limited above by a sharp carina. First tergite with a very weak transverse carina at its summit. Second tergite not much broader than first, weakly depressed apically but not reflexed. Second sternite flattened toward the base. Length to apex of second tergite 7 mm.

Female: About as in male except as follows: clypeus with two pale spots basally. Abdominal markings as in male (some paratypes with an apical pale band on tergite 4). Mandible stout, 5 toothed. Length to apex of second tergite 8.5 mm.

Holotype, male (C.A.S. No. 5386), **Todos Santos, Lower California**, Aug. 18, 1919 (J. R. Slevin); *allotype*, female (C.A.S. No. 5387), 20 mi. N. Comondu, Lower California, Oct. 3, 1941 (Ross and G. Bohart); 3 female *paratypes*, Baboquivari Mts., Arizona, Aug., 1924 (O. C. Poling). *Paratypes* in writer's collection.

In all probability the specimens of "*Odynerus (Alastor) mexicanus* Sauss." cited by Fox (1894) from San José del Cabo (G. Eisen) are referable to *slevini*.

(23) ***Pachodynerus californicus*** (Saussure)

Odynerus californicus SAUSSURE, 1870, Rev. and Mag. Zool., (2)22:57.

Odynerus saussurei Fox, 1893, Proc. Calif. Acad. Sci., (2)4:13*

This appears to be the commonest species of solitary Vespidae in Lower California where it is apparently endemic. In markings it closely resembles *Rygchium subannulatum* R. Bohart, but the latter has no oblique pronotal

* Lectotype (by present designation) female, San José del Cabo, Lower California (G. Eisen), type C.A.S. No. 260.

carina characteristic of the genus *Pachodynerus*. *P. californicus* differs from other North American members of the genus in having no membranous flanges on the upper part of the propodeum.

Type locality: Cape San Lucas (J. Xantus).

Distribution: Lower California: Cape San Lucas, Cataviña, Coyote Cove, San Ignacio, La Paz, Comondu, San Augustin, Sierra Laguna, Todos Santos, Espiritu Santo Island.

(24) **Leptochilus congressus** (Viereck)

Odynerus congressus VIERECK, 1908, Tr. Am. Ent. Soc., 33:405 (holotype, U.K.).

Odynerus congressus of R. BOHART, 1942, Pan. Pac. Ent. 18:151.

The large impunctured ocellar and ocular tubercles are distinctive. Also, the propodeum has a sharp upper ridge, and tergites 1, 2, 4 only are banded whitish.

Type locality: Congress Junction, Arizona.

Distribution: 20 mi. W. San Augustin, Lower California, Sept. 24, 1941 (Ross and G. Bohart). I have seen specimens also from many localities in Arizona; from Imperial, Riverside, and San Bernardino counties in California; and from Florida, New Mexico.

(25) **Leptochilus monotylus** (R. Bohart)

Odynerus monotylus R. BOHART, 1940, Pan-Pac. Ent., 16:86 (holotype, C.A.S.)

This is the only species known from Lower California which has a single interocellar tubercle. Also distinctive are the ridged postscutellum, untoothed propodeum, interantennal tubercle, and black and yellow markings.

Type locality: Chatsworth, New Jersey.

Distribution: Big Canyon, Sierra Laguna, Lower California, Oct. 14, 1941 (Ross and G. Bohart). I have seen specimens also from New Jersey, Massachusetts, New York, Virginia, North and South Carolina, Georgia, Alabama, Texas, Arizona, and California. The specimen of "*Odynerus acohuues*" cited by Fox (1894) from San José del Cabo (G. Eisen) was probably *monotylus*.

(26) **Leptochilus levinodus** R. Bohart, new species

Male: Black with the following parts ivory: clypeus, scape in front, front margin of pronotum, tegula partly, spot beneath, semilunate spot on scutellum, legs partly, apical margins of first two tergites and second sternite. Wings smoky, venation dark. Pubescence short, fine, silvery on head and thorax, pulverulent on abdomen, front well silvered. Puncturation moderate on head, thorax, second sternite, and subapically on first two tergites; very sparse and fine on remainder of abdomen. Clypeus narrowly and sharply incised apically; antennal hook minute, reaching to middle of eleventh segment; interantennal tubercle definite; humeral angle sharp; postscutellum serrately ridged; propodeal concavity with a tooth-like dorsolateral ridge; second tergite not reflexed

apically; second sternite hollowed but not creased basomedially. Length to apex of second tergite 7 mm.

Female: Markings as in male except as follows: apex and two black central dots of clypeus black. Mandible regularly 4-toothed; clypeus moderately but narrowly incised apically. Length to apex of second tergite 7 mm.

Holotype, male (C.A.S. No. 5388), and *allotype*, female (C.A.S. No. 5389), 15 mi. N. San Ignacio, Lower California, Sept. 29, 1941 (Ross and G. Bohart).

This species is most closely related to *electus* (Cresson) and *tosquineti* (Cameron), but the almost smooth first and second tergites of *levinodus*, as well as the absence of red nodal marks, are sufficient for separation.

(27) **Leptochilus propodealis** R. Bohart, new species

Plate 12, figs. 4-6.

Male: Black with the following yellow markings: clypeus, scape in front, spot on mandible, front margin of prothorax, tegula, spot beneath, broad stripe across scutellum, posterior projections of propodeum, legs partly, apical bands on first two tergites and second sternite. Wings smoky, venation brown. Punctuation close and moderately coarse, especially on vertex; swollen apices of first two tergites impunctured. Pubescence silvery, moderate but short on sides of thorax and face, scanty above clypeus, obscure elsewhere. Clypeus very narrowly and angularly incised apically, almost quadrate in shape. Mandible 4-toothed. Antennal hook very small, reaching to base of eleventh segment. Ocelli large. Humeral angle sharp. Postscutellum sharply and serrately ridged. Propodeal concavity with a superior tooth-like ridge. First two tergites indented subapically and slightly swollen apically. Second tergite somewhat broader than long. Second sternite with no basal median crease. Length to apex of second tergite 5 mm.

Female: Markings about as in male except as follows: clypeus with an apical black spot, scape and mandible black. Clypeus very narrow apically, and slightly incised. Mandible with a long indistinctly dentate area between basal and apical teeth, making mandible appear only 2 toothed. Length to apex of second tergite 7.5 mm.

Holotype, male (C.A.S. No. 5390), **Riverside, California**, Apr. 21, 1927, on *Lotus scoparium* (P. H. Timberlake); *allotype*, female (C.A.S. No. 5391), Riverside, California, Oct. 9, 1925, on *Eriogonum gracile* (P. H. Timberlake). *Paratypes* (all from California), 11 males and 54 females, Riverside (P. H. Timberlake); 2 females, N. of San Jacinto Cyn., Riverside Co. (C. D. Michener); 2 females, Los Angeles Co.; 1 male, Gavilan (P. H. Timberlake); 1 female, Morongo Valley, San Bernardino Co. (C. D. Michener); 1 female, Claremont (C. F. Baker); 1 male, Brea (R. M. Bohart); 1 male and 2 females, San Diego, (P. H. Timberlake); 1 female, San Diego Co. (E. P. Van Duzee). *Paratypes* in collections of U. S. National Museum, University of Kansas, J. Bequaert, P. H. Timberlake, C. D. Michener, and the writer.

I have seen specimens also from Guaymas, Mexico, and the following

localities in Lower California : Espíritu Santo Island, May 31, 1921 (E. P. Van Duzee) ; Puerto Refugio, May 1, 1921 (E. P. Van Duzee) ; Monserrate Island, May 25, 1921 (E. P. Van Duzee) ; Concepcion Bay, June 17, 1921 (E. P. Van Duzee) ; 20 mi. W. San Augustin, Sept. 24, 1941 (Ross and G. Bohart). The species appears to fly from April to October.

L. propodealis belongs to a distinct group of *Leptochilus* which possess peculiar female mandibles, sharp humeral angles, no head tubercles, toothed propodeum, and creaseless second sternite. The group is most closely related to the *electus* group and males are sometimes separated with difficulty by other than specific characters.

(28) ***Leptochilus michelbacheri*** R. Bohart, new species

Male : Black with the following parts yellow : clypeus, scape in front, front margin of pronotum, tegula mostly, spot beneath, crescentic posterior spot across scutellum, posterior propodeal processes, legs partly, margins of first two tergites and second sternite. Wings smoky, venation dark. Puncturation of head and thorax moderate but close ; clypeus moderately punctured ; first tergite, base of second tergite, and abdominal segments 3 to 7 very sparsely punctured ; second abdominal segment with the punctures well spaced but abundant. Pubescence obscure and short, silvery in some lights, especially on face and sides of thorax. Clypeus one and one-third times as broad as long, roundly notched apically. Antennal hook minute, reaching almost to base of eleventh segment. Humeral angle moderate. Postscutellum serrately ridged. Propodeal concavity with a tooth-like upper ridge. First tergite with a sharp transverse subapical depression. First two tergites with smooth, slightly thickened apical margins. Second tergite almost one and one-half times as broad as long. Second sternite hollowed but not creased basomedially. Length to apex of second sternite 4 mm.

Female : Markings, puncturation, and pubescence about as in male, clypeus narrowly and slightly incised apically, one and one-half times as broad as long. Length to apex of second tergite 5 mm.

Holotype, male (C.A.S. No. 5392), and 2 male *paratypes*, **Coyote Cove, Lower California**, Oct. 1, 1941 (Ross and G. Bohart) ; *allotype*, female (C.A.S. No. 5393), 10 mi. E. San Ignacio, Lower California, Sept. 30, 1941 (Ross and G. Bohart) ; 2 male *paratypes*, Pescadero, Lower California, Oct. 8, 1941 (Ross and G. Bohart) ; 1 female *paratype*, 5 mi. W. San Bartolo, Lower California, July 13, 1938 (Michelbacher and Ross). *Paratypes* in collection of writer.

This species is most closely related to *propodealis* but the difference in puncturation of the first tergite and in size should be sufficient for separation. Some of the paratype males of *michelbacheri* have the fourth tergite apically banded.

(29) **Stenodynerus vanduzeei** R. Bohart, new species

Plate 12, figs. 9-12.

Male: Black with the following parts ivory-colored: clypeus, mandible partly, scape in front, interantennal spot, postocular spot, front margin of pronotum, tegula partly, spot beneath, postscutellum mostly, spot on lateral angle of propodeum, legs partly, apical margins of first two tergites and second sternite, lateral attached spot on first and unattached spot on second tergite. Antenna beneath, mandible at apex, wing veins basally, tibiae partly, reddish. Wings lightly brown-stained. Puncturation in general moderate, coarse at apex of second tergite, and very coarse on third sternite. Pubescence very short and inconspicuous, but appearing pulverulent in certain lights, especially on abdomen. Clypeus sharply bidentate and moderately incised apically; mandible strongly curved toward apex; antennal hook very small, not reaching base of segment 11; interocellar area with a pair of punctured tubercles; vertex with a prominent shining tubercle on either side of the middle and with low tubercles adjacent to the eyes; front face of pronotum shining, median pair of pits hardly indicated; postscutellum not serrate; propodeum deeply cleft but without tubercles; first tergite about half as long as second in dorsal view; no acarinarium present; second abdominal segment constricted angularly toward the base as viewed laterally; second tergite greatly prolonged and reflexed apically, half again as long as second sternite; second sternite with no trace of a basal median suture. Length to apex of second tergite 8 mm.

Female: About as in male except as follows: markings whitish yellow, clypeus with 4 yellow spots. Length to apex of second tergite 10 mm.

Holotype, male (C.A.S. No. 5396), *allotype*, female C.A.S. No. 5397), 17 male and 7 female *paratypes*, **Baboquivari Mts., Arizona**, July to August, 1924 (O. C. Poling); 1 male *paratype*, Huachuca Mts. Arizona, July 8, 1932 (R. H. Beamer); 1 female *paratype*, Pinaleno Mts., Arizona, Feb., 1917; 1 female *paratype*, Oracle, Arizona, July 27, 1924 (E. P. Van Duzee); 1 female *paratype*, Willow Creek Mts., New Mexico, Aug. 28, 1933 (H. S. Gentry); 3 male and 2 female *paratypes*, Organ Mts., New Mexico; 1 male and 1 female *paratype*, Las Animas, Sierra Laguna, Lower California, Oct. 12, 1941 (Ross and G. Bohart); 1 male *paratype*, Big Canyon, Sierra Laguna, Lower California, Oct. 13, 1941 (Ross and G. Bohart).

Paratypes in collections of University of Kansas, U. S. National Museum, J. Bequaert, and the author.

This unique species is on the borderline between *Stenodynerus* and *Leptochilus*. In most of its characters it falls in the former, but the pits of the front face of the pronotum are barely visible. Provisionally it is placed in *Stenodynerus*. Superficially, it resembles *S. rectangulis* (Viereck) which has the second tergite similarly drawn out and reflexed. However, *rectangulis* has a median furrow on the second sternite, spots in the eye emarginations, and no

shining ocular tubercles. There is also some resemblance to *Leptochilus deformiceps* (R. Bohart) which has similar vertex tubercles and second tergite. *L. deformiceps* differs in many respects, however, including the presence of a median furrow on the second sternite.

(30) ***Stenodynerus microstictus*** (Viereck)

Odynerus microstictus VIERECK, 1906, Tr. Am. Ent. Soc., 32:199 (holotype, U.K.).

Odynerus gulielmi VIERECK, 1908, Tr. Am. Ent. Soc., 33:408.

Stenodynerus microstictus of R. BOHART, 1944, Pan-Pac. Ent., 20:72.

This species is distinguished by the shining and sparsely punctured female clypeus, the hardly thickened hind margin of the second tergite, and by the abruptly swollen middle tibia in the male.

Type locality: Clark Co., Kansas.

Distribution: Texas, Kansas, South Dakota, Colorado, New Mexico, Wyoming, Nevada, Arizona, California, and Lower California. Lower California material consists of 1 male, San Domingo (Michelbacher and Ross), and 1 female, 20 mi. N. Mesquital (Ross and G. Bohart).

(31) ***Stenodynerus xanthianus*** (Saussure)

Odynerus xanthianus SAUSSURE, 1870, Rev. and Mag. Zool., (2)22:103.

Odynerus xantianus SAUSSURE, 1875, Smithsonian Misc. Coll., 254:204.

Stenodynerus xantianus of R. BOHART, 1944, Pan-Pac. Ent. 20:74.

Although *xanthianus* is rare in California, it is apparently one of the commonest solitary vespids in Lower California. It is related to *microstictus* and to *claremontensis* but *xanthianus* is easily separated from these by its finely punctured thorax. In size and markings it resembles *S. toltecus* (Saussure) which occurs also in Lower California, but the latter possesses an acarinarium and has the apex of the third tergite unthickened.

Type locality: Cape San Lucas (J. Xantus).

Distribution: Lower California: Cataviña, San Ignacio, Triunfo, Coyote Cove, Comodu, San Augustin, Cape San Lucas, and Angeles Bay. California: Coachella Valley, Morongo Valley, Borego Valley, and San Jacinto Mts.

(32) ***Stenodynerus lacunus*** (Fox)

Odynerus lacunus Fox, 1894, Proc. Calif. Acad. Sci. (2), 4:111

This species belongs to the group of *Stenodynerus* which possess an acarinarium. It is most closely related to *austrinus* (Cresson) which differs in having the legs almost entirely reddish.

Lectotype (by present designation); female, San José del Cabo, Lower California (G. Eisen), type C.A.S. No. 259.

Distribution: Lower California: San José del Cabo, October (G. Eisen); Coyote Cove, Oct. 1, 1941 (Ross and G. Bohart); Tiburon Island, July 5, 1921 (E. P. Van Duzee). California: Coachella Valley, Borego Valley, Imperial Co. Arizona: Baboquivari Mts., Santa Catalina Mts., Tucson, Congress Junc-

tion, Lowell Ranger Station, New Mexico: Albuquerque, Las Cruces. Texas: Brownsville, Austin, Rio Grande, Sabinal, Knippa, Cypress Mills.

(33) **Stenodynerus toltecus** (Saussure)

Odynerus toltecus SAUSSURE, 1857, Rev. and Mag. Zool., (2)9:277.

Odynerus arizonaensis CAMERON, 1908, Tr. Am. Ent. Soc., 34:208.

The strongly reflexed and subcanaliculate second tergite is characteristic of this species. Other salient points are the prominent interocellar tubercles, presence of an acarinarium, and the lightly punctured vertex and pronotum in the male.

Type locality: temperate Mexico.

Distribution: Lower California: Coyote Cove, June 9, 1938 (Michelbacher and Ross); Coyote Cove, Oct. 1, 1941 (Ross and G. Bohart); 10 mi. E. San Ignacio, Sept. 30, 1941 (Ross and G. Bohart); Espíritu Santo Island, Pond Island Bay, Angeles Bay, and San Marcos Island, June, 1921 (E. P. Van Duzee). Mexico: Sierra Madre Valley, Mextitlan, Hermosillo, Guaymas. I have seen specimens also from California, Arizona, New Mexico, Texas, Utah, Idaho, Washington, and Oregon.

(34) **Stenodynerus valliceps** R. Bohart, new species

Plate 12, figs. 14-17.

Male: Black with yellowish-white markings as follows: clypeus, scape in front, interantennal spot, lower orbits, postocular spot, large angular spots on either side of pronotum, tegula mostly, spot beneath, mesonotal spot, post-scutellum above, legs partly, apical bands on first five tergites and sternites 2 and 3, those on tergite 2 and sternite 2 broadly broken medially (that on tergite 2 complete in some paratypes), lateral spots on first two tergites, those on first attached to apical band, spot on sixth tergite. Antenna fulvous beneath except for last 2 segments. Wing veins reddish to brown, membrane slightly clouded. Mandible apically reddish. Puncturation of head and thorax moderate, that of abdomen more sparse, especially toward bases of the segments; clypeus hardly punctured. Pubescence obscure, short, fine. Clypeus with its lateroapical margin longer than the lateral margin, broadly and weakly incised apically. Antennal hook reaching to base of segment 11. Interocellar area raised but not tuberculate. Humeral angles moderate. Parategular process slender and pointed. Propodeal concavity without a superior shelf. Tergite 2 not reflexed apically and without an acarinarium at its base. Second sternite very faintly creased toward the base medially. Aedeagus slightly swollen and hooked medially. Length to apex of second tergite 5.5 mm.

Female: Characters about as in male except as follows: mandible white, black, and red; clypeus with a basal pale spot only, apical band on third tergite narrowly interrupted. Clypeus shining, sparsely punctured, lateral margin short. Vertex with a V-shaped depression extending about to middle of lateral ocelli. Length to apex of second tergite 6.5 mm.

Holotype, male (C.A.S. No. 5394), *allotype*, female (C.A.S. No. 5395), 6 female *paratypes*, and 3 male *paratypes*, **Green River, Wyoming**, July, 1920 (6100 ft.). Three male and 2 female *paratypes*, Jenny Lake, Wyoming, July, 1937. Two males and 2 females, Rock Springs, Wyoming, June 29, 1920. Also, I have seen *metatypes* from the following localities: Lower California (San Domingo and La Paz), California (widespread), Oregon (Steen Mts., Lick Creek, Narrows, Prospect, Ontario, and Huntington), Washington (Pullman), Idaho (Giveout, Bear Lake, Montpelier), Utah (many localities), Wyoming (Carbon Co., Rawlins), Colorado (many localities), New Mexico, Kansas (Sherman Co., Meade Co., Lenora), Mexico proper (Los Mochis, Sinaloa). *Paratypes* in collections of U. S. National Museum, J. Bequaert, University of Kansas, Oregon State College, and the writer.

Only two species of *Stenodynerus* are known with a V-shaped depression on the female vertex, smooth male clypeus with long lateral margins, and partially fulvous male flagellum. These can be separated by the following key:

Depression of female vertex extending about to middle of lateral ocelli, surface of the depression very finely reticulate, becoming punctured anteriorly; male antenna with the last two segments dark; aedeagus relatively slender.....*valliceps*

Depression of female vertex extending about to inside edges of lateral ocelli; surface of depression irregularly roughened; male antenna with last two segments fulvous as on inner surface of flagellum; aedeagus greatly expanded at middle.....*noticeps*

(35) ***Stenodynerus noticeps noticeps*** R. Bohart, new species and subspecies

Male: Black, marked with whitish as follows: mandible except for reddish tip, clypeus, scape in front, interantennal spot, lower orbits, postocular spot, front margin of pronotum, tegula mostly, spot beneath, postscutellum mostly, legs partly, apical bands on first five tergites and sternites 3 to 5, that on tergite 3 broken in the middle, lateral spots on first two tergites, that on tergite 1 connected with the apical band, median spot on sixth tergite. Wing veins brown, membrane slightly stained. Antenna fulvous beneath and on last two segments. Puncturation moderate, becoming finer toward bases of abdominal segments, fairly sparse and fine on clypeus. Pubescence obscure, silvery. Clypeus roughly hexagonal, apex moderately incised, lateral edge about as long as lateroapical edge. Last antennal segment flattened, apically rounded, reaching to base of eleventh segment. Humeral angle weak. Parategular process slender and pointed. Propodeal concavity without a superior shelf. Second tergite without apical reflex or basal acarinarium. Second sternite with a weak median basal crease. Aedeagus greatly expanded at the middle when flattened out. Length to apex of second tergite 7 mm.

Female: Markings as in male except as follows: clypeus with a basal triangular pale mark; scape black, antenna mostly black, dark reddish beneath; orbital and interantennal spots small; pronotal band broken medially so as to form 2 quadrate spots; mesonotal and propodeal spots present; apical band on third tergite complete, that on third sternite incomplete, none on fourth

sternite. Clypeus broad, moderately punctured. Vertex pit reaching as far as inside edges of lateral ocelli, its surface roughened and with scattered large punctures. Length to apex of second tergite 8 mm.

Holotype, male (C.A.S. No. 5398), **Kelton, Utah**, June 17, 1932 (G. F. Knowlton). *Allotype*, female (C.A.S. No. 5399), Logan, Utah, April 18, 1933. *Paratypes*, Utah: 1 male each from Lampo, Rosette, Corinne, and 1 female each from Roosevelt, Lucin, Iosepa (all collected by G. F. Knowlton); Nevada: 1 female from Mt. Montgomery (R. M. Bohart), 1 female from Tuscarora (P. H. Baldwin), and 1 female from Paradise City (P. H. Baldwin); Oregon: 2 males from 14 mi. E. Mitchell, and 2 females from Steens Mts. I have seen specimens also from Wyoming (Green River, Jenny Lake), Colorado (Leadville), Washington (Stratford, Toppenish), and California (Modoc Co.). *Paratypes* in collections of Utah State College, Oregon State College, U. S. National Museum, J. Bequaert, and the writer.

A yellow-marked form of this species occurs in California and Lower California. It is described below.

(36) ***Stenodynerus noticeps clarki*** R. Bohart, new subspecies

Male: Markings distinctly yellow, wings brown-stained. Length to apex of second tergite 5.5 mm.

Female: Clypeus yellow, bordered with black, and with 2 black dots; scape yellow in front; scutellum with two small yellow dots. Length to apex of second tergite 6 mm.

Holotype, male (C.A.S. No. 5400), *allotype*, female (C.A.S. No. 5401), and 3 female *paratypes*, **Bear Valley, Santa Cruz Mts., California**, Aug., 1913 (F. C. Clark); 4 female *paratypes*, Emeryville, California (G. Bohart and J. MacSwain); 2 female *paratypes*, Oakley and Millbrae, California, September (E. C. Van Dyke). I have seen California specimens also from Claremont, Coleville, and Fort Seward; and Lower California specimens from 20 mi. N. Mesquital, Sept. 27, 1941 (Ross and G. Bohart). The three female specimens from Lower California average lighter in color than those from California. *Paratypes* in collections of U. S. National Museum, J. Bequaert, and the writer.

(37) ***Stenodynerus declivatus*** R. Bohart, new species

Plate 12, figs. 7-8.

Male: Black with the following light yellowish markings: clypeus, mandible mostly, scape in front, interantennal spot, ocular spot, postocular spot, front margin of pronotum, tegula mostly, spot beneath, parategular process, post-scutellum mostly, legs partly, apical bands on first two tergites and second sternite. Antenna fulvous beneath except for last two segments. Wings strongly stained with brownish, slightly violaceous. Puncturation moderate, close; metapleural triangular area between middle and hind coxa, and area at base of second tergite distinctly punctured; clypeus finely and sparsely

punctured. Pubescence pale, obscure. Clypeus moderately but narrowly incised apically. Antennal hook flattened and apically rounded, reaching base of segment 11. Parategular process moderately slender, rounded apically. Second abdominal segment angularly bent at basal third as seen in lateral view so as to form a slanting constriction above and below. Second sternite without a basal median crease. Second tergite hardly thickened and not reflexed apically, with an acarinarium at its base. Length to apex of second tergite 7 mm.

Female: Markings and structure about as in male. Clypeus with a lunate basal pale mark, antennal flagellum black, mandible mostly black. Clypeus well punctured, moderately long. Length to apex of second tergite 9 mm.

Holotype, male (C.A.S. No. 5402), **La Laguna, Sierra Laguna, Lower California**, Oct. 14, 1941 (Ross and G. Bohart); *allotype*, female (C.A.S. No. 5403), Muertos Bay, Lower California, March 17, 1928 (Craig). *Paratypes*, California: 1 male, Coronado Island, Lower California, Aug. 21 (W. P. Cockerell); 1 female, San Diego Co., Aug., 1913 (E. P. Van Duzee); 1 female, San Diego, Aug. 7, 1935 (Jean Russell); 1 female, Costa Mesa, July 20, 1938 (J. Shanafelt). *Paratypes* in collections of J. Bequaert and the writer.

This species is closely related to *perennis* Saussure, but the latter has the punctures of the first tergite much coarser than those of the vertex, and the clypeus is more heavily punctured, particularly in the male.

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EXPLANATION OF PLATE 12

(Figures not drawn to the same scale, dotted lines define limits of whitish or yellow markings.)

Figs. 1-3. First two abdominal segments, clypeus, and last four antennal segments of *Eumenes coyotae* R. Bohart, new species, male paratype from Concepcion Bay, Lower California.

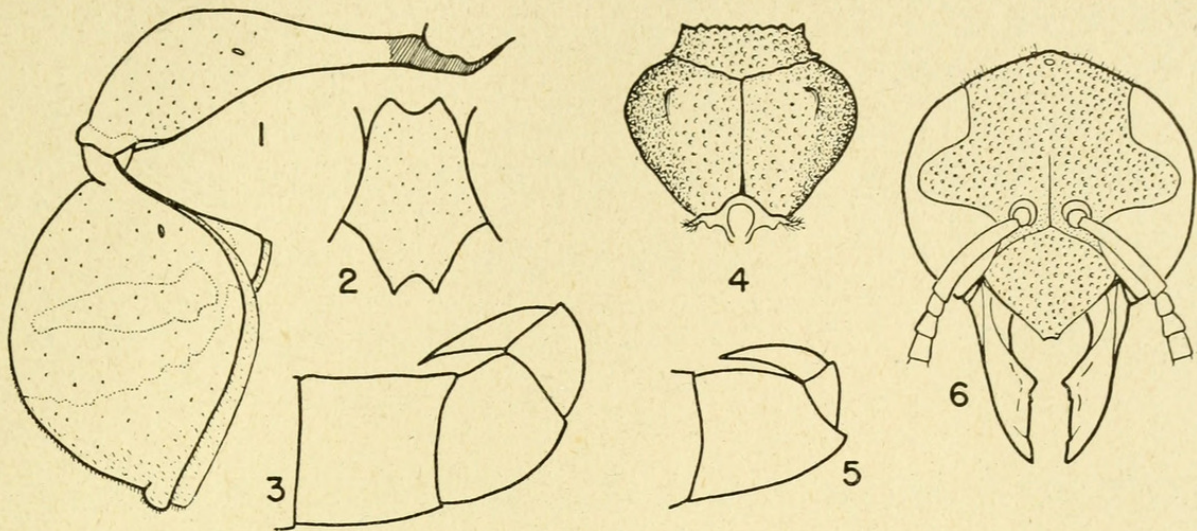
Figs. 4-6. Metathorax in posterior view (female paratype), last three antennal segments (male paratype), and anterior view of head (female paratype) of *Leptochilus propodealis* R. Bohart, new species. Female paratype from Riverside, California and male paratype from San Diego, California.

Figs. 7-8. First two abdominal segments and clypeus of *Stenodynerus declivatus* R. Bohart, new species, female paratype from San Diego, California.

Figs. 9-12. First two abdominal segments, anterior face of pronotum, first three antennal segments, and last 3 antennal segments of *Stenodynerus vanduzeei* R. Bohart, new species, male paratype from Las Animas, Lower California.

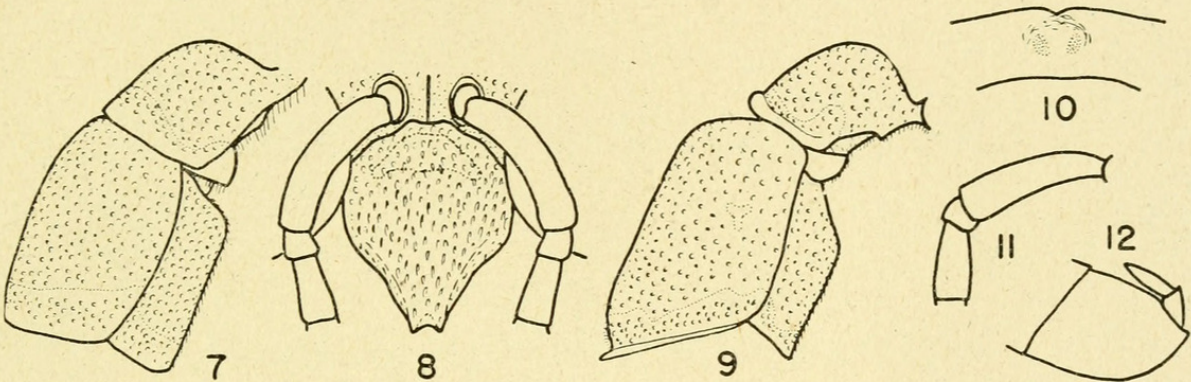
Fig. 13. Postocellar area of vertex of *Stenodynerus noticeps noticeps* R. Bohart, new species and subspecies, female paratype from Roosevelt, Utah.

Figs. 14-17. Postocellar area of vertex (female paratype), anterior face of pronotum (female paratype), last three antennal segments (male paratype), and anterior view of head (male paratype) of *Stenodynerus valliceps* R. Bohart, new species. Female paratype from Jenny Lake, Wyoming and male paratype from Rock Springs, Wyoming.



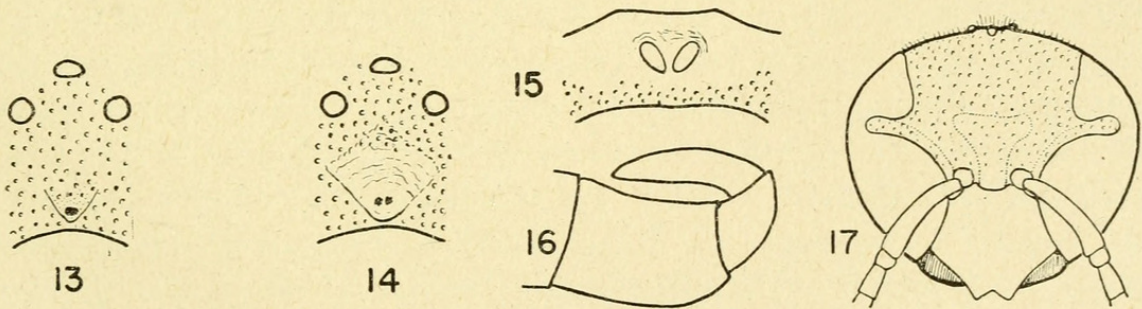
Eumenes coyotae

Leptochilus propodealis



Stenodynerus declivatus

Stenodynerus vanduzeei



St. noticeps

Stenodynerus valliceps



Bohart, R. M. 1948. "Contributions toward a knowledge of the insect fauna of lower California. No. 9. Hymenoptera; Eumeninae." *Proceedings of the California Academy of Sciences, 4th series* 24, 313–336.

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