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A REVISION OF THE GENUS OROPUS CASEY

(Coleoptera: Pselaphidae)

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INTRODUCTION

The genus *Oropus* was proposed by Casey in 1886 for his new species *O. convexus*, *O. interruptus*, *O. abbreviatus* and for *O. striatus* described in *Trichonyx* by LeConte (1874). A total of 13 species was described between 1874 and 1908. Five of these were considered by Brendel and Wickham in 1890 and all 13 were treated by Casey in 1908. Casey's 1908 paper, along with his description of the genus, appeared in Bowman's Pselaphidae of North America (1934). No additional species were described until 1960 when Park included a new species in the pselaphid section of Hatch's Beetles of the Pacific Northwest.

The opportunity to study Casey's types and his 1908 publication prompts the following remarks which may be useful to others who wish to use the Casey papers on *Oropus*. Casey's key to the 13 species contains several errors and his types can not be separated satisfactorily by it. *Oropus debilis* of Group III was based on a male, although Casey assumed it to be a female and neglected to describe the male characters of tergite four. Although Casey may not have realized it, couplet two separates males from females. The ratios of length to width of the elytra of the types of *O. curtipennis* and *O. castaneus*, which are females, are the same as those of many of the males. The key characters finally used to separate Group II (females) are in part erroneous and not sufficient to distinguish the species. According to our own measurement data, the ratios of widths of head (excluding eyes) and prothorax for males of Casey's Group I fall within a range of 0.82 to 0.88. If the ratios are allocated to two subgroups, one with a range of 0.82 to 0.84 and the other with a range of 0.85 to 0.88, three species fall into each subgroup. However, in the Casey key, this procedure incorrectly places *O. interruptus* and *O. keeni*.

Casey's remarks at the end of his 1908 paper are confusing. He states that "out of 17 examples" of Group I, "there seems to be only one male". However, Casey described five species based on males. "Of 12 examples of Group II", he states that "there is but 1 female" although the four species considered in Group II are described from females.

BIOLOGY

Adults of *Oropus* can be collected during any season and presumably they remain in a relatively active state throughout the year. There appears to be no well-defined time of

pupal emergence since teneral adults have been collected from late fall through early spring. Most of the teneral specimens have been collected during the fall period.

Adult beetles feed on entomobryids. As determined by smears of gut contents, most of the individuals examined contained entomobryids only. Others contained additional matter. Possibly the additional substances, such as spores, and hyphae of fungi, were ingested incidentally.

Maturing sperm has been noted as early as 26 Apr. 1959 in males from Pescadero Creek, San Mateo County, California, and as late as 1 Oct. 1959 in males from Charleston, Oregon. The development of eggs seems to occur during the fall. This was determined by acetocarmine preparations of ovaries taken from females captured during August, September and October. The ovaries could not be distinguished in April.

The immature stages are unknown. Larvae suspected to be those of *Oropus* have invariably died before pupation and adults have not reproduced in the laboratory although they lived many months in containers of soil and litter.

Males of this genus usually have large eyes and are winged and the females have smaller eyes and are brachypterous. Since most of the specimens have been collected in Berlese funnels, there is no bias toward winged males as would result from light trap collections. The proportion of females to males is 3 : 2 but individual species may exhibit exceptions. This inequality has been noted for other genera, particularly *Pselaptrichus*, where the sex ratio is approximately equal only in populations of species with small-eyed, wingless males.

DISTRIBUTION

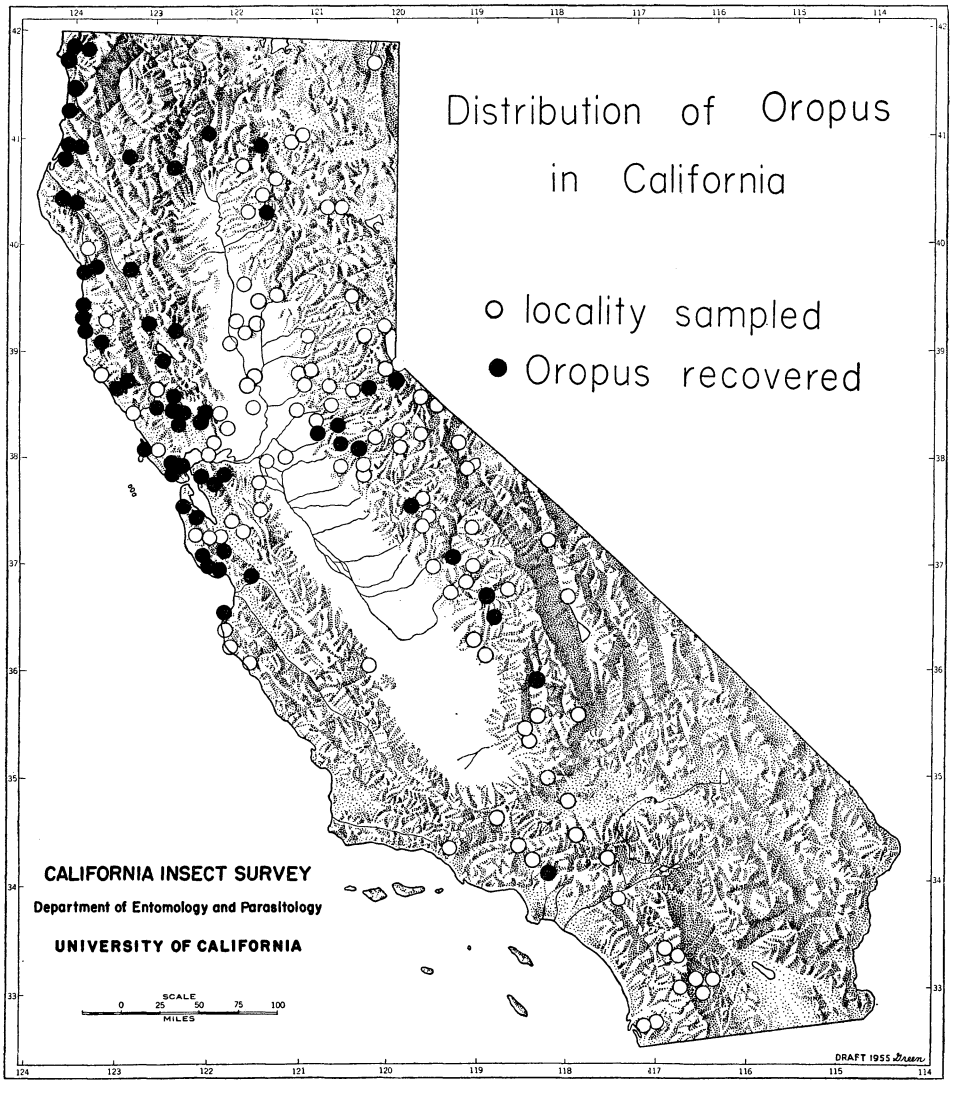
The distribution of soil-inhabiting arthropods in California is poorly known. However, the number of sampled areas is sufficient to form basis of a few generalizations about their distributions.

The genus *Oropus* is restricted in its distribution to the Pacific slope of North America. In California, the species of this group inhabit the boreal areas and none have yet been taken from austral areas. The largest numbers of individuals have been recovered from the North Coastal Montane situations. Smaller numbers have been taken from the Sierran Montane. The genus may not be expected to occur east of the crest of the Sierras in the latitudes of California.

The distribution of *Oropus* thus seems to be correlated with the past and present range of the redwood forest association. There are no records from territory east of the Sierras and few from the Southern California Montane areas.

Specimens of *Oropus* are most easily collected from the layer of organic debris which accumulates in areas where leaf drop and moisture conditions provide a habitat of relatively high humidity throughout the year. A map shows the areas of California from which soil and litter samples have been processed in Berlese funnels and those from which *Oropus* have been recovered.

In California, *Oropus* species are vertically distributed to about 1200 meters. The largest number of specimens has been taken from elevations between 0 and 150 m. In the Sierran Montane, members of this genus are found occasionally between 900 and 1200 m,



but most of the specimens have been recorded from lower elevations. Records for a few coastal localities such as Mount Diablo and Mount Saint Helena may also have been from elevations up to 1200 m.

It is natural that collections have been made with greater frequency along accessible road systems below 1200 m, but a sufficient number of samples has been processed from higher altitudes so that an upper limit of about 1200 m seems to be quite realistic.

ACKNOWLEDGMENTS

The following persons have collected specimens or supplied soil and litter samples

from which specimens were recovered. In the locality records their names are abbreviated as follows: B. J. Adelson (BA), S. F. Bailey (SB), W. C. Bentinck (WB), F. E. Blaisdell (FB), D. J. Burdick (DB), H. P. Chandler (HC), P. P. Cook (PC), E. E. Gilbert (EG), J. R. Helfer (JH), C. D. MacNeill (CM), G. A. Marsh (GM), J. A. Powell (JP), F. C. Raney (FR), V. D. Roth (VR), R. O. Schuster (RS), L. M. Smith (LS), N. A. Walker (NW), M. Wasbauer (MW).

We wish to express our appreciation to Mr. H. B. Leech of the California Academy of Sciences for the loan of specimens, to Dr. O. L. Cartwright and Dr. J. F. Gates Clarke of the U. S. National Museum for the opportunity to examine the Casey types of *Oropus*, and to Dr. P. J. Darlington, Jr., of the Museum of Comparative Zoology for loaning the type of *O. striatus*.

TAXONOMY

The extremely conservative genitalic structure of the males of this genus is compensated for by the diversifications of tergite IV. Frequently this tergite is wonderfully unique for a given species. In other cases, the appearance of the sulcus of tergite IV differs subtly and seems to change in shape with differing magnifications, lighting, and angle of observation. Inability to define the precise nature of the sulcus makes it difficult to distinguish between some closely related species.

Pselaphids of the western slope of North America have been extensively collected for the past eight years for this study. Also, older collections of the California Academy of Sciences have been included. Nevertheless, a large number of the species of *Oropus* are represented by unique males. Many of the population samples we have examined are too small to show the range of variability of the species or to ascertain their relation to other populations. In questionable cases we have elected to mention the specimens as being closely related to a particular species. Species represented by females only have not been described.

Two groups have been designated arbitrarily to facilitate the discrimination of species. In the species assigned to group A, tergite I is not much longer than tergite II. Males of most of these species have a delimited sulcus on tergite IV and a number of long setae at the base of sternite IV. In the species assigned to group B, tergite I is over half again as long as tergite II. Tergite IV of the males of most of these species is broadly concave in part, there being no delimited sulcus. The long setae of sternite IV are usually lacking. In both of these groups, the aedeagus is practically identical.

MORPHOLOGY

The head is wider than long, bearing weak antennal tubercules which are widely separated by the sloping frons. Two perforate, nude vertexal foveae are connected by a broadly inverted "U"-shaped impression. These foveae appear pubescent on pointed specimens. An additional fovea occurs behind each antennal tubercule (an obvious and interesting character not previously reported). The eyes, when present, are usually large in the male and smaller in the female. The ventral surface of the head has a weak median longitudinal carina. The setae of the ventral surface of the head of group A are

long, abundant, and multidentate distally. Those of group B are simple. The antennae have 11 segments, the last three forming a distinct club. Segment II usually has a sensory pit. Segments IX to XI have a number of larger setae. On segments IX and X the larger setae are restricted to the bases. The maxillary palpus has four segments as illustrated.

The pronotum has a median sulcus (caniculation) and a transverse sulcus in the area of the basolateral foveae. A basolateral tooth, nearly obsolete in some species, occurs laterad to each fovea and a number of subsidiary denticles frequently occur on the posterior and occasionally on the anterior margins. Wings may be fully developed or brachypterous. Elytra always with a subhumeral fovea and epipleural sulcus. A fovea attends each side of the suture and the sutural stria is complete. Three antebasal foveae are associated with discal striae of varying lengths.

The primary claw of the male proleg is cleft in some, if not all of the species. A carina occurs on the undersurface of the profemora of both sexes and the metatibia has a distal comb of setae.

The abdomen of both sexes consists of five visible tergites and six apparent sternites. A seventh sternite, primarily internal, is sclerotized distally and at times may be visible externally. A large, deeply impressed and spongeously pubescent area occurs at the middle of the anterior margin of the first visible tergite and can be used to associate the sexes of some species. The fourth tergite of the male always has a secondary sexual modification, that of the female rarely so. The fourth sternite of the male frequently bears a number of long setae medianly at the anterior margin. The fifth sternite of the male may have a transverse row of pits, a central clump of pits, or none, and that of the female almost always has a transverse row. In the males, sternite VI usually has a distal median emargination of varying shape with another, smaller, emargination on each side. The female sternite VI is sinuate distally. The aedeagi are extremely conservative, there being little difference in the structure to be found between species or species groups.

The following procedure has been adopted to simplify description: 1) Measurements of head length are based on the distance from the clypeus to the rear of the tempora. Head width, exclusive of the eyes, is greatest just behind the eyes. Measurements of the position of the vertexal foveae are made from the center of the aperture. The elytral length is measured along the suture. The width of abdominal segments excludes the margins. All other measurements are given as maximal distances possible for the structure. 2) The position of the lateral teeth is given as a ratio of the distance from the front of the pronotum to a line across the teeth to the total length of the pronotum. 3) The four elytral foveae (not considering the subhumeral fovea) are numbered from the suture laterad, the sutural fovea being I, etc. 4) The tergites are numbered with the first visible tergite designated as I (disregarding the first actual tergite). 5) When tergite IV of the male is described, the term sulcus is restricted to mean the actual depression. There is usually a finely pubescent area associated with the sulcus. This pubescence, not the actual sulcus, is seen when the specimen is slide mounted and it is referred to as a microsetigerous area.

The drawings were made with the aid of an ocular micrometer and grid paper. Some have been shaded to indicate the shapes of various characters. Each of the latter was drawn with the structure in the flattest position possible with a light source 45° above and

to the left. It should be appreciated that small changes of position greatly change the appearance of parts and that specimens require careful orientation when they are compared with the drawings.

The type specimens are deposited in the California Academy of Sciences (CAS).

Key to males of group A

1. Tergite IV with an integumental protuberance 2
   Tergite IV lacking protuberance but with microsetigerous area of varying size and shape 3
2 (1). Tergite IV with a median setate protuberance behind a well defined sulcus ..... **cristatus**
   Tergite IV with a median basal protuberance; the segment generally broadly convex ..... **cyranus**
3 (1). Lateral pronotal margin usually with a definite tooth, not crenulate in anterior 1/2; sternite IV with a number of median setae 4
   Entire lateral pronotal margin crenulate; sternite IV lacking long median setae ..... **tuberculatus**
4 (3). Apparent sulcus of tergite IV a median circular depression, flattened or lacking; microsetigerous area small, along basal margin; sternite III apically produced at center as a small tumosity set with a few glandular setae 5
   Sulcus of tergite IV of varying size and shape but always transverse; sternite III neither tumid nor set with glandular setae 6
5 (4). Tergite IV with a small median depression; pronotal teeth blunt; sternite VI medianly depressed ..... **obtusus**
   Tergite IV with a small median depression; pronotal teeth blunt; sternite VI not medianly depressed ..... **curtipennis**
   Tergite IV with at most a small distal flattened area; pronotal teeth acute; sternite VI medianly depressed ..... **acriculus**
6 (4). Mandibular rami with four teeth of which one of the proximal is abruptly larger 7
   Mandibular rami with five to seven teeth, none of which are abruptly larger 8
7 (6). Tempora rounded; small tubercules between vertexal fovea and eye .... **magnidens**
   Tempora angulate; lacking tubercules between vertexal fovea and eye ... **macneilli**
8 (6). Sternite V with few pits, usually less than 6 9
   Sternite V with many pits in a transverse row 10
9 (8). Microsetigerous area of tergite IV straight along basal margin, bilobed, the lobes directed posteriorly; apex of sternite VI emarginate; large species, pronotum over 520 μ in length and width ..... **vellosus**
   Microsetigerous area of tergite IV of uniform thickness and nearly transverse; apex of sternite VI sinuate; species of moderate size, pronotum over 500 μ in length and width ..... **sinifundus**
   Microsetigerous area of tergite IV usually constricted medianly, the lobes pointing forward; apex of sternite VI emarginate; small species, pronotum

about 450 μ in length and width ..... **castaneus**

10 (8). Sternite V with a median, uninterrupted row of pits 11

Sternite V with a row of pits narrow or interrupted medianly .....
..... **interruptus** and **convexus**

11 (10). Pronotal teeth ratio of 0.68–0.70; microsetigerous area 135–180 μ long ... **testaceus**

Pronotal teeth ratio of 0.73–0.76; microsetigerous area 187–217 μ long .....
..... **umbraticus**

Pronotal teeth ratio 0.73–0.74, microsetigerous area over 225 μ long .....
..... **striatus** and **keeni**

Oropus castaneus Casey Figs. 3, 10, 12, 13, 23.

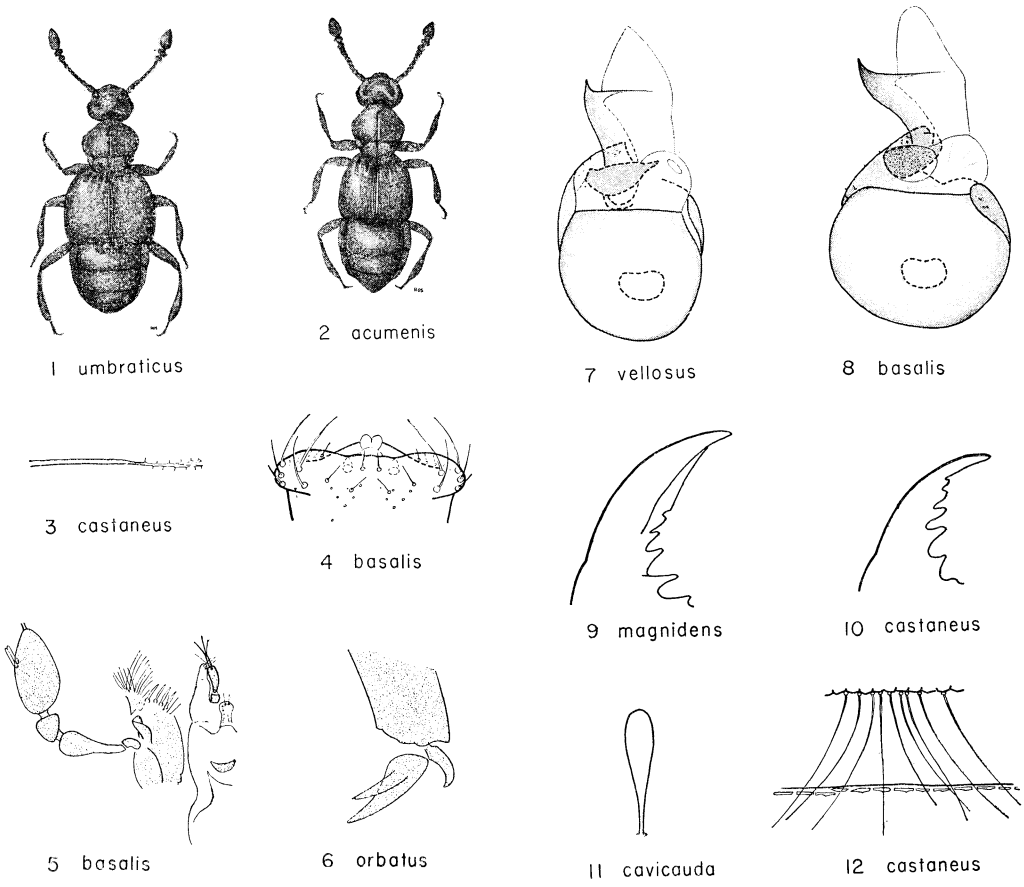
Oropus castaneus Casey, 1908, Canadian Ent. **40** (8): 276.

Male: Head 295 ± 9 μ long × 390 ± 18 μ wide, separation of vertexal foveae 186 ± 6 μ; antenna 714 ± 27 μ long; antennal segment IX 55 ± 2 μ long × 77 ± 2 μ wide; X 63 ± 4 μ long × 91 ± 3 μ wide; XI 177 ± 7 μ long × 109 ± 6 μ wide; pronotum 454 ± 16 μ long × 454 ± 27 μ wide; elytra 599 ± 27 μ long; metatibia 499 ± 18 μ long; second metatarsus 173 ± 9 μ long; aedeagus 154 ± 6 μ wide. [1]

Eyes well developed, 7–10 peripheral facets visible from above; tempora rounded to neck; a number of tubercules may occur mostly in an area around eyes; vertexal foveae on a line behind middle of eyes, about 2 × as far apart as distance from fovea to closest eye margin; apodemes of postantennal foveae irregular, usually not extending to those of vertexal foveae; ventral surface of head set with straight, thick, apically dentate setae, those of gular area pointing forward, dorsal surface with curved setae; right mandibular ramus with 6 teeth, left with 5 or 6; labrum 123 μ wide; lengths of palpus segments; I 18 μ, II 91 μ, III 33 μ, IV 104 μ, with sensory setae 60 μ from base on lateral surface; segment I slightly elbowed, II clavate with 2 or 3 setae in a group past anterior 1/2 and a number of setae distally, III globose, IV terminating in a small palpal cone. Lengths/widths of antennal segments I through VIII: I 136/69 μ, II 73/60 μ, III 46/55 μ, IV through VIII 37/55 μ, segments IX, X and XI with occasional larger setae, those of segments IX and X arising only around the base. Pronotum with longitudinal and transverse sulci normal; pronotal teeth R = 0.70. Winged, 2.75 mm. Elytra with 3 antebasal foveae and striae in addition to sutural and subhumeral foveae; stria II just shorter than III, III extending 3/4 length of elytra; IV just over 1/2 length of III. Mesocoxal cavities contiguous but completely separated by processes of meso- and metasterna. Microsetigerous area of tergite IV slightly bilobed, between 195 μ and 295 μ, averaging 203 μ long, just over 1/2 as wide as segment. Sternite IV with 10 setae arising at anterior margin, setae longer than segment. Sternites II through V with a long recurved seta on each side of center, those of sternite VI near basolateral angles; sternite V with circular marking at median posterior margin; sternite VI emarginate medianly with a smaller emargination on each side. Profemora with a carina 145 μ long at anterior ventral margin with about 12 small setae posterior to the line.

Female: Resembles ♂ except: Eyes smaller, about 5 peripheral facets visible from above; vertexal foveae on a line behind posterior margins of eyes. Brachypterous. Tergite IV lacks sulcus; sternite IV lacking long anterior setae; sternite V with a small trans-

1. n. varied between 18 and 23 specimens from one locality in Marin County.



Figs. 1–12. 1, dorsal aspect of group A ♂; 2, dorsal aspect of group B ♂; 3, seta of ventral surface of head, group A ♂; 4, labrum; 5, maxilla and palpus; 6, tarsal claws of proleg; 7 and 8, dorsal aspect of aedeagi; 9 and 10, left mandibles; 11, spatulate seta; 12, long median setae of ♂ sternite IV.

verse row 90–125 μ long of about 22 pits; sternite VI apically sinuate.

Additional information based on point-mounted specimens: ♂, total length 1.67 mm average, minimum 1.60 mm, maximum 1.79 mm; width 0.66 mm average, minimum 0.61 mm, maximum 0.73 mm. Foveae behind antennal tubercules obvious at 90X; median pronotal sulcus continuous although discreet, deeper areas exist, one at anterior inception and another before transverse sulcus. Transverse sulcus of tergite IV slightly shallower and narrower at center; posterior margin of sulcus seems to form sharp carina when viewed from one position because setae of microsetigerous area stand erect in median 1/3 of sulcus. In lateral view this shows as a distinct fine line arising from the sulcus. Sternite VI slightly depressed distally on each side of middle.

DISTRIBUTION: California: ALAMEDA CO., Hills back of Oakland, 1 ♂ I–9–54 (GM, RS); Oakland, 1 ♂, 2 ♀ IV–15–53 (WB), 1 ♂ X–20–55 (NW), 1 ♀ I–13–56 (NW).

CONTRA COSTA CO., Redwood Park, 1 ♂, 1 ♀ VI–28–53 (EG), 4 ♂, 7 ♀ V–18–53 (EG), 7 ♂, 7 ♀ V–28–53 (EG). DEL NORTE CO., 10 km E of Crescent City, 1 ♀ VII–10–58 (JP); 3 km N of Fort Dick, 1 ♂, 11 ♀ XI–21–53 (VR); 29 km S of Klamath, 1 ♂, 31 ♀ IX–19–53 (EG, RS); Smith River cutoff, 1 ♂, 4 ♀ XI–13–54 (VR). HUMBOLDT CO., 14 km E of Alton, 1 ♂ IX–20–55 (NW), 2 km S of Dyersville, 2 ♂, 21 ♀ VIII–13–53 (GM, RS), 4 ♂, 5 ♀ IX–19–53 (EG, RS); Freshwater, 28 ♂, 34 ♀ VIII–13–53 (GM, RS). MARIN CO., Alpine Lake, 1 ♂ VI–18–53 (CM, RS); Inverness, 4 ♂ XI–8–53 (GM, RS); Samuel P. Taylor State Park, 15 ♂, 16 ♀ X–24–53 (VR), 23 ♂, 39 ♀ XI–1–53 (GM, RS), 14 ♂, 26 ♀ XI–8–53 (EG, GM, RS), 1 ♂ VIII–18–54 (CM, RS), 4 ♂, 5 ♀ XII–13–54 (JH), 1 ♂, 2 ♀ VII–5–56 (EG, NW), 11 ♂, 9 ♀ II–3–58 (JH). MENDOCINO CO., Caspar, 26 ♂, 67 ♀ III–7–54 (JH), 3 ♂, 2 ♀ IX–30–54 (JH), 1 ♀ V–15–55 (JH), 1 ♀ VIII–3–57 (JH); Comptche, 5 ♀ VII–27–54 (JH); Paul M. Dimmik Memorial Grove State Park, 1♂ V–15–55 (JH); Fort Bragg, 2♂, 3♀ VII–3–54 (JH), 3♂ VII–29–54 (JH); 3♂, 5♀ XII–24–54 (JH), 4♂, 9♀ I–5–57 (JH), 1♂, 4♀ VIII–16–57 (JH); Little River, 4♂, 1♀ V–3–55 (JH), 1♂, 3♀ VI–7–55 (JH), 3♂, 2♀ VIII–4–57 (JH), 4♂, 10♀ VIII–10–57 (JH), 6♂, 10♀ I–9–58 (JH), 1♀ I–19–58 (JH); Mendocino, 1♀ VII–19–53 (JH), 1♂ XII–19–53 (JH), 4♂, 13♀ II–14–54 (JH), 1♂, 4♀ III–1–54 (JH), 3♂, 13♀ IV–17–54 (JH), 3♂, 15♀ VII–15–54 (JH), 1♀ X–29–54 (JH), 3♀ XI–1–54 (JH), 1♂ XI–10–54 (JH), 1♀ XI–25–54 (JH), 1♂, 1♀ XI–30–54 (JH), 1♀ XII–19–54 (JH), 11♂, 11♀ I–8–55 (JH), 6♂, 8♀ I–20–55 (JH), 2♂, 5♀ II–23–55 (JH), 1 ♂, 1♀ V–26–55 (JH), 4 ♂ VI–20–55 (JH), 1 ♀ VII–4–55 (JH), 1 ♂ VII–14–55 (JH), 1 ♂, 1 ♀ II–27–57 (JH), 1 ♂ VI–6–57 (JH), 2 ♂, 6 ♀ VII–6–57 (JH, RS), 4 ♂ VII–21–57 (JH), 2 ♂, 2 ♀ VIII–4–57 (JH), 4 ♂, 3 ♀ XI–15–57 (JH), 5 ♂, 7 ♀ II–27–58 (JH), 3 ♂, 2 ♀ III–15–58 (JH). MONTEREY CO., 12 km S of Point Sur, 1 ♀ XII–22–53 (VR), SAN MATEO CO., Crystal Springs Lake, 4 ♂ III–4–55 (EG); Pescadero Creek, 10 km S of Half Moon Bay, 20♂, 10♀ XII–5–53 (VR), 5♂, 6♀ IV–18–54 (EG, RS), 9♂, 8♀ VI–1–57 (RS), 3♂, 1 ♀ VII–21–57 (RS), 2♂, 1♀ IV–26–59 (RS). SANTA CLARA CO., Mount Madonna, 1 ♂, 5♀ I–2–54 (DB). SANTA CRUZ CO., Ben Lomond, 1♀ VII–5–53 (CM); Big Basin, 6 ♂, 25 ♀ XII–23–53 (VR), 7 ♂ III–28–54 (JH); 12 km N of Boulder Creek, 1 ♂, 4 ♀ I–22–55 (DB); 20 km N of Boulder Creek, 2 ♀ I–22–55 (DB); 2 km N of Santa Cruz, 1 ♂ XII–23–53 (VR); Santa Cruz, 7 ♂, 1 ♀ XII–23–53 (VR), 6♂ III–27–54 (JH). SONOMA CO., Kruse Rhododendron Reservation State Park, 19 ♀ X–9–54 (CM, RS), 1 ♂, 3 ♀ II–23–55 (JH). Oregon; COOS CO., Charleston, 2 ♂ X–1–59 (VR).

The collection data accompanying specimens from most of the localities gives redwood litter or rotting redwood logs as the environment sampled. In only one exception, Inverness, the specimens were recovered from litter of *Umbellularia californicus*. Although collection data are not appended to most of the specimens from Alameda County, most were taken from *Sequoia* and *Umbellularia* litter.

The type of *O. castaneus* was not slide-mounted. It agrees well with point-mounted females from the above series. The locality from which the type was collected (Marin County) further indicates that it is properly identified.

The sex ratio is close to 2 ♂ for every 3 ♀, 299 ♂ and 460 ♀ having been examined.

This species is composed of a number of somewhat heterogeneous populations, none of which differ markedly in characters considered to be important for the definition of the

species.

Oropus abbreviatus Casey

Oropus abbreviatus Casey, 1886, Calif. Acad. Sci. Bull. **2** (6) : 200.

This species, described from a ♂ from Sonoma County, can not be recognized on the basis of the original description. From the known distribution of species and the description, it is possible that *O. abbreviatus* was the ♂ of *O. castaneus*. The specimen designated as the type in the U. S. Nat. Mus. is from Fort Gaston, Hoopa Valley, Humboldt County and must be considered a pseudotype. This specimen is a ♂ of *O. umbraticus*, a species of unlikely occurrence in Sonoma County. The type must be presumed lost and the species can not, at present, be identified.

Oropus testaceus Casey Fig. 24.

Oropus testaceus Casey, Canadian Ent. **40** (8) : 274.

Male: (slide) Head 286 μ long×381 μ wide; antenna 704 μ long; pronotum 463 μ long×477 μ wide; elytra 536 μ long; metatibia 499 μ long; aedeagus 150 μ wide.

Eyes well developed, 8–10 peripheral facets; tempora rounded to neck, tubercules not evident posterior to eyes; vertexal foveae on a line just forward of posterior margins of eyes, over 2×as far apart as distance between fovea and eye; postantennal apodemes angular, ending short of vertexal foveae; mandibular rami with 6 teeth; labrum 123 μ wide; lengths of palpus segments: I 18 μ, II 81 μ, III 28 μ, IV 104 μ, with sensory setae 60 μ from base on lateral surface; lengths/widths of antennal segments in microns: I 136/60, II 69/60, III 46/46, IV through VII 37/46, VIII 42/60, IX 46/83, X 55/92, XI 172/104. Pronotum as in *O. castaneus*. Brachypterous. Elytra with stria II 1/5 length of III, III 3/4 length of elytra, IV less than 1/2 length of III. Mesocoxal cavities contiguous but completely separated. Microsetigerous area of tergite IV bilobed, 154 μ long, less than 1/2 width of segment. Sternite IV with 6 long setae; V with a row of pits near anterior margin, distal emargination rounded; VI as in *O. castaneus*.

Female: Resembles ♂ except: Eyes smaller, of 5 or 6 peripheral facets; vertexal foveae on a line behind posterior margin of eyes. Tergite IV lacks sulcus; sternite IV lacking long anterior setae; sternite V with a transverse, multiple row of pits; VI distally sinuate.

DISTRIBUTION: California: ALAMEDA CO., Oakland, 1 ♀ I–28–53 (RS), 1 ♂ X–20–55 (NW). CONTRA COSTA CO., Mount Diablo, 1 ♂ V–18–47 (HC), Redwood Park, 1 ♂ V–28–53 (EG). MARIN CO., Samuel P. Taylor State Park, 3 ♀ XI–1–53 (GM, RS). SAN MATEO CO., Crystal Springs Lake, 1 ♂, 5 ♀ III–4–55 (EG); Pescadero Creek, 10 km SE of Half Moon Bay, 1 ♀ IV–18–54 (EG, RS), 4 ♂ XII–5–53 (VR), 4 ♂, 5 ♀ VI–1–57 (RS); 6 km W of San Mateo, 1 ♀ IV–18–54 (RS). SANTA CLARA CO., Mount Madonna, 1 ♂, 2 ♀ I–2–54 (DB); Stevens Creek, 2 ♂ VI–2–57 (RS). SANTA CRUZ CO., Ben Lomond, 1 ♂ VI–21–53 (CM), 6 ♂, 3 ♀ VII–5–53 (CM), 1 ♂ I–22–55 (DB); Big Basin, 1♀ VI–14–53 (PC), 7♂, 3♀ XII–23–53 (VR), 1♀ III–27–54 (JH); 1♀ III–28–54 (JH); Boulder Creek, 1♂, 2♀ I–22–55 (DB); 19 km N of Boulder Creek, 2♂, 10

♀ I–22–55 (DB); Santa Cruz, 2 ♀ III–27–54 (JH).

Only 3 of these localities were definitely samples of redwood litter. They were Samuel P. Taylor State Park, Pescadero Creek and Mount Madonna. Two samples, Mount Diablo and Stevens Creek, could not have been redwood litter and were probably *Umbellularia* or *Quercus* sp. The sample from 19 km N of Boulder Creek consisted of mixed oak and madroño litter.

There is, actually, very little difference between the ♂ of *O. testaceus* and *O. castaneus*. The sulcus of tergite IV of *O. castaneus* varies from moderately shallow to very deep, the microsetigerous area from 195 μ to 245 μ. Pitting of sternite V is usually lacking, however, up to 3 pits occur on some individuals. In *O. testaceus*, the sulcus varies from obsolete to moderately deep, the microsetigerous area from 136 μ–216 μ. The pitting of sternite V ranges from 6 to about 40. Males of *O. castaneus* are winged, those of *O. testaceus* are frequently brachypterous. The ♀ of *O. castaneus* have a row of pits in a nearly straight line on sternite V, those of *O. testaceus* have a wider area of pitting, the pits being in multiple rows. The antennal funicle of *O. testaceus* tends to be somewhat narrower, and the elytral striae II and IV are frequently shorter.

Samples of geographically separated population of the two species show minor differences in relations of vertexal foveae to eyes, development of pronotal teeth, strength of elytral striae, shape of mesocoxal apodemes, and development of secondary sex characters. Although the characters which separate these species are not as marked as those distinguishing many other species in the genus, the differences can not be disregarded. Frequent occurrence of the two forms in the same locality necessitates their separation.

We have considered as conspecific populations in which the sulcus of tergite IV varies from moderately deep to nearly obsolete. The holotype is in closest agreement with specimens in which the sulcus is shallow, the microsetigerous area slightly curved, of apparently uniform thickness, and about 165 μ in length.

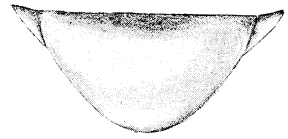
Although *O. testaceus* has been considered to be a distinct species, at least one other possibility should be mentioned. Many pselaphid species have dimorphic ♂. The differences are usually sex-limited and affect size of eyes and wing development. The differences between *O. castaneus* and *O. testaceus* are mainly confined to secondary sex characters, and it is possible that the tendency toward a shallow sulcus with attendant decrease in the microsetigerous area, the tendency toward brachyptery and the presence of a few extra pits on the sterna of both sexes may well be the result of minor genetic variations in occasional specimens of *O. castaneus*. Occurrence of closely related "species pairs" in the same geographical area is a common phenomenon in this genus which probably will not be completely understood until techniques for laboratory breeding have become established.

Oropus sinifundus Schuster and Grigarick n. sp. Fig. 25.

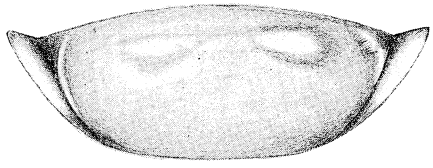
Male: (slide) Head 330 μ long×420 μ wide; antenna 780 μ long; pronotum 510 μ long×510 μ wide; elytra 765 μ long; metatibia 585 μ long; aedeagus 175 μ wide.

Eyes of 8 or 9 peripheral facets; no tubercules behind eyes; tempora rounded to neck; vertexal foveae inner diameter 30 μ, on a line behind middle of eyes, separated by 2× distance from fovea to eye; postantennal apodemes truncate or rounded, ending 30 μ

13 castaneus

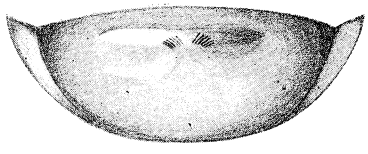


18 cyranus

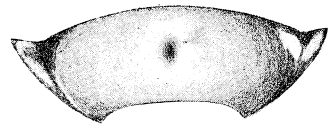


14 vellosus

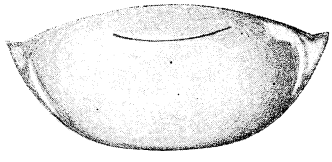
19 tuberculatus



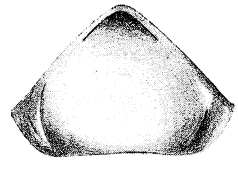
15 cristatus



20 obtusus

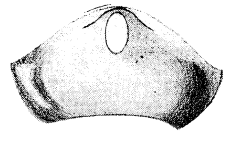


16 interruptus



21 basalis

17 magnidens



22 delimatus

Figs. 13–22. ♂ tergites IV.

short of inner edge of vertexal foveae; mandibular rami with 6 teeth; labrum 115 μ wide; lengths of palpus segments: I 20 μ, II 90 μ, III 35 μ, IV 105 μ with sensory setae 66 μ from base; lengths/widths of antennal segments in microns: I 135/80, II 75/70, III 45/55, IV and V 45/60, VI 45/55, VII 40/60, VIII 35/65, IX 60/90, X 65/105, XI 330/195. Pronotum with moderately developed to prominent, blunt lateral teeth, R=0.68 to 0.73. Winged, 2.95 mm. Elytral stria II 0.5, III 0.6 and IV 0.3 elytra length. Mesocoxal cavities confluent; postcoxal apodemes barely overlap. Tergite IV 480 μ wide, the microsetigerous area 225 μ long, of uniform width with ends slightly curved anteriorly. Sternite IV with 9 long setae; V without pits; VI apically sinuate as would be expected for a ♀.

Female: Seems to be indistinguishable from that of *O. castaneus* except in size.

This species is represented by 5 ♂ collected at Freshwater, Humboldt County, California on 13 Aug. 1953 by G. A. Marsh and R. O. Schuster. Holotype, in CAS; paratypes retained by authors.

The sinuate distal margin of sternite VI and the reduced pitting of sternite V characterize the ♂ of this species.

Oropus umbraticus Schuster and Grigarick n. sp. Figs. 1, 26.

Male: (slide) Head 285 μ long×360 μ wide; antenna 735 μ long; pronotum 475 μ long×480 μ wide; elytra 635 μ long; metatibia 525 μ long; aedeagus 90 μ wide.

Eyes of 8 or 9 peripheral facets; lacking tubercles behind eyes; tempora rounded to neck; vertexal foveae inner diameter 20 μ, located on a line through the posterior 1/4 of eyes, separated by over 2× distance from fovea to eye; postantennal apodemes truncate or slightly rounded, ending 45 μ short of center of vertexal foveae; mandibular rami with 6 or 7 teeth; labrum 120 μ wide; length of palpus segments: I 15 μ, II 90 μ, III 30 μ, IV 115 μ with sensory setae 60 μ from base; lengths/widths of antennal segments in microns: I 105/75, II 65/60, III through VII 37/50, VIII 37/55, IX 55/75, X 60/90, XI 180/105. Pronotal teeth blunt, R=0.73. Winged, 2.70 mm. Elytral stria II 0.37, III 0.75, and IV 0.25 elytra length. Mesocoxal cavities contiguous. Tergite IV 435 μ wide, the microsetigerous area 210 μ long; VI medianly emarginate.

Female resembles ♂ except: Eyes smaller, of 5 or 6 peripheral facets; vertexal foveae on a line behind posterior margin of eyes. Brachypterous. Tergite IV lacking sulcus; sternite IV lacking long setae; V with a transverse multiple row of pits 210 μ long; sternite VI distally sinuate.

Holotype, ♂ (CAS), 3 ♂ and 8 ♀ paratypes, 13 km S of Dunsmuir, Siskiyou County, California, 26 June 1954, B. J. Adelson and R. O. Schuster. Additional paratypes collected at same locality as follows: 2 ♂, 4 ♀ VII-11-54 (EG, RS), 8 ♂, 11 ♀ XI-23-54 (EG, RS). Specimens considered to be conspecific but which were not included in the type series were from 16 km S of Dunsmuir, and from 30 km E of Green Point Ranch, Humboldt County.

The consistent occurrence of a line of pits on sternite V separates this species from *O. castaneus*. It differs from *O. testaceus* by the greater size of the tergal sulcus and microsetigerous area.

Oropus montanus Casey

Oropus montanus Casey, 1887, Calif. Acad. Sci., Bull. **2** (8) : 479.

This species is described from a ♀ of intermediate size, about as large as *O. interruptus* or a larger ♀ of *O. umbraticus*. There is an outside chance that *O. montanus* may be a specimen of the latter species. This can not be determined without the knowledge of characters that can not be seen on the point-mounted type of *O. montanus*.

Oropus striatus LeConte Fig. 27.

Oropus striatus LeConte, 1874, Amer. Ent. Soc., Trans. **5** : 49.

Male: (slide) Head 370 μ long × 480 μ wide; antenna 920 μ long; pronotum 567 μ long × 585 μ wide; elytra 746 μ long; metatibia 635 μ long; aedeagus 185 μ wide.

Eyes with about 9 peripheral facets; lacking tubercules around eyes; vertexal foveae with inner diameter of 25 μ, on a line behind middle of eyes, separated by 2 × distance from fovea to eye; postantennal apodemes rounded except for small terminal point, not attaining those of vertexal foveae; mandibular rami with 7 teeth; labrum 150 μ wide; lengths of palpus segments: I 27 μ, II 104 μ, III 36 μ, IV 123 μ with sensory setae 64 μ from base; lengths/widths of antennal segments in microns: I 165/90, II 73/73, III through VII 45/68, VIII 45/77, IX 77/95, X 82/109, XI 200/135. Pronotal teeth R=0.74. Winged. Mesocoxae contiguous; postcoxal apodemes directed obliquely posterior. Tergite IV 512 μ wide, microsetigerous area 227 μ, with a tendency towards median interruption. Sternite IV with 10 long median setae; V with a row of pits 270 μ long.

Females have not been positively identified and remain undescribed. We have seen only 2 ♂ strictly comparable to the type. One was taken at Stanley Park, Vancouver, B. C. on 29 May 1950 by W. Lazorko, the other at Vancouver, 18 Mar. 1932 by K. Graham. Specimens from localities in Washington and Oregon are smaller, for example up to 40 μ for length and width of pronotum, but otherwise could be considered to be *O. striatus*.

The size, over 2 mm, the bilobed microsetigerous area medianly interrupted or nearly so, and the straight, unbroken line of pits on sternite V characterize this species. Although the sulci of *O. striatus* and *O. keeni* are distinctly different on the point-mounted types of those species, slide-mounted specimens indicate a very close relation between them. The paucity of specimens available from the Pacific Northwest presently prohibits a thorough understanding of these two forms which, seemingly, occur together in much of Washington and Oregon. Females taken with ♂ can not be separated into two distinct groups.

Oropus ? keeni Casey Fig. 28.

Oropus keeni Casey, 1908, Canadian Ent. **40**(8) : 275.

The description of *O. keeni* given below is based on material collected in Washington and Oregon. Although the point-mounted specimens closely agree with the holotype, they are slightly smaller than the specimen from the type locality.

Male: (slide) Head 331 μ long × 436 μ wide; antenna 817 μ long; pronotum 536 μ long × 527 μ wide; elytra 659 μ long; metatibia 590 μ long; aedeagus 182 μ wide.

Eyes with about 9 peripheral facets; no tubercules around eyes; vertexal foveae with inner diameter of 27 μ, on a line behind middle of eyes, separated by over 2 × the dis-

tance from fovea to eye; postantennal apodemes rounded, not attaining those of vertexal foveae; mandibular rami with 6 or 7 teeth; labrum 127 μ wide; lengths of palpus segments: I 27μ, II 91 μ, III 33μ, IV 114μ with sensory setae 68μ from base; lengths/widths of antennal segments in microns: I 145/77, II 77/68, III through VII 45/54, VIII 45/59, IX 59/82, X 68/91, XI 195/114. Pronotal teeth R = 0.74. Brachypterous. Mesocoxae contiguous; postcoxal apodemes large, directed obliquely posterior. Tergite IV 486 μ wide, the microsetigerous area 232 μ long, slightly bilobed. Sternite IV with 7 long median setae; V with a row of pits 154 μ long.

Female: Without characters of tergite and sternite IV; sternite V with a row of pits 309 μ long, pits more numerous laterally; VI distally sinuate, inner margin of border relatively straight.

DISTRIBUTION: Oregon: CLATSOP CO., Seaside, 4 ♂ IV–7–55 (VR). CURRY CO., Saddle Mountain, 2♂ VI–5–55 (VR); Cape Sebastian State Park, 1♂ VI–29–59 (LS). DOUGLAS CO., Loon Lake, 1♂ VI–30–59 (LS), 13 km N of Loon Lake, 1♂ VII–5–59 (LS). LINN CO., Berlin, 1♂ IV–23–54 (VR). TILLAMOOK CO., 11 km N of Garibaldi, 6♂, 2♀ III–15–55 (VR). Washington: GREYS HARBOR CO., 6 km N of Amanda Park, 2♂, 1♀ VII–9–59 (LS). JEFFERSON CO., 3 km N of Brinnon, 1♂ VII–7–59 (LS).

The shallow sulcus with its microsetigerous area of nearly uniform thickness is characteristic of this species. The ♂ can be either winged or brachypterous.

Oropus brevipennis Casey

Oropus brevipennis Casey, 1908, Canadian Ent. **40** (8): 275.

This name probably applies to ♀ of *O. keeni.*

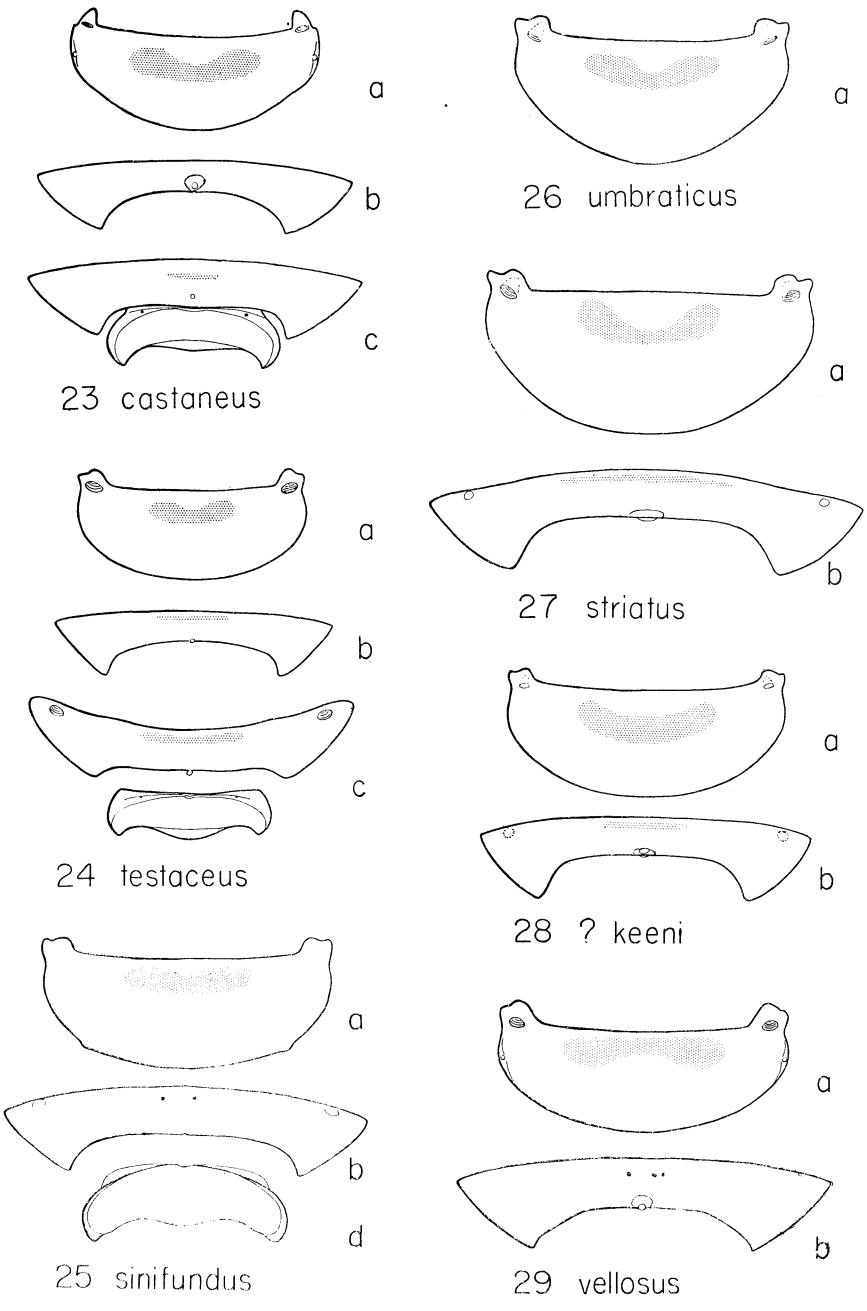
Oropus vellosus Schuster and Grigarick n. sp. Figs. 7, 14, 29.

Male: (slide) Head 368 μ long × 477 μ wide; antenna 863 μ long; pronotum 527 μ long × 527 μ wide; elytra 726 μ long; metatibia 608 μ long; aedeagus 159 μ wide.

Eyes of about 10 peripheral facets; tempora weakly rounded, slightly angulate; inner diameter of vertexal foveae 33 μ, on a line behind middle of eyes, separated by 2 × distance from fovea to eye; apodemes of postantennal foveae not reaching those of vertexal foveae; mandibular rami with 6 teeth; labrum 154 μ wide; length of palpus segment: I 23 μ, II 104 μ, III 36 μ, IV 99 μ, with sensory setae 59 μ from base; lengths/widths of antennal segments in microns: I 163/91, II 82/77, III through VIII approximately 50/64, IX 64/95, X 73/104, XI 204/123. Pronotal teeth large, triangular, R=0.68. Winged, 2.90 mm. Elytra with stria II 0.38, III 0.68 and IV 0.38 elytra length. Mesocoxal cavities apparently confluent; postcoxal apodemes directed slightly posterior, overlapping. Tergite IV 499μ wide, microsetigerous area 295 μ long, bilobed, widest each side of middle. Sternite IV with 7 long median setae; V with 3 random pits; VI distally grossly uni-emarginate, the lateral emarginations small and obscure, the center part medianly interrupted, shallowly sinuate.

Additional description from point-mounted specimens: ♂ about 2.01 mm long; elytra 697 μ long × 836 μ wide; eyes contain about 40 facets.

The holotype, (CAS), Petrified Forest, Sonoma County, California, 21 Nov. 1953, J. R.



Figs. 23–29. Abdominal segments: a, ♂ tergites IV; b, ♂ sternite V; c, ♀ sternite V or V and VI; d, ♂ sternite IV.

Helfer. One paratype was collected at same time and one from near Mark West Springs, Sonoma County on same date by Mr. Helfer; paratypes retained by authors. Female unknown.

The pronotal teeth are large and acute as in *O. interruptus*. The moderately deep sulcus appears to be nearly transverse and microsetigerous area distinctly bilobed. These latter characters distinguish this species from *O. interruptus*.

Oropus cristatus Schuster and Grigarick n. sp. Figs. 15, 30.

Male: (slide) Head 359 μ long × 445 μ wide; antenna 908 μ long; pronotum 495 μ long × 508 μ wide; elytra 645 μ long; metatibia 613 μ long; aedeagus 150 μ wide.

Eyes of about 10 peripheral facets; tempora rounded to neck; no tubercules posterior to eyes; vertexal foveae with inner diameter of 32 μ, on a line behind middle of eyes, just over 2× as far apart as from fovea to eye; postantennal apodemes rounded, extending only 1/2 way to those of vertexal foveae; mandibular rami with 7 teeth; labrum 136 μ wide; lengths of palpus segments: I 32 μ, II 95 μ, III 32 μ, IV 123 μ with sensory setae 77 μ from base; lengths/widths of antennal segments in microns: I 173/82, II 78/78, III 56/56, IV 55/59, V 55/55, VI 50/55, VII 50/59, VIII 50/64, IX 77/82, X 86/91, XI 200/109. Pronotum with moderately large, subacute lateral teeth, R = 0.72. Winged, 2.67 mm. Elytral stria II 0.43, III 0.78, and IV 0.43 elytral length. Mesocoxal cavities contiguous; postcoxal apodemes transverse, scarcely overlapping. Microsetigerous area of tergite IV interrupted medianly, 232 μ long, located near base of segment; a large median tubercle bearing a number of setae directed obliquely forward occurs behind the sulcus. Sternite IV has 6 elongate setae medianly; V has a small median cluster of pits.

Additional description from point-mounted specimen: Eyes contain about 40 facets; longitudinal pronotal sulcus shallow but entire; total length 1.96 mm; width 0.78.

Holotype, ♂(CAS), 11 km E of Rutherford, Napa County, California, 6 Jan. 1959, R. O. Schuster. Female unknown.

The setate tubercule of tergite IV is unique and easily separates this species from any other *Oropus*.

Oropus interruptus Casey Figs. 16, 31.

Oropus interruptus Casey, 1886, Calif. Acad. Sci. Bull. 2 (6): 199.

Male: (slide) Head 341 μ long×418 μ wide; antenna 850 μ long; pronotum 499 μ long×513 μ wide; elytra 681 μ long; metatibia 590 μ long; aedeagus 136 μ wide.

Eyes of about 9 peripheral facets; tempora rounded to neck; inner diameter of vertexal foveae 30 μ, on a line through middle of eyes, separated by over 2× distance from fovea to eye; apodemes of postantennal foveae cuneiform, ending shortly before those of vertexal foveae; mandibular rami with 5 or 6 teeth; labrum 136 μ wide; lengths of palpus segments: I 20 μ, II 104 μ, III 33 μ, IV 104 μ with sensory setae 50 μ from base. Antennal segments lengths/widths in microns: I 159/86, II 77/73, III through VII approximately 45/59, VIII 36/68, IX 64/91, X 68/100, XI 218/118. Pronotum with prominent, triangular lateral teeth, R = 0.75. Winged. Elytral stria II 0.53, III 0.70, and IV 0.40 elytra length. Mesocoxal cavities contiguous; postcoxal apodemes directed slightly to posterior, overlapp-

ing. Tergite IV 409 μ wide, microsetigerous area gently curved, of uniform width, 191 μ long. Sternite IV with 6 long setae; V with a multiple row of pits 254 μ long, medianly interrupted.

Female: Resembles ♂ except: Head slightly wider; pronotum, elytra and metatibia slightly shorter; eyes of 6–8 peripheral facets. Brachypterous. Sternite IV lacking median setae; V with a row of pits narrowed medianly; VI with posterior margin sinuate, the border of uniform width.

Specimens comparable to the *O. interruptus* type have been collected at Mendocino, Little River, Faulkner Park and Rockport, Mendocino County and at Prairy Creek and Alton in Humboldt County.

A few specimens have been collected in northern Humboldt County and in Del Norte County, California, in which the sulcus is more pronounced and attendant minor differences can be seen on slide-mounts. The relation of these specimens is not clear from the limited material now available, but they may represent a different species replacing *O. interruptus* in the extreme northern part of California.

Specimens of this species, point-mounted, average 1.97 mm long with a minimum of 1.88 mm and a maximum of 2.04 mm. Elytra average 664 μ long and 773 μ wide. The nearly obsolete sulcus and barely perceptible microsetigerous area of ♂ distinguish this species.

Oropus convexus Casey

Oropus convexus Casey, 1908, Canadian Ent. **40** (8): 274.

Male: (point-mounted holotype) Head 435 μ wide; pronotum 492 μ long×492 μ wide; elytra 681 μ long; total length 2.04 mm.

The type of *O. interruptus* was collected at Fisks Mill, Sonoma County and the type of *O. convexus* was from Sonoma Co., presumably, although the label is one not included in Casey's list of localities. We have examined specimens of these species from Mendocino County. Slide-mounted ♂ agreeing with the type of *O. interruptus* are nearly indistinguishable from those agreeing with the type of *O. convexus*. Measurement of 11 characters on the 2 holotypes were made. Those of the pronotal length, elytral length, antennal club and funicle were exactly the same. Measurements for other characters, all over 400 μ did not vary by more than ±20 μ, or approximately 1 standard deviation.

The type of *O. convexus* differs from the type of *O. interruptus* in the following respects. The head is 0.01 mm wider and pronotum 0.02 mm narrower. The pronotal teeth of *O. convexus* are smaller and blunter and the specimen, dorsoventrally, is only 7/8 as thick as *O. interruptus*. The tergal sulcus of *O. interruptus* is a bit wider and the microsetigerous area but weakly visible. In *O. convexus* the sulcus shows a definite microsetigerous area.

Oropus magnidens Schuster and Grigarick n. sp. Figs. 9, 17, 32.

Male: (slide) Head 285 μ long×375 μ wide; antenna 645 μ long; pronotum 450 μ long×450 μ wide; elytra 600 μ long; metatibia 510 μ long; aedeagus 165 μ wide.

Eyes of 7 or 8 peripheral facets; a number of small tubercules present around eyes; tempora rounded to neck; inner diameter of vertexal foveae 15 μ, on a line behind mid-

dle of eyes, separated by over 2× distance from fovea to eye; postantennal apodemes cuneiform, ending short of those of vertexal foveae; mandibular rami with 4 teeth; labrum 128 μ wide; lengths of palpus segments: I 15 μ, II 107 μ, III 31 μ, IV 117 μ with sensory setae 56 μ from base; lengths/widths of antennal segments in microns: I 102/71, II 61/63, III 87/56, IV and V 41/61, VI 41/66, VII and VIII 46/66, IX 45/70, X 45/90, XI 165/105. Pronotal teeth minute, blunt, R=0.67. Winged, 2.55 mm. Elytral stria II 0.38, III 0.46, IV 0.38 elytral length. Mesocoxal cavities contiguous; postcoxal apodemes transverse, barely overlapping. Tergite IV 434 μ wide, the microsetigerous area 204 μ long, bilobed with lobes curved anteriorly. Sternite IV with 5 long setae; V with a multiple row of pits 270 μ long.

Female: Resembles ♂ except: Eyes smaller, of about 4 peripheral facets; vertexal foveae on a line behind posterior margin of eyes. Brachypterous, 365 μ. Tergite IV lacking sulcus; sternite V 522 μ wide, the multiple row of pits 272 μ long; VI medianly extending past the basolateral margin.

Holotype, ♂ (CAS), Seaside, Clatsop County, Oregon, 7 Apr. 1955, V. D. Roth. Two ♂ and one ♀ paratypes, same data. Four ♀, considered to be conspecific but not included in the type series, Saddle Mountain, Clatsop County, Oregon, 5 June 1955, Roth.

Unique ♂ of related populations have been collected at Gold Beach, Curry County, Gates, Marion County, and Loon Lake, Douglas County, Oregon.

The tendency for the third and fourth teeth of the mandibular rami to be abruptly larger, tubercules on head, rounded tempora and small pronotal teeth serve to distinguish this species.

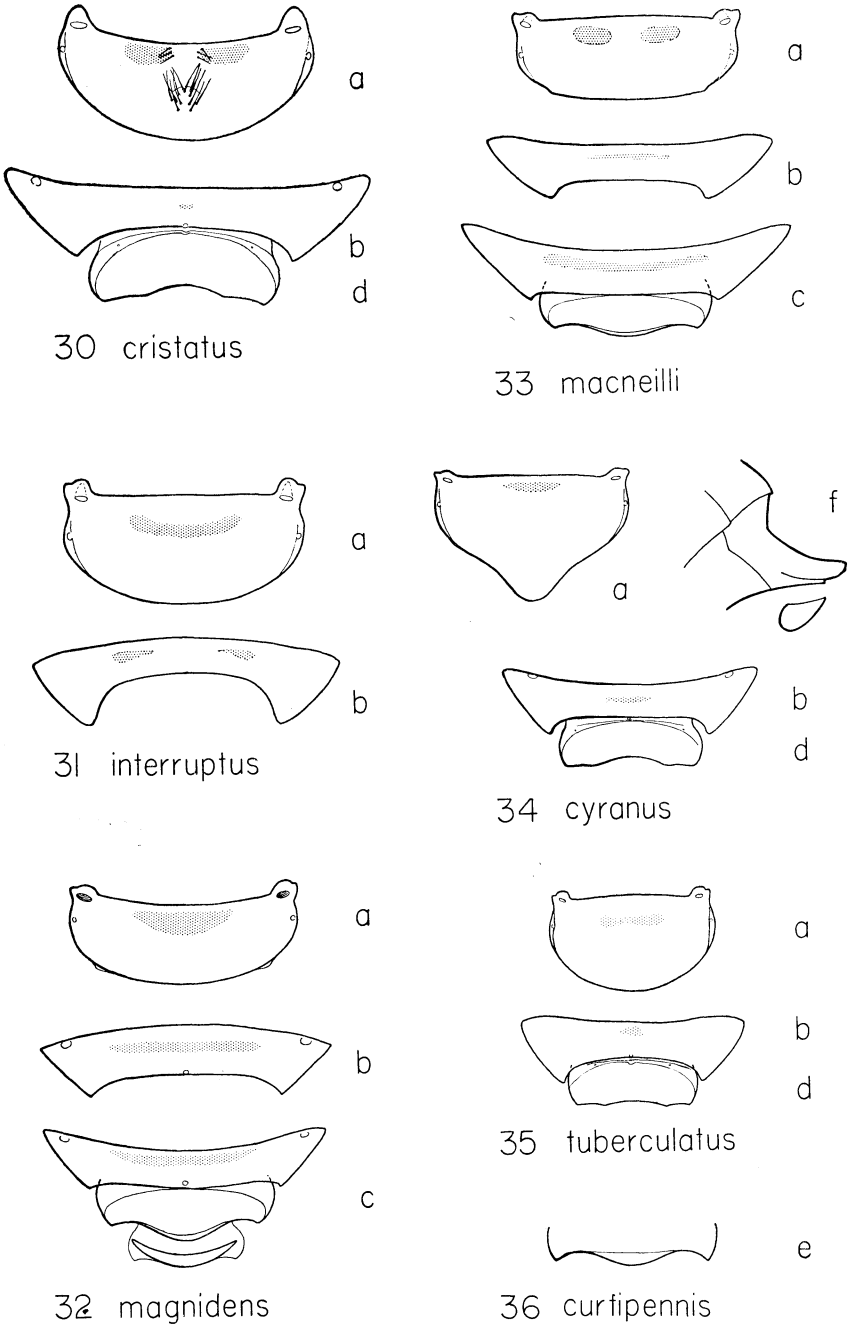
Oropus macneilli Schuster and Grigarick n. sp. Fig. 33.

Male: (slide) Head 270 μ long×350 μ wide; antenna 510 μ long; pronotum 405 μ long×445 μ wide; elytra 525 μ long; metatibia 415 μ long; aedeagus 120 μ wide.

Eyes of 6 or 7 peripheral facets; tempora angled to neck; tubercules present by anteroventral margin of eyes; vertexal foveae 20 μ in diameter, on a line through middle of eyes, over 2× as far apart as distance from fovea to eye; postantennal apodemes rounded, ending 7 μ short of vertexal foveae; mandibular rami with 4 teeth, proximal tooth 2 largest and separated from others; labrum 110 μ wide; lengths of palpus segments: I 18 μ, II 78 μ, III 30 μ, IV 85 μ with sensory setae 55 μ from base; lengths/widths of antennal segments in microns: I 100/67, II 52/60, III through VII approximately 32/45, VIII 32/52, IX 45/68, X 50/76, XI 150/90. Pronotal teeth small, blunt, R=0.75. Winged. Mesocoxal cavities contiguous; postcoxal apodemes transverse. Tergite IV with microsetigerous area 157 μ long, interrupted medianly, located on basal 1/4 of segment. Sternite IV with 5 long setae; V with a transverse row of pits 155 μ long.

Female: As described for ♂ except: Eyes smaller, of 4 or 5 peripheral facets; vertexal foveae on a line through posterior margin of eyes. Brachypterous. Tergite IV lacking sulcus. Sternite V with a transverse, multiple row of pits 300 μ long; VI distally sinuate.

Holotype, ♂ (CAS), Alpine Lake, Marin County, California, 18 June 1953, C. D. MacNeill and R. O. Schuster; ♀, same data. A ♂ from Mendocino, Mendocino County, is considered to be conspecific but is not included in the type series.



Figs. 30-36. Abdominal segments: a, ♂ tergites IV; b, ♂ sternite V; c, ♀ sternite V or V and VI except figure 32 in which VII is included; d, ♂ sternite VI; e, apex of sternite VI of ♀; f, lateral aspect of tergite IV.

This species is closely related to *O. magnidens* from which it differs in the following respects: The pronotal teeth are larger, tempora broadly rounded-angulate, and depression of tergite I of unusual form in that the foveae of the lateral apodemes are, or nearly are, obscured by the lateral margins of the depression.

Oropus cyranus Schuster and Grigarick n. sp. Figs. 18, 34.

Male: (slide) Head 282 μ long × 363 μ wide; antenna 658 μ long; pronotum 390 μ long × 400 μ wide; elytra 499 μ long; metatibia 454 μ long; aedeagus 135 μ wide.

Eyes of 7 to 9 peripheral facets; tempora angled to neck; tubercules small and sparse behind eyes; vertexal foveae on a line through middle of eyes and 2× as far apart as distance from fovea to eye; postantennal apodemes not attaining those of vertexal foveae; mandibular rami with 4, possibly 5, teeth; labrum 114 μ wide; lengths of palpus segments: I 18 μ, II 77 μ, III 33 μ, IV 100 μ, the lateral sensory setae not visible; lengths/widths of antennal segments in microns: I 127/54, II 59/54, III 45/35, IV through VI approximately 36/36, VII and VIII 36/45, IX 59/64, X 68/77, XI 163/100. Pronotal teeth small, blunt, unequal; basolateral margin crenulate; R=0.73. Winged, 2.25 mm. Mescoxal cavities contiguous; postcoxal apodemes transverse, slightly overlapping. Microsetigerous area of tergite IV restricted to lateral edges of a basal integumental projection; distal portion of tergite IV fringed with numerous setae, those of median area pointing obliquely towards base. Sternite IV has 6 long setae; V with a transverse row of pits 68 μ loug.

Holotype, ♂ (CAS) labelled Mokel Hill, Calaveras Country, California, F. E. Blaisdell (probably from Mokelumne Hill located a few km N of San Andreas). Female unknown.

Although related to the two preceding species in many respects, the highly modified tergite IV allows immediate recognition of this species, even from a point-mounted specimen.

Oropus tuberculatus Schuster and Grigarick n. sp. Figs. 19, 35.

Male: (slide) Head 277 μ long × 327 μ wide; antenna 590 μ long; pronotum 363 μ long × 363 μ wide; elytra 454 μ long; metatibia 386 μ long; aedeagus 91 μ wide.

Eyes of 8 or 10 peripheral facets; tempora broadly rounded-angulate, set with tubercules as is the entire head; vertexal foveae with an inner diameter of 14 μ, on a line through middle of eyes, separated by slightly over 2× distance from fovea to eye; postantennal apodemes short, rounded, extending about 1/2 way to those of vertexal foveae; right mandibular ramus with 5 and left ramus with 3 teeth; labrum 100 μ wide; lengths of palpus segments: I 14 μ, II 68 μ, III 33 μ, IV 77 μ; lengths/widths of antennal segments in microns: I 123/50, II 59/45, III through VI approximately 27/27, VIII 33/45, IX 54/68, X 64/73, XI 150/91. Pronotal integument bearing numerous tubercles, those along margin giving it a crenulate appearance; the basolateral teeth nearly obsolete, R= 0.75. Winged, ±2.0 mm. Elytral stria II and IV not evident, III strong, 0.60 elytra length. Mesocoxal cavities contiguous; postcoxal apodemes directed transversely forward. Tergite IV 291 μ wide, the microsetigerous are a slightly narrowed medianly, 118 μ long; sternite IV without median setae; V with a central clump of about 12 pits.

Holotype, ♂ (CAS), 22 km E of Briceburg, Mariposa County, California, 12 Mar. 1955, R. O. Schuster. Female unknown.

This species belongs in *Oropus* but it does agree in many respects with the California species of *Rhexidius* (the tuberculate nature of head and pronotum, reduced pronotal teeth and crenulate anteriolateral margin of pronotum). It is related to the 3 preceding species.

Oropus obtusus Schuster and Grigarick n. sp. Figs. 20, 37.

Male: (slide) Head 263 μ long × 368 μ wide; antenna 636 μ long; pronotum 409 μ long × 427 μ wide; elytra 499 μ long; metatibia 418 μ long; aedeagus 123 μ wide.

Eyes of about 10 peripheral facets; tempora rounded to neck; a few tubercules may be present behind eyes; vertexal foveae with inner diameter of 15 μ, on a line behind middle of eyes, over 2× as far apart as distance between fovea and eye; postantennal apodemes rounded or cuneiform, not attaining vertexal foveae; each mandibular ramus with 6 teeth; labrum 104 μ wide; length of palpus segments: I 23 μ, II 77 μ, III 27, IV 91 μ; lengths/widths of antennal segments: I 123/64, II 59/59, III through V about 36/45, VI through VIII slightly wider, IX 45/68, X 54/86, XI 159/114. Pronotal teeth blunt, R= 0.73. Winged, ±2.20 mm. Elytral stria II 0.36, III 0.64, IV 0.36 elytra length. Mesocoxal cavities contiguous. Microsetigerous area of tergite IV 140 μ long, slightly over 1/3 segment width. Sternite III with a median area of glandular setae distally; IV with 8 long setae; V with a basal transverse row of pits 182 μ long (to 227 μ on other specimens); VI with a median basal pattern projecting for 1/3 segment length.

Female: Resembles ♂ except: Eyes have approximately 5 peripheral facets; vertexal foveae on a line with rear margin of eyes; elytra slightly shorter. Brachypterous, 726 μ. Mesocoxal cavities may be confluent; tergite IV lacking microsetigerous area; sternite III without glandular setae; IV with no long setae; transverse row of pits of sternite V 304 μ long.

Additional description from point-mounted specimens: Males with eyes of about 40 facets; microsetigerous area of tergite IV not visible and the sulcus consists of a small median depression; tergite VI medianly impressed. Eyes of ♀ having about 20 widely spaced facets; tergite IV impressed medianly as in ♂; sternite VI with a small, deep, median impression.

Holotype, ♂ (CAS), 13 km S of Dunsmuir, Siskiyou County, California, 11 July 1954, E. E. Gilbert and R. O. Schuster. Paratypes: 7 ♂, 10 ♀ same data as holotype, 5 ♂, 16 ♀ XI–23–54 (EG, RS), 3 ♂, 1 ♀ VI–26–54 (BA, RS). Specimens from 18km E of Douglas City, Trinity County, California are probably conspecific but are not included in type series.

Males and ♀ from coastal localities which we have associated with the *O. curtipennis* type do not have a medianly impressed sternite VI. Both sexes of *O. obtusus* show this character. Females agreeing with Casey's type collected from localities in Del Norte County have, at the apex of sternite VI, a thick elongate border, the inner margin of which is a nearly straight line. In *O. obtusus* this border is narrow, the inner margin of uniform distance from the outer which is sinuate.

Oropus curtipennis Casey Fig. 36.

Oropus curtipennis Casey, 1908, Canadian Ent. **40** (8): 275.

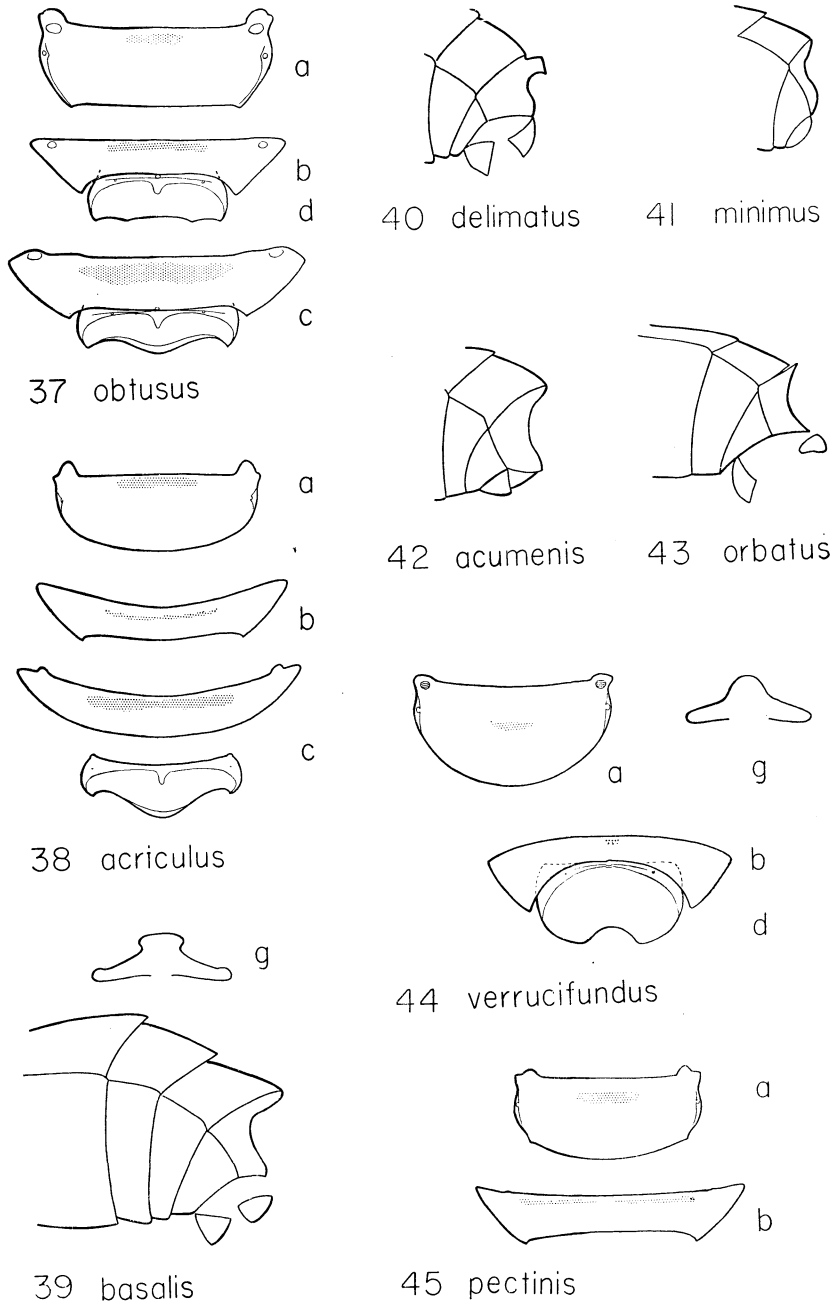


Fig. 37–45. Abdominal segments: a, ♂ tergite IV; b, ♂ sternite V; c, ♀ sternite V or V and VI; d, ♂ sternite VI; g, median impression of tergite I; 39 through 43, lateral aspect of ♂ abdomen.

We have seen 2 ♀ from Del Norte County which appear to be identical with the *O. curtipennis* type from Humboldt Co. From these we have taken the characters mentioned in the discussion of *O. obtusus*.

Oropus acriculus Schuster and Grigarick n. sp. Fig. 38.

Male: (slide) Head 263 μ long×372 μ wide; antenna 680 μ long; pronotum 418 μ long×402 μ wide; elytra 508 μ long; metatibia 445 μ long.

Eyes of about 8 peripheral facets; tempora rounded-angulate to neck; a few minute tubercules around eyes; vertexal foveae inner diameter 18 μ, on a line behind middle of eyes, over 2× as far apart as distance from fovea to eye; apodemes of postantennal foveae cuneiform, not attaining those of vertexal foveae; mandibular rami with 7 or 8 teeth; labrum 104 μ wide; lengths of palpus segments: I 23 μ, II 77 μ, III 33 μ, IV 90 μ; lengths/widths of antennal segments in microns: I 122/64, II 64/59, III 36/41, IV through VI 36/45, VII and VIII 36/50, IX 55/77, X 55/82, XI 163/109. Pronotal teeth acute, curved to rear, R=0.69. Winged, 1.90 mm. Elytral striae not clear. Mesocoxal cavities contiguous; postcoxal apodemes directed posteriorly, abutting. Tergite IV 350 μ wide, microsetigerous area 154 μ long. Sternite III with about 20 glandular setae medianly at distal margin; IV with 5 long median setae; V with a row of pits 200 μ long; VI without protruding median elongation of basal border.

Female: Resembles ♂ except: Eyes of approximately 5 peripheral facets. Brachypterous, 770 μ. Lacking microsetigerous area; sternite III without median glandular setae; IV lacking long median setae; V with transverse row of pits 300 μ long; VI medianly extending past lateral apical angles, apex sinuate, with border of uniform thickness.

Holotype, ♂ (CAS), 29 km NE of California Hot Springs, Tulare County, California, 12 June 1956, N. A. Walker. Paratype ♀ same data retained by authors.

A ♂ and 2 ♀ taken 2 km E of Camp Nelson, Tulare County, are possibly also *O. acriculus*. However, they differ from the described form in a number of particulars. The ♂ of *O. acriculus* is winged and has slightly smaller eyes than the ♂ from Camp Nelson which is brachypterous. The ♀ associated with ♂ of *O. acriculus* has a depression in sternite VI following shape of segment. This depression is median and quite circular in the ♀ associated with the brachypterous ♂. Possibly one species exists with alate and brachypterous ♂, or two nearly identical species occur within the same geographical area. There are not sufficient specimens or localities represented at present from which to draw a conclusion.

The described form can easily be told from *O. obtusus* and *O. curtipennis* by the recurved pronotal teeth.

Key to males of group B

Group B contains species in which tergite I has a length to width ratio of 0.65 or greater and a ratio of the lengths of tergite I to tergite II of 1.85 or greater. These values for group A are 0.60 or less for the former and 1.55 or less for the latter. Tergite IV of ♂ is concave with the median basal area normally developed into a spine, arch shaped or blunt projection.

1. Post-mesocoxal foveae and apodemes present; sternite VI broadly and shallowly emarginate distally with sternite VII inconspicuous..... 2
Post-mesocoxal foveae and apodemes lacking; sternite VI deeply emarginate distally, the opening filled by the large, tumid sternite VII..... **verrucifundus**

2 (1). Eyes well developed 3
Eyes reduced to a single facet ..... **orbatus**

3 (2). Elytron with sutural and 3 discal foveae 4
Elytron with sutural and 2 discal foveae ..... **minimus**

4 (3). Development of tergite IV with simple setae at apex 5
Development of tergite IV with spatulate setae..... **cavicauda**

5 (4). Median area of depression of tergite I over 1/3 total width of depression 6
Median area of depression of tergite I less than 1/3 width of depression..... **basalis**

6 (5). Apex of development of tergite IV small with relatively few setae or obviously transverse..... 7
Apex of development of tergite IV a slightly longitudinal spongeous area set with hundreds of setae ..... **delimatus**

7 (6). Tergite IV with a median basal development 8
Tergite IV with a transverse microsetigerous area, setae much longer than width of their insertion area ..... **pectinis**

8 (7). Tergite IV with a small basal development and few setae; tergite III modified to accommodate IV ..... either **fenderi** or a new species[1]
Tergite IV with a large crescent shaped development, its entire apex set with setae; distal margin of tergite IV with 3 or 4 rows of large, flattened setae... ..... **acumenis**

Oropus basalis Casey Figs. 4, 5, 8, 21, 39.

Oropus basalis Casey, 1908, Canadian Ent. **40** (8): 276.

Male: (slide) Head 263 μ long×372 μ wide; antenna 705 μ long; pronotum 427 μ long×431 μ wide; elytra 517 μ long; metatibia 468 μ long; aedeagus 127 μ wide.

Eyes well developed, about 10 peripheral facets visible from above; tempora rounded to neck; no tubercles evident posterior to eyes; vertexal foveae with inner diameter of 23 μ, on a line with posterior margin of eyes, separated by over 2 × distance from fovea to eye; postantennal apodemes irregular, attaining those of vertexal foveae; each mandibular ramus with 5, 6, or 7 teeth; labrum 104 μ wide; lengths of palpus segments: I 18 μ, II 77 μ, III 27 μ, IV 100 μ with sensory setae 54 μ from base; lengths/widths of antennal segments in microns: I 136/54, II 64/50, III 45/45, IV and V 36/45, VI 33/45, VII 36/45, VIII 36/50, IX 59/73, X 68/91, XI 154/123. Pronotal teeth moderate, subacute, R=0.69; rugose in a narrow area along the posterior margin. Winged, 1.85 mm. Elytral striae II and III 0.70 length of elytra, IV about 1/4 as long. Mesocoxal cavities contiguous; postcoxal apodemes directed transversely, overlapping. Tergite I 318 μ long×508 μ wide; II

1. *Oropus debilis* Casey and *O. fenderi* Park are not included in this key. *Oropus debilis* keys to couplet 8 but does not fit either dichotomy. *Oropus fenderi* keys to the first dichotomy of couplet 8 as does an apparently undescribed species from N. California.

159 μ long; median impression of I very narrow apically, about 65 μ; setae of median basal development of tergite IV simple, other setae not set on tubercules; sternite IV lacking median setae; V with few or no pits, deeply emarginate distally.

Female: Resembles ♂ except: Eyes smaller, of about 6 peripheral facets. Brachypterous, 340 μ. Tergite IV evenly convex; sternite V with a basal, multiple row of pits; VI medianly reaching or surpassing basolateral angles.

DISTRIBUTION: California: SAN MATEO CO., Pescadero Creek, 10 km SE of Half Moon Bay, 1 ♂ VI–1–57 (RS-redwood). SANTA CLARA CO., Mount Madonna, 2♂, 3♀ I–22–54 (DB). SANTA CRUZ CO., Carmel, 1♂ II–23–57 (GM-monterey cypress); Ben Lomond, 3♂, 3♀ VI–21–53 (CM-redwood); 12 ♂, 15 ♀ VII–5–53 (CM-redwood), 1 ♂, 1 ♀ I–22–55 (MW).

The extremely narrow anterior portion of the median impression of tergite I identifies both ♂ and ♀ of this species. The integumental development of tergite IV of ♂ is quite large, and when viewed from rear, its median part is somewhat concave with lateral margins bevelled and minutely punctate. This species is similar to, but larger than, *O. cavicauda*.

Oropus cavicauda Casey Fig. 11.

Oropus cavicauda Casey, 1893, Coleop. Notices **5**: 448.

We have not seen slide-mounted specimens of this species from Marin County, the type locality. A specimen from 3 km W of Oakville, Napa County, is considered conspecific and described as follows:

Male: (slide) Head 225 μ long×330 μ wide; pronotum 376 μ long×376 μ wide; elytra 430 μ long; metatibia 416 μ long; aedeagus 115 μ wide.

Eyes of 8 or 9 peripheral facets; a few small tubercles around eyes; vertexal foveae on a line with rear margin of eyes, 13 μ in diameter, separated by 2× distance from fovea to eye; postantennal apodemes attaining those of vertexal foveae; mandibular rami with 6 or 7 teeth; labrum 99 μ wide; lengths of palpus segments: I 19 μ, II 60 μ, III 26 μ, IV 80 μ with sensory setae 46 μ from base; lengths/widths of antennal segments in microns: I 110/59, II 53/46, III through VII approximately 33/39, VIII 30/46, IX 39/59, X 53/79, XI 139/99. Pronotal teeth small, blunt, R=0.75; pronotum rugose in area behind transverse sulcus. Brachypterous, 660 μ. Elytral striae not clear on slide. Mesocoxal cavities contiguous; postcoxal apodemes transverse, overlapping. Tergite I 283 μ long×448 μ wide; II 158 μ long; median impression of I 92 μ wide; tergite IV with setae at apex of basal development thin, flattened, the other setae not set on tubercules, distal margin with 3 or 4 rows of larger setae. Sternite IV lacking elongate median setae; V with a transverse row of pits 140 μ long.

In addition to the slide-mounted specimen described, we have seen specimens agreeing with the type from the following localities: CONTRA COSTA CO., Redwood Park, 2 ♂ V–28–53 (EG). LAKE CO., Cobb Mountain, 2 ♂, 1 ♀ V–15–51 (SB). MARIN CO., Point Reyes Station, 1 ♂ I–26–51 (SB). MENDOCINO CO., 5 km N of Potter Valley, 1 ♂ VII–29–59 (LS, RS). A number of specimens have been collected at Stevens Creek, Santa Clara Co., but these differ in that the ♂ is winged and lacks pits on sternite V.

Oropus cavicauda differs from *O. basalis* in its smaller size, in the basal development

of tergite IV being smaller, without bevelled lateral edges, and in the presence of a few spatulate setae at the apex of the development.

Oropus delimatus Schuster and Grigarick n. sp. Figs. 22, 40.

Male: (slide) Head 236 μ long × 327 μ wide; antenna 627 μ long; pronotum 390 μ long × 381 μ wide; elytra 468 μ long; metatibia 409 μ long; aedeagus 118 μ wide.

Eyes of about 10 peripheral facets; tempora rounded to neck; no tubercles posterior to eyes; inner diameter of vertexal foveae 23 μ, on a line slightly before rear margin of eyes, separated by over 2 × distance from fovea to eye; postantennal apodemes irregular, attaining or nearly attaining those of vertexal foveae; each mandibular ramus with 6 small teeth; labrum 95 μ wide; lengths of palpus segments: I 14 μ, II 68 μ, III 23 μ, IV 91 μ with sensory setae 45 μ from base; lengths/widths of antennal segments in microns: I 110/59, II 54/50, III 33/36, IV 27/36, V and VI 33/41, VII 33/45, VIII 33/50, IX 45/68, X 50/77, XI 150/100. Pronotal teeth small, acute, R = 0.73; pronotum rugose in a narrow area of the posterior margin. Winged, 1.75 mm. Elytral stria II 0.30, III 0.60, and IV 0.20 length of elytra. Mesocoxal cavities contiguous; postcoxal apodemes short, directed transversely, not overlapping. Tergite I 250 μ long × 436 μ wide; II 145 μ long; median impression of I is apically wide, over 100 μ; setae of median basal development of tergite IV simple, other setae not set on tubercles; sternite IV lacking median setae; V without pits.

Female: Resembles ♂ except: Eyes smaller, of about 5 peripheral facets; vertexal foveae on a line behind posterior margin of eyes. Brachypterous, 295 μ. Tergite IV evenly convex; sternite V with a transverse row of pits 210 μ long.

Holotype, ♂ (CAS), Oakville, Napa County, California, with 3 ♂ and 3 ♀ paratypes, 14 Mar. 1954, J. R. Helfer. Other specimens considered conspecific but not included in the type series were collected as follows: MARIN CO., Mill Valley, 1♀ VI-19-52 (HL-laurel). NAPA CO., 14 km S of Monticello, 1 ♀ XII-13-57 (RS); 3 km W of Oakville, 1♂ XII-31-53 (GM, VR, RS); Mt. St. Helena, 1♀ XI-21-53 (JH). SONOMA CO., Armstrong Redwood State Park, 1♂ V-24-58 (FR), 4♂ III-14-54 (JH); Mark West Springs, 1 ♂, 8 ♀ XII-31-53 (GM, VR, RS), 1 ♂ I-22-58 (RS-douglas fir), 1♀ III-14-54 (JH).

The broad median impression of tergite I separates ♀ of this species from those of *O. basalis*. The ♂ are distinguished by the truncate projection of tergite IV in lateral view, or the elongate oval appearance of this structure when viewed from the rear.

Oropus minimus Schuster and Grigarick n. sp. Fig. 41.

Male: (slide) Head 227 μ long × 318 μ wide; antenna 572 μ long; pronotum 381 μ long × 359 μ wide; elytra 381 μ long; metatibia 363 μ long; aedeagus 127 μ wide.

Eyes large, of about 10 peripheral facets; tempora rounded to neck; 5 or 6 tubercles posterior to each eye; vertexal foveae with inner diameter of 13 μ, on a line before middle of eyes, separated by over 2 × distance from fovea to eye; apodemes of postantennal foveae attaining those of vertexal foveae; each mandibular ramus with 6 teeth; labrum not visible; lengths of palpus segments: I 14 μ, II 68 μ, III 23 μ, IV 86 μ with sensory setae 33 μ from base; lengths/widths of antennal segments in microns: I 118/59, II 59/54,

III through VI 33/36, VII 33/41, VIII 33/45, IX 45/64, X 59/77, XI 136/95. Pronotum rugose posterior to transverse sulcus; lateral teeth moderate, subacute, R = 0.74. Brachypterous, 295 μ. Elytral foveae III and IV coalesced into a single fovea; stria II 0.38, III 0.63, and IV 0.38 elytra length. Mesocoxal cavities contiguous; postcoxal apodemes directed obliquely to the rear, overlapping. Tergite I 272 μ long × 413 μ wide; II 136 μ long; impression of tergite I broad apically; setae of median development of tergite IV simple, other setae not set on tubercules; sternite IV lacking median setae; V with a transverse row of large irregular pores 159 μ long.

Holotype, ♂ (CAS), Ryan Creek, Mendocino County, California, 10 Apr. 1955, R. Craig. Female unknown.

Oropus minimus differs from *O. cavicauda* in a number of particulars. The impression of tergite I is wider apically, tergite IV lacks spatulate setae and the pitting of sternite V is large and irregular. There has not been observed, in any other species, a tendency toward reduction of elytral foveae. In this specimen the coalescence of foveae III and IV is complete on one elytron and nearly complete on the other, two small apodemes extending from the common fovea. This elytral character serves also to separate *O. minimus* from *O. debilis.*

Oropus acumenis Schuster and Grigarick n. sp. Fig. 42.

Male: (slide) Head 236 μ long × 322 μ wide; antenna 554 μ long; pronotum 377 μ long × 377 μ wide; elytra 431 μ long; metatibia 395 μ long; aedeagus 100 μ wide.

Eyes moderate, of 7 or 8 peripheral facets; tempora rounded-angulate, vertexal foveae with inner diameter about 14 μ, separated by slightly over 2 × the distance from fovea to eye, located on a line through middle of eyes; apodemes of postantennal foveae attaining those of vertexal foveae; each mandibular ramus with 5 or 6 teeth; labrum 86 μ wide; lengths of palpus segments: I 18μ, II 63μ, III 23μ, IV 82μ with sensory setae inserted 45 μ from base; lengths/widths of antennal segments in microns: I 114/54, II 55/50, III and IV 33/36, V 33/45, VI 27/45, VII and VIII 33/45, IX 45/68, X 50/77, XI 136/100. Pronotal teeth small, blunt; rugosity of base extends to transverse sulcus. Brachypterous, 304 μ. Elytral stria II 0.35, III 0.65, IV 0.30 elytral length. Mesocoxal cavities slightly confluent; postcoxal apodemes short, transverse, slightly overlapping. Tergite I 272 μ long × 413 μ wide; tergite II 182 μ long; median impression of tergite I broad apically; tergite IV with setae of median basal development simple, other setae not set on tubercules, distally with about 3 rows of large flattened setae (mostly lost on the type); sternite IV lacking long setae; V with a transverse row of pits 95 μ long; VI as illustrated.

Female: Resembles ♂ except: Eyes smaller, of 3 or 4 peripheral facets; tempora more evenly rounded, vertexal foveae on a line posterior to rear margin of eyes; wings shorter, apparently 180 μ long; tergite IV evenly convex, the distal setae not enlarged; sternite V with a multiple row of pits 182 μ long.

Holotype, ♂ (CAS), 2♂ and 5♀ paratypes, 10 km N of Ione, Amador County, California, 25 Apr. 1958, Leslie M. Smith and R. O. Schuster; paratypes retained by authors. Considered conspecific, but not included in the type series, are a ♂ from Martel, Amador Co., and a ♀ from Riverton, El Dorado Co.

This species is the same as *O. cavicauda* in all respects except lacking the spatulate

setae at the apex of the development of tergite IV. In *O. acumenis* these setae all appear to be simple. As these spatulate setae are found on all of the *O. cavicauda* specimens from localities in the Coast Range and as there are no examples known of pselaphid species occuring in both the coastal and sierran mountains, their absence has been considered sufficient reason for considering the Sierra population as a distinct species.

Oropus debilis Casey

Oropus debilis Casey, 1908, Canadian Ent. **40** (8): 277.

The type, assumed by Casey to be a ♀, is actually a ♂. The character of tergite VI is reduced to a small tubercule ending in a few long setae. In view of the reduced sex characters and the name given the species by Casey, one might wonder if he actually believed the specimen to be a ♀. Casey's specimen had the normal complement of elytral foveae and we could discern no modification of tergite III for reception of tergite IV. We have not seen specimens of this species other than the type.

Oropus orbatus Schuster and Grigarick n. sp. Fig. 43.

Male: (slide) Head 268 μ long × 377 μ wide; antenna 798 μ long; pronotum 422 μ long × 422 μ wide; elytra 413 μ long; metatibia 454 μ long; aedeagus approximately 118 μ wide.

Eyes reduced to 1 questionable facet; tempora rounded-angulate; a number of small tubercules posterior to eye facet; inner diameter of vertexal foveae 14 μ, on a line with the eye facets, separated by 2 × distance from fovea to closest head margin; postantennal apodemes attain those of vertexal foveae; left mandibular ramus with 7 teeth, right with 5 teeth; labrum 104 μ wide; lengths of palpus segments: I 18 μ, II 64 μ, III 23 μ, IV 82 μ with sensory setae 59 μ from base; lengths/widths of antennal segments in microns: I 132/55, II 55/50, III and IV 36/41, V, VI and VII 36/45, VIII 36/50, IX 54/68, X 77/77, XI 163/95. Rugose pattern of pronotum restricted to a narrow posterior border; pronotal teeth minute, R = 0.75. Brachypterous, 409 μ. Elytral stria II 0.30, III 0.55 elytra length, IV very short and not visible on the slide. Mesocoxal cavities broadly confluent; postcoxal apodemes directed obliquely forward. Tergite I 331 μ long × 468 μ wide; II 182 μ long; median impression of tergite I 132 μ wide; tergite III modified for reception of development of tergite IV, setae along rear margin very large, possibly flattened; median basal development of tergite IV narrow, pointed, with simple setae, other setae of tergite IV set on tubercules; sternite IV lacking long setae; V without pits.

Holotype, unique ♂ (CAS), Fort Baker, Marin County, California, 9 Apr. 1921, F. E. Blaisdell. Female unknown.

Oropus orbatus differs from other members of the group in several characters the most obvious of which is the reduced eyes. The ♀, when recovered, would be easily associated with the ♂ and will probably be totally blind.

Oropus verrucifundus Schuster and Grigarick n. sp. Fig. 44.

Male: (slide) Head 245 μ long × 336 μ wide; pronotum 400 μ long × 363 μ wide; elytra 522 μ long; metatibia 463 μ long; aedeagus 150 μ wide.

Eyes moderately developed, of about 8 peripheral facets; tempora rounded to neck; a number of tubercules on head capsule mainly around eyes; vertexal foveae inner diameter 18 μ, over 2 × as far apart as distance from fovea to eye, on a line through middle of eyes; postantennal apodemes cuneiform, attaining vertexal foveae; mandibular rami with 5 or 6 teeth; labrum 100 μ wide; lengths of palpus segments: I 14 μ, II 73 μ, III 23 μ, IV 91 μ with sensory setae 45 μ from base; lengths/widths of antennal segments in microns: I 136/59, II 59/50, III, IV and V 36/36, VI 32/36, VII 36/41, VIII 36/45, IX 59/64, X 68/73, XI 173/95. Pronotal teeth small, R = 0.68, entire basolateral margin crenulate, anterolateral margin weakly tuberculate. Winged, 2.50 mm. Elytral stria II 0.43, III 0.70, and IV 0.43 elytral length. Mesocoxae contiguous; postcoxal foveae and apodemes lacking. Tergite I 341 μ long × 477 μ wide; II 183 μ long; anterior extension of depression of tergite I narrow, about 1/3 as wide as the depression; tergite IV with slightly curved microsetigerous area just before middle, 91 μ long, about 1/4 segment width. Sternite IV lacking median setae; V with a central area of pitting about 23 μ long; VI greatly elongate with a large distal median crescentric emargination. Aedeagus with parameres attached more approximately and anteriorly than is found in other species.

Additional description from point-mounted specimen: Eyes of about 38 facets; tergite IV with sulcus broad and shallow, not well defined, the microsetigerous area obvious as a small central line, the setae long and erect; sternite VI is long, transversely impressed at distal margin; sternite VII shows as a tumosity filling the deep emargination of sternite VI.

Holotype, unique ♂ (CAS), Ash Mountain, Sequoia National Park, Tulare Co., California, 28 Apr. 1950, R. C. Bechtel. Female unknown.

The characters of sternites VI and VII and the lack of foveae behind the mesocoxae distinguish this species. The ♀, when collected, should be recognized by the depression of tergite I and by not possessing foveae behind the mesocoxae.

Oropus pectinis Schuster and Grigarick n. sp. Fig. 45.

Male: (slide) Head 227 μ long × 318 μ wide; antenna 568 μ long; pronotum 386 μ long × 363 μ wide; elytra 459 μ long; metatibia 381 μ long; aedeagus 123 μ wide.

Eyes well developed, about 10 peripheral facets; tempora rounded to neck; no tubercules posterior to eyes; vertexal foveae inner diameter 23 μ, on a line before posterior margin of eyes, over 2 × as far apart as distance from fovea to eye; postantennal apodemes attaining those of vertexal foveae; each mandibular ramus with 5 teeth; labrum 81 μ wide; lengths of palpus segments: I 18 μ, II 73 μ, III 27 μ, IV 82 μ with sensory setae 33 μ from base; lengths/widths of antennal segments in microns: I 109/50, II 50/50, III and IV 27/36, V and VI 27/41, VII and VIII 27/45, IX 41/68, X 50/77, XI 136/104. Pronotal teeth small, blunt, R = 0.76; pronotum rugose in area posterior to transverse sulcus. Winged, 2.10 mm. Elytral stria II 0.40, III 0.60, and IV 0.20 elytral length. Mesocoxal cavities confluent; postcoxal apodemes directed slightly posterior, overlapping. Tergite I 275 μ long × 426 μ wide; II 150 μ long; III not modified for reception of IV; IV with transverse microsetigerous area, the setae long. Sternite IV lacking setae; V with a transverse row of pits 123 μ long.

Female: Resembles ♂ except: Eyes small, of about 4 peripheral facets; vertexal

foveae on line behind front margin of eyes. Brachypterous, 227 μ. Tergite IV evenly convex; sternite V with a transverse row of pits 318 μ long.

Holotype, ♂ (CAS), and one ♀ paratype, near Bridge, Coos County, Oregon, 24 July 1954, V. D. Roth; paratype retained by authors.

The ratios of the length to width of tergite I and of the lengths of the first to the second tergites are slightly less than the minimum stated for group B but they are greater than those given for group A. The transverse microsetigerous area and lack of a basal projection on tergite IV tend to place this species in group A. The simple head setae, long postantennal apodemes and lack of setae on sternite IV are characters of group B. This combination of characters places the species intermediate between the two defined groups, and serves to identify it.

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