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## Species of the *fuscus* and *vittatus* groups of *Pedilus*

(*Coleoptera, Anthicidae: Pedilinae*)

With 44 textfigures and 6 maps

The genus *Pedilus* is the only member of the tribe Pedilini. The diagnostic characters are: eyes emarginate; neck wide; pronotum not constricted at apex; front coxal cavities externally and internally open behind; anal (= wedge) cell of the wing closed; gonostyli or lateral lobes of the tegmen separate at apex; and styli borne on apex of two-segmented coxites in the ovipositor.

After studying forty-six nominal species of the Holarctic genus *Pedilus*, I have classified them in fourteen natural groups mainly on the characters of the male genitalia. I have examined the types of species of *Pedilus* described by FALL and LECONTE at the Museum of Comparative Zoology, Harvard University, and by HORN at the Philadelphia Academy of Natural Sciences. In this paper two species groups and eight species from U.S.S.R., U.S.A., and Canada are treated in detail.

The last abdominal sternum is visibly the sixth in males and the fifth in females, and morphologically the eight and the seventh respectively.

All the records of distribution are new, except those otherwise stated. Localities not known to me but mentioned by the collectors are marked by an asterisk\*.

The following abbreviations are used: AMNH = American Museum of Natural History, New York; BM = British Museum (Natural History) London; CAS = California Academy of Science, San Francisco; CDA = California Department of Agriculture, Sacramento; CM = Carnegie Museum, Pittsburgh, Pennsylvania; CNC = Canadian National Collection, Ottawa; CNHM = Chicago Natural History Museum, Chicago; CU = Cornell University, Ithaca, New York; DEI = Deutsches Entomologisches Institut, Berlin; Harvard = Museum of Comparative Zoology, Harvard University, Cambridge, Mass.; INHS = Illinois State Natural History Survey, Urbana; LACM = Los Angeles County Museum; OSU = Ohio State University, Columbus; SPBF = State Plant Board of Florida; UCB = University of California, Berkeley; UCD = University of California, Davis; U. Mass. = University of Massachusetts, Amherst; U. Mich. = University of Michigan, Ann Arbor; U. Mo. = University of Missouri, Columbia; USNM = United States National Museum, Washington, D.C.; and WSU = Washington State University, Pullman. I am grateful to the authorities of the above institutions for the loan of specimens and to Professor R. OMAR RILETT, Head of the Department of Biological Sciences, Illinois State Normal University, for time and research facilities.

### *fuscus* group

Antennae serrate or flabellate. Head sparsely or densely, finely or coarsely punctate; tempora reduced in some species. Hind tibiae not arcuate. Front and middle tarsi not dilated. Claws with short teeth. Pronotum sparsely, finely or coarsely punctate. Elytra sparsely or densely, finely or coarsely punctate, not modified at apex. Mes-episterna meeting or not in front of mesosternum. Male genitalia

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with gonostyli longitudinally divided at apex or branched due to a subapical tongue projecting on inner edge. Aedeagus short or long; tapering at apex; sometimes bearing a pair of leaflike projections below.

#### Key to subgroups

- 1 Antennae flabellate in male; elytra coarsely punctate . . . . . *flabellatus* subgroup
- Antennae serrate; elytra finely punctate . . . . . 2
- 2 Pronotum coarsely punctate; elytra sparsely punctate; gonostyli longitudinally divided at apex, but not branched subapically (fig. 3); aedeagus simple and not bearing processes (fig. 4) . . . . . *fuscus* subgroup
- 3 Pronotum finely punctate; elytra densely punctate; gonostyli bearing a subapical projecting process on the inner side (figs. 9, 15); aedeagus bearing a pair of leaflike projections below (figs. 10, 16) . . . . . *inconspicuus* subgroup

#### *fuscus* subgroup

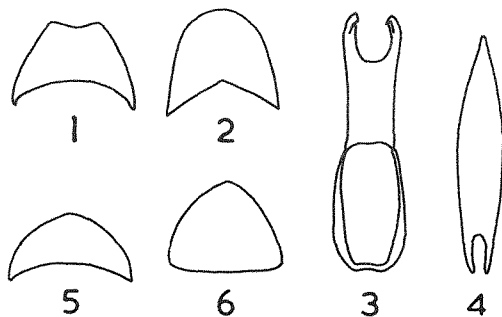
Antennae serrate; with basal two segments darker in color and shinier than others. Head sparsely, coarsely punctate above; frons densely punctate; punctation not very dense on sides and below. Pronotum sparsely, coarsely punctate; about as wide as head. Elytra moderately sparsely, coarsely punctate. Mesepisterna meeting in front of mesosternum. Male genitalia with gonostyli longitudinally divided for a short distance apically, forming an outer larger lobe which is hooked or bears short, pointed toothlike process at apex, and an inner lobe (fig. 3). Aedeagus short, stout, simple, tapering at apex and pointed (fig. 4).

#### *Pedilus fuscus* FISCHER

(Figs. 1—6)

*Pedilus fuscus* FISCHER, 1822, Entomogr. ross., 1, 35—36; JACQUELIN DU VAL, 1859—1863, Genera des Coléoptères d'Europe, 3, p. 364—365; MULSANT & REY, 1866, Tribu des Colligères, Ann. Soc. Linn. Lyon, 13, 134—135; FAUST, 1876, Hor. Soc. ent. Ross., 12, 325; SEMENOW, 1893, Hor. Soc. ent. Ross., 27, 328; REITTER, 1901, Wien. ent. Ztg., 20, 116; SEMENOW, 1902, Hor. Soc. ent. Ross., 35, 264.

Length: 5.0 to 5.5 mm. Antennae black, hirsute, more than half as long as body in male, slightly shorter in female. Head black, shining; tempora prominent. Mandibles bifid at apex. Clypeus and legs black. Pronotum black, shining, widest near middle, narrowed at both ends. In male, last abdominal sternum



Caption for figures

Figs. 1—6. *Pedilus fuscus* FISCHER. — 1. Last abdominal sternum of male. — 2. Last abdominal tergum of male. — 3. Tegmen, ventral view. — 4. Aedeagus (median lobe), ventral view. — 5. Last abdominal sternum of female. — 6. Last abdominal tergum of female

emarginate (fig. 1), others entire; last abdominal tergum entire (fig. 2); genitalia as in figures 3 and 4. In female, last abdominal sternum and tergum entire (figs. 5, 6).

Type Locality: Mounts d'Altai, Siberia, U.S.S.R.

Records: Siberia: Mountain of Altai, GEBLER, one male (CDA); "Jrkutsk.", one female (BM). Thian-S(chan): one female (BM).

Remarks: This is the type of the genus *Pedilus*.

#### *inconspicuus* subgroup

Antennae serrate in both sexes, with basal two segments darker in color and shinier than others. Head sparsely, coarsely punctate above; punctation denser on sides and below. Pronotum sparsely, finely punctate. Elytra moderately, densely, coarsely punctate. Mes-episterna meeting in front of mesosternum. Male genitalia with goostyli bearing a subapical projecting tongue on the inner side (figs. 9, 15). Aedeagus sharply pointed apically; bearing a pair of leaflike projections below which are usually united medially (figs. 10, 16).

#### Key to Species

- Elytra black; apex of aedeagus relatively less pointed and shorter (fig. 10)  
 . . . . . *inconspicuus* (HORN)  
 Elytra rufotestaceous to yellow; apex of aedeagus relatively more pointed and longer (fig. 16) . . . *flavidus* FALL

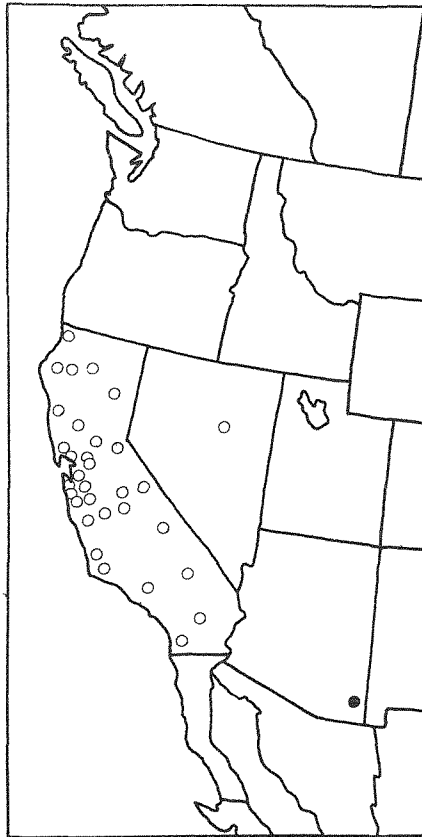
#### *Pedilus inconspicuus* (HORN)

(Figs. 7–12; Map 1)

*Corphyra inconspicua* HORN, 1874, Trans. Amer. ent. Soc., 5, 42; HORN, 1883, Trans. Amer. ent. Soc., 10, 310.

*Pedilus inconspicuus*, FALL, 1915, Journ. Ent. & Zool., 7, 28.

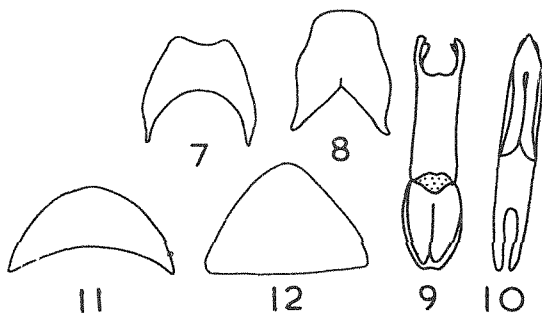
Length: 5.0 to 7.5 mm. Antennae black, more than half as long as body in male, slightly shorter in female. Head black, moderately shining. Mandibles entire at apex. Clypeus black, partly rufous in some specimens. Legs black. Pronotum rufous, shining. Elytra black, shining. In male, last abdominal



Map 1. Geographical distribution of *Pedilus inconspicuus* (HORN). Open circles = County records; and closed circles = specific locality within a County

sternum emarginate (fig. 7); penultimate abdominal sternum broadly emarginate; antepenultimate abdominal sternum entire; last abdominal tergum entire (fig. 8); genitalia as in figures 9 and 10. In female, last abdominal sternum and tergum entire (figs. 11, 12).

Type Locality: California



Figs. 7–12. *Pedilus inconspicuus* (HORN). — 7. Last abdominal sternum of male. — 8. Last abdominal tergum of male. — 9. Tegmen, ventral view. — 10. Aedeagus (median lobe), ventral view. — 11. Last abdominal sternum of female. — 12. Last abdominal tergum of female

Seasonal Distribution: Specimens were collected from March to October.

Bionomics: Specimens were collected on *Pinus ponderosa* and *Quercus agrifolia* at Placerville and Paraiso Hot Springs, respectively, in California.

Records: United States: Arizona: Onion Saddle to Rustler Park, 7600–8500 feet, Chiricahua Mountains, Cochise County, June 14 (UCB). California: “Anoyo (= Arroyo ?) Seco Camp”\*, Monterey County, May 1 (UCD); Azusa, Los Angeles County (CAS); Blocksburg, Humboldt County, May 20 (UCB); Calistoga, Napa County, June 20 (CNHM); Carrville, Trinity County, May 31 (CAS); Cazadero, Sonoma County, March 30 (CAS); Chester, Plumas County, July 1 to 4 (OSU); Claremont, Los Angeles County (CM); Coalinga, Jucalitos Canyon, Fresno County, March 18 (CAS); “Conn Creek”\*, Napa County, April 20 (UCB); Cuyama River, Santa Barbara County, May 1 (CAS); Davis, Yolo County, April to August (CDA, UCD); Del Norte County, June 3 (USNM); El Cerrito, Contra Costa County, May 29 (CDA); Elsinore, Riverside County, April (CAS, CU, U. Mo.); Fairfax, Marin County, April 6 to 21 (CAS); Felton, Santa Cruz Mountains, Santa Cruz County, 300 to 500 feet, May 20 to 25 (CU); 12 miles east of Fort Bragg, Caspar Lumber Camp, Mendocino County (CAS); Fort Seward, Humboldt County, May 27 to June 3 (CAS); Glacier Lodge, Big Pine Inyo County, July 29 (LACM); Green Valley, Los Angeles County, April 7 to 8 (UCD); Lagunitas, Marin County (UCB); Lake County (CAS); Lakeport, Lake County, April 21 to 23 (AMNH, UCD); Leavitt Meadows, Lassen County, June 28 to July 25 (CDA, UCB); “Leevenin Canyon”\*, Mono County, June 24 (CDA); Los Angeles County, March (USNM); Marin County (CAS); Marion Mount Camp, San Jacinto Mountains, Riverside County, July 1 to 6 (UCD); Mendocino County, October 18 (USNM); Mill Valley, Marin County, April 19 to May 30 (CAS, UCB); Miller Canyon, San Bernardino Mountains, San Bernardino County, May 19 (CAS); “Mix Canyon”\*, Solano County, April 17 (UCD); “Mount House”\*, Mendocino County, May 9 (UCD); Mount Tamalpais, Marin County, April 28 (CAS); Muir Woods, Marin County, May 17 (CNHM); Orinda, Contra Costa County, May 25 (UCB); Palo Alto, Santa Clara County, April 23 to May 23 (USNM); Paraiso Hot Springs, Monterey County, June 15 (CAS); Pasadena, Los Angeles County, April to May (CAS, CM, CNHM, Harvard, LACM, USNM); Placerville, El Dorado County, April 18 (USNM); Pleasant Hill, Contra Costa County, May 19 (UCD); Pomo, Mendocino County, April 20 (CDA); Putah Creek, Solano County, March 14 (UCB); Redondo, Los Angeles County, March 5 (CAS); “Redwood Canyon”\*, Contra Costa County, May 23 (CAS); Ryan, Inyo County, May 15 (UCB); San

Benito County, 3000 feet, June 24 (CAS); San Bernardino County, (CAS); San Diego, San Diego County, June 1 (CNHM); San Francisco, San Francisco County (CAS); San Mateo, San Mateo County, May 26 (UCB); San Simeon, San Luis Obispo County, May 22 (CAS); Santa Cruz Mountains, Santa Cruz County, May 20 to June 6 (CAS, UCD); Santa Rosa, Sonoma County (Harvard); "Sardine Creek"\*, Mono County, July 11 (UCD); Shaver Lake, Fresno County, July 14 (CDA); Sobre Vista, Sonoma County, April 23 (CAS); South California (INHS); Stone, Humboldt County, April 21 (CAS); Tamalpais, Marin County (UCB); Temecula, Riverside County, April 8 (UCB); Trinit, Sonoma County, April 11 (UCB); 8 miles north of Ukiah, Mendocino County, April 21 (CAS); Viola, 4500 feet, Shasta County, June 27 (CAS); Willits, Mendocino County, May 24 to 29 (CAS, CNC); Yorkville, Mendocino County, May 1 (CAS); Yosemite, 3880—4000 feet, Mariposa County, June 20 (CAS, LACM, UCB). Nevada: "Red House"\*, Eureka County, June 11 (UCD).

Total number of specimens examined: 246.

Remarks: *Pedilus inconspicuus* superficially resembles *abnormis* but can be distinguished easily by the following characters: claws with short teeth; punctures on head coarse and close on sides and below; gonostyli of male branched. In *abnormis* the claws have a tooth of medium size, the head is sparsely, finely punctate, and gonostyli of the male are unbranched.

A male specimen at the Philadelphia Academy of Natural Science has been designated as the lectotype (no. 3038). A paralectotype is at the Museum of Comparative Zoology, Harvard University (no. 7985, male).

### *Pedilus flavidus* FALL

(Figs. 13—18; Map 2)

*Pedilus inconspicuus* var. *flavidus* FALL, 1915, Journ. Ent. & Zool., 7, 28—29.

This species closely resembles *inconspicuus* and was originally described by FALL (1915) as a variety of it. However, the following distinguishing characters are, in my opinion, sufficient reason to consider it a distinct species: elytra rufo-testaceous to yellow, with sutural edge, side margins (at least towards apex) and tip blackish; elytral apex in male yellow, tipped with black; clypeus and legs black to partly or entirely rufous. In male, last abdominal sternum and tergum less broad (figs. 13, 14); aedeagus larger, with apex more pointed and longer and median struts longer (fig. 16).

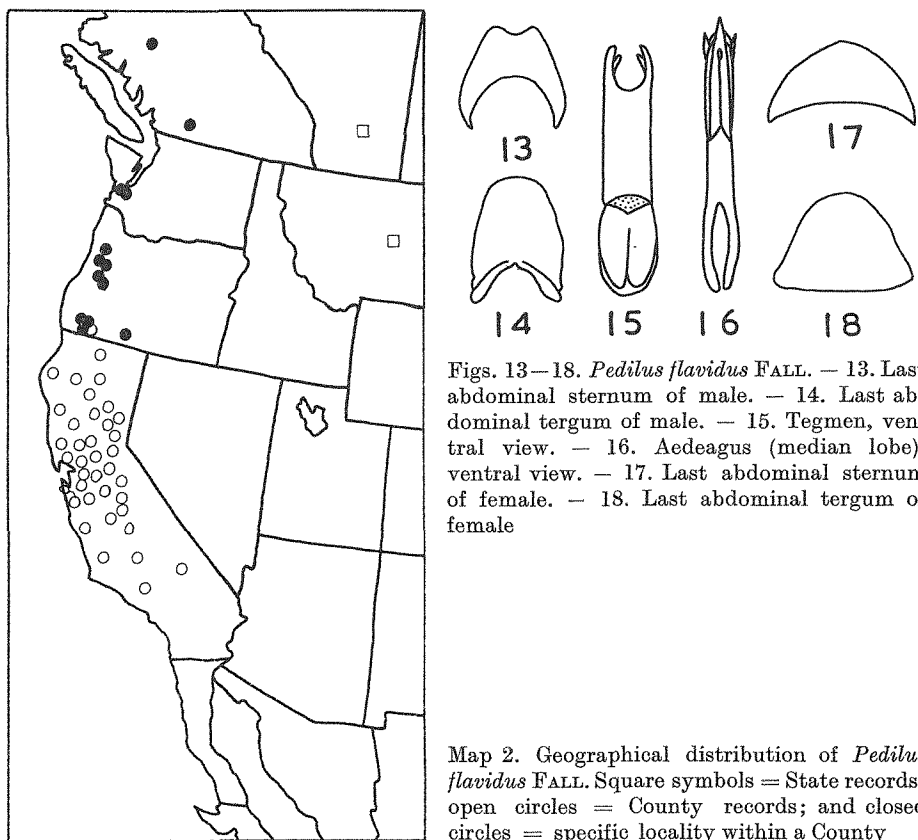
Type Locality: Eldorado County, California.

Seasonal Distribution: Specimens were collected from March to October.

Bionomics: Specimens were collected on Hooker Oak (*Quercus lobata*) at Cedar Mount Ridge, California, and on *Populus trichocarpa* at Hayfork, California.

Records: Canada: Alberta: Nash Mine\*, 5000 feet, Trinity County, June 14 (CAS); (British Columbia: Chilcotin, June 16 (CAS); North Bend (USNM); "Powder Creek"\* (USNM).

United States: California: State label only (AMNH, CAS, CDA, CNHM, DEI, Harvard, INHS, UCB, U. Mich., U. Minn., USNM); Adobe Creek, Stanislaus County, April 20 (UCB); "Ahuahuac"\*, May (CM); Alameda County, April 4 to May 10 (CAS, CNHM, USNM, UCD); Ahwahnee, Madera County, May (CAS); "Ash"\*, Tulare County, April 19 (CAS); Atascadero, San Luis Obispo County, April 23 to 26 (CAS); "Bates"\*, Madera County, March 18 (AMNH); Berkeley, Alameda County, April 24 to May 5 (AMNH, CAS,



Figs. 13–18. *Pedilus flavidus* FALL. — 13. Last abdominal sternum of male. — 14. Last abdominal tergum of male. — 15. Tegmen, ventral view. — 16. Aedeagus (median lobe), ventral view. — 17. Last abdominal sternum of female. — 18. Last abdominal tergum of female

Map 2. Geographical distribution of *Pedilus flavidus* FALL. Square symbols = State records; open circles = County records; and closed circles = specific locality within a County

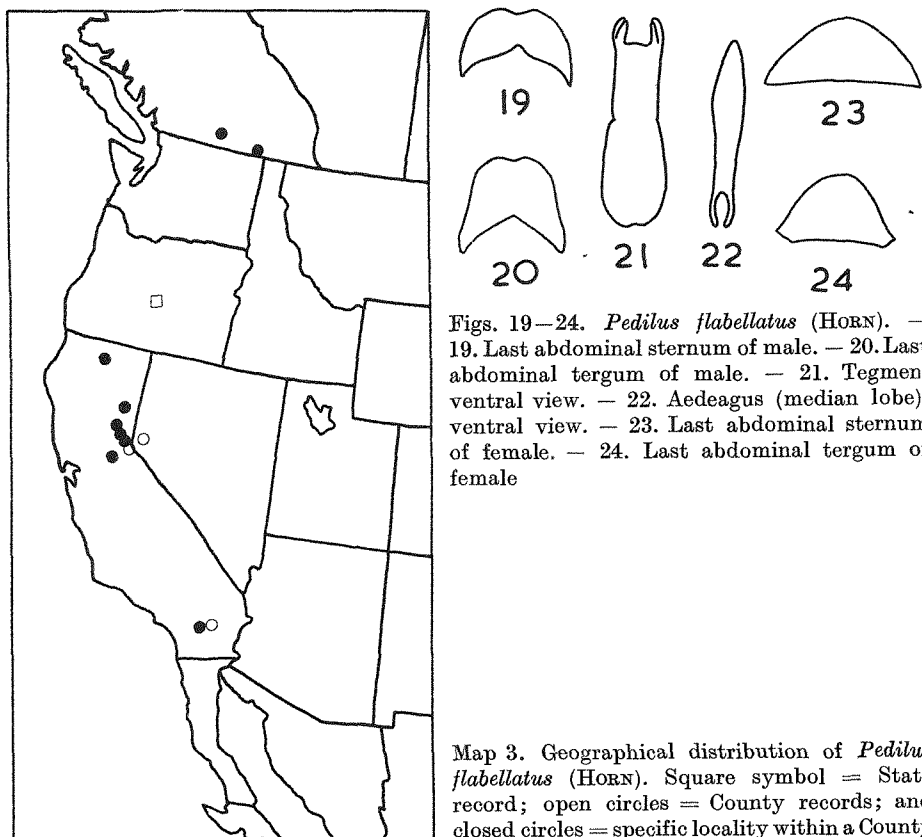
UCB); Blocksburg, Humboldt County, May 30 (CAS); Bradley, Monterey County, April 23 to May 22 (CAS); Bryson, Monterey County, April 26 (CAS); Bucks Lake, Plumas County, July 1 (UCB); Cache Creek Canyon, Yolo County, April 7 (UCD); Caliente, Kern County, April 24 to 29 (CAS, CNC, Harvard, U. Mass.); Carmel, Monterey County, March 21 to October 18 (CAS); Carville, Trinity County, June 2 to 31 (CAS); Castella, Shasta County, May 10 (CAS); Castro Valley, Alameda County, May 17 (AMNH); Cedar Mount Ridge, Nevada County, May 3 (UCD); Chico, Butte County, April 18 to 26 (CAS); Colony Road, "Watsons Springs"\*, Tulare County, April 30 (CAS); Contra Costa County, May 23 (CNHM); near Cotati, Sonoma County, April 30 (CAS); "Crystal Lakes"\*, San Mateo County, May 7 to 19 (CAS); "Cypress Ridge"\*, Marin County, April 11 (CAS); Davis, Yolo County, April 19 to 28 (UCD); Dunlap, Fresno County, April 9 (UCD); Dunsmuir, Siskiyou County (CDA, Harvard, UCB, USNM); Dutch Flat, Placer County, May 2 (UCD); Eldridge, Sonoma County, May 19 (CAS); Elk Grove, Sacramento County, May 1 to 3 (UCD); El Portal, Mariposa County, May 18 (UCB); Emigrant Gap, Placer County, June 26 (AMNH); Fairfax, Marin County, April 5 to May 25 (CAS, USNM); Fallen Leaf, El Dorado County, July 7 (CAS); Felton, Santa Cruz Mountains, 300 to 500 feet, Santa Cruz County, May 10 to 25 (CU, SPBF); Fort Seward, Humboldt County, May 15 to June 3 (AMNH, CAS, UCB); Gilroy Hot Springs, Santa Clara County, May 26 (CAS); "Glacier National Park, Lake MacDonald"\*, July 7 (CAS); Glennville, Kern County, April 24 (UCB, UCD); Gold Lake, Sierra County, July 15 to 18 (CAS); Grass Valley, Nevada County (DEI); 8 miles south of Grass Valley, Nevada County, May 18 (CAS); "Green Point"\*, Humboldt County, June 4

to 9 (CAS); Green Valley, Los Angeles County, May 8 (UCD); Guerneville, Sonoma County, May 29 (CAS); Hastings Natural History Reservation, Santa Lucia Mountains, Jamesburg, Monterey County, 1900 to 2700 feet (AMNH); Hayfork, Trinity County, April 19 (CAS); Hills back of Oakland, Alameda County, April 12 to 30 (CAS); Hilltops south of Marin City, Marin County (CAS); "Hope Valley"\*, Alpine County, July 18 (UCB); Hospital Rock, Los Angeles County, May 25 (CAS); Hydesville, Humboldt County, June 1 (CAS); Inverness, Marin County, March 8 to May 3 (AMNH, UCB); 1 mile south east Inverness, Marin County, April 27 (UCB); Jamesburg, Monterey County, May 28 (CAS); "Kalamath"\*, June 27 (UCD); Kaweah, Tulare County, March 21 to July 1 (CAS, CNHM, UK); Kelseyville, Lake County, May 29 (CAS); La Grange, Stanislaus County, March 16 (UCB); Lagunitas, Marin County, May 11 to June 27 (CAS, UCB, U. Mo.); La Honda, San Mateo County, May 20 to 25 (CAS); Lake County, June 18 (CAS); Lakeport, Lake County, April 21 (UCD); Lebec, 4000 feet, Kern County, May 15 (CAS); "Leland Meadow"\*, Tuolumne County, July 1 (UCB); Lemon Cove, Tulare County, March 18 to 29 (CAS, UCB); "Leona Hits"\*, Alameda County, May 5 (CAS); Linden, San Joaquin County, April (UCB); Los Altos, Santa Clara County, May 19 (UCD); Los Angeles, Los Angeles County, April to May (CAS, CM); Los Gatos, Santa Clara County (USNM); Madera County, June 27 (CU); Marin County, April 28 (CNHM, CAS); Mark West Springs, Sonoma County, May 11 (CAS); Meadow Valley, 4000 to 5000 feet, Plumas County, June 9 (CAS); Mill Valley, Marin County, April 20 (CAS); Mokel (umne) Hill, Calaveras County, April (CAS, USNM); Monterey County, April 12 (AMNH); Monterey and Carmel, Monterey County, "Rivers 23"\* (DEI); Moraga, Contra Costa County, May 6 (AMNH); Mount Diablo, Contra Costa County, April 18 to 23 (AMNH, CAS, UCB, UCD); Mount Hamilton, Santa Clara County, May 21 to 25 (UCB, UCD); "Mount Madena"\*, April 22 (UCD); "Mountains Back of Alma"\*, April 22 (CAS); Mount Saint Helena, Napa County, April 5 to June 6 (CAS, UCD); Mount Tamalpais, Marin County, April 28 to May 12 (CAS); Muir Woods, Marin County, April 23 to May 24 (CAS); Murphys, Calaveras County, 2500 feet, May 6 to 8 (CAS); Nashville, El Dorado County, April 25 (UCD); near "Frk.", Cache Creek, Highway 20, Lake County, May 18 (UCD); near Sunol, Alameda County, April 10 (UCB); Niles Canyon, Alameda County, April 15 (USNM); Oakland, Alameda County, May 4 to 13 (CAS, UCB); Orinda, Contra Costa County, May 4 (AMNH); Palo Alto, Santa Clara County, April 15 to 25 (CAS, USNM); Paradise, Butte County, April 24 (UCD); "Paradise Cove"\*, Marin County, May 6 to June 14 (CAS); "Paradise Hot Springs"\*, May 29 to 30 (CAS); Paraiso Springs, Monterey County, April 22 to June 6 (CAS); Pentz, Butte County, April 5 (CAS); Pinnacles, National Park, San Benito County, April 28 (CAS); Placerville, El Dorado County, April 18 to 21 (CAS, USNM); "Pleyto"\*, Monterey County, May 21 (CAS); Plumas County, June 10 (CNHM); Port Reyes, Los Angeles County, June 4 (CAS); Porterville, Tulare County, March 5 (CAS); "Potwisha"\*, 3000 to 5000 feet, May 9 (CAS); Putah Creek, Solano County, April 25 (UCD); Red Bluff, Tehama County, May 1 (CAS); Richmond Hills, Contra Costa County, April 30 (UCD); Riverton, El Dorado County, June 16 (UCD); Ross, Marin County, April 28 (CAS); Rumsey, Yolo County, March 21 to April 14 (CDA, UCB, UCD); Sacramento, Sacramento County, May 27 (UCD); "Saint Elmo" (CM); "Salada Beach"\*, San Mateo County, April 21 (CAS); "Samuel Springs"\*, Napa County, May 13 (UCD); San Andreas, Calaveras County, May 7 (CAS); San Antonio Valley, San Bernardino County, April 20 to May 6 (UCD); San Francisco County, June (CAS); San Francisco, San Francisco County, April 30 (CAS); San Jose, Santa Clara County, April 28 (UCB, UCD); San Leandro Hills, Oakland, Alameda County, May 12 (UCB); San Mateo County, May 8 to June 8 (CNHM); San Pablo Valley, Contra Costa County, May 9 (AMNH, UCB); Santa Clara County, May (CU); Santa Cruz Mountains, Santa Cruz County, May 1 (CAS, CDA); Sausalito, Marin County, May 19 (USNM); Sequoia National Park, Tulare County, April 23 to June (CU, UCD, U. Mich.); Shasta County, April 13 to June 17 (AMNH, CAS); Sierra City, Sierra County, June 16 (AMNH); Sonoma County, "Rivers 19" (DEI); Soquel, Santa Cruz County, April 12 (UCD); Squaw Valley, Placer County, March 25 (USNM); Stevens Creek, Santa Clara County, June 4 (UCB); Stone, Humboldt County, April 21 (CAS); Strawberry Canyon, Berkeley Hills, Alameda County, April 19 to May 13 (LACM, UCB); South California (CM, CNHM,

INHS); "Summit Mix"\* (Solano County, May (UCD)); "Sylvania"\* (CDA, USNM); Tassajara Hot Springs, Monterey County, May 30 (CAS); Tehama County, April 4 to 28 (CNHM); Tilden Park, "Alameda County" (Tuolumne County?), May 13 (UCB); Three Rivers, Tulare County, March 28 (CAS); Trinity County, May 1 (CNHM); Trinity National Forest, Trinity County, June 23 (CAS); Ukiah, Mendocino County, May 8 (UCD); Vacaville, Solano County, March 28 (UCD); Walker, Los Angeles County?, June 3 (CAS); Walnut Creek, Contra Costa County, April 13 (CAS); Willits, Mendocino County, May 24 (CAS); Winters, Yolo County, May 3 (UCD); Wrights, Sonoma County, April 23 (CAS); Yorkville, Mendocino County, April 30 to May 1 (CAS); Yosemite, 3880 to 4000 feet, Mariposa County, May 19 (UCB). Montana: State label only (BM). Oregon: State label only (Harvard, U. Minn.); Ashland, Jackson County, June 17 (CAS); Bly, Klamath County, June 13 (U. Mass.); Corvallis, Benton County, May 14 to June 12 (AMNH, OSU); Eugene, Lane County, May 29 (CAS); "Green Springs"\*, Jackson County, July 7 (UCD); McMinville, Yamhill County, May 17 to 24 (U. Mass.); Medford, Jackson County, May 15 (UCD); Philomath, Benton County, May 20 (OSC); Springfield, Lane County (Harvard); Talent, Jackson County, May 7 (AMNH). Washington: Elmer, Okanogan County, May 27 (USNM); Tenino, Thurston County (USNM).

Total number of specimens examined: 630.

Remarks: The holotype is in the Museum of Comparative Zoology, Harvard University (no. 24315, male).



Figs. 19–24. *Pedilus flabellatus* (HORN). — 19. Last abdominal sternum of male. — 20. Last abdominal tergum of male. — 21. Tegmen, ventral view. — 22. Aedeagus (median lobe), ventral view. — 23. Last abdominal sternum of female. — 24. Last abdominal tergum of female

Map 3. Geographical distribution of *Pedilus flabellatus* (HORN). Square symbol = State record; open circles = County records; and closed circles = specific locality within a County



*flabellatus* subgroup

Antennae flabellate in male, serrate in female. Head sparsely or densely, finely or coarsely punctate; tempora small or indistinct. Pronotum sparsely, finely punctate. Elytra sparsely or densely, finely punctate. Mes-episterna meeting or not meeting in front of mesosternum. Male genitalia with gonostyli longitudinally divided, forming an outer and an inner lobe, without hooks (figs. 21, 29). Aedeagus, very short, tapering apically, (figs. 22, 30).

Key to Species

- Head finely punctate above; tempora small; elytra sparsely punctate; mes-episterna meeting in front of mesosternum; gonostyli without a median process (fig. 21). . . . . *flabellatus* (HORN)  
 Head coarsely punctate above; tempora indistinct; elytra densely punctate; mes-episterna not meeting in front of mesosternum; gonostyli with a long, median, triangular, projecting process (fig. 29) . . . . . *parvicollis* FALL

*Pedilus flabellatus* (HORN)

(Figs. 19–24; Map 3)

*Corphyra flabellata* HORN, 1883, Trans. Amer. ent. Soc., 10, 306–207.

*Pedilus flabellatus*, FALL, 1915, Journ. Ent. & Zool., 7, 15.

Length: 4.5 to 6.5 mm. Antennae black to piceous, more than half as long as body in male, slightly shorter in female. In male, segments two and three short, unbranched; four to ten branched; branches on four and five small, those on six to ten larger; eleventh segment largest, as long as preceding four to five segments combined or the process of penultimate segment; first three segments darker in color than others. In female, only segment two small; eleventh segment only slightly longer than tenth; first two segments pale at apex, darker in color behind. Head black, shining, sparsely, finely punctate above, punctation coarser on sides and below. Eyes prominent. Mandibles entire at apex. Clypeus and legs black to rufous. Pronotum rufous, shining, widest before middle. Mes-episterna meeting in front of mesosternum. Elytra black, rufous, or pale, shining, sparsely, finely punctate. In male, last abdominal sternum broadly emarginate, much broader than long (fig. 19); penultimate abdominal sternum broadly, feebly emarginate; last abdominal tergum slightly emarginate apically (fig. 20); gonostyli without a median process (fig. 21). In female, last abdominal sternum and tergum entire (figs. 23, 24).

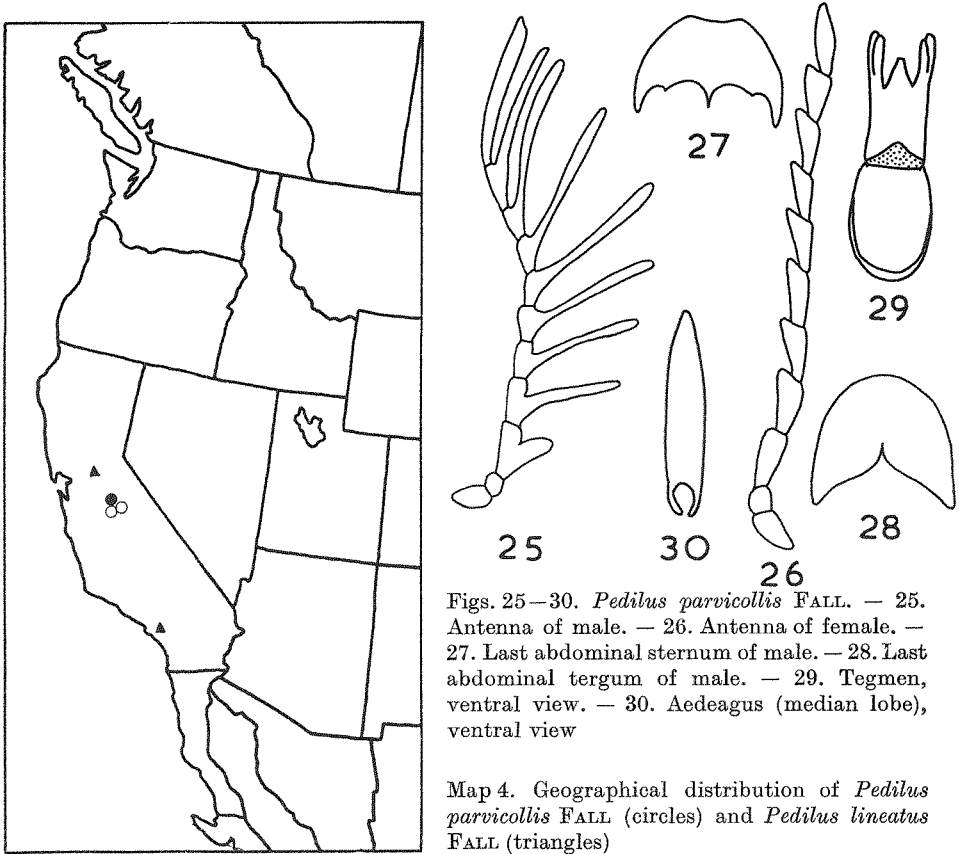
Type Locality: Western Nevada

Seasonal Distribution: Specimens were collected from May to July.

Bionomics: Specimens were collected on *Pinus monticola* in Trinity Valley, British Columbia.

Records: Canada: British Columbia: Annis Bay, Nelson Island, July 31 (CAS); "Trinity Valley"\*, July 12 to 23 (CAS); Vernon, May 12 (CAS).

United States: California: Castle Crag, Shasta County (FALL, 1915); Clio, Plumas County, June 14 (CAS); "Facht"\*, Lassen County, June 20 to July 17 (CAS); Fallen Leaf Lake, Lake Tahoe, El Dorado County, June 20 (CAS); Huntington Lake, 7000 feet, Fresno County, July 8 to 19 (CAS, UCD); Idyllwild, San Jacinto Mountains, Riverside County, June 20



Figs. 25–30. *Pedilus parvicollis* FALL. — 25. Antenna of male. — 26. Antenna of female. — 27. Last abdominal sternum of male. — 28. Last abdominal tergum of male. — 29. Tegmen, ventral view. — 30. Aedeagus (median lobe), ventral view

Map 4. Geographical distribution of *Pedilus parvicollis* FALL (circles) and *Pedilus lineatus* FALL (triangles)

(CAS); McCloud, Siskiyou County, June 25 to 29 (CAS); Mohawk, Plumas County, June (CAS); Plumas County (FALL, 1915); "Sisson"\*, June (FALL, 1915); Tahoe City, Lake Tahoe, Placer County (FALL, 1915); "Tahiquitz Canyon"\*, Riverside County June 30 (CAS); "Tallac"\*, Lake Tahoe, El Dorado or Placer County, July (CAS). Nevada: Western Nevada (HORN, 1883). Oregon: Mount Hood, Homestead Inn, Hood River County, July 2 (CAS).

Total number of specimens examined: 20.

Remarks: The holotype is in the Philadelphia Academy of Natural Sciences (no. 3036, male).

*Pedilus parvicollis* FALL

(Figs. 25–30; Map 4)

*Pedilus parvicollis* FALL, 1919, Canadian Ent., **51**, 216; FALL, 1929, Bull. Brooklyn ent. Soc., **24**, 13–14.

*Dendroides parvicollis*, VAN DYKE, 1928, Bull. Brooklyn ent. Soc., **23**, 260.

Length: 6 to 8 mm. Antennae black to rufotestaceous, shorter than half the body length. In male, segment two shortest, broader than long; segments three to ten with processes, three as long as previous two combined and with a branch slightly shorter than its own length; four to ten shorter; process of segment four

nearly twice longer than that of third; eleventh longest, unbranched, as long as process of five preceding segments (fig. 25). In female, segments one to two or four darker in color than others; penultimate segment slightly longer than antepenultimate (fig. 26). Head rather small, black, shining, constricted just behind eyes; frons coarsely, densely punctate; vertex and occiput sparsely, coarsely punctate; eyes large, bulging, broadly and feebly emarginate, coarsely faceted, as compared with other species of *Pedilus* separated by a distance equal to their own width above and very narrowly so below, especially in males. Mandibles bifid at apex. Clypeus and legs black to rufous; legs varying from brown to piceous, with tarsi paler. Pronotum rufous to pale, shining, of same width as head; sides strongly produced before middle, oblique and nearly straight posteriorly; pronotum as long as or slightly longer than broad. Mes-episterna not meeting in front of mesosternum. Elytra black to dark brown, shining, long, densely, finely punctate, sparsely punctate at apex. In male, last abdominal sternum broadly, feebly emarginate, broader than long (fig. 27); others entire; last abdominal tergum entire (fig. 28); gonostyli with a long, median, projecting process (fig. 29). In female, last abdominal sternum entire, very broadly obtusely rounded on sides, much broader than long; last abdominal tergum entire, broader than long.

Type Locality: Monache Meadows, Tulare County, 8000 to 8300 feet, California.

Seasonal Distribution: Specimens were collected from July to August.

Records: United States: California: "Bullfrog"\*, 10,600 feet, Fresno County, July 20 to 26 (CAS); Giant Forest, Round Meadow, Tulare County, July (CAS); "Gray Meadow"\*, July 3 (CAS); "Huckleberry Meadow"\*, 6500 feet, Fresno County, August 1 (CAS); "Mount Mitchell, Rea Lake"\*, 10,500 feet, July 20 to August (CAS); "Scaffold Meadow"\*, July 11 (CNC).

Total number of specimens examined: 14.

Remarks: This species resembles *flabellatus* with respect to the flabellate male antennae and the form of the thorax. But in *flabellatus* the antennal processes begin on the fourth segment and in *parvicollis* there is a process on the third segment also. In *Pedilus parvicollis* the head and thorax are of the same width, the tempora are not developed and the mes-episterna are not meeting in front of mesosternum.

VAN DYKE (1928) placed this species in the genus *Dendroides* on the basis of the shape of the head and pronotum and elytral features, but *parvicollis* is morphologically closer to *Pedilus flabellatus* than to the species of *Dendroides* (FALL, 1929).

The holotype is in the Museum of Comparative Zoology, Harvard University (no. 24321, male).

#### Summary of the comparative characters of species in the *fuscus* group

The species are numbered in their order of presentation: 1 = *fuscus*, 2 = *inconspicuus*, 3 = *flavidus*, 4 = *flabellatus*, 5 = *parvicollis*. Antennae are serrate in males of 1-3 and flabellate in 4-5. Head is sparsely punctate in 1-5 but 5 also has dense punctures. Head is finely punctate in 4 and densely so in others. Punctures are coarse on pronotum of 1 and fine in others. Mesepisterna meet in front of mesosternum in 1-4 but not in 5. Elytral punctures are sparse in 1 and 4, and dense in 2 and 3. Elytra are coarsely punctate in 1-4

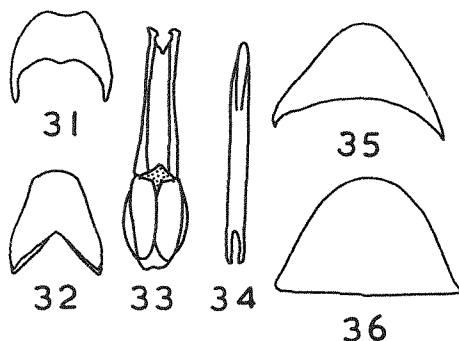
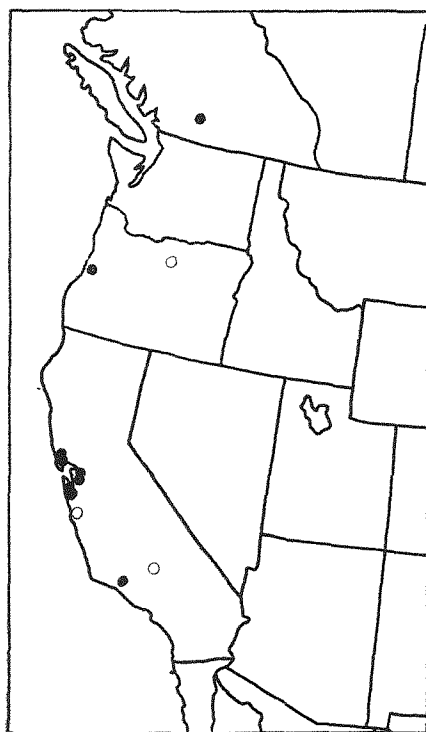
and finely so in 5. Aedeagus (median lobe) is without apical leaf-like projections in 1, 4 and 5, and with them in 2 and 3. Size ranges as follows: 1 = 5.0-5.5 mm; 2 = 5.0-7.5 mm; 3 = 5.0-7.5 mm; 4 = 4.5-6.5 mm; and 5 = 6-8 mm.

### *vittatus* group

Antennae serrate; with basal two segments partly or entirely rufous. Head densely, coarsely punctate. Hind tibiae not arcuate. Front and middle tarsi usually dilated in male but not in female. Claws with short teeth. Pronotum sparsely or densely, finely punctate, feebly impressed medially or not so. Elytra moderately densely, coarsely or finely punctate. Elytral apex not impressed in male. Mes-episterna meeting in front of mesosternum. Male genitalia with gonostyli nearly straight, barbed internally near apex (figs. 33, 41). Aedeagus pointed apically, ridged dorsally, bearing a pair of leaflike projections below (figs. 34, 42).

### Key to species

- 1 Elytra vittate, coarsely punctate; elytral apex not modified . . . . . 2  
     Elytra not vittate; finely punctate; elytral apex in male more broadly margined than  
     in female but not otherwise modified . . . . . *oregonus* FALL
- 2 Pronotum rufous, more coarsely punctate, with a fine median impressed line of  
     variable length . . . . . *lineatus* FALL  
     Pronotum black, more finely punctate, usually without a median line . . . . . *vittatus* (HORN)



Figs. 31-36. *Pedilus vittatus* (HORN). — 31. Last abdominal sternum of male. — 32. Last abdominal tergum of male. — 33. Tegmen, ventral view. — 34. Aedeagus (median lobe), ventral view. — 35. Last abdominal sternum of female. — 36. Last abdominal tergum of female

Map 5. Geographical distribution of *Pedilus vittatus* (HORN). Open circles = County records; and closed circles = specific locality within a County

*Pedilus vittatus* (HORN)

(Figs. 31—36; Map 5)

*Corphyra vittata* HORN, 1871, Trans. Amer. ent. Soc., 3, 279; HORN, 1874, Trans. Amer. ent. Soc., 5, 41; HORN, 1883, Trans. Amer. ent. Soc., 10, 310.

*Pedilus vittatus*, FALL, 1915, Journ. Ent. & Zool., 7, 30—31.

Length: 5.5 to 8.8 mm. Antennae black to pale brownish testaceous; nearly half as long as body, slightly longer in male than in female. Head black, shining; tempora less pointed compared with other species. Mandibles entire. Clypeus and legs black to rufous. Pronotum black (rarely rufous around margins), densely punctate, frequently with a very narrow median impunctate line. Elytra vittate, with black and yellow stripes, coarsely punctate. Elytral apex in male not modified; punctuation as on rest of elytra but sparser. In male, last abdominal sternum emarginate (fig. 31); penultimate abdominal sternum broadly, feebly emarginate; last abdominal tergum entire (fig. 32); genitalia as in figures 33 and 34. In female, last abdominal sternum and tergum entire (figs. 35, 36).

Type Locality: Amador Valley, Amador County, California.

Seasonal Distribution: Specimens were collected from April to June.

Records: Canada: British Columbia: Midday Valley, Merritt, June 17 (CAS).

United States: California: State label only (AMNH, BM); Alameda County (CAS); Castro Valley, Alameda County, May 17 (AMNH); "Cypress Ridge"\*, Marin County (Orange County?), April 27 (CAS); "Fort Tejon"\*, Kern County, May 14 (CAS); Marin County (CAS); Moraga Valley, Contra Costa County, April 4 (CAS); Muir Woods, Marin County, April 23 to May 24 (CAS); Ojai, Ventura County, May 1 (CAS); Paraiso Springs, Monterey County, May 8 (CAS); Point Reyes, Marin County, June 4 (CAS); Redwood Creek, Mendocino County, May 14 to 23 (CAS, CM); San Pablo Valley, Contra Costa County, May 9 (AMNH); Santa Cruz, Santa Cruz County (FALL, 1915); Soquel Creek, Santa Cruz County, May 30 (CAS); Sunol, Alameda County, May 24 (AMNH). Oregon: "Mount Creek"\*, Wheeler County, June 25 (UCD); Waldport, Lincoln County, June 13 (CAS).

Total number of specimens examined: 57.

Remarks: The holotype is in the Philadelphia Academy of Natural Sciences (no. 3040, male).

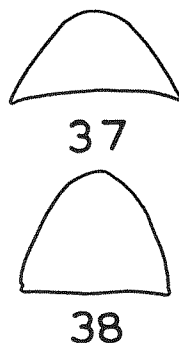
*Pedilus lineatus* FALL

(Figs. 37—38; Map 4)

*Pedilus lineatus* FALL, 1915, Journ. Ent. & Zool., 7, 31.

Length: 5.6 to 8.0 mm. This species closely resembles *P. vittatus* but differs in the following characters: punctuation coarser throughout; tempora slightly more convergent; pronotum rufous, with a fine median impressed line of variable length. Male genitalia as in *P. vittatus*. In female, last abdominal sternum and tergum entire, as in figures 37 and 38.

Type Locality: Pasadena, Los Angeles County, California.



Figs. 37—38. *Pedilus lineatus* FALL. — 37. Last abdominal sternum of female. — 38. Last abdominal tergum of female

Seasonal Distribution: Specimens were collected from April to June.

Records: United States: California: Pasadena, Los Angeles County (FALL, 1915); Sacramento, Sacramento County, April 24 (UCD); South California (CAS).

Total number of specimens examined: 6.

Remarks: The elytra are vittate, as in *P. vittatus*.

The holotype is in the Museum of Comparative Zoology, Harvard University (no. 24318, male).

*Pedilus oregonus* FALL

(Figs. 39–44; Map 6)

*Pedilus oregonus* FALL, 1915, Journ. Ent. & Zool., 7, 24–25.

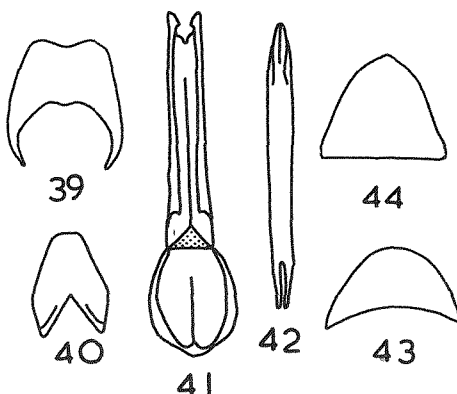
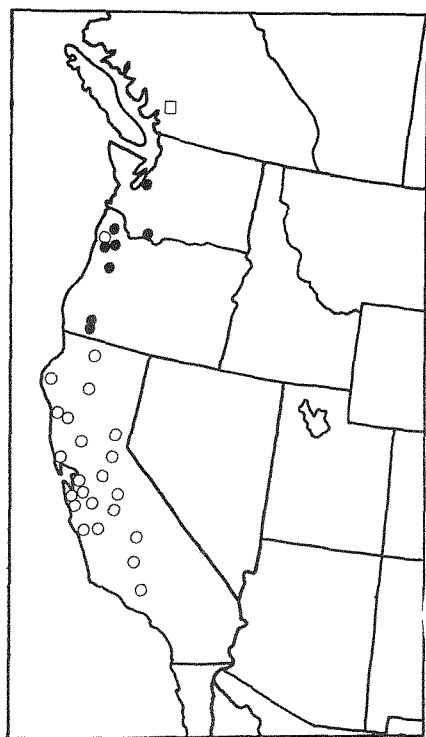
Length: 5.9 to 7.8 mm. Antennae black, half as long as body in male, a little shorter in female. Head unusually densely punctate. Mandibles entire at apex. Clypeus and legs rufous to black. Pronotum black or rufous; sparsely punctate. Elytra rufotestaceous to black, finely punctate. Elytral apex in male not modified, more widely reflexoexplanate, tipped with yellow in some specimens, black in others, not produced or caudate. In male, last abdominal sternum and tergum as in figures 39 and 40; genitalia as in figures 41 and 42. In female, last abdominal sternum and tergum as in figures 43 and 44.

Type Locality: Josephine County, Oregon.

Seasonal Distribution: Specimens were collected from April to July.

Records: Canada: British Columbia: "Saanich"\*, June 6 to July 9 (CNC).

United States: California: Alameda County (CAS); Big Sur, Monterey County, May 12 (CAS); Camp Nelson, Tulare County, July (CAS); Cisco, Placer County, June (CAS); Cole, Los Angeles County, July (CAS); Crystal Lake, "San Mateo County"\* (Nevada County), May 7 (CAS); Davis, Yolo County, May 23 (CDA); Fallen Leaf Lake, El Dorado County, July 7 (CAS); Fairfax, Marin County, June 13 (CAS); Fort Seward, Humboldt County, May 17 (AMNH); Half Moon Bay, San Mateo County, April 12 (CAS); Hopland, Mendocino County, May 9 (CAS); Hydenville, Humboldt County, June (CAS); Lafayette, Contra Costa County, May 24 (CAS); Lake County, Adams Springs, June 18 (CAS); Lake Tahoe, June 23 (CAS); Loma Prieta (San Diego County?), May 6 (CAS); Los Gatos, Santa Clara County, June (USNM); Mokel (umne) Hill, Calaveras County (CAS); Muir Woods, Marin County, May 24 (CAS); Oakhurst, Madera County, May 26 (UCB); Palo Alto, Santa Clara County, April 5 (WSU); Panoche Pass, San Benito County, 1400 feet, May 12 (CAS); Pescadero, San Mateo County, June 1 (CAS); Piedmont, Alameda County, July 14 (UCB); Salt Creek, "Tulare County" (Riverside County?) (CAS); San Anselmo, Marin County, June (U. Mich.); Santa Cruz Mountains, Santa Cruz County, June 6 to 15 (UCB); Santa Monica, Los Angeles County, July 4 (CAS); Siskiyou County, May 28 to 31 (CNHM); Tehama County, April 28 to 29 (CNHM); "Tehon Pass"\*, Kern County, April 25 (UCD); Yosemite Valley, June 10 (CAS). Oregon: State label only (CAS, Harvard, U. Minn., USNM); Ashland, Jackson County, April 27 to June 17 (CAS, UCD); Corvallis, Benton County, June 23 (AMNH, CAS, USNM); Dayton, Yamhill County, April 11 (U. Mass.); Forest Grove, Washington County, June 9 to 27 (U. Mass.); McMinnville, Yamhill County, May 21 (CAS); Medford, Jackson County, June 15 (UCD); Turriot, June 5 (USNM); Yamhill County, May 24 (CAS). Washin-



Figs. 39–44. *Pedilus oregonus* FALL. — 39. Last abdominal sternum of male. — 40. Last abdominal tergum of male. — 41. Tegmen, ventral view. — 42. Aedeagus (median lobe), ventral view. — 43. Last abdominal sternum of female. — 44. Last abdominal tergum of female

Map 6. Geographical distribution of *Pedilus oregonus* FALL. Square symbol = State record; open circles = County records; and closed circles = specific locality within a County

ton: Cooks, Skamania County (FALL, 1915); Seattle, King County, July 2 (CAS); Withe Salmon, Klickitat County (FALL, 1915).

Total number of specimens examined: 90.

Remarks: The holotype is in the Museum of Comparative Zoology, Harvard University (no. 24320, male).

#### Summary of the comparative characters of species in the *vittatus* group

Pronotum is densely punctate in *vittatus* and *lineatus* but sparsely so in *oregonus*. Elytral punctures are fine in *oregonus* and coarse in others. A vitta is present on elytra of *vittatus* and *lineatus* but not on *oregonus*. Size ranges are: *vittatus* = 5.5–8.8 mm; *lineatus* = 5.6 bis 8.0 mm; *oregonus* = 5.9–7.8 mm.

#### Summary

Two groups and eight species of *Pedilus* from U.S.S.R., U.S.A., and Canada are revised in this paper. The *fuscus* group includes *fuscus* FISCHER, *inconspicuus* (HORN), *flavidus* FALL, *flabellatus* (HORN), and *parvicollis* FALL and is distinguished by its longitudinally divided or subapically branched gonostyli or lateral lobes of the male genitalia. The *vittatus* group includes *vittatus* (HORN), *lineatus* FALL and *oregonus* FALL, and is distinguished by its internally barbed or toothed gonostyli. Unlike many American species of the genus *Pedilus*, the elytral apices of males are not modified in the species treated here.

### Zusammenfassung

Zwei Gruppen und acht Arten der Gattung *Pedilus* aus der UdSSR, USA und Canada werden revidiert. Die *fuscus*-Gruppe schließt *fuscus* FISCHER, *inconspicuus* (HORN), *flavidus* FALL, *flabellatus* (HORN) und *parvicollis* FALL ein und unterscheidet sich durch die verschiedenen langen oder subapical verzweigten Gonostyli oder lateralen Lappen der männlichen Genitalien. Die *vittatus*-Gruppe umfaßt *vittatus* (HORN), *lineatus* FALL und *oregonus* FALL und hebt sich ab durch die innen bestachelten oder gezähnten Gonostyli. Die Elytren-Spitzen der Männchen sind bei den hier behandelten Arten nicht wie bei vielen amerikanischen Arten der Gattung *Pedilus* modifiziert.

### Резюме

Проверены две группы и восемь видов рода *Pedilus* из СССР, США и Канады. К группе *fuscus* относятся *fuscus* FISCHER, *inconspicuus* (HORN), *flavidus* FALL, *flabellatus* (HORN) и *parvicollis* FALL, которые отличаются разветвленными в конце и различными по длине гоностилиями или боковыми долями мужских половых органов. Группа *vittatus* включает *vittatus* (HORN), *lineatus* FALL и *oregonus* FALL и отличается гоностилиями, снабженными внутри колючками или зазубренными внутри гоностилиями. Концы жестких крыльев мужских особей рассмотренных видов модифицированы не так, как у многих американских видов рода *Pedilus*.