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NEW NORTH AMERICAN BEES OF THE GENUS
DUFOUREA

(Apoidea: Halictidae)

PART I,

By

GEORGE E. BOHART

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NEW NORTH AMERICAN BEES OF THE GENUS DUFOUREA

(Apoidea: Halictidae)

PART I

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The number of known species of North American *Dufourea* has increased rapidly in recent years. In 1937 C. D. Michener¹ raised the number of valid described species from 20 to 26. P. H. Timberlake in 1939² and 1941³ added 14 species. T. D. A. Cockerell⁴ in 1941 added one from Lower California. The following seven new species plus eight more which will be described in the next paper of this series, will bring the total number of species to 56.

Males of all species of *Dufourea* can be readily recognized. Facial measurements, antennal proportions and pubescence, and modifications of the legs and sternites present the most striking characters. Females conform rather closely to a common pattern and in related species they are often difficult to separate. For a few pairs of related species no consistent characters of differentiation have been found.

The following descriptions have been made rather detailed in view of the large number of species in the genus and the lack of any adequate system of subgenera. Moreover, it is hoped that the species herein described may be recognized for the present without complete tables for separation and that the characters described will serve as guides for further studies in the genus.

Holotypes and allotypes of species described in this paper will be deposited at the California Academy of Sciences in San Francisco. Paratypes will be distributed to the following collections besides the author's: U. S. National Museum; U. C. Citrus Experiment Station, Riverside, California; American Museum of Natural History, New York. When available, paratypes will be sent to other collections upon request.

Dufourea gilia n. sp.

Male.—Length about 6 mm., length of anterior wing 3.4 mm.; pubescence wholly pale, mostly white; integument dark with bluish reflections distinct only on head. *Head*: Face length to breadth 95–90; eyes distinctly convergent below, the distance between them at antennal insertion slightly less than eye length; face viewed from front with distance behind posterior ocellus nearly equal to ocellar diameter; no concavities behind or laterad to ocelli; distance from antennal socket to clypeus one half again as great as socket diameter; clypeus, supra-

¹Ann. & Mag. Nat. Hist. (10) 19, pp. 328 and 393–401.

²Ann. Ent. Soc. Amer. 32, pp. 395–414.

³Ann. Ent. Soc. Amer. 34, pp. 38–42.

⁴Trans. San Diego Soc. Nat. Hist. 9, p. 347.

clypeal area concealed by dense, white, reclining pubescence; punctures of frons moderately fine, close, mostly little less than one puncture width apart, absent from area laterad to posterior ocellus; antennae black, as long as anterior wing, flagellar segments mostly about half again as long as broad, the first three-fourths as long as second, all entirely roughened, slightly expanded medially and with many pale, hooked hairs about half as long as flagellar width and confined to under side but not to definite rows; scape a little over twice as long as broad, with long inner and short outer hairs; maxillary stipes one seventh longer than hind tibia, the galea beyond palpus nearly four times as long as broad, apically attenuate; maxillary palpus longer than hind tibia, the second segment nearly twice as long as first and as long as next three combined; labial palpus three-fourths as long as maxillary, the first segment equal to next two combined. *Thorax*: Mesoscutum and mesoscutellum strongly, moderately closely punctured, the punctures mostly a little more than one puncture width apart; area between punctures polished; mesoscutal hair both long and short, not at all concealing integument; mesoscutellar pubescence dense and mostly about as long as scape; wings definitely yellow-tinged, first transverse cubital vein offset from first recurrent by two-thirds its own length; legs not highly modified; femora slightly swollen, fore and mid ones broadest near base, the former with hair fringe longer than scape; hind tibia decidedly swollen beyond middle, over one-third as broad as long, swollen portion with pubescence two-thirds as long as tibia; mid tibia strongly swollen near apex where it is twice as broad as at base, and with outer face covered by long, dense pubescence; hind metatarsus parallel-sided, nearly four times as long as broad, the succeeding three segments about as broad as long. *Propodeum*: Enclosure coarsely rugo-carinate throughout, with about 12 rugae on either side of mid line. *Abdomen*: Tergites finely, sparsely punctate, first segment mirror-like but with rather numerous scattered punctures on middle half; apical fascia long, complete on apical four segments but not so dense as in *tuolumne*; last three tergites with numerous scattered white hairs between fascia, lateral pubescence of sixth longer than the segment; sternites without lateral hooklets; fifth emarginate apically, the emargination broadly truncate medially, mid line swelling almost imperceptible; sixth with median elevated ridge very similar to that of *tuolumne*; posterior arms of seventh slender, narrowly rounded apically, with short hair; apical projection of eighth slender but broadened in profile.

Female.—Length about 5 mm.; length of anterior wing 4 mm.; pubescence whitish, somewhat tinged with yellow on dorsum of thorax; integument black, with feeble bluish reflections on frons; body robust.

Head: Face nine-tenths as broad as long; inner eye margins parallel, distance between them at antennal insertions equal to eye length; distance from antennal socket to clypeus greater than socket diameter; face, viewed directly from front, with postocellar length less than ocellar diameter; anterior face of clypeus with about 30 coarse punctures, most of them sublateral; hair of clypeus sparse, semi-erect, that of supraclypeal area dense, reclining; frons with numerous short hairs visible mainly in profile; frons evenly convex, with punctures about one

puncture width apart except for impunctate area laterad to posterior ocellus; antennal flagellum black. *Thorax*: Dorsum rather dull, strongly punctured, the punctures generally not more than one puncture width apart; mesoscutum with only very short yellowish pile, conspicuous in lateral aspect; mesoscutellum and metanotum largely obscured by dense, yellowish hair; hind wing with 5 hamuli; apical bristles of fore tibia testaceous; mid tibial spur testaceous to whitish; tibial scopa moderately dense, whitish, the hairs somewhat appressed. *Propodeum*: Enclosure coarsely rugo-carinate (crinkly), with strong posterior transverse carinae. *Abdomen*: Tergites with fine, mostly setigerous punctures, the first segment mirror-like but with several hundred tiny punctures on dorsal disk; whitish apical borders of tergites three and four with complete but not dense hair bands; basal hair border of tergite three complete, well defined; anal fimbria reddish testaceous.

Holotype male, *allotype*, 3 male *paratypes*: 16 miles east of Mt. Hamilton, Santa Clara Co., California, April 20, 1947, from *Gilia* (G. E. Bohart).

The only variation noted in the series was a slight increase in the density of the abdominal hair bands over the holotype.

This species is very close to *D. tuolumne* new species but has a decidedly longer face in both sexes and more dilated hind tibia and metatarsus in the male.

Dufourea tuolumne n. sp.

Male.—Length about 5 mm., length of anterior wing 3.1 mm.; pubescence wholly pale, mostly white; integument dark with bluish tints, especially on head. *Head*: Face slightly broader than long; eyes rather strongly converging below, distance between them at antennal insertion no greater than eye length; face, as viewed directly from in front, with distance from posterior ocellus to posterior vertex margin negligible, less than half an ocellar diameter; no concavities behind or laterad to ocelli; distance from antennal socket to clypeus slightly greater than socket diameter; clypeus, supra-clypeal area concealed by dense, white, reclining pubescence; punctures of frons moderately fine, close, mostly a little less than one puncture width apart, absent from small area just laterad to posterior ocellus; antennae black, long, reaching at least to metanotum, the flagellar segments mostly a little more than half as broad as long, entirely roughened, non-crenulate, the second slightly longer than first or third, all segments with more than ten (many with more than twenty) pale hooked hairs, less than half as long as flagellar width, confined to under side but not to definite rows; scape slightly more than twice as long as broad, inner hairs long, outer ones short; maxilla with stipes shorter than posterior tibia, no longer than eye; galea three times as long as broad, pointed apically; maxillary palpus over half as long as stipes, first segment not more than three times as long as broad, three-fourths as long as second, both together longer than next four (which are sub-equal) together; labial palpus nearly as long as maxillary, first segment five times as long as broad, longer than succeeding two together, second slightly longer than fourth, nearly twice the third. *Thorax*: Mesoscutum strongly, moderately closely punctured, the punctures mostly about or a little more than

one puncture width apart mesoscutellum more densely punctate; area between punctures shining, non-reticulate; mesoscutum with rather sparse, fine, wholly white hair never concealing integument, often moderately long; metanotum, mesoscutellum with dense pubescence as long as antennal scape; wings clear, faintly clouded with yellow, first transverse cubital vein offset from first recurrent by its own length; legs not conspicuously modified; femora slightly swollen, about twice as long as broad, anterior, middle ones broadest near base, the former with fringe of hairs nearly as long as femur; fore, mid tibiae with short, uniform pubescence, hind one swollen just beyond the middle, less than three times as long as broad, with fringe of hairs sometimes longer than tibia; fore basitarsus with very long hairs, longer than itself, mid basitarsus distinctly arcuate, with similar hair fringe to fore one; hind basitarsus three times as long as broad, succeeding two segments longer than broad, penultimate one broader than long. *Propodeum*: Enclosure coarsely rugo-striate, medially rugose with about eight comparatively distinct acrinæ on either side of mid line, the sculpturing no weaker posteriorly. *Abdomen*: Tergites sparsely, finely punctured, numerous but separated by several puncture widths because of their minute size, sparsest on first tergite; all tergites with distinct, long, apical fasciae, the basal two strong laterally only, those of fourth, fifth tergites, when abdomen is not extended, nearly half as long as visible sternite portions; tergites with white hair between fasciae, prominent laterally on last three; sternites without lateral hooklets; fifth sternite slightly raised along mid line, emarginate apically, the emargination truncate medially; sixth sternite with median, longitudinal, colorless transparent, elevated area, broadest sub-basally, narrowing, increasing in height posteriorly, forming a terminal, sharp ridge running along mid line of the short, flat sternite projection; posterior arms of seventh narrowed most of their length, apically acute, with hairs confined to apices, basal ventral flaps considerably broader than long; apical process of eighth sternite broadest just basad to middle, narrow for apical third, slightly expanded at apex to one-half greatest breadth, hairs of base of narrow portion three times as long as at apex.

Female.—Length about 5 mm., length of anterior wing 3.8 mm., pubescence white to pale brown, short, abundant; integument black with metallic bluish tinge on head, slight purplish copper tinge on mesoscutum; body robust. *Head*: Face slightly less than six-sevenths as long as broad; inner eye margins nearly parallel, slightly converging below, their length not quite so great as distance between them at antennal insertion. Face, as viewed directly from in front, with distance from a posterior ocellus to posterior vertex margin not more than half an ocellar diameter; distance from antennal socket to clypeus nearly as great as socket diameter; clypeus uniformly but very sparsely, coarsely punctate, fringed basally with pale brown hairs; frons strongly convex in profile, uniformly covered with fine, short pubescence, dense but not distinct except in profile, surface very uniformly punctate, the punctures moderately strong, separated by distinctly less than one puncture width; antennal flagellum black. *Thorax*: Mesoscutum dull, finely, rather closely punctured, the punctures much as on frons, a little finer, denser anteriorly; mesonotum densely covered with very short,

fine, pale brownish hair, conspicuous only from lateral view, these interspersed with a few darker brown hairs as long as an ocellar diameter; apical bristles of fore tibia testaceous; mid tibial spur testaceous to whitish, apical two fifths with about eight needle-like teeth, basal portion apparently edentate; tibial scopa moderately dense, pale brownish, hairs mostly somewhat appressed. *Propodeum*: Enclosure coarsely, irregularly rugose, rugae becoming straighter laterally. *Abdomen*: Tergites with fine punctures, mostly setigerous, except on first where they are typically punctiform but very thin, separated by several puncture widths; apical tergite borders testaceous; hair distinct, whitish, nearly complete, often nearly concealing impunctate tergite borders; remainder of tergum with pale, short hair, conspicuous as viewed laterally; anal fimbria bright testaceous. *Holotype*: Tuolumne Co., California, elevation 3500 ft., June 9, 1938, from *Linanthus filipes*, (R. M. Bohart). *Allotype*: Same as for holotype. *Paratypes*: 38 males, 15 females, same data as for holotype (some collected by N. F. Hardman). Very little variation is observable. The closeness of mesoscutal punctures is slightly but not significantly variable.

This species is related to *californica* (Mich.) and *linanthi* Timb. It can be easily distinguished by the high carina of the sixth sternite and the arcuate mid basitarsus of the male.

***Dufourea vanduzeei* n. sp.**

Male.—Length about 6 mm.; length of anterior wing 3.4 mm.; pubescence wholly pale, mostly white; integument dark with bluish reflections distinct on head, almost imperceptible on thorax; body slender. *Head*: Face nine-tenths as long as wide; eyes rather strongly converging below, the distance between them at antennal insertions a little less than eye length; face, viewed from in front, with postocellar distance subequal to ocellar diameter; areas behind and laterad to ocelli without concavities; distance from antennal socket to clypeus slightly less than socket diameter; clypeus, and to lesser extent supra-clypeal area concealed by dense, white, reclining pubescence; punctures of frons rather fine and sparse, averaging at least two puncture widths apart, absent from crescentic area just laterad to posterior ocellus; antennae blackish, as long as anterior wings, the terminal 5 segments distinctly lobate, the others less so; under sides of flagellum with very numerous tiny erect hairs bent at the tips and conspicuous in profile compared to the minute reclining pubescence of the "bare" remainder; first flagellar segment a little longer than broad, over two-thirds as long as second, two-thirds as long as third which is nearly twice as long as broad; scape three times as long as broad, mostly parallel sided; maxillary stipes three-fourths as long as posterior tibia, the galea beyond palpus half as broad as long; maxillary palpus three-fifths as long as stipes, segments one and two subequal, each as long as segments three, four and five combined; labial palpus about four-fifths as long as maxillary, the first segment subequal to the others combined. *Thorax*: Mesoscutum strongly but not closely punctured, the punctures averaging about two puncture widths apart; interpunctural areas subshining, slightly reticulate; mesoscutum rather densely covered with long yellowish pubescence, partially obscuring the integument in lateral view;

mesoscutellum and metanotum more densely clothed with longer hair of the same color; wings faintly yellowish, the first transverse cubital vein offset from first recurrent by two-thirds its own length; legs slender; metatarsi parallel sided, from four to six times as long as broad; hind tibia four times as long as broad, polished, with hair of dorsal margin nearly as long as tibial breadth; second and third hind tarsal segments longer than broad; hair of hind metatarsus about as long as tarsal width. *Propodeum*: Enclosure coarsely rugo-carinate, about 10 major carinae on either side of mid line; posterior margin of enclosure with a single transverse ridge. *Abdomen*: Tergites with fine but numerous punctures; apical hair bands well defined, complete on all segments; tergal pubescence otherwise abundant, yellowish, partially obscuring integument from lateral view; first five sternites without hooklets but with well defined postero-lateral hair bands; apex of sternite five evenly emarginate; sternite six with a broad oval median glabrous plate produced apically into a keel-like projection which is also produced from the posterodorsal margin of the sternite; posterior arms of sternite seven broad, flat, nearly pointed apically with long, dense terminal hair tufts; posterior projection of sternite eight slender throughout, nearly as broad at apex as at base. *Holotype* male and *paratype* male: Bryson, Monterey Co., California, May 19, 1920 (E. P. Van Duzee); also one damaged male (abdomen missing) with the same collecting data. The holotype has part of the ventral margin of the projection on sternite six and the inner margins of the arms of sternite seven chewed away (presumably by psocids). Otherwise it checks in detail with the paratype.

This species appears to be in the *D. californica* Michener group and falls closest to *D. tuolumne* new species but is easily distinguished by its larger size, broader median plate on the sixth sternite; shorter face, and more slender legs.

***Dufourea neocalifornica* n. sp.**

Male.—Length about 7 mm.; length of anterior wing 5 mm.; integument dark with dark blue and some coppery reflections; pubescence pale, mostly white. *Head*: Face four-fifths as long as wide; eyes rather strongly converging below, their length a little shorter than distance between them at antennal insertions; face, viewed from in front, with postocellar distance about half an ocellar diameter; area between eyes and posterior ocellus not depressed; distance from antennal socket to clypeus greater than socket diameter; clypeus closely punctate, concealed by dense, reclining pubescence; supra-clypeal area bare (perhaps abraded), polished, practically impunctate; frons densely punctate except along inner eye margins and laterad to posterior ocelli, mostly less than one puncture width apart; antennae black, long, at least four-fifths as long as anterior wing, most of the segments distinctly lobate; scape about twice as long as wide; first flagellar segment two thirds as broad as long, three-fourths as long as second which is slightly longer than succeeding segments except terminal one; under side of flagellum rather flat, bearing mat of numerous short hooked hairs, over 20 on most segments and about one-third as long as flagellar width; maxillary stipes about three-fourths as long as posterior tibia; galea beyond palpus slightly more than twice as long as broad, almost pointed apically;

maxillary palpus three-fourths as long as stipes, first segment four-fifths as long as second, the two together as long as next four combined; labial palpus five-sixths as long as maxillary, the first segment three-fourths as long as next three combined. *Thorax*: Mesoscutum closely, strongly punctured, the punctures less than one puncture width apart, the interpunctural areas shining; mesonotum rather densely clothed with long yellowish pubescence, somewhat obscuring integument from lateral view; wings faintly yellowish, the first transverse cubital vein offset from first recurrent by slightly over half its own length; legs rather stout but not strongly modified; femora about twice as long as broad; hind tibia nearly one-third as broad as long, broadest just beyond middle, with hairs of inner margin not longer than tibial width; mid metatarsus depressed above near base; hind metatarsus half as long as tibia, two-fifths as broad as long, the next two segments produced dorsally, broader than long. *Propodeum*: Enclosure coarsely, evenly carinate, a straight line drawn transversely across the middle cutting about twenty-five carinae. *Abdomen*: Tergum shining but with numerous well defined punctures; tergite one with at least 100 well defined punctures on disk; apical hair bands white, well defined, contrasting strongly with remaining short brown tergal pubescence; sternum shining, with only minute pubescence, lacking hair bands except at corners; sternite five slightly elevated medially and rounded apically; sternite six with a triangular projection a little longer than broad, bearing a median ridge with a strong apical summit, the projection glabrous except for a short stiff lateral fringe; posterior arms of sternite seven evenly tapered, narrowly rounded apically; apical projection of sternite eight slender, with tip about twice as broad as narrowest part and less than half as broad as broadest part.

Holotype (unique): Sequoia National Park, California, elevation 2000-3000 ft., May 1930 (collector unknown).

This is very close to *D. californica* (Michener) but differs by having a pronounced apical summit on the projection of the sixth sternite and lacking a pair of strong sublateral hair tufts on the same segment.

Dufourea tarsata n. sp.

Male.—Length (abdomen extended) about 9 mm., length of anterior wing 5.2 mm., pubescence wholly whitish; integument dark, with distinct metallic bluish tint to head, thorax, dorsum of abdomen. *Head*: Face as long as broad; eyes converging slightly below, distance between them at antennal insertion about equal to eye length; face viewed from front with distance from posterior ocellus to vertex margin somewhat greater than ocellar width; area laterad to posterior ocellus shallowly concave; distance from antennal socket to clypeus about equal to socket diameter; clypeus with erect, white pubescence long basally, grading down to short apically, except for marginal fringe; supra-clypeal area bare except for sparse lateral tuft; punctures of frons fine, rather dense laterally, very sparse medially and just laterad to ocelli; area enclosed by subantennal sutures entirely impunctate; antennae black, short, non-crenulate, ventrally flattened, basally swollen; basal two flagellar segments slightly cupped beneath, with dense curled pubescence, the remaining segments with ventral surfaces bearing rather dense mats of

curled hairs mostly about as long as antennal width; first flagellar segment as broad as long, longer than second which is longer than third which is nearly twice as broad as long; scape globose, about three-fourths as broad as long, covered with long white hair; maxilla with stipes practically as long as hind tibia, galea less than three times as long as broad; maxillary palpus a little shorter than eye, first segment about twice as long as broad, about three-fourths as long as second, both together shorter than next three together which are subequal; labial palpus a little longer than first four maxillary palpal segments; the first segment four times as long as broad, slightly longer than second which is slightly longer than either of last two. *Thorax*: Mesoscutum strongly, moderately closely punctured, the punctures between one and two puncture widths apart; mesoscutellum more densely punctate; interpunctural areas polished; mesoscutum with long, rather sparse hair not at all concealing integument; wings with yellowish tinge, the first transverse cubital vein offset from first recurrent by nearly its length; legs somewhat swollen; femora about half as broad as long, broadest medially; mid tibia about half, hind tibia about two-fifths as broad as long, broadest near apex; mid metatarsus about half, hind metatarsus nearly two-thirds as broad as long, succeeding segments of hind tarsus broader than long, strongly projecting dorso-apically. *Propodeum*: Enclosure strongly, closely carinate, about 15 carinae on either side of midline; posterior margin with three strong transverse carinae. *Abdomen*: Tergum with very fine sparse punctures, first segment mirror-like, practically impunctate; apical hair bands rather sparse, not concealing integument, that of apical segments no stronger than other hair; fourth sternite with a pair of recurved hooklets near posterior margin; fifth gently rounded medially; sixth with flat, testaceous, truncate apical projection about as long as broad, and covered with a short, dense tuft of testaceous hair; posterior arms of seventh broad to near their acute apices, the basal ventral flaps about two-thirds as long as remainder; apical process of eighth about three times as long as basal breadth, slightly expanded at apex.

Female.—Length 7 mm.; length of anterior wing 5 mm.; pubescence white to testaceous, rather sparse, not obscuring integument which has dark bluish and coppery reflections. *Head*: Face as long as broad; inner eye margins parallel; eye length six-sevenths interocular width at insertion of antennae; when viewed from in front, distance from posterior ocellus to vertex about equal to ocellar diameter; frons with broad shallow concavity laterad to posterior ocellus; distance from antennal socket to clypeus about two-thirds socket diameter; clypeus with about 30 coarse punctures and about as long as width between inner bases of teeth on apical margin which bears tawny hairs as long as clypeus; punctures of frons separated by about one puncture width except near ocelli; facial vestiture light testaceous, sparse; antennal flagellum partially dull brownish yellow on apical five segments. *Thorax*: Mesoscutum and scutellum shining, uniformly covered with fine punctures from one to two puncture widths apart, and with vestiture composed of numerous short hairs and a few scattered long ones, which together do not obscure integument, even from lateral view; hind wings with 7 hamuli; apical bristles of fore tibia testaceous; mid tibial spur reddish

testaceous throughout; tibial scopa whitish, moderately appressed; hind tibia and metatarsus each about four times as long as broad. *Pro-podeum*: Enclosure coarsely carinate, with about 20 carinae on either side of mid line and a few transverse carinae near posterior border, followed by a non-carinate slightly roughened area. *Abdomen*: Tergites with very fine, mostly setigerous punctures, first segment mirror-like, with about 75 minute punctures on dorsal disk; apical tergite borders transparent, not at all concealed by sparse hair fringes; anal fimbria reddish testaceous.

Holotype male, *allotype*, 6 *paratype* males and 4 *paratype* females: 16 miles east of Mt. Hamilton, Santa Clara Co., California, elevation 2000 ft., April 20, 1947, from *Gilia* (G. E. Bohart).

Some of the females differ from the *allotype* in being smaller and having wholly dark antennae.

This is very closely related to *D. sandhouseae* Michiner but is easily distinguished in the male by the bare, impunctate area enclosed by the subantennal sutures and by the more swollen mid and hind tarsi. The female is somewhat larger than *sandhouseae* and has a slightly narrower face. Certain females of the two species are probably indistinguishable morphologically.

Dufourea timberlakei n. sp.

Male.—Length about 7 mm.; length of anterior wing 5 mm.; pubescence white, long, sparse; integument black without bluish or greenish reflections; last 10 flagellar segments yellow on outer sides. *Head*: Face ten-elevenths as long as broad; eyes slightly convergent below, their length six-sevenths as great as distance between them at antennal insertions; clypeus over twice as broad as long, densely punctured, covered with reclining white pubescence except for basal bare, impunctate strip; distance from antennal socket to clypeus about two-thirds socket diameter, half distance between sockets; cheek between antenna and base of mandible with patch of long brown hair; frons irregularly, sparsely punctate, the punctures averaging over one puncture width apart, nearly impunctate on broad, slightly concave area laterad to posterior ocellus; antennae short, scarcely over one-third length of anterior wing; scape at least half as broad as long; first flagellar segment broader than long, about three-fourths as long as second which is slightly longer than any of remaining segments; flagellum bare except for usual minute general pubescence; maxilla with stipes slightly shorter than hind tibia, galea less than half as long as stipes, rounded apically; maxillary palpus about two-thirds as long as stipes, first segment less than four times as long as broad, about three-fourths as long as second, as long as fourth and fifth together; labial palpus a little over half as long as stipes, first segment one and one-half times as long as second or third and fourth combined. *Thorax*: Mesoscutum rather sparsely punctate medially where many punctures are two or three puncture widths apart; punctures of mesoscutellum, sides of mesoscutum one to two puncture widths apart; dorsum, sides of thorax covered with long, sparse pubescence, mostly as long as scape, largely hiding short meso-scutal pubescence; wings slightly yellowish, the first transverse cubital vein offset from first recurrent by two thirds its own length; legs rather

stout but not highly modified; fore and mid femora half as wide as long; hind tibia evenly tapered, about three times as long as broad, with many hairs of inner margin two-thirds tibial length; metatarsi about four times as long as broad, parallel sided; second, third, fourth hind tarsal segments each about as long as broad. *Propodeum*: Enclosure strongly, evenly carinate, a straight transverse line drawn through middle cutting about 35 carinae. *Abdomen*: First tergite nearly impunctate on disk but subshining and reticulate, not mirror-like; remaining tergites with apical hair margins weakly defined laterally, not differentiated dorsally from semi-erect brownish tergal pubescence; sternum with first five segments rather densely covered with short, erect hair; fourth with a pair of tiny sublateral thorn-like projections; apical margin of fifth gently convex medially; sixth with a broad median circular depression and a short, broad, gently emarginate apical process, the depressed area bare, twice as broad as long, the process with rather long marginal hair ventrally; posterior arms of seventh about two-fifths as broad as long and evenly tapered, with apex rounded and margined by long hairs; posterior projection of eighth with apex twice as broad as narrowest, half as broad as broadest parts.

Holotype male and two *paratype* males: Mt. Pinos, Ventura Co., California, May 31, 1942 (R. M. Bohart).

This is closest to *D. truncata* Timberlake but is larger, has a broader, less thickened process of the sixth sternite, a brown patch of hair above the sides of the clypeus, and no metallic blue color on the frons. One of the paratypes differs from the type in having a largely impunctate area in front of the median ovellus and scattered large punctures in the areas laterad to the lateral ocelli. Both paratypes have a more polished first abdominal tergite than has the type.

Dufourea femorata n. sp.

Male.—Length about 11 mm., length of anterior wing 7 mm.; integument black with no tinge of blue, green, or copper; pubescence pale except for some black facial hair; body elongate. *Head*: Face a little broader than long; inner eye margins approximately parallel, slightly converging below, distance between them at antennal insertion slightly greater than eye length; face, as viewed directly from in front, with distance between posterior ocelli not greater than from one of them to posterior margin of vertex; distance from antennal socket to clypeus as great as socket diameter; area between posterior ocellus and upper margin of eye distinctly depressed; clypeus concealed by a long, white, dense, reclining tuft of hair extending beyond clypeus a distance equal to clypeal length, and with a few erect black hairs at its base; supra-clypeal area distinctly but sparsely punctate, with white, prostrate hair bounded laterally by long, erect, black hair extending upwards along inner eye margins; frons moderately coarsely, irregularly punctate, the punctures nearly contiguous except along eye margins and posterior to median ocellus where they are frequently separated by one or more puncture widths; antennae rather short, reaching about to tegulae, the flagellum black, not at all clubbed, slightly crenulate, the segments, as viewed from above, slightly longer than broad, the second but little longer than first or third, shorter than last; flagellar hairs pale brown to

whitish, as long as flagellar width, strongly bent near their middles toward flagellar apex, never more than three per segment, confined to first nine segments; scape over twice as long as broad; maxilla with stipes nearly one-third its length longer than eye, about as long as posterior tibia; galea a little less than three times as long as broad, narrowly rounded apically; maxillary palpus nearly four-fifths as long as stipes, first segment three times as long as broad, four-fifths as long as second, approximately equal to each of remaining segments; labial palpus three-fourths as long as maxillary, first segment five times as long as broad, a little longer than second maxillary palpal segment or second labial, one-third its length longer than third or fourth labial. *Thorax*: Mesonotum uniformly, moderately closely, coarsely punctured, the punctures averaging a little less than one of their diameters apart except on median line, surface sparsely covered with long, white and a few brown hairs, some short, white pubescence; wings clear but distinctly stained with brownish yellow, the second transverse cubital vein separated from second recurrent by half its own length; legs strikingly modified; femur nearly as broad as long, produced ventrally at the middle to an angle of somewhat greater than 90 degrees; mid tibia one-third as broad as long, broadest apically, where it overhangs base of tarsus; mid tibial spur strongly curved; mid metatarsus greatly flattened, elongated, with a large, flat, semi-lunar, ventral production whose apex is directed distally, the segment being half as broad as long with its base having a small, inner, knot-like hump from which springs a dense tuft of stiff hairs; posterior femur with a strong, ventral, blunt, spine-like projection at its middle, directed at right angles to tibial axis, causing the segment to be as broad as long; posterior tibia arcuate, over one-third as broad as long, with a rather long brush of white hairs on outer apical half and a ridge of very long white hairs along inner ventral margin; posterior metatarsus nearly twice as long as remainder of tarsus, more than one-third as broad as long, polished on its outer surface; remaining tarsal segments, except the last, strongly produced posteriorly, over twice as broad as long. *Propodeum*: Enclosure completely, strongly carinate, the carinae rather even and parallel, the inter-carinal spaces no broader than carinae. *Abdomen*: Tergites finely, sparsely punctate, those on first tergite minute, many puncture widths apart and on next two more abundant, especially basally; white hair bands distinct but sparse; median hair of tergites brownish; third with apical lateral corner slightly projecting; fourth with a pair of strong, recurved hooklets just inside apical lateral corners, connected by low ridges with small ventrally directed teeth at the extreme corners; fifth emarginate apically, the emargination truncate medially; sixth with a convex, laterally impressed, median, longitudinal area, slightly broadened sub-apically, entirely covered with a short, fine, dense pad of hair, and terminating apically in a weakly bilobed, flat projection which extends slightly beyond sternite proper; dorsally placed under the apex of this area is a flat, rounded apical lobe, twice as long as broad, as long as mid line of sternite proper and covered with a dense, long tuft of white hair; posterior arms of seventh nearly three times as long as their basal, ventral flaps, carinate laterally, apically surrounded with dense yellow pubescence less than one-third as long as the arms; apical projec-

tion of eighth basally broadened, narrowest at middle, remaining parallel sided to apex which is less than one-fifth as broad as base.

Female.—Length about 11 mm., length of anterior wing 6.5 mm.; pubescence mostly pale; integument black as in male; body slightly elongate. *Head*: Face almost precisely as long as broad (a minute fraction broader); inner margins of eyes essentially parallel, the distance between them at antennal insertion somewhat greater than eye length; face, viewed directly from in front, with distance from posterior ocelli to posterior margin of vertex three-fourths that between them; distance from antennal socket to clypeus slightly less than socket diameter; clypeus coarsely, moderately densely punctate, the punctures, except on apical margin, little more than one of their diameters apart; hair of clypeus, inner eye margins, frons dark brown, that of antennal scapes, area between them with long white hairs mixed with a few dark ones; frons moderately strongly, densely punctate, the punctures between lower two-thirds of eyes and along entire inner eye margins mostly separated by one to two puncture widths, those of areas behind ocelli and between lateral ocellus and compound eye mostly less than one width apart; antennae black. *Thorax*: Elevated posterior portion of pronotum long laterally but nearly obsolete medially, the lateral margins with dense white hair tufts; mesonotum uniformly, rather finely, closely punctate, the punctures mostly separated by about one of their diameters; mesonotal surface provided with only a few long, dark brown hairs, and very few short ones except for microscopic pubescence scarcely protruding beyond punctures; apical bristles of fore and mid tibiae testaceous; mid tibial spur testaceous; about twelve times as long as broad, rather strongly curved at apex, with over fifteen small teeth having needle-fine apices, the apical sixth of spur edentate; tibial scopa rather dense, white, appressed, with a fringe of brownish hairs along upper margin. *Propodeum*: Enclosure coarsely, uniformly carinate, the carinae diverging posteriorly; a straight transverse line drawn through middle of enclosure cutting from twenty to twenty-five carinae. *Abdomen*: Tergites distinctly punctured, the first very sparsely, the punctures being several to many of their diameters apart; second tergite more closely punctured but with punctures two or more diameters apart; impunctate tergite borders testaceous; abdominal hair bands no longer than tergite borders, the first two incomplete; median hair of tergites dark brown; anal fimbria dark testaceous; apical tergite with distinct median, longitudinal carina.

Holotype male and *allotype*: Tuolumne Co., California, elev. 3500 ft., June 9, 1938, from *Gilia capitata*, (R. M. Bohart); *Paratypes*: 5 males, 36 females, same data; 7 males, 1 female, Marsh Creek Springs, Contra Costa Co., California, April 26, 1937, from *Gilia tricolor*, (G. E. Bohart, R. M. Bohart, C. D. Michener); 3 males, 4 females, same place and host, May 21, 1938, (G. E. Bohart, R. M. Bohart); 1 male, Butte Cr., near Chico, Butte Co., California, April 25, 1922, (Helen Van Duzee); 1 male, Antioch, Contra Costa Co., Calif., May 18, 1936, (M. A. Cazier); 1 male, Mt. Hamilton, Santa Clara Co., California, April 26, 1913, (J. C. Bridwell).

Variation is slight in this species. The first transverse cubital and first recurrent veins are sometimes nearly contiguous. The size of the

relatively impunctate areas of the frons is also somewhat variable. Body size is often smaller than that described for the holotype.

This is easily distinguished from all except *D. virgata* (Ckll.) by its large size, dense punctures, flattened face, and pale pubescence in both sexes, and in the male by its peculiar leg characters. It can be told from *D. virgata* by its larger size, finer propodeal sculpturing, and the reversed condition in degree of production of mid and hind femora.