Idothea (Pentidotea) schmitti Menzies, new species.

(Plate 5, figures A-F; Plate 9, figures G-H).

Idotea Whitei Stimpson, 1864, p. 155 *(species inquirenda).*

Idotea whitei Stimpson.—Miers, 1883, pp. 42-43.—Richardson, 1899a, pp. 846-847;—1899b, p. 266;—1900a, p. 227.

Pentidotea whitei Stimpson.—Richardson, 1905a, pp. 373-374, figs. 405-406;—1909, p. 109.—Gurjanova, 1936, p. 260.—Ricketts and Calvin, 1939, p. 128.—Hatch, 1947, p. 217, fig. 92.

Stimpson's description of *Idothea whitei* is much too incomplete and general for his species to be identifiable today. Miers' concept of what Stimpson's species was like fits the description of two species *I. (P.) whitei* (of Richardson) and *I. (P.) aculeata* Stafford. Richardson's description and figures (1905) definitely set the pattern for subsequent reference to the species; however, it should be noted that her concept of *I. (P.) whitei* can scarcely represent Stimpson's concept of the species. Stimpson writes: "Body slender—outer antennae nearly two-thirds as long as the body,—(abdomen) slightly narrowing posteriorly, with the extremity rounded, truncate, and bluntly acuminate at the middle.—it is allied to *I. Wosnesenskii,* but is very much more elongated." (1864, p. 155). Such a description applies much better to the form of *I. (P.) montereyensis* Maloney than that of *I. whitei* (of Richardson). The body of Richardson's *I. whitei* is not narrow but fairly broad, being very similar to that of *I. (P.) wosnesenskii.* In *I. (P.) montereyensis* the body is indeed narrow in comparison to that of *I. (P.) wosnesenskii.* The second antennae of Richardson's *I. whitei* do not nearly approach two-thirds the body length, while such is more nearly the case in certain specimens of *I. (P.) montereyensis.* The telson is bluntly acuminate at the middle in both species as it is also in *I. (I.) fewkesi* which species perhaps might also be identified with Stimpson's *I. whitei.* Whether one prefers to recognize Stimpson's species or not it appears clear that the form he described is not the same as the one which Richardson called *I. whitei* and that Richardson's species is in reality a species new to science. It is with considerable pleasure that I name this species in honor of Dr. Waldo L. Schmitt, Head Curator, Department of Zoology, United States National Museum, who has contributed greatly to science not only through his very valuable pub-

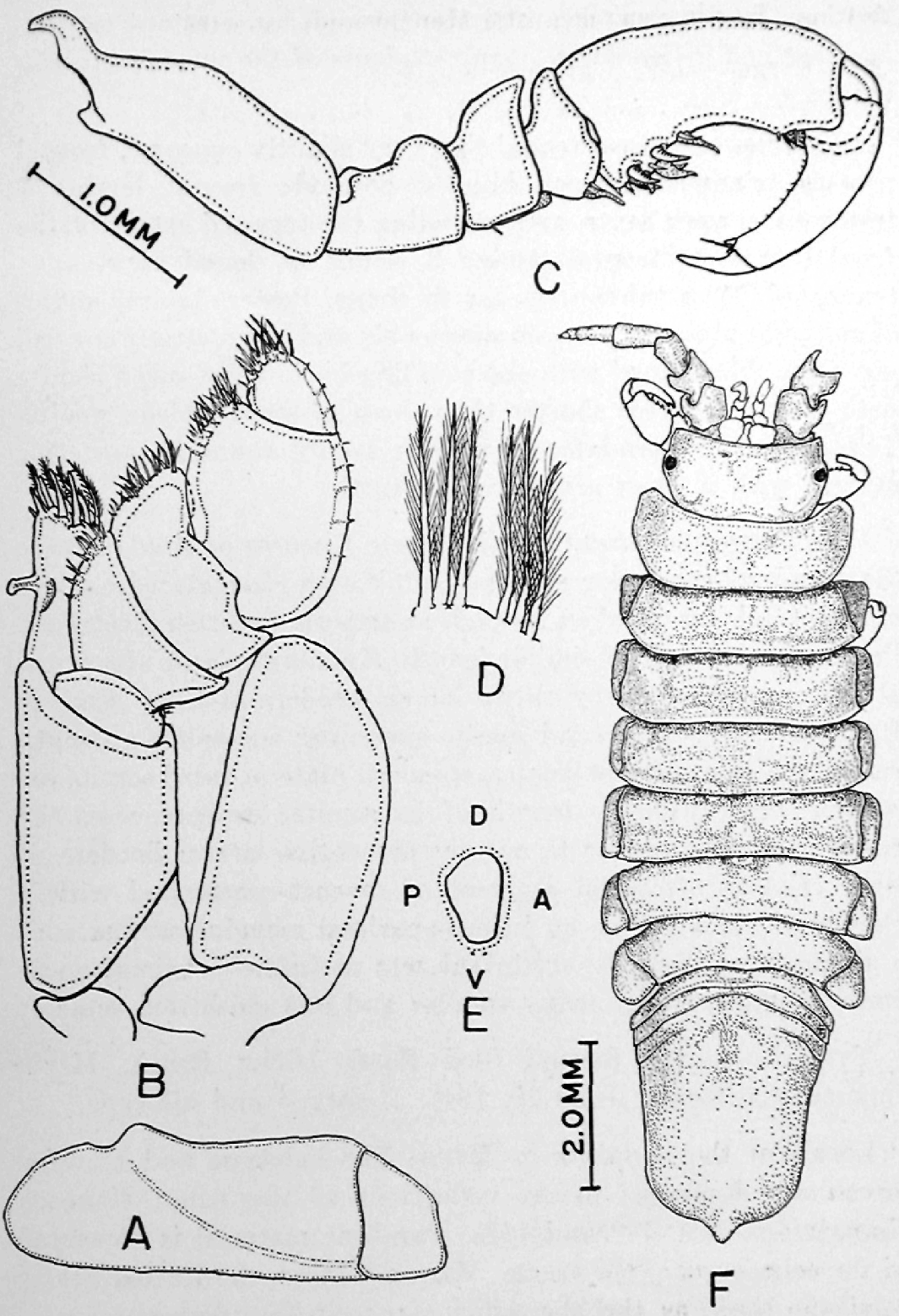

Plate 5. *Idothea (Pentidotea) schmitti* Menzies. Figure A. uropod; B. maxilliped; C. seventh peraeopod; D. plumose setae at outer distal angle of uropodal basal segment, inner surface; E. eye, lateral view; F. holotype, dorsal view.

lications on the crustacea but also through his constant encouragement and assistance to many students of the marine invertebrates.

Diagnosis: Supra-antennal line very slightly concave; frontal process triangulate, apex bluntly pointed; frontal lamina 1 triangulate, apex acute, and exceeding the forward extent of the frontal process; frontal lamina 2 visible in dorsal view, apex truncated. Eyes subrectangular in shape. Postero-lateral angles of epimeral plates of peraeon somites six and seven evenly curved, not acute. Maxilliped with one coupling hook. First pleon somite with lateral margins shorter than those of second pleon somite. Telson with postero-lateral margins evenly rounded, posterior margin with a short acute median tooth.

Description (diagnostic and generic features omitted): Body short and robust. Color generally pink with characteristic white patches on dorsum and on uropods at articulation with pleotelson. Peraeon somites all of similar length. Epimeral plates of somites 4 to 7 appear to occupy entire lateral borders of those somites. Epimeral plates of second somite exceeding one-half the length (along midline) of that somite, epimeral plate of third somite exceeding two-thirds the length of its somite; in both cases the epimeral plates appear to occupy the entire lateral borders of their somites. Propodal segment of seventh peraeopod with a cluster of strong setae on infero-proximal margin, carpus with a single, large, heavily chitinized seta at infero-proximal angle which is bordered by many smaller and less chitinized setae.

Type Locality: Second Sled Road, Dillon Beach, Marin County, California, June 28, 1946. Holotype and allotype.

Location and Number of Type: The holotype and allotype have been deposited in the collections of the Allan Hancock Foundation, Nos. 462 and 462a. Paratype material is deposited in the collections of the Pacific Marine Station, the United States National Museum, and the Allan Hancock Foundation.

Measurements of Types: Holotype female, length 13.5 mm., width 4.0 mm. Allotype length 30.0 mm., width 8.0 mm.

Ecology: Most specimens examined were collected from rocky coast localities, generally at the laminarian zone. A few speci-

mens were taken from the surface at a night light near the channel entrance to Tomales Bay, Marin County, California. Two ovigerous specimens were collected during the month of February.

GEOGRAPHIC RANGE: Bering Sea to Monterey Bay, California.

SPECIMENS COLLECTED: A total of eight male and four female specimens that had been collected from various localities in northern California were examined.

Idothea (Pentidotea) wosnesenskii (Brandt, 1851).

(Plate 6, figures A-K; Plate 9, figures E-F).

Idotea Wosnesenskii BRANDT, 1851, p. 146.

Idotea wosnesenskii BRANDT.—STIMPSON, 1857b, p. 504.—BATE, 1866, p. 281.—MIERS, 1883, p. 40.—RICHARDSON, 1899a, p. 846;—1899b, p. 265;—1900a, p. 227;—1904a, p. 218 or 216;—1904b, p. 663;—1905b, p. 216.

Idotea media DANA, 1854, p. 175.—BATE, 1866, p. 282. (taken from RICHARDSON, 1905a, p. 370). (Probably *species inquirenda.)*

Idotea hirtipes DANA, 1852, (1853), p. 704, pl. 46, fig. 6.

Idotea Oregonensis DANA, 1854, p. 175, new name for I. *hirtipes* DANA, 1852.

Pentidotea wosnesenskii BRANDT.—RICHARDSON, 1905a, pp. 370-373, figs. 402-404;—1909, p. 109.—FEE, 1927, pp. 19-20.—JOHNSON AND SNOOK, 1935, p. 290, fig. 246.—GUBERLET, 1936, pp. 340-341, 1 pl.—GURJANOVA, 1936, p. 259-260.—RICKETTS AND CALVIN, 1939, p. 126, fig. 62.—LIGHT, 1941, p. 87, 88, figs. 55a, 56a-b.—HATCH, 1947, pp. 216-217, figs. 88-89, 162 (var *exlinae* Hatch).

Brandt's original description is today recognizable and thus few difficulties in synonymy are encountered.

Dana's *I. media,* which he considered related to *I. oregonensis,* should be considered a *species inquirenda* in that the description is hardly more than generic. It applies equally well to a number of known species, such as, *I. (P.) montereyensis* Maloney, *I. (P.) stenops* Benedict, and *I. (P.) schmitti* Menzies.

DIAGNOSIS: Supra-antennal line evenly concave; frontal process wide, with a blunt evenly rounded apex, and is shorter than frontal lamina 1; frontal lamina 1 wider than frontal process and triangulate in shape; frontal lamina 2 visible in dorsal view, triangulate, apex blunt. Eyes reniform, with convex edge

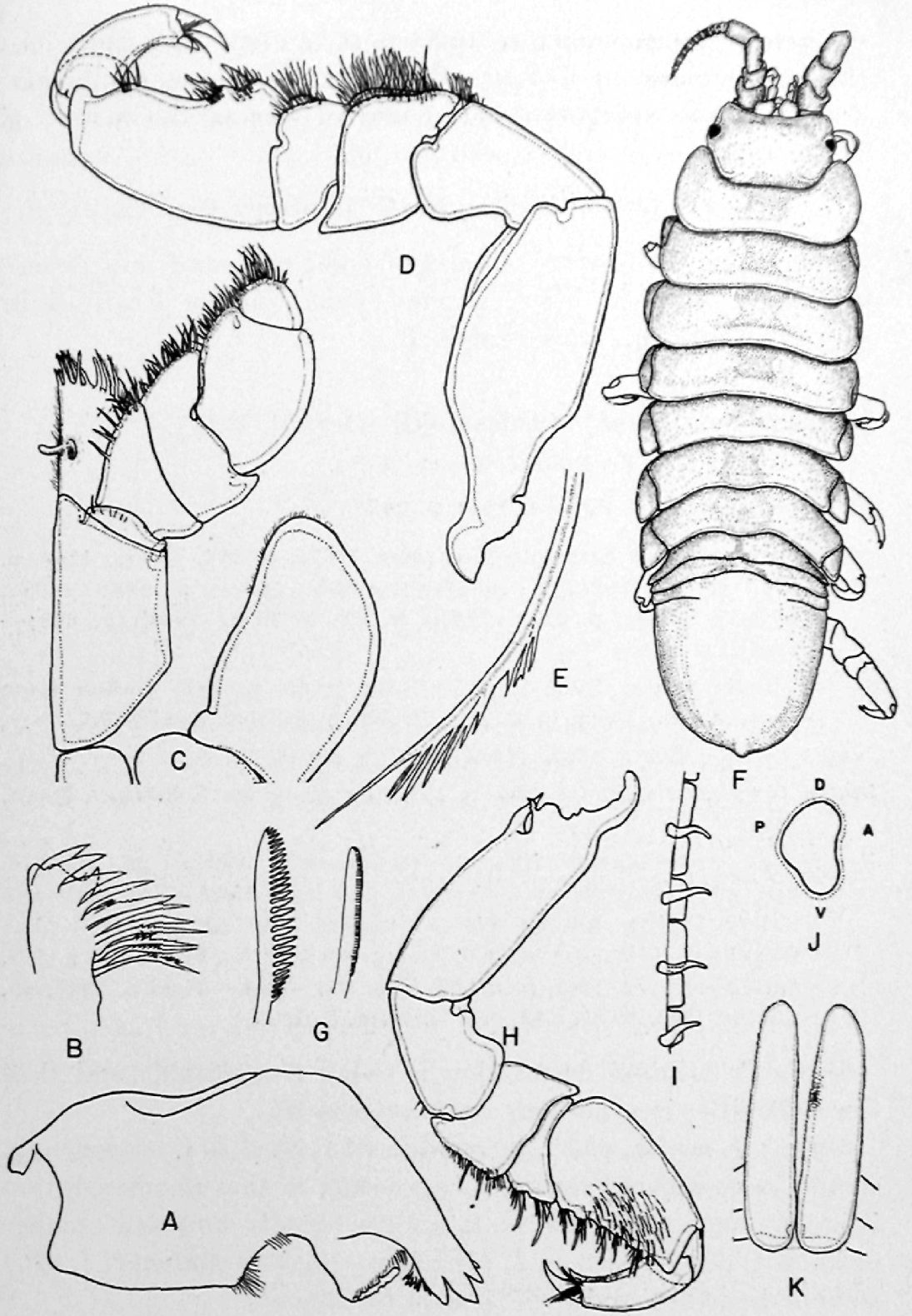

Plate 6. *Idothea (Pentidotea) wosnesenskii* Brandt. Figure A. left mandible; B. lacinoid seta and setal row of right mandible; C. maxilliped; D. seventh peraeopod, male; E. the most proximal seta in setal row of right mandible; F. male, dorsal view; G. comb-like setae of first peraeopod; H. first peraeopod; I. setae and scale-like structures of inferior margin of dactyl of first peraeopod; J. eye, lateral view; K. penis.

directed posteriorly. Maxilliped with a single coupling hook. Epimeral plates of seventh peraeon somite with acute postero-lateral edges. First pleon somite with acute lateral edges. Telson with an evenly rounded posterior margin having no suggestion of postero-lateral angles and having a minute median tooth.

TYPE LOCALITY: No exact location is given for the species in the original description although the following areas are noted: "Ochotskischen Meere, ferner bei den Inseln Attu, Atcha, St. Paul, Kadjak, Sitcha, und an der Nord-Californischen Kuste."

LOCATION AND NUMBER OF TYPE: These data are not known to the writer.

MEASUREMENTS OF TYPE: Not given.

MEASUREMENTS OF SPECIMENS OTHER THAN THE TYPE: Figured male, length 23.0 mm., width 6.0 mm.; large male, length 36.4 mm., width 9.6 mm.; large ovigerous female, length 25.0 mm., width 7.9 mm.

ECOLOGY: Specimens of this species were collected mostly from the mid-intertidal zones of the protected and open rocky coast. One specimen was taken in a surface plankton haul at the mid channel entrance to Tomales Bay, another was collected on rocks near Marshalls, Tomales Bay. Such bay occurrences are, however, unusual and not typical of the species' ecology. The species is commonly a member of the *Mytilus* bed biotope, although specimens were collected on the alga *Ulva* outside of the *Mytilus* biotope and less frequently on other species of algae in the middle and upper intertidal zones. Ovigerous specimens were noticed in July.

GEOGRAPHIC RANGE: Okhotsk Sea to Estero Bay, San Luis Obispo County, California.

Idothea (Pentidotea) aculeata Stafford, 1913.

(Plate 7, figures A-G; Plate 9, figures I-J).

(Text figure 2).

Pentidotea aculeatus STAFFORD, 1913a, p. 165.

Pentidotea aculeata STAFFORD, 1913b, pp. 185-188, figs. 8-10.—JOHNSON AND SNOOK, 1935, p. 290, fig. 245.—HEWATT, 1946, p. 199.

This species is one of the best originally described and figured species in the genus. The young differ somewhat from the adults and the following diagnosis applies primarily to young specimens, although it is applicable to adults as well.

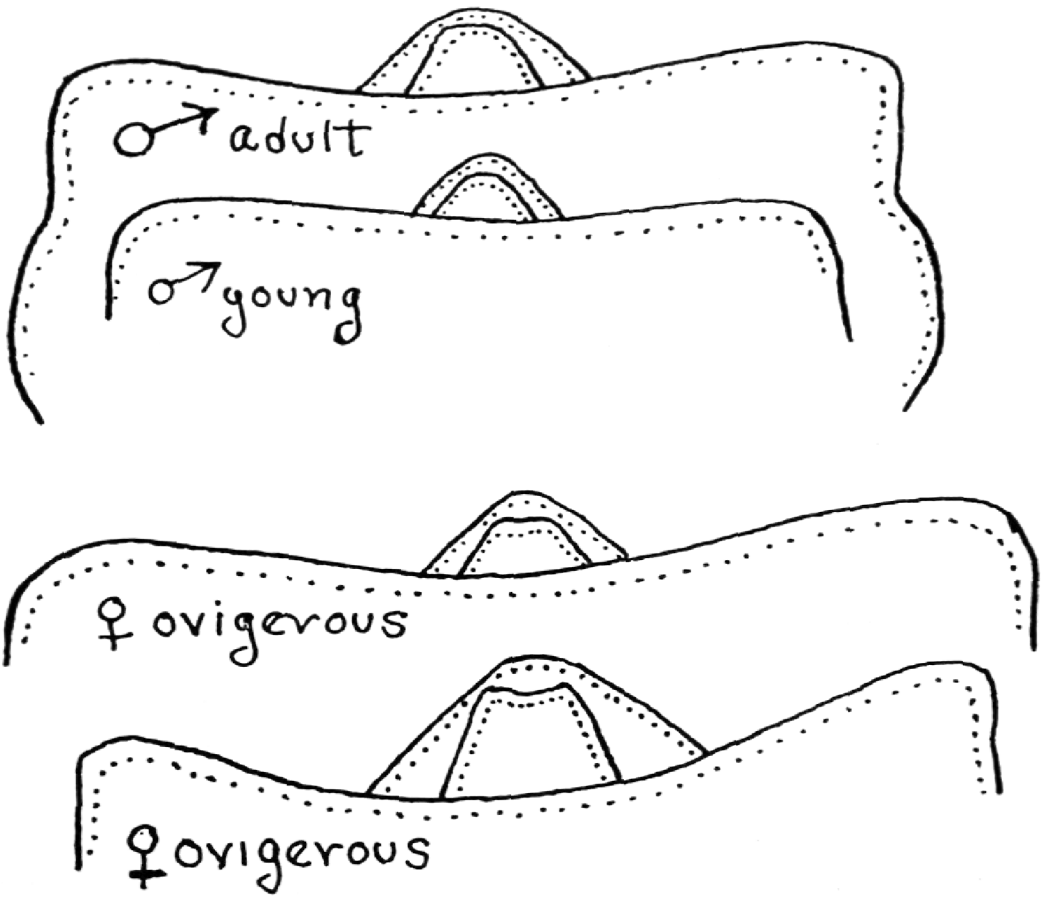

Figure 2. *Idothea (P.) aculeata* Stafford. Variations in the form of the frontal process. All specimens taken from the subintertidal at La Jolla, California.

Diagnosis: Supra-antennal line concave; frontal process broadly triangulate with apex bluntly acuminate and often somewhat concave, frontal process shorter than frontal lamina 1; frontal lamina 1 broadly triangulate; frontal lamina 2 not visible in dorsal view. Eyes almost circular. Maxilliped with a single coupling hook. Epimeral plate of peraeon somites six and seven with acute postero-lateral angles. First pleon somite with long straight lateral borders. Telson elongate, with slightly concave postero-lateral borders and a large, elongate, bluntly pointed, median posterior projection the base of which nearly covers the median one-third of the posterior margin of the telson.

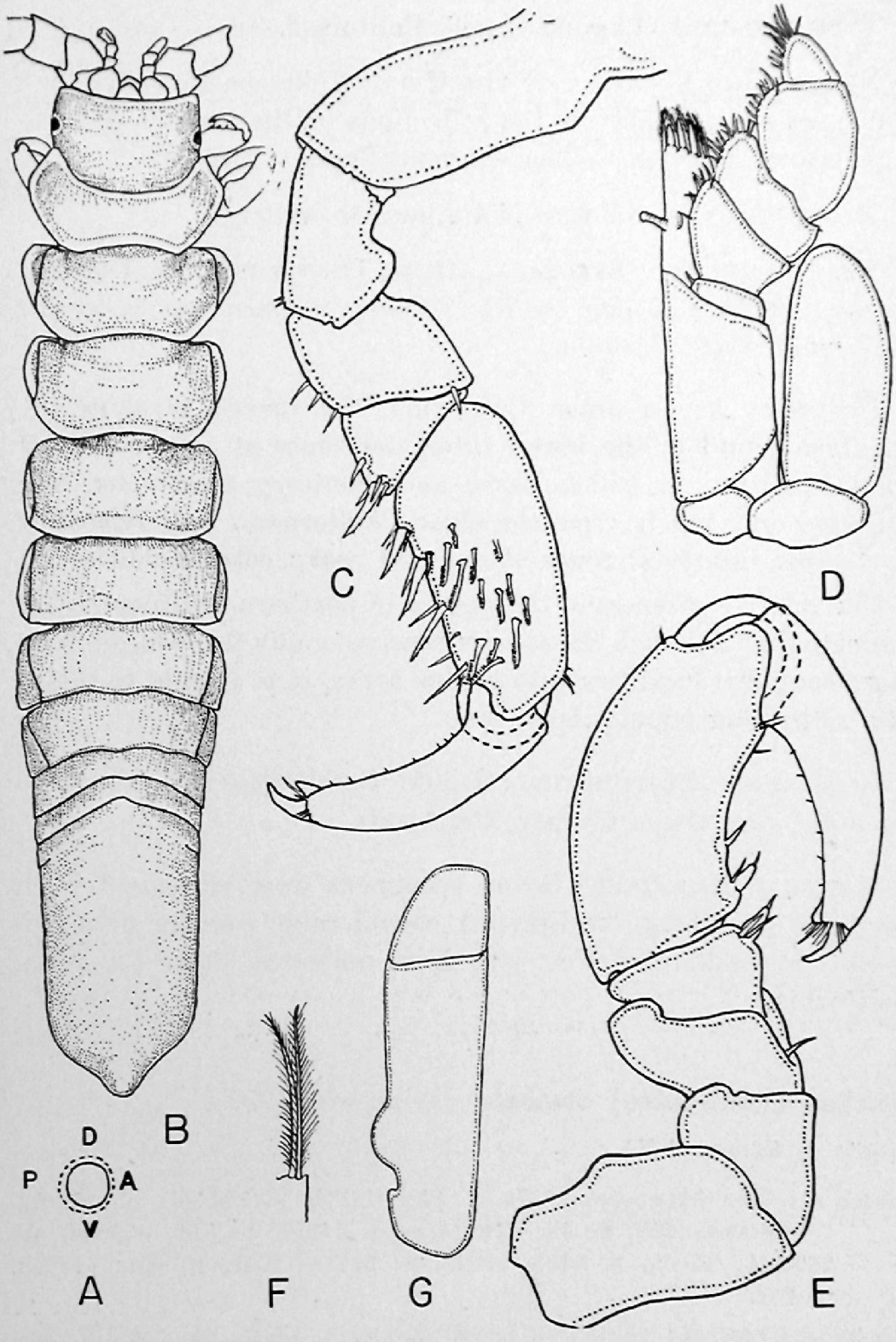

Plate 7. *Idothea (Pentidotea) aculeata* Stafford. Figure A. eye, lateral view; B, young female, dorsal view; C. first peraeopod; D. maxilliped; E. first peraeopod; F. plumose setae at outer distal angle of uropodal basal segment, inner surface; G. uropod.

TYPE LOCALITY: Laguna Beach, California.

NUMBER AND LOCATION OF THE TYPE: Unknown to writer, but the types are probably in the collections of the Laguna Marine Laboratory, Pomona College, Laguna Beach, California.

MEASUREMENTS OF TYPE: Not known to writer.

MEASUREMENTS OF SPECIMENS OTHER THAN THE TYPE: Figured female, length 13.0 mm., width 2.2 mm.; mature female, length 16.7 mm., width 3.0 mm.

ECOLOGY: At La Jolla, California, the species is abundant on algae found in the lowest intertidal zones at exposed rocky coast localities. At Dillon Beach and Monterey, specimens were collected only rarely from the algae *Phyllospadix* and *Bossea* at the lowest intertidal zones at exposed rocky coast localities.

The relative rareness of the species in northern California may indicate that although the species is occasionally introduced from more southern localities into colder areas, it is unable to maintain a thriving population there.

GEOGRAPHIC DISTRIBUTION: Dillon Beach, Marin County, to La Jolla, San Diego County, California.

MATERIAL EXAMINED: Seven specimens were examined from northern California localities. A considerable number of specimens were examined that had been collected from La Jolla, California.

Idothea (Pentidotea) resecata (Stimpson, 1857).

(Plate 8, figures A-F).

Idotea resecata STIMPSON, 1857a, p. 88;—1857b, p. 504-505, pl. 22, fig. 7;—MIERS, 1853, p. 45.—RICHARDSON, 1899a, p. 844;—1899a, pp. 263-264; 1900a, p. 226;—1904a, p. 216;—1904b, p. 661;—1905b, p. 216.

Pentidotea resecata (STIMPSON).—RICHARDSON, 1905a, pp. 369-370, figs. 400-401.—SEARLE, 1914, p. 364.—HALE, 1924, p. 220.—FEE, 1926, p. 19.—JOHNSON AND SNOOK, 1935, p. 290, fig. 244.—GUBERLET, 1936, pp. 338-339, 1 pl.—RICKETTS AND CALVIN, 1939, p. 155, fig. 73.—LIGHT, 1941, pp. 87-92, fig. 56c.—HEWATT, 1946, p. 201.—HATCH, 1947, p. 218, fig. 93.—MENZIES AND WAIDZUNAS, 1948, pp. 107-113, figs. 1-20.

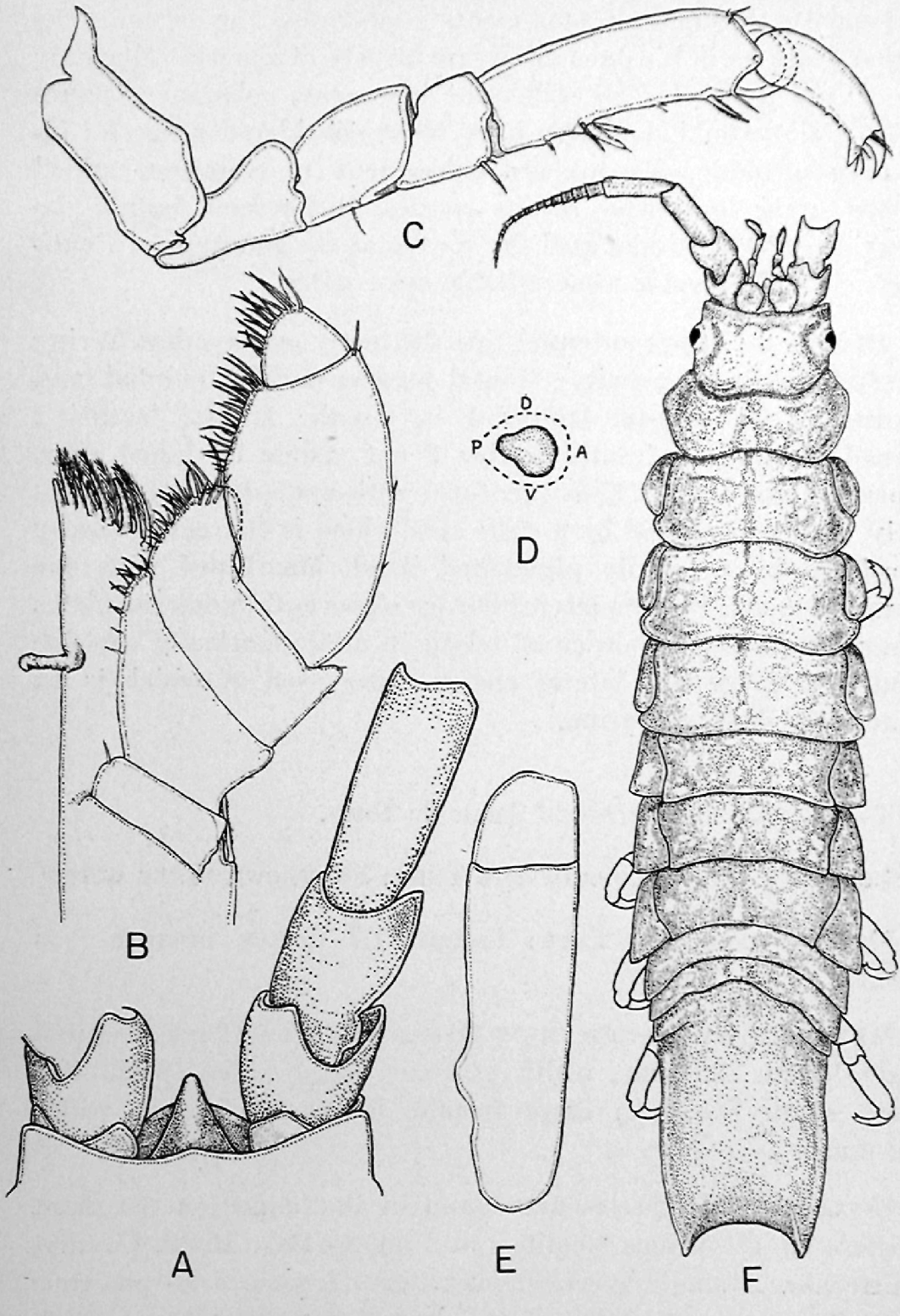

Plate 8. *Idothea (Pentidotea) resecata* (Stimpson). Figure A. cephalon, dorsal view, first antenna removed; B. maxilliped; C. seventh peraeopod; D. eye, lateral view; E. uropod; F. male, dorsal view.