

Stimpson's original description is recognizable as valid today primarily through his statements concerning the telson. The other features in his description are largely of generic value only and were it not for his somewhat inaccurate subsequent figure his species would doubtless have to be considered a *species inquirenda* today. Researchers subsequent to Stimpson added little to the knowledge of the species. Richardson figured the maxilliped, Hale designated the species as the genotype of *Pentidotea*, and Fee made some reliable color notes.

DIAGNOSIS: Supra-antennal line distinctly concave but having a small median convexity; frontal process narrow, pointed, and exceeding the frontal lamina 1 in length; frontal lamina 1 broadly rounded; frontal lamina 2 not visible in dorsal view, apex minutely cleft. Eyes pyriform with apex directed posteriorly. Eye surrounded by a clear area which is characteristically bordered by a heavily pigmented band. Maxilliped with one coupling hook. Postero-lateral border of seventh epimeral plates angulate. Posterior border of telson in adult markedly concave and with projecting lateral angles above each of which is an anteriorly directed carina.

TYPE LOCALITY: Strait of Juan de Fuca.

LOCATION AND NUMBER OF THE TYPE: Not known to the writer.

MEASUREMENTS OF TYPE: Length 1.7 inches, breadth 0.33 inches.

MEASUREMENTS OF SPECIMENS OTHER THAN THE TYPE: Figured male, length 22.5 mm., width 4.0 mm.; large male, length, 40.0 mm., width 7.0 mm.; large female, length, 16.5 mm., width 3.0 mm.

ECOLOGY: This species was found in abundance on the plant *Zostera* sp. at various localities in Tomales Bay, Marin County, California. A single specimen was taken from a crab pot rope one mile north west of Dillon Beach in Bodega Bay. Some specimens loaned by the University of California were found in off-shore kelp beds at Monterey Bay, California. Richardson records the species from the open ocean off southern California. The species appears in spite of these records to be predominantly

an inhabitant of fairly quiet bay localities. Specimens were occasionally taken at the surface at a night light near the channel entrance to Tomales Bay. Ovigerous specimens were taken in July.

**GEOGRAPHIC RANGE:** Karta Bay, southeast Alaska to southern California.

**MATERIAL EXAMINED:** A total of 9 male, 4 female, and 21 juvenile specimens collected at various localities in Washington and northern California have been examined.

***Idothea* (*Pentidotea*) *montereyensis* Maloney, 1933.**

(Plate 10, figures A-K; Plate 9, figures C-D).

*Pentidotea montereyensis* MALONEY, 1933, pp. 146-147, fig. 2.

*Stenosoma gracillimum* DANA, 1854, p. 175 (*species inquirenda*).—STIMPSON, 1857b, p. 505.

*Idotea gracillima* DANA.—MIERS, 1883, p. 35.—RICHARDSON, 1899a, p. 844;—1899b, p. 264;—1900a, p. 226;—1904a, pp. 216-218;—1904b, pp. 661-663, figs. 2-3.—1905a, pp. 356-358, figs. 384-385.

*Idothea ochotensis* HATCH, 1947, p. 219 (not *I. ochotensis* of Brandt or Richardson).

Maloney described this species apparently unaware that specimens identical with it had been known previously under a different name because he makes no mention of synonyms in his description.

Dana described *Stenosoma gracillimum* so very incompletely that one wonders how it was possible for Richardson to assign any form to Dana's species. Certainly Dana's description is applicable to several of the species known during that time. A comparison of Richardson's specimens with paratypes of Maloney's species shows them to be identical. The specimens reported by Hatch as *Idothea ochotensis* belong, as an examination of his specimens indicated, to this species.

**DIAGNOSIS:** Supra-antennal line slightly concave; frontal process narrow, elongate, pointed, and exceeding the length of frontal lamina 1; frontal lamina 1 wide, semi-circular in outline; frontal lamina 2 not visible in dorsal view. Eyes about as long as wide, having an almost straight anterior border and a convex posterior border. Maxilliped with one coupling hook.

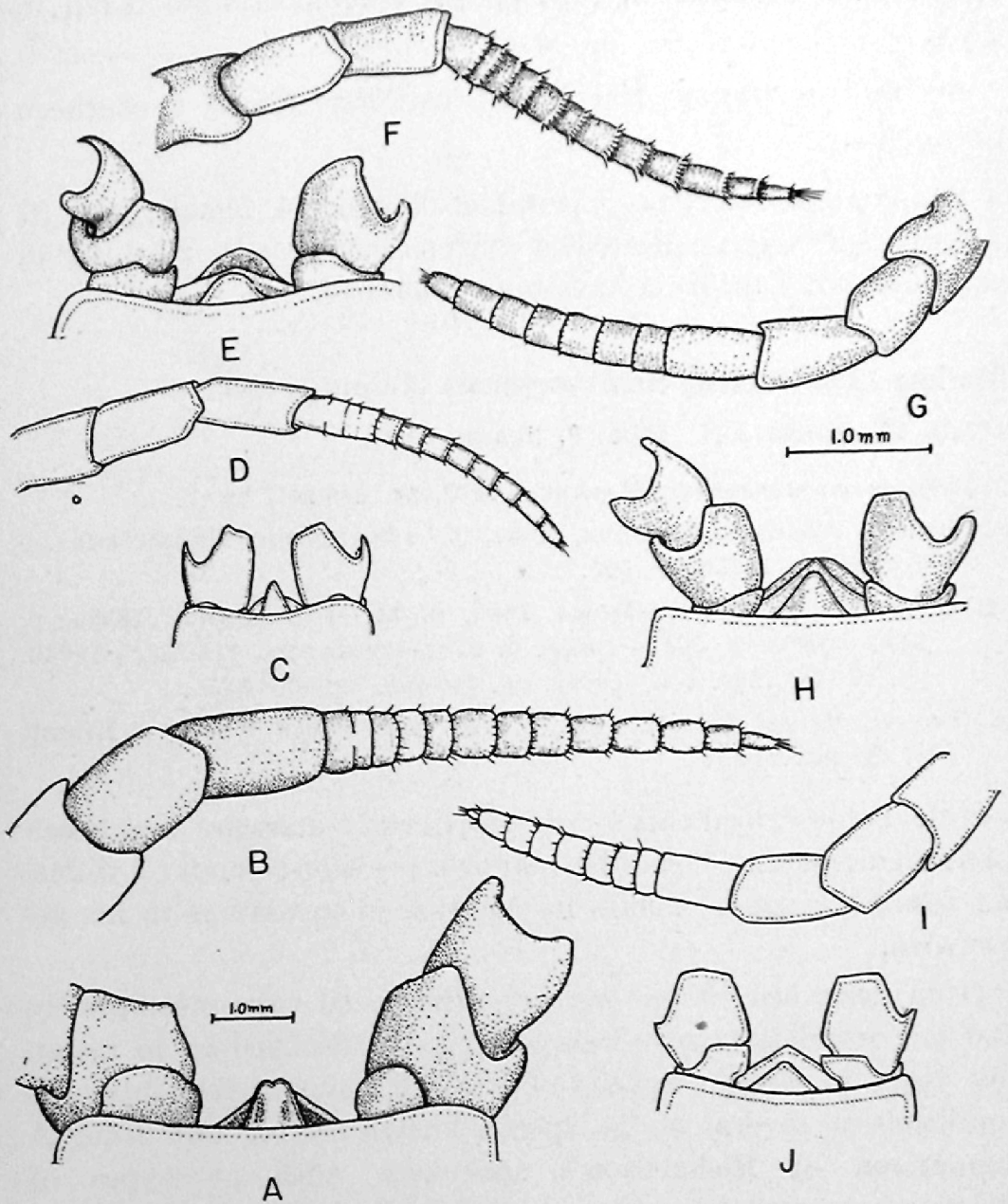


Plate 9. *Idothea (P.) stenops* Benedict. Figure A. cephalon, dorsal view, first antennae removed; B. second antenna. *Idothea (P.) montereyensis* Maloney. Figure C. cephalon; D. second antenna. *Idothea (P.) wosnesenskii* Brandt. Figure E. cephalon; F. second antenna. *Idothea (P.) schmitti* Menzies. G. second antenna; H. cephalon. *Idothea (P.) aculeata* Stafford. I. second antenna; J. cephalon.

Postero-lateral angle of seventh epimeral plates acute. First pleon somite with straight wide lateral borders. Posterior margin of telson slightly convex, postero-lateral margins evenly rounded, apex with a small tooth. In some, probably injured specimens, the posterior margin of the telson is truncate.

TYPE LOCALITY: Monterey Bay, California.

LOCATION AND NUMBER OF TYPE: United States National Museum, Cat. No. 66414.

MEASUREMENTS OF TYPE: Male, length 12.5 mm., width 3.75 mm.

MEASUREMENTS OF SPECIMENS OTHER THAN TYPE: Figured ovigerous female, length 13.2 mm., width 3.5 mm.; figured male, length 14.3 mm., width 2.0 mm.

ECOLOGY: Most specimens were collected at the lowest intertidal zone of exposed rocky coast localities on the eelgrass, *Phyllospadix* sp., although some were taken on other kinds of marine algae such as *Laminaria* and *Egregia*. Individuals collected from *Phyllospadix* were generally a light green in color, whereas those collected from *Laminaria* were usually dull purple-green in color. Specimens were frequently taken in tide pool plankton hauls and one specimen was collected in a surface plankton haul near the channel entrance to Tomales Bay. A considerable number were taken from fish stomachs. Ovigerous specimens were found during the months of August, October, and November.

GEOGRAPHIC RANGE: Seabeck, West Seattle, Washington, to Estero Bay, San Luis Obispo County, California. Both localities constitute extensions of the known range of this species.

SPECIMENS EXAMINED: A total of 113 male, 123 female, 39 juvenile specimens which had been collected at various localities from Washington to northern California were examined.

#### THE COMPOSITION AND DISTRIBUTION OF THE NORTHERN CALIFORNIA IDOTHEID FAUNA

Twelve species belonging to the genus *Idothea* (*sensu lato*) are known from the Pacific Coast of North America. Four of the

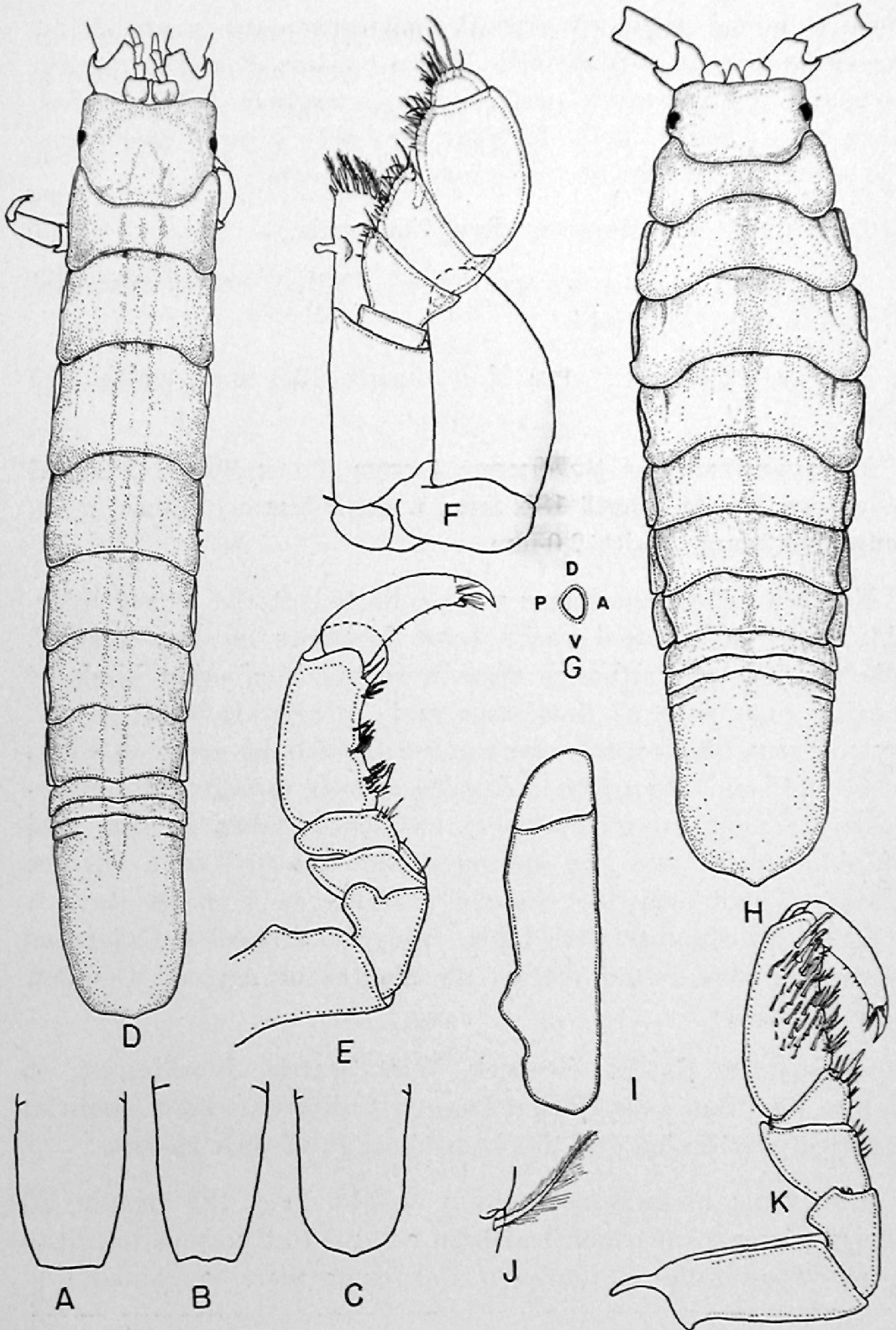


Plate 10. *Idothea (Pentidotea) montereyensis* Maloney. Figure A. telson, male; B. telson, female; C. telson, male; D. male, dorsal view; E. seventh peraeopod; F. maxilliped; G. eye, lateral view; H. female, dorsal view; I. uropod; J. plumose seta at outer distal angle of uropodal basal segment, inner surface; K. first peraeopod.

twelve do not appear to be specifically distinct from one another, at least as far as one can tell from the descriptions at present available. These four species are *Idothea (I.) ochotensis*, *I. (I.) aleutica*, *I. (I.) derjugini*, and *I. (I.) fewkesi*. The northern California fauna contains nine species including at least one of the above mentioned four. That species I prefer to call *I. (I.) fewkesi* for reasons mentioned earlier in this paper. One of the species known in the northern California fauna, *I. (P.) aculeata*, has not been reported north of California although it is a major component of the isopod fauna south of Point Conception. Four species, *I. (P.) schmitti*, *I. (P.) stenops*, *I. (P.) wosnesenskii*, and *I. (I.) rufescens* (excluding the three troublesome species, *I. (I.) ochotensis*, *I. (I.) aleutica*, and *I. (I.) derjugini* from the discussion) have not been recorded south of Monterey, California. Three species, *I. (I.) fewkesi*, *I. (P.) schmitti*, and *I. (P.) wosnesenskii* have similar recorded distributions along the entire Pacific Coast as far south as Monterey, California.

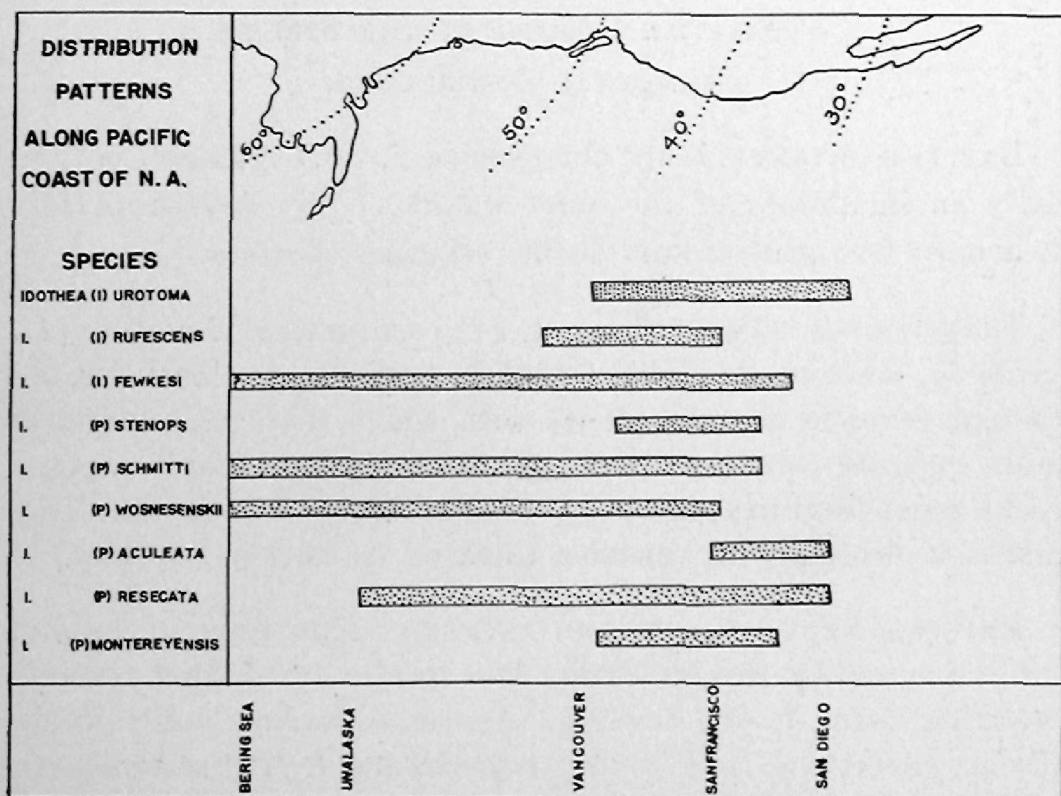


Figure 3. Distribution patterns of *Idothea* species along the Pacific Coast of North America.

It is of particular interest to note that almost all of the species belonging to *Idothea* (*sensu lato*) which have thus far been recorded from the Pacific Coast to North America are represented in the northern California fauna. Such a relationship does not obtain in the case of most genera belonging to the family Idotheidae. One genus, *Mesidotea*, has thus far not been reported south of Oregon. The genera *Cleantis*, *Eusymerus*, and *Colidotea*, on the other hand, have not been reported north of Point Conception, California. The genus *Synidotea*, which is represented in localities north of Washington by perhaps eight species, has but a single known species south of Point Conception, California. That species is *Synidotea harfordi* Benedict. The genus *Idothea* (*sensu lato*) is thus of further interest in having a relatively large number of species which are able to cross an oceanographic barrier which appears to impose very real limits to a rather considerable number of species and genera. The patterns of geographic distribution of the species considered in this report are summarized in text figure 3, p. 189.

#### COMPARATIVE ECOLOGY OF THE SPECIES HORIZONTAL DISTRIBUTION

**BAY INHABITANTS:** Only one species, *I. (P.) resecata*, is typically an inhabitant of the quiet waters of bay localities. Here it is most frequently found on the eel-grass, *Zostera*.

**TRANSITIONAL:** Two species, *I. (P.) wosnesenskii* and *I. (I.) urotoma*, were occasionally found in typical bay localities, although never in the abundance with which they were found at more exposed localities. Both species typically inhabit exposed rocky coast localities; however, their occurrence in bay localities makes it necessary to consider them as transitional species.

**EXPOSED ROCKY COAST INHABITANTS:** This type of habitat seems favored by the remaining five species (excluding the sub-intertidal form, *I. (I.) fewkesi*). As far as Marin County localities are concerned, *I. (P.) montereyensis* and *I. (P.) wosnesenskii* appear to be the dominant forms. *Idothea (P.) stenops* was collected only occasionally and *I. (I.) rufescens* and *I. (P.) aculeata* were found only rarely.

## VERTICAL DISTRIBUTION

**SUBINTERTIDAL SPECIES:** Only one species, *I. (I.) fewkesi*, appears really to belong to this designation. It was taken in considerable numbers from a depth of 25–35 feet in Bodega Bay. An occasional record exists of this species being taken from the surface. No intertidal records are known, at least for Marin County; however, considering the relatively shallow habitat of the species an intertidal record would hardly be surprising.

**TRANSITIONAL SPECIES:** Here only one species, *I. (P.) stenops* need be mentioned, although certain others perhaps also belong to this designation. In areas from which that species was rarely taken intertidally it was found with surprising consistency in the stomachs of the sea-trout (*Hexagrammos* sp.) fished from the water beyond the lowest reaches of the minus one foot tide. One other species, *I. (P.) montereyensis*, also occurred in fish stomachs. Its great abundance in the intertidal zone in contrast to the scarcity of *I. (P.) stenops* makes this occurrence hardly unexpected.

**INTERTIDAL SPECIES:** It is to this classification that the majority of the species belong. Here they may be divided into two groups: those living in the upper intertidal, *Ulva-Mytilus* to *Egregia* zones; and those living in the lower *Phyllospadix-Laminaria* zones. Two species, *I. (P.) wosnesenskii* and *I. (I.) urotoma* belong in the first category. *Idothea (P.) wosnesenskii* was usually found in the *Mytilus* biotope; however, during unusual periods of abundance it was found also on the alga *Ulva* and other marine algae. In contrast to this, specimens of *I. (I.) urotoma* were encountered most frequently on the under surface of rocks encrusted by bryozoa. The remainder of the species, *I. (P.) montereyensis*, *I. (P.) aculeata*, *I. (P.) resecata*, *I. (P.) schmitti*, and *I. (I.) rufescens* were found on marine algae at the lowest reaches of the low tide.

Five species, *I. (P.) resecata*, *I. (P.) wosnesenskii*, *I. (P.) schmitti*, *I. (P.) montereyensis*, and *I. (I.) fewkesi*, were taken occasionally at the surface of the water in plankton hauls and with dip nets at night lights near the channel entrance to Tomales Bay, Marin County, California.



## FORMS CONSIDERED SPECIES INQUIRENDAE IN THIS REPORT

Below is a list of species which I have preferred to place in a *species inquirendae* status. All are so very poorly described that the identification of any with a known form is in my opinion quite impossible; indeed, in certain instances the genus is even in doubt. These forms I consider essentially *nomina nuda*, because of the complete lack of limiting characteristics used in the original "descriptions." A description to be useful must limit the form to a single species. Any attempt to resurrect the following names supplanting better described forms merely because of date priority can meet only with failure simply because it is impossible for one to prove with certainty to which of the several species the names should apply. I do not mean to imply that I consider the term *species inquirenda* a synonym of *nomen nudum*; because I do not. I would have simply called the forms *nomina nuda* were it not for the multitude of objections that certainly have been raised against such a stand. To place them in *species inquirendae* status permits future workers to come to their own conclusions regarding the doubtful descriptions. The species concerned are: 1. *Idotea rectilinea* Lockington, 1877, p. 36. 2. *Idotea Whitei* Stimpson, 1864, p. 155, 3. *Idotea media* Dana, 1854, p. 175, and 4. *Stenosoma gracillimum* Dana, 1854, p. 175.

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