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NATURAL SCIENCES OF PHILADELPHIA.

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A REVISION OF THE GENUS SYNIDOTEA.*

BY JAMES E. BENEDICT, PH.D.

Among the unnamed Isopods in the National Museum seven species regarded as new have been referred to *Synidotea* as defined by Harger. Of the eight described species of the genus, five were in the collection and an additional one was loaned by the California Academy of Sciences. With so many new, and six of the eight described species at hand, it was thought best to treat the genus monographically, and the descriptions of the two remaining species were added.

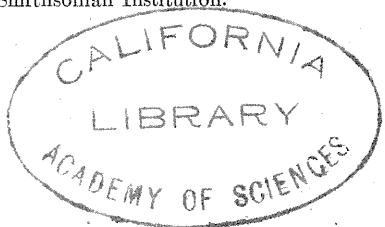
The new species all come from the North Pacific Ocean and Bering Sea. One was taken in San Francisco Bay by Mr. C. H. Townsend while examining the oyster beds for the U. S. Fish Commission; the others were dredged by the 'Albatross,' one off the State of Washington and five in Bering Sea; two of the latter had, however, previously been taken by Mr. W. H. Dall.

The bathymetrical range of the genus is from shallow water to 695 fathoms. The geographical range is as follows: One species in South African waters, one from Japan, one from Lower California, two from California, one off the State of Washington, seven in Bering Sea and the adjacent waters of the Arctic Ocean, and two from the North Atlantic.

The genus *Synidotea* was instituted by Harger in 1878 to receive *Idotea bicuspidata* Owen and *I. nodulosa* Krøyer. The two species now represent the two sections of the genus; the *bicuspidata* section contains eleven and the *nodulosa* four species. All of the species come well within the limits of the genus.

The antennæ of all have multi-articulate flagella. The palpus of the maxillipeds has but three joints. The epimera of the four anterior segments are indicated, if at all, by a slight notch or pit in the posterior margins midway between the lateral margins and the median line; the epimera of the three posterior segments are distinctly outlined in a dorsal view, and are solidly united to the true

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segmental margins. The abdomen is composed of two segments united above but separated at the sides by short incisions.

In addition to the above generic characters, most species agree in having the head excavated in front, a cross-like areolation between the eyes, the extremities of the cross being usually armed with tubercles or spines; in having a spine or tubercle between the eyes and the front. A deep transverse suture near the back of the head cuts off a postcephalic lobe or areolation; between this areolation and the cross are two lateral areolations, sometimes united at the base and sometimes separated by a channel. The sides of the thorax in all species show undulations or nodules of more or less prominence.

The section of the genus of which *bicuspidata* is the type is characterized by having the distal end of the abdomen emarginate or bicuspid, while in the *nodulosa* section the end is bluntly pointed.

The basal plates of the operculum in all species except *harfordi* are crossed by a diagonal line or ridge.

SYNIDOTEA Harger.

Synidotea Harger, American Journal of Science (3), XV, p. 374, 1878.

Edotia Miers, Journal Linn. Soc. Lond., XVI, p. 65 (pars),¹ 1883.

Synidotea G. O. Sars, Norwegian North Atlantic Expedition, Crust., p. 116, 1885.

Synidotea Harger, character emended.

"Antennæ with an articulated flagellum." Epimeral sutures not evident above on the first four segments; on the last three the lines of demarcation are more or less distinct. "Pleon apparently composed of two segments, united above but separated at the sides by short incisions. Operculum with a single apical plate. Palpus of maxillipeds three-jointed."

¹ Miers, in his "Revision of the Idoteidæ" in this journal, unites several genera under *Edotia* Guérin-Méneville, then arranges *Edotia* in three sections as follows:

‡ Antennæ well developed, with the flagellum composed of several joints. Postabdomen uniarticulate. (*Synidotea*).

‡‡ Antennæ very small, with the flagellum rudimentary; postabdomen uniarticulate. (*Edotia*).

‡‡‡ Flagellum of the antennæ obsolete; postabdomen biarticulate. (*Desmarestia*, *Epelys*.)

In this arrangement Professor Sars does not concur, but says in regard to *Synidotea*. "This genus was first instituted by Harger, and should unquestionably be maintained."

Key to Species Examined.

- a Abdomen emarginate or notched at the distal end.
 - b Two spines or tubercles overhanging the frontal notch.
 - c Spines united near the base. *pallida*
 - c' Tubercles free at the base. *erosa*
 - b' No spines or tubercles overhanging the frontal notch.
 - c With a low ridge arising between the eyes and interrupted on the median line.
 - d Outlines of abdomen subparallel. *nebulosa*
 - d' Outlines strongly arcuate. *angulata*
 - c' Without a ridge between the eyes.
 - d Outline of abdomen subtriangular.
 - e Front not excavated. *consolidata*
 - e' Front excavated.
 - f Outlines of thorax subparallel. *marmorata*
 - f' Outlines of thorax strongly arcuate. *bicuspidata*
 - d' Outlines of abdomen rounded.
 - e Length of abdomen equal to width at base. *laticauda*
 - e' Length of abdomen equal to one and one-half times the width at base. *harfordi*
- a' Abdomen pointed.
 - b Undulations of the body not tubercular or spiny.
 - c Tubercle in front of the eyes not margined. *nodulosa*
 - c' Tubercle on the frontal margin and forming a part of it. *lavis*
 - b' Undulations of the body tubercular and spiny.
 - c Four spines on the front of the head; body spinous. *muricata*
 - c' A wedge-shaped tubercle behind the frontal notch; body tubercular. *picta*

Synidotea bicuspidata (Owen). Fig. 1.

Idotea bicuspidata Owen, Crustacea of the 'Blossom,' p. 92, pl. xxvii, fig. 6, 1839.

Idotea pulchra Lockington, Proc. Cali. Acad. Sci., VII. p. 44. 1877.

Edotia bicuspidata Miers, Journal of the Linnean Society of London, XVI, p. 66, 1883 (pars).

Synidotea bicuspidata Sars, Crustacea, Norwegian North Atlantic Exped., p. 116, pl. X, figs. 24-26, 1885; equal to *Synidotea incisa* Sars, Crustacea et Pycnogonida nova, etc., No. 8.

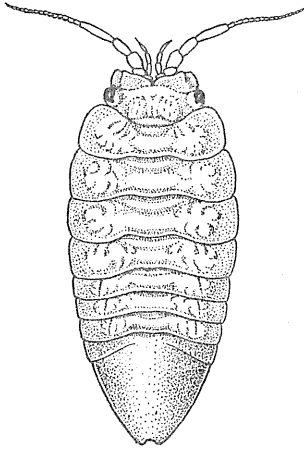


Fig. 1. *Synidotea bicuspada*
(Owen). $\times \frac{1}{2}$.

There are a large number of specimens of this species in the collection from Bering Sea and the Arctic Ocean. The species is the largest and its shell is the heaviest and strongest of any in the genus. This and the closely related Atlantic form, *S. marmorata* Packard, and the small Californian species *S. consolidata* (Stimpson), are easily distinguished from any known species by the triangular abdomen with a comparatively sharp bicuspid apex. Some of the largest specimens measure 31 mm. in length and 14.5 in width.

Shallow water to 56 fathoms.

Synidotea marmorata (Packard). Fig. 2.

Idotea marmorata Packard, Memoirs Boston Society of Natural History, I, p. 296, pl. viii, fig. 6, 1867. Whiteaves, Canad. Nat., p. 262, 1875.

Idotea marmorata equals *I. bicuspada* Streets and Kingsley, Bulletin Essex Institute, IX, p. 108, 1877.

? *Idothea rugulosa* Buchholz, Zweite Deutsche Nordpolarf., II, p. 285, 1874.

Synidotea bicuspada Harger, Proceedings U. S. National Museum, II, p. 160, 1879; also U. S. Fish Commission Report for 1878, p. 352, 1880.

Edotia bicuspada Miers, Jour. Linn. Soc. Lond., XVI, p. 66, 1883 (pars).

This species was described by A. S. Packard, Jr., in his paper on the "Recent Invertebrate Fauna of Labrador" from specimens taken in Kyuetaaruck Bay in seven fathoms on a sandy bottom. The National Museum series consists of four specimens from Station 2,431, lat. N. $43^{\circ} 00' 00''$, lon. W. $50^{\circ} 47' 30''$, 129 fathoms; one from Station 2,436, lat. N. $43^{\circ} 36' 00''$, lon. W. $50^{\circ} 06' 30''$, 36 fathoms, and five from the Gloucester fishermen. Compared with *S. bicuspada* it is not so wide; the thin epimeral projections so prominent in *bicuspada* are much reduced in this species; the joints of the antennæ are relatively longer and more slender in *marmorata*. The average size of the specimens of *marmorata* is much

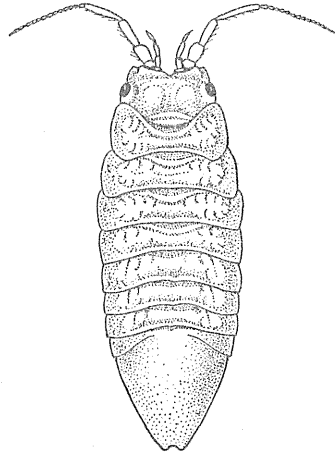


Fig. 2. *Synidotea marmorata*
Packard. $\times 2\frac{1}{2}$.

smaller than those of *bicuspidata*; a larger series might change this. The largest male *S. marmorata* measures 18 mm. in length and 7 mm. in width. A male *S. bicuspida* of about equal size, measures 17 mm. in length and 8 in width.

Synidotea consolidata (Stimpson). Fig. 3.

Idotea consolidata Stimpson, Proc. Cal. Acad. Sci., I, p. (89) 97, 1856, also Boston Jour. Nat. Hist., VI, p. 503, 1857.

Edotia bicuspida (nec *Idotea bicuspida* Owen) Miers, Jour. Linn. Soc. Lond., XVI, p. 66, 1833 (pars).

Two specimens of this species, labelled 'Pacific Grove, California,' were received from Mr. J. O. Snyder.

The front is emarginate, the median notch is large. The deep excavation of the front in *S. bicuspida* is in sharp contrast to the nearly straight front of this species. Behind the frontal notch is a pair of large, blunt tubercles transversely placed. The lateral margins of the thorax are subparallel in the male and strongly arcuate in the female. The margins are incised in this species; in *bicuspidata* they are full. There is a line of low swellings on the median line and another line of like swellings part way between the median line and the margin. The abdomen is much like that of *bicuspidata*.

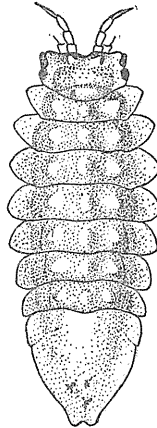


Fig. 3. *Synidotea consolidata* (Stimpson). $\times \frac{1}{2}$.*

Synidotea laticauda, new species. Fig. 4.

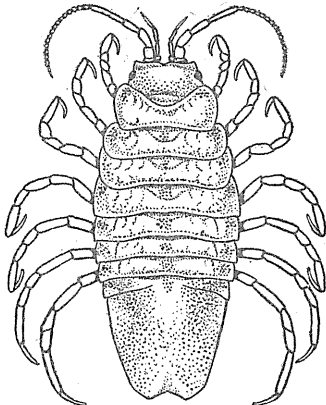


Fig. 4. *Synidotea laticauda*
Benedict. $\times 2\frac{1}{2}$

A single specimen of *Synidotea* was taken by Mr. C. H. Townsend in San Francisco Bay; it is readily distinguished from any species yet described.

The head is wider than long, the anterior margin is nearly straight and is slightly produced horizontally; its whole upper surface is evenly swollen and has neither elevations nor depressions of any kind; the cephalic lobe is little more than indicated. The eyes are large, round, lateral and but very slightly projecting. The antennæ are equal

* Incorrect. The antennæ should be placed as in the others and show seven or eight joints in the flagella.

to the head and thorax in length, the flagellum has twenty-one articles. The basal segment of the peduncle is short, reaching but a little beyond the front; the second segment is as broad as long; the third segment is about once and a half as long as broad; the fourth is a little more than twice the breadth; the fifth is nearly as long as the third and fourth together. The antennulæ extend a little beyond the base of the fourth segment of the antennæ.

The thorax is widest at the fourth segment. From the sides of the fourth segment the outline curves around to the eye. Posteriorly from the fourth segment the outline is straight to the distal third of the abdomen. The second, third and fourth segments are longest. There are no spines or tubercles anywhere and the rugosities so common to the species of the genus are barely indicated.

The abdomen is very little longer than its breadth at the base. It tapers gradually for the first two-thirds of its length where it begins to taper more rapidly to a broad emarginate extremity.

The feet are sparsely set with coarse hair. The valves of the operculum are diagonally crossed by a curved line.

The specimen is clouded with dark patches made up of small black spots.

This species can be distinguished from any other yet described by its broadly emarginate abdomen.

Length 17 mm., width 7 mm. (No. 20,504, U. S. N. M.).

Synidotea nebulosa, new species. Fig. 5.

The front of the head is excavated; between the median notch and the antero-lateral margin the outline is emarginate; between the margin and the eyes the protuberances are but little elevated; the cross areolation is smooth; the lateral areolations are separated by an extension of the cross; this extension is itself slightly divided by a slightly impressed line. The depression in front of the postcephalic lobe is deep. The sides of the head extend to the vertical line of the eyes, cutting off the vision from objects directly below. The antennæ are about 6 mm. in

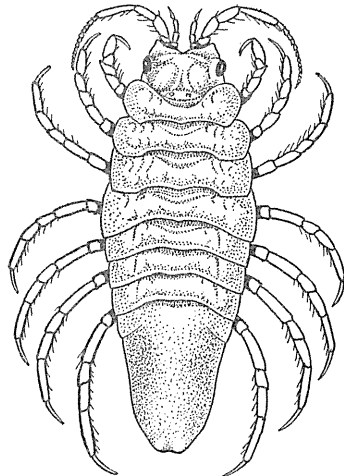


Fig. 5. *Synidotea nebulosa*
Benedict. $\times \frac{3}{4}$.

length in a large specimen and have a ten-jointed flagellum; the distal joint of the peduncle is 1.5 mm. in length. The outline of the thorax is ovate in both sexes; the undulations are distinct; the fourth segment is the longest. The epimeral sutures of the three posterior segments can be made out under a lens. The incisions on the sides of the abdomen are short; the areolations at the base and summit are large and smooth. The lateral outline of the anterior half is straight or slightly concave, of the posterior half convex. The distal end is slightly excavated.

Several specimens of both sexes were taken at Station 3,600 in company with *S. picta*, and at Station 3,637 in 32 fathoms. Mr. Dall obtained them at Unalaska in 16 fathoms; at Kyska Harbor, 9 to 16 fathoms; Semidi Islands, 12 to 25 fathoms. Types (No. 20,503, U. S. N. M.) from Station 3,600, lat. N. 55° 06' 00", lon. W. 163° 28' 00", 9 fathoms.

This species can be distinguished at sight from all other alcoholic specimens of the genus by its dark-colored head and fourth segment, and by the dark line surrounding the elevated portions of the abdomen. The first and last three segments of the thorax are light with small flakes of black uniformly sprinkled over the surface; the median line of the first three is usually broad and dark.

Length of a large male, 17 mm.; width, 6.5 mm. Length of a large female, 15 mm.; width, 7 mm.

Synidotea angulata, new species. Fig. 6.

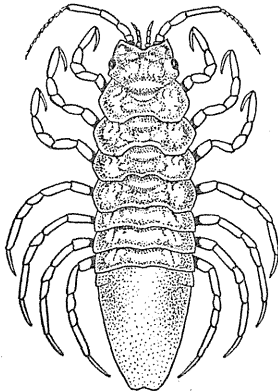


Fig. 6. *Synidotea angulata*
Benedict. x $\frac{1}{4}$.

This is a small species easily distinguished from the others of the genus in its region by the angular and projecting lateral margins of the first three thoracic segments; it is most nearly related to *S. nebulosa*.

The head is excavated in front in a nearly even curve, and there is no distinct median notch as in *nebulosa*. Between the eyes and the front the tubercles are very low and inconspicuous; the cross areolation is a low ridge interrupted in the middle by a V-shaped notch; the lateral areolations of other species, in this, form a single transverse areolation not at all separated in the middle; it is separated from the postcephalic lobe by a deep impression. The sides of the head

do not extend to the vertical line of the eyes. The flagellum of the antennæ has nine or ten joints. The sides of the thorax are very much less arcuate than in *nebulosa*, and where in the latter species the margins are rounded, in this they project in obtuse angles; the lateral margins of the three posterior segments are straight. The abdomen is very much as in *nebulosa*. In color this species in part simulates *nebulosa*. In the specimens examined it lacks the black flakes, there is a line of spots near the margin and one in line with the epimeral lines.

The largest good specimen is 11 mm. in length.

Stations 2,868, 2,869 and 2,872, in 31 to 38 fathoms.

Station 2,869, lat. N. $47^{\circ} 38' 00''$, lon. W. $124^{\circ} 39' 00''$; 32 fathoms. Types (No. 20,506, U. S. N. M.).

Synidotea pallida, new species. Fig. 7.

The frontal margin is deeply and evenly concave, there being no median notch. The surface between the eyes is protuberant and is divided by a slight median impressed line. In the angle formed by the raised portion between the eyes and the horizontal front are two horn-like tubercles united at the bases by a very short ridge across the median line. The cephalic suture is deep but closed at the bottom. The peduncles of the antennæ are about equal to the flagella in length; the latter have from 12 to 16 segments. The eyes are small, situated at a distance from the margin on slight elevations. The sides of the head and of all the thoracic segments are thin and produced, nearly horizontal. The four anterior segments are long, with rounded post-lateral angles, the three posterior segments are short with subacute angles. On each side at a little distance from the median line on the 2d, 3d and 4th segments is a single spine. In young specimens the spines are proportionately longer and they are replaced on the posterior segments by low

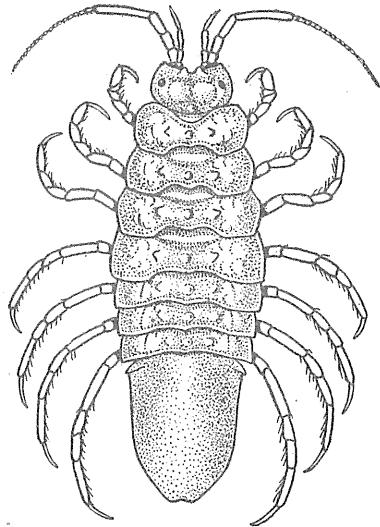


Fig. 7. *Synidotea pallida* Benedict.
x $2\frac{1}{2}$.

tubercles; the median line is also tubercular. The legs are long and slender on the 7th segment, a little shorter on the 6th, and so on to the 1st which are quite short.

The abdomen is markedly narrower than the 7th segment, it tapers gradually to a point near the end which is broad and well rounded, the median line ends in a small concavity best seen with a lens. Excepting the usual lateral incisions, the upper surface is smooth and glabrous.

A large male measures 22 mm. in length and 7.5 in breadth; a female, with eggs, 12 mm. in length and 4.5 in breadth.

Not less than one thousand specimens of this species were dredged off Chirikoff Island, Alaska, at Station 3,340, lat. N. 55° 26' 00", lon. W. 155° 26' 00", 695 fathoms (No. 20,500, U. S. N. M.).

Synidotea erosa, new species. Fig. 8.

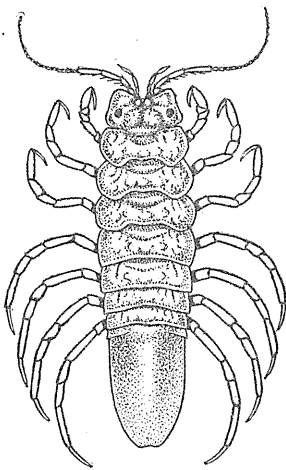


Fig. 8. *Synidotea erosa*
Benedict. $\times \frac{2}{1}$.

Several specimens of this species were dredged at Station 3,210 off Sannakh Islands, Alaska, in 483 fathoms; lat. N. 54° 00' 00", lon. W. 162° 40' 30" (No. 20,505, U. S. N. M.).

Erosa is more nearly related to *S. pallida* than to any species yet discovered, as in the latter there are two horn-like protuberances just back of the frontal margin. The cephalic suture is the same except that it is more open at the bottom. The other protuberances and depressions of the head are the same, except that in *erosa* there is a prominent tubercle between the eyes and the front; in *S. pallida* this is lacking, or, if represented at all, by a low swelling. All of the projections

of the head are more or less eroded. The segments of the thorax have very low tubercles or slight swellings where the spines are situated in *pallida*. The rugæ of the lowest portions of the thorax are much more prominent in this species. In outline *erosa* is narrower and less arcuate, the outer margins of the segments are much less produced. The 7th segment is not noticeably wider than the base of the abdomen. The abdomen holds its width to a point beyond the middle, whence it is rounded to the terminus, which, as in

pallida, is slightly concave. The slightly arcuate outline of the thorax running into the straight outline of the abdomen differentiates this from all other species of the genus. Other differences are, the larger eyes situated nearer the margin of the head, the very hairy edges of the valve, and the sparsely granulated abdomen. The length of the adults from which the foregoing description is made ranges from 21 to 22 mm.

A female, about 14 mm. in length, has arcuate lateral margins, and all of the tubercles of the large male are exaggerated in size; the tubercles between the eyes and the front and the pair separated by the median line form a row of four large tubercles on the front.

The young males have almost parallel sides; the median tubercles of the front are swollen and much eroded, as are all of the prominences of the head. On each of the first four segments of the thorax is a median tubercle on the transverse ridge and also a smaller one in front of it; there is another row of tubercles on the sides. The sides of the abdomen are rough and warty.

Synidotea nodulosa (Krøyer).

The limits of this species are hard to define. All of the species with pointed abdomens are very similar, yet constitute, I believe, good species. Abundant material will not unlikely show that additional species must be recognized. Krøyer described *nodulosa* from South Greenland; Harger had several specimens from the Eastern Fishing Banks and also records them from off Queen Charlotte Island.

I have not found *nodulosa* in the west coast collections. A dry specimen from Jugor Schar presented by the Royal Zoological Museum of Copenhagen has the cross areolation between the eyes armed with four tubercles, the two on the transverse line are slightly compressed, those on the median line are united at the base, the posterior one is much the larger; the areolations between the post-cephalic lobe and the cross are well elevated, coarsely punctate, and divided on the median line; the tubercles between the margin and the eyes are well elevated and free from the margin. On each segment of the thorax a short ridge crosses the median line, forming a slightly elevated angular tubercle on the line. The abdomen measures at the base about four-fifths of its length, or 4.2 mm. broad to 5.3 long.

A specimen from the fishing banks of the northeast coast is probably nearer Krøyer's type than any other in the collection; in this the cross is armed with four tubercles that are much less conspicu-

ous than those of the Jugor Schar specimen, the posterior one on the median line is the largest and is not so positively united at the base; the areolations behind the cross are not so elevated, and are but faintly punctate; in this and in some smaller specimens they are united on the median line; the tubercles in front of the eyes are not so nearly vertical and are much more angular; the transverse ridges are not so large but more acute, with slight tubercles at their intersection with the median line. The abdomen measures at its base 3.2 mm. in breadth, its length is 4.25 mm. In *S. lævis* the cross is armed with but a single tubercle on the median line; this is not vertical as in *nodulosa*, but horizontal, and when seen from above covers the median notch of the front, otherwise the cross is a smooth areolation with slightly elevated transverse extremities. The areolations behind the cross are smooth and broadly united at the median line. The tubercles in front of the eyes arise from the margin and form a part of it. The segments of the thorax are inconspicuously tubercular on the median line. The breadth of the abdomen at the base is 4 mm., length 5.4 mm.

Synidotea lævis, new species. Fig. 9.

Numerous specimens from Stations 3,252, lat. N. 57° 22' 20", lon. W. 164° 24' 40", 29½ fathoms, and 3,253, lat. N. 57° 05' 50", lon. W. 164° 27' 15", 36 fathoms, respectively, differ from *S. nodulosa* and its near allies by the lack of three tubercles on the head and the less prominent elevations of the thorax. The cross-like areolation between the eyes is smooth with the exception of a single tubercle which is prolonged horizontally over the median notch. The tubercles which in *nodulosa* arise between the eyes and the front, in this species arise at the margin and form a part of it. They are less erect than in *nodulosa* and are more angular.

Harger says of *nodulosa*, "Color in alcohol gray, often with brownish transverse markings;" these specimens are gray in alcohol with a dark, broken, median line on the anterior segments.

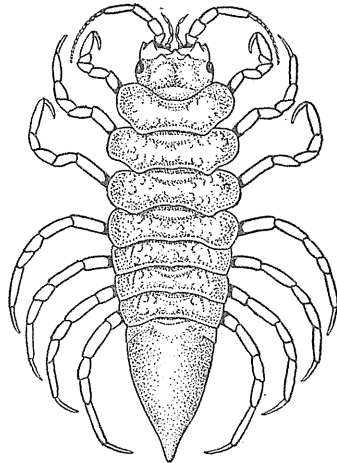


Fig. 9. *Synidotea lævis* Benedict.
x ¼.

Length 15 mm., breadth 4.8 mm. Types (No. 20,501, U. S. N. M.).

Synidotea muricata (Harford). Fig. 10. *Idotea muricata* Harford. Proc. Cal. Acad. Sci., VII, Pt. I, p. 117, (1876), 1877.

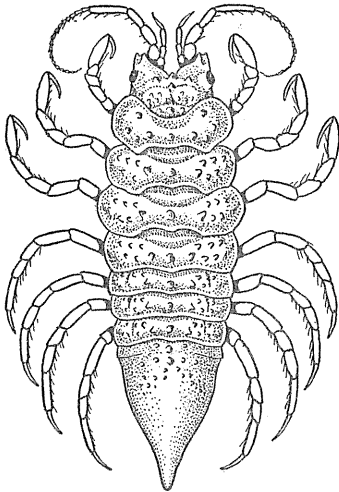


Fig. 10. *Synidotea muricata*
Harford. x 2½.

Six specimens, taken by the 'Corwin' off Icy Cape differ from all other species of the genus yet described by the spiny nature of the dorsal surface, head and pleon included. The locality is lat. 70° 15' 00" N., long. 162° 55' 00" W., in 25 fathoms.

The head is deeply excavated in front, the margin running inward from the lateral prolongations to a median notch. The flagella of the antennæ have from 10 to 12 segments. A small spine overhangs the median notch, a second spine is situated a little behind the first, a third is in line on the posterior lobe; two other spines, one on each side of the first two, form, in connection with them, the figure of a diamond; the spines of the median line are at the obtuse angles. A little behind the margin and in front of the eye is a short spine with a compressed base. Spines with compressed bases are not peculiar to the front, but begin on the postcephalic lobe and extend to the end of the thorax situated on transverse ridges and forming the median line of spines. The spines on the abdomen are not compressed. On either side of the median line is a lateral line of spines; below these spines on each segment is a group of five spines arranged in two transverse rows, three in the anterior and two in the posterior rows. The abdomen has two transverse ridges, the basal ridge has three spines and the next ridge five. On each side is a group of from five to nine very short spines, the number varying according to the size of the specimen. The abdomen is broad at the base, constricted at about the middle and runs out to an acute terminus. The specimens have been in poor alcohol too long to make color notes of any value.

Length of a large specimen 21 mm., breadth 7 mm.

Synidotea picta, new species. Figs. 11 and 12.

The head is deeply excavated in front; the notch is deep; the tubercles in front of the eyes are near to and overhang the margin.

The median line of the cross areolation is elevated into a wedge-shaped ridge which overhangs the notch in a vertical view; the transverse extremities of the cross are elevated forming tubercles; the lateral areolations are protuberant and are separated by a deep depression which unites with the depression in front of the postcephalic lobe and the one behind the cross, altogether forming a B-shaped depression. The elevated portions of the head are pitted. The flagellum of the antennæ is composed of eight or nine segments. From the anterior angles the body widens to the fourth segment; from this point it diminishes evenly in size to the end of the abdomen. All of the segments have low swellings on the median line and numerous rugosities on the sides. The extremity of the abdomen is pointed; the surface is punctate.

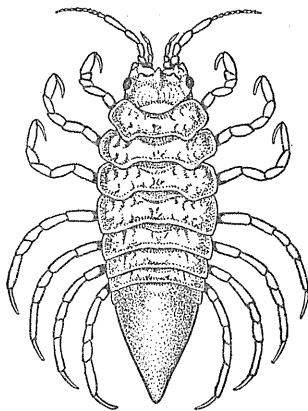


Fig. 11. *Synidotea picta*
Benedict. $\times \frac{1}{2}$.

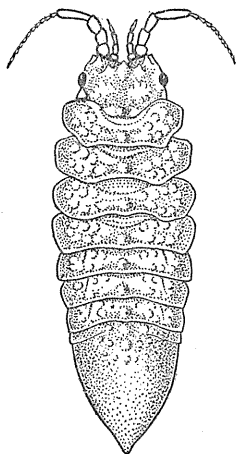


Fig. 12. *Synidotea picta*,
var. $\times \frac{1}{2}$.

This species is beautifully colored; the antennal peduncles are patched with dark, the anterior margins of the head are in some specimens blotched with rose; the rugosities of the thorax are tinged with red, the abdomen is blotched with red and dark. In the more highly colored specimens the lower portion of the segments are light and red, except on the fourth which is always dark. The legs have a patch of dark on each joint.

The length of a large specimen is 14 mm.

The seven type specimens were dredged at Station 3,600, lat. N. $55^{\circ} 06' 00''$, lon. W. $163^{\circ} 28' 00''$, 9 fathoms, in company with *S. nebulosa* (No. 20,502, U. S. N. M.).

Variety.—Specimens obtained by Mr. Dall in Bering Strait (No. 13,311, U. S. N. M.),

and at Cape Lisburne (No. 13,325, U. S. N. M.) and by Lieutenant Stoney in Norton Sound (No. 13,641, U. S. N. M.), differ from the types in having a stouter abdomen and a much more solid shell; they also lack color, not unlikely because of the greater length of time in alcohol. These specimens come from localities far to the north of the station where the types were obtained. More material in a fresh state may show sound lines of demarcation that are not sufficiently evident in the material at hand.

Synidotea harfordi, new name. Fig. 13.

Idotea marmorata Harford, Proc. Cal. Acad. Sci., VII, p. 117, 1877.

The name given by Mr. Harford was preoccupied by Professor Packard in 1867. (See p. 392).

The front of the head is nearly straight, the sides are bent abruptly downward and inward; the eyes are on the angle thus formed, extending the range of vision to objects beneath. The length of the antennæ laid off on the median line reaches from the front to the middle of the sixth thoracic segment; the fifth joint of the peduncle equals in length the third and fourth taken together; the flagellum has twenty-two segments.

The body is widest at the second and third segments, tapering forward to the antero-lateral angles of the head; its anterior outline is arcuate; posteriorly the body tapers to the end of the narrow abdomen in nearly straight lines. The four anterior segments are the longest. The surface of the body is finely punctate under a lens. The median line of the thorax is dark-colored; on the second, third and fourth segments is a light and slightly impressed V-shaped line, the V opening forward; on these segments there is also on each side of the V a diagonally-placed light spot shaped like a half-moon: the surface is elsewhere spotted and blotched with light and dark. The specimen is labelled 'Magdalena Bay, L. C., W. J. Fisher.'

Length 16.5 mm., breadth 5 mm.

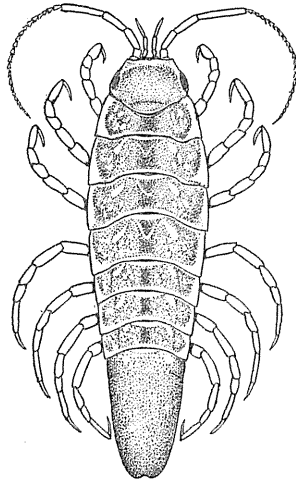


Fig. 13. *Synidotea harfordi*
Benedict, new name. $\times 3\frac{1}{2}$.

Synidotea hirtipes (Milne-Edwards).

Idotea hirtipes Milne-Edwards, Hist. Nat. des Crust., III, p. 134, 1840.
Krauss, Die Sudafrikan. Crust., p. 61, 1843.

Edotia hirtipes Miers, Jour. Linn. Soc. Lond., XVI, p. 68, 1883.

Miers' description of Milne-Edwards' type is as follows:

"In this species the body is somewhat ovate, moderately convex, arcuated on the sides, evenly granulated above, with large inequalities on the sides of the thoracic segments at some distance from the lateral margins. Head with the anterior margin very slightly excavated, and with a semicircular curved impressed line posterior to its frontal margin, and another, nearly straight line near its posterior margin; its antero-lateral angles prominent and nearly right angles. The first three thoracic segments with an impressed curved line in the middle of the dorsal surface, and rounded at their postero-lateral angles; in none of the segments are these angles prolonged backward. Postabdomen short, rounded posteriorly, with a fissure on each side at its base, and with a small and shallow median emargination at its distal end. Eyes large. Antennules reaching nearly to the end of the penultimate joint of the antennæ, with their basal joints very small. Terminal joint of the peduncle of the antennæ longer than the preceding; flagellum with about 14-21 joints. Legs long, slender, hairy, and terminating in a long claw. Terminal plates of the opercular valves irregularly four-sided, being much narrowed at the distal end. Length of the largest specimen nearly 1 inch (25 mm.), breadth nearly $\frac{1}{2}$ inch (10 mm.)."

Localities, Cape of Good Hope (Types); Simon's Bay, South Africa, in 4-7 fathoms.

Synidotea lævidorsalis (Miers).

Edotia hirtipes, var. *lævidorsalis* Miers, Jour. Linn. Soc. Lond., XVI, p. 69, pl. III, figs. 1, 2, 1883.

Miers says of this species "Two males are in the collection of the Museum from Jatiyama Bay, Japan, obtained at a depth of 6½ fathoms, lat. 39° 2' N., long. 189° 50' E., presented by Dr. J. Gwyn Jeffreys and collected by Capt. H. C. St. John, R. N., that differ so slightly from *I. hirtipes* that I cannot regard them as specifically distinct. The body is quite smooth in the larger example, and very nearly so in the smaller (which is of larger size than any specimen of the typical *I. hirtipes* that I have seen), and in both is of a decidedly narrower-oval form; the antero-lateral angles of the head

are perhaps not so prominent and more rounded; the eyes are smaller. Length of the largest example about 1 inch, 1 line (28 millim.); breadth about $\frac{1}{2}$ inch (10 millim.). In this specimen the flagellum of the antennæ is about 30-jointed, but in the smaller example (length $\frac{5}{8}$ inch, 21 millim.) only about 21-jointed."

