

Chelisoches Dohertyi, n.

Antennæ 17-segmentatæ, articulis 1-13 atra, 14-15 alba, 16 fuscum, 17 nigrum; elytra et alæ nigra.

Patria. Macassar (coll. m.).

Chelisoches semiluteus, Borm., n.

Chelisoches melanocephalus, Dohrn, var. nov., Burr, Ann. & Mag. Nat. Hist. (6) xx. p. 315 (1897).

Antennæ 15-segmentatæ, 1-4 testaceis, 5-10 brunneis, 11-12 pallidis, 13-15 fuscis; elytra et alæ fusco-brunnea.

Patria. W. Java, Pengalengan (coll. Brunner, coll. mea).

Chelisoches Feei, Borm.

Milne Bay, New Guinea. 1 ♀.

Opisthocosmia armata, de Haan.

Macassar. 5 ♂.

Opisthocosmia forcipata, de Haan.

5 ♀, Sangir, of the variety with the red head (v. Burr, *op. cit.* p. 316).

Opisthocosmia tenella, de Haan.

Macassar. 1 ♀.

Forficula Alberti, Dubr.

Milne Bay, New Guinea. 1 ♀.

Dormans Park, East Grinstead,
August 3rd, 1899.

XXVI.—*Key to the Isopods of the Pacific Coast of North America, with Descriptions of Twenty-two new Species.* By HARRIET RICHARDSON.

[Continued from p. 187.]

III. VALVIFERA.

Analytical Key to the Families of Valvifera.

- a. Body more or less broad, depressed. Legs usually nearly alike, but first three pairs sometimes with propodus dilated and dactylus reflexed. IX. IDOTEIDÆ.

- a'*. Body narrow, scarcely depressed. Four anterior pairs of legs unlike three posterior pairs, and not ambulatory nor strictly prehensile, directed forward, slender, ciliated, with terminal joint minute; last three pairs are stouter, ambulatory, with terminal joint bifid. X. ARCTURIDÆ.

Family IX. Idoteidæ.

Analytical Key to the Genera of Idoteidæ *.

- a*. Sides of head emarginate or cleft and laterally produced beyond eyes, which are situated upon its dorsal surface. Three anterior pairs of legs, with penultimate joint or propodus dilated and forming, with reflexible dactylus, a prehensile hand 17. *Glyptonotus*.
- a'*. Sides of head in a dorsal view entire and not laterally produced. Eyes lateral. Legs all ambulatory; three anterior pairs with penultimate joint not or not much dilated.
- b*. Flagellum of second pair of antennæ well developed and multiarticulate.
- c*. Palpus of maxillipeds four-jointed. Epimera of all the segments well developed and evident in a dorsal view. Abdomen † consisting of three † segments with lateral sutures, indicative of another partially coalescent segment . . . 18. *Idotea*.
- c'*. Palpus of maxillipeds not four-jointed. Abdomen consisting of one segment, uniarticulate.
- d*. Maxillipeds with a three-jointed palp. All the epimera coalesced and perfectly united with the segments . . . 19. *Synidotea*.
- d'*. Maxillipeds with a two-jointed palp. Epimera of second, third, and fourth segments coalesced and perfectly united with the segments; those of the fifth, sixth, and seventh segments distinct and well developed 20. *Colidotea*, gen. nov.
- b'*. Flagellum of second pair of antennæ with joints all consolidated and forming a single piece, or with flagellum composed of only two or three joints.
- c*. Body smooth, linear. Epimera of all the thoracic segments distinct and visible; those of the second, third, and fourth segments short and narrow; those of

* See Miers on the Idoteidæ, Journ. Linn. Soc. London, Zool. xvi. 1883, pp. 9, 19, 20.

† Including terminal segment.

† Dollfus, Feuille des Jennes Naturalistes, 3^e sér. 1895, p. 4; Sars, Crust. of Norway, 1897, pts. 3, 4, p. 79.

the fifth, sixth, and seventh segments large and broad. Palp of maxillipeds two-jointed..... 21. *Cleantis*.

- c'. Body smooth, ovate. Epimera of second, third, fourth, and fifth thoracic segments coalesced with segments; those of sixth and seventh segments distinct and visible. Palp of maxillipeds three-jointed. Joints of flagellum all consolidated and forming a single piece .. 22. *Eusymmerus*, gen. [nov.]

17. GLYPTONOTUS, Eights.

Analytical Key to the Species of Glyptonotus*.

- a. Joints of the peduncle of antennæ not dilated; flagellum eight- to fourteen-jointed. Antero-lateral cervical lobes prominent 35. *G. entomon* (Linnæus).
- a'. Joints and peduncle of antennæ greatly dilated; flagellum seven- to eight-jointed. Antero-lateral cervical lobes not prominent 36. *G. Sabini* (Kröyer).

35. *Glyptonotus entomon* (Linnæus).

Oniscus entomon, Linnæus, Syst. Nat. 12th ed. ii. 1766, p. 1060; Pallas, Spicil. Zool. ix. 1772, p. 64, pl. v. figs. 1-6.

(?) *Entomon pyramidale*, Klein, Rém. sur les Crustacés, figs. 1-3.

Squilla entomon, De Geer, Mém. pour servir à l'Hist. des Insectes, vii. 1778, p. 514, pl. xxxii. figs. 1-10.

Asellus entomon, Olivier, Encycl. Méth. 1789, p. 253.

(?) *Cymothoa entomon*, Fabricius, Ent. Syst. ii. 1793, p. 505.

Idotea entomon, Bosc, Hist. Nat. des Crust. ii. 1802, p. 178; Latreille,

Hist. Nat. Crust. et Ins. vi. 1803-4, p. 361, vii. pl. lviii. figs. 2, 3;

(?) Lamareck, Hist. des Anim. sans. Vert. 1st ed. v. 1818, p. 159;

(?) Desmarest, Consid. Crust. 1825, p. 289; Rathke, Neuste Schriften

der naturf. Gesellsch. in Danzig, i. 1820, p. 109, pl. iv.; Kröyer, Vid.

Selsk. Skrift. vii. 1838, p. 323; Milne-Edwards, Hist. Nat. Crust. iii.

1840, p. 128; Kröyer, Nat. Tidsskr. ii. 1847, p. 402; White, List Cr.

Brit. Mus. 1847, p. 93; Brandt, Cr. in Middendorff's Sibirische

Reise, ii. 1851, p. 145; Meinert, Nat. Tidsskr. 3rd ser. xi. 1877,

p. 84; Brandt, Comptes Rendus, 1880, p. 713; Ann. & Mag. Nat.

Hist. vi. 1880, p. 98.

(?) *Saduria entomon*, Adams, in White, Sutherland's Voy. Baffin's Bay &c., Appendix, 1852, p. ccvii.

Idotea longicauda, Lockington, Proc. Cal. Acad. Sci. vii. 1877, pt. i. p. 45.

Glyptonotus entomon, Miers, Trans. Linn. Soc. London, xvi. 1883, pp. 12, 13, pl. i. figs. 1, 2. (See Miers for further synonymy.)

Hab. Circumpolar; west coast of North America to Pacific Grove, California.

* This key is taken from Miers, Journ. Linn. Soc. London, Zool. xvi. (1883), p. 11.

36. *Glyptonotus Sabini* (Kröyer).

Idotea Sabini, Kröyer, Nat. Tidsskrift, 2nd ser. ii. 1847, p. 401; Atlas of Crust. in Gaimard's Voy. en Scand. pl. xxvii. fig. 1; Reinhardt, Fortegnelse over Grönland's Krebsdyr, 1857, p. 34; Lütken, List of Crust. of Greenland in Arctic Manual, 1875, p. 149; Sars, Arch. f. Math. og Naturvidensk. ii. 1877, p. 350.

Chiridothea megalura, G. O. Sars, Archiv f. Math. og Naturvidensk. iv. 1880, p. 432.

Glyptonotus Sabini, Miers, Journ. Linn. Soc. London, Zool. xvi. 1883, pp. 15, 16, pl. i. figs. 3-5. (See Miers for further synonymy.)

Hab. Circumpolar; west coast of North America (*Miers*).

18. IDOTEA, Fabricius.

Analytical Key to the Species of Idotea *.

- a. Terminal segment emarginate at its extremity 37. *I. resecata*, Stimpson.
 a'. Terminal segment not emarginate at its extremity.
 b. Body slender, linear, filiform.
 c. Terminal segment truncate at apex .. 38. *I. gracillima*, Dana.
 c'. Terminal segment acute at its extremity.
 d. Postero-lateral angles of terminal segment prominent and separated by a tooth from subtriangular middle portion, which bears a small tooth at the middle 39. *I. urotoma*, Stimpson.
 d'. Postero-lateral angles not separated by a tooth from middle portion .. 40. *I. rectilineata*, Lockington.
 b'. Body oblong-ovate.
 c. Terminal segment regularly rounded, with small median point 41. *I. Wosnesenskii*, [Brandt].
 c'. Terminal segment triangulate posteriorly, with subparallel sides.
 d. Epimera of second, third, and fourth segments short, not reaching the post-lateral angles of their respective segments 42. *I. ochotensis*, Brandt.
 d'. Epimera of all the segments reaching the post-lateral angles of their respective segments.
 e. Sides of thorax arcuate 43. *I. stenops*, Benedict.
 e'. Sides of thorax more nearly parallel 44. *I. Whitei*, Stimpson.

37. *Idotea resecata*, Stimpson.

Idotea resecata, Stimpson, Bost. Journ. Nat. Hist. vi. 1857, p. 64, pl. xxii. fig. 7; Proc. Bost. Soc. Nat. Hist. 1859, p. 88; Miers, Journ. Linn. Soc. London, Zool. xvi. 1883, p. 45.

* See Miers, Journ. Linn. Soc. London, Zool. xvi. 1883, p. 43.

Hab. Straits Juan de Fuca, opposite Fort Townsend, Vancouver Island; Gulf of Georgia, Orcas Island; Pacific Grove, San Pedro, and Monterey Bay, California.

38. *Idotea gracillima*, Dana.

Idotea gracillima, Dana, Proc. Acad. Nat. Sci. Philad. vii. 1854, p. 175; Stimpson, Bost. Journ. Nat. Hist. vi. 1857, p. 505; Miers, Journ. Linn. Soc. London, Zool. xvi. 1883, p. 35.

Hab. California.

39. *Idotea urotoma*, Stimpson.

Idotea urotoma, Stimpson, Proc. Acad. Nat. Sci. Philad. 1864, p. 155; Miers, Journ. Linn. Soc. London, Zool. xvi. 1883, p. 34.

Hab. Puget Sound.

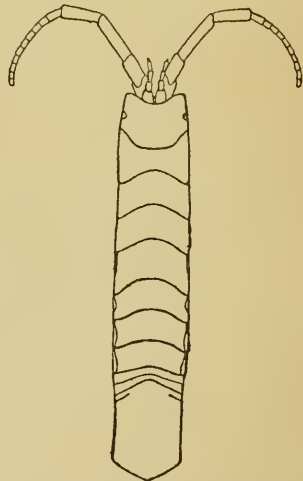
40. *Idotea rectilineata*, Lockington.

Idotea rectilineata, Lockington, Proc. Cal. Acad. Sci. vii. 1877, pt. 1, p. 36; Miers, Journ. Linn. Soc. London, Zool. xvi. 1883, p. 34.

Hab. Along the Pacific coast from Humboldt County, California, to Ensenada, Lower California.

From an examination of specimens, this species, which Miers * says is scarcely to be distinguished from *I. ochotensis*, Brandt, is seen to be specifically distinct. It differs from *I. ochotensis* in the proportions of the body, *I. rectilineata* being more slender—about five times as long as broad—while in *I. ochotensis* the length is only three and a half times greater than the width; in the relative length of the antennæ to the body and the proportions of the joints in the peduncle of the antennæ, the antennæ in *I. ochotensis* reaching only to the posterior margin of the third thoracic segment (in all the specimens examined), the joints of the peduncle being short and stout, while in *I. recti-*

Fig. 20.



Idotea rectilineata, Lockington.
× 2.

lineata the antennæ extend to the posterior margin of the fifth thoracic segment, the joints of the peduncle being long and slender; in the form of the anterior margin of the head,

* Journ. Linn. Soc. London, Zool. xvi. 1883, p. 34.

the excavation being deeper and wider in *I. rectilineata* than in *I. ochotensis*; in the shape of the first thoracic segment, which in *I. ochotensis* is produced laterally and has the antero-lateral angles truncate, while in *I. rectilineata* this segment is not produced and has rounded antero-lateral angles; in the size of the epimera, which are much more slender in *I. rectilineata* than in *I. ochotensis*; and in the shape of the terminal segment of the body, the posterior angle of which in *I. ochotensis* is more acute, the line from the lateral angle to the median angle being excavate, while in *I. rectilineata* this line is straight and the median angle obtuse.

41. *Idotea Wosnesenskii*, Brandt.

Idotea Wosnesenskii, Brandt, Middendorff's Sibirische Reise, ii. 1851, Crust. p. 146; Stimpson, Bost. Journ. Nat. Hist. vi. 1857, p. 504; Spence Bate, Lord's Naturalist in British Columbia, ii. 1866, p. 281; Miers, Journ. Linn. Soc. London, Zool. xvi. 1883, p. 40.

Idotea hirtipes, Dana, Cr. U.S. Expl. Exp. pt. ii. 1853, p. 704, pl. xlvi. fig. 6.

Idotea oregonensis, Dana, Proc. Acad. Nat. Sci. Philad. vii. 1854, p. 175.

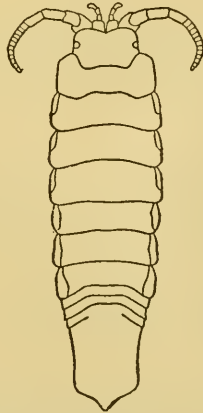
Idotea media (Dana?), Spence Bate, Lord's Naturalist in British Columbia, ii. 1866, p. 282.

Hab. Sea of Ochotsk and Kamchatka Sea; west coast of North America to Monterey Bay, California.

42. *Idotea ochotensis**, Brandt.

Idotea ochotensis, Brandt, Middendorff's Sibirische Reise, ii. 1851, Crust. p. 145, pl. vi. fig. 33; Miers, Journ. Linn. Soc. London, Zool. xvi. 1883, p. 32, pl. i. figs 8-10.

Fig. 21.



Idotea ochotensis, Brandt. $\times 2$.

* The following is quoted from Miers, Journ. Linn. Soc. London, Zool. xvi. 1883, p. 63:—"Mr. Spence Bate (Lord's 'Naturalist in British

Hab. Awaatsch Bay, Sea of Ochotsk; north-west coast of North America to Vancouver Island (*Miers*).

43. *Idotea stenops*, Benedict.

Idotea stenops, Benedict, Proc. Biol. Soc. Washington, xii. 1898, pp. 54, 55.

Hab. Monterey, California.

44. *Idotea Whitei*, Stimpson.

Idotea Whitei, Stimpson, Proc. Acad. Nat. Sci. Philad. 1864, p. 155; *Miers*, Journ. Linn. Soc. London, Zool. xvi. 1883, pp. 42, 43.

Hab. Puget Sound; Monterey Bay, California, collected by Mr. Heath.

A specimen from Monterey Bay, California, agrees with *Miers's* description of two males received from California, which he refers to this species. It is unlike *Idotea Vosnesenskii* in the following points, and from an examination of a large number of individuals of *I. Vosnesenskii*, in which these points remain constant, it seems to demonstrate the impossibility of uniting the two species:—

1. "Form of epimera of second to fourth thoracic segments, which reach quite to the postero-lateral angles of these segments.

2. "Epimera of the second segment are broader anteriorly, and the terminal segment more resembles that of *I. ochotensis*, being more angulated and less rounded at the postero-lateral angles" *.

3. The absence of hairs on the legs.

The legs of *I. Vosnesenskii* (the males) are thickly covered with hairs and very bushy in appearance.

4. The smooth margins of the epimera, which in *I. Vosnesenskii* have thickened edges.

19. SYNIDOTEA, Harger.

Analytical Key to the Species of Synidotea †.

a. Abdomen emarginate or notched at its distal end.

b. Two spines or tubercles overhanging the frontal notch.

c. Spines united near the base 45. *S. pallida*, Benedict.

Columbia, ii. 1866, p. 282) refers, without any description, specimens from Esquimault Harbour, British Columbia, to *Idotea stricta*, Dana; it is far more probable that they belong to *Idotea ochotensis*."

* *Miers*, Journ. Linn. Soc. London, Zool. xvi. 1883, pp. 42, 43.

† Benedict, Proc. Acad. Nat. Sci. Philad. (1897), p. 391.

- c'. Tubercles free at base 46. *S. erosa*, Benedict.
- b'. No spines or tubercles overhanging frontal notch.
- c. With a low ridge arising between the eyes and interrupted on the median line.
- d. Outlines of abdomen subparallel. 47. *S. nebulosa*, Benedict.
- d'. Outlines strongly arcuate 48. *S. angulata*, Benedict.
- c'. Without a ridge between the eyes.
- d. Outline of abdomen subtriangular.
- e. Front not excavated 49. *S. consolidata* (Stimpson).
- e'. Front excavated 50. *S. bicuspidata* (Owen).
- d'. Outlines of abdomen rounded.
- e. Length of abdomen equal to width at base 51. *S. laticauda*, Benedict.
- e'. Length of abdomen equal to one and one-half times width at base 52. *S. Harfordi*, Benedict.
- a'. Abdomen pointed.
- b. Undulations of body not tubercular or spiny.
- c. Tubercle in front of eyes not margined 53. *S. nodulosa* (Kröyer).
- c'. Tubercle on the frontal margin and forming a part of it 54. *S. lævis*, Benedict.
- b'. Undulations of the body tubercular and spiny.
- c. Four spines on the front of the head; body spinous 55. *S. muricata* (Harford).
- c'. A wedge-shaped tubercle behind the frontal notch; body tubercular 56. *S. picta*, Benedict.

Mr. Adrian Dollfus, in his paper on "Les Idoteidæ des Côtes de France" *, has wrongly confounded *Synidotea*, Harger, with *Stenosoma*, Leach. *Synidotea* can by no means be considered a synonym of *Stenosoma*, as anyone who is familiar with the two genera will undoubtedly admit. It differs from *Stenosoma* in the consolidation of the epimera with the segments. The epimera are firmly and perfectly united with the segments, and the only trace or indication of a separation is represented in the anterior segments by a slight and almost imperceptible notch in the posterior margins, halfway between the lateral margin and the median line of the body, and in the three posterior segments by a very faint line. In *Stenosoma* all the epimera are very distinct from the segments.

* 'Feuille des Jeunes Naturalistes,' 1895.

45. *Synidotea pallida*, Benedict.

Synidotea pallida, Benedict, Proc. Acad. Nat. Sci. Philad. 1897, pp. 396, 397.

Hab. Chirikof Island, Alaska.

46. *Synidotea erosa*, Benedict.

Synidotea erosa, Benedict, Proc. Acad. Nat. Sci. Philad. 1897, pp. 397-399.

Hab. Sannakh Island, Alaska.

47. *Synidotea nebulosa*, Benedict.

Synidotea nebulosa, Benedict, Proc. Acad. Nat. Sci. Philad. 1897, pp. 394, 395.

Hab. Unalaska, Kyska Harbour, Semidi Islands, Unimak Island, Bering Sea, Kamchatka.

48. *Synidotea angulata*, Benedict.

Synidotea angulata, Benedict, Proc. Acad. Nat. Sci. Philad. 1897, pp. 395, 396.

Hab. Off Cape Johnson, Washington; off Destruction Island, Washington; off Cape Flattery, Washington.

49. *Synidotea consolidata* (Stimpson).

Idotea consolidata, Stimpson, Proc. Cal. Acad. Sci. i. 1856, p. 89; Bost. Journ. Nat. Hist. vi. 1857, p. 503.

Edotia bicuspidata, Miers, Journ. Linn. Soc. London, Zool. xvi. 1883, p. 66.

Synidotea consolidata, Benedict, Proc. Acad. Nat. Sci. Philad. 1897,

p. 393.

Hab. Pacific Grove, California.

50. *Synidotea bicuspidata* (Owen).

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

Idotea pulchra, Lockington, Proc. Cal. Acad. Sci. vii. 1877, p. 44.

Idotea bicuspidata, Miers, Journ. Linn. Soc. London, Zool. xvi. 1883, p. 66.

Synidotea bicuspidata, Sars, Crust. Norwegian North-Atlantic Expedition, 1885, p. 116, pl. x. figs. 24-26; Benedict, Proc. Acad. Nat. Sci. Philad. 1897, pp. 391, 392.

Hab. West coast of Alaska and Bering Sea.

51. *Synidotea laticauda*, Benedict.

Synidotea laticauda, Benedict, Proc. Acad. Nat. Sci. Philad. 1897, pp. 393, 394.

Hab. San Francisco Bay.

52. *Synidotea Harfordi*, Benedict.

Idotea marmorata, Harford, Proc. Cal. Acad. Sci. vii. 1877, p. 117.
Synidotea Harfordi, Benedict, Proc. Acad. Sci. Philad. 1897, p. 402.

Hab. Magdalena Bay, Lower California.

53. *Synidotea nodulosa* (Kröyer).

Idotea nodulosa, Kröyer, Naturhist. Tidssk. ii. 1846, p. 100.
Synidotea nodulosa, Harger, Report of U.S. Commissioner of Fish and Fisheries, 1878, pt. 6, pp. 351, 352; Benedict, Proc. Acad. Nat. Sci. Philad. 1897, pp. 398, 399.

Hab. Dixon Entrance, north of Queen Charlotte Islands, British Columbia.

54. *Synidotea levis*, Benedict.

Synidotea levis, Benedict, Proc. Acad. Nat. Sci. Philad. 1897, pp. 399, 400.

Hab. Between Bristol Bay and Pribilof Islands, Alaska; Bering Sea.

55. *Synidotea muricata* (Harford).

Idotea muricata, Harford, Proc. Cal. Acad. Sci. vii. 1877, pt. 1, p. 117.
Synidotea muricata, Benedict, Proc. Acad. Nat. Sci. Philad. 1897, p. 400.

Hab. Icy Cape.

56. *Synidotea picta*, Benedict.

Synidotea picta, Benedict, Proc. Acad. Nat. Sci. Philad. 1897, pp. 401, 402.

Hab. Alaska and Bering Straits.

Fig. 22.



Maxilliped of *Colidotea rostrata* (Benedict).

20. COLIDOTEA *, gen. nov.

57. *Colidotea rostrata* (Benedict).

Idotea rostrata, Benedict, Proc. Biol. Soc. Washington, xii. 1893, pp. 53, 54.

Hab. San Pedro, California.

21. CLEANTIS, Dana.

Analytical Key to the Species of Cleantis.

- a. Flagellum consolidated and forming a single piece. Sides of abdomen not separated by an acute tooth from rounded posterior portion 58. *C. occidentalis*, sp. n.
- a'. Flagellum composed of three joints. Sides of abdomen separated by an acute tooth from rounded posterior portion 59. *C. Heathii*, sp. n.

58. *Cleantis occidentalis*, sp. n.

Body narrow, elongate; surface smooth.

Head of same width as thoracic segments and with a small median anterior depression. Eyes lateral. First pair of antennæ consisting of four joints, reaching the middle of the third joint of the second pair of antennæ. Second pair of antennæ contain six joints (five seen from a dorsal view), the last joint being the flagellum.

The thoracic segments show a gradual though marked decrease in length, the first one being the longest and somewhat excavate on its anterior margin. The epimera of the second, third, and fourth segments are short and narrow, reaching but half the length of the segments, while those of the last three segments are broad, with their posterior angles produced beyond the segments.

The abdomen is composed of four segments—three short ones and the terminal segment, which bears suture-lines indicative of another coalesced segment. The terminal segment is rounded posteriorly. The anterior three fourths of the segment is raised considerably above the posterior fourth, which is flat, and there is a groove in the median line on the posterior third of the anterior part of the segment.

The legs are similar to those of the type species of the genus. The three anterior pairs increase in length, the third pair being the longest, and all are directed anteriorly. The fourth pair are very short and fold across the body. The last

* See key on p. 261 for characters of genus.

three pairs increase in length, the seventh pair being the longest, and all these are directed posteriorly. The legs are compact and lie folded on the ventral side and cannot be seen from a dorsal view.

Fig. 23.

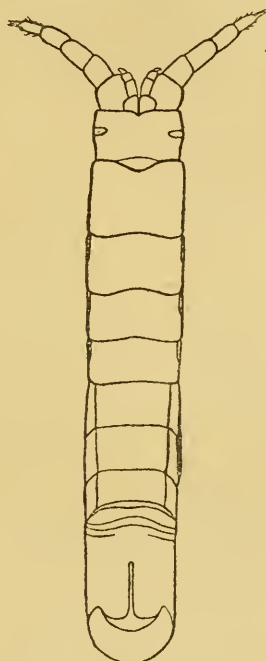
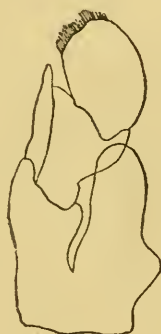


Fig. 24.

Fig. 23.—*Cleantis occidentalis*. $\times 10$.Fig. 24.—Maxilliped of *Cleantis occidentalis*, greatly enlarged.

There is but one specimen, collected by the 'Albatross' in 1888 at Magdalena Bay, Lower California; depth 12 fathoms.

Type. No. 22578, U.S. N. M.

This species, when compared with *Cleantis planicauda**,

* *Cleantis planicauda*, Benedict, sp. n.

Body linear, densely granulated, five times longer than broad. Feet folded beneath, out of view from above. Body lined longitudinally by six more or less broken black lines. The lines on the sides are more distinct than those above.

Head subquadrate, partially immersed in the first thoracic segment and rounded on the posterior margin; sides parallel, anterior margin emarginate; a deep depression or groove runs from the median notch to the

Benedict, from Pensacola, Florida, presents points of difference which are interesting and which can easily be recognized in the manuscript quoted in the footnote (pp. 271-273).

59. *Cleantis Heathii*, sp. n.

Body slender, elongate; surface smooth.

Head with lateral margins straight; anterior margin slightly excavate. Eyes small, lateral.

First pair of antennæ consist of four joints and are a little longer than half the width of the head. The second pair of antennæ are half as long as the body and are composed of nine joints, the three terminal ones forming the flagellum, which cannot be distinguished from the peduncle.

Thoracic segments subequal, with narrow epimera, those of the second, third, and fourth segments reaching but half the length of the segments, the last three epimera extending to the extremity of the segments.

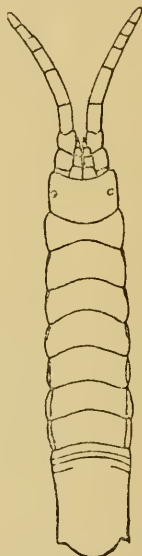
The abdomen is composed of three segments with suture-lines indicative of another. The terminal segment is broadly rounded posteriorly, with small but acute lateral angles. The sides are almost parallel.

The first four pairs of legs are directed anteriorly; the last three extend in a posterior direction. There is no perceptible inequality in length. The dactyli are bifid.

Two specimens were sent by Mr. Heath from Monterey Bay, California.

Type. No. 22577, U.S. N. M.

Fig. 25.



Cleantis Heathii. × 63.

centre of the head. The eyes are situated near the antero-lateral angle; postoccipital lobe distinct; antennæ with six segments, first very short and nearly immobile, second very short and stout; the third segment is equal in length to the second, but not so stout; the fourth and fifth are of equal length and about one third longer than the second and third segments. The terminal segment or flagellum is lighter in colour and is armed with short bristles. The length of the antennæ is equal to the length of the head and first two thoracic segments. The antennulæ extend to the middle of the third segment of the antennæ. The first segment is

22. *EUSYMMERUS*, gen. nov.

Body elliptical. Palp of maxillipeds three-jointed. Second pair of antennæ with joints of flagellum all consolidated and forming a single piece. Eyes dorsally situated.

Lateral margins of thoracic segments expanded, edges straight and full. Epimera of second, third, fourth, and fifth segments coalesced and firmly united with segments, those of the sixth and seventh segments distinct and visible.

Abdomen composed of one segment, with suture-lines indicative of another partly coalesced segment.

60. *Eusymmerus antennatus*, sp. n.

Body elliptical, tapering toward the extremity; surface smooth.

Head three times broader than long, with the antero-lateral angles prominent. Anterior margin excavate. Lateral margins expanded. Eyes situated dorsally on the extreme lateral margin in the median transverse line. First pair of antennæ four-jointed, short, extending only a little beyond the second joint of the second pair of antennæ. Second pair of antennæ are six-jointed, geniculate, the last or flagellar joint being somewhat clavate.

quadrate, the second subquadrate, the third is pear-shaped, the fourth segment is very small.

The segments of the thorax are nearly equal in length and breadth, the third and fourth being but little longer than the others. The epimera of the second, third, and fourth segments are very small and cannot be seen from above. On the fifth, sixth, and seventh segments the epimera are large and project well behind the margin of the segment in the form of an acute angle.

The pleon is composed of four segments; the first three are very narrow; the terminal segment is elongated, with subparallel sides. A marked character of the pleon is its obliquely truncated extremity. The oblique terminus is perfectly flat, with a raised margin.

The feet of this species, as in the typical species described by Dana, are in two series. The first is composed of the first three pairs of feet, which are comparatively stout and increase in length to the third segment. The second series begins on the fourth segment with a pair of short feet, which fold transversely; the other pairs are successively longer and fold backwards. The feet of the second series are much more slender than those of the first. The dactyli of all are biungulate. The carpal and propodal joints are spinulose beneath.

The operculum is not traversed by an oblique line. The sides of the basal segment are subparallel. The terminal segment is about as broad as long.

Length 15 millim.; width 3 millim.

Type. No. 22579, U.S. N. M.

Thoracic segments with lateral margins expanded. Lateral edges straight, full. Epimera of second, third, fourth, and fifth segments coalesced and firmly united with the segments; epimera of sixth and seventh segments distinct and articulating with segments.

Fig. 26.

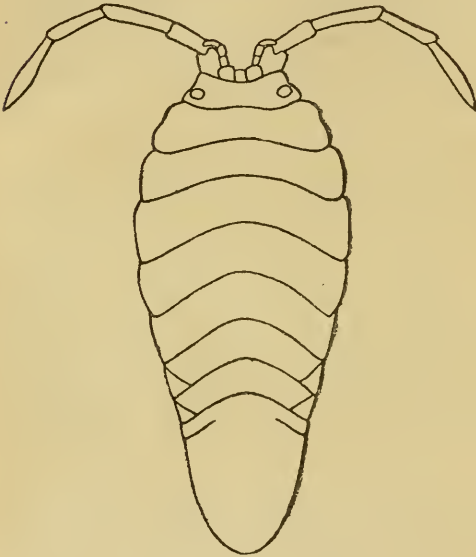


Fig. 27.

Fig. 26.—*Eusymmerus antennatus*. $\times 8$.Fig. 27.—Maxilliped of *Eusymmerus antennatus*.

Abdomen of only one segment, with suture-lines indicative of another partly coalesced segment. Abdomen posteriorly rounded, tapering from the base to the extremity.

Legs slender, with dactyli biunguiculate.

Colour of specimen brown. Lateral edges of thoracic segments colourless.

One individual from off Abreojos Point, Lower California, Station 2835, was collected by the U.S. Fish Commission steamer 'Albatross'; depth 48 fathoms.

Type. No. 22580, U.S. N. M.

Family X. Arcturidæ.

23. ARCTURUS, Latreille.

Flagellum of second pair of antennæ more than four-jointed.

Fourth segment of thorax not greatly longer than others. Marsupium of female composed of four pairs of plates. Posterior thoracic legs biunguiculate.

Analytical Key to the Species of Arcturus *.

- a. End of abdomen notched as seen from above.
- b. Body smooth and free from spines . . . 61. *A. beringanus*, Benedict.
- b'. Body spiny.
- c. Head and six segments of thorax each with a pair of spines on the dorsum. Second and third articles of antennæ without spines 62. *A. longispinis*, Benedict.
- c'. Head and segments of thorax with not less than two pairs of spines to the segment.
- d. Head with one large median spine on anterior part of head in front of eyes 63. *A. intermedius*, sp. n.
- d'. Head with three spines on anterior part of head in front of eyes. 64. *A. Murdochi*, Benedict.
- a'. End of abdomen without notch 65. *A. glaber*, Benedict.

61. *Arcturus beringanus*, Benedict.

Arcturus beringanus, Benedict, Proc. Biol. Soc. Washington, xii. 1898, pp. 46, 47.

Hab. Alaska ; Bering Sea.

62. *Arcturus longispinis*, Benedict.

Arcturus longispinis, Benedict, Proc. Biol. Soc. Washington, xii. 1898, pp. 44, 45.

Hab. Aleutian Islands.

63. *Arcturus intermedius*, sp. n.

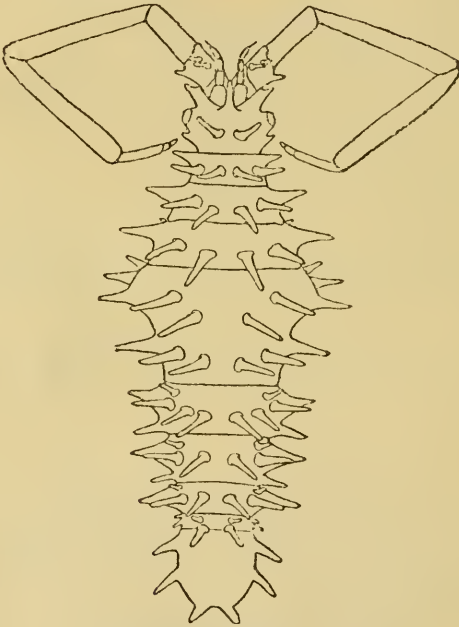
Head with a deep excavation on its anterior margin, the antero-lateral angles being produced in a double process, the inner one rounded, the outer one acutely pointed. Near the anterior margin in the median line is one large spine. Just back of the eyes and between them are two long spines. The lateral margins of the head are produced in two small angulations, with a rounded sinus between, posterior to the double antero-lateral process. On the post-lateral margin on either side of the head is a small spine.

The first pair of antennæ are small and short, not reaching

* Dr. Benedict's key is used in part for the genus *Arcturus*. Proc. Biol. Soc. Washington, xii. (1898) pp. 42, 43.

to the end of the second joint of the second pair of antennæ. The first joint of the second pair of antennæ is visible and unarmed; the second joint is armed with three spines; the third joint is unarmed and is about twice as long as the second joint; the fourth and fifth joints are about equal in length and are each about twice as long as the third; the flagellum contains three joints.

Fig. 28.

*Arcturus intermedius.* × 10.

The first, second, and third thoracic segments have a transverse row of six large spines, three on either side of the median longitudinal line, the two centre ones being the longest, although all are very long. The fourth segment is twice as long as any of the other segments and has a transverse constriction on the posterior half of the segment. On the anterior portion are six spines, three on either side of the median line, the four outer ones being in a straight line, the inner two below this line. On the posterior portion are six spines also, three on either side of the median line. The fifth thoracic segment has twelve spines, six on either side of the median line. The sixth segment has ten spines, five on either side. The seventh and last segment has eight spines, four on either side.

The abdomen is composed of two segments. The first is short, with twelve spines, six on either side of the median line, the four inner ones being arranged in two longitudinal series, the two upper ones being small, the two lower ones very long. The terminal segment has the upper surface smooth. This segment terminates in two long divergent spines. There is a single spine on the lateral margin on either side halfway down the segment. The three anterior pairs of legs have each two spines on the coxal joint and one spine on the basis. The body increases in width from the first to the fourth segment, and then decreases in width from the fourth to the terminal segment.

One specimen from Kyska Harbour, Aleutian Islands, 10 fathoms, collected by Mr. W. H. Dall.

Type. No. 22581, U.S. N. M.

Our species differs from *A. Murdochi* in the absence of spines on the third joint of the second pair of antennæ; in the greater length of this joint in relation to the preceding joint; in the greater length of the two following joints; in the presence of a single spine on the anterior part of the head, while in *A. Murdochi* there are three, and of two spines on the posterior part, while in *A. Murdochi* there are four; in the absence of two small spines just below the constriction in the fourth segment; in the absence of the row of spines on the terminal segment of the body; and in the presence of two spines on the coxal joint and one on the basal joint of the legs, while in *A. Murdochi* there is but one spine on the basal joint.

This species is also distinguished from *A. hystrix* in the presence of a single median spine on the anterior part of the head, while in *A. hystrix* there are two, one on either side of the median line and widely separated; in the presence of two spines on the posterior part of the head, while in *A. hystrix* there are four; in the absence of the double row of spines on the terminal segment of the body; and in the absence of the spine at the articulation of the third joint of the second pair of antennæ.

64. *Arcturus Murdochi*, Benedict.

Arcturus Murdochi, Benedict, Proc. Biol. Soc. Washington, xii. 1898, pp. 49, 50.

Hab. Point Franklin, Alaska.

65. *Arcturus glaber* *, Benedict.

Arcturus glabrus, Benedict, Proc. Biol. Soc. Washington, xii. 1898, p. 46.

Hab. Bering Sea.

* *glabrus* by error.

[To be continued.]