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CARCINOLOGICAL NOTES; NUMBER V.[1]

BY J. S. KINGSLEY.

IN the present number of these notes I have gathered a number of new species and remarks on little known forms of macrurous Crustacea, the results of my studies of the collections at Salem, Boston and Philadelphia, together with outline illustrations of some hitherto unfigured forms.

Genus **PENÆUS** FABR.

Mr. E. J. Miers has recently given a revision of the species of this genus (Proc. Zool. Soc'y, London, 1878, pp. 298–310) and I would here give the localities of the specimens which I have examined.

Penæus affinis.

Specimens in the Museum of the Peabody Academy of Science, Salem, Mass., from Hawaian Islands (A. Garrett), Hong Kong (Capt. W. H. A. Putnam), Zanzibar (Capt. Webb).

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[1] The previous articles of this series may be found in the Proceedings of the Academy of Natural Sciences of Philadelphia for 1880. (No. I, pp. 34–37; No. II, pp. 135–155, pl. X; No. III, pp. 179–186; No. IV, pp. 187–224.)

Penæus amazonicus.

Specimens in the Museum of the Boston Society of Natural History from the upper Amazon (James Orton).

Penæus avirostris Dana.

Boston Society: Japan (E. S. Morse).

Penæus braziliensis Latr.

P. brevirostris Kingsley.

Boston Society: Trinidad (W. O. Crosby), Bahamas (Dr. Henry Bryant). Union College: Sarasota Bay, Marcou Pass and Charlotte Harbor, Fla., Beaufort, N. C. (H. E. Webster). Peabody Academy: Rio Grande, Brazil (Capt. Harrington); Bahia, Brazil (Prof. C. F. Hartt); Magdalena River, New Granada (A. P. Smith); Realigo, West coast of Nicaragua (J. A. McNiel).

Penæus brevicornis M.-Edw.

Peabody Academy: China (Capt. W. H. A. Putnam).

Penæus canaliculatus Oliv.

Boston Society: Japan (Prof. E. S. Morse).

Penæus constrictus Stimp.

Union College: Marcou Pass, Fla. (H. E. Webster). Peabody Academy: Ft. Jefferson, Fla. (Lieut. Jacques).

Penæus kroyeri Heller.

Xiphopeneus hartii Smith.

Peabody Academy: Abrolhos, Brazil (Prof. C. F. Hartt).

Penæus monocerus Fabr.

Peabody Academy: Whampoa, China (Capt. W. H. A. Putnam).

Penæus monodon Fabr.

Peabody Academy: Hong Kong (Capt. W. H. A. Putnam).

Penæus sculptilis Heller.

Peabody Academy: Pulo Penang (Capt W. H. A. Putnam).

Penæus semisulcatus Dr. Haan.

Peabody Academy: Singapore (Capt. W. H. A. Putnam).

Penæus setiferus Linn.

Boston Society: Guatemala (C. H. Van Patten), Port Orange, Fla. (S. N. Chamberlain). Peabody Academy: Charleston, S. C. (A. S. Packard, jr.).

Genus **PALÆMON** Fabr.

Palæmon africanus n. s.

Carapax microscopically granulate, hepatic spine present. Rostrum shorter than the antennal scales, with nine or ten teeth above and five or six below, the tip three toothed. First pair of feet slender; the middle of the carpus extending as far forward as the tip of the antennal scale; hand about one-third the length of the carpus, fingers with pencils of hairs. Second pair of feet equal, greatly elongate and armed with longitudinally arranged spiniform tubercles; the meros is shorter than the carpus and about equal to the palm. Carpus slightly shorter than the hand, fingers occupying from one-third to two-fifths of the manus, completely closing, the occludent margins smooth, toothless and covered with hairs. Its nearest allies are *P. idæ* Heller, from which it differs in the shorter carpus and longer meros; *P. acanthurus*, which has a longer and reflexed rostrum, and *P. japonicus* de Haan, in which the first pair of feet are much longer. It may prove to be *P. macrobrachion* Hecklots (Addit. Faun. Africam Occid.) but the description of that species is too imperfect to decide the question.

West coast of Africa; P. du Chaillu (Philadelphia Academy). West coast of Africa; Dr. Perkins (Boston Society of Natural History, *type*).

Palæmon grandimanus Randall.

The types (two in number) of this species are still preserved in the Philadelphia Academy.

Palæmon jamaicensis (Herbst) Oliv.

P. carcinus Leach, Zool. Misc., ii, p. 92, pl. 92, 1815.
P. punctatus Randall, Jour. Phil. Acad., viii, p. 145, 1839.

An examination of Randall's type of *P. punctatus*, which is preserved in the museum of the Philadelphia Academy of Natural Sciences, shows it to belong to the well-known *P. jamaicensis*. In the same collection are specimens from St. Martin's (Dr. Rigjersma), San Domingo (W. M.Gabb), Guatemala (W. S. Vaux), Cuba (Guerin), Brazil (Dr. T. B. Wilson). In the Peabody Academy of Science there are specimens brought by J. A. McNiel from Polvon, on the west coast of Nicaragua.

Palæmon longimanus Fabricius.

P. longimanus Fabr., Suppl. Ent. Syst., p. 402, 1798.
P. lar Fabr., l. c., p. 402, 1798.
P. ornatus Oliv., Encyc. viii, p. 660. Edw. Hist. Nat Crust., ii, 396, 1837.

These three descriptions were doubtless drawn from individuals of the same species, and of the two Fabrician names I have chosen *longimanus* to stand for the species, as it is to a certain extent descriptive.

Palæmon ohionis Smith.

This species was described by Professor Smith from specimens taken in the Ohio river at Cannelton, Indiana. Prof. S. A. Forbes (Bulletin Ill. Mus. Nat. Hist., i, p. 5, 1876) reports it from several places in Illinois and, on the authority of boatmen, from St. Louis to New Orleans, growing larger towards the south. I have seen specimens in the museum of the Boston Society of Natural History from Milliken's Bend, Miss. (C. A. Shurtleff), and in the Museum of the Academy of Natural Sciences of Philadelphia, from Vicksburg, Miss. (L. C. Rice) and Mississippi (Guerin-Meneville, types of *P. sallei* Guer. MS.).

Palæmon sinensis Heller.

Specimens of this species, which was originally described from Shanghai, were brought from Japan by Prof. E. S. Morse and are now in the museum of the Boston Society of Natural History.

Palæmon acanthurus Wiegmann.

P. forceps Milne-Edwards.

Three specimens of this species in the Museum of the Peabody Academy brought by J. A. McNiel from the west coast of Nicaragua. It has hitherto been known only from the eastern shores of this continent.

Genus **LEANDER** Desmarest.

Leander hammondii n. s. Pl. I, fig. 2.

Carapax smooth; rostrum elongate, a fifth longer than carapax and considerably recurved, its dorsal margin armed with nine or ten nearly equidistant teeth, the two posterior being on the carapax; inferior margin six-toothed, the apex bifid. Last two joints of antennular peduncle subequal, and together about equalling the preceding joint. The two basal joints armed externally with a slender spine, each of which extends beyond the middle of the succeeding joint. Three

antennular flagella, the two outer (and stouter) branches being united for about a fifth of their length. Antennal scale narrow and very long, nearly equalling the rostrum in length. Antennal flagellum slightly longer than the whole body. External maxilliped hirsute, small, slender and not reaching beyond the tip of the antennular peduncle. First pair of feet slender, extending half way between tip of antennular peduncle and the apex of the rostrum. Second pair also slender; ischium, meros, and carpus sub-equal. Palm inflated, fingers about equal to palm, depressed, slender and gaping, and extending their whole length beyond the rostrum. Remaining feet slender, propodal joints spinulose beneath. Telson slender, triangular, with four dorsal aciculi and its apex armed with four small spines, the two outer ones the shorter. Length of body 29 mm., carapax 13 mm., second pair 15 mm.

The specimens on which this species is founded are in the museum of the Peabody Academy of Science at Salem, Mass. (no. 171), and were brought from Baker's Island, North Pacific, by Capt. Joseph Hammond, who for many years has been in charge of the Exhibition Rooms of the Academy and for whom I have named the species. Its closest relative seems to be *L. modestus* Heller (Verh. k. k. zool. bot. Gesellschaft in Wien xii, pl. 527, 1862) from Shanghai, from which it appears to differ in the shape of the rostrum, hands, etc.

Genus **Anchistia** Dana.

Anchistia Americana, Kingsley, Proc. Acad. Nat. Sci., Philadelphia, 1878, p. 96.

A few details of this species are given on plate II, fig. 10.

Genus **ALPHEUS** Faber.

(Including *Betæus*, Dana.)

Notwithstanding the remarks of my friend Mr. Lockington (Ann. & Mag. Nat. Hist. V, i, p. 466, 1878), I am still of the opinion that these two genera should be united and the examination of many hundred specimens of the two forms in the largest museums of America, only renders me more certain of my position. Mr. Miers says (Proc. Zoöl. Soc., 1879, p. 52): "There is probably scarcely any genus of Crustacea in which the species are more numerous, and which more greatly needs revision than the present," with which I fully agree. I commenced a revision some three years ago, but for several reasons I have been unable to finish it. Moreover, some sheets of my manuscript having been mislaid I cannot give this list of species that completeness which I could wish and which it once possessed. Still it is to be

hoped that the following notes which embrace almost every species, nominal or otherwise, will aid some future reviser in the work.

To aid in the identification of forms I have thrown the species into groups characterized by more or less prominent features; but there remain a number of nominal forms which (either from inadequacy of description or from the works in which they are published being inaccessible to me) are not so arranged.

A. Rostrum present; orbital hoods prolonged into spines.

a. Dactylus of 1st pair normal, *i. e.*, working in a vertical plane and above the pollex.

* Larger hand constricted above and below.

§ A spine on basal joint of antenna.

Alpheus megacheles *Norman.*

Hippolyte rubra Westwood. Mag. Nat. Hist., viii, p. 272 (1835); *non Alpheus ruber* Edw. *ex* Rafinesque.

Hippolyte megacheles Hailstone. Mag. Nat. Hist., viii, p. 395 (1835).

Dienecia rubra Westwood, *l. c.*, p. 552 (1835).

Alpheus edwardsii Edwards. Hist. Nat. Crust., ii, p. 352 (1837); Dana U. S. Exp. Exp. Crust., p. 543, pl. xxxiv, fig. 2 (1852); *non* Audouin.

Alpheus affinis Guise. Ann. & Mag. N. H., II, xiv, p. 275 (1854).

Alpheus platyrhynchus Heller. Sitzungsber. K. Akad., Wien, xliv, i, p. 400, pl. 1, f. 21–24 (1862).

Alpheus milnei Guerin, in De Sagra's Hist. Cuba, Crust., p. xlix (1857).

Alpheus megacheles Norman. Ann. & Mag., N. H., IV, ii, p. 175 (1868).

England to the Mediterranean (Auct.).

Alpheus thetis *White.* Pl. II, fig. 7.

Alpheus thetis White. List Crust. Brit. Mus., p. 75 (1847) *sine descr.* Miers Zoöl. Voyage Erebus & Terror, Crustacea, p. 5, pl. iv, f. 7 (1875).

The following description giving some details additional to those of Mr. Miers, is drawn from two specimens in the museum of the Academy of Natural Sciences of Philadelphia, presented by Dr. T. B. Wilson and labelled in Adam White's handwriting. They agree well with the figure quoted above and may be regarded as typical.

Front three spined, rostrum slightly longer than the ocular spines and separated from them by deep sulci. Second joint of antennular peduncle much the longest, the peduncle equalling the antennal scale in length. External maxillipeds much exceeding the antennal scales.

Larger hand longer than the carapax and shaped much as in *A. strenuus* Dana, but more elongate. Both margins are constricted and a well marked longitudinal sulcus runs backward on the lower margin. The inner and outer surfaces of the hand are sulcate. The fingers are nearly as long as the palm, the dactylus being slightly longer than the pollex. The carpus of the second pair is five jointed; first joint as long as the next two, second as long as the third and fourth, which are equal and together are as long as the fifth. The hand is about as long as the fourth and fifth carpal joints together.

New Zealand! (Dr. Wilson, Phil. Acad.); New Holland (White).

Alpheus bellimanus *Lockington.*

Alpheus bellimanus Lockington. Proc. Cal. Acad., vii, p. 34 (1876); Ann. & Mag. Nat. Hist., V, i, p. 470 (1878).

San Diego, Cal. (Lockington).

Alpheus sulcatus *Kingsley.*

Alpheus sulcatus Kingsley. Bull. U. S. Geol. Surv., iv, p. 193 (1877).

Panama! and Zorritas, Peru! (F. H. Bradley, Yale College).

Alpheus dentipes *Guerin.*

Alpheus dentipes Guerin. Exp. Sci. Morée, Zoöl., p. 39, pl. xxvii, f. 3 (1832).

Mediterranean (Guerin, Lucas and Heller).

Alpheus equidactylus *Lockington.*

Alpheus equidactylus Lockington. Proc. Cal. Acad., vii, p. 35 (1876).
Alpheus æquidactylus Lockington. Ann. & Mag., N. H., V, i, p. 472 1878.

Monterey, Cal. (Lockington).

§§ No spine on basal joint of antenna.

Alpheus Websteri *Kingsley.* Pl. II, fig. 5.

Alpheus Websteri Kingsley. Proc. Acad. Nat. Sci., Philadelphia, p. 416 (1879).

In this species the constriction on the lower margin of the palm is very slight and possibly it should be placed near *A. lottinii* (*infra*), but it appears, however, to be more closely allied to *Alpheus sulcatus* than to any other form. The types are in the collection of Union College and were brought from Key West, Fla., by Prof. H. E. Webster, to whom the species is dedicated.

Alpheus euchirus *Dana.*

Possibly this species should be arranged here. I have, however, placed it in the section with contorted hands. The dactylus works slightly out of the vertical plane.

** Larger hand notched above, entire below.

§ A spine on basal joint of antenna.

Alpheus gracilipes *Stimpson.*

Alpheus gracilipes Stimpson. Proc. Acad. Nat. Sci., 1860, p. 31.
Tahiti (Stimpson).

Alpheus malleator *Dana.*

Alpheus malleator Dana. U. S. Exp. Exp. Crust., p. 557, pl. 35, f. 9 (1852).
Rio Janeiro?! (Wilkes Exp., Phil. Acad.).

Alpheus gracilis, *Heller.*

Alpheus gracilis Heller. Sitzungsber. k. Akad., Wien, xliv, i, p. 271, pl. III, figs. 19–20 (1862).
Red Sea (Heller).

§§ No spine on basal antennal joint.

Alpheus trispinosus *Kingsley.*

Betæus trispinosus Stimpson. Proc. Acad. Nat. Sci., p. 32 (1860).
Alpheus trispinosus Kingsley. Bull. U. S. Geol. Surv., IV, 190 (1878).

What reason Dr. Stimpson had for calling this a *Betæus* I cannot imagine; for, according to his description, it has a long rostrum and the larger hand is not inverted, the only characters given for the genus *Betæus* by Dana.

Port Jackson, Australia (Stimpson).

*** Larger hand with both margins entire.

§ First joint of carpus of second pair of feet shorter than, or at the most equal to, the second and third joints. A spine on the basal joint of the second antenna.

Alpheus socialis *Heller.*

Alpheus socialis Heller. Reise der Novara, Crustaceen, p. 106, pl. 10, f. 1 (1865); Miers Catalogue New Zealand Crustacea, p. 82 (1876).
Auckland, Sydney (Heller); New Zealand (Miers).

Alpheus panamensis *Kingsley.*

Alpheus panamensis Kingsley. Bulletin, etc., p. 192 (1877).

Acajutla, Central America! and Panama! (F. H. Bradley, Yale College Museum).

Alpheus lottinii *Guerin.*

Alpheus lottinii Guerin. Voyage Coquille, Crustaces, p. 38, pl. III, f. 3 (1830).

Alpheus ventrosus Edw. Hist. Nat. Crust., ii, p. 352 (1837).

Alpheus lævis Randall. Jour. Acad. Nat. Sci., Phil., viii, p. 141 (1839); Dana U. S. Exp. Exp. Crust., p. 556, pl. XXXV, f. 8 (1852).

A comparison of the types of Guerin and of Randall shows the specific identity of the two so-called species. Guerin's figure is poor, that of Dana is far better. The bottle containing Guerin's type bears the label (in his handwriting) "303 *Alpheus lottini.* Guer. Voy. Coq. Edw. 2. 353, Ile de France;" while the manuscript catalogue of his collection (which was purchased by Dr. Thomas B. Wilson, and by him presented to the Academy of Natural Sciences of Philadelphia) has "303 *A. lottinii* Guer. Voy. Coq. Edw. 2. 353 (type) Nouvelle Irland, 1 Alk." In the published description Nouvelle Irland is given as the locality. Under these circumstances I am inclined to believe that the locality "Ile de France" was a slip of the pen.

New Ireland! (Guerin, Phil. Acad. *type*); Sandwich Islands! (T. Nuttall, Phil. Acad., Randall's *type*); Zanzibar! (C. Cooke, Peabody Acad.); Red Sea, Nicobar and Sydney (Heller); Fiji (Dana); Mauritius (Edw.); Society and Friendly Islands.

Alpheus rouxii *Guerin.*

Alpheus rouxii Guerin, in De Sagra Hist. Cuba, Animaux Articules, p. 1 (1857).

Bombay (Guerin).

This in all probability is the same as the preceding. Guerin's description runs: "Très voisin de l'A. ventrosus, Edw., p. 352. Il en diffère par ses pattes mâchoires externes qui ne sont pas larges et obtuses au bout, mais qui sont, au contraire, larges à la base du dernier article, avec son extrémité effilée et aigüe; par l'article basilaire des antennes externes qui porte une forte épine atteignant presque la moitié de la piece lamelleuse du pédoncule."

Alpheus ventricosus *Kingsley.*

Cryptophthalmus ventricosus Costa, Fauna Napoli, Crostacei, pl. vii, f. 3.[2]

I place this species in this section with some doubt, as I know nothing of the presence or absence of an antennal scale. Dr. Heller (Crustaceen des südlichen Europas, p. 272, 1863) regards this identical with his *Alpheus lævimanus*, but Costa's figure represents a widely different species. Dr. Heller also quotes as a synonym "*Cryptophthalmus costæ*, Prestandrea Nuovi annali d. sc. nat. 1838, p. 298," a paper which I have not seen. Dr. Heller's synonymy is, however, never to be relied upon.

§§ First joint of carpus of second pair of feet larger than the second and third together.

Alpheus minus *Say.*

Alpheus minus Say. Jour. Acad. Nat. Sci., Phil., i, p. 245 (1818); Edw. Hist. Nat. d. Crust., ii, p. 536 (1837); Kingsley Bulletin, l. c., p. 190 (1877).

Alpheus formosus Gibbes. Proc. Am. Assoc. Adv. Sci., iii, p. 196 (1851).

Alpheus tridentulatus Dana. Proc. Phil. Acad., vi, p. 22 (1852); U. S. Exp. Exp. Crust., p. 552, pl. xxxv, f. 4 (1852).

Alpheus saulcyi Guerin, in De Sagra's Hist. Cuba, p. xlviii, pl. II, f. 8 (1857).

Alpheus minor Lockington. Ann. & Mag. N. H., V, i, p. 472 (1878).

Beaufort, N. C.! (H. C. Yarrow, Yale College); Florida! A. S. Packard, jr., Peabody Academy); Martinique! (Guerin's type of *A. saulcyi* in Philadelphia Academy); Bermudas! (G. B. Goode, Yale College); Panama! (F. H. Bradley, Yale College); Bahamas! (H. Bryant, Boston Society); Trinidad! (W. O. Crosby, Boston Society).

Alpheus neptunus *Dana.*

Alpheus neptunus Dana. Proc. Phil. Acad., vi, p. 22 (1852); U. S. Exp. Exped. Crust., p. 553, pl. XXXV, f. 5 (1852).

?Alpheus biungulatus Stimpson. Proc. Phil. Acad., 1860, p. 31.

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[2] This work is one of the wonders of book-making. It has neither consecutive pagination nor systematic numbering of plates, there being half a dozen "Pl. I," and others in similar proportion. The parts themselves are not numbered, nor are the signatures dated or numbered. In the two copies which I have seen, the covers, in which the parts were issued, were wanting and so I can not give the dates. Some parts were apparently issued before the publication of the first volume of Milne Edwards' Classic (1834), while others were not written until 1851.

?Alpheus lævisculus Lockington. Ann. & Mag., V, i, p. 474 (1878); (*nec* Dana).

?Alpheus charon Heller. Verhandlung der zoöl.-bot. Gesellschaft in Wien, Bd. xi, p. 27 (1861).

The *Alpheus lævisculus* of Lockington is certainly the same as the *A. biungulus* of Stimpson.

Eastern seas. ? W. coast America.

Alpheus spiniger *Stm.*

Alpheus spiniger Stm. Proc. Phil. Acad., 1860, p. 31.

Near Loo Choo (Stm).

Alpheus tricuspidatus.

Alpheus tricuspidatus Heller. Verhandl. zoöl-bot. Gesellschaft in Wien, xi, p. 26 (1861).

Red Sea (Heller).

Alpheus lævimanus *Heller.*

Alpheus lævimanus Heller. Sitzungsber. k. k. Akad., Wien, Bd. xlv, p. 403, pl. I, f. 25–27 (1862); Crust. s. Europa, p. 272 (1863); *non syn.*

Mediterranean (Heller).

Alpheus tenuimanus *Lockington.*

Alpheus tenuimanus Lockington. Ann. & Mag. Nat. Hist., V, i, p. 473 (1878).

Gulf of California (Lockington).

The following species which belong in section *** I am not able to assign more nearly to their proper position, on account of insufficient detail in the descriptions and figures.

Alpheus doto *White, Miers.*

Alpheus doto White. List Crust. in Brit. Mus., p. 75 (1847) *sine descrip.*; Miers Zool. Voy. Erebus and Terror, Crustacea, p. 5, pl. iv, f. 5 (1874).

Sir Charles Hardy's Island, Australia (Miers).

Alpheus poeyi *Guerin.*

Alpheus poeyi Guerin, in De Sagra's Cuba, Crust., p. l, pl. II, f. 10 (1857).

The type of this species is preserved, though in an imperfect condition, in the museum of the Philadelphia Academy.

Cuba! (Guerin).

Alpheus bidens Edw.

Palæmon bidens Olivier, Encyclopedie Methodique, viii, p. 663 (1790).
Alpheus bidens M. Edw. Hist. Nat. Crust., ii, p. 353, pl. XXIV, f. 11–12 (1837).

In Milne Edwards figure (*l. c.*) this species is represented as having a four jointed carpus, probably an error on the part of the artist.

Asiatic seas (M. Edw.), New Holland (Olivier).

Alpheus villosus Edw.

Palæmon villosus Olivier, l. c., p. 664 (1790).
Alpheus villosus Edw. Hist. ii, p. 354 (1837).

Asiatic seas (Edw.), New Holland (Oliv.).

Alpheus spinifrons Edw.

Alpheus spinifrons Edw. Hist. etc., ii, p. 355 (1837).

Alpheus panamensis Kingsley, may prove to be this species but only a study of Milne Edwards type can determine; his description is utterly inadequate and would apply to several other species as well.

Chili (Edw.).

Alpheus savignyi Guerin.

Athanas nitescens Audouin (*nec* Leach) Expl. Pl. Savigny, p. 274, pl. 9, f. 4 (teste Guerin).
Alpheus savignyi Guerin, in De Sagra's Hist. Cuba, Animaux Articules, p. xlix (1837).

Egypt (Savigny).

Alpheus comatularum Haswell.

Alpheus comatularum Haswell, Catalogue of Australian Crustacea, p. 189 (1882).

Queensland (Haswell).

b. Hand contorted, the dactylus working either in a horizontal plane or in a vertical one below the pollex.

* No spine on the basal joint of the antenna.

Alpheus streptochirus Stm.

Alpheus streptochirus Stm., Proc. Phil. p. 30 (1860).

Cape Verdes Is. (Stm.).

Alpheus brevipes Stm.

Alpheus brevipes Stm. Proceedings Phil. Acad., p. 30 (1860).

Hawaiian Is. (Stm.)

Alpheus barbara Lockington.

Alpheus barbara Lckn.

Alpheus clamator Kingsley, Bull. U. S. Geol. Survey, iv, p.

Alpheus euchirus Dana.

Alpheus euchirus Dana.

** A spine on the basal joint of the antennæ.

Alpheus clamator Lockington.

Alpheus clamator Lock., Proc. Cal. Acad. vii, p. 43 (1876) Ann. and Mag. N. H.

Sta. Barbara Is. (Lock.),

Alpheus collumianus Stm.

Alpheus collumianus Stm., Proc. Phila. Acad., p. 30 (1860).

Bonin Is. (Stm.)

The following species belong in the section with the three-spined front (A) but no details are given of the hands and so their affinities cannot be recognized from the descriptions given.

Alpheus acutofemoratus Dana.

Alpheus acutofemoratus Dana, Proc. Phil. Acad., vi, p. 22 (1852) U. S. Ex. Crust. p. 550, pl. XXXV, f. 2 (1852).

Balabac Straits (Dana).

Alpheus monoceros Heller.

Alpheus monoceros Helle1, Sitzungsberichte, K. Acad. Wiss. Wien, xliv, p. 274 (1862).

Red Sea (Heller).

B. Rostrum spiniform, ocular hoods rounded, not spiniform.

a. Basal joint of antennal with an external spine.

* Larger hand constricted above and below.

§ First joint of carpus of second pair longer than the second joint.

Alpheus parvirostris Dana.

Alpheus parvirostris Dana, Proc. Phila. Acad. vi, p. 22 (1852) U. S. Ex. Ex. Crust. p. 551, pl. XXXV, f. 3 (1852).

Balabac Straits (Dana), Red Sea (Heller).

Alpheus diadema Dana.

Alpheus diadema Dana, Proc. Phila. Acad. v, p. 23 (1852) U. S. Exp. Exped. Crust. p. 555, pl. XXXV, f. 7 (1852).

In this species the constriction of the larger hand is very slight and possibly the affinities are with *A. fasciatus*, *infra*, and the name is for that reason repeated there.

Hawaiian Islands (Dana).

Alpheus parvimanus Kingsley.

Alpheus parvimanus Kingsley, Bulletin, etc., p. 195 (1877).

Panama! (F. H. Bradley, Yale College Museum).

Alpheus sulcatus Kingsley.

Alpheus sulcatus Kingsley, Bulletin, etc., p. 193 (1877).

Panama! Zorritas, Peru! (F. H. Bradley, Yale Museum).
This species has affinities with this section and hence is repeated.

§§ First and second joints of carpus of second pair of feet equal.

Alpheus normannii Kingsley.

Alpheus affinis Kingsley, Bulletin, etc., p. 195, 1871 (*nec* Guise).
Alpheus normannii Kingsley, Proc. Phil. Acad. 1878, p. 93.

Panama! (F. H. Bradley, Yale Museum).

Alpheus packardii Kingsley, Pl. II, fig. 2.

Alpheus packardii Kingsley, Proc. Phila. Acad. 1879, p. 417 (1880).

Key West, Fla.! (H. E. Webster, Union College Museum).

§§ First joint of carpus shorter than the second.

Alpheus spinicaudus Lockington.

Alpheus spinicaudus Lockington, Ann. and Mag. Nat. Hist. V, i, p. 476 (1878).

Gulf of California (Lockington).

** Larger hand notched above, entire below.

§ First carpal joint shorter than second.

Alpheus pugnax Dana.

Alpheus pugnax Dana, Proc. Phila. Acad. vi, p. 23 (1852) Ex. Ex. Crust. p. 554, pl. XXXV, f. 6 (1852).

Hawaiian Islands (Dana).

§§ First and second carpal joints equal.

Alpheus insignis Heller.

Alpheus insignis Heller, Verh. z. b. Ges. Wien xi, p. 26, 1861; Sitzungsber. k. k. Akad. Wien, xliv; p. 269, pl. III, f. 17–18 (1862).

Red Sea (Heller).

*** Both margins of larger cheliped entire.

§ First carpal joint larger than second.

Alpheus fasciatus Lockington.

Alpheus fasciatus Lockington, Ann. and Mag. N. H., v, p. 478 (1878).

Gulf of California (Lockington).

Alpheus diadema Dana. *Vide supra.*

§§ First and second carpal joint nearly equal.

Alpheus novozelandiæ Miers.

Alpheus novozelandiæ Miers, Ann. and Mag. N. H. p. 82, pl. II, f. 2 (1876).

New Zealand (Miers).

§§§ First carpal joint shorter than the second.

Alpheus ruber Milne Edwards.

Cryptophthalmus ruber Costa *op cit.*

Alpheus ruber M. Edw. Hist. Nat. de Crust. ii, p. 351 (1837); Régne Animal de Cuvier, III^{e} edition Crustace, pl. 53, fig. 1.

Mediterranean! (Phila. Acad.)

§§§§ No details of carpal joints.

Alpheus crassimanus Heller.

Alpheus crassimanus Heller, Verh. z. b. Ges. Wien, p. 526 (1860).

Nicobars (Heller).

b. Basal joint of antennæ without an external spine.

*Dactylus working in a horizontal plane, at right angles to the usual one.

Alpheus cylindricus Kingsley.

Alpheus cylindricus Kingsley, Bulletin, etc., iv, p. 196 (1877).

Panama! (F. H. Bradley, Yale Museum).

** Dactylus normal.

§ Both margins of larger cheliped constricted.

Alpheus bisincisus De Haan.

Alpheus bisincisus De Haan, Fauna Japonica, Crustacea, pl. XLV, f. 3 (1849).

Alpheus avaris De Haan, *l. c.* p. 179 (1849).

Alpheus strenuus Dana, Proc. Phila. Acad. p. 21 (1852) U. S. Ex. Exped. Crust. p. 543, pl. XXXIV, f. 4 (1852).

Japan (De Haan), Tongatabu (Dana), Eastern Seas (Auct.).

Alpheus lobidens De Haan.

Alpheus lobidens De Haan, F. Jap. Crust. p. 179 (1849).

Japan (De Haan).

Alpheus Edwardsii Audouin.

Alpheus Edwardsii Audouin, Explication Planches de Savigny, Egypt, pl. X, fig. I (*teste Auct.*) Heller, Sitzungsber. K. Akad. Wien, xliv, i, p. 267 (1862).

Alpheus neptunus White, Zool. Ereb. and Terror, pl. iv, f. 3 (1874).

Red Sea (Heller), Mozambique (Bianconi), Port Essington, Australia (Miers).

Alpheus heterochelis Say.

Alpheus heterocheles Say, Jour. Acad. Nat. Sci. Phila. i, p. 243 (1818); Kingsley, Bulletin, etc., iv, p. 194 (1877).

Alpheus armillatus Edw. Hist. Nat. Crust. ii, p. 354 (1837).

Halopsyche lutaria Saussure, Rev. et Mag. de Zoologie, 1857, p. 100.

Alpheus bispinosus Streets, Proc. Phila. Acad. 1872, p. 242.
Alpheus lutarius Saussure, Mem., Soc. Phys. et Hist. Nat. de Geneve, t. xiv, p. 461, pl, III, f. 24 (1858) [ext. p. 45].

From North Carolina! to Brazil, Rio Janeiro! West Indies! Panama! Realijo, Nicaragua! This form belongs to both coasts of tropical and sub-tropical America. Mr. Lockington (Ann. and Mag. Nat. Hist. V, i, p. 475, 1878) reports it from Lower California.

Alpheus pacificus Dana.

Alpheus pacificus Dana, Proc. Phila. Acad. vi, p. 21 (1852) U. S. Expl. Exped. Crust. p. 544, pl. XXXIV, f. 5 (1852).

Hawaiian Is. (Dana).

Alpheus japonicus Miers.

Alpheus japonicus Miers, Proc. Zool. Socy., London 1874, p. 53.

Japan (Miers).

Alpheus spinicaudus Lockington.

Alpheus spinicaudus Lockington, Ann. and Mag. Nat. Hist. V, i, p. 476 (1878).

Lower California (Lockington).

Alpheus jourdainii Guerin.

Alpheus jourdainii Guerin in De Sagra, Hist. Cuba, p. li (1837). [=? *A. sculptimanus.*]

No locality given.

Alpheus sculptimanus Guerin.

Alpheus sculptimanus Guerin, l. c. p. li, 1837.

Janaon (Guerin).

Alpheus laevigatus Guerin. Pl. II, fig. 3.

Alpheus laevigatus Guerin, Voy. Coquille Crust., p. 38.

Alpheus strenuus.

Alpheus strenuus Dana, U. S. Ex. Ex. Crust. 543, xxxiv, f. 4 (1852).
Alpheus doris White, List Crust. Brit. Mus. 75, 1847, Crust. Erebus and Terror, pl. 4, f. 2 (1874).

Alpheus rhode White, l. c.

? *A. Avarus* Heller, Voy. Novara, Crust. p. 108 (1863).

Torres Straits, Sydney, Tongatabou, Philippines.

§§ Upper margin of larger chela notched, the lower entire.

Alpheus brevirostris Edw.

Alpheus brevirostris (Edw.) (*ex* Olivier) Hist. Nat. d. Crust. ii, p. 350 (1837). New Holland.

Alpheus kingsleyi Miers.

Alpheus kingsleyi Miers, P. Z. S. London, 1879, p. 54.

Japan (Miers).

Alpheus rapax Fabr.

Alpheus rapax Fabricius, Suppl. Ent. Syst. p. 405, 1798, De Haan, op. cit. p. 177, pl. XLV, f. 2 (1849).

Japan (De Haan).

Alpheus malabaricus Fabr.

Alpheus malabaricus Fabr., Suppl. f. 405 (1798) De Haan, op. cit. p. 177, Pl. XLV, f. 1 (1849).

Alpheus brevicristatus De Haan, l. c.

Japan (De Haan).

§§§ Both margins of the larger chela entire.

Alpheus chiragricus Edw.

Alpheus chiragricus Edw., Hist. Nat. des Crustaces, p. "354" (1837).

Asiatic Seas (Edw.)

Alpheus crinitus Dana.

Alpheus crinitus Dana, Proc. Phila. Acad. vi, p. 21 (1852) U. S. Ex. Exped. Crust. p. 548, pl. XXXIV, f. 8 (1852).

Balabac Straits (Dana).

Alpheus obesomanus Dana.

Alpheus obesomanus Dana, Proc. Phila. Acad. vi, p. 21 (1852) U. S. Ex. Ex. Crust. p. 547, pl. XXXIV, f. 7 (1852).

Samoan Is.! (Phila. Acad.) Fiji Archipelago (Dana).

Alpheus floridanus Kingsley, Pl. II, fig. 8.

Alpheus floridanus Kingsley, Bulletin, U. S. Geol. Geog. Survey, iv, p. 193 (1877).

Fort Jefferson, Fla.! (Lieut. Jacques, Peabody Academy).

Alpheus mitis Dana.

Alpheus mitis Dana, Proc. Phila. Acad. vi, p. 22 (1852) Ex. Ex. Crust. p. 549, pl. XXXV, f. 1 (1852).

Balabac Straits (Dana).

Alpheus paracrinitus Miers.

Alpheus paracrinitus Miers, Ann. and Mag. Nat. Hist., Nov., 1881, p. 365.

Goree, Senegambia (Miers).

C. Front of carapax truncate, rostrum absent, orbital hoods without spiniform prolongation.

a. Hands normal.

Alpheus frontalis Edw.

Alpheus frontalis Edw., Hist. Nat. Crust. ii, p. 356 (1837). R. An. Cuv. pl. 53, fig 2.

New Holland (Edw.), Tahiti (Heller).

Alpheus emarginatus Edw.

Alpheus emarginatus Edw., Hist. Nat. Crust. ii, 357 (1837).

Locality unknown (Edw.).

Alpheus pachychirus Stm.

Alpheus pachychirus Stm. Proc. Phil. Acad., p. 30 (1860).

Loo Choo (Stm.).

Alpheus simus *Guerin.*

Alpheus simus Guerin, in De Sagra's Hist. Cuba, p. li, pl. 2, f. 11 (1857).

Cuba (Guerin).

Alpheus affinis *Guerin.*

Alpheus affinis Guerin, in De Sagra's Hist. Cuba, p. li (1857).

Bombay (Guerin).

Alpheus sinuosus *Guerin.* Pl. II, fig. 6.

Alpheus sinuosus Guerin, in De Sagra, p. li (1857).

Callao, Chili! (Guerin, type in Philadelphia Academy).

b. Hands inverted.

Alpheus longidactylus.

Betæus longidactylus Lockn. Proc. Cal. Acad., vii, p. 35 (1876).
Alpheus longidactylus Kingsley. Bull. U. S. Geol. Surv., iv, p. 198 (1877).

Alpheus harfordi *Kingsley.* Pl. II, fig. 4.

Alpheus lævigatus Nicollet in C. Gay, Hist. Chili, Zool., iii, p. 215 (1849); *non* Guerin.
Betæus equimanus Lckn. Proc. Cal. Acad., vii, p. 43 (1876); *non* Dana.
Alpheus harfordi Kingsley. Bull. U. S. Geol. Surv., iv, p. 198 (1877).
Alpheus equalis Kingsley, l. c., p. 199 (1877).
Betæus æqualis Lckn. Ann. and Mag. N. H., V, i, p. 478 (1878).

Alpheus australis *Kingsley.*

Betæus australis Stm. Proc. Phil. Acad., p. 31 (1860).
Alpheus australis Kingsley. Bull. U. S. Geol. Surv., iv, p. 190, 1877.

Port Jackson, Australia (Stm).

Alpheus æquimanus *Kingsley.*

Betæus æquimanus Dana. U. S. Exp. Exped., Crust., p. 560, pl. XXV, f. 11, 1852.
Alpheus equimanus Kingsley. Bull. U. S. Geol. Surv., iv, p. 190 (1877).

Alpheus candei *Guer.*

Alpheus candei Guer., in De Sagra's Hist. Cuba Zool., vii, p. pl. fig. (1857).
Alpheus transversodactylus Kingsley. Bull. U. S. Geol. Surv., iv, p. 196 (1877).

Santa Barbara! (W. G. W. Harford, Yale, Peab. Acad.); San Diego, Cal.! (Yale, Dr. E. Palmer); Bermudas! (J. M. Jones, Yale); Key West, Fla.! (H. E. Webster, Union College); Cuba! (Guerin, Phil. Acad.).

Alpheus truncatus *Kingsley.*

Betæus truncatus Dana. U. S. Ex. Ex. Crust., p. 559, pl. xxxv, f. 5 (1852).

Alpheus truncatus Kingsley. Bulletin Geol. Surv., iv, p. 190 (1877).

Terra del Fuegia (Dana).

Alpheus scabrodigitus *Kingsley.*

Betæus scabrodigitus Dana, l. c., p. 560, pl. xxv, f. 12 (1852).

Valparaiso (Dana).

The following species are either too imperfectly characterized to admit of recognition, or do not belong to the genus Alpheus as at present restricted.

Alpheus aculeatus *Sabine = Hippolyte grönlandica.*
Alpheus amethysteus *Risso = Anchistia amethystea.*
Alpheus amphitrite *White* MS.
Alpheus avarus *Fabr.*
Alpheus caramote *Risso = Peneus caramote.*
Alpheus cougneti *Risso = ?Hippolyte sp.*
Alpheus elegans *Risso = Gnathophyllum elegans.*
Alpheus elongatus *Risso = Hippolyte sp.*
Alpheus ensiferus *Risso = Hippolyte sp.*
Alpheus marmoratus *Fabr. = Hippolyte marmoratus.*
Alpheus monopodium *Bosc. = Alpheus edwardsii.*
Alpheus olivieri *Risso = Hippolyte sp.*
Alpheus polaris *Sabine = Hippolyte polaris.*
Alpheus punctulatus *Risso = ?.*
Alpheus pelagicus *Risso = ?.*
Alpheus scriptus *Risso = Anchistia scripta.*
Alpheus sivado *Risso = Pasiphæ sivado.*
Alpheus spinus *Leach = Hippolyte spinus.*
Alpheus tamulus *Fabr.*
Alpheus tyrrhenus *Risso = Pontonia tyrrhena.*
Alpheus viridis *Otto = Hippolyte sp.*

Of the following species I can say nothing, as the descriptions are in works at present inaccessible to me.

Alpheus galathea.

Alpheus galathea White. List B. M. Crust., p. 75 (1847), *sine descr.*; Miers Zool. Erebus and Terror, p. 5, pl. iv, f. 4 (1875).

Port Essington, Australia.

Alpheus alope *White.*

Alpheus alope White. List B. M. Crustacea, p. 75, 1847 (*s. d.*); Miers Zool. Erebus and Terror, p. 5, pl. iv, f. 6 (1875).

Port Stephens, Australia.

Alpheus costæ.

Cryptophthalmus costæ, Prestandrea. Nuovi annali d. sc. nat., 1838, p. 298 (*teste* Heller).

Mediterranean.

This is given by Heller (Crust. süd. Europa, p. 272, 1863) as a synonym of *A. lævimanus*; but whether it be that species or *A. ventricosus* or rather a distinct species I have not the means at hand to determine.

Alpheus digitalis *De Haan.*

Alpheus digitalis De Haan. Fauna Japonica, p. 178, pl. xlv, f. 4.

Japan (De Haan).

Alpheus forceps *White* MS.

Alpheus latifrons *A. Milne Edwards.*

Alpheus latifrons A. Milne Edwards. Jour. Mus. Godeffroy, iv, p. 87, 1873.

Samoan Islands (A. M.-E.).

Alpheus minor *De Haan.*

Alpheus minor De Haan, *op. cit.*, p. 180, pl. xlv, f. 6.

Japan (De Haan).

Alpheus triton *White* MS.

Alpheus lineifer *Miers.*

Alpheus lineifer Miers. Ann. and Mag. Nat. Hist., IV, xvi, p. 343, 1875.

Samoan Islands (Miers).

This species belongs either in the section with *Alpheus bisincisus* or in that which contains *A. parvirostris* and *A. spinicaudus;* but as no details are given regarding antennal spine and carpal joints, its affinities cannot be more closely indicated.

Genus **HIPPOLYTE** Leach.

Hippolyte prionota *Stimpson.* Pl. II, fig. 9.

Hippolyte prionota *Stimpson.* Proc. Phil. 1864, p. 153.

I figure this beautiful species from a specimen from Puget Sound, in the collection of the Philadelphia Academy.

Genus **CARIDINA** Edw.

Caridina africana *nov. sp.* Pl. I, fig. 3.

Carapax smooth, compressed; suborbital spine alone present; rostrum nearly as long as the carapax; its apex slightly reflexed and armed above and below with minute teeth. Peduncle of antennulæ about as long as the rostrum, its penult and last joints subequal. Antennal scale slightly longer than antennular peduncle, its apex regularly ovate, its sides parallel, no spine on the basal joint. Ambulatory feet very slender, short, the carpus of the first pair about as long as the palm, of the second as long as the handfingers of both terminated by pencils of short hairs. Dactyli of three posterior pairs of feet slightly curved, simple and about one-fifth the length of the propodal joints. Telson narrow, the sides straight and but slightly converging to the truncate tip which falls a little short of the narrow caudal lamellæ of the sixth segment.

Zulu Mission, South Africa (S. A. Grout).

Genus **XIPHOCARIS** Martens.

In my revision of the genera of Palæmonidæ (Proc. Acad. Nat. Sci. Phila., 1879, p. 426), I referred the single species of this genus to *Caulurus* of Stimpson; but having since seen specimens, I have

found that its affinities are not with the Palæmonidæ, but rather with *Atya* and *Caradina*, as it possesses the mandibles characteristic of that group.

Genus **HIPPOLYSMATA** Stimpson.

Hippolysmata wurdmanni *Stimpson*. Pl. I, fig. 8.

Hippolysmata intermedia *Kingsley*. Pl. I, fig. 4.

I give figures of some details of these two species to aid in their identification.

Genus **NECTOCRANGON** Brandt.

N. alaskensis *nov.*

Carapax but little depressed, with four prominent equally spaced teeth in the median line, the anterior one forming the rostrum, and with a fifth smaller tooth between the first and second. A strong spine on each hepatic region. Front strongly elevated, the orbits elongate, tubular, and each with two spiniform teeth above. Pterygostomian spine very prominent. Peduncle of antennulæ barely reaching to middle of the antennal scale, and the flagella not reaching its tip, otherwise both pairs of antennæ are much as in *N. lar*. The external maxilipeds and thoracic feet present no important differences from *N. lar*. The sterna of the three last thoracic segments bear large prominent spines. The abdomen has a median dorsal carina, which on the sixth segment and telson is double as in the previously described species. Length about one and one-half inches.

Marmot Island, Kodiac Archipelago, Alaska (Dr. W. H. Jones, Philadelphia Academy).

Genus **CRANGON** Fabricius.

Crangon tenuifrons *nov*. Pl. I, fig. 10.

Carapax depressed, its surface uneven, with two spines in the median line above, of which the posterior is just behind the middle and the smaller, anterior one at the base of the rostrum. Rostrum elevated, arcuate, somewhat elongated, and reminding one of that of *Sabinea septemcarinata*. Subocular, pterygostomian, and hepatic spines prominent. Antennulæ with a broad basal scale, the peduncle extending nearly to the middle of the antennal scale. Two flagella present, the outer thicker one reaching the tip of the antennal scale,

the inner extending a little farther. Antennal scale narrow, elongate, flagellum two-thirds as long as the body. External maxillipeds with the distal joints hairy, and exceeding by half their length the antennal scales. First pair of feet much as in *C. vulgaris*, the carpus with a spine on each side below. The occludent margin of the hand very oblique. Second and third pairs of feet slender, the second chelate and a little shorter than the third; fourth and fifth pairs elongate cylindrical, the dactyli styliform. First five joints of the abdomen with a median carina, the sixth and telson with two carinal telson elongate, sides straight, tip acute.

Length two inches.

Marmot Island, Kodiac Archipelago, Alaska (Dr. W. H. Jones, Phila. Acad.).

I insert for comparison figures of *C. vulgaris* (pl. I, fig. 5), *C. boreas* (pl. I, fig. 6), and *C. franciscorum* (pl. I, fig. 7).

Crangon vulgaris *Fabr.* Pl. I, fig. 5.

I have examined numerous specimens of this species from the east and west coasts of America and from Europe, and fully agree with Professor Smith in uniting with it the form formerly known as *C. nigricauda.* Specimens in the Peabody Academy from Beverly, Mass. (No. 138) have the sixth and seventh abdominal segments sulcate above as in the majority of the west coast forms. Kinahan's figures (Proc. Roy. Irish Acad., viii, pl. iv, 1864) are very incorrect. The second pair of feet are greatly larger than in any specimens I have seen, and the joints of the external maxillipeds are wholly unlike those found in nature.

Crangon salebrosus *Owen.*

This is probably to be found in North American waters; there are specimens in the museum of the Philadelphia Academy without locality, but which came with other American forms (*Paracrangon echinatus*, *Hippolyte prionota*, etc.). Its original locality, Kamtschatka, would seem to favor this idea.

Crangon batei.

Crangon intermedius Bate. Proc. Zoöl. Soc'y, London, 1863, p. 503, pl. XLI, f. 6. Haswell Cat. Australian Crust., 181 (1882), desc. compiled.

This Australian species must be renamed, the term *intermedius* having been used in 1860 by Stimpson for a species from Behrings Straits. Mr. Bate is rather unfortunate with the species described in this paper,

for with the exception of this and one other species, every form is assigned to a wrong genus. The genus *Angasia* is, as I have previously shown, synonymous with the earlier *Tozeuma* of Stimpson.

Evaxius tricarinatus *n. g. et n. s.* Pl. I, fig. 1.

A single imperfect specimen, lacking both chelipeds, forms the basis of this description. I should hesitate to describe it were its other characters so well marked as to render it a very distinct and interesting form.

Cephalothorax small, compressed; abdomen large and somewhat depressed. Body everywhere with a sparse pubescence, among which are interspersed larger hairs. Carapax with a median dorsal carina extending from the "cervical suture"[3] as far as the eyes and terminating anteriorly by a sharp tooth; just behind this tooth occurs a broad and shallow emargination. On either side of this median carina is found a less conspicuous one extending from above the eyes half way back to the "cervical suture;" its anterior extremity likewise terminating in a tooth similar to that of the median carina. In front of these carinæ the carapax is strongly deflexed and terminates anteriorly in a small triangular rostrum extending about half its length, beyond the eyes. The anterior and inferior margins of the carapax are smooth and unarmed. The basal joints of the antennulæ are hairy, the two distal ones being subequal. Flagella two, of equal length, but the inner of smaller diameter; no spines or scales on the basal joints. Antenna without a basal scale, the penult joint compressed and over twice the length of the last joint; flagellum a little longer than the carapax. External maxillipeds pediform, flattened and extending to the extremity of the antennal peduncle. In the specimen the first pair of pereiopoda had been broken off during life, but were in process of restoration; the chelæ were didactyle, the fingers being equal. Second pair of walking feet compressed; carpus and propodus subequal; the chelæ well formed. Third and fourth pairs also compressed, monodactyle, the propodus pectinate and bristled beneath. Fifth pair smaller, subchelate. Pleopoda small and inconspicuous. Lower margins of abdominal segments rounded. Caudal lamellæ broad with rounded extremities, each with a median

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[3]This suture does *not* indicate the line of division between the head and thorax as is usually stated. Those who may be interested will find a masterly exposition of the meaning and significance of this line in the portions on the morphology of the Crustacea with which Professor Dana begins his splendid work on the Crustacea of the U. S. Exploring Expedition.

carina on the dorsal surface. Telson broad and rounded, ecarinate, pubescent above, extremity rounded. Length one and one-half inches.

The single specimen which is in the Museum of the Boston Society of Natural History was brought from Zanzibar by Dr. Charles Pickering.

This form clearly belongs to the Gebidæ as limited by Dana, but it is clearly separated from all known genera by well marked characters: from *Gebia* and its allies by the absence of the antennal scale and the chelate second pair of pereiopoda; from *Axius* in the absence of the antennal scale and from *Gebiopsis* A. Milne-Edwards, by the characters of the second pair of walking feet. Its position seems to be intermediate between *Axius* and *Gebiopsis*.

Nephrops occidentalis *Randall*. Pl. II, fig. 1.

Nephrops occidentalis Randall. Jour. Phila. Acad., viii, p. 1839 [1840].

When at work at the collections of the Philadelphia Academy, I was unsuccessful in my search for the type of this species, which was supposed to have been brought from the west coast of America. In the collection which formed the basis of Dr. Randall's paper, there were specimens from California and from the Sandwich Islands, and it is possible that some transfer of labels took place here as well as in the case of one of the *grapsidæ*. This supposition is rendered the more probable from the fact that this species has never been reported from our shores, except by Randall, and so far as I am aware, it has never been seen by carcinologists since his day. In going over the collections of the Boston Society, I found, however, three imperfect specimens from Mauai, Hawaiian Islands, presented by Dr. Winslow, which agree well with Dr. Randall's description, and one of which furnished the illustration accompanying the present article. It is a valid member of the genus, and can readily be identified by the figure and description.

EXPLANATION OF PLATES.

PLATE I.

FIG.

1 *Evaxius tricarinatus.*

2 *Leander hammondi; a*, antennula; *b*, carapax; *c*, second thoracic foot.

3 *Caradina africana; a*, second thoracic foot.

4 *Hippolysmata intermedia.*

5 *Crangon vulgaris; a*, mandible; *b*, chela; *c*, antennal scale.

6 *Crangon boreas;* with chela, mandible and antennal scale.

7 *Crangon franciscorum* and chela.

8 *Hippolysmata wurdemanni* and mandible.

9 Antennal scale of *Crangon vulgaris* (the form described as *nigricauda*).

10 *Crangon tenuifrons.*

PLATE II.

FIG.

1 *Nephrops occidentalis.*

2 *Alpheus packardii.*

3 *Alpheus lævigatus; a*, second thoracic foot.

4 Chela of *Alpheus harfordi; a*, anterior portion of carapax, etc.

5 *Alpheus websteri.*

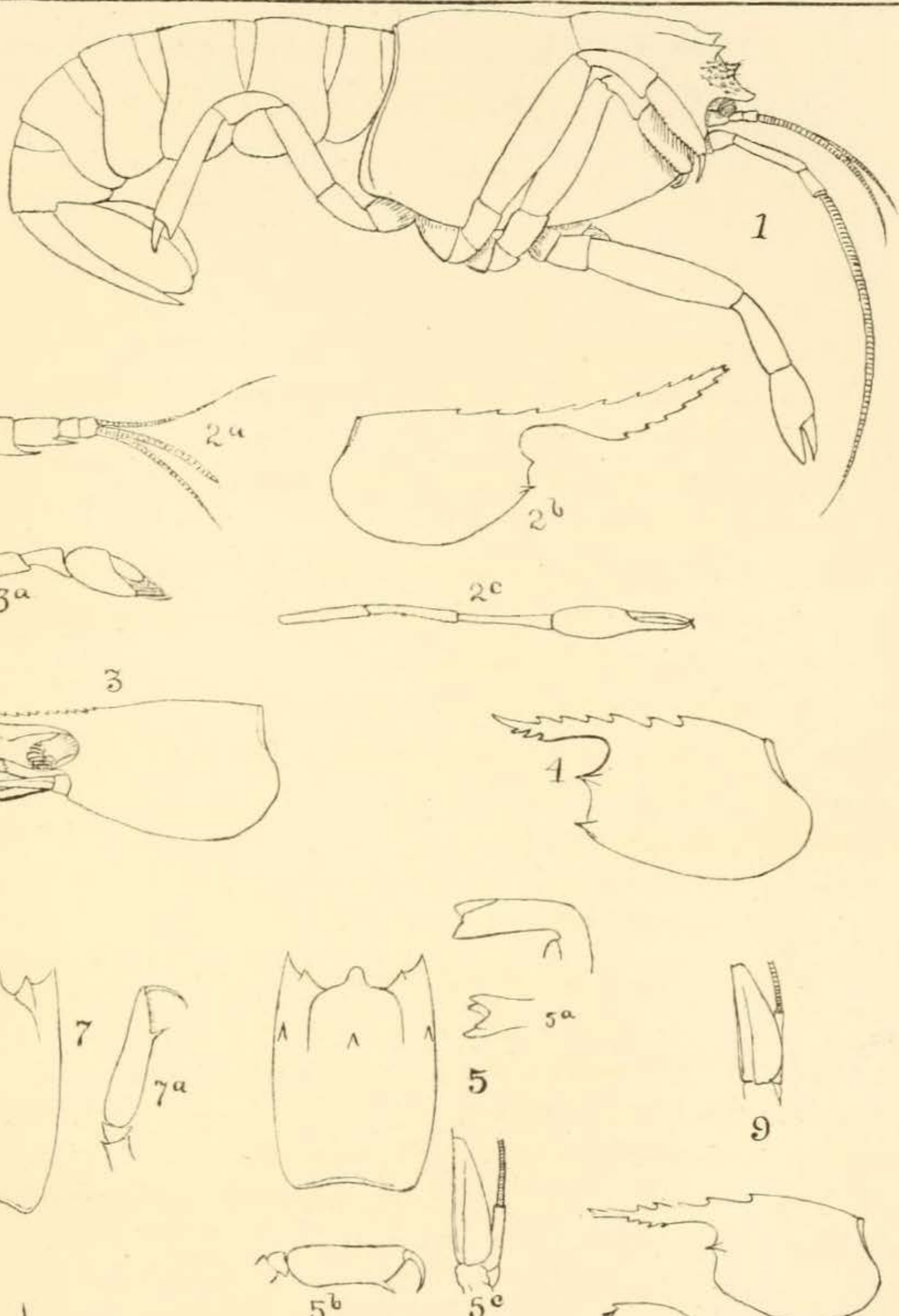
6 *Alpheus sinuosus.*

7 *Alpheus thetis.*

8 *Alpheus floridanus.*

9 *Hippolyte prionota.*

10 Rostrum and *a*, antennula of *Anchistia americana.*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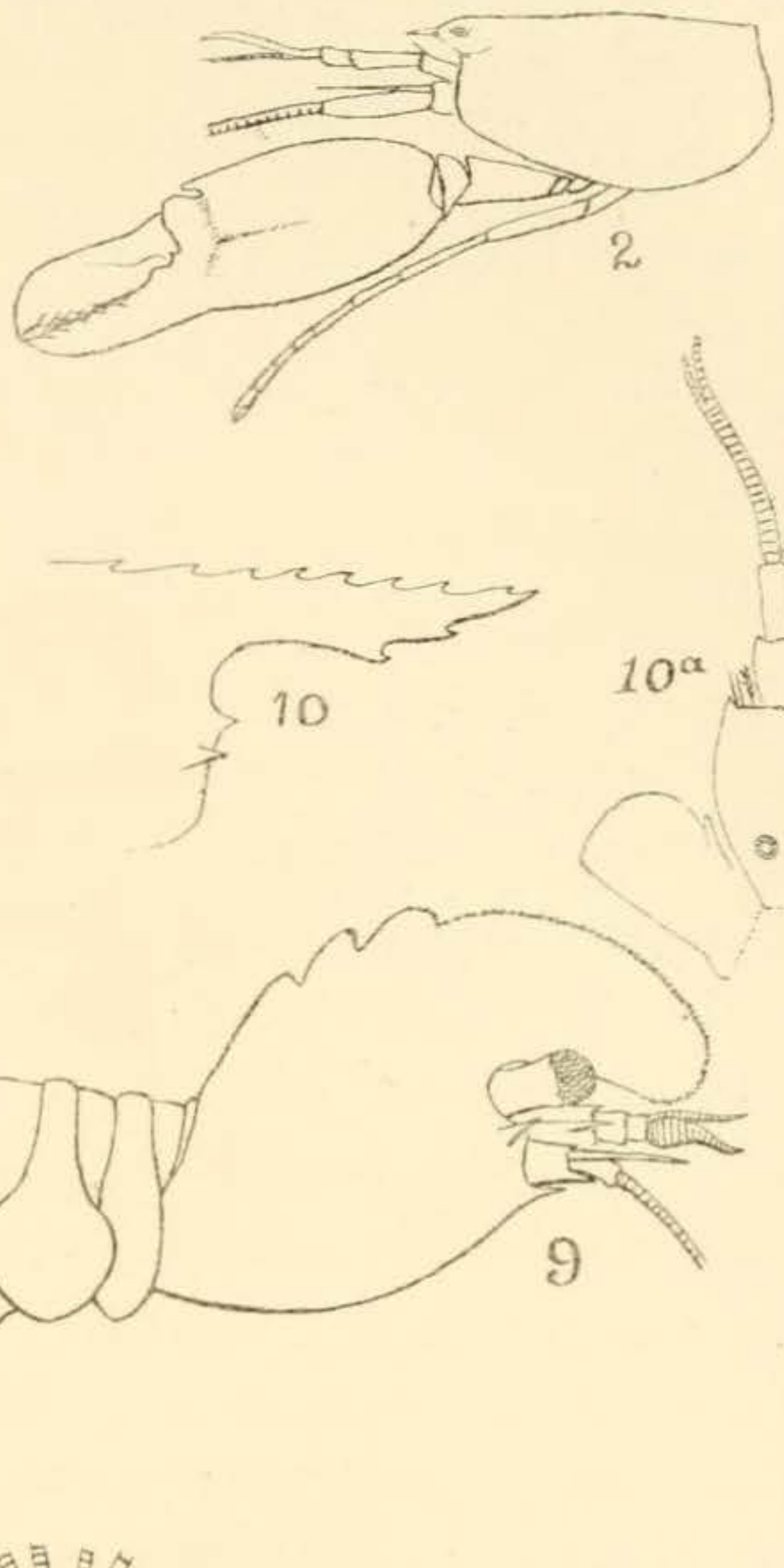
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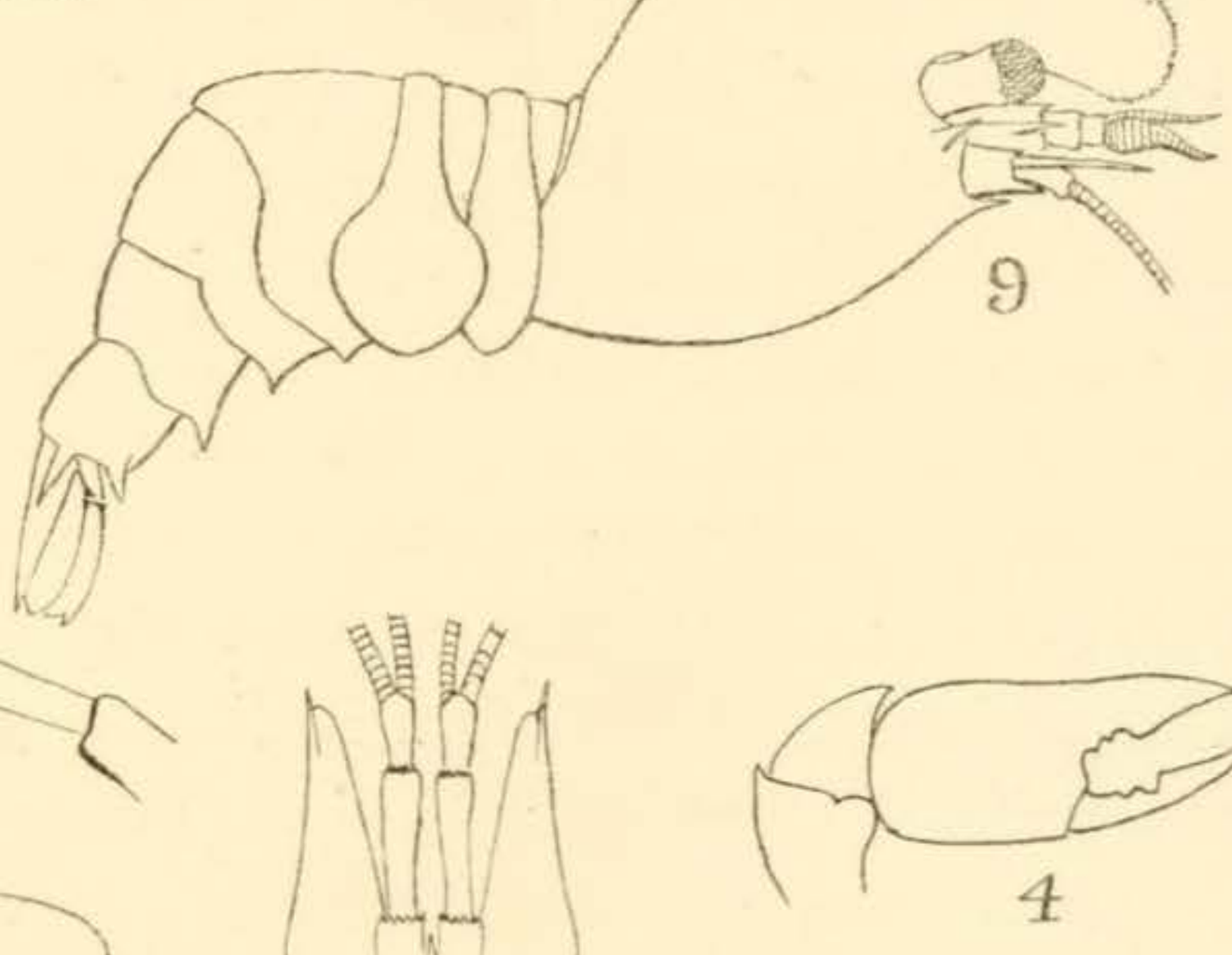
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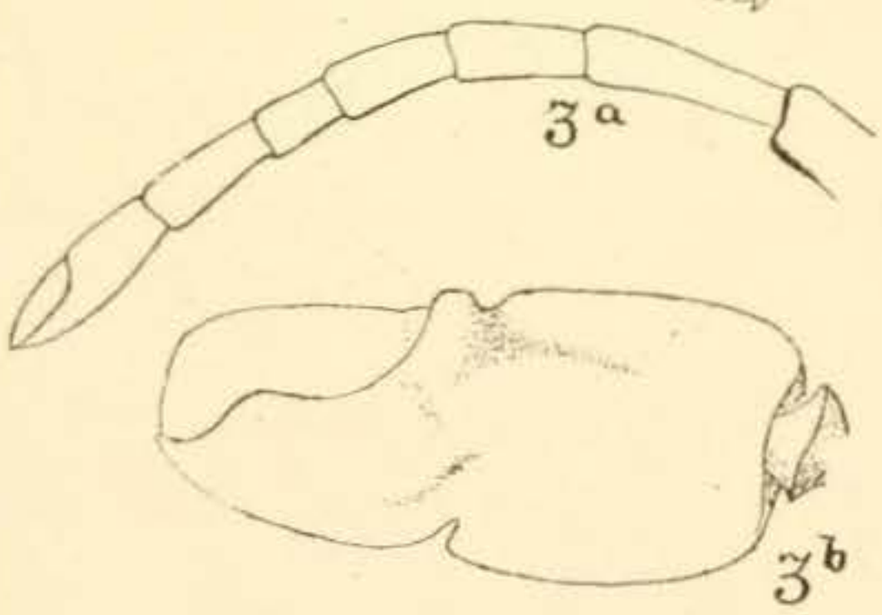
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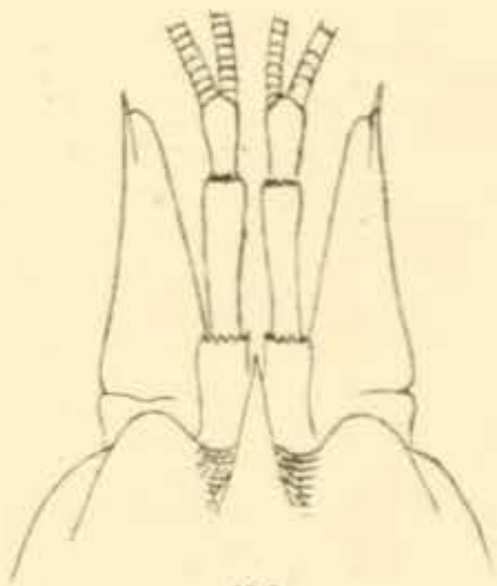
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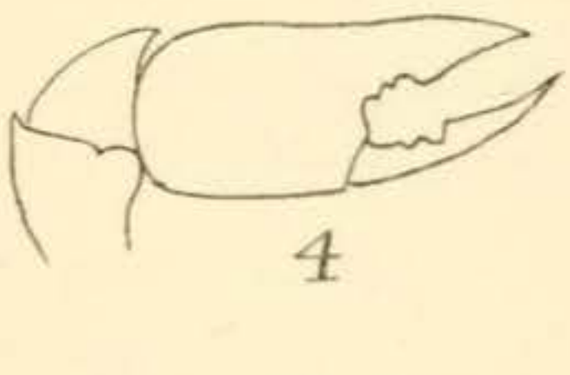
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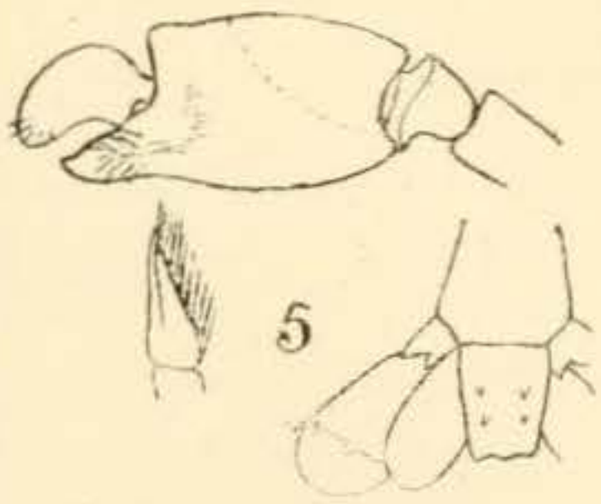
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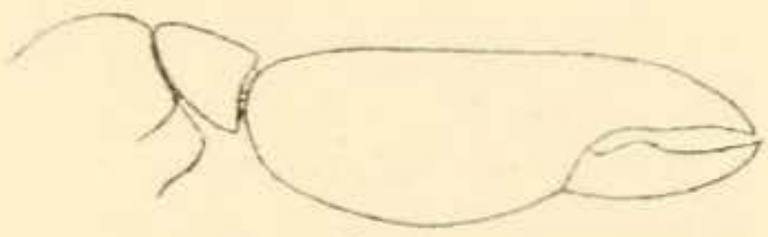
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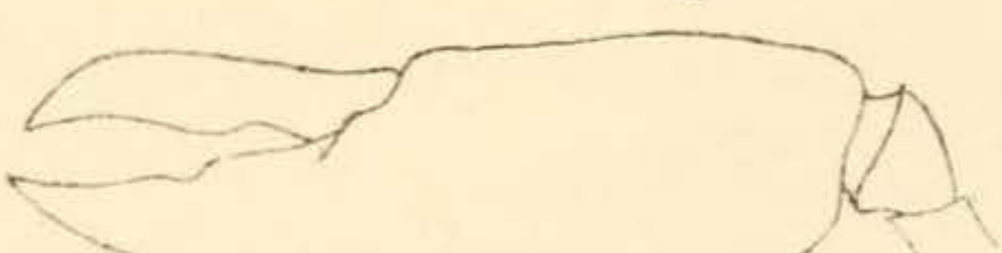
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