The segments of the thorax are subequal in length. The first one has the antero-lateral angles produced to surround the head, and they extend almost to the base of the antero-lateral angles of the head. The epimera are perfectly united with the segments. The lateral mar gins are straight.

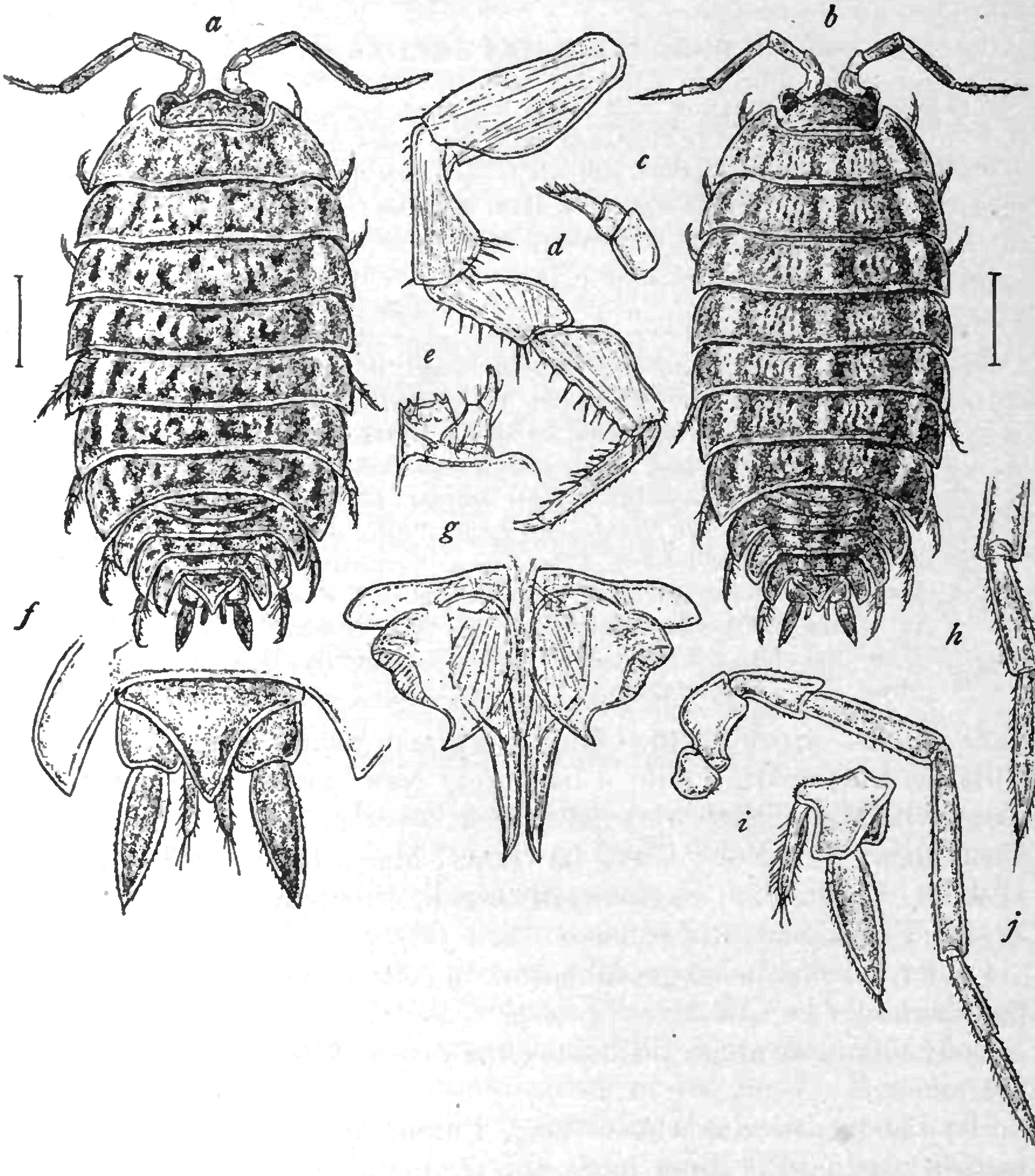

FIG. 668.—PORCELLIO RATHKEI (AFTER SARS). *a*, DORSAL VIEW OF MALE. *b*, DORSAL VIEW OF FEMALE. *c*, FIRST ANTENNA. *d*, SEVENTH LEG. *e*, MAXILLIPED. *f*, LAST SEGMENT OF ABDOMEN AND UROPODA. *g*, FIRST PLEOPOD OF MALE. *h*, FLAGELLUM. *i*, UROPOD. *j*, SECOND ANTENNA.

All six segments of the abdomen are distinct, the first two having the lateral parts covered by the seventh thoracic segment. The third, fourth, and fifth segments have the lateral parts produced so as to continue the oval outline of the body. The sixth or terminal segment is triangular with apex produced in a long, narrow process. The length of the segment from the base to the extremity of the apex is equal to its width at the base, 1 mm.: 1 mm. The peduncle or basal article of

the uropoda extends almost to the extremity of the posterior angle of the lateral part of the fifth abdominal segment, which is a little shorter than the tip of the apical process of the sixth segment. The inner branch is 1 mm. long and is partly concealed by the apical process of the sixth abdominal segment; it extends to the middle of the outer branch. The outer branch is 1 mm. long, and extends about two-thirds of its length beyond the apical process of the sixth abdominal segment.

All the legs are ambulatory in structure.

In color it is a dark brown with three longitudinal lines of light yellow, one median and one on either side at the place of union of the epimera with the segments. Between the median line of light yellow and the lateral lines are wavy lines of light yellow on the brown color, giving it a broken, mottled effect.

The surface of the body is covered with low granules.

PORCELLIO SPINICORNIS Say.

Porcellio spinicornis SAY, Jour. Ac. Nat. Sci. Phila., I, 1818, pp. 431, 432.
Porcellio pictus BRANDT and RATZEBURG, Med. Zool., II, 1830–1834, p. 78, pl. XII, figs. 5, 5e, 5f.
Porcellio melanocephalus KOCH, Deutschl. Crust., 1835–1844, p. 28.
(?) *Porcellio spinicornis* DE KAY, Zool. New York, Pt. 6, 1844, p. 51.
Porcellio mixtus FITCH, Rep. noxious ins., 1856, p. 120.
Porcellio pictus KINAHAN, Nat. Hist. rev., IV, 1857, p. 278.—BATE and WESTWOOD, Brit. Sess. Crust., II, 1868, p. 480.—BUDDE-LUND, Nat. Tidsskr. (3), VII, 1870, p. 239; Crust. Isop. Terrestria, 1885, pp. 123–125.—G. O. SARS, Crust. of Norway, II, 1899, pp. 177, 178, pl. LXXVIII, fig. 1.—STOLLER, 54th Report New York State Museum, 1902, p. 213.

Localities.—North America, at New York; Niagara; Goshen, Connecticut; also Sweden; Denmark; Germany; Britain; France; Hungary; Russia; coast of Norway.

Found in the crevices of rocks and on shady limestone ledges. (STOLLER.)

Body nearly twice as long as wide, 7 mm. : 13 mm.

Head twice as wide as long, 1½ mm. : 3 mm., with the front produced in three lobes, the antero-lateral lobes being large and rounded, the median lobe wide but short and almost truncate on its anterior margin. The eyes are small, oval, composite, and situated at the base of the antero-lateral lobes. The first pair of antennæ are rudimentary and inconspicuous. The basal article of the second pair of antennæ is short; the second and third are subequal and each is twice as long as the first; the fourth is one and a half times as long as the third; the fifth is one and a half times longer than the fourth. The flagellum is composed of two articles, the first of which is one and a half times longer than the second. The second antennæ extend to the posterior margin of the third thoracic segment. The second article

of the second antenna has the inner margin expanded into a spine-like process, which is very conspicuous. The maxillipeds have a palp of three articles. The palp of the mandibles is wanting.

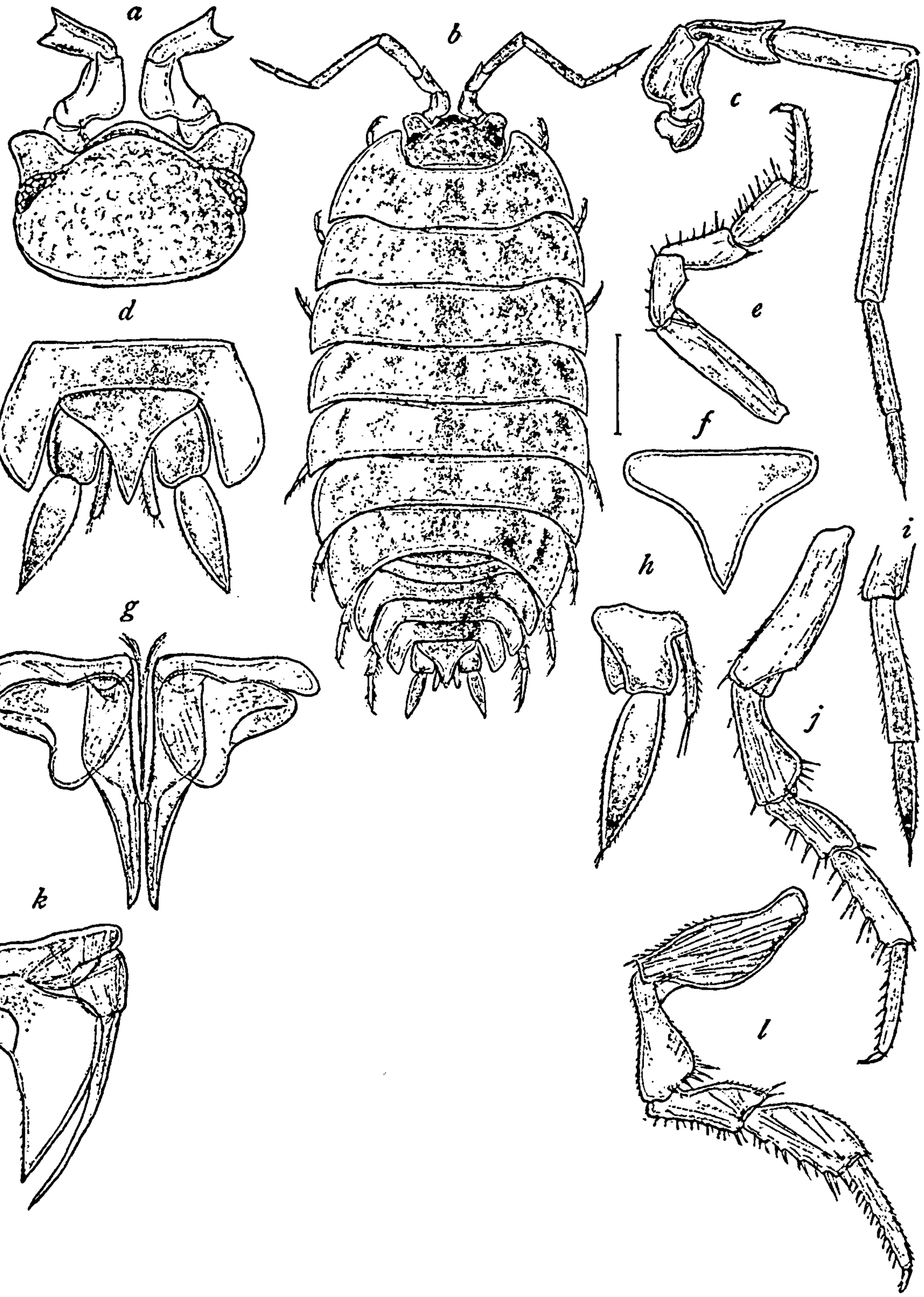

FIG. 669.—PORCELLIO SPINICORNIS (AFTER SARS). *a*, HEAD. *b*, DORSAL VIEW OF FEMALE. *c*, SECOND ANTENNA. *d*, LAST TWO SEGMENTS OF ABDOMEN AND UROPODA. *e*, FIRST LEG OF FEMALE. *f*, LAST SEGMENT OF ABDOMEN. *g*, FIRST PLEOPOD OF MALE. *h*, UROPOD. *i*, FLAGELLUM. *j*, SEVENTH LEG OF FEMALE. *k*, SECOND PLEOPOD OF MALE. *l*, SEVENTH LEG OF MALE.

The first segment of the thorax is 2 mm. in length, a little longer than any of the others, which are subequal and each is 1½ mm. in length. The epimera are not separated off from the segments.

The abdomen is as wide as the thorax. The first two segments have the lateral parts covered by the last thoracic segment. The sixth or terminal segment is triangular, with apex produced to a long, narrow process rounded at the extremity. The terminal segment is 2 mm. wide at the base and 1½ mm. long. The peduncle of the uropoda

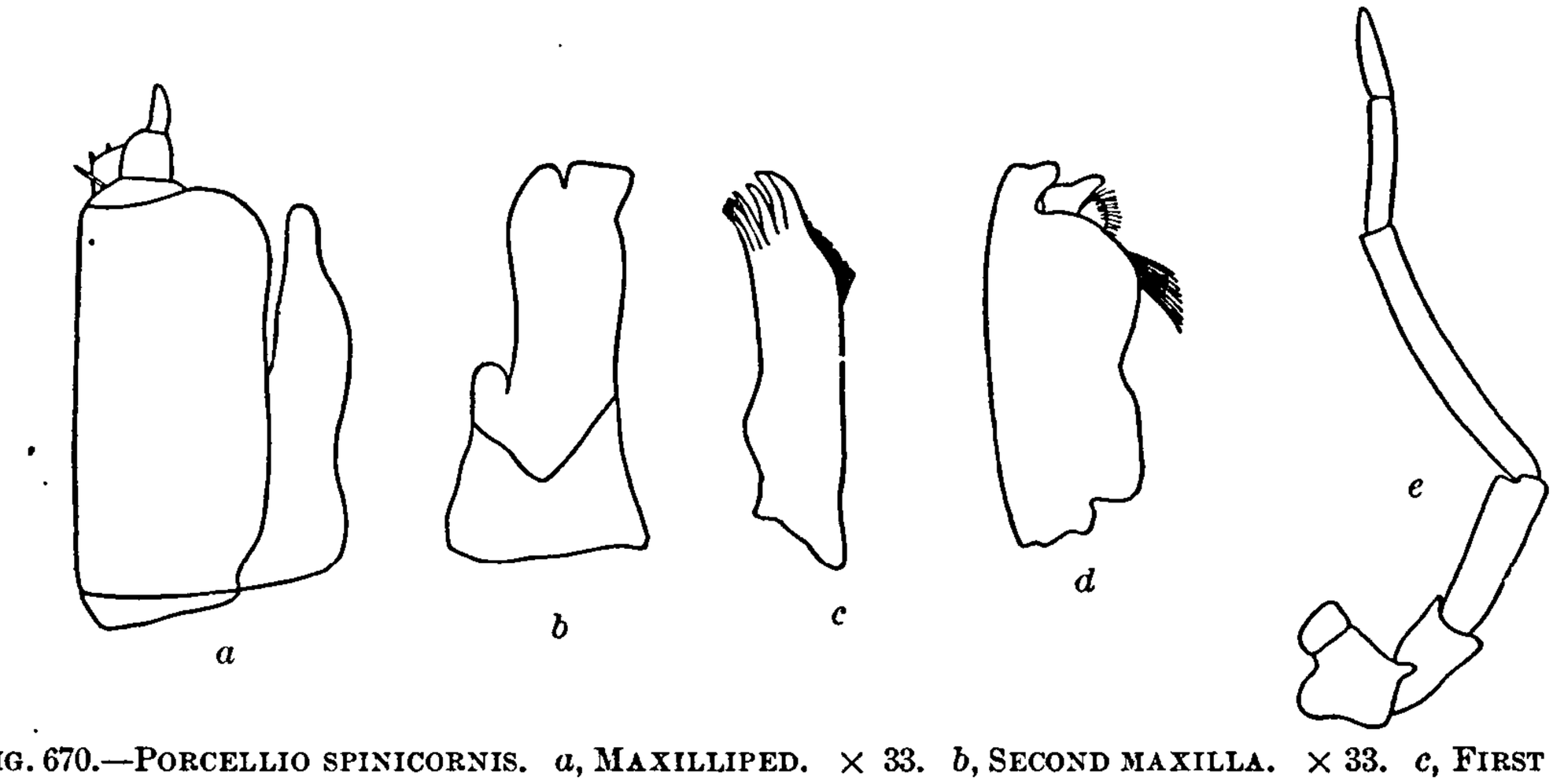

FIG. 670.—PORCELLIO SPINICORNIS. *a*, MAXILLIPED. × 33. *b*, SECOND MAXILLA. × 33. *c*, FIRST MAXILLA (OUTER LOBE). *d*, MANDIBLE. × 33. *e*, SECOND ANTENNA.

extends almost to the extremity of the terminal segment of the body. The inner branch extends a very short distance beyond the terminal abdominal segment. The outer branch is about twice as long as the peduncle. The whole surface of the body is closely covered with small tubercles.

All the legs are ambulatory.

PORCELLIO SCABER Latreille.

Porcellio scaber LATREILLE, Hist. Crust. Ins., VII, 1804, p. 45; Gen. Crust., I, 1806, p. 70.—LEACH, Edinb. Encycl., VII, 1814, p. 406.—RISSO, Crust. de Nice, 1816, p. 155.

Oniscus granulatus LAMARCK, Hist. Nat. des animaux sans vertèbres, V, 1818, p. 154.

Porcellio nigra SAY, Journ. Phil. Acad. Nat. Sci., I, 1818, p. 432.

Porcellio granulatus BRÉBISSON, Mém. Soc. Calv., 1825, p. 261.

Porcellio scaber DESMAREST, Consid. Crust., 1825, p. 321.—BRANDT and RATZEBURG, Med. Zool., II, 1830–1834, p. 77, pl. XII, figs. 1–4 and A–B.—BRANDT, Bull. Soc. Imp. de. Naturalistes de Moscou, VI, 1833, p. 14.

Porcellio brandtii MILNE EDWARDS, Hist. Nat. des. Crust., III, 1840, p. 168.

Porcellio granulatus MILNE EDWARDS, Hist. Nat. des Crust., III, 1840, p. 169, pl. XXXII, fig. 21.

Porcellio scaber MILNE EDWARDS, Cuvier Rg. An., 1849, pl. LXXI–LXXI *bis*.

Porcellio nigra GOULD, Rep. Invert. Mass., 1841, p. 337.

Porcellio scaber KOCH, Deutschlands Crust., 1835–1844, p. 34.

Porcellio dubius KOCH, Deutschlands Crust., 1835–1844, p. 34.

Porcellio scaber LEREBOULLET, Mém. Strasb., IV, 1853, p. 34, pl. I, figs. 4, 5; pl. II, figs. 43–47.

Porcellio gemmulatus DANA, Crust. U. S. Expl. Exp., XIV, 1853, p. 725, pl. XLVII, fig. 7.—STIMPSON, Bost. Journ. Nat. Hist., VI, 1850–1857, p. 506.

Philoscia tuberculata STIMPSON, Proc. Cal. Acad. Sci., I, p. 1856, p. 97.

Porcellio montezumæ SAUSSURE, Mém. Soc. Phys. Hist. Nat. Genève, XIV, 1858, Pt. 2, p. 480, pl. v, figs. 41–41 *bis*.
Porcellio scaber BATE and WESTWOOD, Brit. Sess.-eyed, Crust., II, 1868, p. 475.
Porcellio paulenses HELLER, Novara Exp., 1868, p. 136, pl. XII, fig. 5.
Porcellio scaber PLATEAU, Bull. Acad. r. Belgique, 2d ser., XXIX, 1870, No. 2, p. 8.—E. BRANDT, Horæ Soc. Ent. Rossi, VIII, 1870, p. 167.—BUDDE-LUND, Nat. Tidsskrift., 3d ser., VII, 1870, p. 238; Crust. Isop. Terrestria, 1885, pp. 129–131.—SARS, Crustacea of Norway, II, 1899, pp. 176–177, pl. LXXVII.—RICHARDSON, Proc. U. S. Nat. Mus., XXI, 1899, p. 863; Amer. Nat., XXXIV, 1900, p. 304; Proc. U. S. Nat. Mus., XXIII, 1901, p. 567.—CHILTON, Trans. Linn. Soc. Lond., (2), VIII, 1901, Pt. 4, p. 139.—STOLLER, 54th Report New York State Museum, 1902, p. 213.—PAULMIER, Bull. New York State Museum, 1905, p. 183.

Localities.—Comax, British Columbia, near Union Wharf, along the shore; Taylor Bay, Gabriola Island, British Columbia, on the shore; San Diego, California; Puget Sound; Oakland, California; Norwood, Ohio; Westwood, Cincinnati, Ohio; Andersons Ferry, Hamilton County, Ohio; Springfield, Ohio; Bering Island; Woods Hole, Massachusetts; Colfax, California; Ocean Grove, New Jersey; Westfield, New York; Magdalen Islands; Victoria, Vancouver Island; Salem, Massachusetts; Northfield, Cook County, Illinois; Beverly, Massachusetts; Hamilton and Warwick, Massachusetts; Crescent City, California; Gulf of Georgia; Britain Island, Nova Scotia; Penikese Island, Massachusetts; Key West, Florida; San Mateo, California; the Bermudas; New York City; West Haven, Connecticut; Bloomington, Illinois; Lawrence, Massachusetts; Woodside, Maryland; Grand Menan, New Brunswick; Saginaw, Michigan; Lagonistas Creek, California; Lake Maxinkuckee, Indiana; Freeport, Maine; Greenland; Newfoundland; New York; Niagara, New York; San Francisco, California; San Pedro, California; St. Paul Island; St. Croix; Ascension Island; Kamchatka; Iceland; Hawaii; Cape of Good Hope; all Europe; distribution world-wide.

Found under dead leaves and stumps, under brick and boards; along the shore; in greenhouses.

Body ovate, not capable of being rolled up into a ball, and less than twice as long as wide, 6 mm. : 10 mm.

Head twice as wide as long, 2 mm. : 1 mm., with the anterior margin produced in three lobes, one median and two lateral lobes. The median lobe is triangular, with apex obtuse; the lateral lobes are rounded and large and extend as far as the median lobe. The eyes are small, round, and composite, and are situated at the base of the antero-lateral expansions. The first pair of antennæ are rudimentary and inconspicuous and are composed of three articles. The second pair of antennæ have the basal article short; the second is about one and a half times as long as the first; the third is as long as the second; the fourth is nearly twice as long as the third; the fifth is nearly twice as

long as the fourth. The flagellum is composed of two unequal articles, the first one being the shorter. The second antennæ extend to the middle of the third thoracic segment. The maxillipeds have a palp of three articles. The palp of the mandibles is wanting.

The segments of the thorax are subequal. There is no indication of epimera on any of the segments.

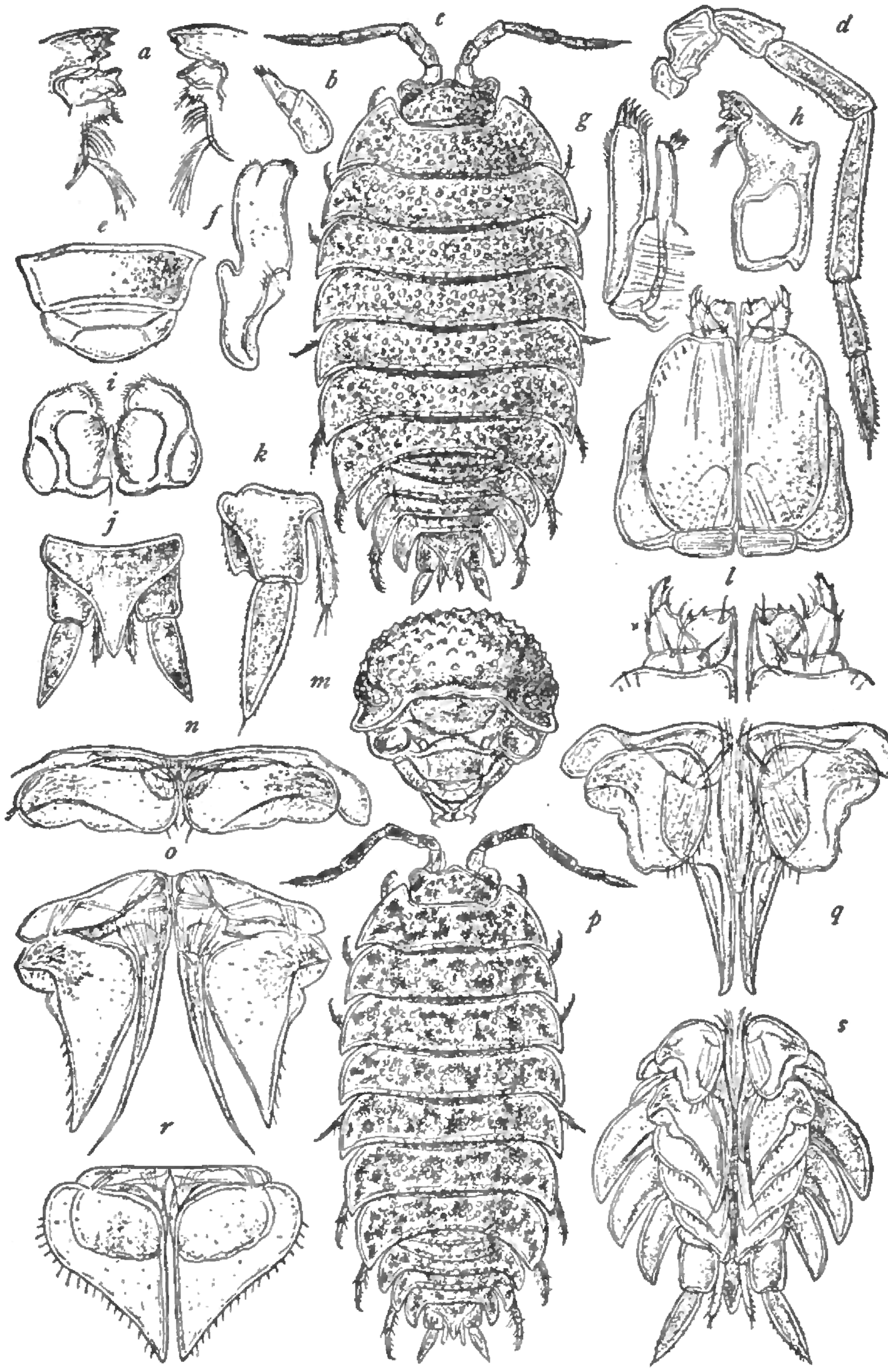

FIG. 671.—PORCELLIO SCABER (AFTER SARS). *a*, MANDIBLES. *b*, FIRST ANTENNA. *c*, DORSAL VIEW OF FEMALE. *d*, SECOND ANTENNA. *e*, ANTERIOR LIP. *f*, SECOND MAXILLA. *g*, FIRST MAXILLA. *h*, MANDIBLE. *i*, POSTERIOR LIP. *j*, LAST SEGMENT OF ABDOMEN AND UROPODA. *k*, UROPOD. *l*, MAXILLIPEDS. *m*, HEAD. *n*, FIRST PLEOPOD OF FEMALE. *o*, SECOND PLEOPODS OF MALE. *p*, VAR. MARMORATA (DORSAL VIEW OF FEMALE). *q*, FIRST PLEOPODS OF MALE. *r*, THIRD PLEOPOD OF MALE. *s*, ABDOMEN (VENTRAL VIEW).

The abdomen is as wide as the thorax. The first two segments are covered at the sides by the lateral parts of the seventh thoracic segment. The sixth or terminal segment is $1\frac{1}{2}$ mm. wide at the base. It is triangularly produced to a long, narrow extremity, which is posteriorly rounded. The terminal segment is 1 mm. long. The uropoda are longer than the terminal segment. The outer branch extends $\frac{1}{2}$

mm. beyond the extremity of the abdomen. The inner branch just reaches the tip of the last segment of the body.

All the legs are ambulatory.

The whole surface of the body is covered with small tubercles.

Color, generally a uniform gray black, sometimes lighter, variegated with irregular dark spots, occasionally black, with the lateral parts of the segments light yellow, forming a marginal border.

110. Genus LEPTOTRICHUS Budde-Lund.[a]

Body rather convex, scarcely contractile, generally setigerous.

Second pair of antennæ short, the first four articles of the peduncle subequal in length; flagellum composed of two articles, of which the first is much shorter than the second.

Front of head without a margin, produced in the middle with the epistome bulbous; antero-lateral processes obtuse. Vertical marginal line posteriorly wanting. Eyes small.

Lateral parts of thoracic segments not expanded.

Terminal segment of abdomen generally triangular; epimera of the third, fourth, and fifth segments moderately large.

First and second pairs of pleopoda furnished with tracheæ.

LEPTOTRICHUS GRANULATUS Richardson.

Leptotrichus granulatus RICHARDSON, Trans. Conn. Acad. Sciences, XI, 1902, p. 303, pl. XL, fig. 58.

Locality.—Found in dead coral at Castle Harbor, Bermudas.

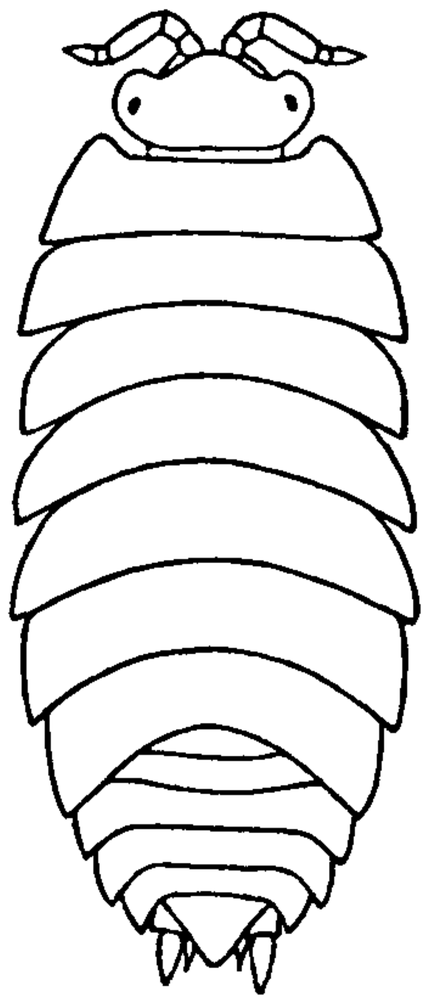

FIG. 672.—LEPTOTRICHUS GRANULATUS. × 11⅜.

Body roughly and minutely granulated. Color light reddish or yellowish brown, with markings of dark brown in patches on each segment, forming four longitudinal rows, the two median rows not extending anteriorly beyond the third segment of the thorax in one specimen, and in the other being almost obsolete.

The head is produced in front in a prominent rounded median lobe, and at the sides in large rounded lateral lobes. The eyes are small, but distinct, and are placed at the base of the lateral lobes. The external antennæ are very short, not reaching the anterior angle of the first thoracic segment. The fourth joint of the peduncle is not longer than the third; the flagellum is composed of two joints, the first of which is about half the length of the second.

The thoracic segments are subequal in length, the lateral parts broadly expanded.

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[a] See Budde-Lund for characters of genus, Crust. Isop. Terrestria, 1885, pp. 192–193.

The first two abdominal segments have the lateral parts undeveloped. The third, fourth, and fifth segments are broadly expanded laterally, the outer margins forming a continuous and unbroken line with the margins of the thoracic segments. The terminal segment of the abdomen extends but a distance of half its length beyond the lateral parts of the preceding segment; its surface is smooth. The basal joint of the uropoda attains half the length of the terminal segment. The inner branch reaches the apex of the last segment. The outer branch extends half its length beyond this.

Two specimens were collected by Prof. A. E. Verrill and party at the Bermudas in 1898. They were found in dead coral at Castle Harbor.

Type in Peabody Museum, Yale University. Cat. No. 3333.

This species can not be identified with any of the described species of the genus: *L. panzerii* (Audouin and Savigny), *L. tauricus* Budde-Lund, *L. squamatus* Budde-Lund, and *L.*[a] *lentus* (Budde-Lund), although it seems more closely related to the last named than to any of the former.

111. Genus METOPONORTHUS Budde-Lund.[b]

Body oblong, depressed, not convex, scarcely contractile.

Head marginate and with lateral lobes very small; frontal lobe wanting; vertical marginal line extending to the lateral lobes; second pair of antennæ long; flagellum composed of two articles, the first article generally longer than the second; abdomen abruptly narrower than the thorax, with the lateral parts of the third, fourth, and fifth segments small, appressed; terminal segment short, triangular, extending moderately beyond the lateral parts of the preceding segment; opercular plates of the first two pairs of pleopods furnished with tracheæ, rarely those of the third or of all the pairs furnished with tracheæ. Inner branch of the uropoda inserted far in front of outer branch, near the inner antero-lateral angle of the peduncle.

ANALYTICAL KEY TO THE SPECIES OF THE GENUS METOPONORTHUS.[c]

a. Lateral parts of the third, fourth, and fifth segments of the abdomen well developed ..... *Metoponorthus saussurei* Dollfus.

a'. Lateral parts of the third, fourth, and fifth segments of the thorax reduced, small.

b. Epistome furnished with a sinuated transverse line.

c. Second pair of antennæ equal to three-fifths the length of the body. First article of the flagellum much longer than the second. Inner face of right mandible furnished with four to five penicils, of the left with six penicils. Terminal segment of abdomen almost flat. Color brown or reddish brown, often mottled with white spots ..... *Metoponorthus pruinosus* (Brandt).

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[a] See Dollfus, Mém. Soc. Zoöl. de France, 1896, pp. 542–543.

[b] For characters of genus see Budde-Lund, Crustacea Isopoda Terrestria, 1885, pp. 161–162, and Sars, Crust. of Norway, II, 1899, pp. 183–184.

[c] This key has been prepared entirely from the descriptions of the forms, which give few characters for a synoptical arrangement.

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c'. Second pair of antennæ a little longer than half the length of the body. First article of the flagellum a little longer than the second. Inner face of the mandibles with three to four penicils. Terminal segment of abdomen a little excavate above. Color yellow or brown or dark, almost black, with obscure or yellowish spots arranged in from four to six longitudinal series, the first two lateral ..... *Metoponorthus sexfasciatus* (Koch)

b'. Epistome smooth ..... *Metoponorthus virgatus* Budde-Lund.

METOPONORTHUS SAUSSUREI Dollfus.

Metoponorthus saussurei DOLLFUS, Bull. Soc. Zool. France, XXI, 1896, p. 48.

Locality.—Cordova, Mexico.

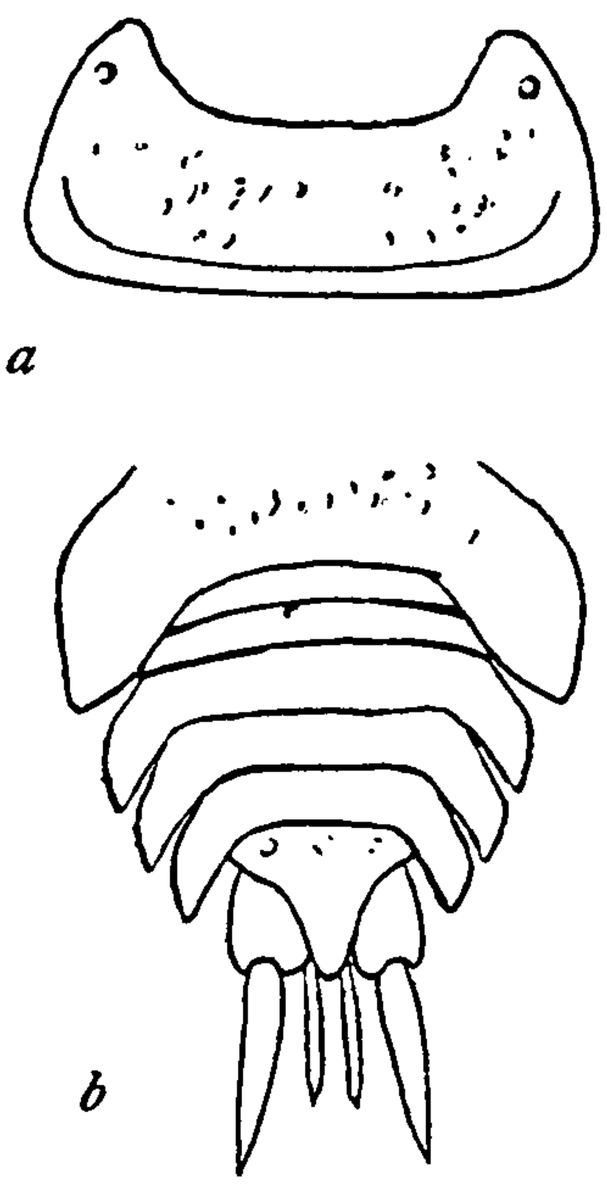

FIG. 673.—METOPONORTHUS SAUSSUREI (AFTER DOLLFUS). *a*, FIRST SEGMENT OF THORAX. *b*, SEVENTH THORACIC SEGMENT, ABDOMEN, AND UROPODA.

Body oval, elongated, feebly and irregularly granulated; each segment of the abdomen has a posterior depression and the first segments are furnished on each side with a little pearl-like granulation.

Head(?) Thorax: The first segment has the posterior margin almost straight and not sinuated. Abdomen a little narrower; the lateral processes of the third to the fifth abdominal segments are well developed and a little divergent. Terminal segment triangular, with the sides incurved and obtuse at the apex. Uropoda with the basal segment reaching the apex of the terminal abdominal segment; inner and outer branches very much elongated, the former being linear, the latter lanceolate. Color, brownish with light wavy spots; there are three little light spots at the base of the terminal segment. Dimensions: Length, 10 mm.(?) Width, 3½ mm.[a]

[a] The above description is adapted from the following one by Dollfus:

Corps ovale, allongé, faiblement et irrégulièrement granulé; chaque segment du pleon présente une dépression postérieure et les premiers segments sont munis de chaque côté d'une petite granulation perliforme. Cephalon? Pereion=le premier segment a le bord postérieur presque droit et non sinueux. Pleon peu rétréci; les processus latéraux des segments 3 à 5 du pleon sont bien développés et un peu divergents. Pleotelson triangulaire, à côtés incurvés et à sommet obtus. Uropodes à base atteignant le sommet du pleotelson; endopodites et exopodites très allongés, les premiers linéaires et les seconds lancéolés. Couleur=brunâtre avec des marbrures et taches claires; trois petites taches claires à la base du pleotelson. Dimension=longueur 10 millimètres? Largeur, 3 millimètres ½.—DOLLFUS, Bull. Soc. Zool. France, XXI, 1896, p. 48.

METOPONORTHUS PRUINOSUS (Brandt).

Porcellio pruinosus BRANDT, Bull. de la Soc. Imp. d. Naturalistes de Moscou, VI, 1833, p. 19.
Porcellio truncatus M. EDWARDS, Hist. Nat. des Crust., III, 1840, p. 171.
Porcellio maculicornis KOCH, Deutschl. Crust., 1835–44, p. 34.

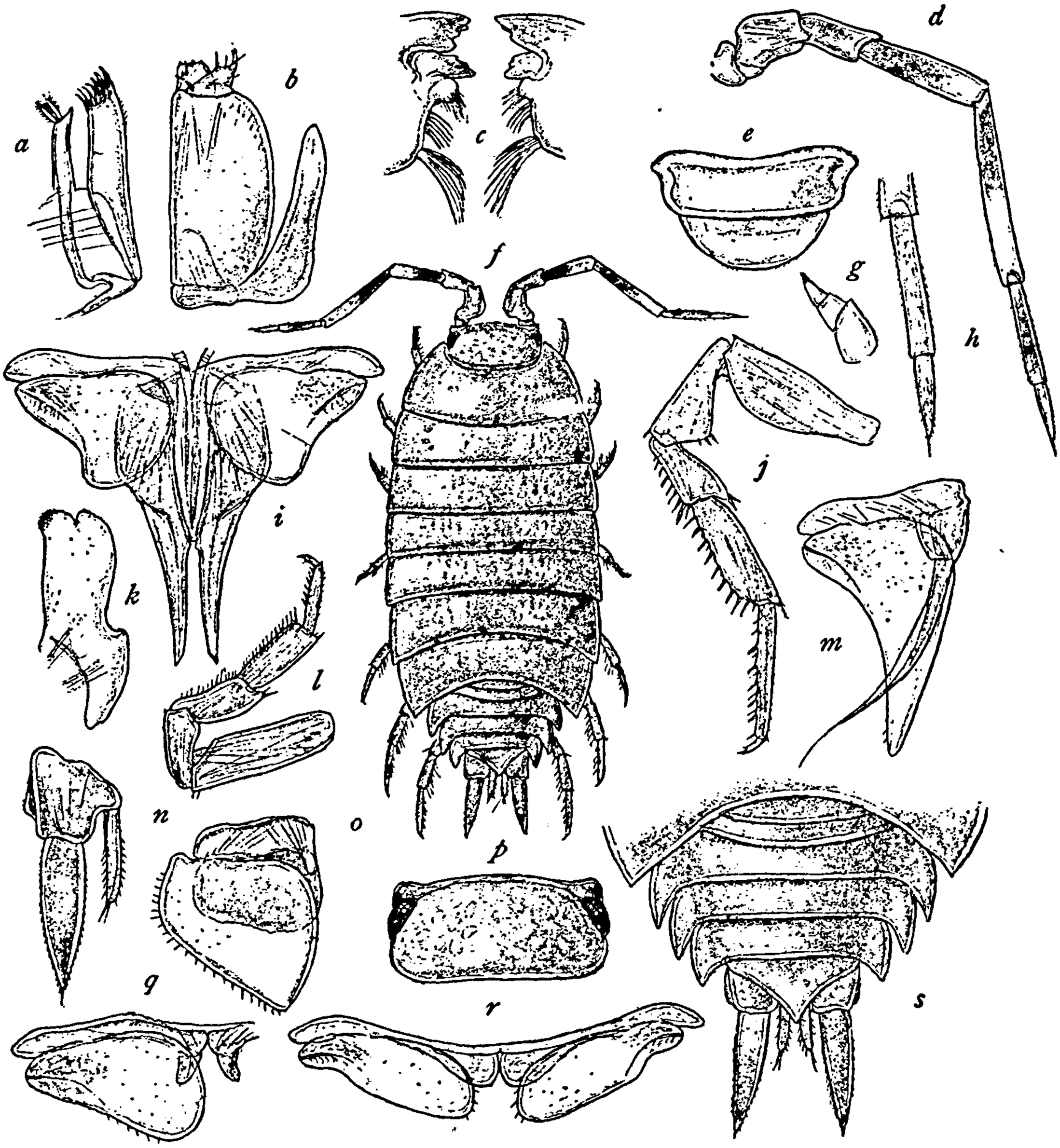

FIG. 674.—METOPONORTHUS PRUINOSUS (AFTER SARS). *a*, FIRST MAXILLA. *b*, MAXILLIPED. *c*, MANDIBLES. *d*, SECOND ANTENNA. *e*, ANTERIOR LIP. *f*, DORSAL VIEW OF MALE. *g*, FIRST ANTENNA. *h*, FLAGELLUM. *i*, FIRST PLEOPOD OF MALE. *j*, SEVENTH LEG. *k*, SECOND MAXILLA. *l*, FIRST LEG. *m*, SECOND PLEOPOD OF MALE. *n*, UROPOD. *o*, THIRD PLEOPOD OF FEMALE. *p*, HEAD. *q*, SECOND PLEOPOD OF FEMALE. *r*, FIRST PLEOPODS OF FEMALE. *s*, ABDOMEN WITH UROPODA.

Porcellio frontalis LEREBOULLET, Mém. Soc. Hist. Nat. Strasbourg, 1853, p. 63, pl. I, fig. 17; pl. III, figs. 81–87.
Porcellio zealandicus WHITE, List Crust. Brit. Mus., 1847, p. 99.
Porcellionides flavo-vittatus MIERS, Proc. Zool. Soc. Lond., 1877, p. 669, pl. LXVIII, fig. 4.
(*?*) *Porcellio jelskii* MIERS, Proc. Zool. Soc. Lond., 1877, p. 668, pl. LXVIII, fig. 3.

Metoponorthus pruinosus BUDDE-LUND, Crust. Isop. Terrestria, 1885, pp. 169–171. (See Budde-Lund for synonymy.)—DOLLFUS, Bull. Soc. Zool. France, XVIII, 1893, p. 187.—BUDDE-LUND, Entom. Meddelel, IV, 1893–94, p. 118.—SARS, Crust. Norway, II, 1899, pp. 184–185, pl. LXXX, fig. 2.—RICHARDSON, Amer. Nat., XXXIV, 1900, p. 303; Proc. U. S. Nat. Mus., XXIII, 1901, p. 569.—CHILTON, Trans. Linn. Soc. Lond. (2), VIII, 1901, p. 141.—STOLLER, 54th Report New York State Museum, 1902, p. 213.—PAULMIER, Bull. New York State Museum, 1905, pp. 183–184.

Localities.—Columbus, Cincinnati, Andersons Ferry, Hamilton County, Ohio; Marion Center, Kansas; Oakland, California; Springfield, Ohio; Washington City; Provo, Utah; Las Vegas, Mesilla Park, New Mexico; Burlington, Ohio; Smiths Island, Virginia; Woodside, Maryland; Texas; Miami, Key West, Florida; Beverly and Salem, Massachusetts; San Antonio, Dallas, Texas; St. Thomas, West Indies; Hamilton Island, Bermudas; Mangrove Bay, Andros Island, Bahamas; also Europe; North Africa; Carácas, La Moka, and Merida, Venezuela; Praslin, etc. Found under logs; in greenhouses, dwellings, and on country roads; along walls and under decaying vegetable matter.

Body oblong-ovate, twice as long as wide, 4½ mm.: 9 mm. Abdomen abruptly narrower than thorax.

Head twice as wide as long, 1 mm.: 2 mm., with the anterior margin slightly convex; antero-lateral lobes small. The eyes are small, composite, and situated at the base of the antero-lateral lobes. The first pair of antennæ are small and inconspicuous. The second pair have the first article short; the second is twice as long as the first; the third is equal in length to the second; the fourth is twice as long as the third; the fifth is one and a half times as long as the fourth. The flagellum is composed of two articles, the first of which is twice as long as the second, and both taken together are almost equal in length to the fifth article of the peduncle. The second antennæ extend to the posterior margin of the fourth thoracic segment.

The first segment of the thorax is perhaps a little longer than any of the others, which are subequal. The antero-lateral angles of the first segment are produced forward to surround the head, and they extend to the base of the antero-lateral lobes of the head. The epimera are not distinctly separated from the segments.

The abdomen is abruptly narrower than the thorax. All six segments are distinct. The first two have the lateral parts covered by the seventh thoracic segment. The third, fourth, and fifth segments have the lateral parts small, not greatly expanded. The sixth or terminal segment is triangular in shape. It is 1 mm. wide at the base and is hardly more than ½ mm. long. The apex is acute, and there is a slight concavity in its dorsal surface. The basal article or peduncle of the uropoda is not longer than the apex of the terminal abdominal segment. The outer branch is 1½ mm. long and extends its entire length beyond the apex of the terminal abdominal segment. The inner branch extends about one-third the length of the outer branch.

All the legs are ambulatory in character.

The surface of the body is slightly granulated. In color the posterior and lateral margins are a uniform reddish brown. The other parts are a lighter color, formed of reddish brown with wavy lines of a light yellow on either side of the median line.

METOPONORTHUS SEXFASCIATUS (Koch).

? Porcellio sexfasciatus KOCH, System der Myriapoden mit den Verzeichnissen und Berichtigungen zu Deutschlands Crustaceen, etc., 1847, p. 208, pl. VIII, fig. 99.

Metoponorthus sexfaciatus BUDDE-LUND, Crust. Isop. Terrestria, 1885, pp. 167–168.—DOLLFUS, Bull. Soc. d'Études Scientifiques de Paris, 12th year, 1890, p. 4.—RICHARDSON, Trans. Conn. Acad. Sciences, XI, 1902, p. 302.

Localities.—Bermudas (Dollfus); also Mediterranean and Canaries, Madeira, Azores, Spain, France, and Algeria.

Body oblong or oblong-ovate, slightly convex, finely but manifestly covered with transverse series of granules. The segments of the thorax each with a raised transverse line.

Inner face of the mandibles with three or four plumose processes. The second pair of antennæ are a little longer than half the length of the body; the fourth and fifth articles are sulcate; the first article of the flagellum is a little longer than the other. The antero-lateral lobes of the head are bent downward, very small, subrectangular; the median lobe is wanting, the frontal margin straight in the middle or a little produced; the transverse line of the epistome is acutely sinuated in the middle, terminating on both sides far from the frontal margin. The abdomen is less abruptly narrower than the thorax; the terminal segment is short, subtriangular, with the sides incurved, the apex acute and a little excavate above; the outer branches of the uropoda rather long.

Color yellow or brown, or dark black, covered with obscure or yellow spots in from four to six longitudinal series, the first two series being lateral. The epistome is black. The epimera of the thoracic segments have a minute shining tubercle. The ventral side and the legs are yellow; the coxæ are spotted with black. Length 10–12 mm. Width 3, 5 mm. to 4, 5 mm. Height 1, 8 mm. to 2 mm.[a]

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[a] The above description is adapted from the following one of Budde-Lund's:

Oblongus vel oblonge ovatus, leviter convexus, tenuiter et sparse sed manifesto transverse subseriatim granulatus. Trunci annuli linea elevata transversa.

Mala interior mandibularum penicillis 3–4.

Antennæ exteriores corporis dimidio paulo longiores; articuli 4–5 sulcati; flagelli articulus prior altero paulo longior.

Lobi frontales laterales deflexi, minimi, subrectanguli; lobus medius nullus, linea marginalis medio recta vel paulum producta; epistomatis linea transversa medio acutius sinuata, utrinque procul a margine frontali desinens. Cauda trunco minus abrupte angustior; annulus analis brevis, subtriangulus, lateribus incurvis, apice acuto, supra paulum excavatus; rami exteriores pedum analium sat longi.

Color flavus vel brunneus, vel e nigro fuscus, maculis vel obscuris vel flavescentibus in series longitudinales 4–6, imprimis duas laterales, digestis. Epistoma subnigrum. Epimera trunci annulorum tuberculo perlucente minuto. Venter et pedes flava; coxæ nigromaculatæ.

Longitudo 10–12 mm., latitudo 3, 5–4, 5 mm., altitudo 1, 8–2 mm.—BUDDE-LUND, Crust. Isop. Terrestria, 1885, pp. 167–168.

METOPONORTHUS VIRGATUS Budde-Lund.

Metoponorthus virgatus BUDDE-LUND, Crust. Isop. Terrestria, 1885, p. 182.—RICHARDSON, American Naturalist, XXXIV, 1900, p. 303; Proc. U. S. Nat. Mus., XXIII, 1901, p. 569.

Localities.—Florida; Nova Aurelia.

Body oblong oval, convex, smooth or obscurely and finely granulated and tuberculated.

Inner face of the right mandible furnished with four plumose processes, of the left mandible with five.

Second pair of antennæ equal to half the length of the body; the first article of the flagellum is shorter than the second.

Antero-lateral lobes of the head small, rounded; median lobe very small, widely rounded; epistome slightly convex, smooth. The terminal abdominal segment is short, triangular, with the sides straight; it is flat above, scarcely excavated.

Color grayish black; there are white tubercles in the middle of the thorax and white spots arranged in three longitudinal lines.

The epimera of the thorax are furnished with a shining tubercle distant from the margin. The legs are spotted with black, thickest on the coxæ.

Length 9–10 mm. Width 4, 5–5 mm. Height 2–2, 2 mm.[a]

112. Genus RHYSCOTUS Budde-Lund.[b]

Body rather convex, very little or scarcely at all contractile.

Second pair of antennæ long; flagellum composed of two articles, the first article shorter than the second. Eyes moderately large. Frontal marginal line bent downward before the eyes on either side, coming in contact with the vertical marginal line back of the eyes, passing through the pleuræ of the head and surrounding the inconspic-

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[a] The above description is adapted from the following one of Budde-Lund's:

Oblonge ovalis, convexus, sublævis vel obscure et tenuiter granulatus et tuberculatus.

Mala interior mandibulæ dextræ penicillis 4, mandibulæ sinistræ 5.

Antennæ exteriores corpus dimidium æquantes; flagelli articulus prior altero brevior.

Lobi frontales laterales parvi, rotundati; lobus medius minimus, late rotundatus; epistoma leviter convexum, læve.

Caudæ annulus analis brevis, triangulus, lateribus subrectis, supra planus, vix excavatus.

Color ex griseo niger; in medio trunco tubercula alba et maculæ albidæ in lineas tres longitudinales condensatæ. Trunci epimera tuberculo perlucente a margine paulum distante munita. Pedes, maxime in coxis, nigromaculati.

Longitudo 9–10 mm.; latitudo 4, 5–5 mm. Altitudo 2–2, 2 mm.—BUDDE-LUND, Crust. Isop. Terrestria, 1885, p. 182.

[b] See Budde-Lund for characters of genus, Crustacea Isopoda Terrestria, 1885, pp. 191–192.

uous antero-lateral lobes. Epistome very bulbous, separated from the front by a transverse groove.

Lateral parts of the thoracic segments small.

Abdomen abruptly narrower than thorax; terminal segment short, triangular, extending much beyond the epimera of the preceding segment.

First and second pairs of pleopods furnished with tracheæ.

RHYSCOTUS TURGIFRONS (Budde-Lund).

Stenomacrus turgifrons BUDDE-LUND, Prosp. generum specierumque Crust. Isop. Terrestrium, 1879, p. 5.

Rhyscotus turgifrons BUDDE-LUND, Crust. Isop. Terrestria, 1885, p. 192.—RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 569.

Locality.—St. Jean, West Indies.

Body oblong, posteriorly attenuated, rather convex, minutely and densely punctuate and covered with scattered hairs. The inner face of the mandibles is furnished with two plumose processes(?).

The second pair of antennæ are longer than half the length of the body; the first article of the flagellum is almost half as long as the second.

The terminal abdominal segment is short, with the sides slightly incurved, the apex obtuse; it is sulcate above. The uropoda are rather long; the basal article is longer than the terminal segment of the abdomen; the outer branch is conical; the inner branch is slender, a little curved, with the apex furnished with hairs.

Color brownish black, lighter on the epimera; ventral side a dark gray; legs dark. Length, 5 mm.; width, 2 mm.; height, 1.3 mm.[a]

113. HYPERGNATHUS, new genus.

Head with antero-lateral lobes obsolete; front not margined but continuous with epistome. Flagellum of second pair of antennæ composed of two articles, the second one being much longer than the first. Mandibles without molar expansion; recurved brush-like appendage wanting. First maxillæ with the inner lobe furnished with two plumose processes at the tip; outer lobe furnished with numerous spines

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[a] The above description is adapted from the following one of Budde-Lund's:

Oblongus, post attenuatus, convexiusculus, minute et dense punctatus, sparse crinitus. Mala interior mandibularum penicillis binis(?).

Antennæ exteriores corpore dimidio longiores, flagelli articulus prior altero fere duplo brevior.

Caudæ annulus analis brevis, lateribus leviter incurvis, apice obtuso, supra sulcatus. Pedes anales longiusculi; articulus basalis annulo anali sublongior; ramus exterior terminalis conicus; ramus interior tenuis, paululum curvatus, apice setaceo.

Color e nigro brunneus, in epimeris dilutior; venter e fusco griseus; pedes fusci.

Longitudo, 5 mm.; latitudo, 2 mm.; altitudo, 1.3 mm.—BUDDE-LUND, Crust. Isop. Terrestria, 1885, p. 192.

at the tip. Second maxillæ more than twice as large as first maxillæ, not bilobed at the tip, the small inner lobe being indicated near the distal end of the inner margin of the larger outer lobe. Maxillipeds with palp reduced; masticatory lobe not developed.

Sixth segment of abdomen triangularly produced at the apex; first and second segments not covered laterally by the last thoracic segment. Inner branch of the uropoda is inserted at the inner distal angle of the peduncle.

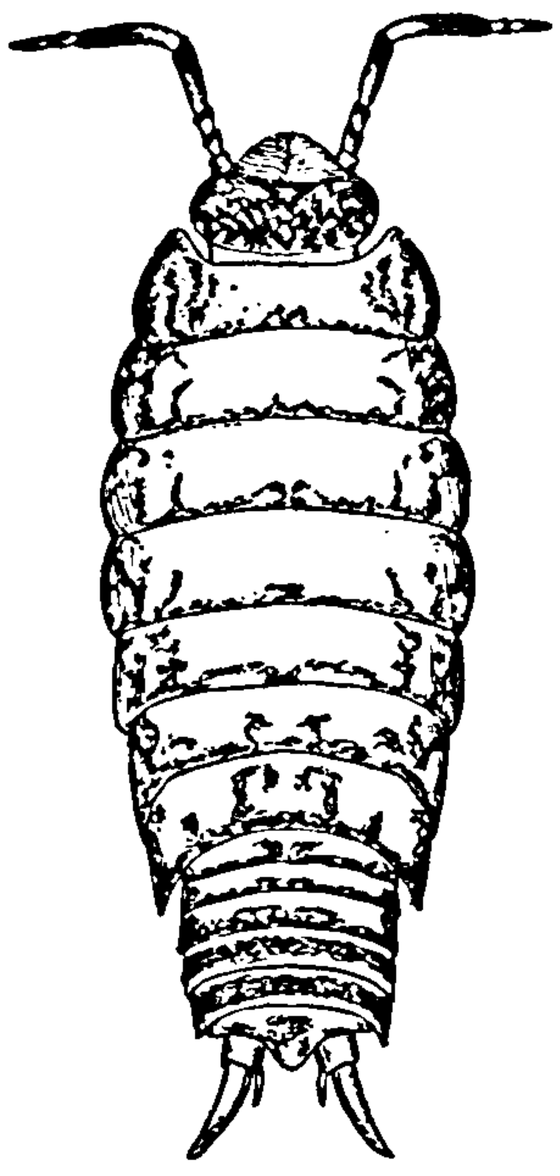


FIG. 675.—HYPERGNATHUS TEXENSIS.

HYPERGNATHUS TEXENSIS, new species.

Body oblong-ovate, more than twice as long as wide, 2½ mm. : 6 mm. Surface perfectly smooth.

Head a little wider than long, 1 mm. : 1½ mm., with the front not margined, straight, continuous between the eyes with the epistome, which is strongly arched, and gives the appearance of a median lobe. There are no lateral lobes. The lateral angles are rounded. The eyes are small, round, composite, and situated at the sides of the head close to the lateral margins. The first pair of antennæ are small and inconspicuous. The second pair have the first three articles short and subequal; the fourth is about one and a half times longer than the third; the fifth is twice as long as the third. The flagellum is composed of two unequal articles, the second one being three times as long as the first.

The seven segments of the thorax are about equal in length; the

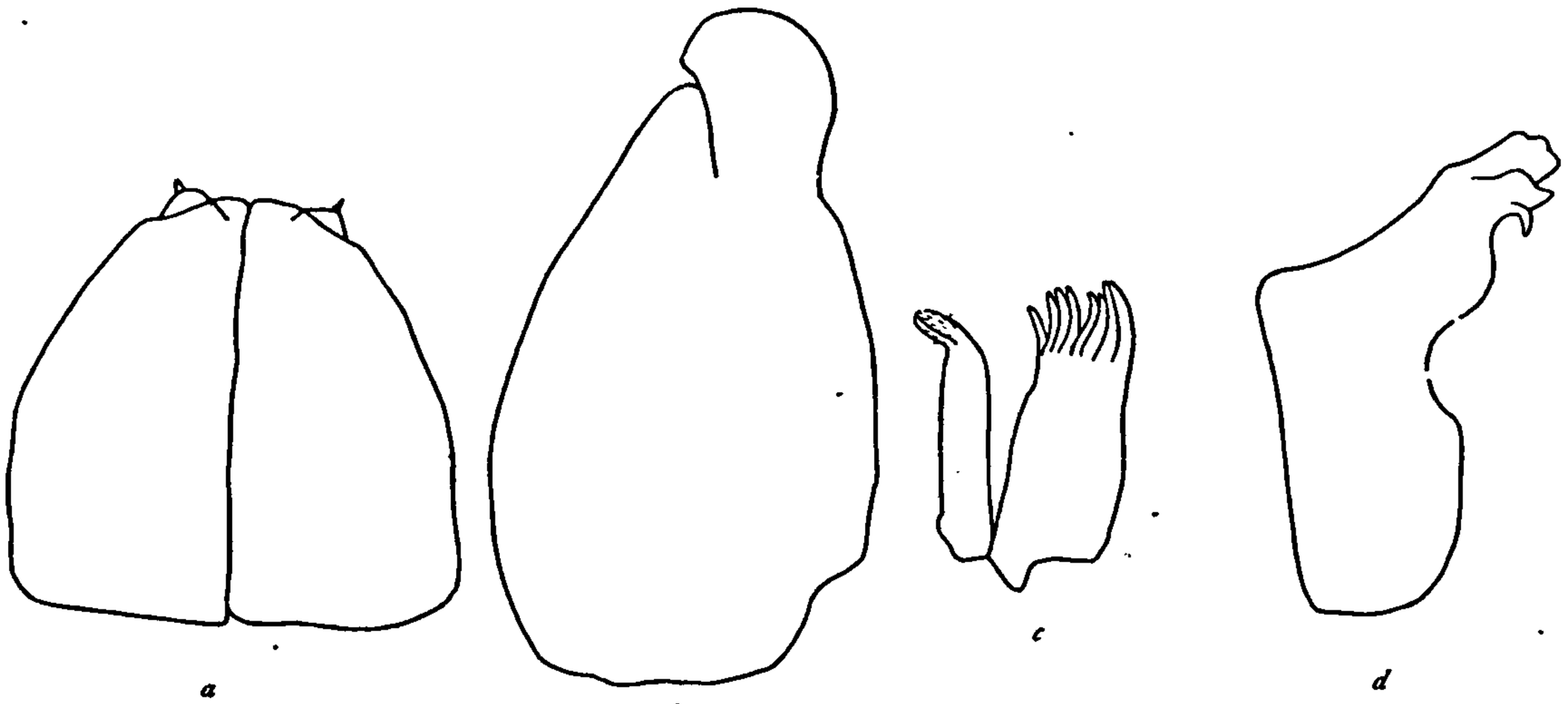


FIG. 676.—HYPERGNATHUS TEXENSIS. *a*, MAXILLIPEDS. × 41. *b*, SECOND MAXILLA. × 77½. *c*, FIRST MAXILLA. × 77½. *d*, MANDIBLE. × 77½.

first one has the antero-lateral angles slightly produced forward and rounded; the last three have the post-lateral angles posteriorly produced, becoming gradually more acutely produced. The epimera are united with the segments.

The five anterior segments of the abdomen are subequal in length, the first two not being covered at the sides by the seventh thoracic segment. The sixth or terminal segment is posteriorly produced to a triangular extremity. The uropoda extend some distance beyond the terminal segment of the body. The peduncle extends beyond the terminal abdominal segment. The outer branch is twice as long as the peduncle. The inner branch is placed at the inner distal angle of the peduncle and is less than half the length of the outer branch.

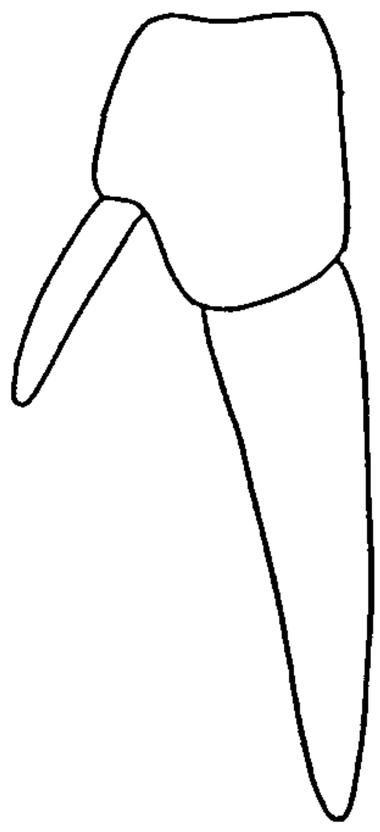


FIG. 677.—HYPERGNATHUS TEXENSIS. UROPOD. × 51½.

The color is a light yellow, with irregular markings of brown on the posterior margins of the segments and on the lateral parts. The head is thickly covered with brown markings, which on the produced portion are arranged in definite transverse lines, but on the remaining surface are arranged irregularly around small, rounded, yellow areas. The abdomen is very closely covered with the brown as is also the posterior half of the outer uropod.

Types, Cat. No. 32075 U.S.N.M., collected by H. S. Barber in Texas.

114. Genus ACTONISCUS Harger.

Head produced in three lobes, a median lobe and an antero-lateral lobe on either side. Second pair of antennæ with the flagellum composed of four articles. First maxillæ with inner lobe furnished at the tip with two bunches of hairs; outer lobe furnished with numerous spines. Second maxillæ small, not larger than first maxillæ, with no indication of lobes at the tip. Masticatory lobe of maxillipeds truncate at the tip; palp with joints indistinctly defined.

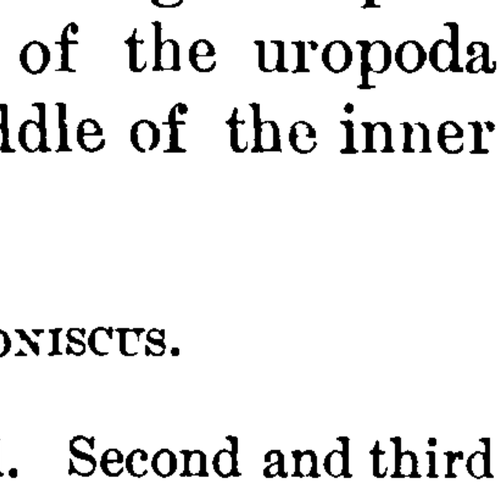
Abdomen not abruptly narrower than thorax; the first two segments are covered laterally by the last thoracic segment; lateral parts of the third, fourth, and fifth segments well developed; terminal segment with apex not produced.

Basal article of the uropoda large, dilated, and simulating the epimera of the fifth abdominal segment; both branches of the uropoda short, styliform, the outer one inserted about the middle of the inner margin of the peduncle.

ANALYTICAL KEY TO THE SPECIES OF THE GENUS ACTONISCUS.

a. Middle frontal lobe of head acute; antero-lateral lobes rounded. Second and third articles of flagellum of second antennæ equal and longest. Terminal segment of abdomen broadly rounded. Surface of body smooth. Fifth article of the peduncle of the second antennæ longer than the fourth; terminal article of flagellum minute. Post-lateral angles of the first thoracic segment not produced.

Actoniscus ellipticus Harger



a'. Middle and antero-lateral lobes of head truncate. Second article of flagellum of second antennæ longest. Terminal segment of abdomen triangulate. Body covered with low tubercles. Fourth and fifth articles of the peduncle of the antennæ subequal; terminal article of flagellum not minute, but as long as preceding one. Post-lateral angles of the first thoracic segment produced.
Actoniscus lindahli, new species

ACTONISCUS ELLIPTICUS Harger.

Actoniscus ellipticus HARGER, Am. Jour. Sci. (3), XV, 1878, p. 373; Proc. U. S. Nat. Mus., II, 1879, p. 159; Report U. S. Commissioner of Fish and Fisheries, 1880, Pt. 6, pp. 309–310, pl. I, fig. 3.
Armadilloniscus ellipticus BUDDE-LUND, Crust. Isop. Terrestria, 1885, p. 239.
Actoniscus ellipticus UNDERWOOD, Bull. Ill. State Lab. Nat. Hist., II, 1886, p. 360.—RICHARDSON, American Naturalist, XXXIV, 1900, p. 307; Proc. U. S. Nat. Mus., XXIII, 1901, p. 576; Trans. Conn. Acad. Sci., XI, 1902, p. 305.

Localities.—Savin Rock, near New Haven, Connecticut; Stony Creek, Long Island Sound; Bermudas; Hungry Bay, Bermudas.

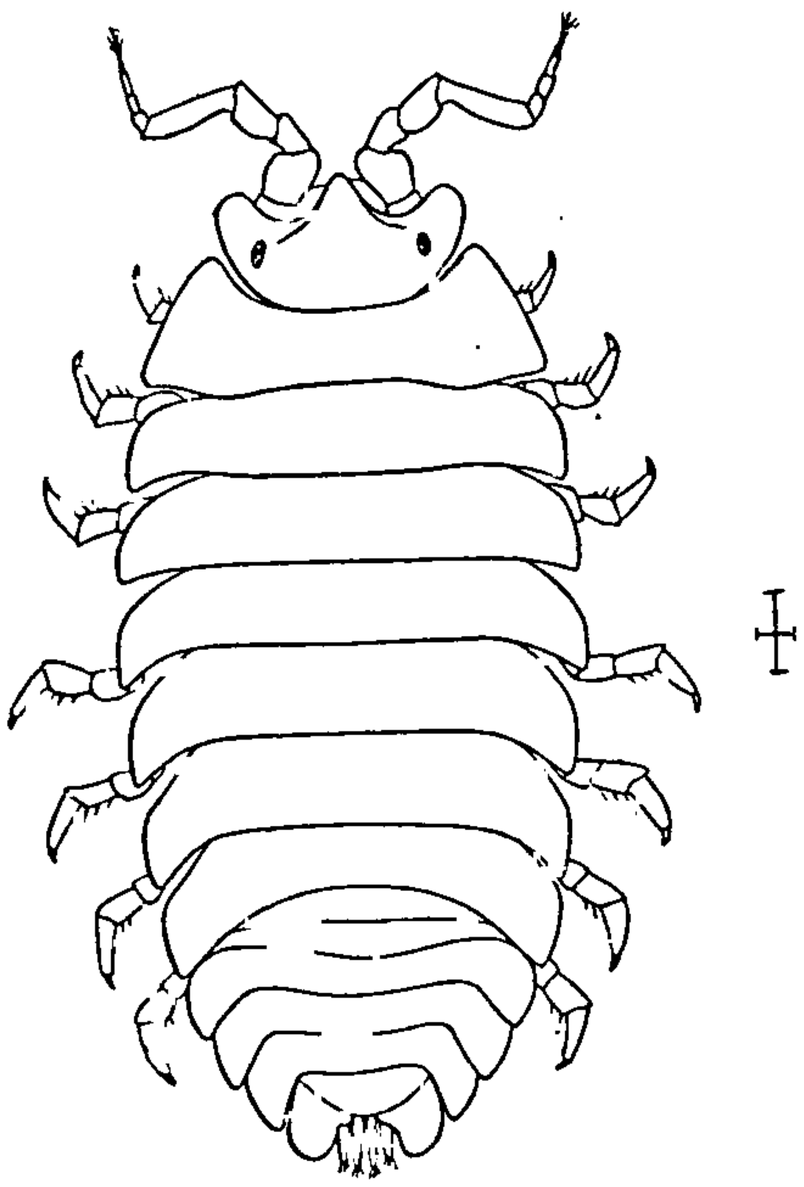


FIG. 678.—ACTONISCUS ELLIPTICUS (AFTER HARGER). × 10.

"The body is oval in outline. The head appears triangular, as seen from above, and is angularly produced in a median lobe, but the lateral lobes are also large and divergent and broadly rounded. The eyes are small, oval, black, and prominent. They are situated at the sides of the median triangular part of the head, and at the base of the lateral lobes. The antennulæ are minute and rudimentary. The antennæ have the basal segment short; the second enlarged distally, especially on the inner side; the third forming an angle with the second and clavate; the fourth flattened-cylindrical, longer than the third; fifth longest, slender, bent at base and forming an angle with the fourth; flagellum shorter than the last peduncular segment, tipped with setæ and composed of four segments, of which the second and third are equal and longer than the first, while the last is the shortest and presents indications of another minute rudimentary terminal segment. The maxillipeds have the basal segment nearly twice as long as broad; the terminal segment elongate triangular, ciliated, and somewhat lobed near the tip.

"The first thoracic segment is excavated in front for the head, admitting it about to the eyes. The next five segments are each a little longer than the first, but the last thoracic segment is the shortest. The first segment is dilated at the sides to about twice its length on the median line. The second and, in an increasing degree, the succeeding segments are produced backward at the sides. The legs are rather small and weak and of nearly equal size throughout.

"The first two segments of the pleon have their lateral processes, or coxæ, obsolete, as usual in the family, but the third, fourth, and fifth segments are produced laterally into broad plates, which are close together and at their extremities continue the regular oval outline of the body with scarcely a perceptible break between the thorax and the pleon. This outline is further continued by the expanded basal segment of the uropods, which are even larger than the adjacent coxæ of the fifth segment. At the extremity of the pleon both pairs of rami are visible, the inner springing from near the base of the basal segments below, the outer from a notch near the middle of the inner margin of the basal segment. The rami are tipped with setæ, and the inner just surpass the outer, which in turn surpass the produced portion of the basal segments.

"Length, 4 mm.; breadth, 2 mm.; color in life, slaty gray."—Oscar Harger.[a]

ACTONISCUS LINDAHLI, new species.

Body oblong-oval, a little more than twice as long as wide, 2 mm. : 4½ mm. Surface of body distinctly covered with low tubercles.

Head with the anterior margin produced in three long lobes, the median one having the dorsal surface concave and being produced as far as the lateral lobes. All three lobes have the anterior extremities truncate. The eyes are small, composite, and placed at the base of the lateral lobes. The first pair of antennæ are small and inconspicuous. The second pair have the first article short; the second is about twice as long as the first; the third is equal in length to the second; the fourth and fifth are subequal and each is about one and a half times longer than the third. The flagellum is composed of four articles, of which the second is the longest.

The segments of the thorax are subequal. The post-lateral angles of the first segment are produced backward in acute processes. The antero-lateral angles of this segment are also somewhat produced to surround the head. The epimera are not distinctly separated on any of the segments.

All six segments of the abdomen are distinct. The first two have the lateral parts covered by the seventh thoracic segment. The lateral parts of the third, fourth, and fifth segments are expanded so as to continue the oval outline of the body. The sixth or terminal segment is triangular in shape, with apex acute. The basal article or peduncle of the uropoda is large and expanded and simulates the lateral parts of the fifth abdominal segment. The outer branch is inserted at the inner margin of the basal article about halfway between the base and the extremity; it does not extend beyond the posterior margin of the basal article. The inner branch is inserted at the upper inner

[a] Report U. S. Fish Comm., 1880, Pt. 6, pp. 309–310.

angle of the basal article on the underside; it is about twice as long as the outer branch, but does not extend beyond the extremity of the outer branch.

The legs are all similar in structure and ambulatory.

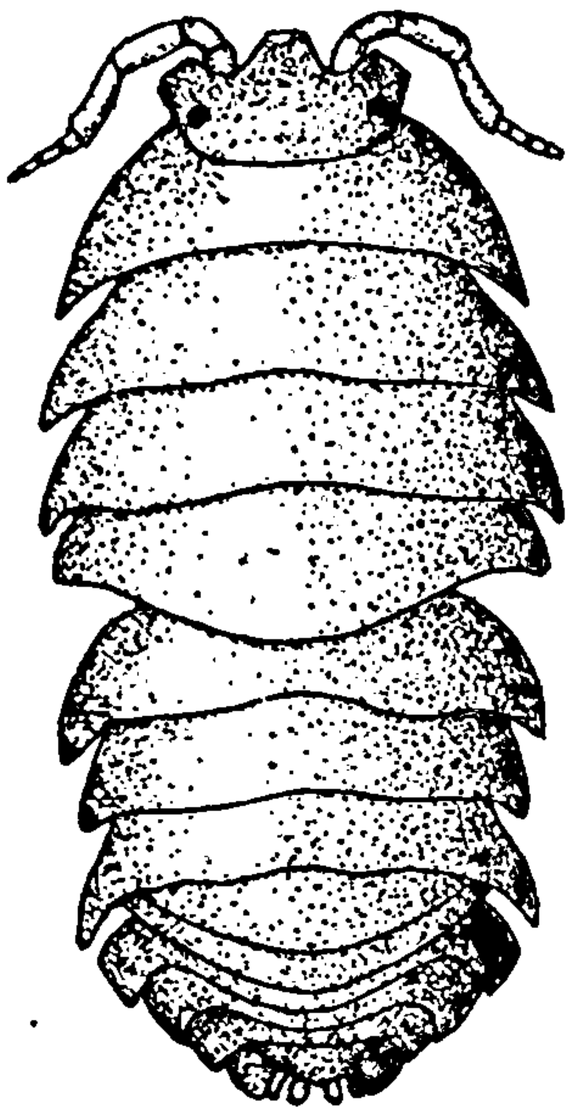


FIG. 679.—ACTONISCUS LINDAHLI. × 13.

In color it is a reddish brown with wavy lines of a light yellow on either side of the median line.

About ten specimens were collected in Oakland, California, by Prof. Josua Lindahl.

This species is very similar to the type and only described species of the genus, *Actoniscus ellipticus* Harger, but differs in having the surface of the body covered with low tubercles; in having the three lobes of the head anteriorly truncate, while in *A. ellipticus* the median one is acutely pointed, the lateral ones rounded; in having the fourth and fifth articles of the peduncle of the antennæ subequal, and the second article of the flagellum longest, the terminal article not minute, but as long as the preceding one; in having the post-lateral angles of the first thoracic segment produced in acute processes, and in having the sixth or terminal segment of the abdomen triangular rather than rounded.

This species is named in honor of Prof. Josua Lindahl, from whom the specimens were received.

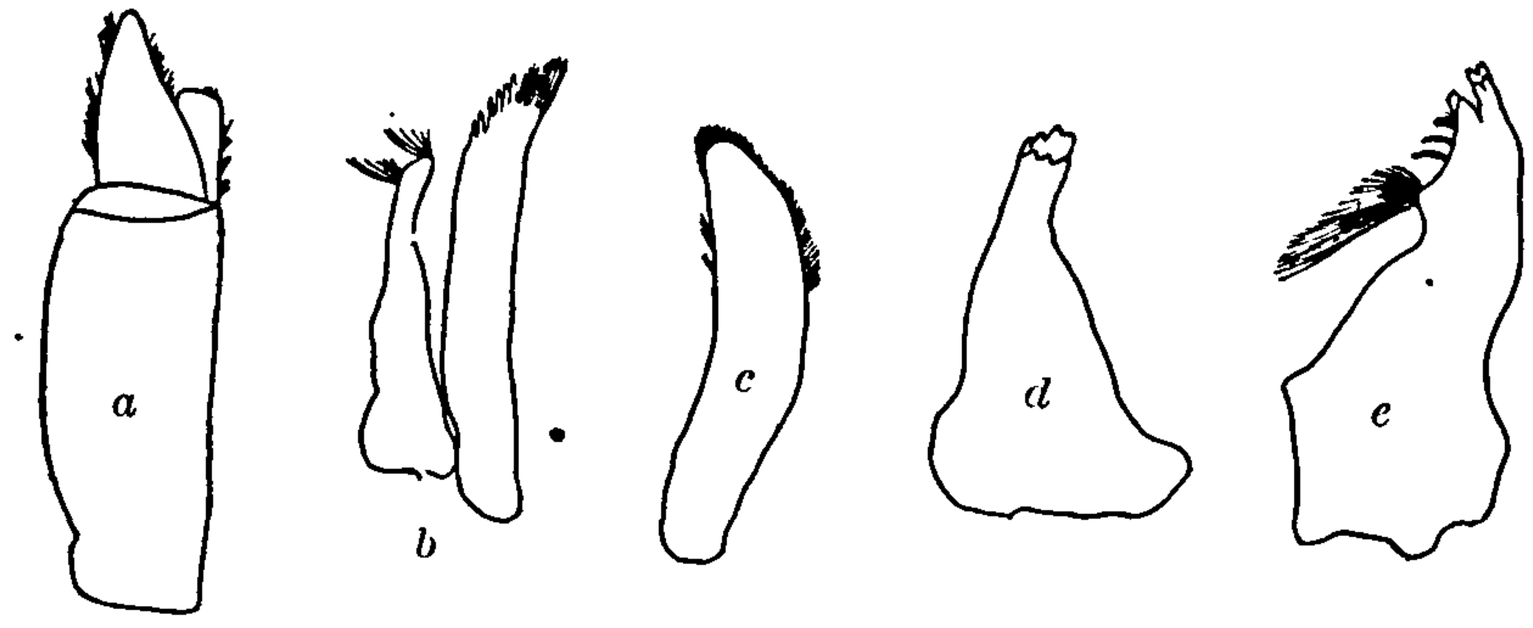


FIG. 680.—ACTONISCUS LINDAHLI. *a*, MAXILLIPED. × 62. *b*, FIRST MAXILLA. × 62. *e*, SECOND MAXILLA. × 62. *d*, MANDIBLE. × 62. *e*, MANDIBLE. × 62.

The types are in the museum of the Cincinnati Society of Natural History. Cat. No. 16365.

115. Genus ACANTHONISCUS (White) Kinahan.

"Body somewhat globose; head rounded; no true median or lateral lobes; a pair of small spurious lateral lobes beneath orbits, arising from production of antennary ring; external antennæ (?); internal antennæ three-jointed.

"Cephalothorax: coxæ well marked. Abdomen: coxæ of first and second somite obsolete; third to fifth narrow.

"Telson: coxæ obsolete; posterior pleopoda (false feet) nearly uncovered; peduncle (basis) somewhat triangular, broad; accessory lobe badly marked; accessory appendage inserted nearly on same line with ischium, flattened, rounded at the extremity; ischium long, subulate. Species, *A. spiniger*."—KINAHAN.[a]

ACANTHONISCUS SPINIGER White.

Acanthoniscus spiniger WHITE, List. Crust. Brit. Museum, 1847, p. 99.—GOSSE, A Naturalist's Sojourn in Jamaica, 1851, p. 65.—KINAHAN, Proc. Dublin University, I, 1859, p. 197, pl. XIX, fig. 4.—BUDDE-LUND, Crust. Isop. Terrestria, 1885, pp. 241–242.—RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 569.

Locality.—Jamaica.

"Body covered over with long spines arranged in a double longitudinal row, one spine to each ring. In cephalothorax a second row of shorter spines (two to each ring) on each side at junction of coxæ and body.

"Head covered with coarse knobs; two minute spines behind; a raised emarginate ridge marks out front.

"Coxæ of first cephalothoracic somite expanded into a circular lobe; coxæ of second to sixth somite narrow; seventh somewhat quadrilateral.

"Abdominal somites: coxæ, first and second, obsolete; third, fourth, and fifth, narrow, curved, triangular.

"Telson cordato-panduriform: apex deeply notched, its extremities triangular, produced, acuminate; sides of telson deeply incurved at base and then broadly convex. Posterior pleopods: accessory filament somewhat flattened; rounded at the extremity, about half length of ischium, and arising from a point distant from apex about a third of total length of peduncle. Ischium long and subulate. Peduncle prolonged as a spine external to origin of ischium. Color: deep chocolate brown black, with lighter patches.

"Locality: Jamaica.

"The specimen in the British Museum, the only one I have seen, wants the external antennæ; but from the fragments of those that remain, and other characters, an affinity can be traced between this genus and the Porcellionidæ. See Remarks on *Deto*, infra.

"The form of the telson is unique; the posterior pleopods show an approximation to *Deto;* but in the absence of the antennæ it is impossible to speak positively."—KINAHAN.[a]

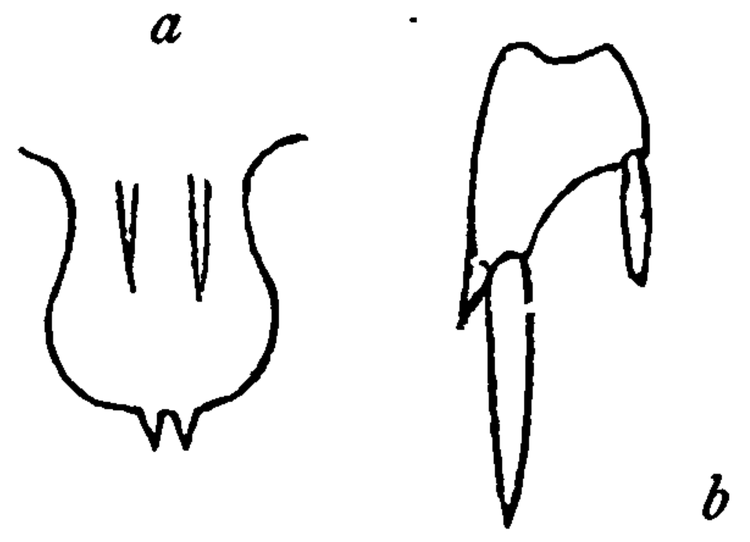


FIG. 681.—ACANTHONISCUS SPINIGER (AFTER KINAHAN). *a*, TERMINAL SEGMENT OF ABDOMEN. *b*, UROPOD.

[a] Proc. Dublin University, I, 1859, p. 197.

Family XXVI. ARMADILLIDIDÆ.[a]

Body convex, contractile into a perfect ball.

Pleural parts of the head fused.

Front of head truncate, marginate; antero-lateral lobes distinct; median lobe wanting; epistome vertical; clypeus perpendicular.

First pair of antennæ small, inconspicuous; flagellum composed of two or three articles. Second pair of antennæ generally short, distant; antennal foramina small.

Abdomen not abruptly narrower than thorax; terminal segment short and broad.

Opercular plates of the first two pairs of pleopoda or of all five pairs provided with tracheæ.

Uropoda short, flattened, not extending beyond the extremity of the terminal abdominal segment or the lateral parts of the preceding segment.

The young, when hatched, have all seven segments of the thorax present.

Mouth parts as in the Oniscidæ. Legs comparatively short.

ANALYTICAL KEY TO THE GENERA OF ARMADILLIDIDÆ.

a. Outer branch of the uropoda very small or minute. Basal joint large.
  b. Flagellum of external antennæ with two or three joints.
    c. Flagellum with two joints.
      d. Last abdominal segment subtetragonal, base wider than apex, more or less contracted in the middle. External branch of the uropoda inserted in the middle of the internal lateral margin of the basal joint. Coxopodites of first and usually of the second segments distinct from the segments (underside) ..... Genus *Cubaris* Brandt.
      d'. Last abdominal segment trapezoidal or subcordiform, narrower at its truncate apex. External branch of the uropoda inserted in the inner post-lateral angle of the basal joint. Coxopodites of the first and second segments distinct (underside) ..... Genus *Pseudarmadillo* Saussure.
    c'. Flagellum with three joints. Coxopodites of the first segment usually distinct on the underside. Terminal segment of body very short, rounded or posteriorly triangular. External branch of the uropoda inserted in the inner post-lateral angle of the quadrangular basal joint, and extending downward. Inner branch reaches much beyond the terminal segment of the body ..... Genus *Sphæroniscus* Gerstæcker.
  b'. Flagellum of external antennæ with a single joint only. Coxopodite distinct on the first segment (underside). External branch of the uropoda inserted at inner post-lateral angle of the basal joint ..... Genus *Haplarmadillo* Dollfus.
a'. Outer branch of the uropoda large, flattened, lamellar, inserted at the apex of the basal joint.
  b. Terminal abdominal segment triangular in shape. Inner branch of uropoda conical. All seven pairs of legs present. Seventh thoracic segment with lateral parts well developed ..... Genus *Armadillidium* Brandt.
  b'. Terminal abdominal segment quadrangular in shape. Inner branch of the uropoda flattened, rounded. Only six pairs of legs present. Lateral parts of seventh segment of thorax not developed ..... Genus *Uropodias* Richardson.

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[a] See Budde-Lund for characters of family, Crust. Isop. Terrestria, 1885, pp. 14–15, and G. O. Sars, Crust. of Norway, II, 1899, pp. 187–188.

116. Genus CUBARIS Brandt.

First pair of antennæ very small, inconspicuous, composed of three articles. Second pair of antennæ short, generally not longer than one-third the length of the body; flagellum composed of two articles.

Eyes composite, small or moderately large. Clypeus very short, with the anterior margin entire, lobate at the sides. Epistome flat, forming a continuously straight frontal marginal line. The vertical marginal line reaches the frontal line.

First thoracic segment with the epimera posteriorly cleft, often also the second; rarely entire. Terminal abdominal segment tetragonal, wider at the base than at the apex, more or less contracted in the middle.

Outer branch of all the pleopoda furnished with tracheæ. Uropoda short, not extending beyond the terminal abdominal segment. Basal article or peduncle large, wide, entire, tetragonal, obliquely produced; outer branch very small, rather slender, inserted at the middle of the inner lateral margin of the basal article; inner branch small, rather slender or rather compressed.[a]

ANALYTICAL KEY[b] TO THE SPECIES OF THE GENUS CUBARIS.

a. Body tuberculate.
  b. Second thoracic segment without a distinct coxopodite.
    c. Coxopodite of the first thoracic segment hardly perceptible as a very small process below the leg. Prosepistoma of head with a shield-like convexity. Apex of telson half as wide as basis. Endopodite of the uropoda extends one-half the length of the telson..... *Cubaris tenuipunctata* (Dollfus)
    c'. Coxopodite of the first thoracic segment hardly perceptible, only a feeble ridge. Prosepistoma of head nearly flat. Apex of telson one-third narrower than basis. Endopodite of the uropoda extends two-thirds the length of the telson..... *Cubaris depressa* (Dollfus)
  b'. Second thoracic segment with a distinct coxopodite (underside).
    c. Coxopodite of the first thoracic segment distant from the edge, crested, and ended by a tooth-like diverging process ..... *Cubaris viticola* (Dollfus)
    c'. Coxopodite of the first thoracic segment not distant from the edge and not crested.
      d. Coxopodite of the first thoracic segment distinct along the entire length of the edge (underside).
        e. Coxopodite of the first segment divergent on the half hind part. Coxopodite of the second segment forming a tooth-like diverging process. *Cubaris silvarum* (Dollfus)
        e'. Coxopodite of the first segment not divergent. Coxopodite of the second segment large, square-shaped ..... *Cubaris perlata* (Dollfus)
      d'. Coxopodite of the first thoracic segment not distinct along the entire length of the edge.
        e. Coxopodite of the first segment small, dentiform, and very unequally cleft..... *Cubaris murina* Brandt

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[a] See Budde-Lund for characters of genus, Crust. Isop. Terrestria, 1885, pp. 15–16.

[b] *Cubaris californica* (Stuxberg) is not included in this key, as the description is not sufficient in detail to obtain characters for synoptical arrangement.

e'. Coxopodite of the first segment not dentiform, subequally cleft.
Cubaris cincta (Dollfus)

a'. Body smooth.
b. Upper surface of terminal segment of body with a shallow depression on each side, and a small median pit near the base..... *Cubaris gigas* Miers
b'. Upper surface of terminal segment of body without shallow depression on each side, or median pit.
c. Inner posterior angle of basal article of uropoda widely excavated.
Cubaris affinis (Dana)
c'. Inner posterior angle of basal article of uropoda not excavated.
d. Coxopodite distinct on the entire length of the lateral edge of the first thoracic segment (underside)..... *Cubaris zigzag* (Dollfus)
d'. Coxopodite not distinct on the entire length of the lateral edge of the first thoracic segment.
e. Second thoracic segment with a large square coxopodite, distinct on its total length (underside)..... *Cubaris dumorum* (Dollfus)
e'. Second thoracic segment with the coxopodite very small.
f. Coxopodite of second thoracic segment forming a tooth-like process.
g. Inner branch of uropoda about half the length of the terminal abdominal segment. Terminal abdominal segment with a blunt double tubercle near the base..... *Cubaris grenadensis* (Budde-Lund)
g'. Inner branch of uropoda extends about one-third the length of the terminal abdominal segment. Terminal abdominal segment without double tubercle near the base..... *Cubaris dugesi* (Dollfus)
f'. Coxopodite of second thoracic segment not tooth-like.
Cubaris pisum (Budde-Lund)

CUBARIS TENUIPUNCTATA (Dollfus).

Armadillo tenuipunctatus Dollfus, Proc. Zool. Soc. London, 1896, p. 389.
Cubaris tenuipunctatus Richardson, Proc. U. S. Nat. Mus., XXIII, 1901, p. 571.

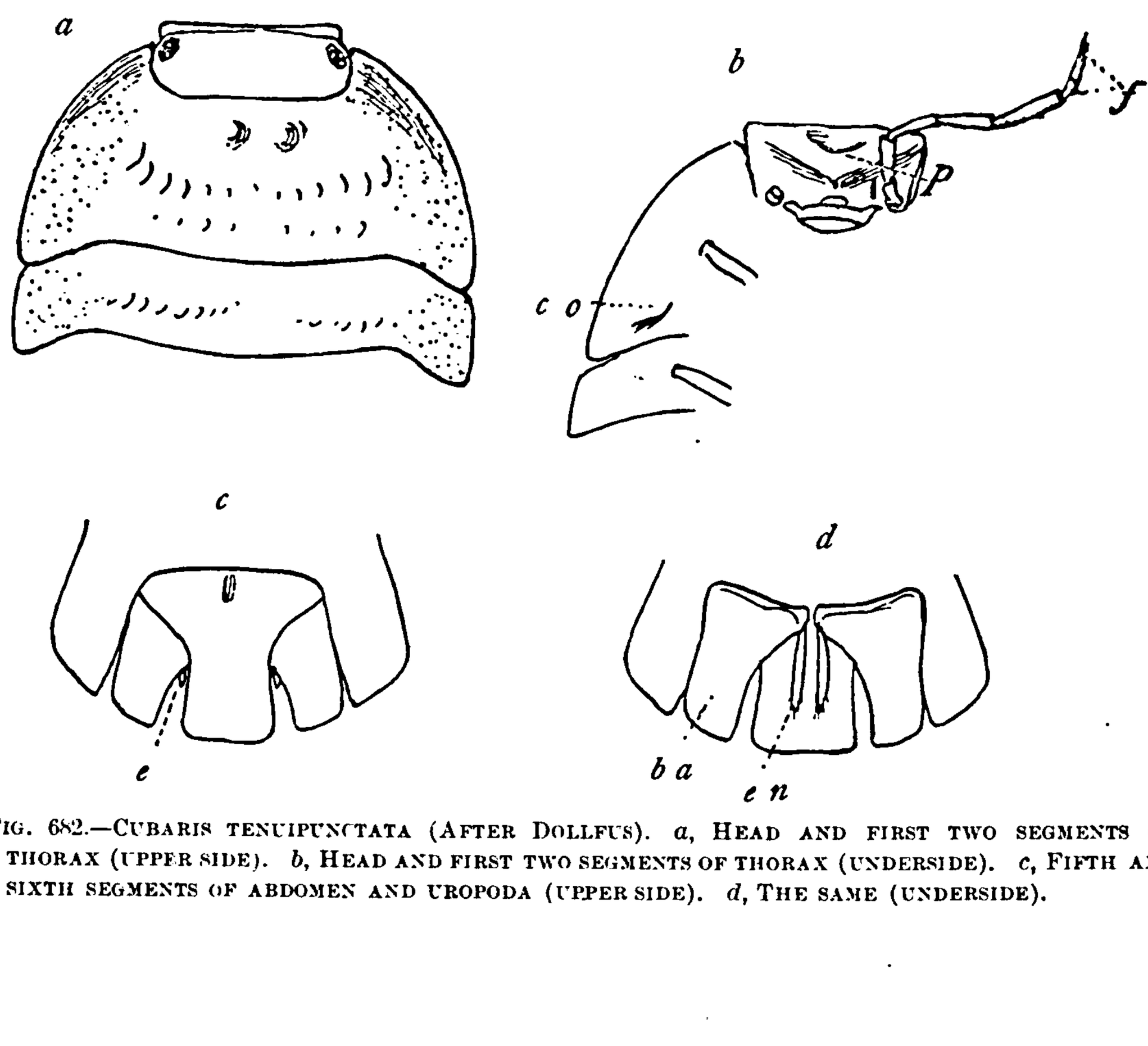


Fig. 682.—Cubaris tenuipunctata (after Dollfus). *a*, Head and first two segments of thorax (upper side). *b*, Head and first two segments of thorax (underside). *c*, Fifth and sixth segments of abdomen and uropoda (upper side). *d*, The same (underside).

Locality.—Mustique Island, West Indies. "Beaten from brush."

"Body rather wide, moderately convex, slightly tuberculated on the pereion. Cephalon: prosepistoma with a shield-like convexity, a little depressed in the middle. Eyes middling; ocelli about 18. Antennæ short; first joint of flagellum twice as short as the second. Pereion: first segment with two antero-median rounded tubercles; lateral edges slightly raised; coxopodite hardly perceptible, as a very small process below the leg. Second segment without a distinct coxopodite. Pleon, telson: pleotelson longer than wide, smooth, with a minute longitudinal wrinkle near the basis; sides feebly curved, the apex being half as wide as the basis. Uropoda: basis nearly straight; endopodite extending to half the length of the pleotelson; exopodite very small, placed near the middle of the internal edge of the basis (upperside). Color: gray, with irregular light markings; the sides are light and minutely punctuated with black. Dimensions: 10 by 4½ mm."—DOLLFUS.[a]

CUBARIS DEPRESSA (Dollfus).

Armadillo depressus DOLLFUS, Proc. Zool. Soc. London, 1896, p. 390.
Cubaris depressus RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 571.

Localities.—St. Vincent, Chateaubelais, West Indies.

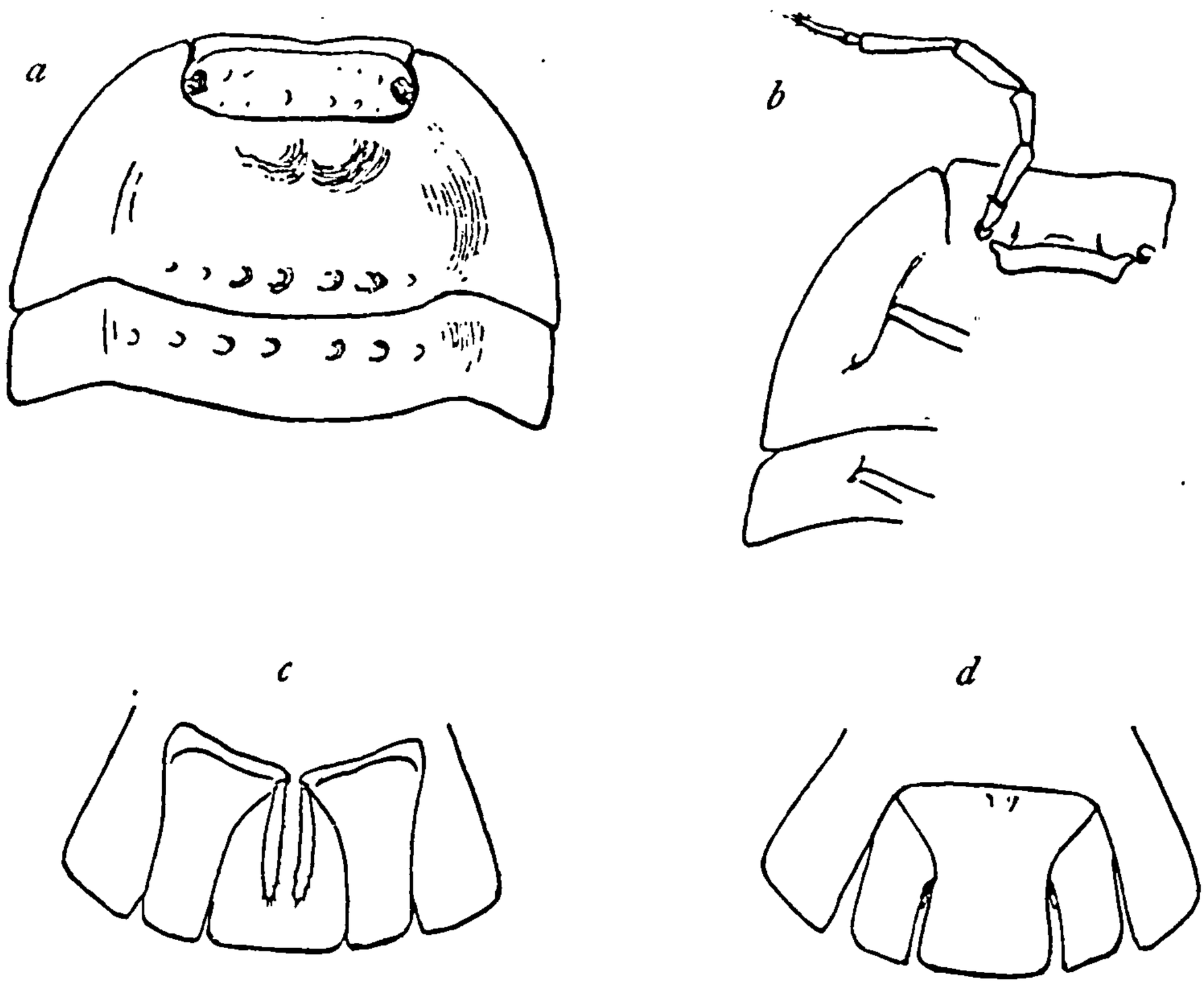


FIG. 683.—CUBARIS DEPRESSA (AFTER DOLLFUS). *a*, HEAD AND FIRST TWO SEGMENTS OF THORAX (UPPER SIDE). *b*, THE SAME (UNDERSIDE). *c*, FIFTH AND SIXTH SEGMENTS OF ABDOMEN AND UROPODA (UPPER SIDE). *d*, THE SAME (UNDERSIDE).

"Body wide, rather depressed, granulated on cephalon and pereion. Cephalon: prosepistoma nearly plain, fore edge a little arched in the

[a] Proc. Zool. Soc. London, 1896, p. 389.

middle. Eyes middling; ocelli about 16. Antennæ: first joint of flagellum three times shorter than the second. Pereion: first segment with a wide, double, antero-median tubercle; lateral edges not raised; coxopodite hardly perceptible, as a feeble ridge. Second segment without a distinct coxopodite. Pleon, telson: sides of the pleon depressed; processus of the fifth segment widening at the apex. Pleotelson longer than wide, smooth; sides feebly curved; apex one-third narrower than the basis. Uropoda nearly straight; endopodite extending to two-thirds the length of the pleotelson; exopodite very small, placed near the middle of the internal edge of the basis (upperside). Color: dark gray, with a narrow light longitudinal line in the middle of the pereion and light lineolæ on both sides. Dimensions: 9 by 4½ mm."—DOLLFUS.[a]

CUBARIS VITICOLA (Dollfus).

Armadillo viticola DOLLFUS, Proc. Zool. Soc. London, 1896, pp. 396–397.
Cubaris viticola RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 571.

Localities.—Grenada, Balthazar, Chantilly, West Indies. Second-growth woods, beaten from vines and brush, 250 feet and 400 feet.

"Body very convex in the middle, rather depressed on the sides, covered with transverse lines of granulations. Cephalon: prosepis-

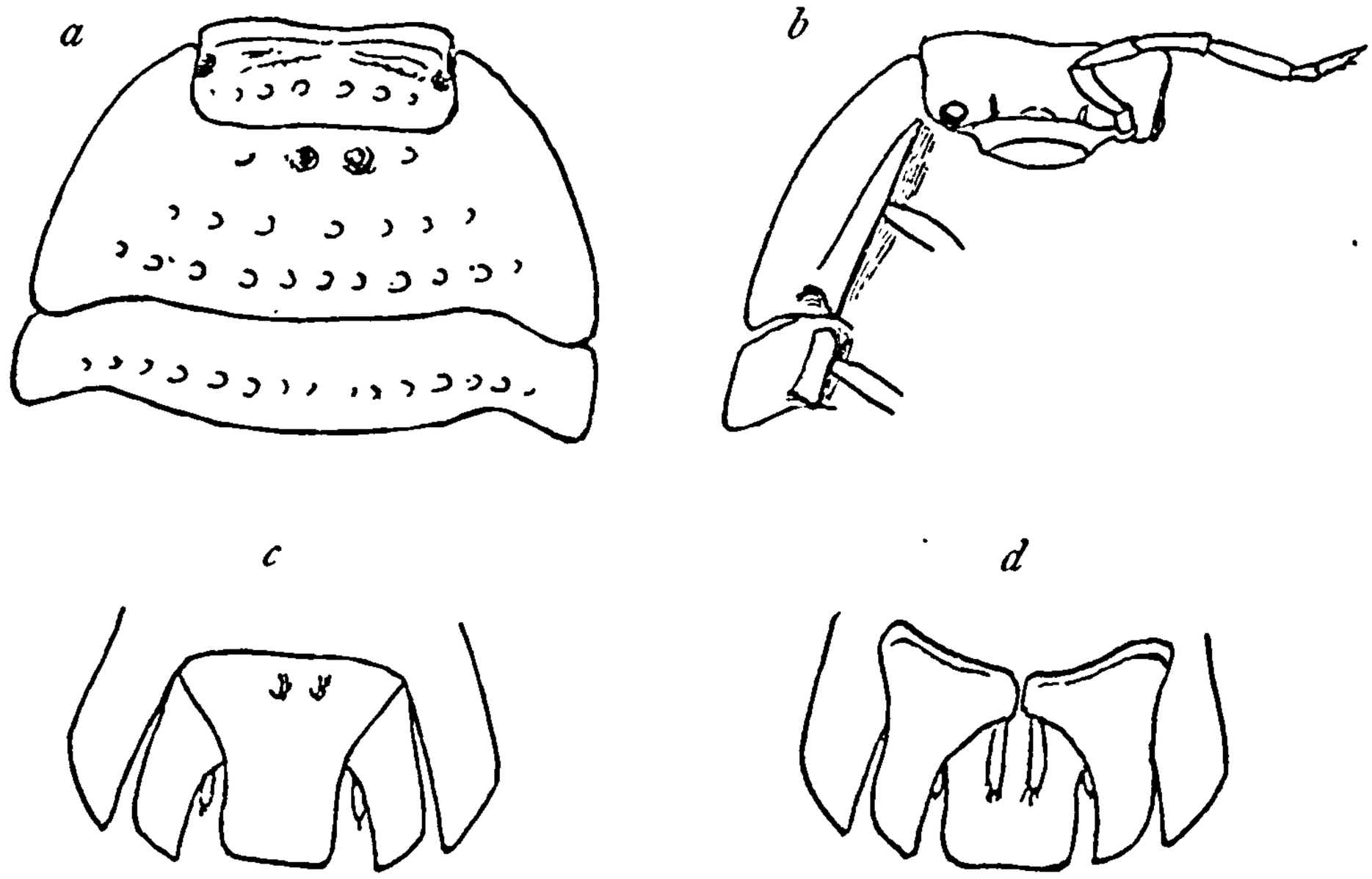


FIG. 684.—CUBARIS VITICOLA (AFTER DOLLFUS). *a*, HEAD AND FIRST TWO SEGMENTS OF THORAX (UPPER SIDE). *b*, THE SAME (UNDERSIDE). *c*, FIFTH AND SIXTH SEGMENTS OF ABDOMEN WITH UROPODA (UPPER SIDE). *d*, THE SAME (UNDERSIDE).

toma plain, fore edge slightly arched in the middle. Eyes moderate; ocelli 12. Antennæ short; first joint of the flagellum three times shorter than the second. Pereion: first segment with four large antero-median granulations; lateral edges hardly raised; coxopodite distant from the edge, crested and ended by a tooth-like diverging

[a] Proc. Zool. Soc. London, 1896, p. 390.

processus. Second segment with a narrow crested coxopodite. Pleon, telson: lateral parts of the pleon narrow; pleotelson longer than wide; sides slightly curved; apex one-half narrower than the basis, with rounded angles. Uropoda: basis very oblique; endopodite reaching to one-half the length of the pleotelson; exopodite a little larger than in the former species (*C. perlatus*), visible on upper and under sides. Color: yellowish, veined, and striped with brown. Dimensions: 9 by 4 mm."—DOLLFUS.[a]

CUBARIS SILVARUM (Dollfus).

Armadillo silvarum DOLLFUS, Proc. Zool. Soc. London, 1896, pp. 393–394.
Cubaris silvarum RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 571.

Localities.—St. Vincent, Chateaubelais; Cumberland Valley, West Indies. Very common under rubbish, forest below 2,000 feet (St. Vincent). Forest, dry hillside under stones, 1,000 feet (Chateaubelais). Damp ground, 1,000 feet (Cumberland Valley).

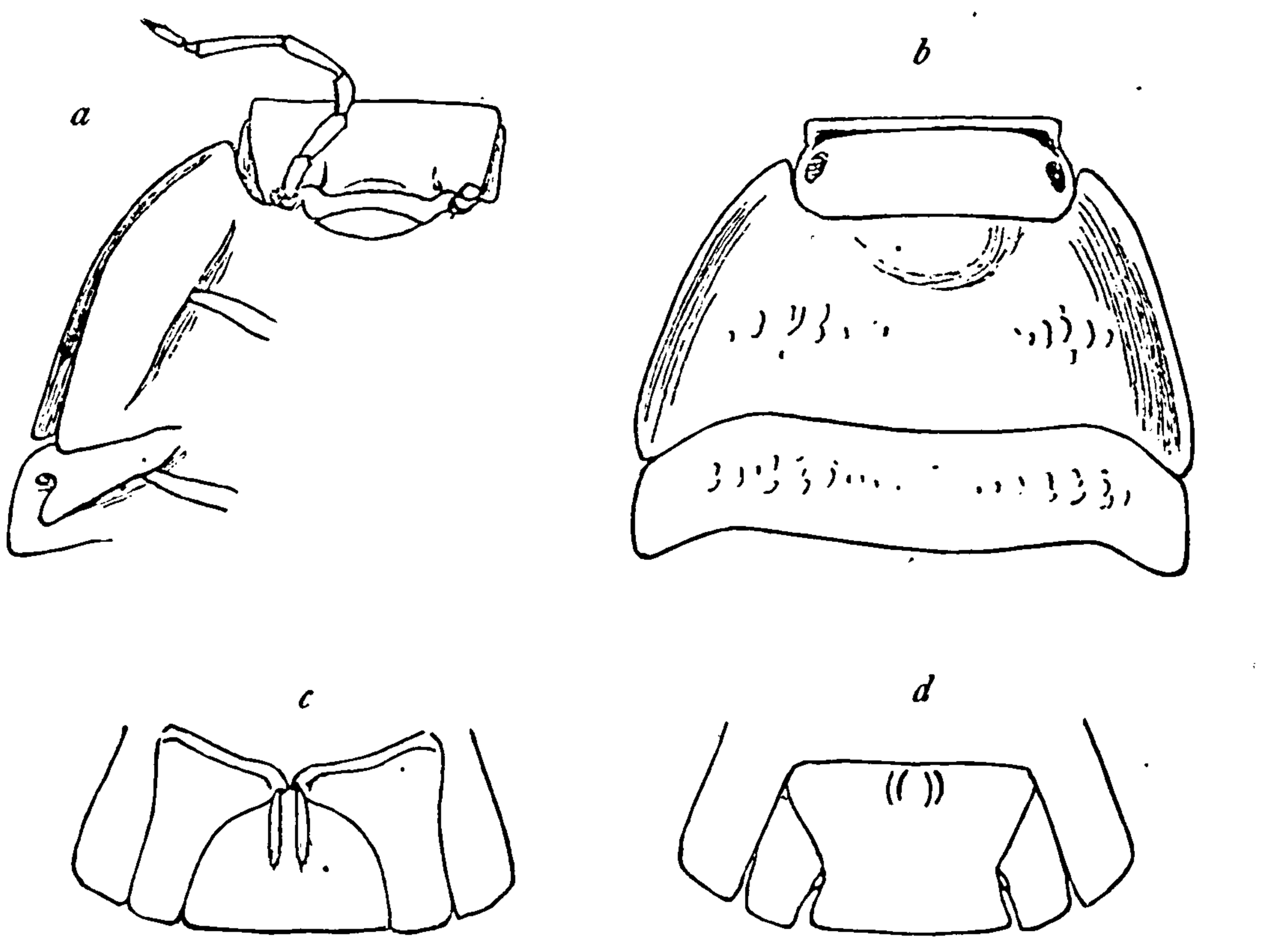


FIG. 685.—CUBARIS SILVARUM (AFTER DOLLFUS). *a*, HEAD AND FIRST TWO SEGMENTS OF THORAX (UPPER SIDE). *b*, THE SAME (UNDERSIDE). *c*, FIFTH AND SIXTH SEGMENTS OF ABDOMEN AND UROPODA (UPPER SIDE). *d*, THE SAME (UNDERSIDE).

"Body convex, slightly tuberculated on the pereion. Cephalon: prosepistoma plain. Eyes large; about 20 ocelli. Pereion: first segment with a blunt, hardly perceptible antero-median tubercle; lateral edge forming a narrow, raised border; coxopodite distinct on the entire length of the edge and divergent on the half hind part. Coxo-

[a] Proc. Zool. Soc. London, 1896, pp. 396–397.

podite of the second segment forming a tooth-like, divergent processus. Pleon, telson: pleotelson wider than long, with a small, double, longitudinal ridge near the basis; sides curved near the apex; apex one-fourth narrower than the basis. Uropoda: endopodite extending to one-half the length of the pleotelson; exopodite minute, placed near the middle of the internal edge of the basis. Color: dark gray or brown, with three longitudiual light lines and a wide spot on the sides of each segment; antennæ and uropoda pale. Dimensions: 16 by 7 mm."—DOLLFUS.[a]

CUBARIS PERLATA (Dollfus).

Armadillo perlatus DOLLFUS, Proc. Zool. Soc. London, 1896, pp. 395–396.
Cubaris perlatus RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 571.

Locality.—St. Vincent, West Indies. Dry forest, leeward, under a log, 800 feet.

"Body convex, covered with large, pearled granulations. Cephalon: prosepistoma with a shield-like convexity which does not reach quite to the front edge. Eyes very small; ocelli 3. Antennæ short; first joint of the flagellum three times as short as the second. Pereion: first segment with two rounded antero-mėdian granulations; lateral edges raised; coxopodite distinet on the entire length of the edge, but not divergent. Second segment with a large and very distinet coxopodite. Pleon, telson: pleotelson, nearly as wide as long, with two large, rounded granulations near the basis; sides curved; apex a little narrower than the basis. Uropoda: endopodite reaching to two-

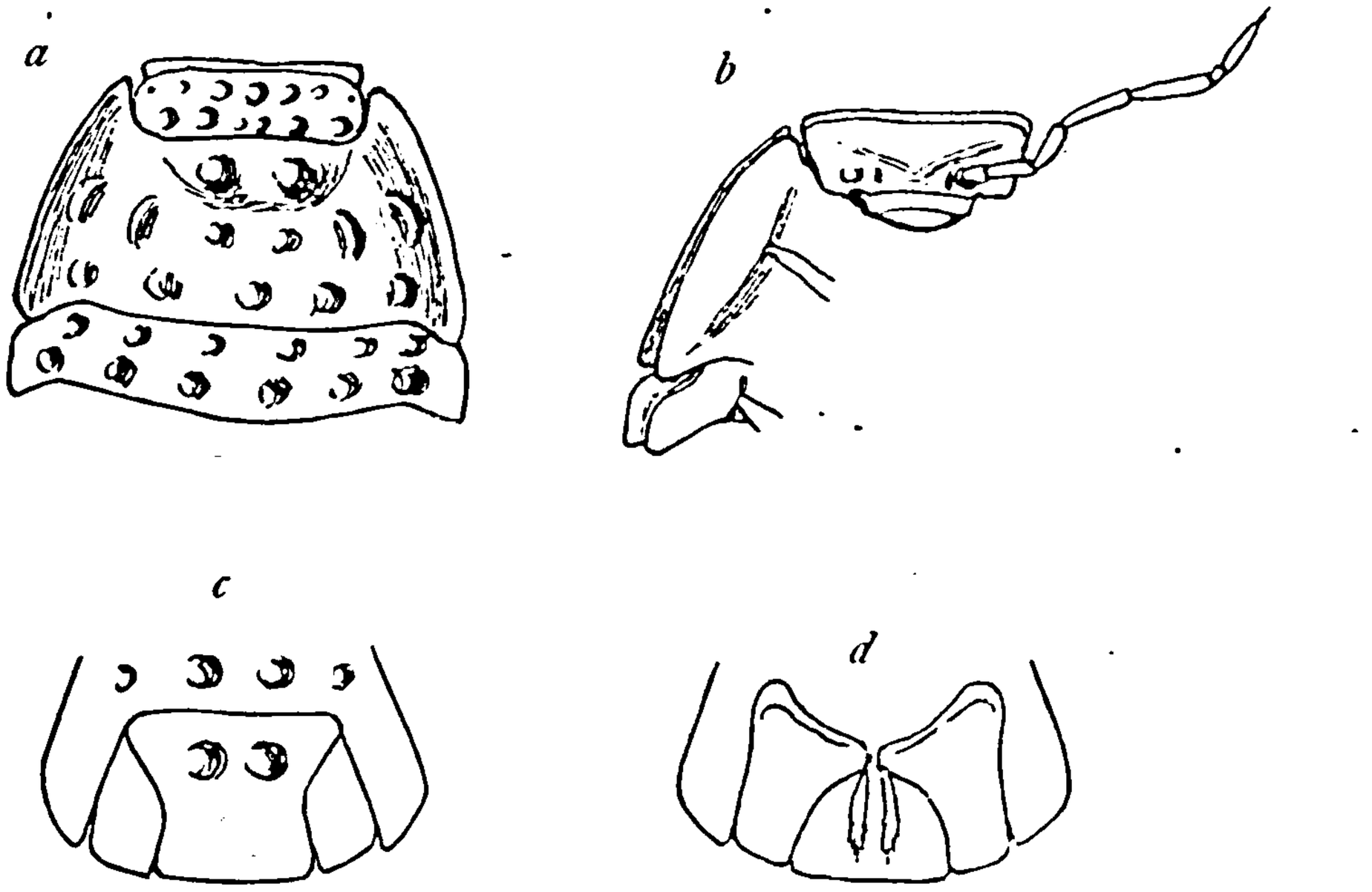


FIG. 686.—CUBARIS PERLATA (AFTER DOLLFUS). *a*, HEAD AND FIRST TWO SEGMENTS OF THORAX (UPPER SIDE). *b*, THE SAME (UNDERSIDE). *c*, FIFTH AND SIXTH SEGMENTS OF ABDOMEN (UPPER SIDE). *d*, THE SAME (UNDERSIDE).

[a] Proc. Zool. Soc. London, 1896, pp. 393–394.

thirds the length of the pleotelson; exopodite imperceivable. Color: light gray, granulations whitish. Dimensions: 4½ by 1½ mm."—DOLLFUS.[a]

CUBARIS MURINA Brandt.

Cubaris murina BRANDT, Bull. Soc. Imp. d. Naturalistes de Moscou, VI, 1833, p. 28.
Cubaris brunnea BRANDT, Bull. Soc. Imp. d. Naturalistes de Moscou, VI, 1833, p. 28.
Armadillo murinus MILNE EDWARDS, Hist. Nat. des Crust., III, 1840, p. 179.
Armadillo brunnens MILNE EDWARDS, Hist. Nat. des Crust., III, 1840, p. 179.
Armadillo cubensis SAUSSURE, Mém. de la Soc. de Physique et d'Hist. nat de Genève, XIV, 1858, Pt. 2, p. 65.
Cubaris affinis MIERS, Proc. Zool. Soc., London, 1877, p. 666, pl. LXVIII, fig. 4.
Armadillo conglobator BUDDE-LUND, Prosp. generum specierumque Crust. Isop. Terrestrium, 1879, p. 7.
Armadillo murinus BUDDE-LUND, Prosp. generum specierumque Crust. Isop. Terrestrium, 1879, p. 7; Crust. Isop. Terrestria, 1885, pp. 27, 28. (See Budde-Lund for synonymy.)
Cubaris murinus RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 571.

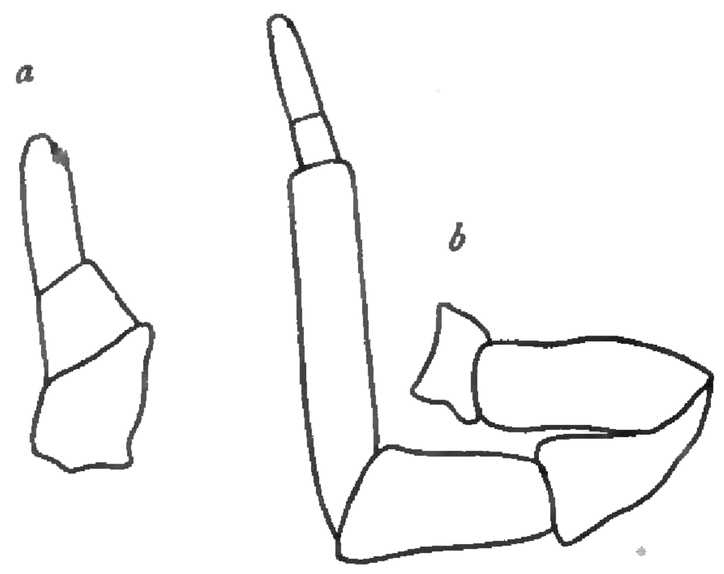
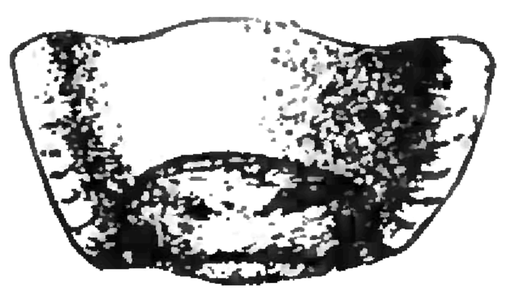
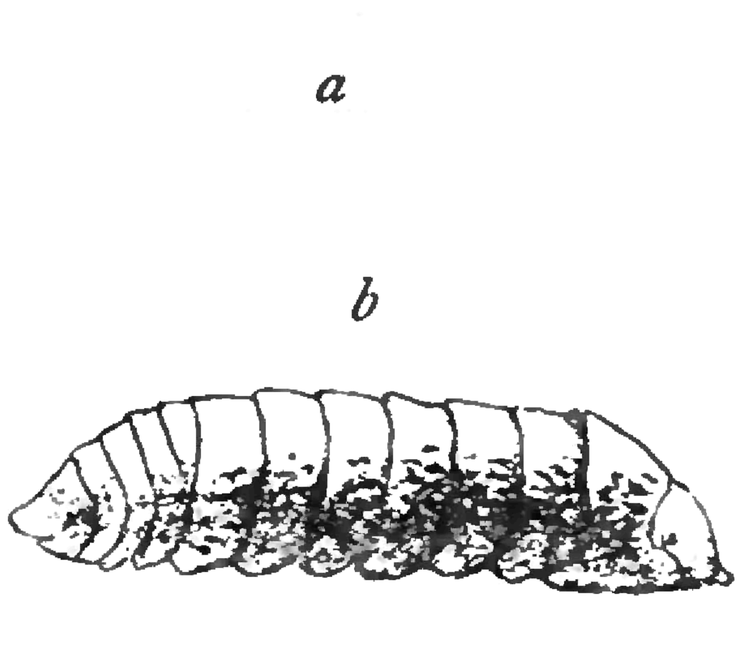


FIG. 687.—CUBARIS MURINA. *a*, FIRST ANTENNA. × 77½. *b*, SECOND ANTENNA. × 23.





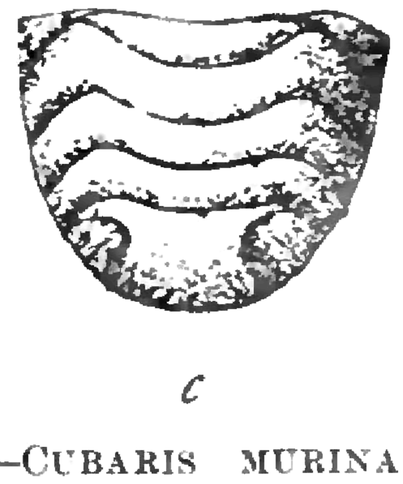


FIG. 688.—CUBARIS MURINA (AFTER MIERS). *a*, HEAD AND FIRST THORACIC SEGMENT. *b*, LATERAL VIEW OF BODY. *c*, ABDOMEN AND UROPODA.

Localities.—Pinar del Rio, Cuba; El Guama, Cuba; Guanajay, Cuba; Pueblo Viejo, Porto Rico; St. Thomas; Jamaica; also, Oahu and Honolulu, Hawaiian Islands; Brazil; Cayenne; Seychelle Islands; Sumatra.

Found under stones; in damp caves.

Body ovate, very convex, and contractile into a ball, a little more than twice as long as wide, 5 mm.: 11 mm.

Head three times as wide as long, 1 mm.: 3 mm., with the anterior margin straight. Eyes small, round, composite, and situated at the sides of the head, halfway between the anterior and the posterior margins. The first pair of antennæ are rudimentary and inconspicuous. They are composed of three articles. The second pair of antennæ have the first two articles short and subequal; the third article is about three times as long as the second; the fourth and fifth are subequal and each is a little shorter than the third; the sixth article is one and a half times

[a] Proc. Zool. Soc. London, 1896, pp. 395–396.

longer than the fifth. The flagellum is composed of two articles, the first of which is about half as long as the second. The second antennæ extend to the middle of the first thoracic segment. The maxilliped has a palp of three articles. The palp of the mandibles is wanting.

The first segment of the thorax is about one and a half times longer than any of the others, which are subequal. The lateral parts of the first segment are produced backward posteriorly, and anteriorly they are produced surrounding the head and extending to its anterior margin. The lateral margins of the first segments curve slightly upward. There are no epimera separated off on any of the segments from above. The epimera of the first two segments are distinct on the underside. They are very small. Those of the first segment do not extend the entire length of the segment, but are represented only at the posterior extremity.

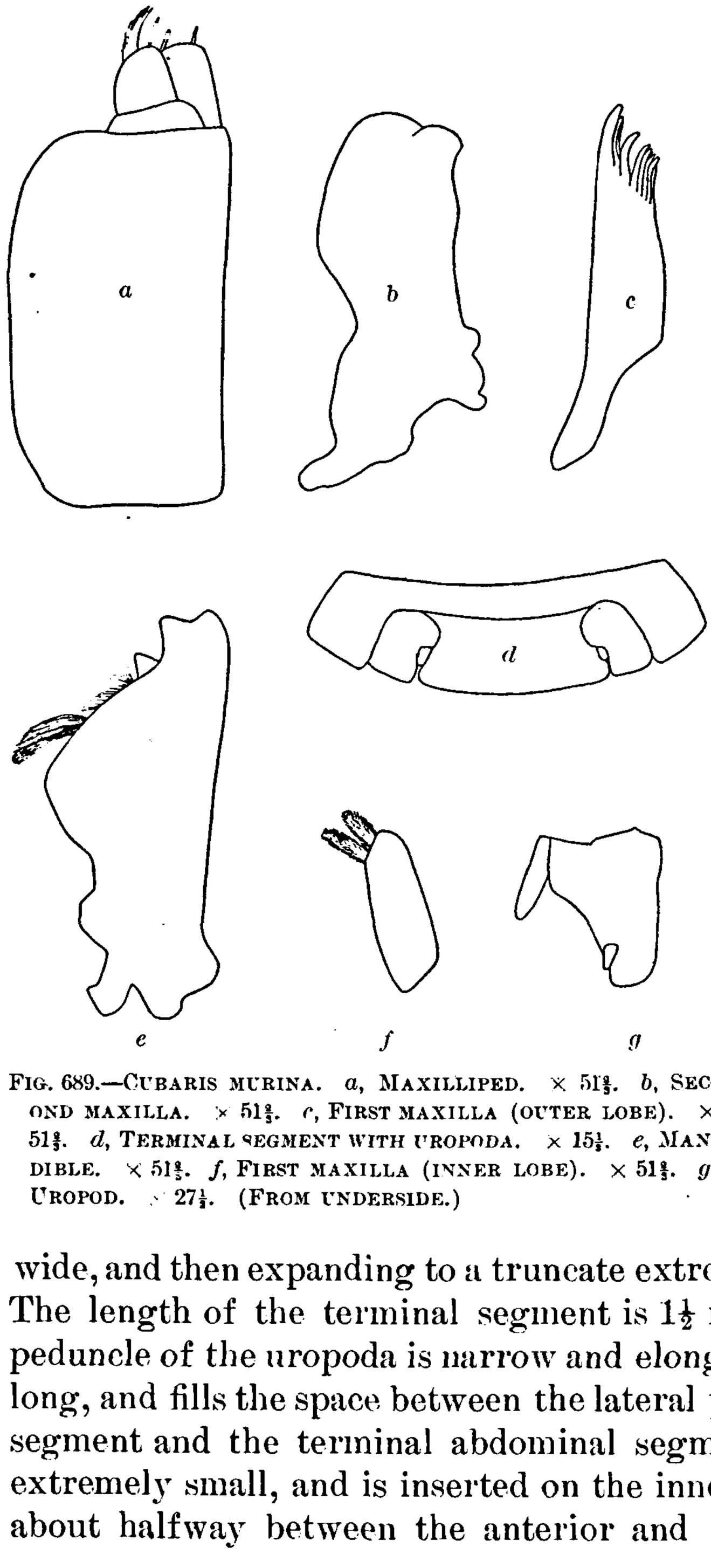


FIG. 689.—CUBARIS MURINA. *a*, MAXILLIPED. × 51⅔. *b*, SECOND MAXILLA. × 51⅔. *c*, FIRST MAXILLA (OUTER LOBE). × 51⅔. *d*, TERMINAL SEGMENT WITH UROPODA. × 15½. *e*, MANDIBLE. × 51⅔. *f*, FIRST MAXILLA (INNER LOBE). × 51⅔. *g*, UROPOD. × 27½. (FROM UNDERSIDE.)

The abdomen is not narrower than the thorax. The lateral parts of the first two segments are covered by the seventh thoracic segment. The sixth, or terminal, segment is 2 mm. wide at the base, becoming constricted about the middle, where it is 1 mm. wide, and then expanding to a truncate extremity, which is 2 mm. wide. The length of the terminal segment is 1½ mm. The basal article or peduncle of the uropoda is narrow and elongate, about twice as wide as long, and fills the space between the lateral parts of the fifth abdominal segment and the terminal abdominal segment. The outer branch is extremely small, and is inserted on the inner margin of the peduncle, about halfway between the anterior and posterior end. The inner

branch is not visible from the dorsal side. Underneath, on the ventral side, it is small and elongated, extending only half the length of the terminal segment.

CUBARIS CINCTA (Dollfus).

Armadillo cinctus DOLLFUS, Proc. Zool. Soc. London, 1896, p. 392.
Cubaris cinctus RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 572.

Locality.—Near Layon, West Indies. On rotten wood, dry forest.

"Body moderately convex, rather wide, depressed on the fore and hind parts of the segments, with a transverse range of tubercles on each segment. Cephalon: prosepistoma nearly plain, fore edge straight. Eyes middling; ocelli about 16. Antennæ: first joint of the flagellum

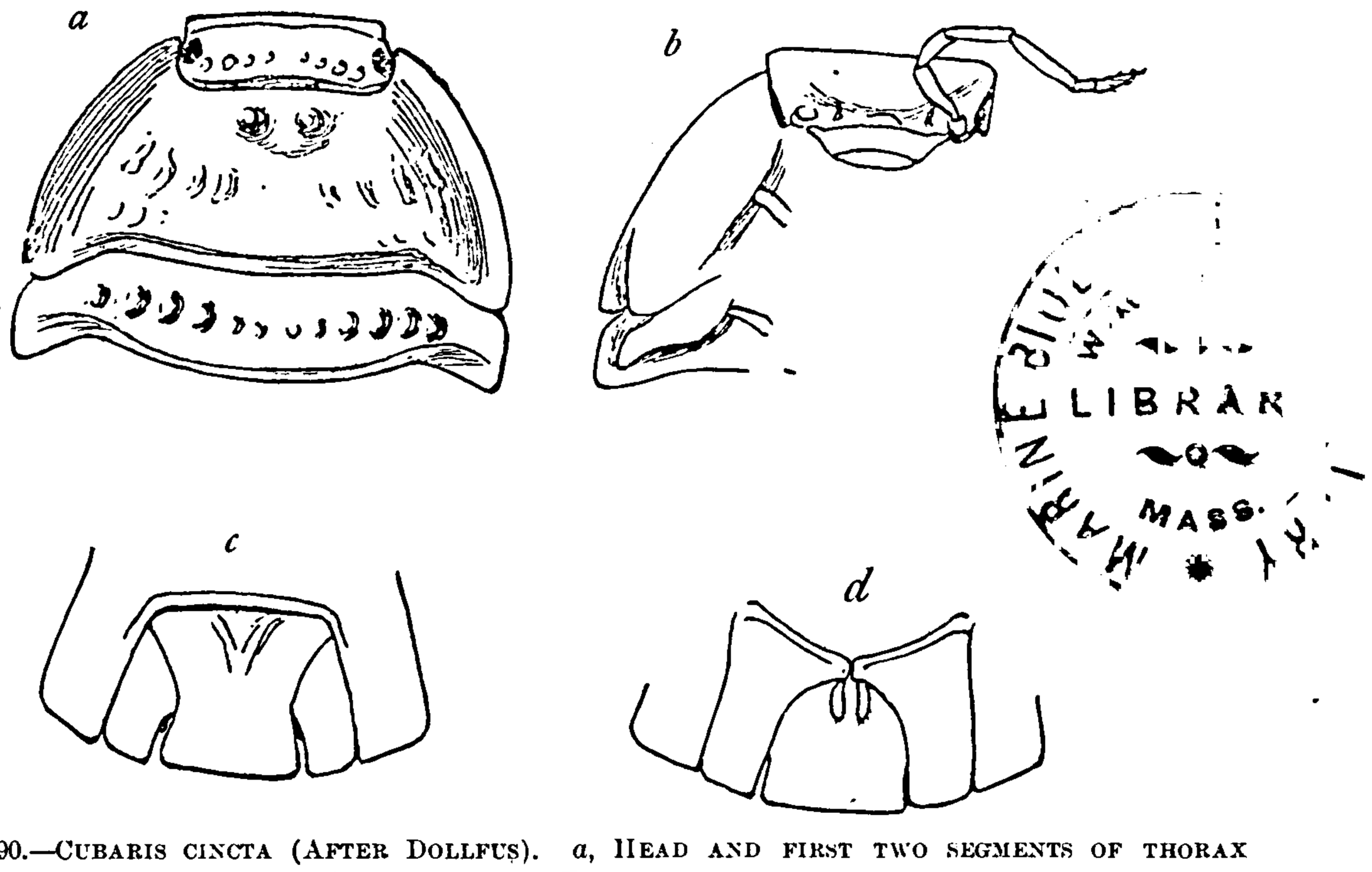


FIG. 690.—CUBARIS CINCTA (AFTER DOLLFUS). *a*, HEAD AND FIRST TWO SEGMENTS OF THORAX (UPPER SIDE). *b*, THE SAME (UNDERSIDE). *c*, FIFTH AND SIXTH SEGMENTS OF ABDOMEN AND UROPODA (UPPER SIDE). *d*, THE SAME (UNDERSIDE).

twice as short as the second. Pereion: first segment with a double antero-median tubercle; lateral edges raised; coxopodite distinct and divergent on the third hind part of the edge (underside). Coxopodite of the second segment forming a narrow, quadrangular processus. Pleon, telson: pleotelson as long as wide, with a triangular tubercle near its basis; sides curved; apex one-fourth narrower than the basis. Uropoda: basis nearly straight; endopodite very small, extending hardly to one-sixth the length of the pleotelson; exopodite minute, placed above the middle of the internal edge of the basis (upperside). Color: dark gray, with small lighter lineolæ on both sides of the median line (pereion) and three light dots on the pleotelson. Dimensions: 7½ by 3¼ mm."—DOLLFUS.[a]

[a] Proc. Zool. Soc. London, 1896, p. 392.

CUBARIS GIGAS Miers.

Cubaris gigas MIERS, Proc. Zool. Soc. London, 1877, p. 666, pl. LXVIII, fig. 1.
Armadillo gigas BUDDE-LUND, Crust. Isop. Terrestria, 1885, p. 40.
Cubaris gigas RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 572.

Locality.—Nicaragua, near San Juan.

"Convex oblong-oval, nearly smooth, surface only very minutely granulated, and with only very obscure indications of larger tubercles on each side of the middle line. Head transverse, with the anterior margin straight, reflexed at a right angle (as seen in a lateral view) with the upper surface of the head, and (as seen in a dorsal view) also forming a right angle with the lateral margins; antero-lateral lobes wanting. First segment of the body very concave on the sides, with

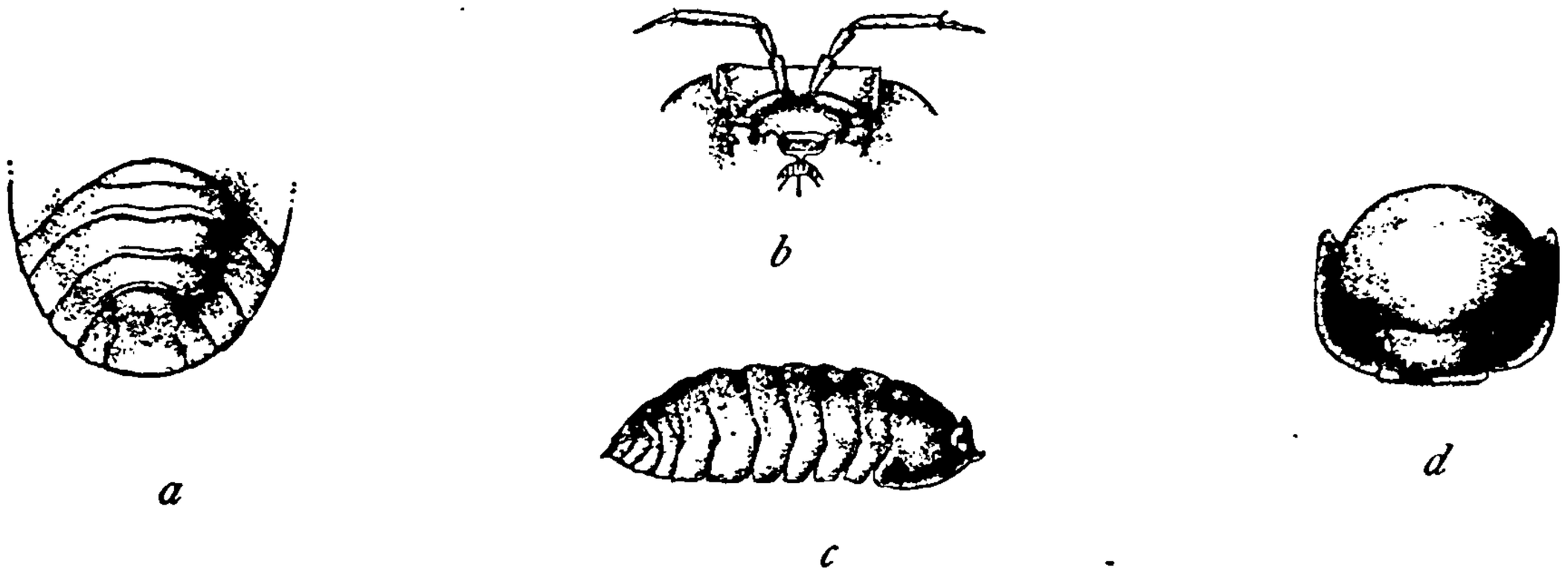


FIG. 691.—CUBARIS GIGAS (AFTER MIERS). *a*, ABDOMEN WITH UROPODA (UPPER SIDE). *b*, HEAD (UNDERSIDE) SHOWING ANTENNÆ. *c*, LATERAL VIEW. × 1½. *d*, HEAD AND FIRST THORACIC SEGMENT (UPPER SIDE).

the lateral margins strongly reflexed; all the segments distinctly flexed backward on the sides, with the posterior margins angulate-excavate. Terminal segment of the tail about as broad as long, with the sides excavated; upper surface flat, with a shallow depression on each side, and a small median pit near the base. Antennæ with the flagellum much shorter than the last joint of the peduncle, with the first joint the shortest. Basal joint of the uropoda (viewed from above) oblong, terminal (apparent lateral) joint quite minute. Colour light gray. Length 10½ lines."—MIERS.[a]

CUBARIS AFFINIS (Dana).

Spherillo affinis DANA, Proc. Acad. Nat. Sci. Phila., VII, 1854–55, p. 176.—STIMPSON, Bost. Jour. Nat. Hist., VI, 1857, p. 505.
Armadillo affinis BUDDE-LUND, Crust. Isop. Terrestria, 1885, p. 39.
Cubaris affinis RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 865.

Locality.—California.

Body superficially smooth and uniform; antennæ very finely rather scabrous, the last two articles together (the sixth and seventh) scarcely

[a] Proc. Zool. Soc. London, 1877, p. 666.

shorter than the fifth. The last abdominal segment a little transverse, constricted in the middle. The uropoda wide, not longer than the width at the base, with the inner posterior angle widely excavated, the anterior, posterior, and external sides almost straight and rectangular, the inner anterior angle truncate, the outer anterior angle rounded, posterior branch minute, scarcely projecting. Length, 4½ lines.[a]

CUBARIS ZIGZAG (Dollfus).

Armadillo zigzag DOLLFUS, Proc. Zool. Soc. London, 1896, pp. 394–395.
Cubaris zigzag RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 572.

Locality.—St. Vincent, West Indies. Forest, damp ground under rubbish, 1,000 feet.

"Body convex, smooth. Cephalon: prosepistoma plain, fore edge nearly straight. Eyes small; about 12 ocelli. Antennæ short; first joint of the flagellum twice as short as the second. Pereion: first segment with a slightly perceptible antero-median tubercle; edges hardly raised; coxopodite distinct on the entire length of the edge

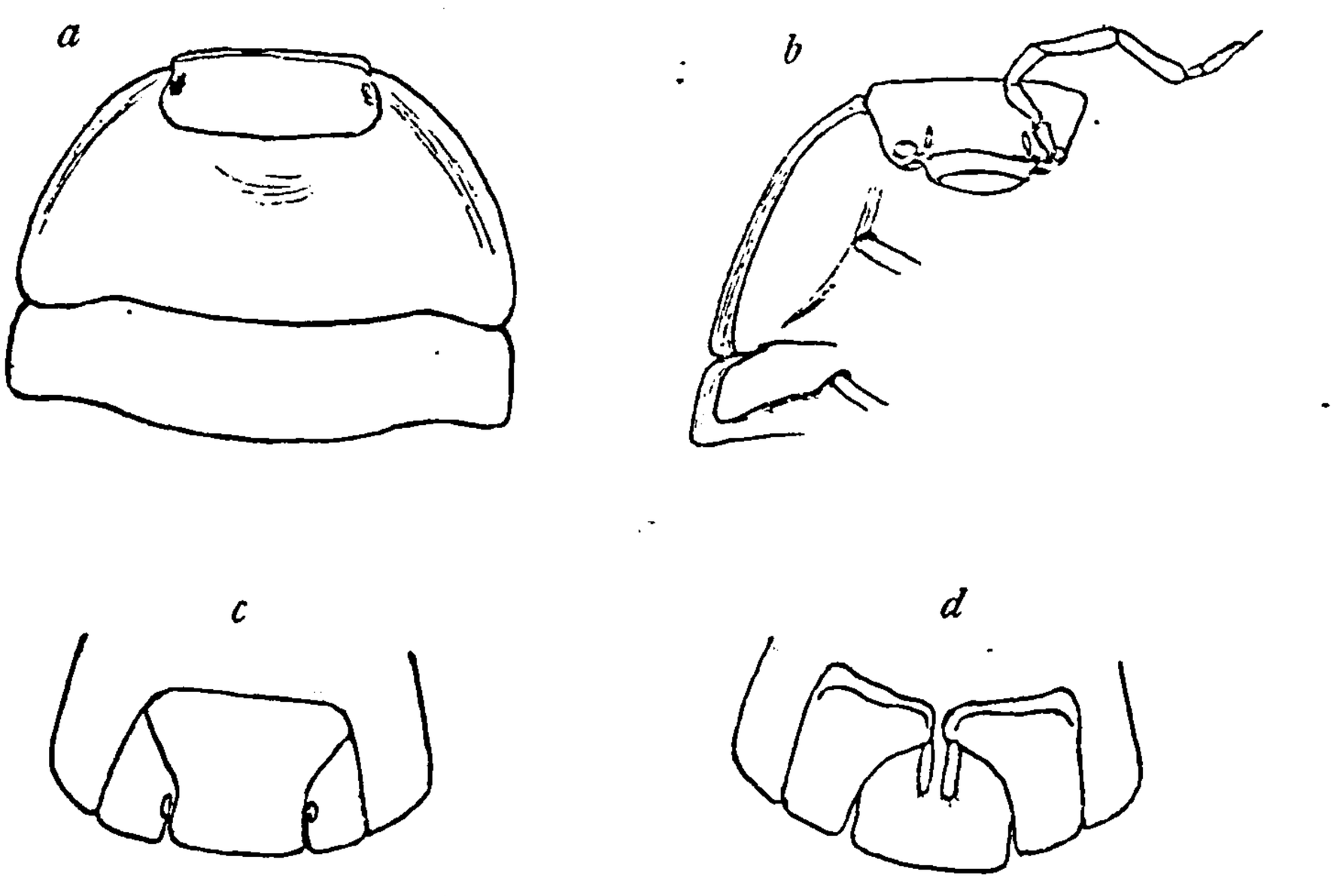


FIG. 692.—CUBARIS ZIGZAG (AFTER DOLLFUS). *a*, HEAD AND FIRST TWO SEGMENTS OF THORAX (UPPERSIDE). *b*, HEAD AND FIRST TWO SEGMENTS OF THORAX (UNDERSIDE). *c*, FIFTH AND SIXTH SEGMENTS OF ABDOMEN AND UROPODA (UPPERSIDE). *d*, THE SAME (UNDERSIDE).

(underside), not divergent. Coxopodite of the second segment narrowly quadrangular. Pleon, telson: pleotelson as wide as long; sides feebly curved; apex with rounded angles, half as wide as the basis. Uropoda: basis oblique, endopodite reaching to one-half the length

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[a] The above description is adapted from the following one of Dana's:

Corpus superficie læve et innotatum. Antennæ subtilissime scabriculæ, articulis duobus ultimis conjunctis (6 to 7 moque) 5to parce brevioribus. Segmentum abdominis ultimum paulo transversum, medio constrictum. Styli caudales lati, latitudine basali non longiores, angulo interno-postiore late excavato, lateribus antico postico et externo fere rectis et inter sese rectangulatis, angulo interno-anteriore truncato, externo-anteriore rotundato, ramo posteriore minuto, parce exserto.—Long. 4½ ///.—DANA, Proc. Acad. Nat. Sci. Phila., VII, 1854–55, p. 176.

of the pleotelson; exopodite minute, placed near the middle of the internal edge of the basis (upperside). Color: yellowish, with a double median and crinkled lateral lines of dark brown; uropoda pale. Dimensions: 4 by 1¾ mm."—DOLLFUS.[a]

CUBARIS DUMORUM (Dollfus).

Armadillo dumorum DOLLFUS, Proc. Zool. Soc. London, 1896, p. 391.
Cubaris dumorum RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 572.

Locality.—Mustique Island, West Indies. Found by beating brush.

"Body very convex, nearly smooth. Cephalon: prosepistoma nearly plain, fore edge straight. Eyes large; about 20 ocelli. Antennæ very short; first joint of flagellum twice as short as the second. Pereion: first segment with a blunt antero-median tubercle; lateral

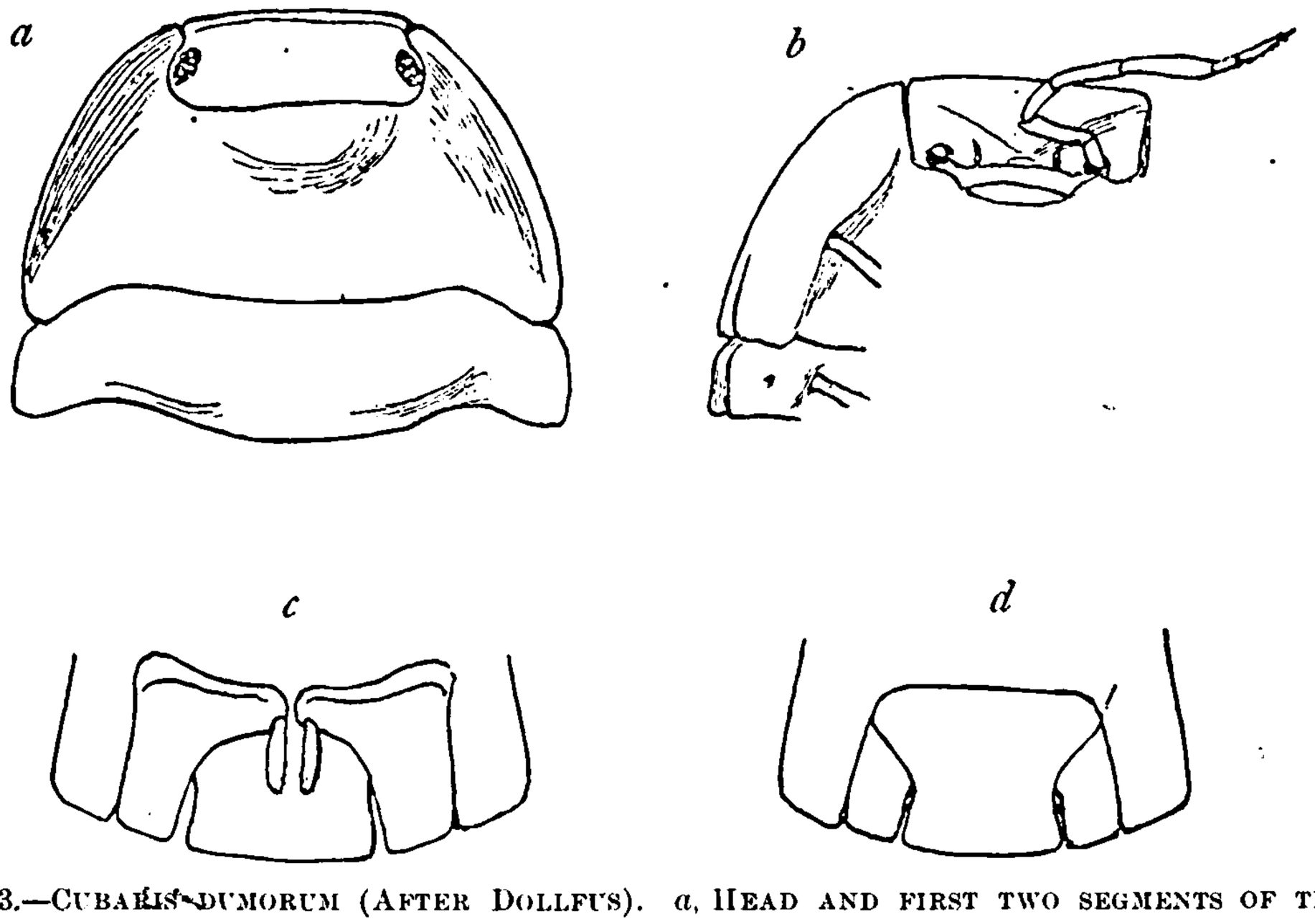

FIG. 693.—CUBARIS DUMORUM (AFTER DOLLFUS). *a*, HEAD AND FIRST TWO SEGMENTS OF THORAX (UPPER SIDE). *b*, THE SAME (UNDERSIDE). *c*, FIFTH AND SIXTH SEGMENTS OF ABDOMEN WITH UROPODA (UPPER SIDE). *d*, THE SAME (UNDERSIDE).

edges raised on the fore part; coxopodite separated by a cleft extending to the third hind part of the segment (underside). Second segment with a square coxopodite, distinct on its total length (underside). Pleon, telson: pleotelson quite as long as wide; sides curved; apex one-third narrower than the basis. Uropoda: basis wide, oblique; endopodite extending to one-third the length of the pleotelson; exopodite very small, placed near the middle of the internal edge of the basis (upperside). Color: dark gray or brown, with light dots and lineolæ on both sides of the median line (pereion). Dimensions: 8 by 3½ mm."—DOLLFUS.[b]

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[a] Proc. Zool. Soc. London, 1896, pp. 394–395.
[b] Idem, p. 391.

CUBARIS GRENADENSIS (Budde-Lund).

Armadillo grenadensis BUDDE-LUND, Entomol. Meddelel., IV, 1893, p. 115.—DOLLFUS, Proc. Zool. Soc. London, 1896, pp. 392–393.
Cubaris grenadensis RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 572.

Localities.—Becquia Island; Grenada; Balthazar, West Indies. Ravine, damp ground, under rotting leaves; 250-feet cocoa orchard, under rotting leaves.

"Body much convex, nearly smooth. Cephalon: prosepistoma slightly convex, fore edge feebly arched in the middle. Eyes rather large; ocelli about 16. Antennæ short; first joint of the flagellum

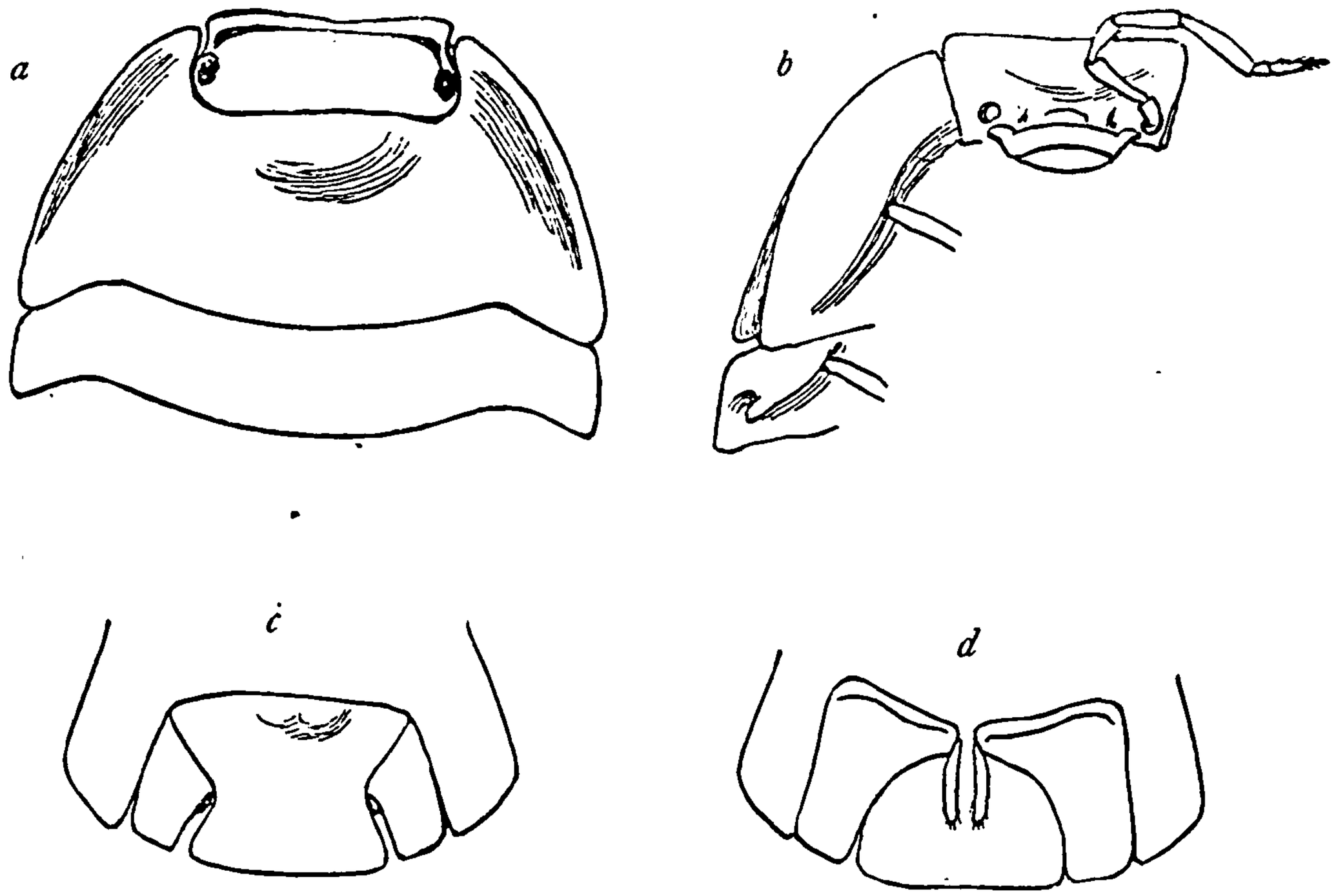

FIG. 694.—CUBARIS GRENADENSIS (AFTER DOLLFUS). *a*. HEAD AND FIRST TWO SEGMENTS OF THORAX (UPPER SIDE). *b*, THE SAME (UNDERSIDE). *c*, FIFTH AND SIXTH SEGMENTS OF ABDOMEN AND UROPODA (UPPER SIDE). *d*, THE SAME (UNDERSIDE).

three times shorter than the second. Pereion: first segment with a blunt antero-median tubercle; lateral edges raised; coxopodite distinct and divergent on the half hind part of the edge (underside). Coxopodite of the second segment forming a toothlike processus. Pleon, telson: pleotelson as wide as long, with a blunt double tubercle near its basis; sides curved; apex nearly as wide as the basis; endopodite reaching to two-thirds the length of the pleotelson; exopodite minute, placed near the middle of the internal edge of the basis. Color: dark gray, with a light median line and light lineolæ on the sides; antennæ whitish. Dimensions: 14 by 6 mm."—DOLLFUS.[a]

[a] Proc. Zool. Soc. London, 1896, pp. 392–393.

CUBARIS DUGESI (Dollfus).

Armadillo dugesi DOLLFUS, Bull. Soc. Zool. France, XXI, 1896, p. 47.

Localities.—Corritos and Morelia, Mexico.

Body narrow, convex, smooth, very finely punctate and setaceous. Head: Prosepistome extending a little beyond the front, especially on the two sides, surface flat; eyes small, about 14 ocelli; flagellum of the antennæ with the first article half as long as the second. Thorax: lateral margin of the first segment elevated along its entire length; antero-median mamelon scarcely visible; coxopodites

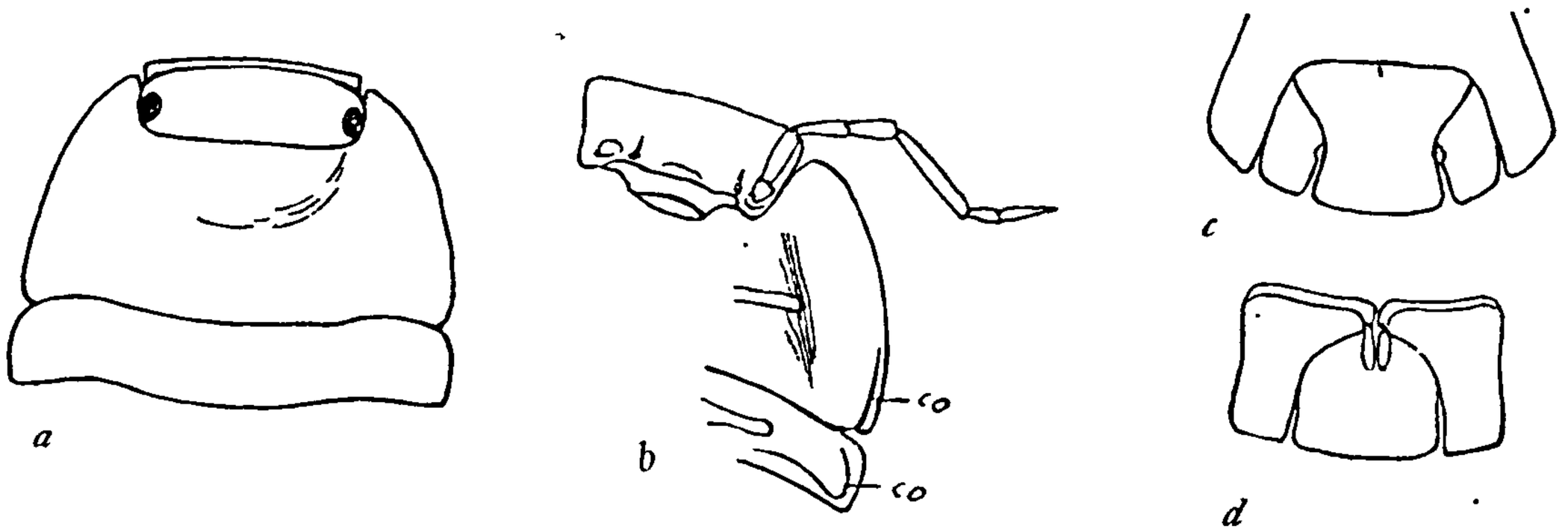

FIG. 695.—CUBARIS DUGESI (AFTER DOLLFUS). *a*, HEAD AND FIRST TWO THORACIC SEGMENTS (DORSAL VIEW). *b*, HEAD WITH ANTENNA AND FIRST TWO SEGMENTS OF THORAX WITH COXOPODITES (*co* AND *co'*) (VENTRAL VIEW). *c*, FIFTH AND SIXTH ABDOMINAL SEGMENTS AND UROPODA (DORSAL VIEW). *d*, SIXTH ABDOMINAL SEGMENT AND UROPODA (VENTRAL VIEW).

distinct only on the posterior third part of the side of the segment, but reaching to the extremity of it. Second segment with the coxopodite very distinct. Pleo , telson: pleotelson as long as wide, with a little relief, followed by an impression, situated near the base; the lateral incurvation well indicated; the apex equal to about three-fourths of the base in size. Uropoda with the basal article a little oblique; the inner branches very small; the outer branches very small, situated about two-thirds of the inner side of the base (superior side). Color uniformly dark gray. Dimensions: Length 8 mm.; width 3½ mm.[a]

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[a] The above description is adapted from the following one of Dollfus's:

Corps étroit, convexe, lisse, très finement ponctué-sétacé. Cephalon: prosépistome dépassant un peu le front, surtout des deux côtés, face plane; yeux petits, environ 14 ocelles; fouet des antennes à premier article deux fois plus court que le second. Pereion: bord latéral du premier segment relevé sur toute sa longueur; mamelon antéro-médian à peine visible; coxopodites distincts seulement sur le tiers postérieur du côté du segment, mais atteignant à l'extrémité de celui-ci. Deuxième segment à coxopodite très distinct. Pleon, telson: pleotelson aussi long que large, avec un petit relief suivi d'une impression, situé près de la base; incurvation latérale bien indiquée; le sommet égal en largeur environ les ¾ de la base. Uropodes à article basilaire peu oblique; endopodites très petits; exopodites minuscules, situés vers les ⅔ du côté interne de la base (face supérieure). Couleur: gris foncé uniforme. Dimensions: longueur, 8 millimètres; largeur, 3½ millimètres.—DOLLFUS, Bull. Soc. Zool. France, XXI, 1896, p. 47.

CUBARIS PISUM (Budde-Lund).

Armadillo pisum BUDDE-LUND, Crust. Isop. Terrestria, 1885, p. 32.
Cubaris pisum RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 572.

Locality.—Florida.

Body oval, very convex, smooth, shining.

Second pair of antennæ a little shorter than half the length of the body, slender; first article of the flagellum one-third as long as the second. Eyes moderately large, with about fifteen ocelli.

Clypeus with the lobes short and widely rounded; epistome with the superior margin curved, hardly extending beyond the front of the head; front and top of the head smooth.

The first segment of the thorax with the lateral margin with a high crest, posteriorly less high and sub-equally cleft, the inner part being a little smaller; the epimera of the second segment cleft, the inner part the smallest. The posterior margins of the segments slightly sinuated on both sides. The terminal segment of the abdomen is a little wider than long, scarcely compressed in the middle, posteriorly truncate, convex above. The basal article of the uropoda is longer than wide, for a short time narrower at the apex; outer branch very small, in the form of a little point, inserted near the apex; inner branch short.

Color, uniformly brown or reddish brown. Length, 4.5 to 5.5 mm. Width, 2.5 to 3 mm.[a]

CUBARIS CALIFORNICA (Budde-Lund).

Armadillo speciosus STUXBERG, Øfversigt af Vetensk. Akad. Forhandl., 1875, No. 2, p. 62.
Armadillo californica BUDDE-LUND, Crust. Isop. Terrestria, 1885, p. 40.
Cubaris californica RICHARDSON, Proc. U. S. Nat. Mus., XXI, 1899, p. 865; Ann. Mag. Nat. Hist. (7), IV, 1899, p. 333; American Naturalist, XXXIV, 1900, p. 305.

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[a] The above description is adapted from the following one of Budde-Lund's:

Ovalis, valde convexus, lævis, glaber, subnitidus.

Antennæ exteriores dimidio corporis paulo breviores, gracilis; flagelli articulus prior altero triplo brevior.

Oculi mediocres; ocelli circiter 15.

Clypeus lobis brevibus, late rotundatis; epistoma margine superiore curvato, frontem vix superante; frons et vertex lævia.

Trunci annulus primus margine laterali altecincto, post minus profunde et subæqualiter fisso, parte interiore paulo minore; epimera annuli secundi fissa, parte interiore minima. Margo posterior annulorum leviter utrinque sinuatus.

Caudæ annulus analis paulo latior quam longior, medio vix coarctato, post recte truncatus, supra convexus. Articulus basalis pedum analium paulo longior quam latior, ad apicem paulisper angustatus; ramus exterior minutissimus, punctiformis, apici proprius insertus; ramus interior brevis.

Color brunneus vel rufobrunneus, uniformis.

Longitudo 4.5–5.5 mm., latitudo 2.5–3 mm.—BUDDE-LUND, Crust. Isop. Terrestria, 1885, p. 32.

Localities.—California at San Francisco and San Pedro.

Budde-Lund suggests that this species may be identical with *Cubaris affinis* Dana.

Inasmuch as the specific name *speciosus* is applied by Dana to another species of *Cubaris*, Budde-Lund suggests for this form the specific name *californica*.

Body ovate, very convex, smooth and shining. Second antennæ with the second article three times longer than the first, the fifth article straight, cylindrical, very long; flagellum with the articles unequal in length, the first one one-fourth as long as the second. The first four segments of the thorax with the posterior margin slightly sinuate on both sides, the three last segments very slightly sinuate. The epimera are moderately large, with the anterior angles obliquely truncate, the posterior angles of the first segment straight, roundly rectangular, with the margin sulcate; those of the second, third, fourth, and fifth segments gradually less widely rounded; those of the sixth and seventh straight, rounded. The last segment of the abdomen by no means equal in width to the length. Color of the dorsal surface gray, with a median line and a lateral series of large light spots on the epimera of the segments of the body. Head very thickly spotted with light spots. Abdomen gray, with the third segment bipunctate. Length 5.5 mm.; width 3 mm.[a]

117. Genus PSEUDARMADILLO Saussure.

Frontal margin of head produced in three processes, one median and two lateral. Second pair of antennæ with the flagellum composed of two articles, the first one of which is much shorter than the second. Coxopodites present on the under side of the first two segments of the thorax. Terminal segment of the body triangular in shape, with the apex produced in a truncate process. Basal article of uropoda large, filling the space between the lateral parts of the fifth abdominal and the terminal abdominal segments and continuing the oval outline of

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[a]The above description is adapted from the following one of Stuxberg's:

Armadillo ovalis, valde convexus, lævis, subnitidus.

Antennæ exteriores articulo secundo triplo longiore quam primo, quinto recto, cylindrico, longissimo, flagelli articulis inæqualibus, interiore quadruplo breviore quam exteriore.

Trunci segmenta quattuor priora margine postico utrinque leviter, posteriora tria levissime sinuata. Epimera mediocria, angulis anticis oblique truncatis, angulis posticis primi segmenti subrectis, rotundate-rectangulis, margine sulcatis, secundi, tertii, quarti, quinti minus minusque late rotundatis, sexti et septimi subrectis, rotundatis.

Caudæ segmentum ultimum latitudine minima longitudinem assequente.

Color dorsi griseus, linea mediana serieque macularum majorum laterali et epimeris segmentorum trunci pallidioribus. Caput creberrime pallide punctulatum. Cauda grisea, segmento tertio bipunctato. Longitudo 5.5 mm., latitudo 3 mm.—STUXBERG, Øfversigt af Vetensk. Akad. Forhandl., 1875, No. 2, p. 62.

the body. The outer branch is minute and is placed at the inner posterior angle of the basal article. The inner branch is only visible from a ventral view, and extends the length of the basal segment on the under side, being attached to the upper inner angle.

The first two segments of the thorax have the epimera posteriorly cleft.

ANALYTICAL KEY TO THE SPECIES OF THE GENUS PSEUDARMADILLO.

a. Thorax armed with two longitudinal rows of long spines. Fifth abdominal segment armed with a long stout spine.....*Pseudarmadillo gillianus* Richardson

a′. Thorax not armed with two longitudinal rows of long stout spines. Fifth abdominal segment not armed with a long stout spine.

b. Coxopodites of the first thoracic segment ending in a bifurcate process. Two tubercles present in longitudinal series in the median line on the sixth abdominal segment. Tubercle on the fifth thoracic segment largest.

Pseudarmadillo dollfusi, new species

b′. Coxopodites of the first thoracic segment not ending in a bifurcate process. One tubercle only present in the median line of the sixth abdominal segment. Tubercle of the sixth abdominal segment largest.

Pseudarmadillo carinulatus Saussure [a]

PSEUDARMADILLO GILLIANUS Richardson.

Pseudarmadillo gillianus RICHARDSON, Proc. U. S. Nat. Mus., XXV, 1902, pp. 509–511..

Locality.—Isla de Pinos.

Body strongly and thickly tuberculate. The thorax is armed with two longitudinal rows of long stout spines, each row being halfway between the median line and the lateral margin. On the seventh thoracic segment, however, the spines are closer together and are much longer. A long median spine is present on the fifth abdominal segment.

The head has the anterior margin produced in three lobes, a median lobe, which is broad and roundly truncate, and two lateral lobes, broadly rounded. The posterior portion of the head bears four prominent tubercles in a transverse series, the two outer ones being much larger and stouter, with broad bases. The eyes are black and distinct and are situated post-laterally. The antennæ reach the middle of the first thoracic segment; the flagellum is two-jointed, the proximal joint being three or four times shorter than the distal one.

The first thoracic segment is covered with small tubercles, except at the sides. The posterior portion of the lateral part of the segment is produced backward a little, the post-lateral angulation being rounded.

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[a] In redescribing *Pseudarmadillo carinulatus* Saussure, Budde-Lund says there is a single median tubercle on the 4–5–6 abdominal segments, all large. He does not mention the presence of one on the third abdominal segment, although Saussure says there is one on each segment following the first two. In describing the epimera of the first thoracic segment Budde-Lund does not say that they terminate on each side in a bifurcate process.

The lateral border is curved upward, forming a slight concavity. On either side of the segment halfway between the median line and the lateral margin, and on the posterior part of the segment, is a long stout spine, directed backward. The coxopodites are distinct the entire length of the first segment on the under side and each is in the form of a ridge, ending in a bifurcate tooth-like process. The second thoracic segment has the coxopodites of the under side in the form of tooth-like processes. The lateral spines of the second, third, fourth, fifth, and sixth segments form two longitudinal series, one on either side of the median line, halfway between that and the lateral margin, and in line with those of the first segment. The spines of the seventh thoracic segment are, however, much closer together and are also much longer. The seventh segment is produced backward about the center, so that it is longer at that point than at the sides. The lateral portions of the second, third, fourth, and fifth segments are drawn out in narrow rounded processes, slightly curving upward at their extremities. The sixth and seventh segments have the lateral portions drawn out in processes which are somewhat truncate at their extremities. All these segments are thickly tuberculate except at the sides and on the anterior portion, where the segment articulates with the one immediately anterior to it.

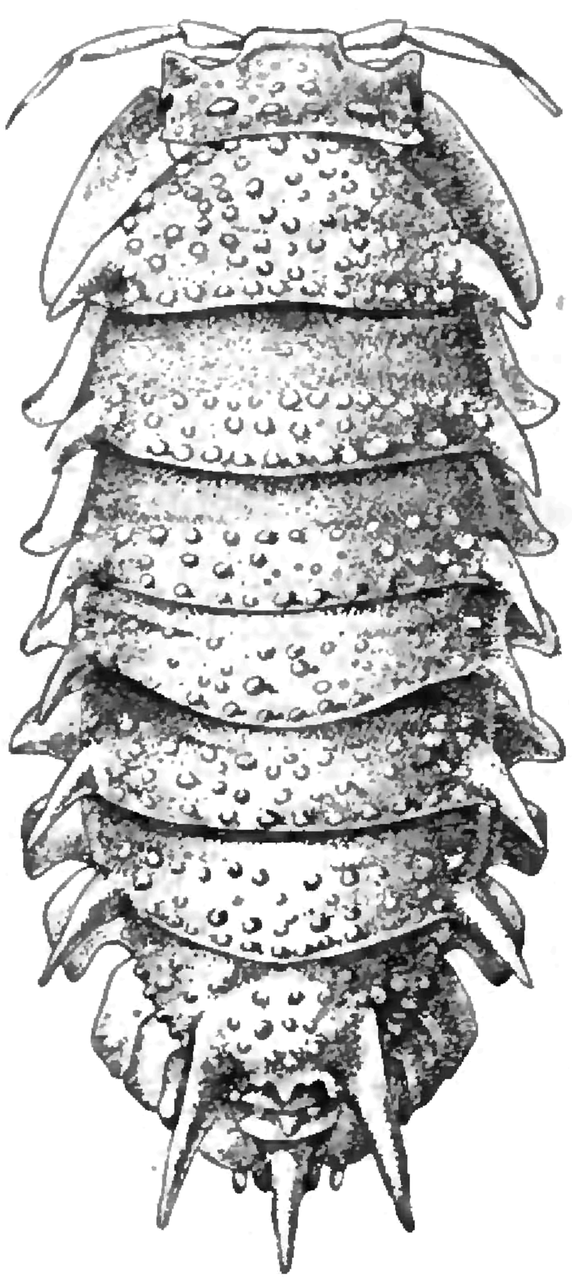

FIG. 696.—PSEUDARMADILLO GILLIANUS. × 5.

The first two segments of the abdomen are concealed by the last thoracic segment. All the abdominal segments are tuberculate. One tubercle in the median line of the third segment is somewhat enlarged and more prominent than the others. One tubercle in the median line of the fourth segment is slightly more enlarged than the tubercle of the preceding segment. A long stout spine directed backward is present on the fifth abdominal segment in the median line. At the base of the terminal segment is a large prominent tubercle, very much larger than those of the third and fourth abdominal segments. The terminal segment is triangularly shaped, with the apex produced in a truncate process. The basal segment of the uropoda, seen from the dorsal side, is large, wider at the base than at the apex, filling the space between the lateral process of the fifth abdominal and the terminal abdominal segments, and continuing the oval outline of the body. The outer branch is very small and is inserted at the posterior angle of the basal joint. The basal joint, seen from the under side, is

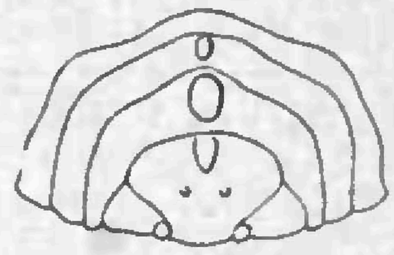

FIG. 697.—PSEUDARMADILLO GILLIANUS. ABDOMEN. × 5.

very large, triangular in shape, the basal joint of either uropod meeting in the median line at the upper inner angle. From this angle the inner branches of the uropoda extend in the form of narrow elongate processes, broader at the apex than at the base and not quite reaching the posterior extremity of the terminal abdominal segment.

A single specimen, a female, was collected by Messrs. Palmer and Riley in Nueva Gerona, Isla de Pinos, Cuba, July 10, 1900.

Type.—Cat. No. 25694, U.S.N.M.

FIG. 698.—PSEUDARMADILLO GILLIANUS. LATERAL VIEW OF ABDOMEN. × 5.

This species differs from the type species of the genus, *Pseudarmadillo carinulatus* Saussure,[a] in the presence of two longitudinal rows of long stout spines on the thorax, a row on either side of the median line halfway between that and the lateral margin, while in the description of *P. carinulatus* only two tubercles (not spines) are mentioned as being present on the thorax, the last thoracic segment alone being armed with two large triangularly shaped (triquètres) tubercles; in the absence of the longitudinal carinæ, mentioned in the description of *P. carinulatus* as being present on the lateral parts of the thoracic segments and the third abdominal segment; in the presence of a large spine on the fifth abdominal segment in the median line, which is represented in *P. carinulatus* by a strong tubercle, and in the presence of eyes, which are wholly wanting in *P. carinulatus*.[b]

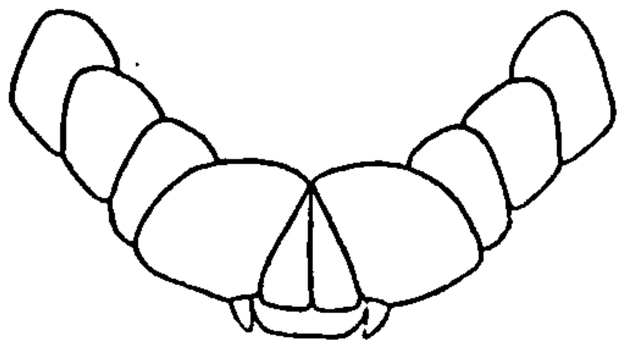

FIG. 699.—PSEUDARMADILLO GILLIANUS. ABDOMEN AND UROPODA (UNDERSIDE). × 9½.

Named for Dr. Theodore Gill, the eminent naturalist.

PSEUDARMADILLO DOLLFUSI, new species.

Body ovate, about twice as long as wide, 5 mm. : 10 mm.

Head two and a half times wider than long, 1 mm. : 2½ mm., with the anterior margin produced into three lobes, one median lobe, which is truncate and broad, and two smaller lateral lobes, which are rounded. The eyes are small, round, composite, and distinct, and situated close to the lateral margins. The head is covered with tubercles, of which there is a prominent line on the posterior margin. The first pair of antennæ are inconspicuous; the second pair have the first article short, the second twice as long as the first; the third and fourth are subequal and each is a little shorter than the second; the fifth is nearly twice as long as the fourth. The flagellum is composed of two articles, the first of which is one-third as long as the second.

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[a] Mém. de la Soc. de Physique et d'Histoire Naturelle de Genève, XIV, 1858, p. 483–485, pl. v, fig. 43.

[b] Budde-Lund says that *Pseudarmadillo carinulatus* has eyes, and that Saussure was in error when he described the species as being without eyes.

The first thoracic segment is nearly twice as long as the second, and is densely and thickly covered with tubercles, except on the lateral parts, which are produced backward in rounded expansions. The following five segments are subequal and densely covered with tubercles. The seventh segment is a little longer than any of the preceding five segments and has two tubercles, a little larger than any of the other numerous tubercles on its surface, situated on the posterior margin, one on either side of the median line. The coxopodites are not evident from above on any of the segments. On the first two they are present on the under side, being represented in the first segment by a longitudinal raised carina or ridge extending the full length of the segment and terminating in a bifurcate process. On the second segment the coxopodites are also in the form of raised carinæ or ridges extending the length of the segment. In the second, third, and fourth segments the lateral margins of the segments are drawn out in narrow processes terminating laterally in rounded extremities. The lateral margins of the last three segments are straight. There is one tubercle on either side of each segment on the posterior margin about halfway between the median line and the lateral margin, which is a little larger than any of the others, those of the sixth segment being most prominent. A faintly raised line crosses transversely the lateral parts of all the segments, with the exception of the first, about the middle.

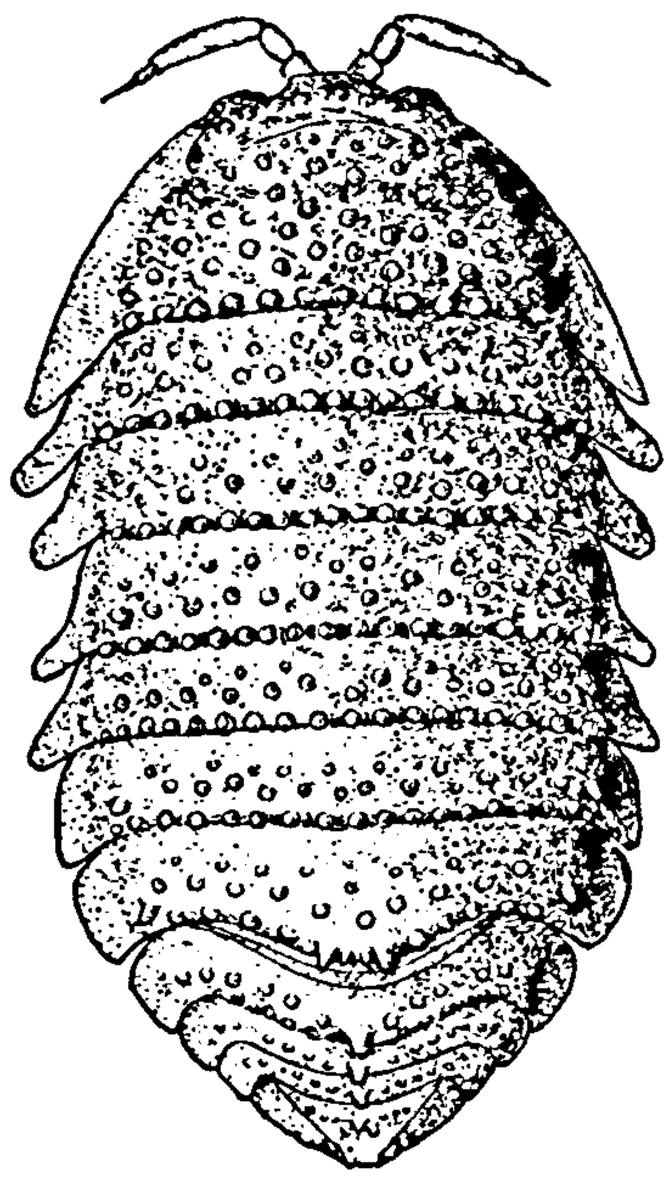

FIG. 700.—PSEUDARMADILLO DOLLFUSI. × 7.

The abdomen is composed of six segments, the first two of which are smooth and short, and covered laterally by the seventh thoracic segment. The third, fourth, and fifth segments are subequal and are covered with tubercles, on each of which is a larger and more conspicuous tubercle in the median line, the tubercles in the series increasing in size from the first to the last, and compressed laterally, and in a lateral view having the upper surface rounded. The terminal segment is triangular, with the apex produced in a truncate extremity. There are numerous tubercles on its dorsal surface, one in the median line being larger than the others; it is as large as the median tubercle on the fourth segment. Posterior to it are two small tubercles, one on either side of the median line. The peduncle of the uropoda is in the form of a large plate, almost rectangular when seen from below, but from a dorsal view being long and narrow and lying close to the terminal abdominal segment and continuing the oval outline of the body. It reaches almost to the extremity of the terminal abdominal segment.

The outer branch is minute and is placed at the inner post-lateral angle of the peduncle. The inner branch can only be seen from the under side, where it is inserted at the upper inner angle of the peduncle, and extends the length of the peduncle, but does not quite reach the extremity of the terminal abdominal segment.

Three specimens of this species were collected by the Bahama expedition, August 1, 1904, at Mangrove Cay, Andros.

This species differs from *P. carinulatus* Saussure in having the

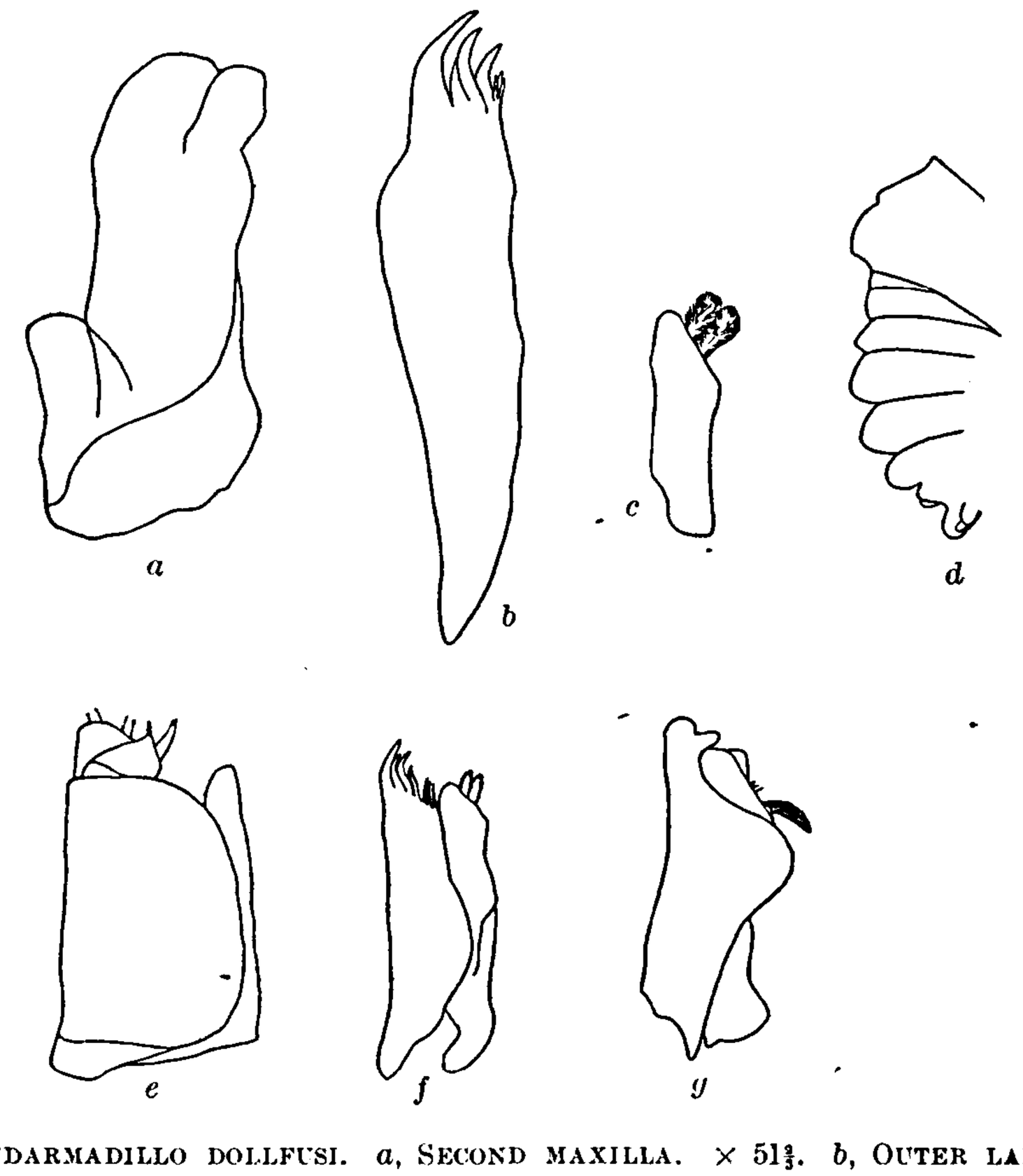

FIG. 701.—PSEUDARMADILLO DOLLFUSI. *a*, SECOND MAXILLA. × 51⅔. *b*, OUTER LAMELLA OF FIRST MAXILLA. × 51⅔. *c*, INNER LAMELLA OF FIRST MAXILLA. × 51⅔. *d*, LATERAL VIEW OF ABDOMEN AND LAST THORACIC SEGMENT. × 9⅔. *e*, MAXILLIPED. × 27⅓. *f*, FIRST MAXILLA. 27⅓. *g*, MANDIBLE. × 27⅓.

epimera of the first thoracic segment ending in a bifurcate process, in having in the median line on the terminal abdominal segment one tubercle followed by two in a transverse series instead of one, in having the tubercle on the fifth segment of the abdomen largest, and in not having the tubercles of the seventh thoracic segment "triquetres."

The types are in the Museum of Comparative Zoology at Harvard University. Cat. No. 6731.

This species is named in honor of Prof. Adrien Dollfus, who has done much work on the terrestrial isopods.

PSEUDARMADILLO CARINULATUS Saussure.

Pseudarmadillo carinulatus SAUSSURE, Revue et Magasin de Zoologie (2), IX, 1857, p. 308; Mém. de la Soc. de Physique et d'Hist. nat. de Genève, XIV, 1858, Pt. 2, p. 483, pl. v, figs. 43–43a.—BUDDE-LUND, Crust. Isop. Terrestria, 1885, pp. 41–42.—RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 572.

Locality.—Mexico or Cuba.

Body rugose, tuberculated; the last segment of the thorax strongly tuberculated; abdomen ornamented with a median series of tubercles.

Inferior margin of the head forming three rounded lobes, projecting in front, the median one of which is the largest and a little more in advance of the lateral ones, which are obliquely directed. The uropods are rather deformed. Their second article, seen from below, presents near the base a kind of transverse ridge; it becomes larger toward the end and terminates in a large border, the two extremities of which are rounded instead of forming angles. The inner margin of this article is thickened, in such a way as to offer a small surface somewhat excavated, and separated from the inner surface by a prominent, distorted ridge. At the base of this surface one sees a little lamella attached to it, which is probably the inner branch of the uropoda. Above, the second article appears in the form of a band, which is placed along the lateral margin of the segment; this band is a little distorted and elevated above, especially at its anterior extremity, where it is also a little larger; at its posterior extremity it forms an angle, which is the inner angle of the margin of the uropoda, to which is articulated the third article, which is very small. The last abdominal segment is in the form of a truncated triangle, not extending beyond the extremity of the uropoda, and which is separated from them a little; its lateral margins are not straight, but a little sinuated. The body is very rough, all covered with little tubercles, rugose. The head is bordered anteriorly with a transverse elevation furnished with a line of tubercles. The first thoracic segment is all covered with rugosities, except at the sides, which are produced backward in the form of a large rounded process, the inferior margin of which is elevated in such a way as to form a concave surface. The other segments are entirely rugose, except on the anterior half, which is smooth for articulation; their inferior extremities are produced backward in the form of narrow processes, a little elevated, less rugose, and carrying above a projecting longitudinal line, which is still to be seen on the third

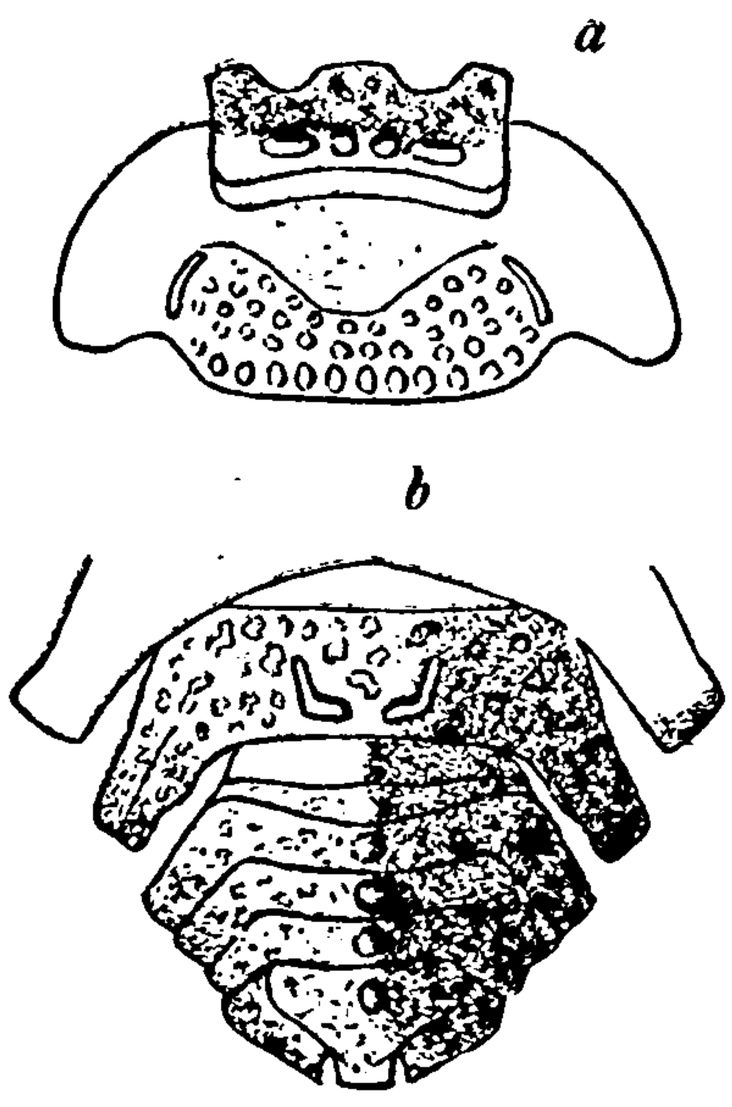

FIG. 702.—PSEUDARMADILLO CARINULATUS (AFTER SAUSSURE). *a*, HEAD AND FIRST SEGMENT OF THORAX. *b*, ABDOMEN AND UROPODA. (ENLARGED.)

abdominal segment. The last thoracic segment is armed above with two large tubercles "triquètres," directed backward. The abdomen is rugose and made in the form of a roof; the first two segments are incompletely visible; the following ones are all armed in the middle with a strong tubercle, the last of which, placed at the base of the terminal segment, is the largest. Color, a uniform grayish-brown. Length, 0.010 m.[a]

118. Genus SPHÆRONISCUS Gerstæcker.

First pair of antennæ very small, inconspicuous, composed of three articles. Second pair of antennæ short; flagellum composed of three articles.

Eyes small, composite, composed of about ten ocelli. Clypeus straight, not lobate. Epistome flat, forming a continuous frontal marginal line. Vertical marginal line reaching the frontal margin.

First segment of the thorax usually with the epimera posteriorly cleft.

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[a] The above description is adapted from the following one of Saussure's:

Rugosus, tuberculatus; thoracis segmentum ultimum valde bituberculatum; abdomen serie mediana tuberculorum ornatum.

Bord inférieur de la tête formant trois lobes arrondis, saillants en avant, dont le médian est le plus large et un peu plus avancé que les latéraux, lesquels sont dirigés obliquement. Dernières fausses-pattes abdominales assez difformes. Leur deuxième article vu en dessous, offre, près de la base, une espèce de crête transversale; il s'élargit vers le bout et se termine par un large bord dont les deux extrémités s'arrondissent au lieu de former des angles. Le bord interne de cet article est épais, de façon à offrir une petite face un peu creusée, séparée de la face inférieure par une crête tordue et tranchante. A la base de cette face on voit une petite lame accolée contre elle, qui est probablement l'appendice interne des fausses-pattes. En dessus, le deuxième article apparaît sous la forme d'une bande qui longe le bord latéral du segment; cette bande est un peu tordue et relevée en haut, surtout à son extrémité antérieure, où elle est aussi un peu plus large; à son extrémité postérieure elle forme un angle qui est l'angle interne du bord des fausses-pattes, sur lequel est articulé le troisième article, qui est très-petit. Dernier segment abdominal en forme de triangle tronqué, ne dépassant pas le bout des fausses-pattes lequel s'en écarte un peu; ses bords latéraux n'étant pas droits mais un peu sinués. Corps très-raboteux, tout couvert de petits tubercules rugueux. La tête étant bordée supérieurement par une éminence transversale garnie d'une ligne de tubercules. Premier segment thoracique tout couvert de rugosités sauf sur les côtés, qui sont prolongés en arrière en forme de large apophyse arrondie, et dont les bords inférieurs sont relevés, de façon à former une surface concave. Les autres segments, entièrement rugueux, sauf dans leur moitié antérieure, qui est lisse, pour l'articulation; leurs extrémités inférieures sont prolongées en arrière en forme d'apophyses étroites, un peu relevées, moins rugueuses et portant en dessus une ligne saillante longitudinale, qui se voit encore sur le troisième segment abdominal. Dernier anneau thoracique armé en dessus des deux gros tubercules triquètres, dirigés en arrière. Abdomen rugueux, taillé en forme de toit; ses deux premiers segments incomplétement visibles; les suivants tous armés au milieu d'un fort tubercle, dont le dernier, placé sur la base du segment anal, est le plus grand. Couleur d'un gris-brun uniforme. Longueur, 0.010 m.—Saussure, Mém. de la Soc. de Physique et d'Hist. nat. de Genève, XIV, 1858, Pt. 2, p. 483.

Terminal segment of abdomen very short, usually triangular. Outer branch of all the pleopoda furnished with tracheæ. Uropoda extending beyond the terminal abdominal segment; the basal article large, triangular, entire; the outer branch small, rather slender, inserted at the inner post-lateral angle of the basal article; outer branch long, rather slender, a little compressed.[a]

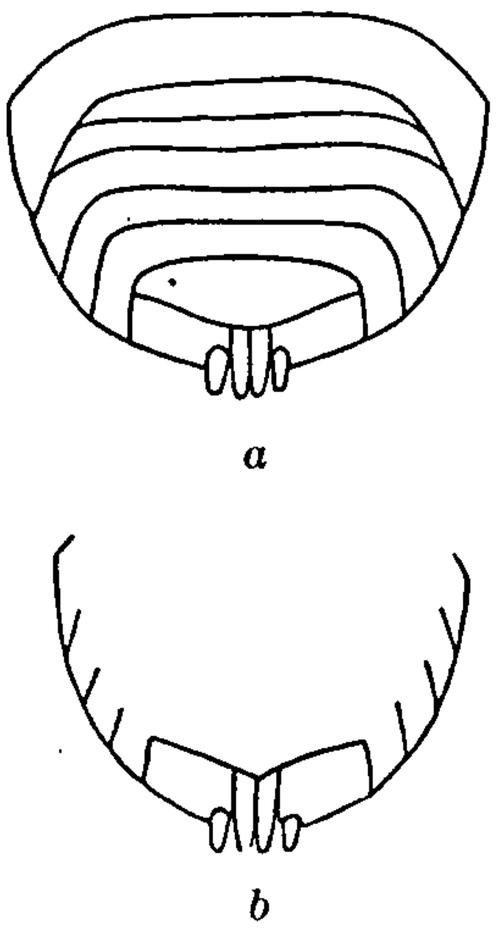

FIG. 703.—SPHÆRONISCUS PORTORICENSIS. *a*, ABDOMEN. *b*. UROPODA (INSIDE).

ANALYTICAL KEY TO THE SPECIES OF THE GENUS SPHÆRONISCUS.

a. Body smooth. Terminal segment of abdomen broad and posteriorly rounded, not constricted. First thoracic segment without distinct coxopodites.

Sphæroniscus portoricensis Richardson

a'. Body covered with little transverse rugæ. Terminal segment of abdomen strongly constricted in the middle and somewhat enlarged toward the outer border. First thoracic segment with a tooth-like lobe on the sides anteriorly (coxopodites?).

Sphæroniscus cacahuamilpensis (Bilimek)

SPHÆRONISCUS PORTORICENSIS Richardson.

Sphæroniscus portoricensis RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 573.

Locality.—El Yunque, Porto Rico, at an altitude of 2,800 feet.

Body oblong, very convex, contractile into a ball. Surface perfectly smooth. Head set in first thoracic segment; front straight; epistoma forming a triangular shield. Eyes very small. Antennæ with flagellum composed of three joints.

First thoracic segment twice as long as head, and longer than any of the other segments. Coxopodites not distinct from segment.

First two abdominal segments with the lateral parts concealed, the three following ones continuing the outline of the body. The terminal segment is twice as broad as long, very short, widely rounded posteriorly. The basal joints of the uropoda are large,

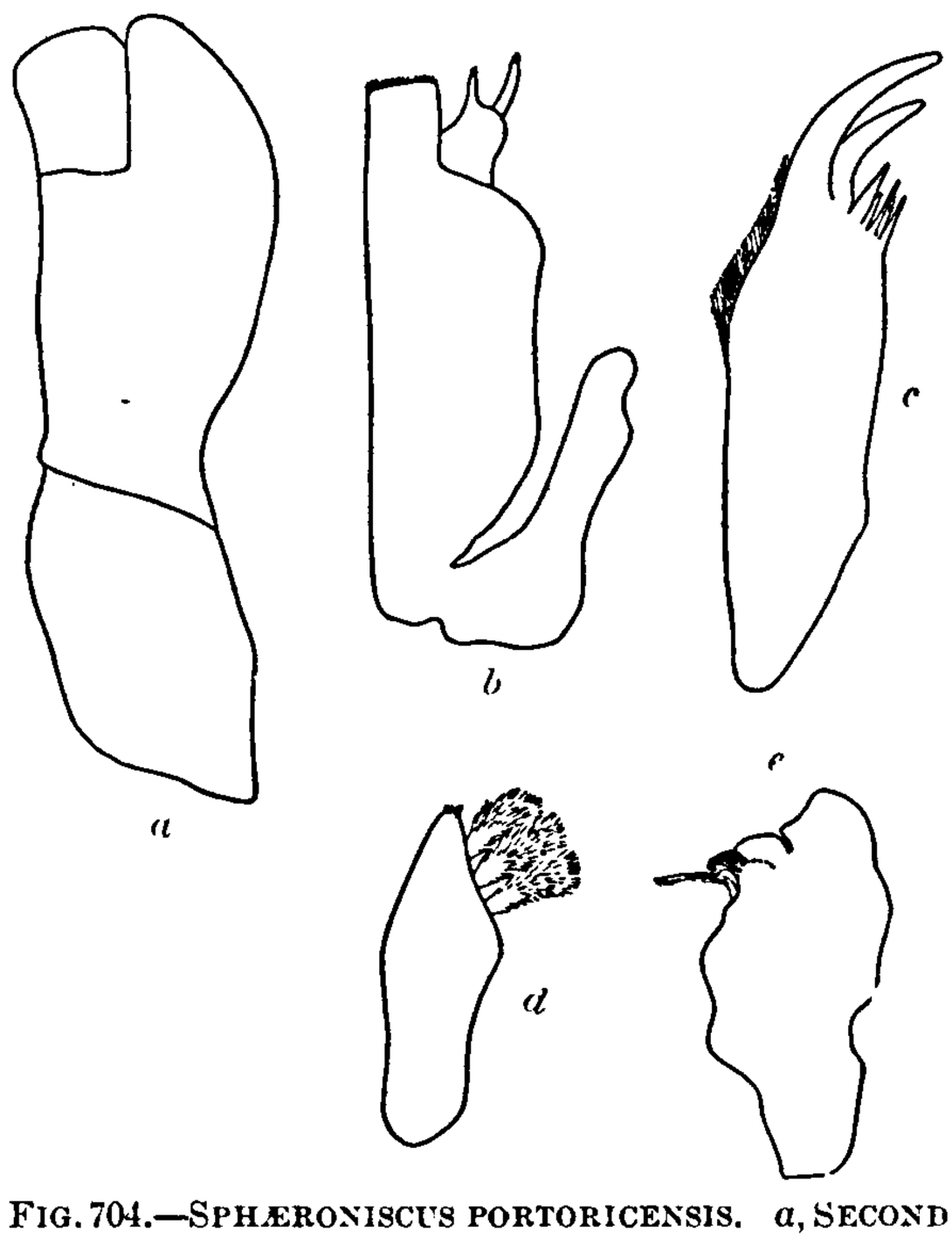

FIG. 704.—SPHÆRONISCUS PORTORICENSIS. *a*, SECOND MAXILLA. × 51⅔. *b*, MAXILLIPED. × 27⅓. *c*, OUTER LAMELLA OF FIRST MAXILLA. × 51⅔. *d*, INNER LAMELLA OF SAME.[b] × 51⅔. *e*, MANDIBLE. × 27⅓.

[a] See Budde-Lund for characters of genus, Crustacea Isopoda Terrestria, 1885, pp. 44–45.

[b] This species differs from all the other Armadillididæ in having the inner lobe of the first maxillæ armed with three plumose processes instead of two. I have examined several specimens and find that they agree in this character.

square, extending the greater part of their length beyond the terminal segment. The external branch is inserted at the inner post-lateral angle of the basal joint and extends downward. The internal branch extends much beyond the last abdominal segment, is longer than the basal joint of the uropoda, and reaches the tip of the external branch.

Color reddish-brown with markings of yellow.

Four specimens were taken by Dr. C. W. Richmond at El Yunque, Porto Rico, at an altitude of 2,800 feet.

Type.—Cat. No. 23914, U.S.N.M.

SPHÆRONISCUS CACAHUAMILPENSIS (Bilimek).

Armadillo cacahuamilpensis BILIMEK, Verh. zool.-bot. Ges. Wien, XVII, 1867, pp. 907–908.—BUDDE-LUND, Crust. Isopoda Terrestria, 1885, p. 40.

Locality.—Cave in Cacahuamilpa, Mexico. Found under stones.

Budde-Lund suggests that this form certainly differs from *Cubaris* because the flagellum of the second antennæ is composed of three articles, according to Bilimek. He suggests that perhaps it is nearer to *Pseudarmadillo*. Inasmuch as the species of *Pseudarmadillo* recently described, and which undoubtedly belong to that genus, have but two articles to the flagellum of the second antennæ, Bilimek's species must be referred to the genus *Sphæroniscus*, which is the only genus of *Armadillididæ* having the flagellum composed of three joints.

Body grayish brown, slightly rugose transversely, head transversely dilated, with the anterior margin raised; first thoracic segment very wide, with a lateral lobe similar to a tooth; last segment of the abdomen strongly constricted in the middle; uropoda narrow, twice as long as wide.

Grayish brown and covered with delicate little transverse rugæ. Head very broad, three times as broad as it is long, anterior border turned up broadly, but diminishing in breadth on the sides under the eyes and especially behind. Antenna 5-jointed, with a 3-jointed flagellum; eyes composed of 14 ocelli. First thoracic segment strongly arched, broadest in the middle, and edged by a delicate border; a tooth-like lobe is formed on the sides anteriorly, in front of which there is found a concave depression; on the back there is a flat transverse depression. Second segment about one-third narrower; the anterior portion is depressed transversely by the overlying anterior segment; the epimeron, which becomes narrower on the sides, is rounded and turned straight downward. Segments 3 to 7 similar, with the exception that the epimera on the side appears to be more bluntly cut off. First abdominal segment quite narrow; it does not reach to the outer edge; second-fourth continue to decrease in breadth and have a horseshoe-shaped appearance; the fifth is bordered with two lateral lobes and is as long as it is broad at the base; it is strongly constricted in the middle and somewhat enlarged toward the outer border. The legs are 5-jointed,

fourth and fifth joint abundantly covered with spines on the inside. The uropoda are thin, twice as long as they are broad; color of feet and antennæ whitish in the dead animal."

119. Genus HAPLARMADILLO Dollfus.

Eyes monocellated. Flagellum of second antennæ composed of a single article. Coxopodites distinct on first thoracic segment. Coxopodites wanting on second segment of thorax.

Terminal segment of abdomen widely triangular.

Basal article of uropoda square, longer than the terminal segment of the abdomen; inner branch as long as the basal article; outer branch minute, inserted at the inner post-lateral angle of the basal article.

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[a] The above description is adapted from the following one of Bilimek's:

Griseo-fuscescens, subtiliter transverse verrucosus; capite transversim dilatato, margine anteriori erecto; primo thoracis segmento latissimo, lobo laterali denti simillimo; abdominis segmento ultimo in medietate valde coarctato; pedibus spuriis angustis, duplo longioribus. Long. 9 mm.; lat. 3½ mm.

Graubräunlich mit feinen Querwärzchen bedeckt. Kopf in die Breite gezogen, 3 mal so breit als lang, Vorderrand breit aufgeworfen, welcher Rand an den Seiten unter den Augen und besonders hinten schwächer wird. Fühler 5-gliedrig mit 3 gliedriger Geissel; Augen aus 14 Punkten zusammengesetzt. 1. Brustkastensegment stark gewölbt, in der Mitte am breitesten, mit einer schwachen Randleiste eingefasst; an den Seiten bildet sich ein zahnartiger Lappen nach vorne zu, vor welchem ein breiter grubenartiger Eindruck vorhanden ist; am Rücken ein flacher Quereindruck. 2. Segment um ⅓ schmäler; die vordere Hälfte der Quere nach eingedrückt von dem darauf sitzenden Vordersegmente; der Lappenfortsatz an den Seiten schmäler werdend, abgerundet, gradaus abwärts gerichtet. 3.–7. Segment von gleicher Beschaffenheit, nur dass der Lappenfortsatz an der Seite immer stumpfer abgestutzt erscheint. 1. Hinterleibssegment ganz schmal, erreicht den Aussenrand nicht; 2.–4. immer schmäler werdend in hufeisenförmiger Gestalt; das 5. mit 2 Seitenlappen eingeschlossen, so lang wie an der Basis breit, in der Mitte stark eingeschnürt und nach dem Aussenrande zu etwas erweitert. Die eigentlichen Füsse 5-gliedrig, das 4. und 5. stark mit Stacheln an der Innenseite besetzt. Afterfüsse schmal, 2 mal so lang als breit; Farbe der Füsse und Fühler im Tode weisslich.

Aufenthalt in der Höhle Cacahuamilpa in Mexico unter Steinen.

Von Pflanzen fand ich einen einzigen Pilz, der auf einer dunklen Unterlage den Rand derselben einfasste, weisslich von Farbe 2–3 mm. gross war; er stand an nassen Stellen auf Kalksinter.—Bilimek, Verhandl. Zool.-Bot. Vereins in Wien, XVII, 1867, pp. 907–908.

HAPLARMADILLO MONOCELLATUS Dollfus.

Haplarmadillo monocellatus DOLLFUS, Proc. Zool. Soc. London, 1896, p. 400.—RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 573.

Locality.—Richmond Valley, St. Vincent, West Indies. Under rotting leaves, 1,100 feet.

"Body convex, smooth, and covered with minute, setose hair. Cephalon: prosepistoma with a shield-like convexity. Eyes monocellate, hardly perceivable. Antennæ very hairy; flagellum single-jointed, with a long, stiff hair at its distal end. Pereion: first segment with a very blunt antero-median tubercle; hind edge nearly straight; sides feebly raised forward; coxopodite distinct on the posterior half of the edge. Second segment with no distinct coxopodite. Pleon, telson: pleotelson widely triangular, much wider than long. Uropoda with a square basis, longer than the pleotelson; endopodite as long as the basis; exopodite minute, placed at the internal distal angle of the basis. Color: dark gray, variegated with lighter lineolæ and irregular stripes. Dimensions: 9 by 4 mm."—DOLLFUS.

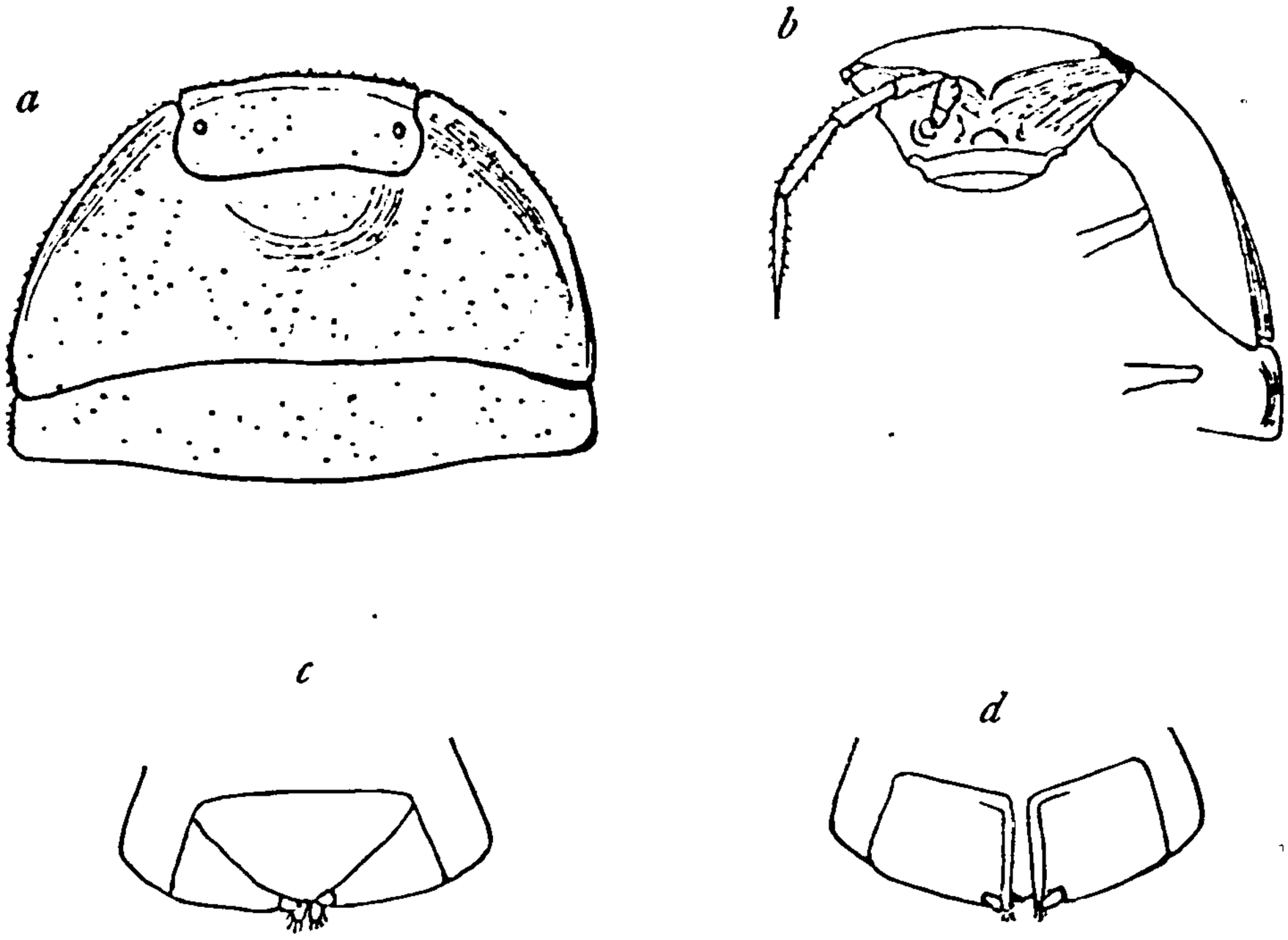


FIG. 705.—HAPLARMADILLO MONOCELLATUS (AFTER DOLLFUS). *a*, HEAD AND FIRST TWO SEGMENTS OF THORAX (UPPER SIDE). *b*, THE SAME (UNDERSIDE). *c*, FIFTH AND SIXTH SEGMENTS OF ABDOMEN (UPPER SIDE). *d*, THE SAME (UNDERSIDE).

120. Genus ARMADILLIDIUM Brandt.[a]

First pair of antennæ very small, inconspicuous. Body oblong, very convex, and contractile into a ball.

Front of head marginate, lateral lobes rounded. Epistome vertical, forming a triangular shield, advancing more or less beyond the frontal

[a] For characters of genus, see Budde-Lund, Crust. Isop. Terrestria, 1885, p. 49, and G. O. Sars, Crust. of Norway, II, 1899, p. 188.

edge. Clypeus very short, with the anterior margin slightly sinuated in the middle, not lobate. Frontal marginal line interrupted in the middle. Vertical marginal line wanting behind the eyes on both sides. Eyes small or moderately large, distinct, lateral, composite. Second pair of antennæ scarcely equal to half the length of the body; flagellum composed of two articles.

First segment of thorax with epimera not cleft posteriorly.

Terminal segment of abdomen quadrangular or triangular in shape, not extending beyond the epimera of the preceding segment.

Opercular plates of the first two pairs of pleopoda furnished with tracheæ.

Uropoda short; basal article broad, obliquely quadrate; outer branch lamellar, flattened; inner branch narrow, cylindrical.

ANALYTICAL KEY TO THE SPECIES OF THE GENUS ARMADILLIDIUM.

a. Head truncate in front, without median emargination, and not surpassed by the epistome. Outer branch of the uropoda posteriorly truncate.

Armadillidium vulgare (Latreille)

a'. Head with a small median V-shaped notch in front, and surpassed by the epistome, which extends some distance in front. Outer branch of the uropoda posteriorly rounded.....*Armadillidium quadrifrons* Stoller

ARMADILLIDIUM VULGARE (Latreille).

Armadillo vulgare Latreille, Hist. Crust., VII, 1804, p. 48; Gen. Crust., I, 1806, p. 71.

Armadillo pilularis Say, Jour. Ac. Nat. Sci. Phila., I, 1818, pp. 432, 433.

Armadillidium commutatum Brandt and Ratzeburg, Med. Zool., II, 1830–1834, p. 81, pl. xiii, figs. 1, 2, 3, A, B.

Armadillo trivialis Koch, Deutschl. Crust., 1835–1844, p. 28.

Armadillo pilularis Gould, Rep. Invert. Mass., 1841, p. 336.—De Kay, Zool. New York, 1844, Pt. 6, Crust., p. 52.

Armadillo ater Schnitzler, De Oniscineis agri Bonnensis, 1853, p. 26.

Armadillidium vulgare Budde-Lund, Crust. Isop. Terrestria, 1885, pp. 66–68 (see Budde-Lund, for synonymy).—Sars, Crust. Norway, II, 1899, pp. 189–190, pl. lxxxii.—Richardson, Amer. Nat., XXXIV, 1900, p. 305; Proc. U. S. Nat. Mus., XXIII, 1901, p. 574.—Chilton, Trans. Linn. Soc. Lond., (2), VIII, Pt. 4, pp. 142–143.—Stoller, 54th Report New York State Museum, 1902, p. 210.—Paulmier, Bull. New York State Museum, 1905, pp. 184–185.

Localities.—Anderson's ferry, Cincinnati, Ohio; Norwood, Ohio; Clifton, Cincinnati, Ohio; Columbus, Ohio; Coney Island, Ohio; Mount Auburn, Cincinnati, Ohio; Redbank, Hamilton County, Ohio; Lexington, Kentucky; Aiken, South Carolina; Harrington Sound, Bermudas; Hamilton, Bermudas; Washington, District of Columbia; Syracuse, New York; Bay Shore, Long Island; Salem, Massachusetts; Charlestown, South Carolina; Providence, Rhode Island; Canton, Mississippi; New Orleans, Louisiana; Lexington, Kentucky; Woodside, Maryland; Fayal, Azores; Orleans villa, Algeria; world-wide in distribution.

Found on floating seaweed; in moist meadows; under stones; in cellars; under boards in damp soil; in hothouses; under rocks.

In New Orleans, Louisiana, this species is reported to be a menace to cucumbers and other vegetables grown in hothouses.

It is also said to be injurious to various plants in Fort Worth,

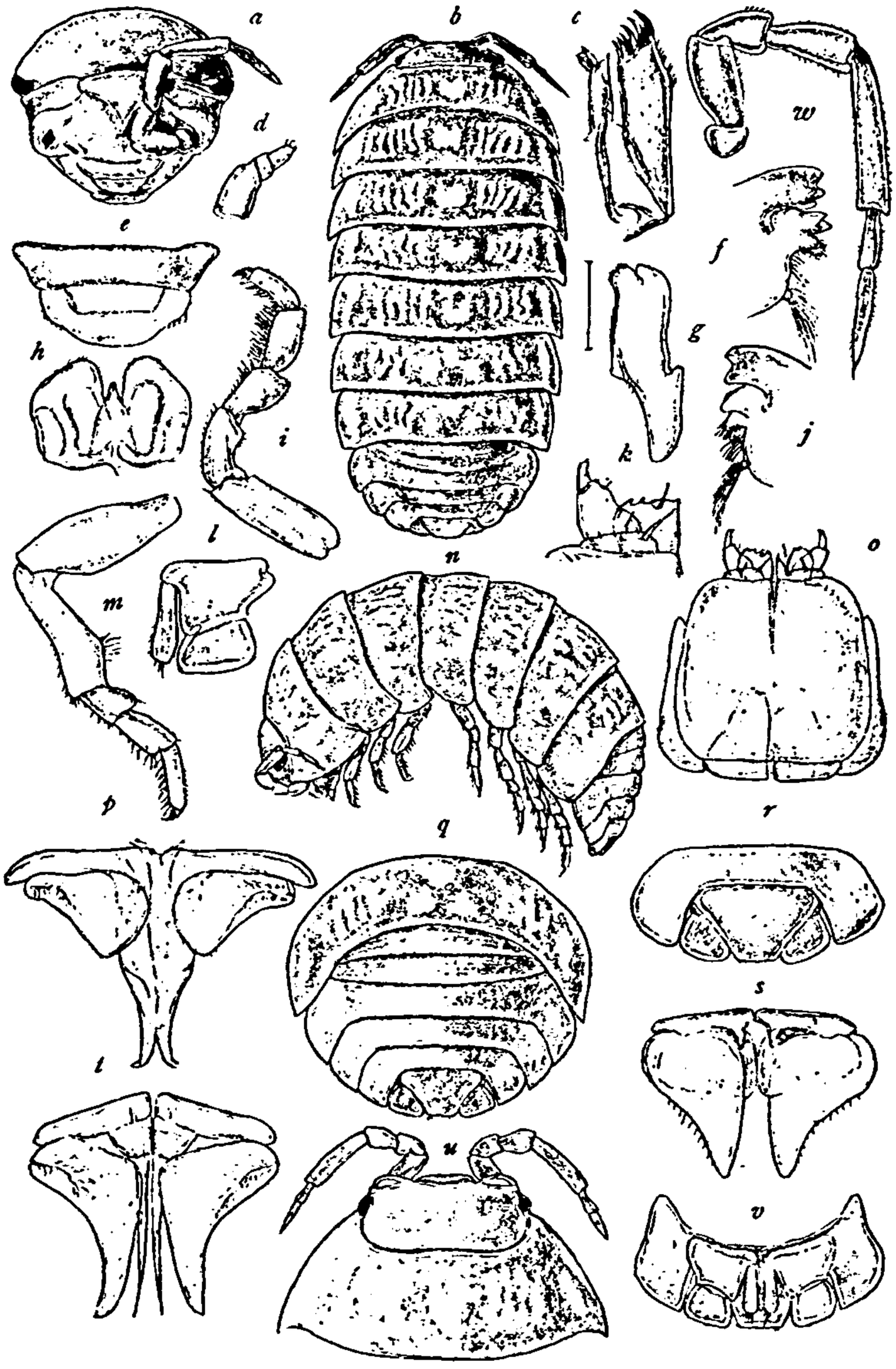


FIG. 706.—ARMADILLIDIUM VULGARE (AFTER SARS). *a*, HEAD WITH ANTENNÆ (VENTRAL VIEW). *b*, DORSAL VIEW OF FEMALE. *c*, FIRST MAXILLA. *d*, FIRST ANTENNA. *e*, ANTERIOR LIP. *f*, RIGHT MANDIBLE. *g*, SECOND MAXILLA. *h*, POSTERIOR LIP. *i*, FIRST LEG. *j*, LEFT MANDIBLE. *k*, TIP OF MAXILLIPED. *l*, UROPOD. *m*, SEVENTH LEG. *n*, LATERAL VIEW OF FEMALE. *o*, MAXILLIPEDS. *p*, FIRST PLEOPOD OF MALE. *q*, ABDOMEN WITH UROPODA. *r*, LAST TWO SEGMENTS OF ABDOMEN WITH UROPODA. *s*, THIRD PLEOPOD OF MALE. *t*, SECOND PLEOPOD OF MALE. *u*, HEAD WITH ANTENNÆ (DORSAL VIEW). *v*, ABDOMEN WITH UROPODA (VENTRAL SIDE). *w*, SECOND ANTENNA.

Texas; found on date palms, imported from Algeria, at the Department of Agriculture, Washington, District of Columbia.

Also found injuring young cotton near Dallas, Texas.

At Berkley, Virginia, it is reported to be one of the most destructive pests with which the mushroom grower has to deal.

Body oblong-ovate, rather convex, and able to be rolled up into a ball; twice as long as wide; 8 mm.: 16 mm.

Head much wider than long, 1½ mm.: 4 mm., with the front straight. Epistome projects but little beyond the frontal margin The eyes are small, round, composite, and situated in the antero-lateral angles of the head. The first pair of antennæ are rudimentary and inconspicuous and are composed of three articles. The second pair of antennæ have the first article short; the second is about four times as long as the first; the third is about half as long as the second; the fourth is one and a half times longer than the third; the fifth is twice as long as the fourth. The flagellum is composed of two nearly equal articles. The second antennæ extend to the posterior margin of the first thoracic segment. The maxillipeds have a palp of three articles. The palp of the mandibles is wanting.

The segments of the thorax are subequal, each being 2 mm. in length. There are no epimera separated off on any of the segments.

The abdomen is as wide as the thorax. The first two segments are covered at the sides by the seventh thoracic segment. The sixth or terminal segment is 2 mm. wide at the base and 1½ mm. long. It tapers to a truncate extremity, which is 1 mm. wide. The uropoda are not longer than the terminal segment of the body. The peduncle is not visible in a dorsal view. The outer branch is broad and fills in the space between the sixth abdominal segment and the lateral part of the fifth segment; it is truncate at its posterior extremity. The inner branch is narrow and elongate, but does not extend beyond the extremity of the abdomen.

All the legs are ambulatory.

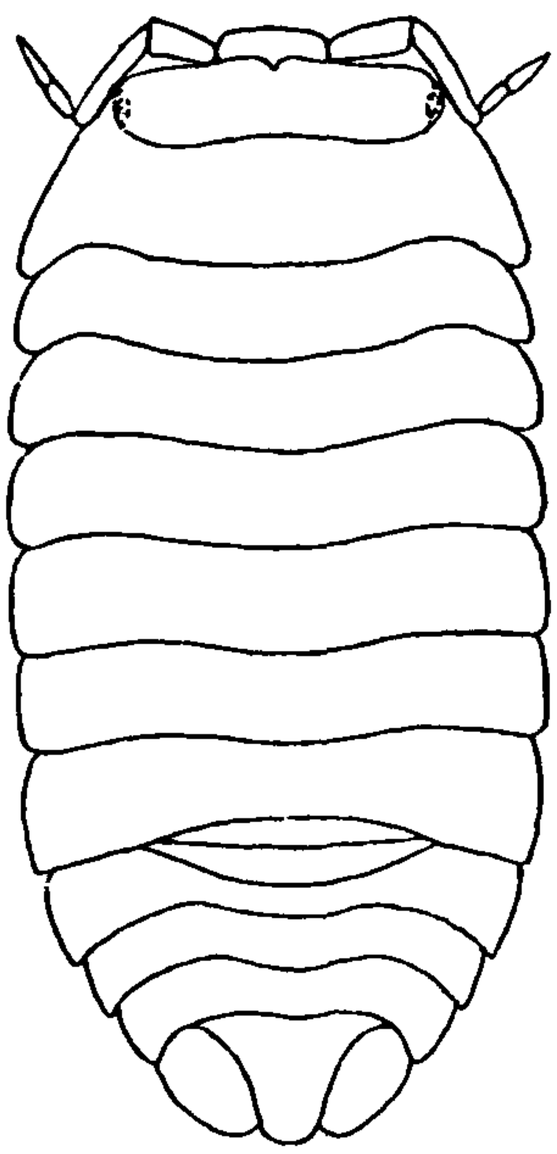


FIG. 707.—ARMADILLIDIUM QUADRIFRONS (AFTER STOLLER). × 5½.

ARMADILLIDIUM QUADRIFRONS Stoller.

Armadillidium quadrifrons STOLLER, 54th Report of the New York State Museum, 1902, pp. 211–212.

Locality.—Schenectady, New York. Found in greenhouses.

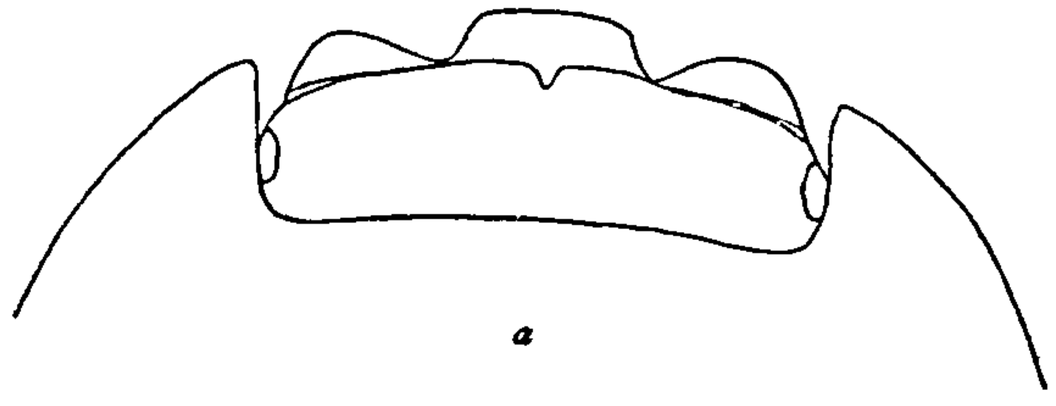
Body ovate, contractile into a ball; nearly twice as long as wide, 5 mm.: 9 mm.

Head nearly three times as wide as long, with a small, median V-shaped notch. The epistome is triangular in shape; the broad, basal part being anterior and projecting in front of the head, giving the head the appearance of having a broad, quadrate median lobe. The eyes are small, composite, and situated in the antero-lateral angles. A groove separates the antero-lateral margin of the head from the antennal lobe, which is large and conspicuous and well rounded. In this groove the antennæ lie. The first pair of antennæ are small and inconspicuous. The second pair have the first article short; the second is twice as long as the first; the third is a little shorter than

the second; the fourth is equal in length to the second; the fifth is twice as long as the fourth. The flagellum is composed of two long, subequal articles. The second antennæ extend to the posterior margin of the first thoracic segment.

The first segment of the thorax is a little longer than any of the following segments, and has the antero-lateral angles produced forward to surround the head, and the post-lateral angles produced backward. The epimera are not distinct in any of the segments.

The first two segments of the abdomen have the lateral parts covered by the seventh thoracic segment. The three following segments continue the oval outline of the body. The sixth or terminal segment is sub-triangular, with sides a little concave and apex rounded. The basal segment or peduncle of the uropoda is not visible in a dorsal view. It is large and somewhat quadrate. The outer branch occupies all the space between the lateral part of the fifth abdominal segment and the terminal abdominal segment. The outer branch is broad posteriorly and well rounded. The inner branch extends to the extremity of the outer branch and to the extremity of the abdomen.



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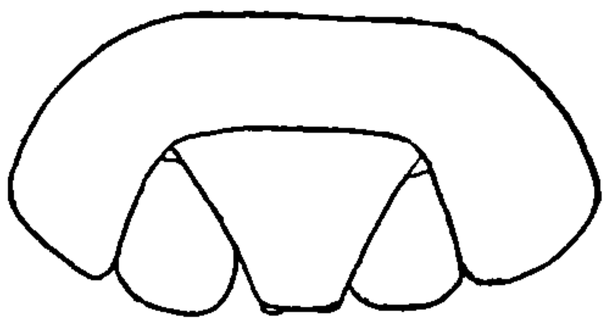

b

FIG. 708.—ARMADILLIDIUM QUADRIFRONS. *a*, HEAD. × 14½. *b*, LAST TWO SEGMENTS OF ABDOMEN WITH UROPODA. × 14½.

All the legs are ambulatory in character.

121. Genus UROPODIAS Richardson.

Head with the front produced in a prominent rounded lobe. Eyes small, obscure. External antennæ, with a flagellum of two joints, the second joint the smaller of the two.

First six thoracic segments with the lateral parts lamellarly expanded. Seventh segment as long as the six preceding segments, but with the lateral parts undeveloped, and not wider than the first two abdominal segments, which likewise have the lateral parts or epimeral plates undeveloped.

Abdomen not narrower than the thorax, the lateral parts of the third, fourth, and fifth segments being expanded and continuing the regular outline of the body. The abdominal segments equal in length and half as long as the thoracic segments. Terminal segment quadrangular in shape, the posterior margin produced in a medium

rounded lobe. The outer branch of the uropoda is large, broad, flattened, with rounded margins; the inner branch is smaller and narrower, and rounded posteriorly.

There are only six pairs of legs, the appendages of the last thoracic segment being wanting.

UROPODIAS BERMUDENSIS Richardson.

Uropodias bermudensis RICHARDSON, Trans. Conn. Acad. Sciences, XI, 1902, pp. 304–305, pl. XL, figs. 59–60.

Locality.—Castle Harbor, Bermudas, under stones in dry places.

Body very convex, able to be contracted into a ball. Surface smooth. Color uniformly light brown.

Head large, produced in front in a prominent rounded projection. Eyes very small, obscure, and situated about the middle of the lateral margin. The external antennæ, with a flagellum of two joints, extend to the middle of the first thoracic segment, and are geniculate at the articulation of the third and fourth joints.

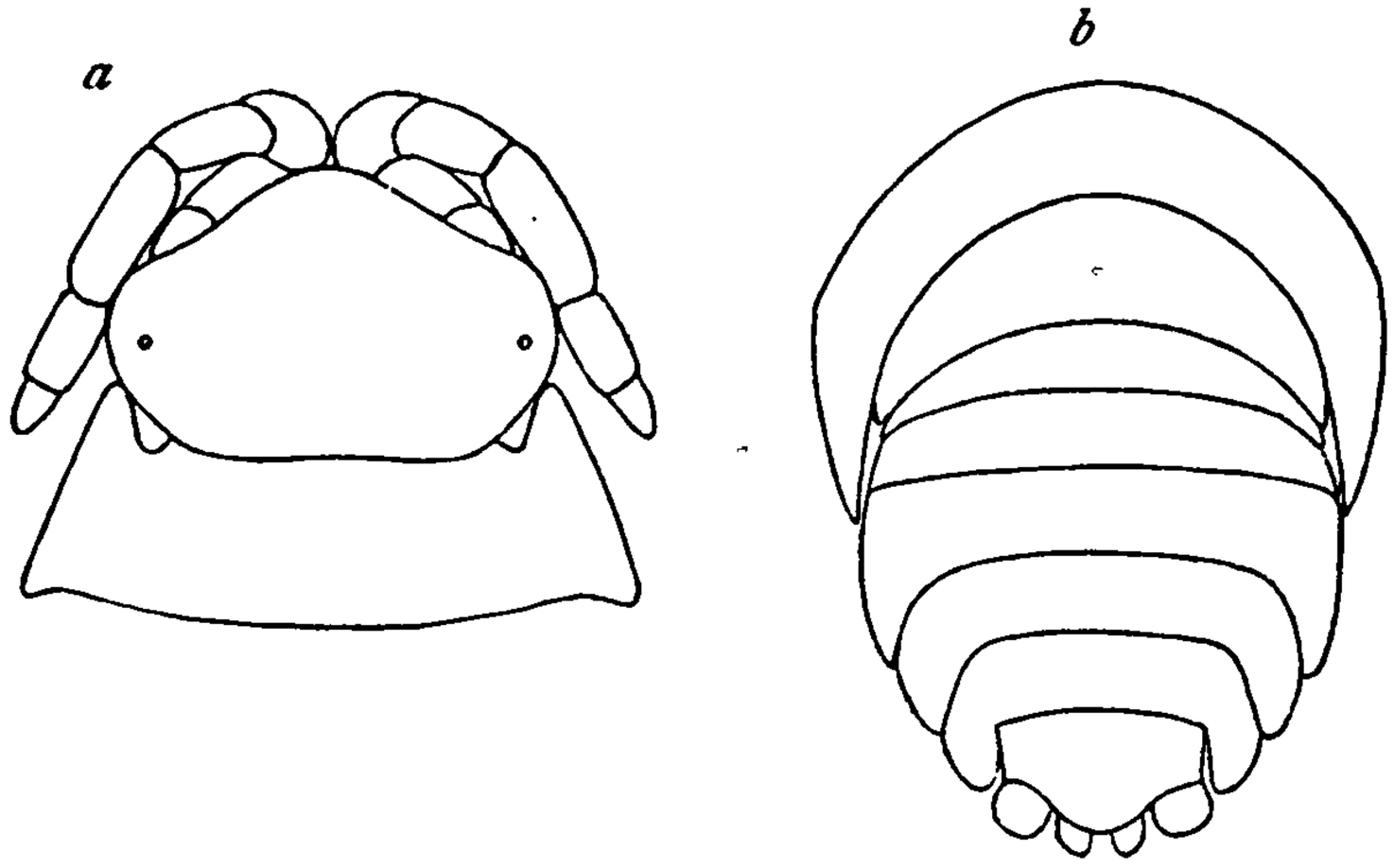

FIG. 709.—UROPODIAS BERMUDENSIS. *a*, HEAD AND FIRST THORACIC SEGMENT. × 62. *b*, ABDOMEN AND LAST TWO THORACIC SEGMENTS. × 62.

The thoracic segments are subequal in length. The seventh segment is abruptly narrower than the six preceding segments, and not wider than the first two abdominal segments. The seventh thoracic and the first and second abdominal segments have the lateral parts undeveloped. The first six thoracic and the third, fourth, and fifth abdominal segments have the lateral parts lamellarly expanded, so that the regular outline of the body is preserved, the third abdominal segment not being narrower than the six thoracic segment, the lateral portions of which extend down laterally beyond the seventh thoracic and the first and second abdominal segments.

The terminal abdominal segment is quadrangular, with the posterior margin produced in a median rounded lobe. The uropoda extend but a short distance beyond the lateral parts of the fifth abdominal seg-

ment. The outer branch is broad, flattened, and round; the inner branch is smaller and narrower, and posteriorly rounded.

There are but six pairs of legs, those of the seventh thoracic segment being wanting.

A few specimens were collected by Prof. A. E. Verrill and party at the Bermudas in 1898, and at Castle Island in 1901, under stones, in dry places.

Type in the Peabody Museum, Yale University. Cat. No. 3224.

Family XXVII. SCYPHACIDÆ.

Head without median or antero-lateral lobes. Front not margined, but continuous with the epistome. Second pair of antennæ with flagellum composed of four articles. First maxillæ with the inner lobe furnished with two plumose setæ; outer lobe furnished with teeth. Second maxillæ furnished with hairs. Mandibles without molar process. Maxilliped with masticatory lobe acutely produced; palp elongate, much longer than masticatory lobe, with articles large and not distinctly defined.

Abdomen not abruptly narrower than thorax.

Uropoda extending beyond the tip of the abdomen; inner branch inserted at the upper inner angle of the basal article.

122. Genus SCYPHACELLA Smith.

Outer lobe of first maxillæ furnished along the distal half of the inner margin with recurved spines.

Inner lobe furnished with two widely separate plumose processes, one at the tip and the other on the inner margin.

Second maxillæ furnished with hairs at the tip.

Both first and second maxillæ long and slender.

Epignath of maxillipeds long and narrow, acutely produced at the tip.

Eyes large, composed of many ocelli.

Abdomen not narrower than thorax.

Uropoda exposed, both branches styliform.

SCYPHACELLA ARENICOLA Smith.

Scyphacella arenicola Smith, Report U. S. Commissioner of Fish and Fisheries, 1873, Pt. 1, p. 567 (274).—Harger with Verrill, Report U. S. Commissioner of Fish and Fisheries, 1873, Pt. 1, p. 337 (43).—Harger, Proc. U. S. Nat. Mus., II, 1879, p. 157; Report U. S. Commissioner of Fish and Fisheries, 1880, Pt. 6, pp. 307–308, pl. 1, fig. 2.

Trichoniscus arenicola Budde-Lund, Crust. Isop. Terrestria, 1885, p. 249.

Scyphacella arenicola Underwood, Bull. Ill. State Lab. Nat. Hist., II, 1886, p. 363.—Richardson, American Naturalist, XXXIV, 1900, p. 307; Proc. U. S. Nat. Mus., XXIII, 1901, p. 576.

Localities.—Egg Harbor, New Jersey; Nobska Beach, Vineyard Sound; Nantucket Island; Woods Hole, Massachusetts; mouth of Choptank River, Dorchester County, Maryland. Found in sand.

Body oblong-ovate, a little more than twice as long as wide, 2 mm.: 4½ mm.; surface very scaly, thickly covered with small tubercles, each tipped with a small spine.

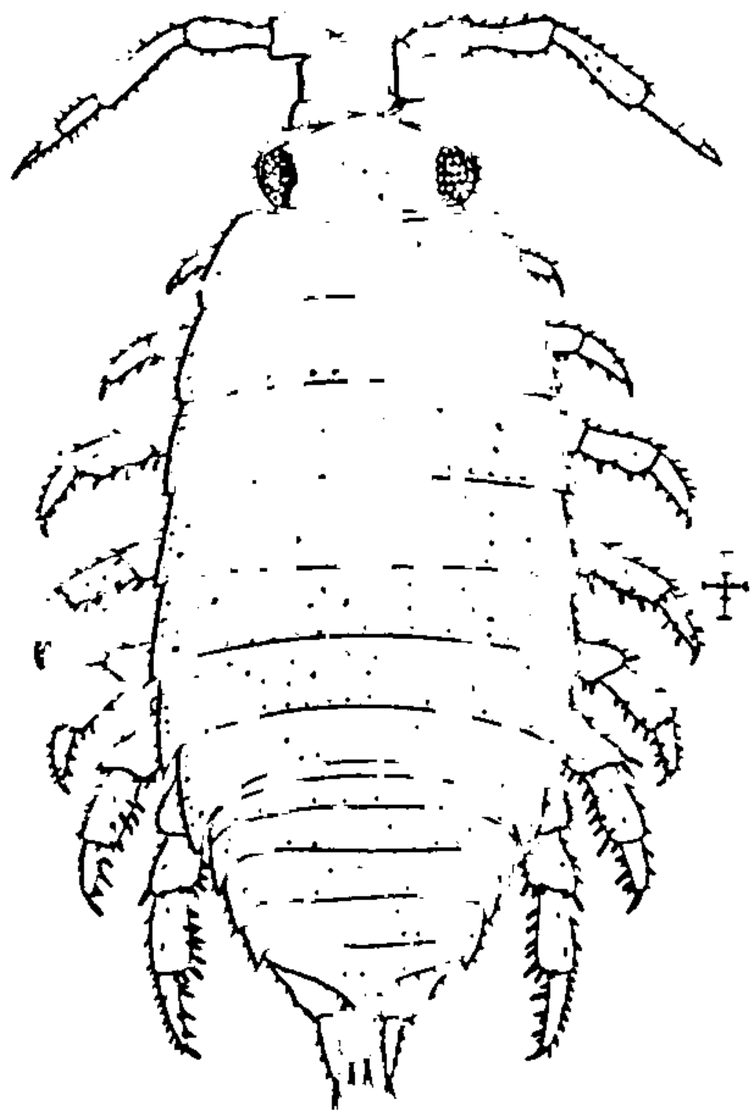

FIG. 710.—SCYPHACELLA ARENICOLA (AFTER HARGER). × 12.

Head wider than long; frontal margin but little produced; lateral lobes small. Eyes large, round, composite, and placed at the sides of the head, close to the lateral

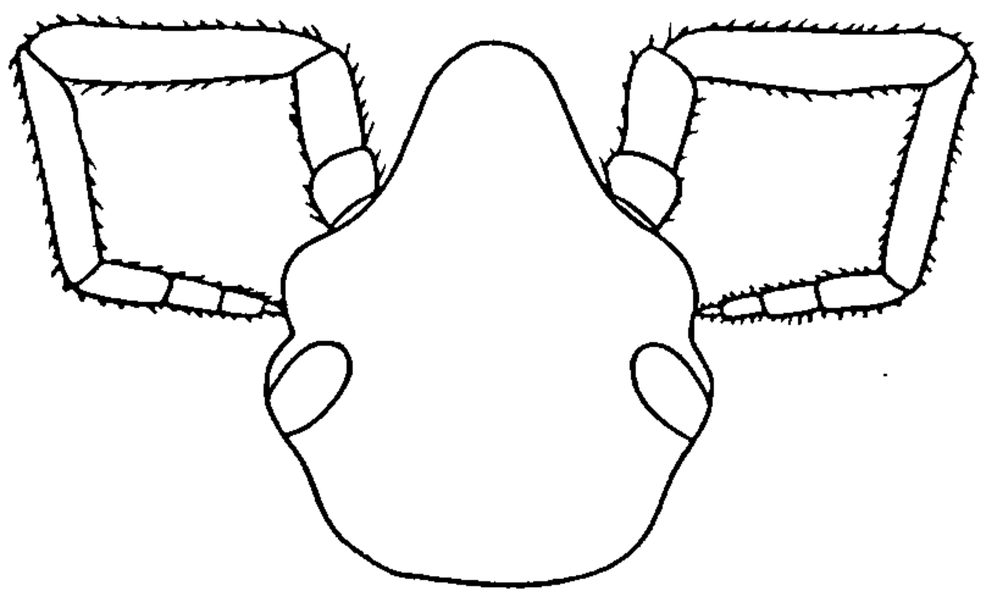

FIG. 711.—SCYPHACELLA ARENICOLA. HEAD WITH ANTENNA. × 27½.

margin. The epistome is continuous with the front of the head, so that the head seems to be produced forward in a triangular extremity which is rounded anteriorly. The first pair of antennæ are small, inconspicuous, the terminal article fringed with hairs at the apex. The second pair of antennæ have the first two articles short, the

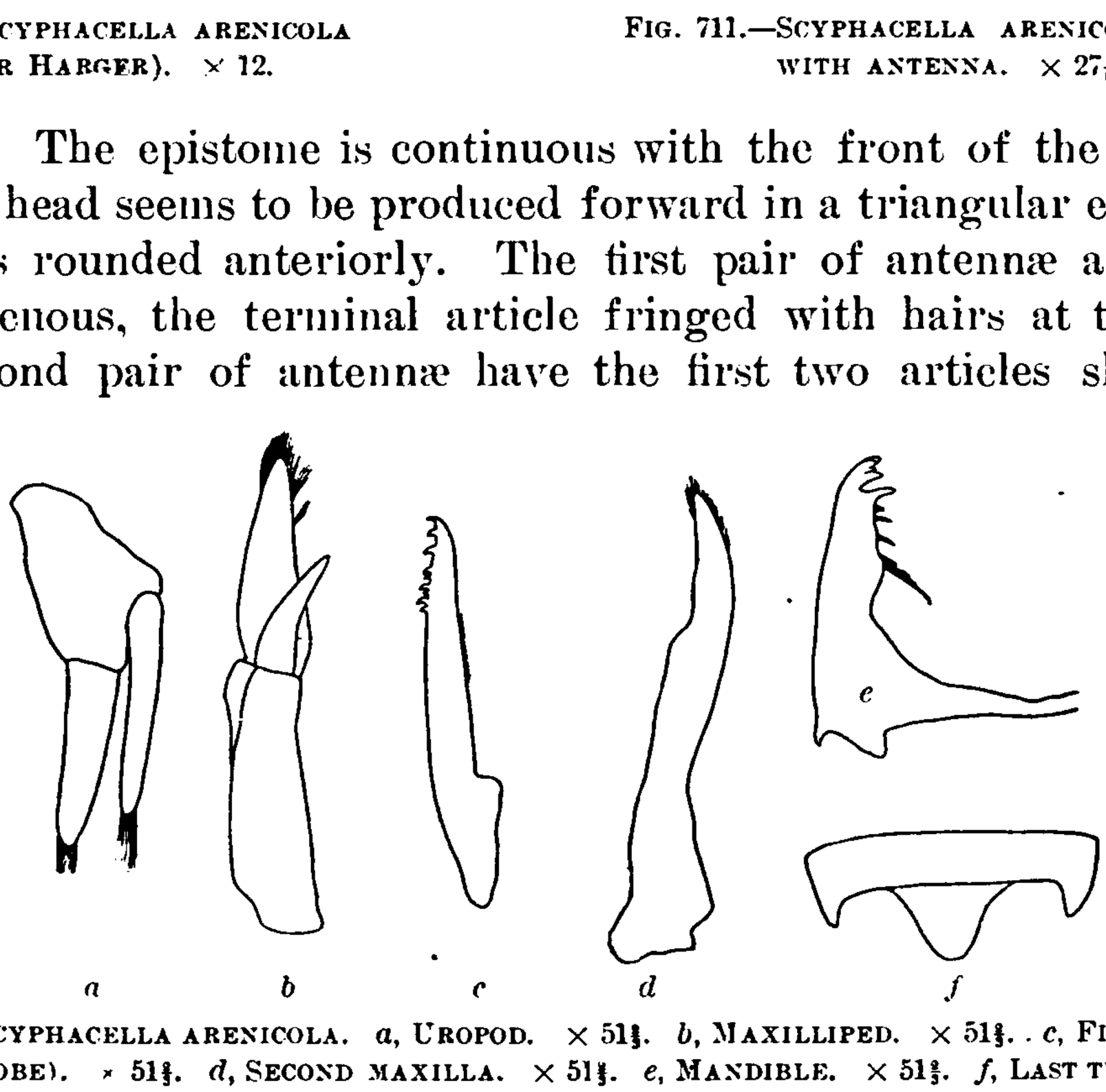

FIG. 712.—SCYPHACELLA ARENICOLA. *a*, UROPOD. × 51½. *b*, MAXILLIPED. × 51½. *c*, FIRST MAXILLA (OUTER LOBE). × 51½. *d*, SECOND MAXILLA. × 51½. *e*, MANDIBLE. × 51½. *f*, LAST TWO SEGMENTS OF ABDOMEN. × 27½.

second one a little longer than the first; the third and fourth articles are nearly subequal, and each is a little longer than the second; the fifth is one and a half times longer than the fourth. The flagellum is composed of four articles, the first article being twice as long as the second; the articles are with difficulty to be distinguished. The antennæ are thickly beset with spines.

The segments of the thorax are subequal; the last two have the post-lateral angles produced backward.

All the segments of the abdomen are distinct. The first two have the lateral parts covered by the seventh thoracic segment. The three following segments have the post-lateral angles produced backward. The terminal abdominal segment is narrow, produced in the middle posteriorly in a long, narrow process, broadly rounded at the apex. The peduncle of the uropoda extends to the end of the terminal abdominal segment. The branches are of nearly equal length.

FIG. 713.—SCYPHACELLA ARENICOLA. INNER LOBE OF FIRST MAXILLA. (DIAGRAMMATIC.)

Color of the specimens, for a long time preserved in alcohol, dark brown, with the margins of the segments of a lighter brown.

Five specimens were collected by Dr. S. D. Judd in the sand on Ram Island, Woods Hole, Massachusetts, and are in the collection of the U. S. National Museum.

Family XXVIII. LIGYDIDÆ.[a]

Body oval. Head without lateral lobes; frontal margin rounded, and not distinctly defined from the epistome. First pair of antennæ with the terminal joint not furnished with sensory hairs. Second pair of antennæ well developed, with flagellum multi-articulate. Buccal mass prominent. Mandibles with the molar process large and broad, having a finely fluted triturating surface. Inner lobe of the first maxillæ furnished at the tip with three plumose processes. Second maxillæ also furnished inside with two similar processes. Maxillipeds with the palp composed of five articles; masticatory lobe truncate.

Opercular branches of pleopods without tracheæ. First two pairs of pleopods modified in male; inner branch terminating in a long stylet.

ANALYTICAL KEY[b] TO THE GENERA OF THE FAMILY LIGYDIDÆ.

a. Uropoda with basal article not produced in a process at the inner distal angle; branches equal in length. Last segment of abdomen large, with lateral parts well developed.....Genus *Ligyda* Rafinesque

a'. Uropoda with basal article produced in a process at the inner distal angle; branches unequal in length. Last segment of abdomen small, with lateral parts obsolete.....Genus *Ligidium* Brandt

123. Genus LIGYDA[a] Rafinesque. 1814

Body oval, or oblong oval; abdomen not abruptly narrower than the thorax. Terminal segment broad, with lateral parts well developed. First pair of antennæ with the third or terminal joint rudimentary, nodiform.

[a] See Sars for characters of family and genus.

[b] The genus *Euphiloscia* Packard is not included, as it is probably a synonym of *Ligidium*.

Second pair of antennæ strong and elongated; flagellum multi-articulate.

Palp of maxillipeds with joints rather expanded; epignath rounded.

Uropoda with the basal article not produced inside at the post-lateral angle; branches subequal, each tipped with a single terminal spine.

ANALYTICAL KEY TO THE SPECIES OF THE GENUS LIGYDA.

a. Uropoda long, equal to two-thirds the length of the body or longer. External antennæ long, extending the entire length of the thorax or longer.
  b. First pair of legs similar to the others in the male.....*Ligyda olfersii* (Brandt)
  b'. First pair of legs in the male differing from the others.
    c. Propodus of first pair of legs armed with a long narrow process at the distal end. Peduncle of second antennæ extends to posterior margin of the third thoracic segment. The second antennæ extend in the male to the end of the body or a little beyond. Body loosely articulated..*Ligyda exotica* (Roux)
    c'. Propodus of first pair of legs in male unarmed. Merus and carpus in the first pair of legs in the male furnished with a row of bristles or stiff hairs. Peduncle of second antennæ extends to the posterior margin of the second thoracic segment. Second antennæ extend in the male to the end of the thorax. Body compact .....*Ligyda baudiniana* (Milne Edwards)

a'. Uropoda not equal to two-thirds the length of the body.
  b. Uropoda equal to half the length of the body. Terminal segment of the body pointed in the middle .....*Ligyda occidentalis* (Dana)
  b'. Uropoda not equal to half the length of the body. Terminal segment rounded in the middle.
    c. Branches of the uropoda twice as long as the peduncle. Uropoda equal to one-eighth the length of the entire body from the tip of the terminal abdominal segment. Lateral parts of the third, fourth, and fifth segments of the abdomen with distinct carinæ .....*Ligyda pallasi* (Brandt)
    c'. Branches of the uropoda four times as long as the peduncle. Uropoda equal to one-fourth the entire length of the body from the tip of the abdomen. Lateral parts of the third, fourth, and fifth segments of the abdomen without distinct carinæ .....*Ligyda oceanica* (Linnæus)

LIGYDA OLFERSII (Brandt).

Ligia olfersii Brandt, Bull. Soc. Imp. Naturalistes de Moscou, VI, 1833, p. 11.—Budde-Lund, Crust. Isop. Terrestria, 1885, p. 268.—Richardson, Proc. U. S. Nat. Mus., XXIII, 1901, p. 575.

Localities.—Key West and Puntarasa, Florida; St. Thomas; Brazil.

Body oblong-ovate, a little more than twice as long as wide, 7 mm. : 15 mm. Length of uropodà, from tip of terminal segment, 8 mm. Entire length of body with uropoda 23 mm.

Head twice as wide as long, 2 mm. : 4 mm. Anterior margin widely rounded. Eyes composite, narrow, oblong, twice as long as wide, situated on the lateral margins and extending along the anterior margin, being separated in front by a distance a little less than the length of one eye. First pair of antennæ inconspicuous and rudimentary, composed of two subequal articles and a minute terminal one and extending only to the end of the first article of the second pair of antennæ.

The first and second articles of the second pair of antennæ are subequal; the third article is one and a half times longer than the second; the fourth is twice the length of the third; the fifth is one and a half times longer than the fourth. The flagellum is composed of twenty-eight articles. When retracted, the second pair of antennæ extend to the end of the fifth abdominal segment. The maxilliped has a palp of five articles.

The first five segments of the thorax are about equal in length; the last two are somewhat shorter. The posterior angles of the lateral parts of the last three are produced downward. The lateral parts of the segments are not separated off from the dorsal portion.

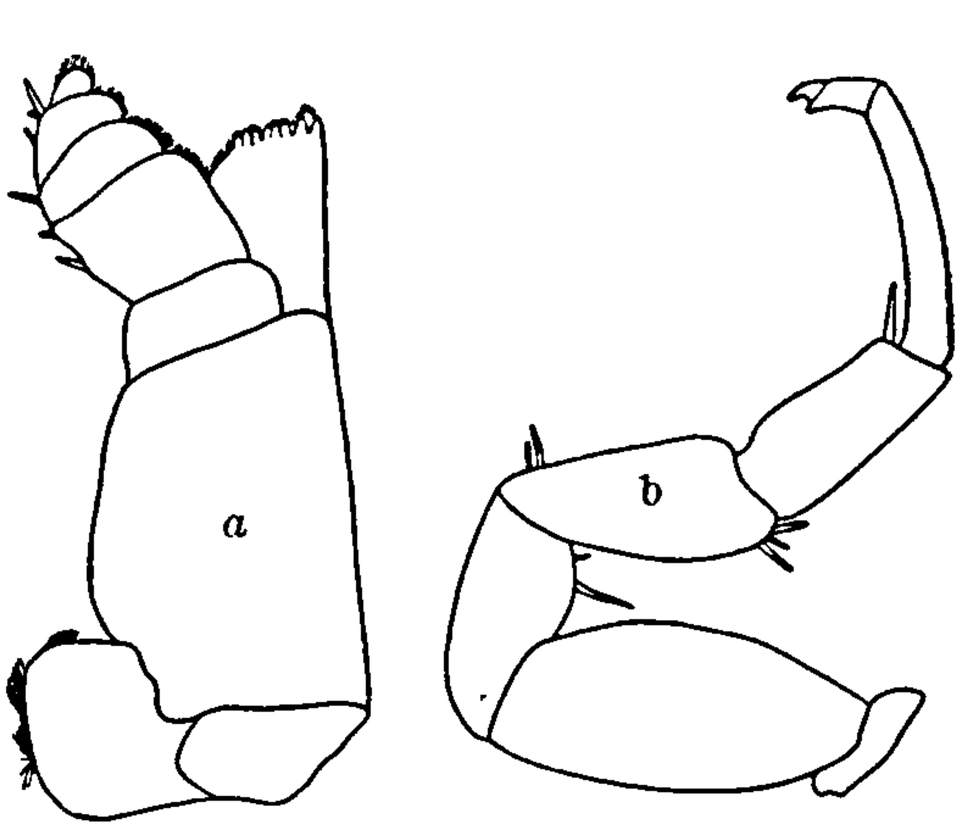

FIG. 714.—LIGYDA OLFERSII. *a*, MAXILLIPED. × 20½. *b*, FIRST LEG OF MALE. × 11½.

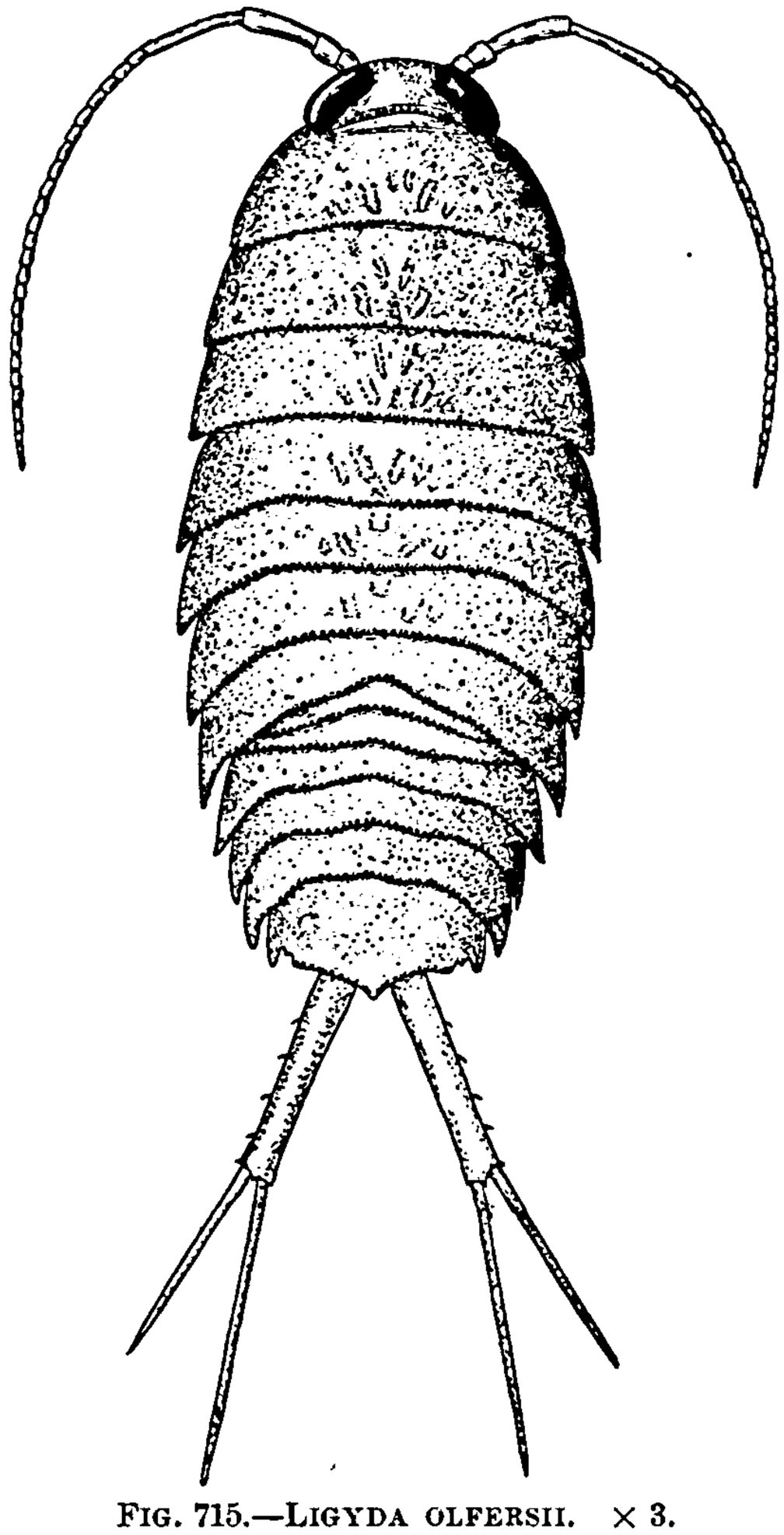

FIG. 715.—LIGYDA OLFERSII. × 3.

There is not even any trace, such as a faint line, to mark the place where coalescence has taken place.

The abdomen is as wide as the thorax, the lateral parts of the third segment extending as far as those of the seventh thoracic segment. The lateral parts of the first two segments are not developed. There is a slight and gradual increase in the length of the segments from the first to the fifth. The lateral parts of the abdominal segments are not separated off from the dorsal portion. The middle portion of the sixth or terminal segment is produced triangularly in an acute point. The lateral angles are short and acute, and do not extend to the tip of the median point. Between the lateral parts and the dorsal portion, there are two angular processes on the posterior margin of the segment, on either side, near the lateral angles, the process adjacent to the lateral angle being more obtuse than the other one.