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U. S. Bureau of Commercial Fisheries:
Fishing Bulletin.

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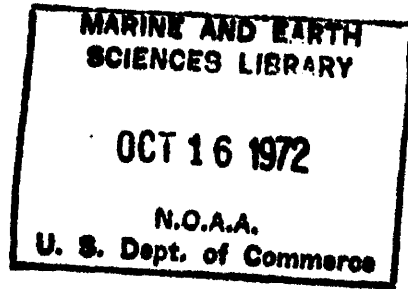
UNITED STATES FISH COMMISSION.

VOL. XX,

FOR

1900.

SECOND PART.



GEORGE M. BOWERS, Commissioner.

WASHINGTON:
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1902.

INVESTIGATIONS

OF THE

AQUATIC RESOURCES AND FISHERIES OF PORTO RICO

BY

THE UNITED STATES FISH COMMISSION STEAMER FISH HAWK

IN

1 8 9 9 .

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REPORT ON PORTO RICAN ISOPODA.

BY

H. F. MOORE.

REPORT ON PORTO RICAN ISOPODA.

By H. F. MOORE.

The Isopoda collected in Porto Rico by the *Fish Hawk* during January and February, 1899, include but seventeen species, but the collection is interesting in furnishing two new genera, one of considerable interest, and eight species apparently not before described. In all, eleven families and fifteen genera are represented. They are as follows:

Tribes.	Families.	Genera and species.
Chelifera	Apsoudiæ	<i>Apsudes espinosus</i> , n. sp.
	Tanaidæ	<i>Leptocheila incerta</i> , n. sp.
Flabellifera	Cirolanidæ	<i>Cirolana mayana</i> Ives. <i>parva</i> Hansen. <i>obtruncata</i> Richardson.
		<i>Branchuropus littoralis</i> , n. gen. and sp.
	Corallanidæ	<i>Corallana tricornis</i> Hansen.
	Alcironidæ	<i>Alcirona hirsuta</i> , n. sp.
		<i>Nalicora rapax</i> , n. gen. and sp.
	Ægidæ	<i>Æga ecarinata</i> Richardson. <i>Rocimela signata</i> Schiödte & Meinert.
	Cymothoidæ	<i>Anilocra laticeuda</i> Milne-Edwards.
	Spharomidæ	<i>Cilicea caudata</i> Ives.
		<i>Dynamene perforata</i> , n. sp.
		<i>Cleantis planicauda</i> Benedict.
Valvifera	Idoteidæ	
Oniscoidea	Ligidæ	<i>Ligia gracilis</i> , n. sp.
	Oniscidæ	<i>Philoscla eulebræ</i> , n. sp.

All of these are littoral or shoal-waters species, none of them being taken in water deeper than 75 fathoms.

*Key to tribes and families of Porto Rican Isopoda.**

- a. Head united with first segment of thorax; first pair of thoracic limbs chelate; pleopods not branchial, sometimes absent Tribe CHELIFERA
- b. First antennæ biflagellate; second antennæ with multiarticulate flagellum APSEUDIDÆ
- bb. First antennæ uniflagellate (flagellum obsolescent in female); second antennæ without scale, flagellum small TANAIDÆ
- aa. Head and first thoracic segments not united; first pair of thoracic limbs not chelate; pleopods, all, or some, branchial.

*Key in part from Stebbing after Hansen.

- c. Telson and uropods forming a caudal fan (except in *Branchuropus*) Tribe FLABELLIFERA
- d. Pleon consisting of six free segments; uropods with both branches freely articulated with peduncle.
- e. Maxillipeds with the "palp" free, the margins of the last two joints more or less setose, never furnished with hooks.
 - First maxillæ with the plate of the third joint tolerably broad, at least toward the middle.
 - f. Mandibles with the distal half stout, very conspicuous, uncovered, or with only the anterior margin concealed; from the base toward the middle directed forward and a little outward.
 - g. Mandibles with the rather broad, more or less tridentate cutting edges meeting squarely behind the large upper lip; the secondary plate and peculiar equivalent for the molar well developed.
 - First maxillæ having the plate of first joint armed with three spines, that of third with many.
 - Second maxillæ of moderate size, the three free plates very setose.
 - Maxillipeds with the "palp" rather broad, very setose CIRROLANIDÆ
 - gg. Mandibles with the distal part produced into a long prominent process, the pair much overlapping; the secondary plate and molar evanescent.
 - First maxillæ having the plate of first joint unarmed, of the third carrying one very long spine.
 - Second maxillæ small and feeble, the free plates almost rudimentary with few setæ.
 - Maxillipeds with "palp" narrowed, not very setose (the antepenultimate joint rather elongate) CORALLANIDÆ
 - ff. Mandibles with the distal half narrow, most or all of it concealed by the upper and lower lips; from the base toward the apex directed gradually inward.
 - First maxillæ having plate of first joint unarmed, of third carrying two spines or only one.
 - Second maxillæ feeble, sometimes very small, with one plate or none, the setæ very few or none.
 - Maxillipeds with the "palp" rather broad, with no elongate joint ALICHRONIDÆ
 - ee. Maxillipeds with the "palp" embracing the cone formed by the distal parts of mouth organs, the inner upper margin and apex never setose, the apex and sometimes the inner upper margin, at least in the males and the females without eggs, being furnished with outward-curved hooks.
 - First maxillæ with the plate of the third joint narrow throughout.
 - Distal parts of the mouth organs forming a short subvertical cone.
 - Second maxillæ large, elongate, and proportionately broad, with two apical plates furnished with hooks.
 - Maxillipeds with the fourth and fifth joints sometimes coalesced, never forming a long joint.
 - h. Mandibles with the secondary plate very often (perhaps always) visible; the "palp" with no inflated joint.
 - Maxillipeds commonly 7-jointed, sometimes 4-jointed, the last joint in the latter case rather short, obtuse TEGIDÆ
 - hh. Mandibles with no secondary plate; the "palp" in the adults with the first joint or both first and second joints inflated.
 - Maxillipeds always four-jointed, the last joint rather long and narrow, subacute CYMOTHOIDÆ
 - dd. First five segments of pleon fused; one branch of uropods immovably fused with peduncle. SPHEROMIDÆ
 - cc. Uropods folding beneath the pleon to cover the pleopods Tribe VALVIFERA
 - Only family represented IDOTEIDÆ
 - ccc. Uropods terminal, various, sometimes filiform or conical, sometimes valvate, but never covering more than the last two segments of abdomen below. First antennæ with three short joints, or fewer, or wanting Tribe ONISCOIDEA
 - i. First maxillæ with three setæ on inner plate. (In the one genus from Porto Rico the second antennæ multi-articulate) LIGIDÆ
 - ii. First maxillæ with two setæ on inner plate. (In the one genus from Porto Rico the second antennæ tri-articulate) ONISCIDÆ

Tribe CHELIFERA.

APSEUDIDÆ.

Aapseudes espinosus, new species.

Cephalothorax short, less than length of first 3 segments of thorax, slightly wider than long; rostrum short, produced to a mere point; eye-stalks short, projecting but slightly beyond sides of head. First 3 segments of thorax subequal to one another in length and breadth, approximately equal to head in breadth. Last 3 segments narrower; fourth segment longer than segments 2 and 3 combined; fifth free segment about equal to them; sixth segment about three-fourths as long as fifth. Epimera of first 3 segments not evident, none of the segments with lateral spines; epimera of last 3 segments small, in dorsal view projecting slightly from beneath each segment near its articulation with its successor. Abdo-

men narrower than last segment of thorax, but not abruptly so; the first 5 segments equal in length and successively slightly narrower; collectively about as long as sixth thoracic segment; lateral margins rounded, somewhat produced posteriorly. Telson about as broad as long, slightly narrower than fifth segment of pleon, bilobate posteriorly.

Peduncle of antennule as long as head, first joint stout, longer than other 3 joints combined, second joint not half as long as first, 2 following joints successively shorter; 2 flagella of equal length, and longer than peduncle, the outer somewhat stouter, with 17 joints, inner flagellum with 15 joints.

Antennæ about two-thirds as long as antennules; peduncle short, consisting of 5 joints, first and second joints stout, second furnished with a scale beset with long setæ, last 3 joints short. Flagellum about as long as flagella of antennule, consisting of 13 setiferous joints.

Mandibles stout, with a 5-dentate cutting edge and a 3-jointed palp. First maxillæ tipped with a number of stout brown spines. Maxillipeds with a stout 4-jointed palp, of which the second joint is very large and stout.

Details in relation to the oral parts are not known, as there was but one specimen, mounted in balsam and not dissected.

The chelipeds in the female are long and slender, the fifth joint being the longest and the second almost as long, but stouter. The third joint is prolonged distally into a curved process furnished with 5 or 6 long hairs on the convex margin; the sixth joint, with the seventh, constituting a slender chela; no molar tubercles; curved margin of "thumb" of sixth joint with a row of slender bristles; a row of blunt spines on cutting edge.

The second pair of limbs have the joints stout and furnished with strong spines. The second joint or basis has 5 or 6 stout curved spines on its outer margin. It is longer than the other joints. The terminal claw is flanked on each side by a strong spine attached to sixth joint. There appear to be but 5 free joints to this and the following limbs, but this appearance may be due to defects in the mounting; following pairs of limbs more slender, the last pair having a second joint almost as long as all the rest, and with an oblique row of small spines near distal end of posterior face of sixth joint.

There are 5 pairs of pleopods, with both branches 1-jointed.

Uropods biramous, the inner ramus with about 50 joints; outer ramus less than one-half as long, with about 25 joints. The joints of both are of irregular length.

One specimen, female, from station 6079, 20 fathoms, 6 mm. by 1.4 mm.

TANAIDÆ.

Leptochelia incerta, new species.

Body of female elongate, about five times as long as broad, slightly narrower in posterior part of thorax.

Head narrower in front, at base of eyes about two-thirds of greatest width, about 1.2 times as long as broad, length about equal to first 3 thoracic segments, slightly produced between bases of first antennæ. The first 3 segments of thorax subequal, last 3 about one-third longer and subequal. Abdomen about 2.5 times as long as last thoracic segment, than which it is slightly broader; first 4 segments about equal to one another, the fifth segment slightly longer, the sixth or terminal segment longest, rounded posteriorly with a blunt process in the median line.

Eye-stalks well developed, nearly as wide as bases of first antennæ, by which they are partly concealed in dorsal view; first antennæ 4-jointed, first joint stout, much longer than other three, second and third joints equal, fourth joint rudimentary, somewhat obliquely attached to third and furnished with about 3 long bristles, third joint also furnished with bristles at its distal end; second antennæ about as long as basal joint of first antennæ, 5-jointed, fourth joint longest, about equal to second and third joints together, second joint with a stout spine on inner distal angle. Mandibles with a tridentate cutting edge and a large molar process; first maxillæ terminated by a tuft of strong spines, palp with 2 long setæ; maxillipeds with large basal joint and a well-developed, strongly setiferous palp. Chelipeds stout, with 5 free joints; ventral margin of penultimate joint not strongly curved at base; thumb rather short, measured from base of dactylus about three-fourths the width of propodus; second thoracic limbs with the ultimate joint somewhat longer than the penultimate

the claw slender and curved; next 2 pairs shorter and stouter, claw short; last 3 pairs also shorter, the joints furnished with a few short spines.

Pleopods, 5; uropods biramus; the inner ramus 1-jointed, shorter than first joint of outer ramus, with a terminal tuft of setæ; outer ramus 5-jointed, fifth joint longest, but shorter than peduncle of uropod.

Arroyo, one specimen; Culebra, one specimen. Length, female, 3.8 mm.; width, 0.8 mm.

This species is distinguishable from *L. savignii* by the greater proportional length of the dactylus, the proportional length of the head, and the segments of the thorax, the shape of the last abdominal segment, the form of the chelæ, and by its greater size. It may possibly be the female of *L. rapax* Harger, of which I have seen no specimens, but is considerably larger than Harger's specimens.

Tribe FLABELLIFERA.

CIROLANIDÆ.

Key to Porto Rican genera and species.

- a. Uropods normal, forming with telson a caudal fan, inner angle of peduncle produced; maxillipeds with 5-jointed palp; peduncle of second antennæ 5-jointed; first pleopods not opercular..... *Cirolana*.
- b. About first 10 joints of second antennæ each with 2 tufts of setæ projecting forward, the whole forming a brush on anterior edge. Clypeus with a prominent obtusely pointed spine on anterior margin.. *C. mayana* Ives.
- bb. Without brush-like rows of setæ on second antennæ. No spine on clypeus.
- c. Apex of telson rounded, uropods subbifid; flagellum of first antennæ 11 or 12 jointed..... *C. parva* Hansen.
- cc. Apex of telson broadly truncate; the uropods rounded at ends; flagellum of the first antennæ 8-jointed..... *C. abtruncata* Rich.
- aa. Uropods resembling the pleopods and concealed beneath telson, peduncle slender; maxillipeds with 1-jointed palp; peduncle of second antennæ 4-jointed; first pleopods not opercular.. *Branchuropsis*, new genus.
Only species..... *B. littoralis*, n. sp.

Cirolana mayana Ives.

Body elongate-ovate, about 2.5 times as long as broad, strongly convex. Front produced to a triangular deflexed process united in front of first antennæ with the quadrate reflexed portion of epistome. Head to base of rostrum about 2.5 times as broad as long, front on each side of median process nearly straight.

First segment about as long as head, fifth and sixth almost as long, rest of segments shorter.

First abdominal segment entirely and the second partly concealed dorsally, the next three equal, the third laterally concealed by the seventh thoracic segment. Telson about one-fourth broader than long, subtriangular, lateral margins curved, tip with short setæ, a strong depression on each side of lateral line near base.

Eyes occupying entire lateral margin of head, first antennæ reaching to the middle of second segment, with a 10 to 12 jointed flagellum, last joint of peduncle with a row of bristle-like setæ on posterior margin. Second antennæ about twice as long as first, reaching to end of third segment, with a 5-jointed peduncle and a flagellum of from 21 to 24 articuli, the first 10 joints (about) short and broad and furnished with 2 rows of close-set setæ near the anterior or outer margin, constituting an outwardly projecting brush.

Epistome subtriangular, sides slightly incurved, expanded and dorsally reflexed in front of second antennæ, and uniting with frontal process. Clypeus with a strong, blunt process projecting downward and forward to between bases of second antennæ. Mouth parts as usual in the genus.

Thoracic limbs and pleopods not peculiar. Uropods reaching beyond end of telson, outer ramus the longer, with two blunt spines near tip and two on inner margin; inner ramus more than half as broad as long, its outer border emarginate, posterior and inner borders with about five spines; outer border of external ramus naked, inner and posterior borders setiferous; almost entire border of inner ramus setiferous; peduncle with a few long setæ on internal angle and several spines at base of outer ramus beneath.

Specimens from Boqueron Bay and Culebra. Largest, 12.5 by 5.1 mm.; smallest, 5.8 by 2.2 mm.

Cirolana parva Hansen.

Body elongate-ovate, between 2.5 and 2.75 times as long as broad. Head broad and produced in front in a slender process between the bases of first antennæ, deflexed and uniting with the epistome.

First segment of thorax longest, the next five subequal, the last shortest.

First segment of pleon hidden, the second sometimes partially so, the fifth longest, hidden at sides by the lateral angles of the fourth.

Telson broad, subtriangular, dorsally uniformly convex; tip rounded and furnished with about eight spines.

First antennæ reaching to about end of head, in situ, about as long as peduncle of second antennæ, flagellum about 11 to 12 jointed. Second antennæ reaching to fifth segment, flagellum 25 to 32 jointed. Epistome pentagonal, about 1.5 times as long as broad, without spine or process. Clypeus without process on anterior margin. Fourth joint of second and third pairs of the thoracic limbs slender. Uropods short, reaching hardly to end of telson. Rami subequal, narrow at ends, bifid, their margins furnished with spines and a few short setæ.

Specimens from Mayaguez, Puerto Real, Boqueron Bay, Ponce, Arroyo, Culebra, and station 6079, 20 fathoms. Largest, 8.5 by 3.3 mm.; smallest, 4.6 by 1.3 mm.

Cirolana obtruncata Richardson.

Body broad and short, hardly 2.25 times as long as broad; head about twice as broad as long, front produced in middle line into an acute process between the bases of first antennæ; first antennæ slightly longer than peduncle of second antennæ, peduncle 2-jointed, flagellum 8-jointed; peduncle of second antennæ 5-jointed, flagellum broken, longest piece with 12 joints.

Epistome pentagonal, about 1.5 times as long as broad, uniting with decurved tip of frontal process. Mouth parts as usual in the genus; maxillipeds with a 5-jointed palp.

First segment of thorax about as long as head, the following six about two-thirds as long, and equal to one another; fourth, fifth, and sixth joints about equal to one another in width; first segment not produced posteriorly, but projecting forward at sides to embrace the eye laterally; the epimeron of second segment slightly produced, but rounded, the following segments successively more produced, more actually angled and broader, the last reaching to almost posterior dorsal border of fourth abdominal segment. All but the second epimeron can be seen in dorsal view.

The thoracic limbs are short and stout; the seventh joint is strong and curved, in the second and third pairs of legs equal to the sixth joint, and in the other pairs almost equal to it.

The first abdominal segment is narrow and hidden at the sides by the last thoracic segment; the next two joints are about equal in length and with their lateral margins produced, the posterior angle of the third embracing the fourth, notched ventrally to embrace base of caudal peduncle and reaching beyond the base of the telson; fourth joint produced laterally and covering the sides of the fifth and the lateral margin of base of telson. Fifth segment longest, first shortest, the rest equal. Telson nearly three-fourths as long as broad, lateral borders nearly straight, broadly truncate behind, the posterior border with about 6 short spines and a number of stout setæ.

Peduncle of uropods with inner angle produced; inner lamella broad, rounded behind, reaching to about end of telson, its margin armed with short spines and furnished with short setæ; outer lamella with its inner and outer borders curved, subparallel, rounded behind, furnished with spines and setæ on outer and posterior margins.

One specimen from Fajardo, 6 by 2.9 mm.

BRANCHUROPUS, new genus.

Eyes well developed, lateral; first antennæ projecting beyond head, peduncle 3-jointed, first and second joints forming an angle with one another; peduncle of second antennæ 4-jointed; palp of maxillipeds small, 1-jointed, sparsely setose; epistome slender, spatulate, emarginate in front. Thoracic limbs resembling those of *Eurydice*. Pleopods confined to middle half of pleon, on each of the first four segments flanked externally by a longitudinal triangular plate, largest on the fourth, external to this the pleon concave.

Uropods resembling the pleopods, hidden beneath the telson; peduncle long, slender.

This genus shows affinities with *Eurydice* in the character of both pairs of antennæ, the mandibles, the thoracic limbs, and the general shape of the body. It is related to *Anuropus* in the 1-jointed

palp of the maxillipeds and the pleopodal character of the uropods. It differs from the latter in the possession of eyes, the more normal character of the first antennæ, in the character of the thoracic limbs, and the general habit of the body. It seems to connect *Anuropus* with the more normal members of the *Cirolanidae*, and makes it more difficult to remove the former to a new family, *Anuropidae*, as has been proposed. *Anuropus branchiatus* Beddard is a deep-sea form, obtained by the *Challenger* in 1,070 fathoms between New Guinea and the Admiralty Islands. It is interesting to find in the West Indies a shoal-water species agreeing with it in such remarkable particulars as have been set forth.

***Branchuropus littoralis*, new species.**

Body moderately convex, about 2.75 times as long as broad; abdomen not abruptly narrower than the thorax. Head rounded in front, about half as wide as greatest width of body, about two-thirds as long as wide.

Thorax broadest at fifth joint, fifth and sixth joints longest; the rest shorter and subequal. Epimera of all but first joint distinct; sides of first segment emarginate, the anterior portion being produced somewhat to embrace the eye; epimera of second and third joints not produced posteriorly, of fourth, fifth, sixth, and seventh produced in a sharp process terminated by a spine, that of the last extending beyond the first abdominal segment.

Abdominal segments all distinct, gradually increasing in length from first to fifth; first joint somewhat narrower, not produced posteriorly at sides, exposed throughout its breadth; the other free segments subequal in breadth, strongly produced posteriorly at sides, the last two armed at each angle with a stout spine.

Telson rounded, about five-sixths as long as broad, margin not armed, abruptly higher in median two-thirds at base, with an ill-defined, low protuberance or process on each side of middle line.

Eyes large, black, space between about as great as diameter of eye. Base of first antennæ projecting from beneath overhanging front; peduncle of three joints, the first and second forming a right angle, the second and third joints subequal; flagellum 4-jointed, first joint long and tapering, 1.5 times as long as the other three, second and third joints subequal, last joint short and reaching to beyond posterior margin of head.

Second antennæ long and slender, when placed close to sides of body reaching to about anterior margin of telson; peduncle 4-jointed, joints increasing gradually in length and slenderness, second joint furnished on distal external angle with 4 or 5 setæ; flagellum with about 18 joints which are longest in its middle.

Epistome slender, expanded in front and emarginate, reaching to about the level of frontal margin of head but not connected with it.

Mandible with tridentate cutting edge, movable pectinate appendage and 3-jointed palp, in general resembling this organ in *Eurydice*.

Maxillipeds 2-jointed, the basal joint long, somewhat transversely of the head; the second joint short and armed with a few hairs distally.

Thoracic limbs gradually increasing in length posteriorly. First limb with second joint longest, the third, fourth, and fifth successively shorter, the sixth joint as long as third, and pectinate by a series of spines, the last one stoutest, and the seventh not forming with the sixth a subchelate hand, as in *Anuropus*. The posterior border of the limb is furnished with spines and setæ. Second and third pairs subsimilar with the fifth joint larger. Fourth to seventh pairs backwardly directed, and becoming successively broader and flatter, resembling the posterior limbs of *Eurydice*, the fourth pair with numerous stout spines along its internal edge, these becoming fewer and weaker on posterior pairs, which are more abundantly furnished with long slender setæ, fifth joint of last pair of legs broad and almost rectangular.

Abdominal appendages subsimilar, the uropods not projecting beyond the margin of telson, attached to under side, in structure similar to the pleopods and probably branchial in function.

Color gray, with arborescent brown pigmentation becoming more dense posteriorly, on abdomen collected principally in a median wedge-shaped mass with the apex on base of telson, each segment of pleon with two subelliptical paler lateral areas, with about 25 to 30 longitudinal lines of pigmentation, the areas between which are reticulated with brown. Mandibles, legs, and under side of body more or less pigmented.

One specimen, from station 6079, 20 fathoms, 6 by 2.2 mm.

CORALLANIDÆ.

Corallana tricornis Hansen.

Body 2.75 to 3 times as long as broad. The head in the male is concave above, in the median line produced into a process projecting upward and forward, and with a smaller but prominent process at the upper inner margin of each eye. In the female the head is slightly concave above, rounded in front, and without either frontal or supraocular processes, about 2.5 times as broad as long.

In the male the first thoracic segment is very convex and furnished with two tubercles near its anterior edge, which are absent in the female. The fifth thoracic segment is longest and broadest, the first, fourth, and sixth almost as long, the rest shorter.

The abdomen is about as long as the width of the body, in some specimens the first segment being exposed, on others it is more or less completely covered by the last thoracic segment. The first four segments are subequal, the fifth a little longer and narrower, all with small tubercles on posterior margin; third, fourth, and fifth segments with a median dorsal depression. Telson triangular, abruptly narrower behind attachment of uropods, the middle of the lateral margin incised. Tip of telson with four spines; margin from front of lateral incision with long setæ, a row of short setæ near front edge of incision, and a longitudinal column on each side of middle line. Telson somewhat concave in middle line and also depressed on each side between the lateral incision and the base; not ornamented with tubercles.

First antennæ about as long as peduncle of second antennæ, peduncle 2-jointed, flagellum 9 to 10 jointed. Flagellum of second antennæ about 1.5 times as long as peduncle, about 20 joints. Uropods extending beyond end of telson, outer branch narrow, bifid at tip, inner ramus broad, nearly two-thirds as broad as long, with 9 or 10 spines; margins of both branches with long setæ.

Twelve specimens from a ray taken at Hucarez, 8.2 by 2.8 mm.

ALCIRONIDÆ.

Key to Porto Rican genera and species.

- a. First maxillæ greatly enlarged, very conspicuous, not concealed by other mouth parts, stout, with one strong, curved apical spine, and an internal knob-like process on the outer joint; the inner joint capped by an expanded papillose disc *Nalicora*, new genus.
- Only species *N. rapax*, new species.
- aa. First maxillæ not conspicuous, more or less concealed by other mouth parts, with two smaller curved spines on outer joint; inner joint not expanded at apex..... *Alcirona*.
- Only Porto Rican species *A. hirsuta*, new species.

NALICORA, new genus.

Clypeus small, peduncle of second antennæ long; mandible weak, with bidentate cutting edge and 3-jointed palp; first maxillæ very large, robust, and conspicuous in situ, outer joint stout, hooked, and terminated by a strong, curved spine in the male, continuous in contour with the rest of the part and with a knob-like process at its base; inner joint with its tip covered by a quadrate, curve-facced cap covered with papillæ; second maxillæ 4-jointed, first two joints stout, short, third joint stout and subconical, terminal joint slender and conical, with a tuft of setæ near tip; palp of maxillipeds 5-jointed, slender.

This genus somewhat resembles *Ianocira*, but the characters of the maxillæ serve to differentiate it.

***Nalicora rapax*, new species.**

Body convex, about 2.3 times as long as broad, first thoracic segment longest, next five about two-thirds as long and subequal, last shorter; posterior four thoracic segments with a row of setæ across middle and another on posterior margin, hairiness increasing posteriorly, occasionally a few setæ on second and third. Fifth segment broadest.

Pleon and telson about two-fifths as long as rest of body. Pleon of four visible segments, first short and narrower than second and third and hidden at side by seventh thoracic; second somewhat produced at posterior lateral angle; third segment strongly produced, angle reaching to beyond base of uropods.

Epimera of all the thoracic segments except the first distinct, of second and third not produced posteriorly, the following ones successively more produced, the last two terminating in strong angles.

First antennæ about as long as peduncle of second antennæ; peduncle of two equal joints, flagellum slightly longer than peduncle, about 8 or 9 jointed; distal ends of segments furnished with a few short hairs; second antennæ reaching to end of second thoracic segment; peduncle 5-jointed, fifth joint longest, slightly exceeding the fourth, which is as long as first three joints together.

Mandible weak, with bifid cutting edge and 3-jointed palp. First maxilla large, robust; plate of first joint expanded at distal end into a somewhat quadrate curved face closely beset with papillæ and looking like a triturating plate; third joint very stout, strongly curved with a very strong terminal spine continuous in contour with the rest of the joint; at base of curved portion, on inner side, a stout knob-like protuberance. The first maxilla is the largest and most conspicuous of the mouth parts, overlapping and hiding the mandible, and in the male reaching to the base of the antennæ. In the female the terminal spine is straighter, not so continuous with the rest of the plate, and points inward and somewhat backward. Second maxilla 4-jointed; first two joints short and stout; second joint stout, decreasing distally; third joint slender and tapering, set at an angle to second joint and furnished at its tip with several setæ, one of which is usually longer and stouter than the others.

Maxillipeds with rather slender 5-jointed palp, more slender in male, first joint shortest, second joint longest, 2 to 3 times as long as first.

First pair of thoracic limbs with fifth joint set obliquely to the plane of the preceding joints, very short, almost hidden on inner or anterior face, but triangular and appearing to be deeply embedded in fourth joint when viewed externally; fourth joint with about 4 stout spines on inferior edge, second limb with fifth joint longer and with slight obliquity; third pair similar but longer. Pairs 4 to 7 more slender, with numerous spines, the third, fourth, fifth, and sixth joints subequal.

Uropods stout, the peduncle prolonged at its inner angle into a robust process. Inner ramus broad (about 1.5 times as long as broad), extending beyond end of telson; outer ramus shorter and narrower, extending barely beyond tip of telson; apex truncate or subbifid.

Telson triangular, about two-thirds as long as broad, lateral margins somewhat excavated, apex narrow, rounded.

Seventeen specimens from stations 6062 and 6063, 25 to 75 fathoms. Largest 8.5 by 3.8 mm.; smallest 5.5 by 2.5 mm.

***Alcirona hirsuta*, new species.**

Front slightly produced and somewhat inflexed between the bases of the antennules, not joining the epistome; eyes small, lateral, distance between two or three times their diameter.

Body strongly arched antero-posteriorly. Epistome narrow, pentagonal. First antennæ with 2-jointed peduncle reaching to about end of fourth joint of antennal peduncle. Flagellum slightly shorter than peduncle, of 7 joints, first joint as long as second and third.

Second antennæ reaching to middle of third segment, with 5-jointed peduncle; first three joints short, fourth and fifth joints each about twice as long as third and subequal, flagellum with 17 joints. Mandibular palp rather robust, 3-jointed, second joint longest, second and third joints with setæ.

Maxillipeds with 5-jointed rather robust palps.

First segment of trunk about 1.6 times as long as second, the next five equal, the seventh a little shorter; third segment with a few setæ on lateral portion of posterior margin; fourth, fifth, sixth, and seventh with complete rows becoming successively more dense posteriorly. In one specimen a very few hairs at side of second segment. First three pairs of pereopods subsimilar, fourth joint broad and armed with several very strong spines, fifth joint very short, almost hidden in the first leg, somewhat longer in the second and still longer in the third. Seventh joint pectinate, with four long spines in the first leg, in the second and third legs these becoming weaker. Claws strong in all.

Last four legs successively longer and relatively to their length more slender than the first three pairs, heavily armed with numerous brown-tipped spines.

Pleon of five visible segments, dorsally strongly setose, first and second segments narrow and laterally covered by the seventh thoracic segment, the first being visible only dorsally; third segment posteriorly produced at the sides, covering the lateral portion of the fourth segment, which is the longest in the median line. This region is so setose that it is difficult to delimitate the segments.

Telson triangular, with the tip rounded and armed with 6 spines, about two-thirds as long as broad; dorsal surface and posterior margin with numerous setæ. Uropods extending somewhat beyond end of telson, inner branch the longer, not much longer than broad, rounded, with about 10 marginal

spines and numerous setae, about half as long as the ramus itself; external ramus narrow, with about eight spines and numerous setae on the posterior and outer margin.

This species is close to *A. insularis*, from which it differs in its greater hairiness.
Two specimens. Station 6079, 20 fathoms, 5 by 2.3 mm.

ÆGIDÆ.

Key to Porto Rican genera and species.

- a. Peduncle of first antennæ dilated anteriorly and not hidden by front margin of head; flagellum consisting of more than 6 joints; head not much produced in front of eyes; epistome large; maxillipeds consisting of 6 or 7 joints.....*Æga*
Only Porto Rican species.....*A. ecarinata*
- aa. Peduncle of first antennæ not dilated, more or less hidden by the projecting front of head, flagellum of 6 joints or fewer; head projecting well in front of eyes, front triangular; epistome minute or rudimentary; maxillipeds consisting of 4 joints.....*Rocinela*
Only Porto Rican species.....*R. signata*

Æga ecarinata Richardson.

"Body elongate and narrow. Length more than three times greater than breadth. Surface punctate. Frontal margin of head bisinuated, the acumen separating the first pair of antennæ. Eyes large and oblong and situated at a small distance apart. First pair of antennæ extending almost to flagellum of the second pair of antennæ; the first two joints of peduncle very broad; second joint extending anteriorly over the third joint, reaching almost to the extremity of that joint; third joint two-thirds narrower than first and second; the flagellum containing nine articles. Second pair of antennæ extending to middle of the first thoracic segment; flagellum containing ten articles."

"Epimera of all the thoracic segments narrow, the first two being rounded, the other four more acute at their extremities. First two pairs of prehensile legs rather stout; third pair less so, and the propodus of this pair is furnished with a large cultriform process. Five spines are present on the merus of all three pairs. Gressorial legs slender and sparsely spinulose."

"All the abdominal segments are visible in a dorsal view. Terminal segment broad and posteriorly bisinuated, forming three teeth with rounded extremities; its surface entirely smooth."

"Outer branch of uropods narrower and somewhat shorter than the inner branch; its extremity is rounded. Inner branch obliquely truncate and crenulate on posterior margin. Uropods and terminal abdominal segment all fringed with a few hairs."

One specimen, station 5052, 310 fathoms, 37 by 11 mm. This specimen was found on deck after the dredge was landed, and probably did not come from the bottom.

Rocinela signata Schiödte & Meinert.

Female, body oval, about 2.25 to 2.50 times as long as broad. The front is triangular and obtusely produced. The fifth and sixth thoracic segments are longest, the fourth and seventh are somewhat shorter, the second and third are shortest, and the first is less than the seventh and a little shorter than the head. The first pleonic segment is narrower than its successors, and more or less hidden dorsally, its posterior margin bisinuate; the next three segments are wider and subequal in length; the fifth segment is narrow, partly hidden laterally by its predecessor, and longer dorsally.

Telson subtriangular, about two-thirds as long as broad, its dorsal surface usually ornamented with three bands of pigmentation, the median one straight, longitudinal, the lateral ones transversely arched; a row of pigment spots on each side near the tip, parallel with the margin; posterior border crenulate and furnished with setae. Eyes small, separated by about one-third of breadth of head. First antennæ reaching to about middle of last joint of peduncle of second antennæ, flagellum 4-jointed. Second antennæ reaching to middle of second thoracic segment, peduncle extending to posterior border of eye, flagellum 11 to 12 jointed. Epistome minute or absent.

Epimera rather large, slender, posteriorly produced and acutely angled, the last reaching nearly or quite to the middle of second abdominal segment.

Uropods hardly reaching to end of telson, inner ramus narrow, not much wider than the outer and a little longer; both branches rounded posteriorly, their borders crenulate and furnished with setae, with spines on their external borders.

Specimens from Culebra, 12.5 by 5 mm.

CYMOTHOIDÆ.

Anilocra laticauda Milne-Edwards.

Ovigerous female. Body elliptical, about 2.6 times as long as broad.

Head of moderate size, subtriangular, about as long as first segment of trunk, about two-thirds as long as broad, front of head produced.

Eyes oval, half as long as lateral walls of head, about two-thirds as wide, distant from one another somewhat more than their length.

First antennæ 8-jointed, reaching to about posterior border of eye; peduncle dilated, second joint with anterior distal angle expanded; flagellum at an angle with peduncle, flattened. Second antennæ dilated, consisting of 9 to 10 joints, reaching to about middle of first trunk segment.

Thoracic segments gradually increasing in length from second to sixth, seventh about equal to third, first and fourth about equal. Anterior margins of first distinctly retreating behind eyes, first, second, third, fourth, and fifth rounded at posterior lateral angles, sixth somewhat produced, seventh strongly produced and reaching to angle of first abdominal segment. Epimera of second and third broadly rounded posteriorly, reaching to about posterior margin of segments; of fourth more slender, reaching to beyond middle of its segment; of fifth, sixth, and seventh more slender, sinuous, and reaching to about middle of their respective segments.

The legs are in two series, the first three are directed forward and inward, and the last four backward. They increase in length from before backward. The first pair have the second joint short and stout, the fourth and fifth subequal, the sixth longer and about equal to the third, the terminal joint with a stout curved claw, reaching to fourth joint when inflexed. The second joint with a keel on anterior outer edge. The next five pairs are subsimilar. The seventh pair much longer than the others, all of the joints except the seventh being lengthened, claw when reflexed reaching only to fifth joint; the first joint with the outer face with a shallow groove. None of the legs with spines or setæ. Six segments of pleon distinct, about one-third the length of body, first five segments shorter than the telson, about two-thirds as long as broad; first segment partly hidden dorsally by last thoracic segment, the rest of the segments subequal, laterally produced, the posterior lateral angles all exposed, of first and second rounded, of third and fourth notched, of fifth strongly notched and fitting around the sides of base of telson.

Telson subcircular, about as broad as long, with a depression on each side near base.

Uropods reaching to about end of telson, internal branch broader and a little longer than external, rounded posteriorly; external ramus falcate.

Color plumbeous.

From Arroyo and Vieques. Two specimens, 35.5 by 14 mm. and 13 by 5 mm.

SPHÆROMIDÆ.

No attempt is made to furnish a key to the genera owing to the extreme confusion that exists in this family, and it is doubtful if the following two species are properly assigned generically. The dissimilarity of the sexes has frequently misled authors into placing them in widely separated genera, and, while this has not been done in the present case, the limitations of the genera are so indefinitely established that the author has not been able to satisfy himself of the generic affinities of the species described.

Cilicea caudata Ives.

Body of male twice as long as broad. Head about 2.5 times as broad as long, produced in a rounded process between the bases of the first antennæ, above each of which there is a rounded notch; rest of frontal margin thickened. Eyes convex, in posterior lateral lobes. First segment about two-thirds as long as the head, laterally notched to receive the lobes of head and produced beneath the eyes, next four about two-thirds as long, the sixth and seventh about equal to first. Lateral margin of first segment long, slightly produced backward and sharply angled at each end; posterior margins of following segments somewhat deflected backward at sides. The sides of segments two to six are narrower externally than the dorsal portions, owing to the thinning of the anterior border to form a ridge over which the grooved posterior surface of the preceding epimeron rides. The last thoracic segment does not extend so far ventrally as the preceding ones.

The free abdominal segment is broader and wider than the last thoracic segment, with two or three furrows at the sides; on its posterior border are three low processes, from a crater in the top of each of which a tuft of setæ projects. The telson has three prominent processes projecting backward from its base, the central one with a tuft of setæ. At the base of the apical incision there is a broad rounded process. The apical notch is furnished with four teeth, two small ones at the base and two larger ones outside of them and at a slightly lower level. The two limbs forming the borders of the notch are notched at their tips and furnished with a tuft of setæ.

The uropods have a long, curved outer branch. The posterior part of telson and the uropods are covered with very short, close-set soft hairs and scattered tufts of longer ones. Most of the body is minutely tuberculate, with scattered tufts of two or three setæ. The epistome is broad, pointed in front and widely forked behind, the two limbs embracing the clypeus.

First antennæ have a 3-jointed peduncle, first joint long, stout; second joint deeply embedded in first; third joint as long as second, slender; flagellum 11-jointed, setose, about as long as peduncle; second antennæ extending to about end of third segment; peduncle 5-jointed, slender; flagellum 14-jointed, a little longer than peduncle. Mandible with cutting edge, molar surface and palp. Maxillipeds with 5-jointed palp, of which the last is slender and the second, third, and fourth strongly produced internally; plate of second joint broad, with hooks and terminal spines. Thoracic legs increasing in length posteriorly, more or less setose, terminal joint biangulate.

Female smaller, resembling male in head and thorax. First joint of abdomen without tubercles; basal processes of telson small, no process at base of apical incision; apical incision small, simple, rounded, without teeth; outer ramus of uropods lamellar, inner ramus well developed, lamellar, fused to peduncle.

From coral reefs at Mayaguez, Boqueron Bay, Puerto Real, Arroyo, and Fajardo. Largest male 7.5 by 3.5 mm. Largest female 4.8 by 2.3 mm. Color in life, red or pink.

The smaller form was described as *Cymodocea burmudensis* by Ives, who at first suspected that it was the female of the other, but concluded otherwise upon finding male organs upon one specimen. In Porto Rico the two were always found associated and as all the larger forms were found to be males, while none of the smaller ones could be so determined, I am inclined to believe that Mr. Ives's specimen was an anomaly. The two forms agree in all particulars save only those which are generally recognized to be sexual.

The form described by Miss Richardson as *Dynamene nodulosa* is probably the female of *Ciliccia caudata gilliana* Richardson, or of a related species.

Dynamene perforata, new species.

Body stout, about twice as long as broad, slightly increasing in breadth posteriorly, sides almost straight. Head short, broad, a little over half as wide as greatest width of body (about 3.5 times as broad as long). First thoracic segment longest, about equal in length to head; last thoracic segment shortest, about half length of first; other five segments equal, about two-thirds as long as first; first segment strongly excavated near sides to receive the eye lobes of posterior margin of head, anteriorly produced at lateral border to an acute process beneath the eye.

The lateral margins of all of the thoracic segments are somewhat produced posteriorly, the posterior edge being grooved to slide over a ridge on the outer anterior margin of the succeeding epimeron when the animal rolls into a ball, the segments thus locking against a transverse stress; the epimeron of the last segment, which in the male is longer than the others, is without this groove, but it slides outside of a forwardly projecting process or lug. The lateral margin of the first segment is long and straight, of the second, third, and fourth is narrower than the dorsal length, the fifth, sixth, and seventh broader and more rounded, the latter being more distinctly produced behind the posterior dorsal margin of the segment, especially in the male, where it forms a large epimeral plate.

Free joint of abdomen a little less than one-third length of telson, produced into a posteriorly projecting process over lateral margin of telson, at base of process a lobe crossed by a suture, indicating probably two of the fused segments which constitute the free abdominal segment.

Telson in male triangular, notched posteriorly; in front of notch a groove in median line connecting with a transverse foramen. This region varies in different individuals; in some the groove is shallow, and in some it is deep, and in one it is clearly an incision connecting the terminal notch with the

foramen. The latter is apparently formed by the coalescence of the lips of a deep terminal notch. The posterior bilobed margin of the foramen is more elevated than the anterior. In the female the telson is more rounded, there is no foramen, and the terminal notch in most cases is obscure, although one specimen presents an appearance like other species of the genus. In some there is an appearance of thinness of the telson in the region occupied by the foramen of the male. In both sexes the telson is globose above, and at its base projects outside the base of the uropods in an epimeral-like process.

In the male the abdomen and the posterior margin of the last three thoracic segments are ornamented with small, close-set papillæ, lacking in the female. In both sexes there are very short hairs scattered over the body.

The eyes are prominent and strongly convex; first antennæ extending beyond first joint of thorax, peduncle 3-jointed, first joint stout, somewhat constricted in the middle, second joint short, third about twice as long as second, flagellum 7-jointed, joints gradually decreasing in length, furnished with sensory hairs; second antennæ reaching beyond second joint of thorax, peduncle 5-jointed, first three joints short, fourth longer, fifth longest; flagellum a little longer than peduncle, 11-jointed; mandible stout, with 2 dental plates on right side, 1 on the left, a strong molar plate, and a 3-jointed setiferous palp, the joints of which decrease in length distally; first maxilla with 4 plumulose setæ on tip of first joint and a group of stout spines at apex of third joint; second maxilla with 3 plates, each armed with about 3 stout curved spines; maxillipeds with a 5-jointed setiferous palp, the terminal two joints slender, the second and third produced to a rounded lobe at internal distal angles, plate of second joint of maxilliped long and broad, and furnished with about 6 stout pectinate setæ distally and a hook which locks it with its fellow of the other side.

Thoracic limbs increasing from first to last, all furnished with hairs and spines; fifth joint of first pair short and triangular, much longer in second and third pairs, in fourth pair shorter than in the two preceding pairs, gradually increasing to the seventh pair, where it is about as long as in the third, but much stouter. The seventh joint of all the legs is furnished with a stout terminal claw with a smaller one at its base. Uropods broad and leaf-like, rounded posteriorly, and serrate or crenulate, outer ramus shorter than inner and folding beneath it, both extending beyond tip of telson.

About 50 specimens from mangrove roots at Culebra, 3.4 by 1.7 mm.

Tribe VALVIFERA.

IDOTEIDÆ.

Cleantis planicauda Benedict.

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

Head subquadrate, partially immersed in the first thoracic segment and rounded on the posterior margin; sides parallel, anterior margin emarginate; a deep depression or groove runs from the median notch to the center of the head. The eyes are situated near the antero-lateral angle; postoccipital lobe distinct; antennæ with six segments; first very short and nearly immobile; second very short and stout; the third segment is equal in length to the second, but not so stout; the fourth and fifth are of equal length and about one-third longer than the second and third segments. The terminal segment or flagellum is lighter in color and is armed with short bristles. The length of the antennæ is equal to the length of the head and first two thoracic segments. The antennulæ extend to the middle of the third segment of the antennæ. The first segment is quadrate; the second subquadrate; the third is pear-shaped; the fourth segment is very small.

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

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

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

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

The above is the original description, to which I wish to add that the fourth pair of legs consists of but six segments, the unguinal joint being absent.

From Mayaguez and Vieques. Largest specimen, 14 by 2.5 mm.; smallest, 6.5 by 1.6 mm.

Tribe ONISCOIDEA.

LIGIIDÆ.

Ligia gracilis, new species.

Body elongate-ovate, rather narrow; about 2.75 times as long as broad.

Head about 2.5 times as broad as long, breadth about two-thirds of greatest width of body, rounded in front, bilobate posteriorly. First segment of thorax longest, the next five subequal, the last somewhat shorter; first segment with front margin excavated to receive lobes of head, which, on account of their convexity, appear to overlap it, produced beneath the eyes at anterior lateral angles; second, third, fourth, and fifth segments of about equal breadth; posterior margins of first, second, and third segments nearly straight; fourth segment somewhat produced at posterior lateral angle, the last three segments strongly produced to acute angles; seventh segment with posterior margin excavated dorsally so as to uncover the first segment of pleon.

Abdomen constituting about one-third of total length of body; first two segments short and narrow, the postero-lateral angles not produced; first segment (sometimes the second) hidden laterally by the angle of the last thoracic segment; third segment widest, the next two successively narrower and longer, all three strongly produced at postero-lateral angles; telson about three-fourths as long as broad, with a sharp tooth at postero-lateral angle and 2 blunt, rounded teeth inside of it on each side; in the median line there is a blunt angle, but no sharp tooth, as in *L. olfersii* and *L. exotica*.

The lateral borders of all of the thoracic and abdominal segments are fringed with minute teeth.

Eyes large, black, lateral, strongly convex, facets small, numerous; first antennæ minute, 3-jointed; second antennæ, when folded back along sides of body, reaching to about end of thorax; peduncle 5-jointed, first two joints short, subequal, last three successively longer, flagellum about 1.5 times as long as peduncle, consisting of about 37 joints.

Mandible without palp, with two apical plates armed with three teeth each, and a dentate plate on internal face. Molar surface beset with small setæ around its base, a row of large plumulose setæ around base of inner dental lamella.

First maxillæ with plate of first joint furnished with three stout plumulose spines and a tuft of slender hairs, third joint with stout spines; second maxilla with one large plate and a shorter, more slender one; maxillipeds broad, with a 5-jointed palp, bearing setæ on its inner edge and stout spines on outer edge and ventral face; plate of second joint furnished with many short crowded spines and setæ.

The thoracic legs increase in length from first to last; in all, the terminal joint is short and biungulate, the sixth or penultimate joint is long, and in the last pair of legs the sixth and seventh joints together equal or slightly exceed the fourth and fifth combined; all of the legs are more or less spiny in all of their joints.

The uropods are biramous, the inner ramus being about twice as long as the peduncle; outer ramus broken.

Ten specimens from Culebra, under algae and drift alongshore. Largest specimen, 15 by 5.5 mm.; smallest, 5 by 1.5 mm.

ONISCIDÆ.

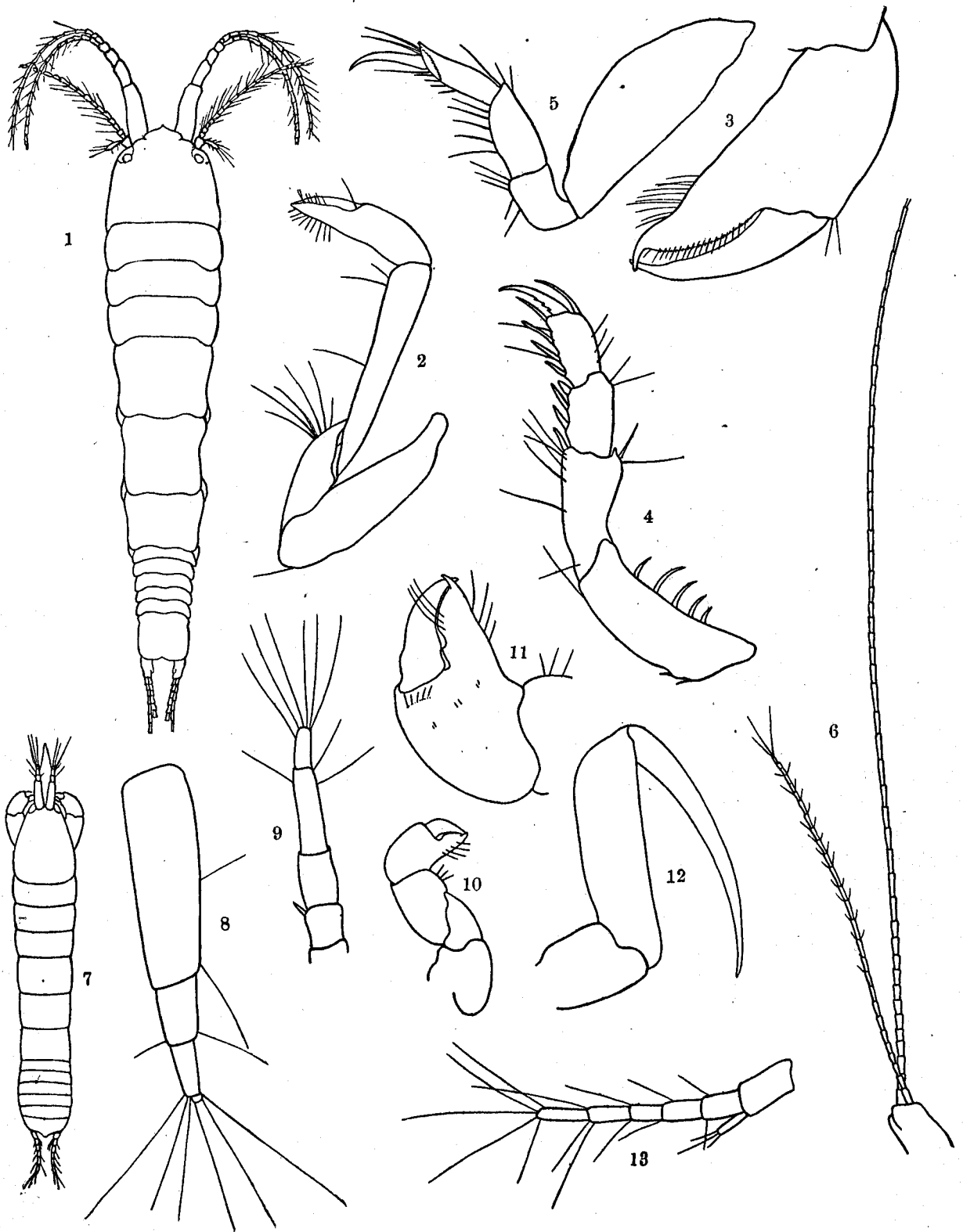
Philoscia culebræ, new species.

Body elongate-oval, about 2.5 times as long as broad; head about twice as broad as long, front somewhat recurved between sides and middle, producing the appearance of a small lobe in front of each eye, sides and posterior margin rounded; first segment of thorax longest, its anterior and posterior margins strongly curved, anterior angle rounded and projecting somewhat beyond sides of head; next six segments subequal in length, second, third, and fourth widest, the last three successively narrower; posterior angles of last four segments produced, successively increasing in length, that of last reaching almost to posterior border of third abdominal segment; abdomen almost as long as last three segments of thorax, gradually decreasing in width posteriorly; segments subequal in length, the sides of the first more or less concealed by the lateral angle of the last thoracic segment; telson, short, hardly longer than other segments, produced to a blunt point in median line posteriorly.

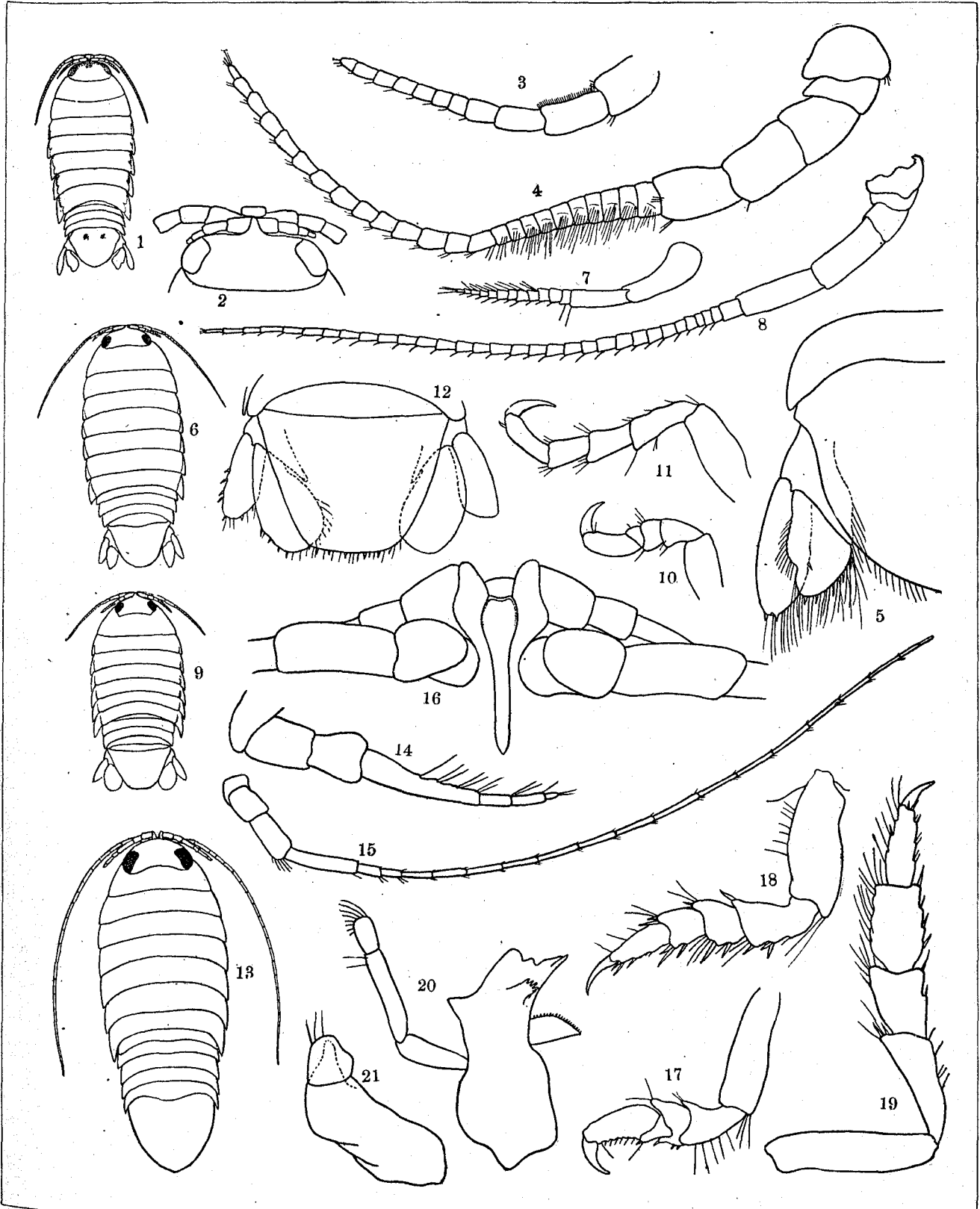
Eyes moderate (for the genus); first antennæ minute, second antennæ when laid against sides of body extending to about end of second thoracic segment, spinose; peduncle, 5-jointed; first joint, short; second and third, equal; fourth, longer; fifth, longest, equal to third and fourth combined; flagellum 3-jointed, about equal to last joint of peduncle. Mandible with narrow 4 or 5 dentate tip, at the base of which are two plumulose setæ, and lower down a brush of fine setæ; no palp. First maxillæ with inner plate furnished with several small spines; outer plate with many.

The legs increase slightly in length from before backward and are furnished with long, acute spines. The uropods are broken off.

From Culebra. Two specimens, under drift on shore, 4.2 by 1.6 mm.



Figs. 1-6. *Apsudes espinosus*, n. sp.—Fig. 1, animal, $\times 15$. Fig. 2, first leg, $\times 33$. Fig. 3, chela, $\times 100$. Fig. 4, second leg, $\times 33$. Fig. 5, seventh leg, $\times 33$. Fig. 6, uropods, $\times 33$.
 Figs. 7-13. *Leptochelia incerta*, n. sp.—Fig. 7, animal, $\times 14$. Fig. 8, first antenna from above, $\times 77$. Fig. 9, second antenna from below, $\times 77$. Fig. 10, left cheliped, $\times 33$. Fig. 11, left chela, anterior view, $\times 77$. Fig. 12, end of second leg, $\times 77$. Fig. 13, uropod, $\times 77$.



Figs. 1-5. *Cirolana mayana* Ives.—Fig. 1, animal, $\times 3$. Fig. 2, head. Fig. 3, first antenna, $\times 40$. Fig. 4, second antenna, from below, $\times 40$.
 Fig. 5, left side telson and uropods from above, $\times 23$.
 Figs. 6-8. *Cirolana parva* Hansen.—Fig. 6, animal, $\times 5.3$. Fig. 7, first antenna, $\times 33$. Fig. 8, second antenna, $\times 33$.
 Figs. 9-12. *Cirolana obruncata* Richardson.—Fig. 9, animal, $\times 6$. Fig. 10, first leg. Fig. 11, seventh leg. Fig. 12, telson and uropods from above.
 Figs. 13-21. *Branchuropsus littoralis*, nov. gen. et sp.—Fig. 13, animal. Fig. 14, first antenna, from above, $\times 83$. Fig. 15, second antenna, from below, $\times 33$. Fig. 16, front of head, from below. Fig. 17, first leg, $\times 33$. Fig. 18, fourth leg, $\times 33$. Fig. 19, seventh leg, $\times 33$. Fig. 20, mandible, $\times 83$. Fig. 21, maxilliped, $\times 100$.

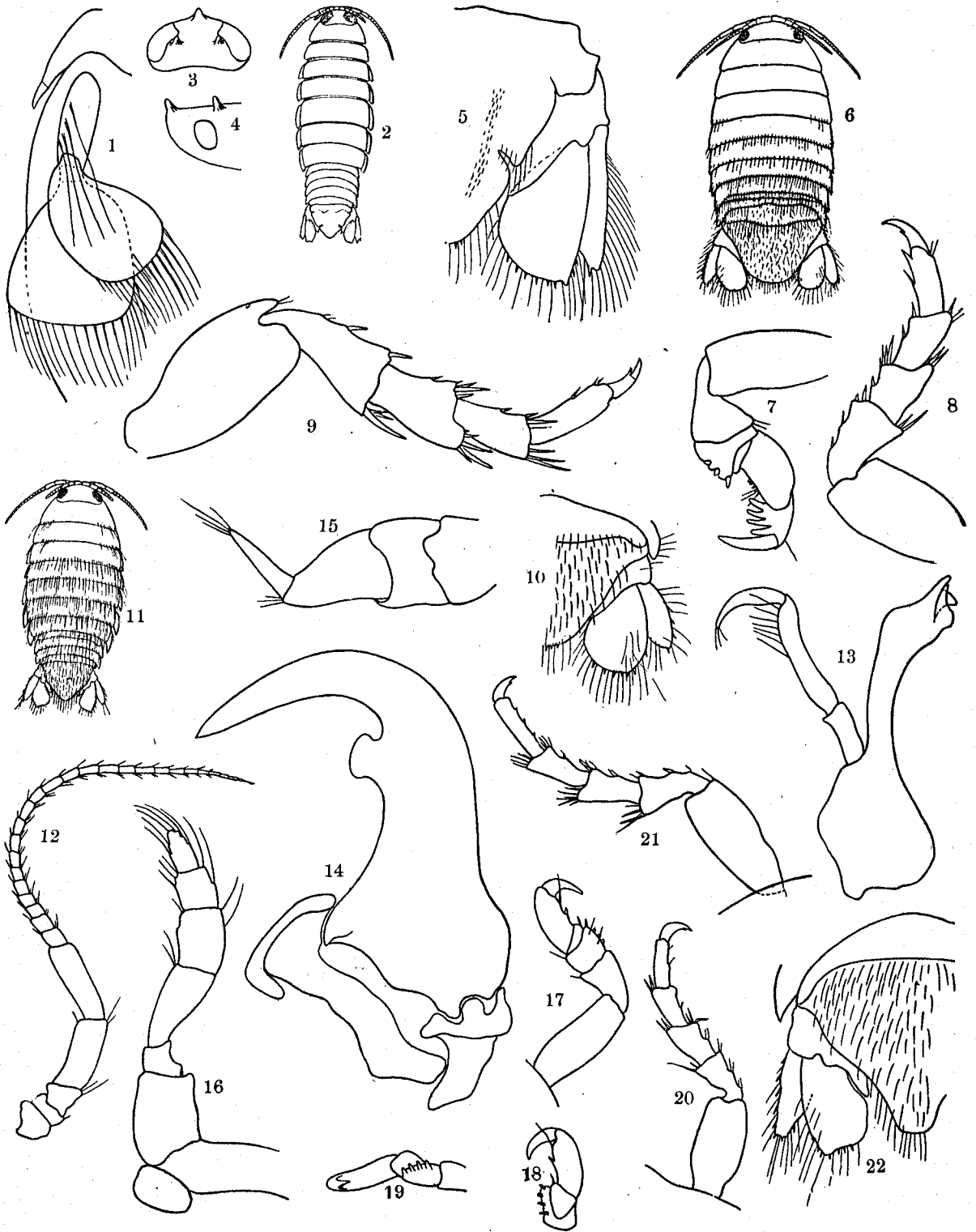


Fig. 1. *Branchuropus littoralis*, nov. gen. et sp.—Uropods, right side from below.
 Figs. 2-5. *Corallana tricornis* Hansen.—Fig. 2, animal, $\times 5$. Fig. 3, head, top. Fig. 4, head, side. Fig. 5, telson and uropods, right side, $\times 33$.
 Figs. 6-10. *Alcirona hirsuta*, n. sp.—Fig. 6, animal, $\times 8$. Fig. 7, first leg, $\times 40$. Fig. 8, fourth leg, $\times 40$. Fig. 9, seventh leg, $\times 40$. Fig. 10, telson and uropods of right side.
 Figs. 11-22. *Naticora rapax*, nov. gen. et sp.—Fig. 11, animal, $\times 5$. Fig. 12, right second antenna, $\times 33$. Fig. 13, mandible, $\times 77$. Fig. 14, first maxilla, $\times 77$. Fig. 15, second maxilla, $\times 77$. Fig. 16, maxilliped, $\times 77$. Fig. 17, first leg, posterior, $\times 20$. Fig. 18, first leg, anterior, $\times 20$. Fig. 19, first leg, inferior, $\times 20$. Fig. 20, fourth leg, $\times 16$. Fig. 21, seventh leg, $\times 16$. Fig. 22, telson and uropods, left side, $\times 14$.

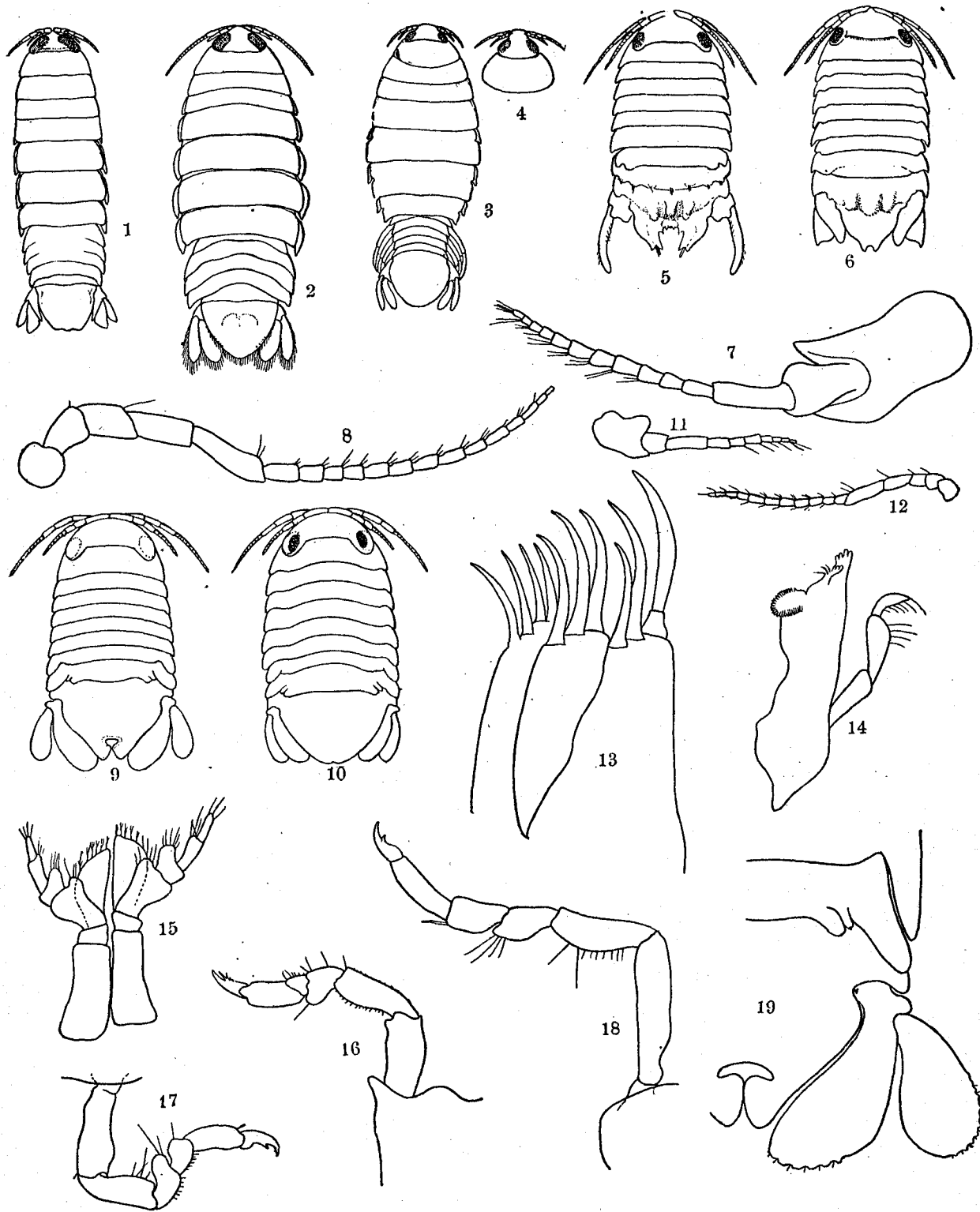


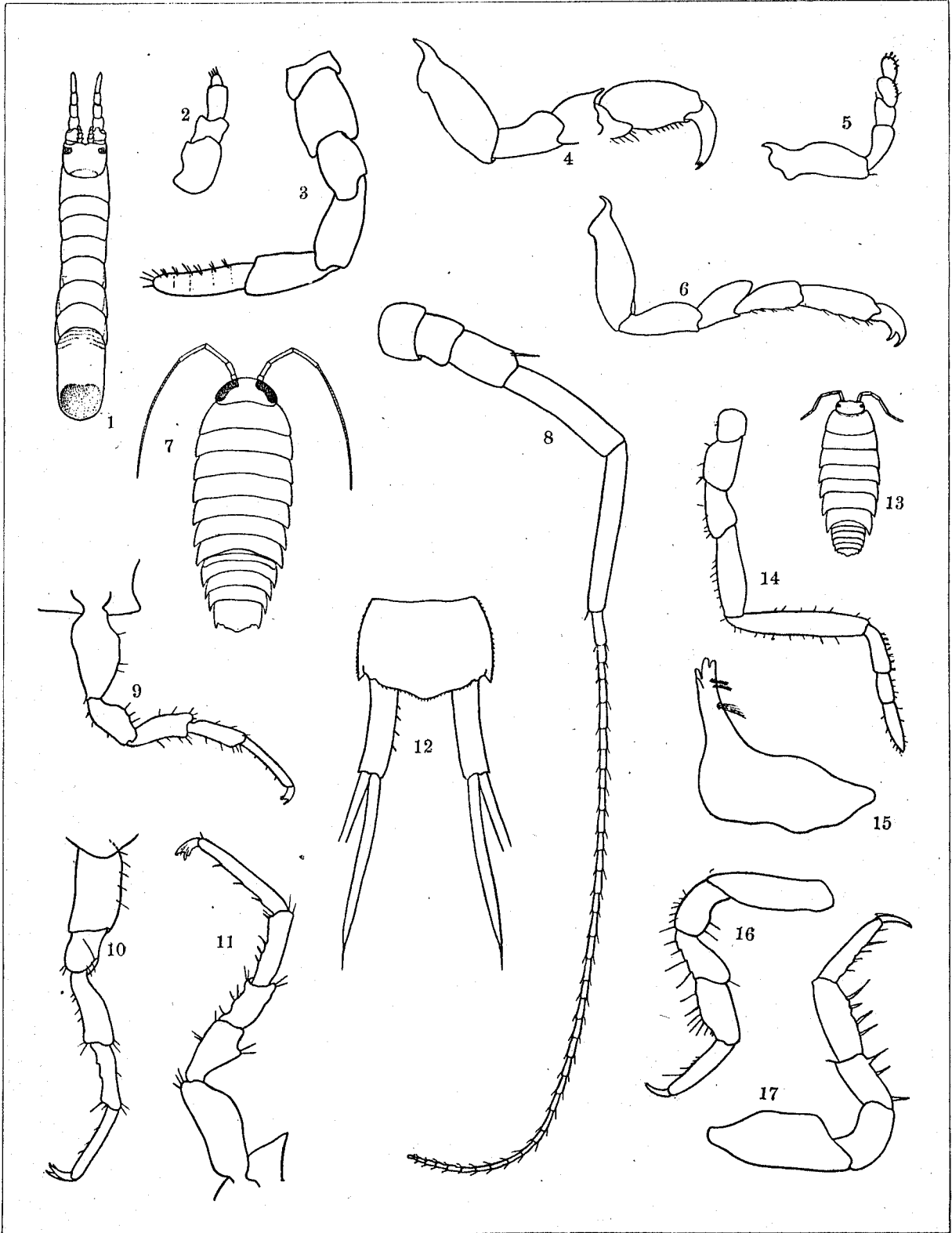
Fig. 1. *Aya ecarinata* Richardson, $\times 1.3$.

Fig. 2. *Rocinela signata* Sch. & Mein, $\times 4.5$.

Figs. 3, 4. *Anilocra laticauda* Milne-Edwards.—Fig. 3, animal, $\times 1.3$. Fig. 4, head of same, $\times 1.3$.

Figs. 5-8. *Cilleca cordata* Ives.—Fig. 5, male, $\times 5.3$. Fig. 6, female, $\times 8$. Fig. 7, first antenna, $\times 40$. Fig. 8, second antenna, $\times 40$.

Figs. 9-19. *Dynamene perforata*, n. sp.—Fig. 9, male, $\times 12$. Fig. 10, female, $\times 12$. Fig. 11, first antenna. Fig. 12, second antenna. Fig. 13, tip of maxilla, highly magnified. Fig. 14, mandible, $\times 77$. Fig. 15, maxillipeds, $\times 77$. Fig. 16, first leg, left, $\times 83$. Fig. 17, fourth leg, left, $\times 83$. Fig. 18, seventh leg, left, $\times 83$. Fig. 19, telson and uropod, right side, male, $\times 83$.



Figs. 1-6. *Cleantis planicauda* Ben.—Fig. 1, animal, $\times 3.3$. Fig. 2, first antenna, $\times 16$. Fig. 3, second antenna, $\times 16$. Fig. 4, first leg, $\times 16$. Fig. 5, fourth leg, $\times 16$. Fig. 6, seventh leg, $\times 16$.
 Figs. 7-12. *Ligia gracilis*, n. sp.—Fig. 7, animal, $\times 3$. Fig. 8, second antenna. Fig. 9, first leg, left. Fig. 10, fourth leg, left. Fig. 11, seventh leg, left. Fig. 12, telson and uropods, $\times 11$.
 Figs. 13-17. *Philoscia culcra*, n. sp.—Fig. 13, animal, $\times 7$. Fig. 14, antenna, $\times 33$. Fig. 15, mandible, $\times 77$. Fig. 16, first leg, $\times 33$. Fig. 17, fourth leg, $\times 33$.

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