

first pair of legs differ from the others in being large and strong; usually this and the second and third pairs are subchelate; the remaining legs are ambulatory. In our genera the outer branch of the first pair of abdominal appendages is expanded and covers the other pleopods; the outer branch of each uropod arches over the base of the telson. Thus, as described at the beginning of this chapter, the respiratory branches of the pleopods are enclosed in a chamber formed by part of the first abdominal appendages, the bases of the uropods, and the telson.

Little is known of the habits of these slender-bodied Isopods, but the mouth-parts are often modified for suction, and doubtless many of the species lead a parasitic life. The family is divided into two groups, one including forms with the mouth organs modified for biting, the other species with oral parts adapted for piercing. A pair of statocysts is usually developed in the telson of the genera of the first group, and a single statocyst is found in the telson of a few species of the second. At least three genera are represented in South Australian waters.

- a. Mouth parts for biting. Maxilliped five-jointed *Mesanthura*.
- aa. Mouth parts for piercing. Maxilliped with less than five joints.
- b. Maxilliped three-jointed *Paranthura*.
- bb. Maxilliped four-jointed *Accalathura*.

MESANTHURA (Barnard).

The abdomen is short, with at most only obscure indications of sutures on the six fused segments. The flagellum of the first antennae is brush-like in the male and two-jointed in the female. The flagellum of the second antennae has no more than four joints.

Mesanthura maculata (Haswell). (spotted).

It is stated that the few species referred to this genus are much alike structurally, but that colour pigment is well developed and each species has a characteristic colour pattern. *M. maculata* is light yellow with extensive black blotches as shown in the figure. Length: 19 mm., or $\frac{3}{4}$ in. (S.A.M.)

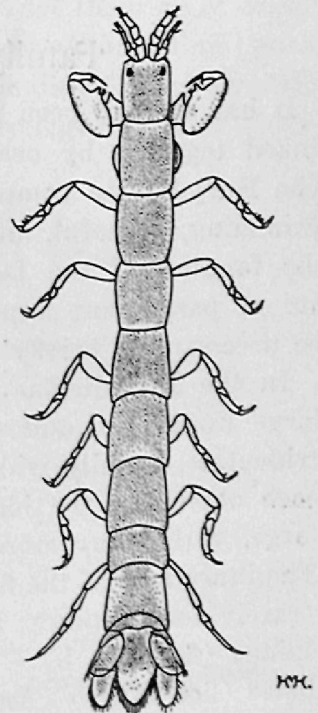


FIG. 238.—*Mesanthura maculata* (x 9).

PARANTHURA (Bate and Westwood).

The abdomen is short, with the sutures more or less distinct, at least towards the sides. The first antennae have a brush-like flagellum in the male and a four to six jointed lash in the female. In both sexes the flagellum of the second antennae consists of one flattened joint.

Paranthura punctata (Stimpson). (marked with small spots).

This species is pale, usually marked with many small pigment spots producing a greyish appearance. Sometimes there are irregularly arranged pigment specks, but usually they are massed into spots, particularly on the hinder part of the body. Length: 16 mm., or $\frac{5}{8}$ in. (S.A.M.)

ACCALATHURA (Barnard).

The short abdomen has distinct sutures, and the flagella of both pairs of antennae are many jointed in both sexes.

Accalathura gigas (Whitelegge). (very large).

South Australian specimens differ from the syntypes of this species in having well pigmented eyes. Eyes are apparently wholly absent in one of the syntypes recently examined, and our examples should possibly be referred to *A. sladeni* (Stebbing), a species described from Seychelles. New South Wales examples of *A. gigas* attain a length of 42 mm. Length (largest South Australian specimen): 25 mm., or 1 in. (S.A.M.)

Family EURYDICIDAE (Sea-lice).

It has already been mentioned that this and the next four families are linked together by certain features and form the "Cymothoid group." The Eurydicidae comprise the sea-lice, the majority of which are free-swimming, graceful, and predaceous creatures. A reference to the key to the families of the Isopoda-Flabellifera will show that the mouth-parts are of paramount importance in the Cymothoid group; it will therefore be necessary to briefly describe the oral organs of each family.

In the Eurydicidae the jaws, or mandibles, meet squarely behind the large upper lip, and their incisor processes have a sharp, more or less tridentate, usually wide cutting edge (fig. 233, a); these edges glide past each other like the blades of a pair of scissors. The movable lacinia is large, with many spines, and the molar process is large and triangular. The inner lobe of the first maxillae is expanded at the apex and bears three (rarely four) spines; the wider outer lobe is furnished with many strong spines (fig. 233, b). The second maxillae have three lobes capped with hairs (fig. 233, c). In this and the two following families the palp of the maxillipeds is free and provided with hairs, not hooks, on the apical joints (fig. 233, d).

Only one genus, *Cirolana*, has so far been recorded. Dr. Leach is said to have derived this and other generic names, such as *Nerocila*, from anagrams on his wife's name Caroline.

CIROLANA (Leach).

The sea-lice are very agile in the water, and many of them, for a short time at least, display some activity on land also. They are eminently carnivorous, and at times are encountered literally in swarms; fishes captured in set nets are sometimes rendered useless through their depredations. The keen-edged jaws are capable of cutting out a comparatively large piece of flesh. Persons wishing to obtain vertebrate skeletons, and not desiring to undertake the unpleasant task of maceration, take advantage of the scavenging habit of the sea-lice, and submerge their material, in the flesh, at a place where these creatures are abundant; the bones are rapidly and very cleanly denuded of all flesh. At least some of the sea-lice not only feed upon offal, but attack living animals. Some time ago a female Port Jackson shark (*Heterodontus phillipi*) was observed to be in difficulties in St. Vincent Gulf. When captured and cut open, it was found to contain hundreds of individuals of *Cirolana woodjonesi*, which had entered the body cavity and were literally eating the unfortunate fish alive. The *Cirolanas* sometimes inflict irritating little wounds on the legs of bathers, and some of them bite quite sharply if incautiously handled. A learned professor once found a living fish teeming with sea-lice. In his hurry to secure this rich harvest he "tried to help himself by keeping some of the parasites in his closed hand, but they bit him so ferociously that he was obliged to let them go at once." In the tropics I have collected a series of a species of an allied genus (*Exciorolana orientalis*) by the simple expedient of standing in shallow water in a mangrove swamp; as the "lice" attacked my bare legs they were picked off and bottled.

Four South Australian species have been described:

- a. Flagellum of second antennae not reaching to hinder margin of fifth segment of thorax.
 - b. Frontal lamina (the small plate between the antennae) sublinear, very much longer than wide.
 - c. Basal joint of last leg expanded, twice as long as greatest width. Body plump *corpulenta*.
 - cc. Basal joint of last leg greatly expanded, only one and one-half times as long as greatest width. Body more slender, but moderately robust *woodjonesi*.
 - bb. Frontal lamina broad, only slightly longer than wide *cranchii australiense*.
- aa. Flagellum of second antennae reaching back well beyond hinder margin of last segment of thorax *vieta*.

Banded Sea-louse. *Cirolana corpulenta* (Hale). (fat).

The first antennae are short, and do not reach to the end of the peduncle of the second antennae; the second antennae reach back to about the hind margin of the second thoracic segment. During life the plump body is white, with bands of black colour cells near the hinder margin of the head, and of the thoracic and first five abdominal segments. Length: 12 mm., or $\frac{1}{2}$ in. (S.A.M.)

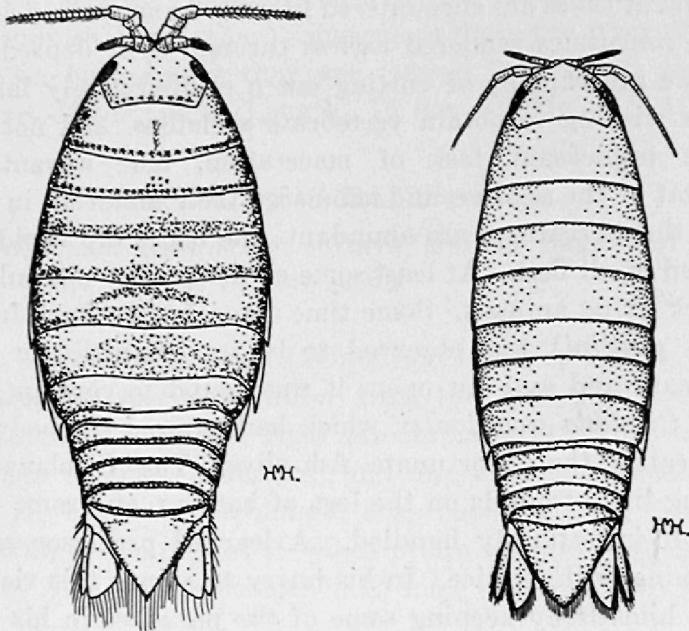


FIG. 239.—*Cirolana corpulenta* (x 5). FIG. 240.—*Cirolana woodjonesi* (x 3).

Smooth Sea-louse. *Cirolana woodjonesi* (Hale). (personal name).

The first antennae are short, and do not reach to the end of the peduncle of the second antennae; the second pair reach back to the hinder margin of the long first thoracic segment. The legs are all flattened, and the basis joint of the posterior limbs is greatly expanded, much more so than in our other species. The body is rather slender. During life this sea-louse is porcelain-white, sometimes suffused with colour owing to food contained in the capacious stomach. Length: 24 mm., or 1 in. (S.A.M.)

This is one of our commonest sea-lice, and often renders itself objectionable by attacking the bait of line fishermen in prodigious numbers.

Grey Sea-louse. *Cirolana cranchii australiense* (Hale). (Australian).

The first antennae reach a little beyond the end of the peduncle of the second antennae, which reach back to the posterior margin of the third or fourth thoracic segment. The whole of the upper surface is closely covered with tiny black dots on a white ground, giving the animal a grey appearance. Length: 13 mm., or $\frac{1}{2}$ in. (S.A.M.)

A very common sea-louse, often taken in company with the foregoing species.

Wrinkled Sea-louse. *Cirolana vieta* (Hale). (wrinkled).

The first antennae are very short, but the second pair have unusually long flagella, which reach back to the hind margin of the fourth segment of

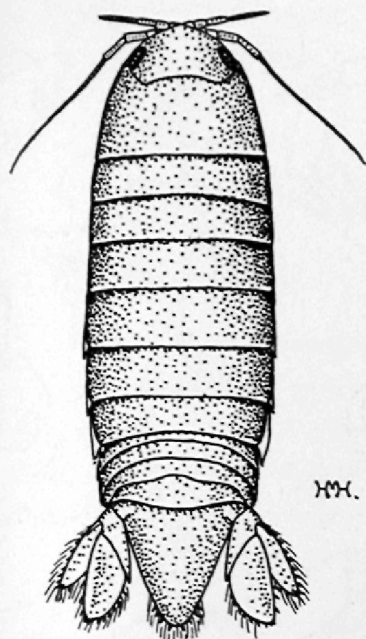


FIG. 241.—*Cirolana cranchii australiense* (x 5).

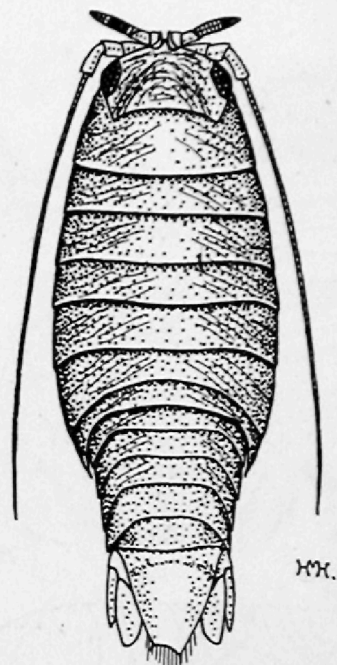


FIG. 242.—*Cirolana vieta* (x 5).

the abdomen. The upper surface of the head, thorax, and part of the abdomen is marked with numerous furrows, giving the animal a wrinkled appearance. The long second antennae and the sculpturing readily separate this from our other forms. Length: 13 mm., or $\frac{1}{2}$ in. (S.A.M.)

Family PHORATOPODIDAE.

The mouth parts are much as in the preceding family, but the molar process of the mandibles is small. The extraordinary development of the legs of the single known representative is, however, very distinctive.

PHORATOPUS (Hale).

Oar-legged Sea-louse. *Phoratopus remex* (Hale). (an oarsman).

Both pairs of antennae have the peduncle expanded, and the flagellum short. There is no trace of eyes. The coxal plates of the second to sixth thoracic segments are very large, those of the last segment relatively small. The first legs are subchelate, the second and third pairs imperfectly subchelate and furnished with curious, hair-like sensory organs. The fourth, fifth, and sixth pairs are greatly expanded and flattened, and the seventh legs are flattened, but only moderately expanded. The last joint or dactylus

is rudimentary in the fourth to sixth legs, and altogether absent in the last pair. Length: 20.5 mm., or $\frac{3}{4}$ in. (S.A.M.)

A single specimen of this queer Isopod was collected at Encounter Bay.

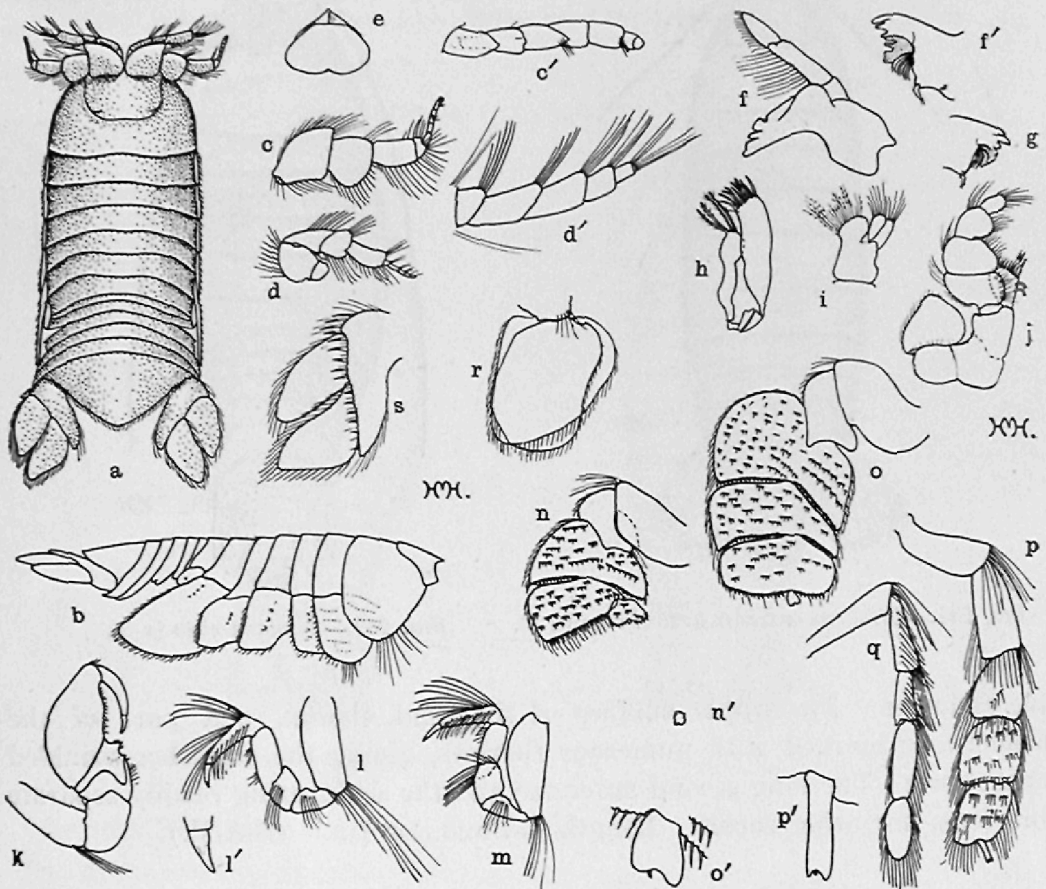


FIG. 243.—*Phoratopus remex*: a and b, dorsal and lateral views (x 2); c and d, first and second antennae (x 4); c' and d', flagellum of first and second antennae (x 15); e, clypeus and labrum (x $4\frac{1}{2}$); f, left mandible (x 6); f', ventral view of anterior part of left mandible (x 6); g, ventral view of anterior part of right mandible (x 6); h and i, first and second maxillae (x 8); j, maxilliped (x 8); k to q, first to seventh legs (x 4); l', claw of second leg (x 32); n', o', and p', dactylus of fourth, fifth, and sixth legs respectively (x 15); r, second pleopod (x 4); s, uropod (x 4).

Family CORALLANIDAE.

The mandible and maxillae of the one species so far taken in our waters is shown in fig. 244. The distal part of the jaw is narrow and inwardly directed; the movable lacinia is small or indiscernible. The molar process in the mandible illustrated is represented by a feeble blade, but this process may be well developed or absent. The outer lobe of the first maxillae is slender and tapering, and armed with one or more large spines, or with minute spines. The apex of the second maxillae is simple, sometimes capped with a few hairs.

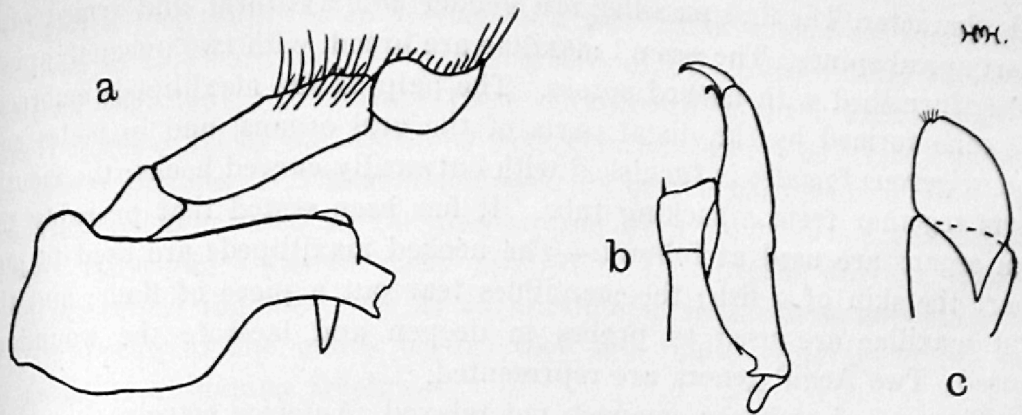


FIG. 244.—a, Mandible : b, first maxilla : and c, second maxilla of *Argathona similis* (x 30).

ARGATHONA (Stebbing).

Argathona similis (Richardson). (similar).

The first antennae are very short, and the second pair have a flagellum longer than, or as long as the thorax. The body is brownish or white during life, and is clothed above with moderately long hairs; this hairy covering is

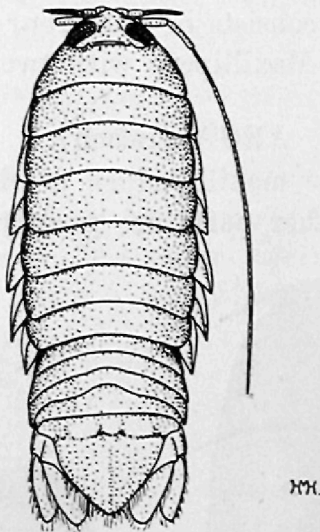


FIG. 245.—*Argathona similis* (x 2½).

not shown in the specimen illustrated. Length: 21 mm., or $\frac{5}{8}$ in. (S.A.M.)

This animal, although a free swimmer, attaches itself to fishes, upon which it feeds. Examples taken from the hinder part of the body of a Parrot-fish were gorged with blood corpuscles and epidermal cells ingested from the host.

Family AEGIDAE (Fish-lice).

The species placed in this and the following family are true parasites, and attach themselves more or less permanently to fishes. It is not surprising, therefore, that the mouth parts are considerably modified. The palp of the mandibles has no inflated joints in the Aegidae, but in the next family, the Cymothoidae, the first joint is inflated, or both first and second joints have

this character. The first maxillae are slender and styliform, and armed with short apical spines. The second maxillae are broad, with two unequal, apical lobes, furnished with hooked spines. The palp of the maxillipeds embraces the cone formed by the distal parts of the oral organs, and in males and non-ovigerous females is furnished with outwardly curved hooks; the mouth-parts together form a sucking tube. It has been stated that probably the oral organs are used as follows:—The hooked maxillipeds are used to pull apart the skin of a fish; the mandibles tear out a piece of flesh; and the first maxillae are used as probes to deepen and lacerate the wound so caused. Two Aegid genera are represented.

- a. Thorax and abdomen compact, not relaxed. Anterior margin of head with a small, median process, separating more or less the basal articles of the first antennae. Flagellum of first antennae composed of numerous articles, as a rule. Frontal lamina rather large. Maxillipeds with five-jointed palp *Aega*.
- aa. Thorax more depressed and abdomen relaxed. Anterior part of head overhanging the basal joints of the first antennae, the flagellum of which consists of only four to six articles. Frontal lamina small. Maxillipeds with two-jointed palp. . . *Rocinela*.

AEGA (Leach).

In females with eggs the maxilliped as a whole is lamellar; the palp has no hooks and the other parts are greatly expanded. The anterior



FIG. 246.—*Aega serripes*, and the food mass removed from stomach ($\times 1\frac{1}{2}$).

marsupial plates of females in this condition overlap the greater part of the mouth organs, and it is said that the creatures are then unable to feed and have never been found attached to a fish.

Ingested food solidifies in specimens preserved in alcohol or dried, and, removed in this hard state, provides a cast of the inside of the capacious stomach (fig. 246). In Europe these dark-brown or black masses were at one time regarded by superstitious fishermen and others as "lucky stones" or "Peter's stones". The stomach contents of the European *A. psora* are said to have been used in the preparation of a salve, hence the popular name "Salve-bug" was formerly applied to the species; further, medical men prescribed the substance as an antidote to sea-sickness and other ills. Three species of the genus occur: they are found clinging to the skin of fishes, or swimming freely:—

- a. Eyes of moderate size, distinctly separated one from the other *serripes*.
- aa. Eyes very large and confluent and occupying the greater part of the dorsal surface of the head.
- b. Inner branch (endopod) of uropods narrow, with outer margin prominently notched near the apex, which is rounded *antillensis*.
- bb. Inner branch of uropods wide, with outer margin not notched and with apex subtruncate *nodosa*.

Saw-legged Fish-louse. *Aega serripes* (M. Edwards). (with serrated legs).

The eyes are rather large, but are distinctly separated. The telsonic segment and inner branch of the uropods are truncate, the hinder margins straight or slightly incised. The outer inferior margin of the last four pairs of legs is produced into a crest which is cut into three or four large

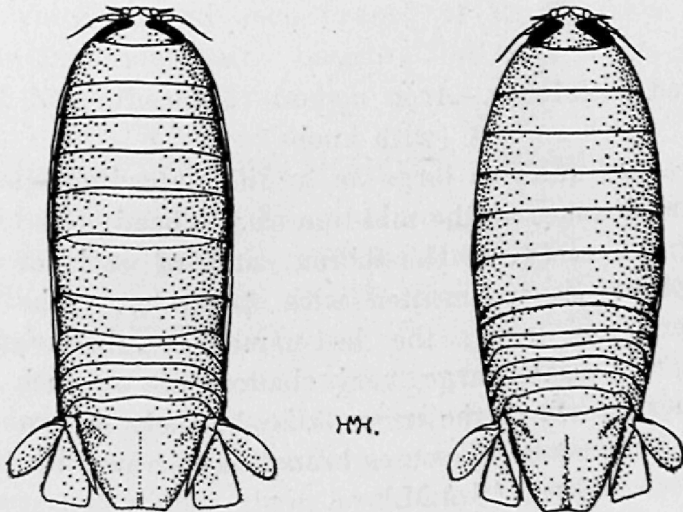


FIG. 247.—*Aega serripes*, male and female (slightly enlarged).

and prominent teeth, a feature which is referred to in the specific name. As shown in the illustrations, the sexes differ somewhat in shape. During life the colour is brown above, marked with longitudinal whitish streaks. The peduncles of the antennae are marked with dark brown, a brown bar

connects the eyes, and there is a brown streak at the antero-lateral angles of the first segment of the thorax. Length: 50 mm., or 2in. (S.A.M.)

This large parasite is fairly common in South Australia.

Shark Louse. *Aega antillensis* (Schioedte and Meinert). (from the Antilles).

The eyes occupy the greater part of the upper surface of the head, leaving a small V-shaped piece at the middle of the anterior margin and a large triangular space behind. The apex of the telson is acute; the branches

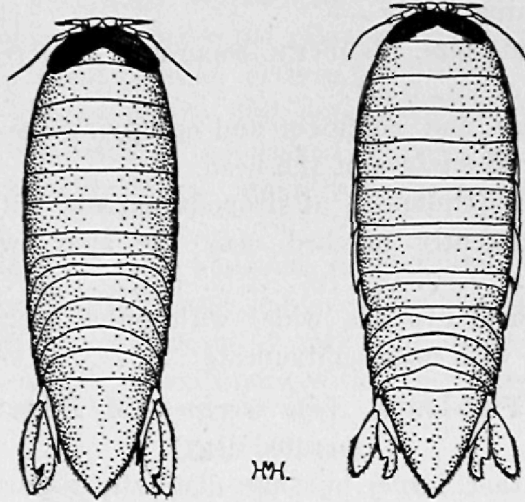


FIG. 248.—*Aega antillensis*, male and female (slightly enlarged).

of the uropods are narrow, suboval in shape, and the inner ramus is conspicuously notched on the outer margin. Length: 48 mm., or $1\frac{15}{16}$ in. (S.A.M.)

Sculptured Fish-louse. *Aega nodosa* (Schioedte and Meinert).
(with knobs).

The eyes are not quite as large as in the preceding species and meet for only a short distance at the mid-line of the head. The hinder margin of the last segment or two of the thorax, and of each of the first five abdominal segments, is ornamented with tubercles. The uropods and telsonic segment are large; the last-named is subtriangular in shape, apically acute, and has a large, very shallow pit on each side near the base. The inner branch of the uropods is obliquely subtruncate, with the postero-lateral angle acute; the outer branch is narrow with the apex acute. Length: 16 mm., or $\frac{5}{8}$ in. (S.A.M.)

ROCINELA (Leach).

Flat-nosed Fish-louse. *Rocinela sila* (Hale). (pug-nosed).

A flat, loosely built fish-louse. The body is suboval in shape, with prominent coxal plates, and the lateral parts of the second to fourth abdominal segments produced and prominent. The front margin of the