CIRRIPEDES

BY

C. A. NILSSON-CANTELL, PH. D. (Venersborg, Sweden).

Distribué le 30 novembre 1930. Vol. III, fasc. 3.

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INTRODUCTION

This collection, belonging to the Natural History Museum, Brussels, was brought home by the Expedition of T. R. H. the Prince and Princess Leopold of Belgium in company of Prof. Dr. V. Van Straelen in the year 1929. I wish here to express my thanks to the Director of the Museum, Prof. Dr. V. Van Straelen for his offer to let me work out the material and to the Assistant, Dr. E. Leloup for willingly given informations about the collection. It is not a large one but yet of great systematical interest.

In all the following fourteen species are represented :

Pollicipes mitella (LINNAEUS, 1767);
Ibla cumingi (DARWIN, 1851);
Octolasmis grayi (DARWIN, 1851);
Chthamalus withersi PILSBRY, 1916;
Chthamalus caudatus PILSBRY, 1916;
Octomeris brunnea DARWIN, 1854;
Balanus amphitrite DARWIN, 1854;
Balanus amaryllis euamaryllis BROCH, 1922;
Pseudoacasta libera nov. g., nov. sp.;
Tetraclita porosa viridis DARWIN, 1854;
Tetraclita purpurascens multicostata nov. var.;
Tetraclita costata DARWIN, 1854;
Chelonibia testudinaria (LINNAEUS, 1758);
Stomatolepas transversa nov. sp.

Though the Malay Archipelago is a rather well-known area as regards the *Cirripedia*, there are included here one new genus, two new species and one new

variety, which shows that our knowledge is in reality still insufficient. All the finds are from shallow water. Most species have been morphologically well studied before, but many are seldom noted in the literature. These will be of zoogeographical interest, as they are taken from localities not previously mentioned. Discussions on the distribution will be found in the special part. The two new species *Stomatolepas transversa* and *Pseudoacasta libera,* are of great interest as the former represents a very little known genus and the later, in my opinion, belongs to a new operculate genus, a rare occurence among the recent cirripedes.

The localities are from different parts of the Malay Archipelago : north of Sumatra, north coast of Java, westcoast of Celebes, and some Islands west of New Guinea. The latter especially, are new as regards the Cirripedia and of interest as showing the connection between the Malay and the Australian regions. The collection contains two species : *B. amaryllis* and *T. purpurascens* occuring in Malaysian and Australian waters.

SPECIAL PART

Familia **SCALPELLIDAE.**

Genus POLLICIPES Leach, 1817.

Pollicipes mitella (Linnaeus, 1767).

For synonymy see Nilsson-Cantell, 1921.

The collection contains chiefly fully grown specimens from two different stations. To the description of this well-known and typical species nothing is to be added.

New localities : n° **14, 15, 16** and **17**. Jefbi, Misoöl Archipelago. **26-II-1929**. Many fully grown specimens.

N° 18. Paloe bay, Celebes, **5-II-1929**. Some fully grown specimens.

Distribution : Indo-Pacific. The species has been noted by me (**1921**) from the Atlantic Ocean, but this locality seems to be very uncertain, as probably a change of labels has taken place during the long time the specimens have been preserved in a museum. The real locality is thus Java (see also Nilsson-Cantell, **1925**, p. 1).

Familia **IBLIDAE.**

Genus IBLA Leach, 1825.

Ibla cumingi Darwin, 1851.

For synonymy see Nilsson-Cantell, 1921.

New locality: n° **20**. Pisang Island, southwest of New Guinea. **18-III-1929**. One dry specimen in a crack in a piece of limestone.

Distribution : Red Sea, Indian Ocean, Malay Archipelago, western part of the Pacific Ocean.

Familia **POECILASMATIDAE.**

Genus OCTOLASMIS Gray, 1825.

Octolasmis grayi (Darwin, 1851).

Fig. 1.

Dichelaspis grayi (*i*) Darwin, 1851, Weltner, 1897, Gruvel, 1905, Annandale, 1909.
Dichelaspis pellucida Darwin, 1851, Weltner, 1897, Annandale, 1906, 1908.
Dichelaspis lepadiformis Gruvel, 1900, 1902, 1905.

Supplementary descriptions : O. grayi is in this collection represented by many specimens situated on a seasnake, *Enhydrina valakadyn* (Boie). As host for this species Annandale (1909) has noted 7 different species of snakes among them the one above mentioned. The same author has already from very rich collections from the Indian Ocean cleared up the synonymy questions. The chief variations in this species occur with regard to the shape of the capitular valves, as I also was able to show from this material.

Especially typical for this species is the *tergum*, shaped like an axe. In very young specimens however, this shape is more obscure, the valve being subtriangular (text-fig. 1*a*).

The *scutum* has two branches of which the vertical as a rule is longer than the horizontal, this yet being a varyable character. To the description of the *carina* nothing is to be added to that given by Darwin (1851).

The *internal parts* are described by Darwin (1851) and Annandale (1909) but not figured. Figures may here be given for the mouth-parts.

The *labrum* concave with many small teeth.

The *palpus* blunt with few bristles.

The *mandible* with four teeth and a small toothlike inner angle, sometimes divided at the top. The fourth tooth very near to the inner angle. The mandible agrees well with the figures given for many species of *Octolasmis*.

The *maxilla I* with a deep notch with a small spine at the bottom as in Annandales figure for var. *pernuda* (1909, fig. 1).

The *maxilla II* with a straigth front edge with spines along the whole edge and the upper margin. A posterior lobe with bristles is differentiated.

Number of segments of the cirri :

Measurements	I.		II.		III.		IV.		V.		VI.		Caudal appendage
Length of capitulum 4.3 mm. Breadth of capitulum 2.6 mm. Length of peduncle 7 mm. Breadth of peduncle 0.8 mm.	5	5	7	7	8	8	8	—	8	8	8	8	1 (5·6)

The *cirrus I* is shorter than the following cirri, with subequal rami. There is some variation as Darwin for *O. pellucida* mentions equal rami and for *O. grayi* unequal by about two segments.

The *cirrus II* nearly of the same length as the following, which have 4 more

rarely 5 pairs of spines on the front edge of the segments. The surface of the segments of the cirri clothed with many small chitinous scales, a feature not mentioned in earlier descriptions. This certainly no character of specific value.

The *caudal appendage* is long, nearly half as long as the cirrus VI. According to Darwin it is not articulated, according to Annandale without joints or

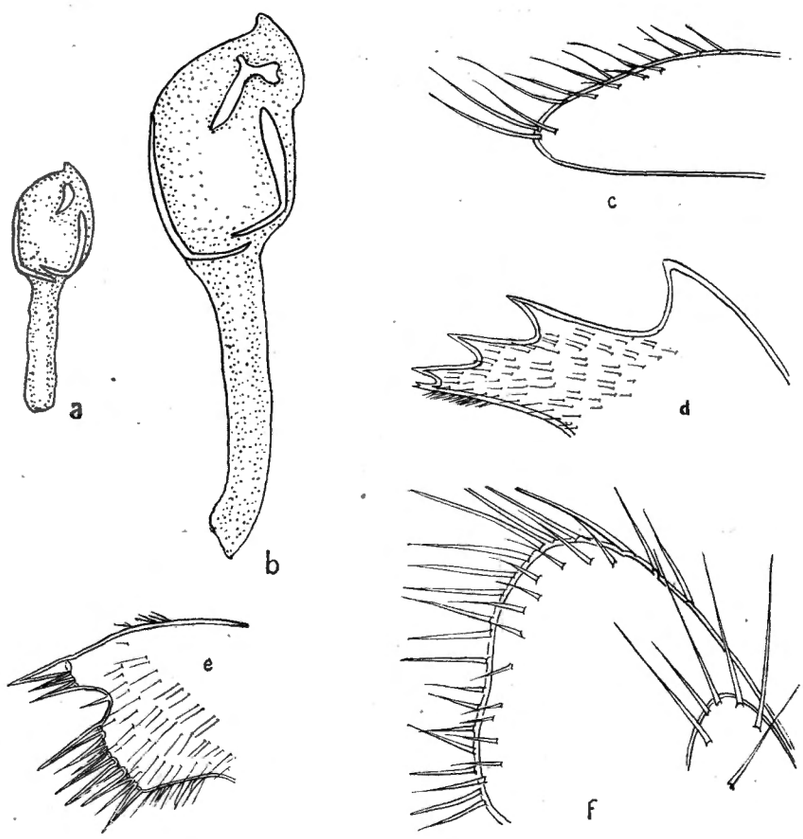

Fig. 1. — *Octolasmis grayi* (Darwin).

a young specimen, total length 4.4 mm.; *b* fullgrown specimen, total length 11,3 mm.; *c* palpus; *d* mandible; *e* maxilla I; *f* maxilla *II*.

with five or six, more or less perfectly differentiated segments. From this material I have been able to show that for the most part it consists of one segment though there is sometimes an incipient segmentation. In most *Octolasmis* species there are one-jointed appendages. The penis is short and much thicker than the pedicel of the cirrus VI.

In the mantle cavity there are eggs in development.

New locality : n° 21. About 16 sea miles north of Medan, Sumatra (1929). On a seasnake, *Enhydrina valakadyn* (Boie).

Distribution : Indian Ocean, Pacific Ocean. Pelagic on seasnakes. The locality here registered is rather near to Annandale's (1909) : Mergui Archipelago.

Genus CHTHAMALUS Ranzani, 1820.

Genus CHTHAMALUS.

Chthamalus withersi Pilsbry, 1916.

Chthamalus withersi Pilsbry, 1916, Nilsson-Cantell, 1921.

Together with *O. brunnea* Darwin 1854, many specimens of the rather typical cirriped *C. withersi* were situated on a piece of limestone. Though these species belong to different genera there are yet resemblances in many respects as in the opercular valves and the internal parts. The number of the compartments of the wall like other characters of the compartments make the difference distinct.

As there is some resemblance between both there was a possibility according to the theory of Broch that the specimens here with six compartments mixed among the larger with eight were younger stages of *Octomeris*. A careful examination shows clearly that they are quite distinct.

As the specimens were dry preserved, the internal parts could only be partly studied. No supplementary description is necessary as the species is well known from the type description by Pilsbry (1916) and the complementary remarks by Nilsson-Cantell (1921).

In studying this dry collection of *C. withersi* some very young individuals were found, the smallest measuring only 0,6 mm. in carinorostral length. In this, certainly the youngest stage with the wall developed, 6 compartments were formed, showing that no tetramerous stage here exists. Broch (1922) has studied young *C. stellatus* and holds the opinion that the hexamerous stage is the only one in *Chthamalus*.

New locality : n° **20**. Pisang Island, southwest of New Guinea. 18-III-1929.

Chthamalus caudatus Pilsbry, 1916.

Chthamalus caudatus Pilsbry, 1916, Nilsson-Cantell, 1921.

Supplementary description : Five small *Chthamalus* individuals were found situated on the shell of *Patella testudinaria*. As they were preserved dry it was rather difficult to study the softer parts, which is necessary if one desires exactly to determine individuals of genus *Chthamalus*. By the use of alcohol and gly-

cerine it was possible to soften the body. The external parts of *Chthamalus* are often rather variable, while the internal parts are for many species very typical. This species is well defined from others by the presence of caudal appendages.

Since the description of *C. caudatus* was given by Pilsbry (1916) this species is only mentioned by me (1921). To the descriptions given by him not much need here be added.

The type specimen was situated on the tergum of *Pollicipes mitella* and had a more oblong wall owing to the substratum. The specimens of this collection are more regularly rounded, which seems me to be the normal appearance. Typical is also the much depressed shell. The largest individual in the collection has a carino-rostral diameter of 7 mm. and a height of only 1 mm., thus it is smaller than the specimen of Pilsbry with respectively 10 and 2,7 mm.

The compartments are rather smooth, only a little ribbed near the margins, in accordance with Pilsbry (1916).

The *scutum* in the dissected specimen without an adductor ridge as given by Pilsbry.

The *tergum* agrees in its much projecting crests for the depressor muscle with Pilsbry's excellent figure.

Mouth-parts are, as I was able to confirm, of the same shape as mentioned in the type description and by Nilsson-Cantell (1921). By its mandible the species can be referred to the group of *C. hembeli* (Nilsson-Cantell, 1921).

The *cirrus I* with 5 and 8 segments and rami very unequal in length.

The *cirrus II* with rami of 6 segments, the posterior slenderer than the anterior, which is a little shorter than the former.

The *remaining cirri* with 12-14 segments.

The *caudal appendage* in this specimen is shorter than in Pilsbry's. I note here 17 segments against 21 in the type description.

Old localities : Catabalonga, Samar, Philippines, on the reef.

New locality : n° 9. Pisang Island, southwest of New Guinea, 18-III-1929. Six dry specimens on the shell of *Patella testudinaria.*

Distribution : From the known localities to judge it seems probable that the species is distributed over the whole Malay Archipelago. Specimens of *Chthamalus* are often found on shells of mollusks and cirripedes. Owing to their small size they have been much overlooked in the collections of the museums. We consequently know very little about the distribution of many species. Thus for instance *C. hembeli* is only noted from two widely separated stations : west-coast of Sumatra and Sandwich Islands.

Octomeris brunnea Darwin, 1854.

Octomeris brunnea Darwin, 1854 and later authors.

On a large piece of limestone some specimens of this well-known but rare species were situated together with some specimens of genus *Chthamalus*. The specimens were preserved dry. To the description given by Darwin (1854) and Nilsson-Cantell (1921) nothing is here to be added.

New locality : n° **20**. Pisang Island, southwest of New Guinea, 18-III-1929. Some dry specimens on limestone.

Distribution : Philippine Archipelago, Sumatra, Java, Pisang Island. The locality : South Atlantic given by Nilsson-Cantell (1921) is certainly incorrect for the same reason as is stated in this paper under *Pollicipes mitella*. (See also Nilsson-Cantell. 1925, p. 1.)

Familia **BALANIDAE.**

Subfamilia **BALANINAE.**

Genus BALANUS da Costa, 1778.

Subgenus BALANUS da Costa.

Balanus amphitrite Darwin, 1854.

Six shells of a *Balanus* situated on a mussel shell are of no interest, as there are no opercular valves and internal parts. They are here only taken up as *B. amphitrite* because they cannot be determined to any subspecies.

Locality : n° **11**. The coast of Java between Surabaja and Grisée among wracks, **21-I-1929**.

Subgenus CHIRONA Gray.

Balanus amaryllis euamaryllis Broch, 1922.

For synonymy see Nilsson-Cantell, 1921.

This typical species has already been well described by several authors. The specimens of this collection were of different sizes. The largest (n° **13** in this collection) has a carino-rostral diameter of 38 mm. and a height of 28 mm. The shape of the shell varies a good deal from rather low and conical to higher and more cylindrical, determined by the position.

Internal parts have been already described by Darwin (1854) and especially by Hoek (1913). I have compared mouth-parts of this species from different localities and not found much variation. In the cirri there exist large varia-

tions in the number of the segments in individuals of different ages as stated by Hoek (1913). Thus I have found in cirrus VI differences ranging from about 50 to 100 segments due to age. In the specimens here studied the segments of the longer cirri wore two pairs of spines on the front edge as stated by Darwin. Hoek (1913) and Broch (1922) state variations, as often there are 3 to 4 pairs of spines. The typical number is, however, two pairs of spines. The surface of the lower segments of the longer cirri in *B. amaryllis* is covered by many very small spines, which is not the case in many species of *Balanus*.

New locality : n° 1, 2, 3. Enoe Island, Aroe Archipelago, 24-III-1919. Some specimens of different ages, most empty shells. For n° 13 no locality has been given.

Distribution : South Japan, Malay Archipelago to the mouth of Indus, north and eastcoast of Australia, from shallow water.

Genus PSEUDOACASTA Nilsson-Cantell, 1930.

Diagnosis : Compartments six, not porous, without any traces of radii, but with long alae broader at the basis, well developed on carina, carino-lateralia and lateralia. Rostrum overlapping the lateralia. Sheath very long, not quite reaching to the base, with the basal edge free from the wall. Scutum and tergum interlocked. Base calcareous, cup-shaped. Internal parts of the balanid type. Fourth cirrus without teeth.

Genotype : PSEUDOACASTA libera Nilsson-Cantell, 1930.

Pseudoacasta libera Nilsson-Cantell, 1930.

Fig. 2-3.

Pseudoacasta libera Nilsson-Cantell, 1930.

Diagnosis : Wall and base not porous, calcareous. Orifice small, toothed. Compartments without radii. Alae arranged as in *Balanus*. Scutum with a weak articular ridge, without an adductor ridge and pits for lateral and adductor muscles. Tergum with a weak articular ridge. No crests for depressor muscle. Spur short and broad. Labrum with a deep notch and three teeth. Palpus long, clubshaped. Mandible with five teeth and a pointed lower angle. Maxilla I without a notch. Maxilla II bilobed, the outer lobe elongated. Cirrus I-III shorter than the following. Cirrus IV with rami different in length.

Holotype : In « Musée royal d'Histoire naturelle de Belgique ».

Discussion : In this collection a very interesting specimen was found. In

external shape it is so like an *Acasta*, that at first I thought it belonged to that genus. But after dissecting the specimen, it was not possible to place it under that genus, not even as a separate subgenus. In some respects it really shows resemblances to *Acasta* and its allied subgenera of *Balanus*, but the diagnosis given for these genera do not permit such an arrangement. I also was doubtfull, if it could be included in subgenus Metabalanus of *Balanus*, erected by Pilsbry (1916) for one species *B. hoekianus* Pilsbry, 1911. This species was held by Hoek (1913) to belong to genus *Hexelasma*, as the radii are wanting. Pilsbry (1916) is yet of the opinion, that his species is a typical *Balanus*. As we do not know the labrum of the mouth-parts of *B. hoekianus*, we must wait to decide the question. Other differences between my specimen and subgenus Metabalanus also exist.

As the compartments of the specimen of this collection in general shape are quite different from *Balanus* and *Acasta*, it is impossible to describe it under these genera. Genus *Acasta* is by later authors ranked as a genus and not a subgenus as by Darwin. Pilsbry is still of the opinion that this genus is of no greater taxonomic rank than the subgenera of *Balanus*, which later on must perhaps be dismembered into several genera.

There is no doubt that this specimen belongs to the balanid series which, in internal parts, is well defined from the chthamalid series. Judging from the morphology only, it is not possible to say how this form must be placed in a phylogenetical tree. But it is certain that affinities exist with *Balanus* and *Acasta*. It is impossible to take it up as a further development of the very specialized *Acasta*, though some resemblances with this genus e. g. in the mouthparts are to be found. But in the cirri there are differences as the very typical teeth on cirrus IV in *Acasta* and allied sub-genera of *Balanus*, living in sponges, are totally lacking. It must certainly have been derived from the balanid stock at an earlier date. From the paleontology there is no evidence which can clear up this question.

Thus my opinion is that this single specimen represents a new genus of the balanid series which I name :*Pseudoacasta*.

Description : This new species I have named *P. libera* from the very free lower edge of the sheath.

The material consists of only one specimen. Externally this specimen is very like an *Acasta*, but a closer examination shows that this resemblance is not very great. The specimen seems not to live imbedded in sponges like *Acasta*. As the base is cupshaped and weak, it must have been placed with the base in a softer substrat, possibly a sponge. The compartments seem to have been free from covering tissue. The collector has not given any information in this regard.

The *shell* is conical, elongated in the carino-rostral axis and consisting of

six compartments. All plates well calcified, not porous, and of a white colour. The growth ridges distincly marked. The longitudinal striation is more indistinct. The orifice is exceptionally small and toothed. It is a very remarkable fact that radii are totally wanting which in my opinion, here must be a primi-

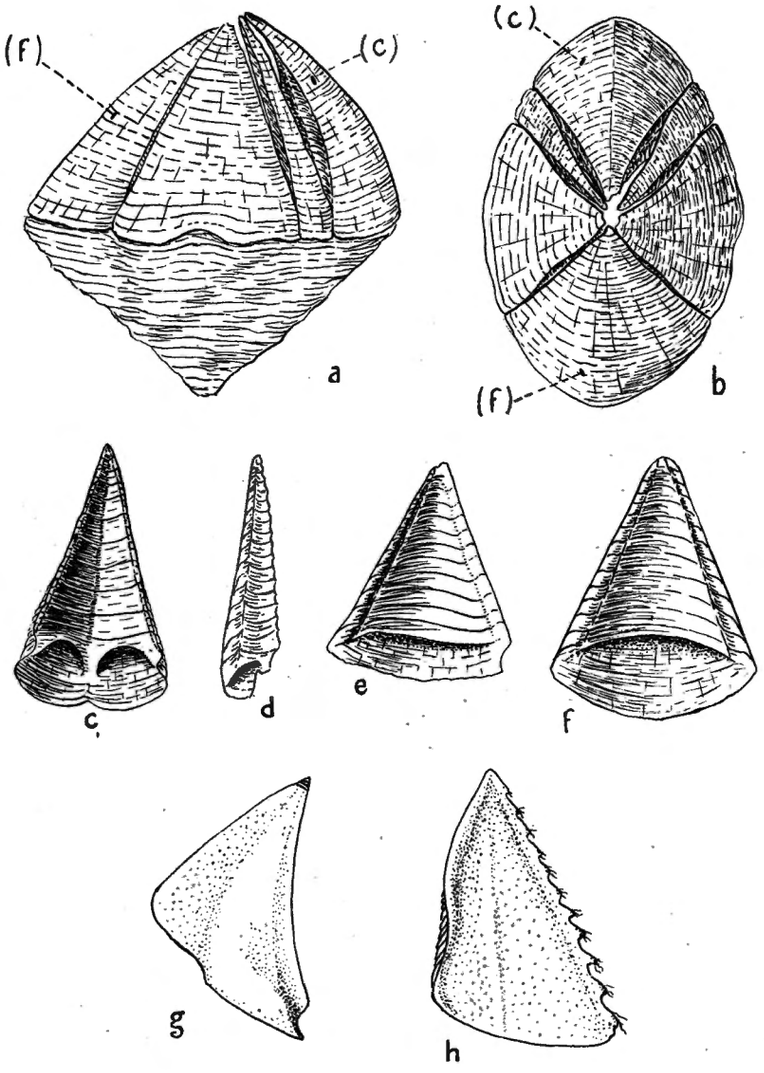

Fig. 2. — *Pseudoacasta libera* Nilsson-Cantell.

a animal in side view; *b* animal from above; *c* carina internal view; *d* carino-lateral compartment, internal view; *e* lateral compartment, internal view; *f* « rostral » compartment, internal view; *g* left tergum internal view; *h* left scutum, internal view.

tive feature. In many species of *Balanus* the radii are much reduced and very little developed, a secondary feature. In genus *Acasta* the radii are well deve-

loped. The compartments, not having radii, yet overlap the neighbouring plates, so the arrangement in a diagram will be the same as for *Balanus* and *Acasta*. The terminology must thus be the same as is supposed in *Balanus*

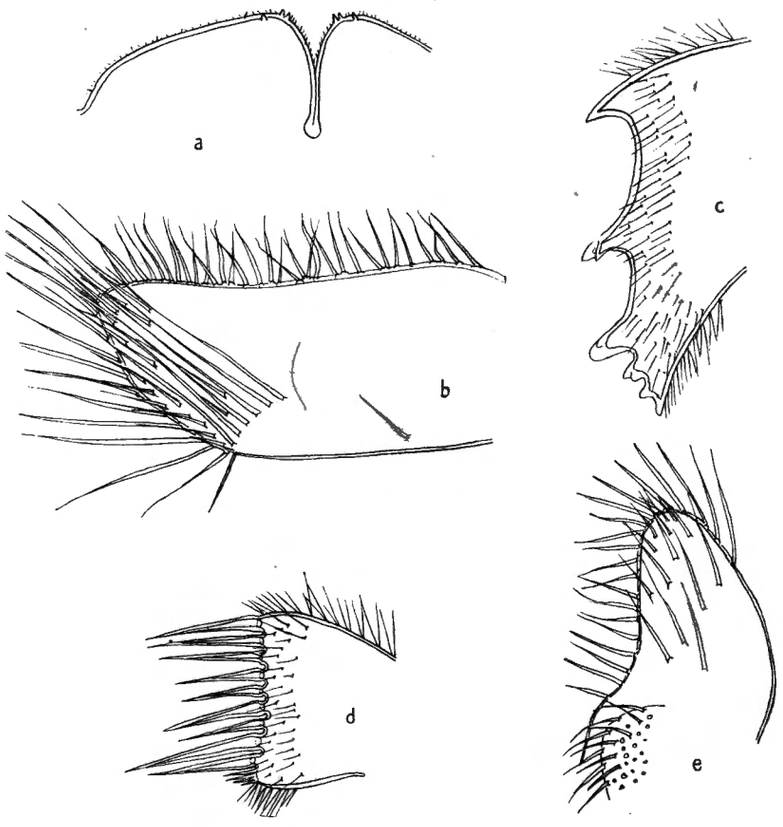

Fig. 3. — *Pseudoacasta libera* Nilsson-Cantell.
a labrum; *b* palpus; *c* mandible; *d* maxilla I; *e* maxilla II.

(Withers, 1928, p. 187). On the other hand the alae are well differentiated, but rather narrow, and of another shape than in *Balanus* and *Acasta*. They extend along the whole compartment and increase in width downwards. In *Balanus* and *Acasta* the radii are wider in the upper part of the compartment.

In all compartments there is a *sheath* well developed, and extending over a large part of the compartments (3/4 or more). The lower edge of the sheath is free in a higher degree than is the case in most species of *Balanus*. The details of the compartments may here be given.

The *carina* is the highest plate of the wall, triangular in shape with a keel from the apex. The compartment is provided with alae, more developed than on other valves. The lower edge of the sheath is grown together on the middle, a feature not found in other operculate genera. The sideparts of the sheath are free.

The *carino-lateral* compartments are narrow as in many genera but differ in shape from all, especially *Balanus* and *Acasta*. It overlaps the carina in the lower half, yet there is no radius. At the lateral side is a narrow ala like those of the carina. The sheath on the inside extends nearly to the base. As the lower edge is free, a small cavity is formed at the base. The carino-lateral compartment of *Acasta* is of quite different shape, pointed at the base (Nilsson-Cantell, **1921**, text-fig. 74*d*). Also *B. hoekianus*, a species of *Balanus* without radii like this one, has a narrow carino-lateral compartment, but with a wide ala developed in the upper part.

The *lateral* compartment is about as wide as the carina. It has a narrow ala along the whole rostral margin, like the alae in other compartments. The carino-lateral side overlaps the ala of the neighbouring compartment, but is without radius. The sheath is free in the lower part.

The « *rostral* » compartment is the widest of all. Really it ought not as by many authors to be called rostrum. As it seems to me very probably that this genus has the same compartments as *Balanus* and *Acasta*, this compartment is in agreement with many authors held to be coalesced by two rostro-lateral compartments and no rostrum. As the homologies in this regards are a little obscure, the term « *rostrum* » may as by other authors be used. There are no real radii but the plate overlaps both the lateral compartments as in *Balanus* and *Acasta*. The sheath is as in the lateral compartments.

The *base* is conical, calcified, but not porous. The growth ridges arranged round the top. The calcification is not very strong. Owing to its weakness the base must have been situated in a hollow of some softer material, for instance a sponge.

Measurements of the specimen in mm. :

Carinorostral length.	Lateral diameter.	Total height.
6	4	6

The opercular valves are much like those of many *Acasta* species and its allies of *Balanus*.

The *scutum* triangular, with the basal margin somewhat convex. The tergal margin with a weakly developed articular ridge in the upper half. Inside no adductor ridge or pit for the adductor muscle. No pit for lateral depressor muscle is indicated. Externally strong growth ridges but no longitudinal striae.

The *tergum* with a weakly developed articular ridge. Internally no crests for depressor muscle. The spur is short and broad, one half the width of the whole valve and placed near the basiscutal corner. Externally a broad and very shallow furrow.

Mouth-parts are much like those of typical *Acasta*.

Labrum with a wide rather deep notch and three teeth on both sides of the edge, sloping from the notch as in genus *Acasta* and its allies.

Palpus clubshaped and elongated. Bristles along the upper margin and the distal part, arranged at the outer surface along an oblique line from the basal margin.

Mandible with three stronger and two lower smaller teeth, the inferior angle pointed.

Maxilla I with straight front edge without a notch. The spines strongly developed. Near the lower angle some stronger teeth followed by smaller ones.

Maxilla II with the outer lobe elongated and pointed, with the front edge concave. The inner lobe small and convex. Both lobes furnished with bristles.

Number of segments of the cirri of the type specimen :

I.		II.		III.		VI.		V.		VI.	
7	12	6	7	7	8	12	16	19	20	20	—

Cirrus I-III are shorter than the following. *Cirrus I* with rami unequal in length. The shorter ramus is only 1/3 of the longer with serrate spines at the top. *Cirrus II-III* also with unequal rami but the shorter ramus about two segments only shorter than the longer. *Cirrus IV* with longer segments, more like the following as in the balanid series. One ramus much shorter than the other (about 1/3), a noticeable feature, not found in other genera studied. As both cirri IV appear the same, it seems not to be an accident. *Cirri V-VI* with equal rami. The segments of the longer cirri are elongated with the spines placed in the upper half. There are 3-4 pairs of spines in the front edge of the segments. The first pair is large, the following smaller. In this much resemblance with *Acasta* and allied subgenera of *Balanus* living in sponges. The erect or curved spines so typical for *Acasta* and allies are not found here. The *penis* is of the normal shape for *Balanus* and *Acasta*.

Locality : n° 4. Enoe Island, Aroe Archipelago, 24-III-1929. One specimen.

SUBFAMILIA **TETRACLITINAE.**

Genus TETRACLITA SCHUMACHER, 1817.

Subgenus TETRACLITA.

Tetraclita porosa viridis DARWIN, 1854.

Fig. 4.

For synonymy see NILSSON-CANTELL, 1921.

These *Tetraclita* specimens, collected from three stations. I have here determined as *T. porosa viridis*. The walls of the specimens were of the typical shape and green coloured, though there may be some variations in the details.

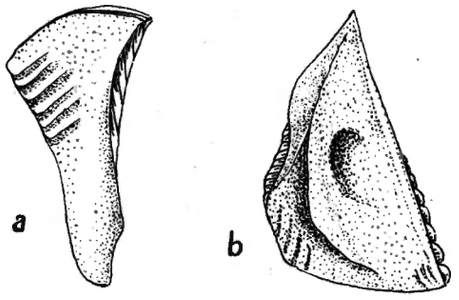

Fig. 4. — *Tetraclita porosa viridis* (Darwin).
No. 7. *a* left tergum; *b* left scutum.

Also in other characters e. g. the scuta some variations in proved (Krüger, 1911). For comparison figures of opercular valves are given. Crista articularis and adductoris of the scutum (text-fig. 4*b*) are in the upper part coalesced approximately as in text-fig. 41*b*, by Krüger, 1911, who has figured a large series showing the variations.

The *tergum* is of the typical shape, not so narrow as stated by Pilsbry (1916).

The mouth-parts in the specimen dissected agree well with those figured for this subspecies by Krüger (1911).

New localities : n° 7. Jefbi, Misoöl Archipelago, 26-II-1929. One large specimen with three smaller on the wall; on rocks in the tidal zone. N° 12 and 22, 25-II-1929. From the same locality. Two full-grown specimens (empty shells).

N° 19, 26-II-1929. From the same locality. One specimen on the shell of *Patella testudinaria*.

N° 8 and 10. Pisang Islands, southwest of New Guinea, 17-III-1929. Eight specimens, three of which on *Patella*.

N° **23**, 18-III-1929. From the same locality. One full-grown specimen (empty shell).

N° **24**. Sabang Island, **12-V-1929**. One very young specimen.

Tetraclita purpurascens var. **multicostata** NILSSON-CANTELL, 1930.

Fig. 5.

Tetraclita purpurascens var. *multicostata* NILSSON-CANTELL, 1930.

Description: One small specimen of *T. purpurascens* was placed on the same shell of *Patella testudinaria* with *T. costata* and *T. porosa viridis*. As the specimen was dry-preserved, no internal parts could be studied.

The specimen measured in carino-rostral lenght **12** mm. and height **2** mm., thus nearly of the same size as Darwin's largest specimen.

The *external shape* of the shell varies greatly according to Darwin. These

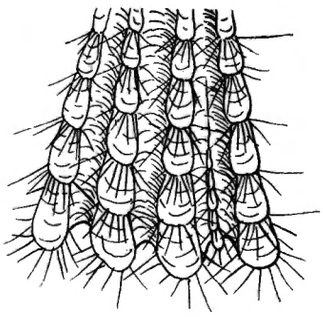

Fig. 5. — *Tetraclita purpurascens* var. *multicostata* NILSSON-CANTELL. Surface of a compartment.

specimens, which I have compared with specimens from Australia, from which most of the Darwinian material was taken, are in some respects different from those earlier described. The differences are not, however, important. Darwin has already found great individual variations, so I cannot take them up as a new subspecies. They are here only described as a variation, called *multicostata*.

The *compartments* are longitudinally ribbed, in a higher degree than was formerly stated. Also the distinct radii with longitudinal growth ridges are prowided with transverse ribs of the same type as the longitudinal ones of the compartments. The number of the tubes in the wall of this variety were larger than in the more typical specimens from Australia, above mentioned. The tubes were more regularly formed, which is perhaps also a character distinguishing this from the more typical ones.

The *opercular valves* agree well with the descriptions given by Darwin (1854) and Nilsson-Cantell (1921).

According to the type description the *base* is membranous, the species differing in this from all others in this genus. This observation does not seem to

me quite correct. Probably there is a rather thin calcareous base, easily overlooked. I find in this specimen a very thin base remaining on the substrat after removing the specimen. By acid testing it was proved to be calcareous, of the same thickness as the base in *T. costata*. It is probable that the base tends to be membranous.

New locality : n° **19**. Jefbi, Misoöl Archipelago, **26-II-1929**. One specimen on the shell of *Patella testudinaria*.

Distribution : New Zeeland, Australia, Sunda Islands, Philippines and China (?).

Tetraclita costata DARWIN, 1854.

Tetraclita costata DARWIN, 1854.

One small specimen of this characteristic species was situated on a shell of *Patella*. The same *Patella* carried also two other species viz. *T. purpurascens* and *T. porosa viridis*. Though this species certainly is rather common in the tidal zone, it is not mentioned in the literature since the description by Darwin was given.

The *shell* is very typical having strongly developed prominent ridges, few in number. This specimen was irregularly grown.

The *scutum* has a longitudinal furrow figured by Darwin.

The *tergum* has the spur confluent with the basi-scutal angle. The specimens were dry-preserved without any remainder of the internal parts which are described by Darwin.

Old locality : Philippine Archipelago, attached to various shells within the tidal limit.

New locality : n° **19**. Jefbi, Misoöl Archipelago, **26-II-1929**. One dry specimen on the shell of *Patella testudinaria*.

Distribution : Though this species according to Darwin seems to be rather common in the tidal zone, we do not know many localities. Certainly the species must be distributed over a larger area than hitherto known.

SUBFAMILIA **CHELONIBIINAE.**

Chelonibia testudinaria (LINNAEUS, 1758).

Fig. 6.

For synonymy see NILSSON-CANTELL, 1921.

The *internal parts* of this externally well-known species have been studied by Krüger (1911) and Nilsson-Cantell (1921). Only a few completing notes are here added as regards the mandibles. Generally I have found the mouth-parts to be rather conservative formations of the body. Yet I can note that the man-

dibles in this species are rather variable in the number of the teeth. Of two specimens here dissected one has more aberrant (monstrous) mandibles with a larger number of teeth. The mandibles has as is typical in this species 5 teeth and a pectinated not much projecting lower angle. The second and third teeth with an additional tooth (text-fig. 6*a*). For comparison the two aberrant mandibles are figured, one showing the beginning of the moulting (text-fig. 6*b*).

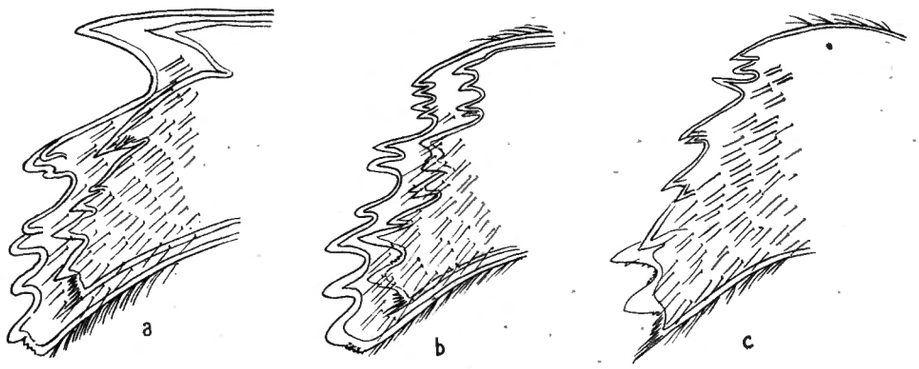

Fig. 6. — *Celonibia testudinaria* (Linnaeus).
a typical mandible; *b*, *c* aberrant mandibles.

As most typical for those it may be mentioned that the first tooth is replaced by 4 respectively 3 teeth. In one mandible of the aberrant (text-fig. 6*c*) the old cuticle is thrown off.

New locality : n° 5. Enoe Island, Aroe Archipelago, 23-III-1929. Twelve specimens, most of them large, from turtles.

Distribution : Tropical and warm-temperate seas.

Subfamilia **CORONULINAE.**

Genus STOMATOLEPAS Pilsbry, 1910.

Diagnosis : Pilsbry, 1916.

Stomatolepas transversa Nilsson-Cantell, 1930.

Fig. 7.

Stomatolepas transversa Nilsson-Cantell, 1930.

Holotype : In « Musée royal d'Histoire naturelle de Belgique ».

Discussion : The genus *Stomatolepas*, erected by Pilsbry (1910) has not been closely discussed since that time. Thus the find here must be of great interest. To the subfamily Coronulinae nine genera are referred, many of them very little known. Pilsbry (1916) has taken up two species of genus *Stomatolepas*. The one *S. elegans* is first described as *Coronula elegans* by da Costa (1838) from Taranto, Italy. Pilsbry suspected that it might be identical with *S. praegusta-*

tor from Florida. As it is not possible to decide from the imperfect descriptions, further finds must be awaited.

The genus *Stomatolepas* is together with three other genera held by Pilsbry to be a Platylepadid series of the subfamily *Coronulinae* developed from *Platylepas*-like ancestors and new evidence for this may be now adduced as the mouth-parts studied on this material and not previously known for the genus agree well with those of *Platylepas* (Nilsson-Cantell, 1921, text-fig. 89).

Diagnosis is not given, as the genus and other species are imperfectly known.

Description : This material consists of five specimens. As there are great difficulties in making out the finer details of the compartments, I have been doubtful in determing them. First I thought of taking them up as *S. praegustator* Pilsbry, 1910, which species is the best known. But the localities do not agree very well as his species is from Florida and the specimen of the collection from the Malay Archipelago. Pilsbry's species was taken from the gullet of *Caretta caretta*, and this material is from the surface (« median plastron ») of *Chelonia mydas*. Further, a closer examination of the specimens shows that the material cannot be determined as *S. praegustator* figured by Pilsbry in his excellent work (1916). There are also differences from the figures of Costas species *S. elegans*.

I must therefore erect a new species *S. tranversa*, named after the transversely elongated calcareous scales on the compartments, hoping that further finds of the species will make it clear whether the species really is a new one.

It is not possible from this material to give an exact figure of the compartments of the type specimen, as the compartments were enclosed in a tissue probably belonging to the turtle, on which the specimens were placed. But it is possible to institute comparison with the description of Pilsbry's species.

The general form of the wall is cup-shaped, more elongated in the carinorostral diameter.

The *measurements* of the holotype in mm. :

Carinorostral length.	Lateral diameter.	Height.
7.5	4	3.5

The inner layer of the compartments is smooth, projecting above the outer layer as in *S. praegustator*. The smooth finger-nail like projections of the inner layer are more or less broken in this material. In this character the genus *Stomatolepas* is different from genus *Stephanolepas* P. Fisher, 1886. As this genus is imperfectly known in many regards it is not possible to decide whether

the genus is distinct. But from the figures it seems to be so. Both genera live on sea turtles. The compartments are externally covered by imbricating scales. Those are of the same shape over the whole surface, a difference from Pilsbry's species. Also the scales are of another shape as they are transversely elongated and not rounded as in the two other species. Small upward-pointing

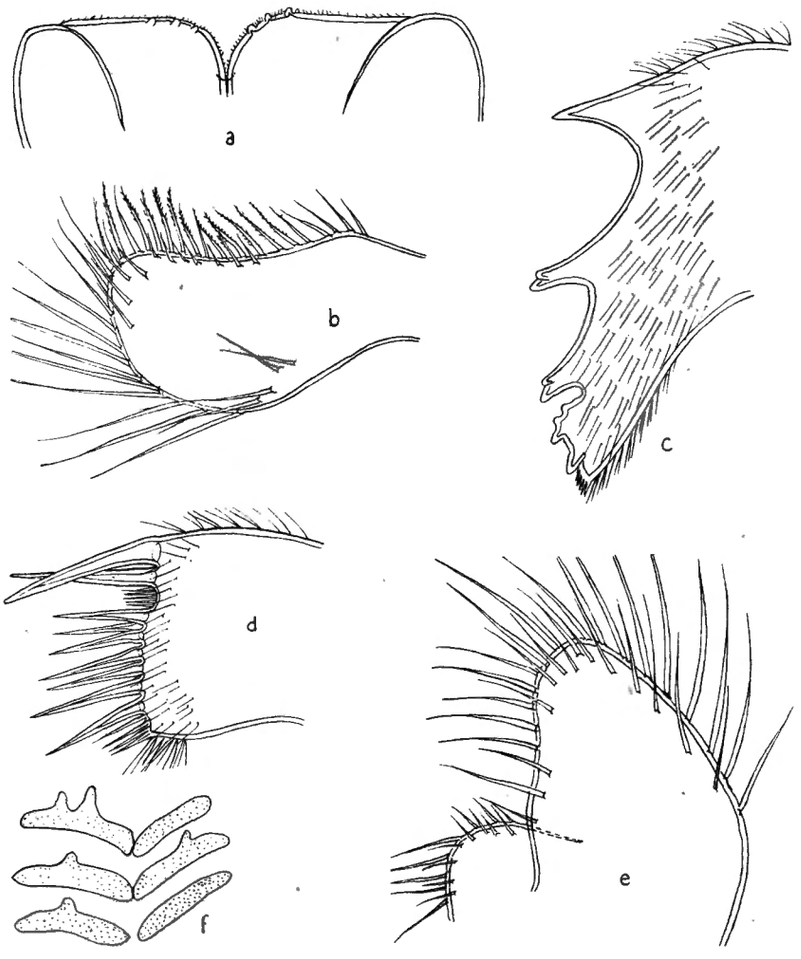

Fig. 7. — *Stomatolepas transversa* NILSSON-CANTELL.
a labrum; *b* palpus; *c* mandible; *d* maxilla I; *e* maxilla II; *f* calcareous scales on the compartments.

projections are found on the scales, especially in the lower part of the compartments. Another difference from the known species is the absence of triangular smooth areas near the base. The scales cover the whole wall so that it is difficult to find the external limits of the six valves. For the genus as a whole the presence of external shallow sulci is characteristic.

The *sheath* seems to be of the same type as described by Pilsbry for his antipodal species. It covers internally nearly the whole valve and is rather indistinctly limited at the lower end.

The *base* is membranous covering an opening far smaller than the orifice.

The opercular valves not imbricating, of the same type as in the other species.

Internal parts : Labrum with a wide notch in the middle with three teeth on both sides and fine hairs.

Palpus club-shaped with bristles round the margin, specially feathered on the upper margin. In the lower part of the palpus some bristles are placed on the side.

The *mandibles* in both specimens dissected are much alike. Four distinct teeth and a smaller fifth on the front edge. The lower corner is pectinated. The teeth **2-3** are double, the fourth with small additional teeth on the upper side.

The *maxilla I* has a straight front edge with a shallow notch with small spines under the two stronger.

The *maxilla II* with the outer lobe pointed and with the front edge straight. Many bristles at the top and the front edge. The inner lobe with bristles. A mentum between the maxillae is found here as in *Platylepas* and other nearly related genera.

The mouth parts of the other species of *Stomatolepas* are not known. A comparison with the genus *Platylepas*, according to Pilsbry nearly related, is of interest, as the mouth-parts agree very well (see Nilsson-Cantell, **1921**, text-fig. **89**).

Number of segments of the cirri of the type specimen :

I.		II.		III.		VI.		V.		VI.	
7	10	7	8	8	10	11	12	15	15	15	16

Cirri I-III are shorter than the following. The rami unequal in length especially in the cirrus I. The *cirrus IV* is intermediate in length between those and the following, with subequal rami. *Cirrus IV* with **3** or in longer segments **4** pairs of spines on the front edge.

Locality : n° **6**. Enoe Island, Aroe Archipelago, **23-III-1929**. Five specimens from the shell (« median plastron ») of the turtle *Chelonia mydas*.

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