

Notes on some Rhizocephala of the genus *Loxothylacus*

(With 16 figures in the text).

By
H. Boschma

(Rijksmuseum van Natuurlijke Historie, Leiden).

For the study of the Rhizocephala it is necessary to have detailed descriptions of the known species so that later other specimens may be compared with these to decide whether they are different or not. The present paper contains more or less elaborate notes on four species of the genus *Loxothylacus*; the material on which these notes are based has served already as an object for previous investigations (cf. the literature cited at the end of this paper). The published data on the specimens dealt with here, however, are still rather incomplete as many details which were regarded as being of minor importance were omitted in previous papers.

One specimen, which previously (Boschma, 1933) was identified as *Loxothylacus aristatus*, is described here as the type of a new species, *Loxothylacus Strandii*. This species is available in one specimen only, and in this case it seemed not advisable to describe it as a new species, as in its characters it showed some resemblance to one of the known species, *Loxothylacus aristatus*. A more detailed investigation of its characters, however, proved that it is specifically distinct from *L. aristatus* and the other species of the genus, and therefore it is described here as new.

Loxothylacus aristatus Boschma

p. p. *Sacculina pilosa* Van Kampen and Boschma 1925, p. 16; pl. I, fig. 4 a, b (lateral surfaces); fig. 5 (section of external cuticle).

Loxothylacus aristatus Boschma 1931 b, p. 61; fig. 39 (longitudinal sections); fig. 3 d (excrescence).

Material examined:

Beo, Talaud Islands (Siboga Expedition, Sta. 131). 1 specimen on *Atergatis floridus* (L.).

The specimen (fig. 1 a) has a greater diameter of 7.5 mm, a lesser diameter of 6 mm, and a thickness of 4 mm. Further details are given in the first of the papers cited above.

From the visceral mass of the specimen a series of longitudinal sections has been made, which shows some defects, but the male genital organs and the colleteric glands are sufficiently preserved.

Parts of sections showing transverse sections of the male genital organs are represented in fig. 2, each consecutive figure being

made after a more dorsal section than the preceding. The vasa deferentia are shown in fig. 2 a, b; their lumen is partially divided by ridges on the inner wall of the canals. In fig. 2 c the extremity of the right testis is visible in the lower part of the figure. Fig. 2 d is

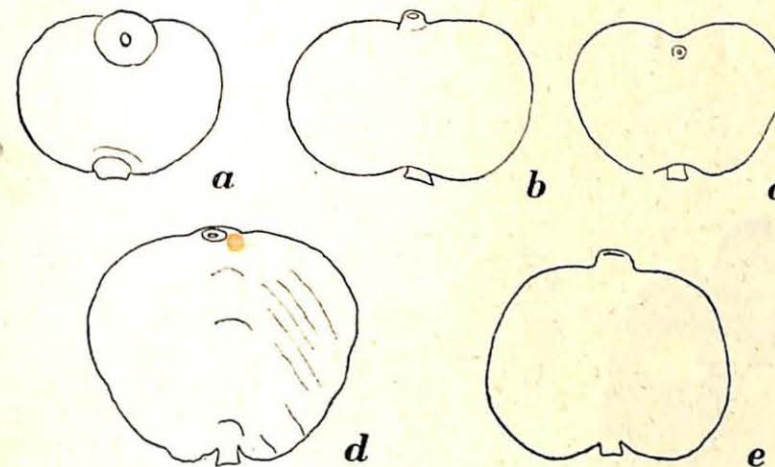


Fig. 1. The specimens dealt with in the present paper. Each specimen shows the surface which was turned towards the thorax of its host. a, *Loxothylacus aristatus* (after Van Kampen and Boschma, 1925, pl. I, fig. 4a), $\times 3.2$; b, *Loxothylacus desmothrix*, specimen from the Siboga-Expedition (after Boschma, 1931 b, fig. 5 l), $\times 10.4$; c, *Loxothylacus desmothrix*, holotype (after Boschma, 1931 a, fig. 33 n), $\times 5.6$; d, *Loxothylacus setaceus* (after Boschma, 1931 b, fig. 5 p), $\times 2.4$; e, *Loxothylacus Strandii* (after Boschma, 1933, fig. 49 a), $\times 1.6$.

from a region where the vasa deferentia gradually pass into the testes, from the left testis only the ventral part is visible, from the right testis also the terminal portion (in the lower part of the figure). The testes are closely surrounded by a muscular sheath. In fig. 2 e the extremity of the left testis is represented: from this part the wall only is seen in the section, the right testis is sectioned in the vicinity of its curve, so that the two openings nearly are united. In the section of fig. 2 f the left testis has a similar aspect as the right testis of fig. 2 e, from the right testis the dorsal part of the curve is sectioned, so that only one opening is present.

As results from these figures the two testes do not differ noticeably in shape and size; both have a comparatively thick wall in the whole of their extent.

From the colleteric glands of the specimen only one section (fig. 3) is represented here. The figure shows a part of a longitudinal section, from which the surface of the visceral mass (the line at the left of the figure) and the epithelium of the canals are drawn. The section is from the region in which the canal system of the gland is strongly divided into small branches, the number of canals present in this section is 56. The colleteric glands form rather compact



Fig. 2. *Loxothylacus aristatus*. Transverse sections through the male genital organs, posterior end of the body at the upper side of the figures. $\times 45$.

masses in which the canals are not arranged in rows parallel to the surface of the visceral mass.

The thickness of the external cuticle of the mantle on an average amounts to about 100μ .



Fig. 3. *Loxothylacus aristatus*. Longitudinal section of one of the colleteric glands, posterior end at the upper side of the figure. $\times 83$.

In a previous paper (Van Kampen and Boschma, 1925, fig. 5) a section of the external cuticle of *Loxothylacus aristatus* is given, which in so far is not altogether correct as the spines of the excrescences are drawn too short in comparison to the common basal part of these cuticular products. In fig. 4 of the present paper the excrescences from three different parts of the external cuticle are drawn. The upper row (fig. 4 a) shows excrescences of rather small size, which consist of comparatively few spines each. The length of these excrescences, from the extremities of the spines to the base, varies between 35 and 55μ . In the second row (fig. 4 b)

excrescences of somewhat larger size are represented; they consist of a greater number of spines each. Here the length of the excres-

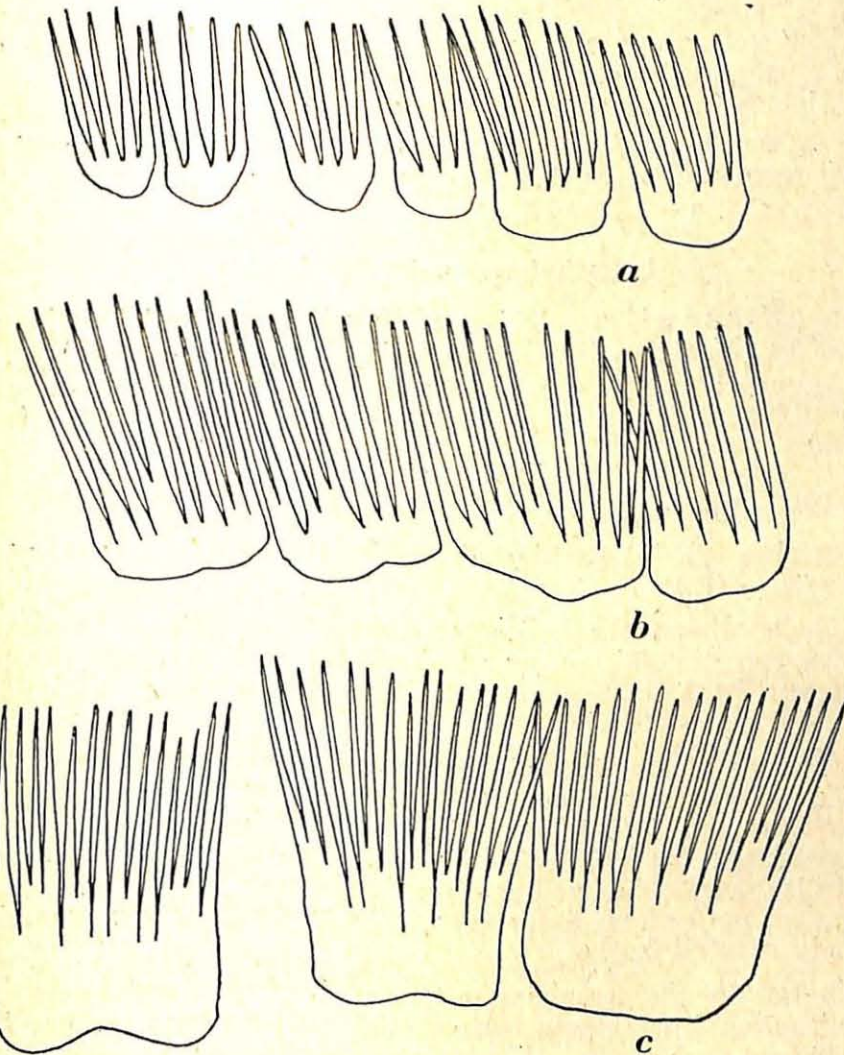


Fig. 4. *Loxothylacus aristatus*. Excrescences from three different parts of the external cuticle of the mantle. $\times 530$.

cences is from 60 to 70μ . The excrescences in the lower row of the same figure (fig. 4 c) are still larger, their dimensions are from 75 to

85 μ ; here each excrescence is composed of a still larger quantity of spines. In general the spines of the larger excrescences are combined into small groups which in their turn are united on a common basal part. The spines themselves are more or less sharp-pointed and very slender.

The very short excrescences occur in certain parts of the mantle only, the greater part of the external cuticle bears excrescences which vary in length between 60 and 85 μ .

Retinacula could not be found on the parts of the internal cuticle which were studied for this purpose.

Loxothylacus setaceus Boschma

p. p. *Sacculina pilosa* Van Kampen and Boschma 1925, p. 17; fig. 6 (section of external cuticle and retinaculum).

Loxothylacus setaceus Boschma 1931 b, p. 62; fig. 5 p (lateral surface); fig. 40 (longitudinal sections); fig. 3 e, f (excrescences).

Material examined:

Celebes (?). M. Weber, 1888—89. 1 specimen on *Calappa hepatica* (L.).

The specimen (fig. 1 d) has a greater diameter of 13 mm, a lesser diameter of 10.5 mm, and a thickness of 7 mm. In the first of the papers cited above more details on the shape of the animal are given.

A series of longitudinal sections has been made from the visceral mass of this specimen, three sections are figured in a previous paper (Boschma 1931 b, fig. 40), in one of these figures (fig. 40 b) there occurs a mistake, as at the left side a vas deferens as well as a testis is drawn. The smaller of the two male genital organs, however, does not possess a curved part, it is more or less straight and strongly reduced in size.

In fig. 5 of the present paper the male genital organs are represented, taken from nine sections, each consecutive section from a more dorsal part of the visceral mass than its predecessor.

Fig. 5 a shows the left male genital opening and the ventral part of the right vas deferens. The vasa deferentia have a narrow lumen, which possesses some very little developed ridges on its inner wall (fig. 5 b). In fig. 5 c in the upper part the two vasa deferentia are shown, they are here of approximately equal sizes, in the lower part of the figure the extreme ventral region of the right testis

is visible. In the upper part of fig. 5 d the ventral region of the two testes is visible, moreover the expanded part of the right testis. In the section of fig. 5 e the left testis is seen next to the region of the right testis where this organ passes into the wide sac-like expansion. This expanded part which in its posterior region (at the upper part of the figure) still possesses a part of the thick-walled region of the



Fig. 5. *Loxothylacus setaceus*. Transverse sections through the male genital organs posterior end of the body at the upper side of the figures. $\times 18$.

testis, is represented again in fig. 5 f; in this region the left testis has become very small, it is seen as a narrow canal at the upper side of the figure. The three other figures (fig. 5 g, h, i) show sections of the expanded part of the right testis, each section from a more dorsal plane than the foregoing.

In this specimen the testes therefore are strikingly different: the left is more or less rudimentary, whilst the right is well developed and in its dorsal part is enlarged into a wide pouch.

Sections through one of the colleteric glands, taken from longitudinal sections of the visceral mass, are represented in fig. 6. Here the canals of the gland are drawn only, and at the right of each fi-

Figure the cuticle of the visceral mass is represented by a double line. Fig. 6 a is from an approximately median section of the colleteric gland. The cuticle of the visceral mass shows the thick plug of chitin which closes the female genital opening (in the lower part of the figure). One large canal is present (a part of the system in the immediate vicinity of the atrium), and several smaller ones. Fig. 6 b,

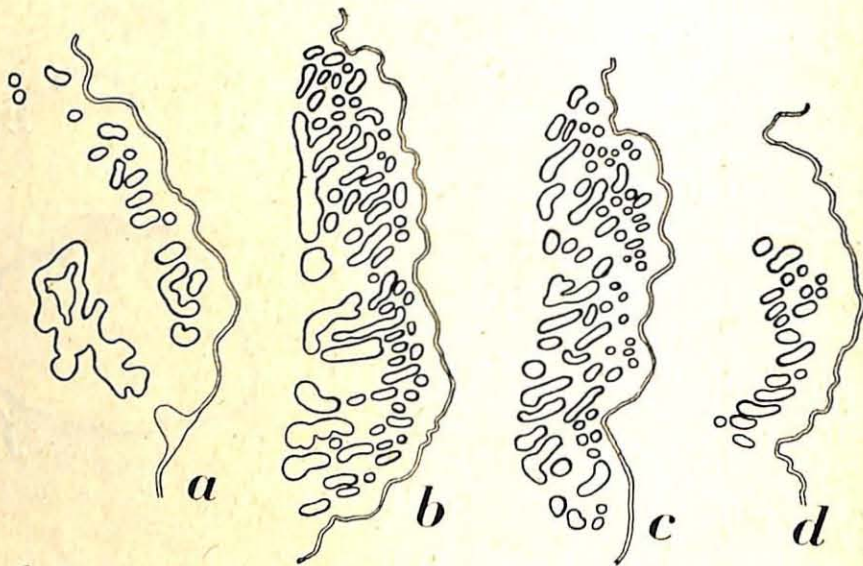


Fig. 6. *Loxothylacus setaceus*. Longitudinal sections of one of the colleteric glands, posterior end at the upper side of the figures. $\times 47$.

which is taken from a section at some distance of the median region, shows a much larger quantity of canals (66), many of which are parts of the larger branches of the system. In the following section (fig. 6 c), from a region which is still farther from the median part, the aspect of the gland is not strongly different from the former; here 68 canals are found in the section, in general the canals are somewhat narrower. A part of the periphery of the gland, with a very small number of canals, is seen in fig. 6 d.

The external cuticle of the mantle on an average has a thickness of 85μ approximately.

The excrescences of the external cuticle of the mantle consist of a small number of spines (3 to 6), united on a common basal part. In fig. 7 the excrescences of three different parts of the external cuticle are represented, in the upper and lower row as they are found in the greater part of the mantle, in the middle row as they occur more rarely. The excrescences vary in size, those represented in

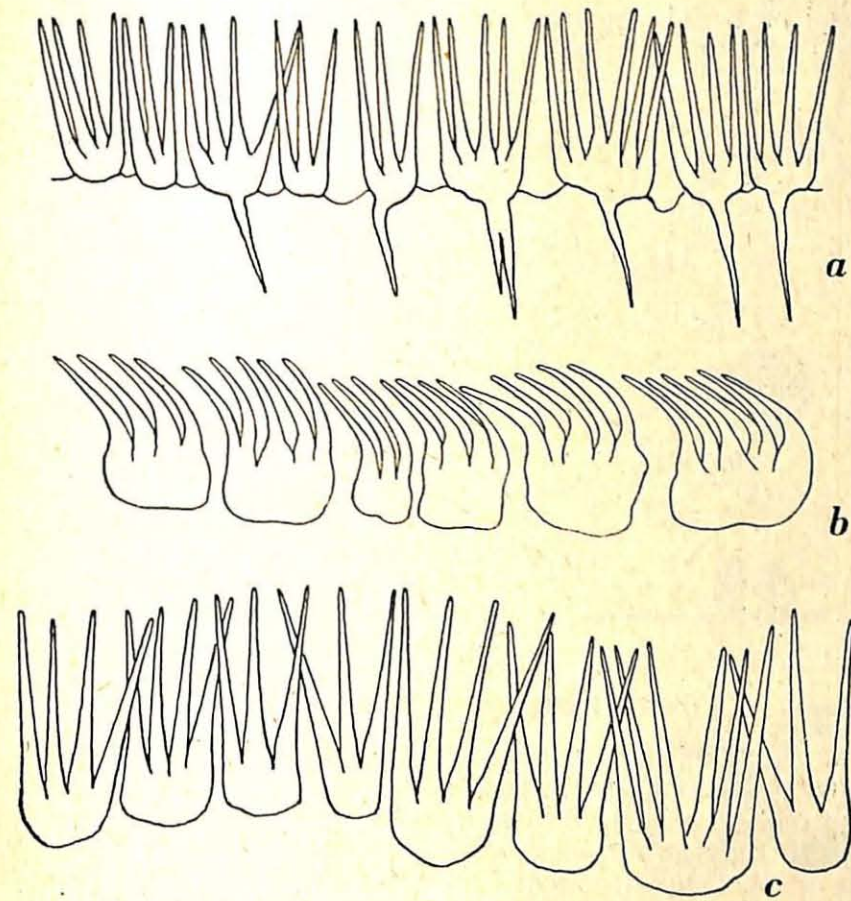


Fig. 7. *Loxothylacus setaceus*. Excrescences from three different parts of the external cuticle of the mantle. $\times 530$.

fig. 7 a measure between 38 and 45μ , those of fig. 7 c between 50 and 65μ . The more or less aberrant excrescences represented in fig. 7 b measure from 30 to 38μ . In some parts of the mantle the excrescences possess protuberances at their basal part which may penetrate for a considerable distance into the main layers of the external cuticle; these outgrowths remain distinctly visible as they consist, like the excrescences themselves, of a kind of hyaline chitin, which in sections does not take stain.

The internal cuticle of the mantle bears retinacula, which are distributed more or less regularly on the surface of this cuticle (fig. 8). Each retinaculum consists of 5 to 10 spindles, united on a com-

mon basal part. The spindles are till 18μ long, they possess very small and indistinct barbs.

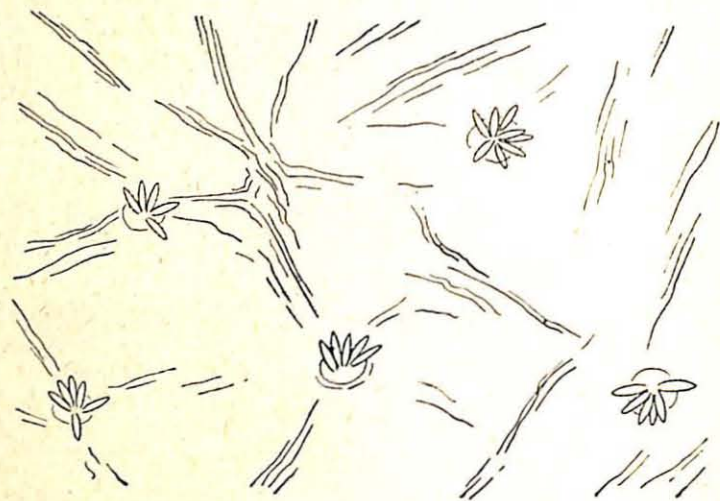


Fig. 8. *Loxothylacus setaceus*. Retinacula on the internal cuticle of the mantle. $\times 235$.

***Loxothylacus desmothrix* Boschma**

p. p. *Sacculina pilosa* Van Kampen and Boschma 1925, p. 21; fig. 11 (section of external cuticle).

Loxothylacus desmothrix Boschma 1931 a, p. 371; fig. 33 n, o (lateral surfaces); fig. 52 (longitudinal section); fig. 53 (section of the external cuticle and excrescences).

Loxothylacus desmothrix Boschma 1931 b, p. 63; fig. 51 (lateral surface); fig. 41 (longitudinal sections); fig. 3 r, s, t (excrescences).

Material examined:

Danish Expedition to the Kei Islands, Banda Neira, ca. 15 m, sand, 9. VI. 1922. 1 specimen (holotype) on *Pilumnus Normanii* Miers.

Siboga expedition, Sta, 269 (Kei Islands, $5^{\circ}36'.5$ S., $132^{\circ}55'.2$ E., 90 m). 1 specimen on *Pilumnus* spec.

The specimen from Banda Neira (fig. 1 c) has a greater diameter of 4.5 mm, a lesser diameter of 3.5 mm, and a thickness of 2 mm; the corresponding dimensions of the specimen from the Siboga Expedition (fig. 1 b) are 3, 2 and about 1 mm. More details on the shape of the animals are found in the first and the third paper cited above.

From both specimens series of longitudinal sections have been made, so that the particulars of their anatomy can be studied.

Sections of the male genital organs of the type specimen are represented in fig. 9. The left male genital opening is seen in fig. 9 a, next to the extreme ventral part of the right vas deferens. The

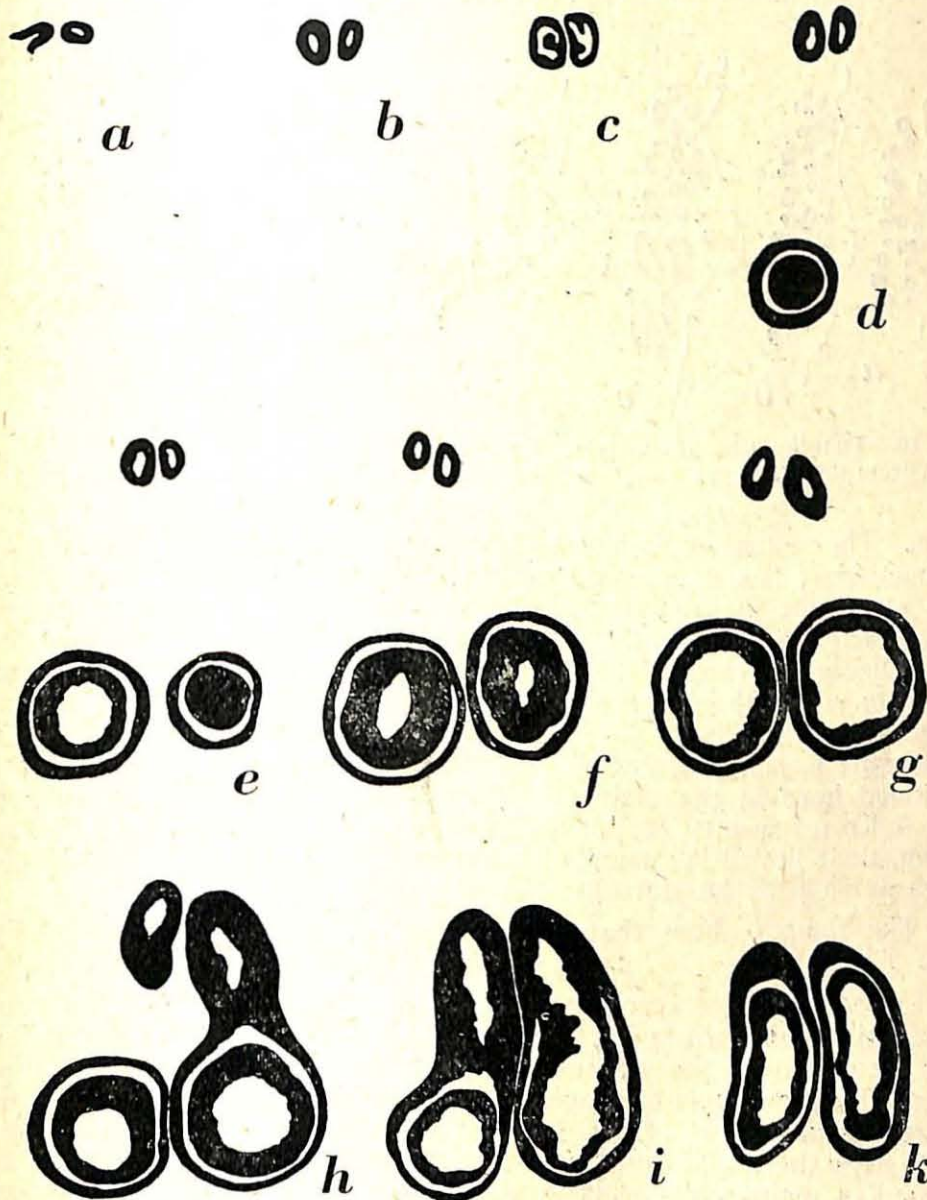


Fig. 9. *Loxothylacus desmothrix*, holotype. Transverse sections through the male genital organs, posterior end of the body at the upper side of the figures. $\times 45$.

vasa deferentia are narrow canals which only in some regions possess ridges on their inner wall (fig. 9 c). In fig. 9 d the curved end of the left testis is seen (in the lower part of the figure), surrounded by its muscular sheath, in fig. 9 e the corresponding part of the right



Fig. 10. *Loxothylacus desmothrix*. Longitudinal sections of colleteric glands. a—d, from the holotype; e—g, from the specimen of the Siboga Expedition. $\times 83$.

testis. The testes are rather widely curved, so that in sections their terminal part lies at a considerable distance from the part which runs along the mesentery and the posterior region of the visceral mass. The lumen of both testes is visible in fig. 9 f, gradually this lumen becomes wider (fig. 9 g). In fig. 9 h a section is drawn from a region in which the posterior part of the testis (in the upper portion of the figure) gradually enlarges in size. In fig. 9 i this part of the right testis is connected with the anterior region, the right testis is sectioned here in the middle of its dorsal curve. The last figure (fig. 9 k) represents sections through both testes in their dorsal region, their lumen is elongated because only the curved part of the testes extends as far dorsally.

The figures show that both testes are of approximately the same size.

Longitudinal sections of one of the colleteric glands of the type specimen are drawn in fig. 10 a-d. At the left of each of these figures the surface of the visceral mass is represented by a single line. In fig. 10 a the canals of a peripheral section of the colleteric gland are represented, that of fig. 10 b is slightly nearer to the median plane, here the gland contains some more canals (35). Farther to the median plane the canals become larger and less in number (fig. 10 c). In median sections only a few canals remain (fig. 10 d), in the figure the female genital opening is seen, with the oviduct passing into the atrium with its wide internal opening.

Four sections of the external cuticle, each from a different part of the mantle of the type specimen, are given in fig. 11. In each of

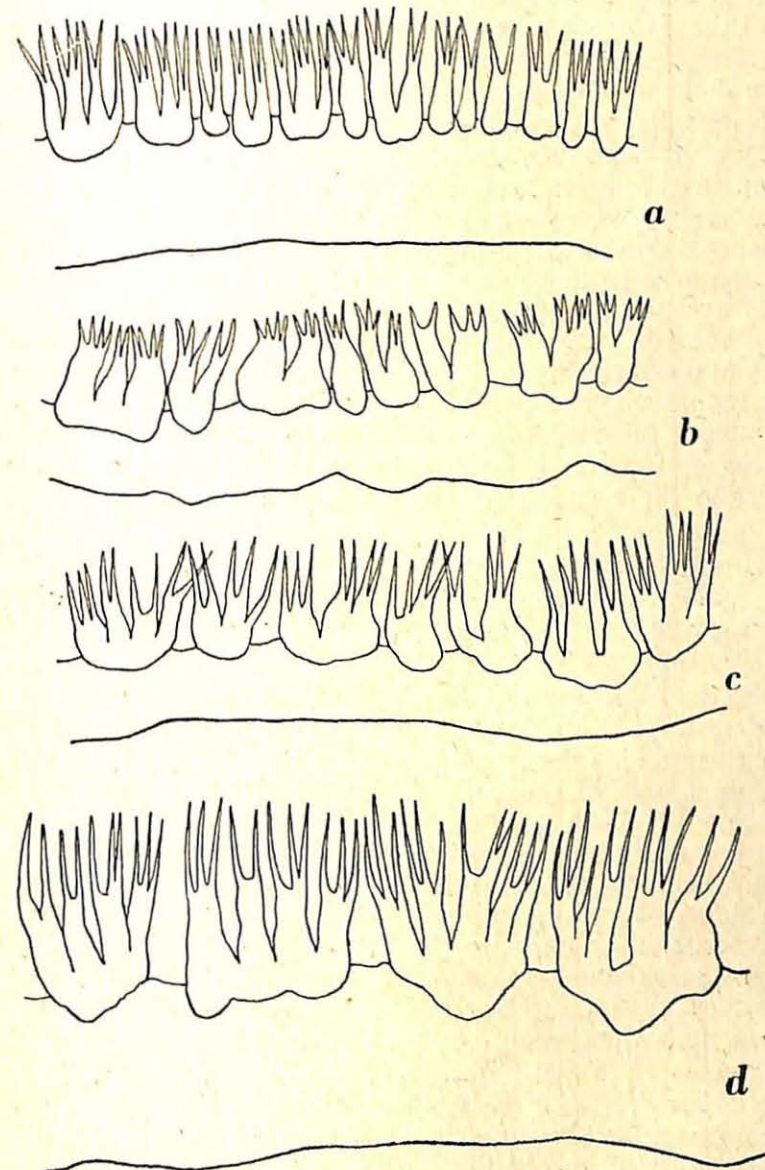


Fig. 11. *Loxothylacus desmothrix*, holotype. Sections of four different parts of the external cuticle of the mantle. $\times 530$.

these sections the thickness of the external cuticle has a different value: this thickness varies from 15 to 45 μ .

The excrescences which occur on the upper surface of the external cuticle in each of these sections have a slightly different form, although in general they are built in the same manner. In their typical form the excrescences of this specimen are composed of a small number of thick branches which are united in their basal part; each of the branches in its extremity is divided into a small number of minute spines. The excrescences are not projecting completely above the surface of the external cuticle, their basal part is more or less embedded in the upper layers of this cuticle. Those represented in fig. 11 a consist of a few branches each, sometimes even the branches remain single. At the top of each of the branches there are a few, comparatively thin spines. In the excrescences of fig. 11 b the branches are much thicker and the spines at the extremities of the branches shorter. Fig. 11 c represents excrescences with thick branches and long spines, whilst those of fig. 11 d are of much larger size than the other figured excrescences, they also consist of a larger number of branches. The dimensions of the excrescences of this specimen vary in length from 23 to 55 μ (measured from the basal part to the extremities of the spines).

On the parts of the internal cuticle studied in this respect no retinacula could be found.

The specimen from Station 260 of the Siboga Expedition differs in some respects from the type specimen, these differences, however, are of minor importance.

Sections of the male genital organs of the Siboga specimen are represented in fig. 12. The left male genital opening and the ventral part of the right vas deferens is drawn in fig. 12 a; fig. 12 b shows a more dorsal part of the two vasa deferentia. In fig. 12 c the terminal region of the left testis is present in the lower part of the figure, at some distance from the vas deferens, so that here also this testis has a comparatively wide curve. In the region of fig. 12 d the vasa deferentia have passed into the testes, from the left testis only the terminal, recurrent part is visible. Fig. 12 e shows the right testis sectioned in its curved part, from the left testis the posterior as well as the anterior (wider) part are visible, enveloped by a common muscular layer. In fig. 12 f, the most dorsal of the figured sections, the dorsal part of the curved region of the two testes is visible, from the right testis the dorsal part of its wall, surrounded by the muscular sheath, from the left testis not yet the extreme dorsal region, as there is still a large lumen.

In contradistinction to the type specimen the testes of the specimen from the Siboga Expedition are of different sizes, the right is much smaller than the left. The right testis is not distinctly curved, though in its dorsal part it runs in an anterior direction (fig. 12 e). On the other hand the left testis is of the same shape as those of

the type specimen. Moreover the curve of the left testis in the Siboga specimen is of a width completely corresponding with that of the male organs of the type specimen.

The colleteric glands of the Siboga specimen are more or less similar to those of the type specimen, but they are much smaller and

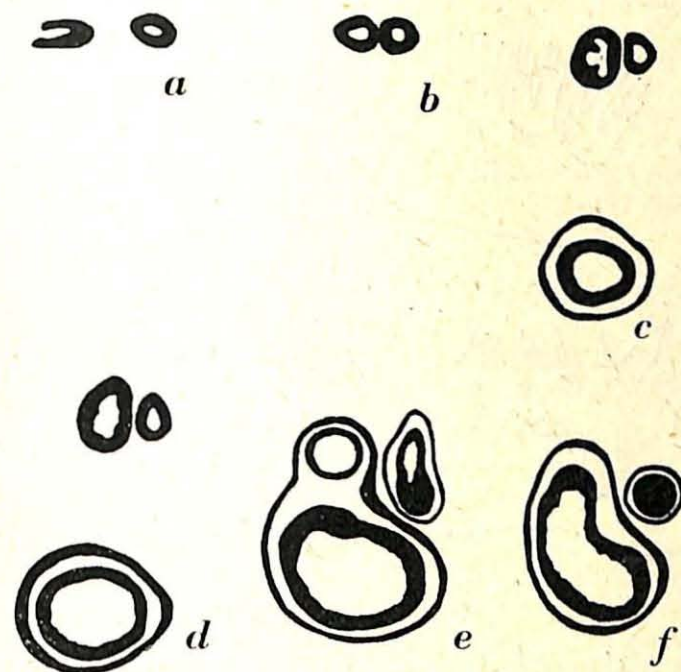


Fig. 12. *Loxothylacus desmothrix*, specimen of the Siboga Expedition. Transverse sections of the male genital organs, posterior end of the body at the upper side of the figures. $\times 80$.

possess a considerably smaller number of canals. Three sections of one of these glands are represented in fig. 10 e-g, the first from the periphery of the gland, the second from a region intermediate between the first and the third, the third from the vicinity of the median region of the gland. The number of canals in the section of fig. 10 f amounts to 13, which is slightly more than one third of the number found in the type specimen. In the figures the line at the right side represents the surface of the visceral mass.

The external cuticle of the mantle has a thickness of 20 to 35 μ . In its upper part the cuticle bears excrescences which often rather deeply penetrate with their basal part into the cuticle.

Sections of the external cuticle from three different parts of the mantle are drawn in fig. 13. Of these fig. 13 a is from a region in the neighbourhood of the stalk, where the excrescences are smaller

than on other parts of the mantle. The excrescences of fig. 13 b consist of a few short thick branches each, which at their extremities are divided into a few short spines. The size of these excrescences, measured from the basal part to the tops of the spines, is 38 to 45 μ . The excrescences represented in fig. 13 c are of somewhat larger

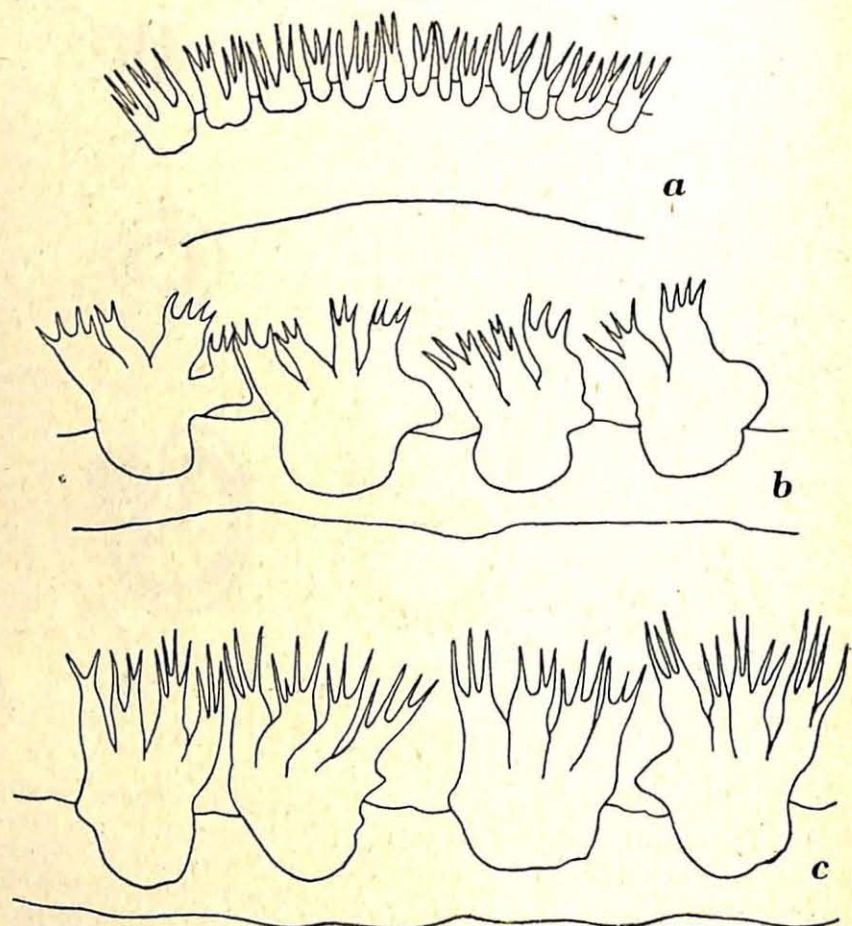


Fig. 13. *Loxothylacus desmothrix*, specimen of the Siboga Expedition. Sections of three different parts of the external cuticle of the mantle. $\times 530$.

size, their dimensions are 45 to 60 μ . They are built in the same manner as those of fig. 13 b, but their branches and the spines into which these branches are divided, are longer and slenderer. The excrescences in the neighbourhood of the stalk are of a somewhat irregular kind. They often consist of one branch only, which is divided into two or three spines. There are also larger compounds in this region, but these are much smaller than those of the greater

part of the mantle. The excrescences of fig. 13 a vary in size from 15 to 25 μ ; these values cannot be regarded as typical.

In general the excrescences of the two specimens of *Loxothylacus desmothrix* are strikingly similar. Those of the Siboga specimen have a more strongly developed basal part, but in other respects they correspond closely.

Retinacula could not be found on the internal cuticle of the mantle of the specimen from the Siboga Expedition.

***Loxothylacus Strandii* nov. spec.**

Loxothylacus aristatus Boschma 1933, p. 538; fig. 49 a (lateral surface); fig. 50 (longitudinal section); fig. 51 (section of external cuticle).

Material examined:

Macclesfield Bank, H. M. S. «Egeria», 42-46 fms. 1 specimen on *Lambrus contrarius* (Herbst).

Diagnosis. Testes of approximately equal size and shape, their dorsal part enlarged into thin-walled pouches. Colleteric glands

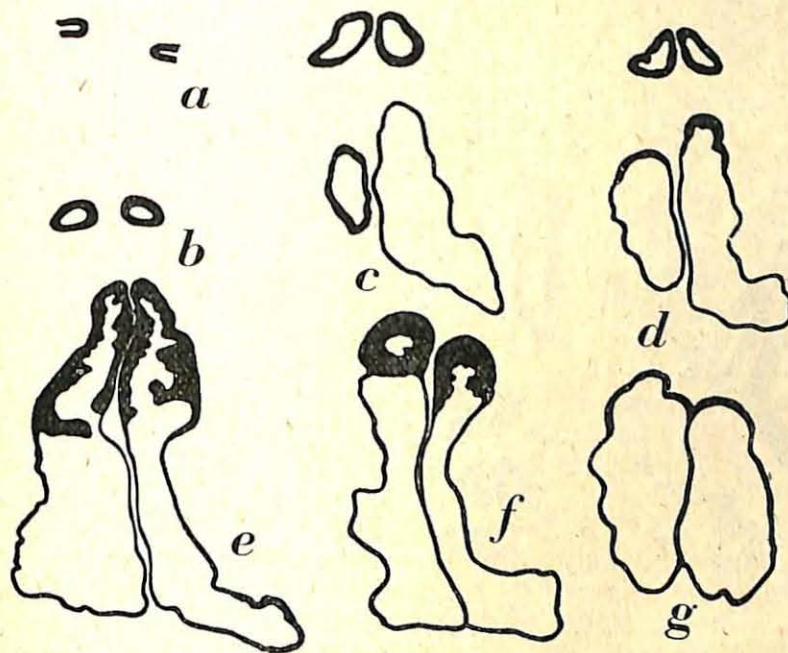


Fig. 14. *Loxothylacus Strandii*. Transverse sections through the male genital organs, posterior end of the body at the upper side of the figures. $\times 12$.

with a large number of branched canals. External cuticle with excrescences consisting of a hyaline kind of chitin, different in structure from that of the main layers. The excrescences consist of pointed

spines which usually are united into groups of two to five, rarely remain single. The excrescences vary in length between 30 and 65 μ . Retinacula unknown, probably not occurring.

The specimen (fig. 1 e) has a greater diameter of 18.5 mm, a lesser diameter of 14 mm, and a thickness of 7.5 mm. A description of its external shape and of the chief particulars of its characters is given in the paper cited above.

By means of a series of longitudinal sections the internal structure of the specimen could be studied.



Fig. 15. *Loxothylacus Strandii*. Longitudinal sections of one of the colleteric glands, posterior end at the upper side of the figures. $\times 47$.

Parts of these sections, representing transverse sections of the male genital organs, are shown in fig. 14. The first figure (fig. 14 a) contains the male genital openings of both sides. Fig. 14 b represents sections of the vasa deferentia in a region somewhat farther to the

dorsal part of the body. In fig. 14 c the posterior parts of the testes (at the upper side of the figure) as well as the anterior parts (the closed ends, at the lower side of the figure) are visible. Fig. 14 d is after a section which is slightly farther towards the dorsal region, the anterior and posterior parts of the testes are still separated. Fig. 14 e represents a section of the region in which the thick-walled posterior part of each testis passes into the thin-walled anterior portion. In fig. 14 e the upper part of the figure still shows the thick-walled parts of the testes, the lower part represents the thin-walled anterior portions of these organs. In fig. 14 f, which is from the dorsal region of the testes, the enlarged thin-walled pouches of the two testes are visible, here they are in close contact, but completely separated from each other.

As results from these figures the two male genital organs are of approximately equal size and shape.

Parts of longitudinal sections containing one of the colleteric glands are given in fig. 15. In these figures the epithelium of the canals with their internal lining of chitin is drawn, and, at the right side of each figure, the thin chitinous covering of the visceral mass. Fig. 15 a represents a section from the median region of the colleteric gland. The wide canal at the left forms part of the atrium, besides this the gland contains a considerable number of canals of fairly large size. The female genital opening is visible in the lower part of the figure, it is closed by a thick plug of chitin forming part of the chitinous layer of the visceral mass. Fig. 15 b shows a section at some distance from the median region; here the canals for a large part are wide, for another part they consist of smaller branches. The section of fig. 15 c has the largest number of canals (81) of the four represented here, besides comparatively wide canals a large number of small ones occur here. In the section of fig. 15 d, from the peripheral region of the gland, the number of canals is small in comparison to that in the two preceding figures.

The external cuticle of the mantle on an average has a thickness of about 80 μ .

On the surface of the external cuticle there occur excrescences which are composed of spines of a hyaline kind of chitin. Usually the spines are combined into complexes of two to five, more rarely they remain single. The excrescences of three different parts of the external cuticle are drawn in fig. 16. In the upper row (fig. 16 a) the spines are arranged into groups, but only about half of them are commonly united into excrescences of two spines each. More often compounds of spines as those of fig. 16 b are found, groups of three to five, united on a common basal part. The length of the excrescences represented in fig. 16 a and b varies between 30 and 45 μ ; the spines may, however, become longer, as those of fig. 16 c. Here

the excrescences, measured from the basal part to the extremities of the spines, have a length of 50 to 65 μ . In many parts of the cuticle each single excrescence is situated on the top of a small mound (fig. 16 c), in other parts, especially in those regions where

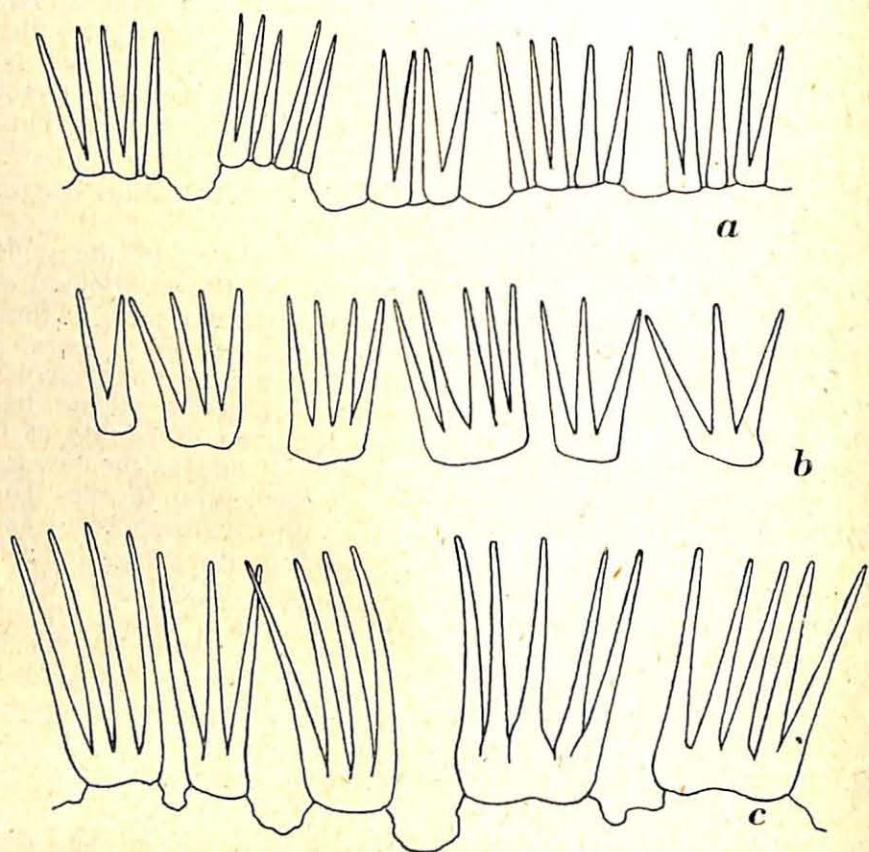


Fig. 16. *Loxothylacus Strandii*. Excrescences from three different parts of the external cuticle of the mantle. $\times 530$.

the spines are very little combined, a group of excrescences takes its origin from an inconspicuous elevation of the cuticle (fig. 16 a).

On the internal cuticle of the mantle no retinacula could be found.

The most striking particulars of the specimen described here as the type of a new species were already mentioned in a previous paper (Boschma, 1933). The specimen then was regarded as a representative of *Loxothylacus aristatus*. The differences of the new species from the latter, however, are rather conspicuous, so that the specimen on *Lambrus contrarius* is described here as the type of a new species, called *Loxothylacus Strandii* in honour of Professor Embrik Strand.

The specimens dealt with in the present paper show sufficient characters to warrant the distinction of four species. These characters are mentioned in the following table.

A few remarks on the size and shape of the parasites may be added.

The two specimens of *Loxothylacus desmothrix* do not differ noticeably in size, the greater diameter of the type specimen is 4 mm, that of the other specimen 3 mm. Both specimens are more or less oval, in one the mantle opening lies at the top of a small tube (fig. 1 b), in the other it does not extend appreciably beyond the surface of the mantle (fig. 1 c).

The specimen of *Loxothylacus aristatus* is small (greater diameter 7.5 mm) in comparison to the specimen of *Loxothylacus Strandii* (greater diameter 18.5 mm). Although the differences in size of specimens of Sacculinidae which belong to the same species may be rather great, the differences in size found here give already evidence for the specific difference of the two specimens. Moreover the parts surrounding the mantle opening (fig. 1 a, e) are strongly different.

In its general appearance the specimen of *Loxothylacus setaceus* (fig. 1 d), which has a greater diameter of 13 mm, is different from the other specimens dealt with in the present paper.

In many cases the identification of the hosts of different specimens of Sacculinidae may serve as a clue for the identification. Afterwards, of course, the identification must be checked by a study of the external and internal cuticle of the mantle, and in many cases by an investigation on the internal anatomy. The fact that the two known specimens of *Loxothylacus desmothrix* both live on specimens of crabs of the genus *Pilumnus* adds a further argument for the opinion that they belong to the same species.

On the other hand the fact that the type specimen of *Loxothylacus aristatus* is a parasite of *Atergatis floridus* (L.), a crab belonging to the Xanthidae, and that the type specimen of *Loxothylacus Strandii* is a parasite of *Lambrus contrarius* (Herbst), a crab of the family Parthenopidae, furnishes a new argument for the opinion that the specimens are specifically distinct.

	aristatus	setaceus	desmothrix	Strandi
Male genital organs	of approximately equal size, not enlarged into wide pouches; with comparatively narrow curve	one testis rudimentary, the other enlarged into a pouch of enormous size	of approximately equal size, or one larger than the other; not enlarged	of approximately equal size, each testis enlarged into a thin-walled pouch
Colleteric glands	with numerous canals	with numerous canals	with moderate or small number of canals	with numerous canals
Thickness of external cuticle	about 100 μ	about 85 μ	15 — 45 μ	about 80 μ
Excrescences of external cuticle	with numerous spines; 35 — 85 μ long	with 3 — 5 spines; 35 — 65 μ long	consisting of a few thick branches, which at their top bear a few small spines; 23—60 μ long	with 2 — 5 spines, rarely consisting of single spines; 30—65 μ long
Retinacula	probably absent	present	probably absent	probably absent
Dimensions	7.5×6×4 mm	13×10.5×7 mm	4.5×3.5×2 mm; 3×2×1.1 mm	18.5×14×7.5 mm
Host	<i>Atergatis floridus</i> (L.)	<i>Galappa hepatica</i> (L.)	<i>Pilumnus Normani</i> Miers; <i>Pilumnus</i> spec.	<i>Lambrus contrarius</i> (Herbst)
Locality	Talaud Islands	Celebes?	Banda; Kei Islands	Macclesfield Bank

If, however, there are found living on crabs belonging to widely different families two specimens of Sacculinidae which closely correspond in the structure of their external and internal cuticle and their internal organization, these parasites must be regarded as representatives of one species. On the other hand one species of crab may be infested by more than one species of Sacculinidae.

As far as concerns the localities of the four species dealt with in the present paper we can state that they are from the East Indian Archipelago or from the vicinity of this region (Macclesfield Bank in the China Sea).

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Neues über *Pediculooides* Targ. Tozz. 1878.

(Mit 3 Texttafeln.)

Von

Dr. A. C. Oudemans, Arnhem.

Diese Gattung unterscheidet sich morphologisch von andern Genera der *Tarsonemini* hauptsächlich dadurch, dass die linken und rechten Coxalplatten III+IV schief zur Medianlinie stehen, dabei sich nicht in der Medianlinie berühren, sondern in ziemlich weiter Entfernung von einander stehen. Ich sehe in dieser Beschaffenheit einen primitiven Zustand. Jede dieser Platten ist in die ebenfalls etwas stärker chitinisierte ventrale Körperdecke aufgenommen, bildet also mit dieser beiderseits eine grössere Platte. Diese berühren sich nur ganz vorn. Sie umschliessen ein sehr hohes Dreieck (Fig. 1, 4, 6). Ob dieses Dreieck etwas weicher als die beiden beschriebenen grösseren Platten ist, wage ich nicht zu entscheiden.

Allgemein wird angenommen, dass es nur eine Art gibt: *ventricosus* (NEWPORT X, 1850). Zweck meines Beitrages zum Jubiläum-Werk Strand ist, zu zeigen, dass diese Meinung falsch ist.