

# XII. Pantopoda.

Von

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Mit 4 Figuren im Text.

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Some little time back Dr. L. SCHULTZE very kindly placed in my hands for description, a small collection of Pycnogonids from Angra Pequena (Lüderitzbucht) and the adjacent coast of Africa. It has been a matter of considerable regret that my engagements have delayed their examination much longer than I anticipated. The collection, if small, is an extremely interesting one containing three new species, for one of which a new genus has been instituted. It is perhaps unfortunate that several specimens are immature, a fact which renders their specific designation more difficult and uncertain.

The Pycnogonida have not received much attention on the African coasts but it is not unlikely that the Fishery Investigations carried on up to quite recently by the Cape Government may have produced some interesting discoveries in connection with this group of animals as has occurred with others.

As far as I have been able to ascertain the following list contains all the species hitherto recorded from Africa south of the Equator. Those occurring in this collection being marked with an asterisk.

<i>Pycnogonum cataphractum</i> MÖBIUS, 1902.	<i>Nymphon distensum</i> MÖBIUS, 1902.
„ <i>microps</i> LOMAN, 1904.	<i>Ammonothea brevicauda</i> LOMAN, 1904.
<i>Phoxichilus clipeatus</i> MÖBIUS, 1902.	* „ <i>cuspidata</i> sp. nov.
<i>Anoplodactylus aculeatus</i> MÖBIUS, 1902.	* „ <i>quadridentata</i> sp. nov.
„ <i>spinosus</i> MÖBIUS, 1902.	<i>Böhmia chelata</i> BÖHM, 1879.
<i>Pallene lappa</i> BÖHM, 1879.	„ <i>tuberosa</i> MÖBIUS, 1902.
* <i>Heteropallene dubitans</i> sp. nov.	* <i>Hannonia typica</i> HOEK, 1881.
<i>Nymphon signatum</i> MÖBIUS, 1902.	* <i>Discoarachne brevipes</i> HOEK, 1881.
„ <i>pilosum</i> MÖBIUS, 1902.	

The majority of these were taken during the "Valdivia"-Expedition and are not littoral forms.

#### *Ammonothea cuspidata.*

##### Specific characters:

Body discoid, lateral processes close together and armed distally with branched spines. A mid dorsal row of these also occur. Similar spines occur on the cheliferi and legs. No auxiliary claws.

Body robust, discoid, due to the varying length of the lateral processes which are quite close together and armed distally with branched spines. Of these the posterior one is much the largest. Cephalon broad, expanded, but the interval between it and the first pair of lateral processes is reduced to a minimum. The ocular tubercle lies in the middle of the cephalon and is a straight but stout structure bearing four

large ovoid eyes, the anterior pair are close together. Above the eyes the tubercle is truncated to terminate in a short spine. The abdomen is rather long, directed upwards, and bears about its middle two branched spines and a few setae more distally. In the mid dorsal line are three long slender branched spines of some considerable elevation. The length of the entire body is 1 mm and its breadth is 0.5 mm.

The proboscis is small, ventral, directed downwards, forming a rounded cone.

The cheliferi are well developed, the scape is single-jointed, short with a strongly developed branched spine about its middle and others distally. The chela are fairly well developed turned vertically downwards, the dactyli about as long as the spinous palm, and curved like a pair of callipers, without teeth.

The palps are not perfectly developed and it is difficult to say how many joints there should be. It was injured in removal for detailed examination, but in its present condition it consists of a short joint with a couple of minute seta distally, then follows a longer joint and the remainder of the appendage is bent to a considerable angle to the preceding portion. At the bend there is a small joint quite triangular

in shape and carrying on its outer margin a spinous setae. The rest of the limb is not divided up into joints but if the arrangement of the setae may be taken as a guide there should be three. The proximal third is stout, dorsally and distally it bears two long spinous setae. The middle third is much more slender and devoid of setae, while the distal third is slightly tapering, with a long spinous seta at its base and half a dozen at the distal extremity.

Ovigers none.

Legs are not long, but armed throughout with spines which are for the most part branched, these are most numerous as well as best developed on the second tibia and arranged dorso-laterally. A few setae occur ventrally.

Of the three coxae the second is a little the longest, the spines being comparatively small and few. The three following joints progressively increase in length to a slight extent, the tarsus is very small, and has a few spinous setae ventrally, the propodus is slightly curved more than half as long as the second tibia, it carries one stout spine ventrally and proximally four or five smaller ones, more distally a few setae occur dorsally and there are no auxiliaries to the stout terminal claw.

The second tibia of the first leg has a very large pair of branched spines dorso-laterally about the middle of its length, another pair, smaller between this central pair and each extremity, there are not less than two pairs of smaller spines and a few scattered ones complete the series.

The first tibia has its principal branched spines about its middle and at the distal extremity.

The posterior pair of legs are not so fully developed as the others, being about three quarters of their length.

The branched spines so characteristic of this species are really dermal prolongations which support one or more stout setae which are usually implanted in a socket.

The two specimens are both immature, one much more so than the other; in fact this last is still in a post-larval condition, the posterior pair of legs is represented only by a single joint, which is however comparatively long, and ends with a small but stout claw. It may seem dangerous to establish a new species on such material. The spinose nature of the animal seems however sufficiently characteristic to justify such a course.

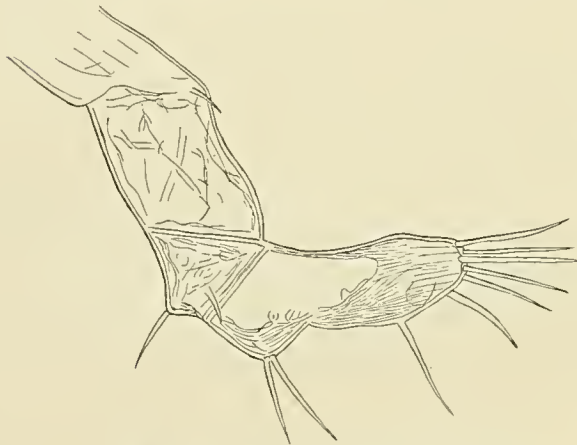


Fig. 1. *Ammothea cuspidata*.



The species has many features in common with *Ammothea Wilsoni* SCHIMKEWITSCH and it is for that reason rather than on account of definite characters that I place it in the genus *Ammothea*.

*Ammothea quadridentata*.

Specific characters:

Body discoid with lateral processes very close together and provided with a tubercle distally.

Proboscis pyriform, long.

Palps 8-jointed, 2nd and 3rd subequal, last four subequal.

Ovigers 10-jointed with very few denticulate spines, these having 10 or 12 lateral teeth.

Legs not very setose. Propodus with four large ventral spines. Terminal claw and auxiliaries large.

Body discoid with the lateral processes stout and very closely pressed together. The cephalon is expanded and its anterior border straight. Arising just in front of the middle and projecting forwards is the ocular tubercle, this is stout, of small elevation, rounded at the apex and having four well developed eyes of which the posterior are the larger.

The segmentation of the trunk is very indistinct as regards the posterior segment. The abdomen is comparatively long and very slightly swollen about the middle of its length, it lies above the posterior lateral processes. The entire body has a length of 1,5 mm, its width is 1 mm.

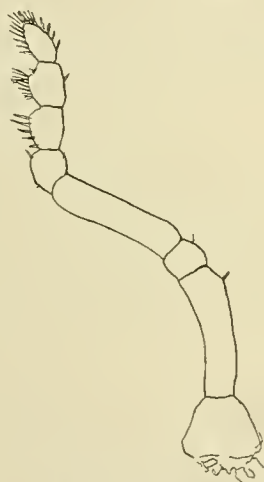


Fig. 2. *Ammothea quadridentata*. ♂.

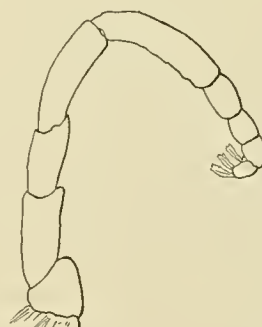


Fig. 3. *Ammothea quadridentata*.

The proboscis is large, pyriform in shape and adds almost another millimetre to the length of the animal.

The cheliferi are rudimentary and comprise a very short slightly curved scape which bears a rounded knob with but the merest vestiges of chelae. Both joints are covered with very minute stiff setae.

The palps arise a little distance outside these from the sides of the wide cephalic border. They are eight-jointed, the first is very short and stout, the second and fourth are subequal and the longest of the appendage, they bear a few small setae distally, the third is very short and only forms a sort of elbow. The four remaining joints are small and subequal, three of them are much swollen ventrally and supplied on this surface with a comparatively dense tuft of setae, the terminal joint is more slender, ovoid in shape and equally richly supplied ventrally and bearing a small number dorsally also as does the penultimate joint.

The oviger is ten-jointed and rises laterally between the proboscis and the first lateral processes.

The first joint is small and stout, the two following are much longer, the third being a little shorter than the second and having the perfectly normal oblique termination, the fourth is longer still, and the fifth even longer and is also slightly curved. The following joints are very small, and progressively decreasing in size to the last, which is minute, all together scarcely equalling the length of the fifth joint. The fifth joint carries a stout spine which is not denticulate. The three terminals bear 2, 1, 2 denticulate spines. They consist of a rather long tapering shaft with a flattened blade furnished with 9 lateral and close set teeth.

In another specimen, which is perhaps scarcely mature the joints of this appendage differ a little in their proportions. The five terminals are together much longer than the fifth joint, the first two are the longest and subequal, the next is shorter, the fourth intermediate in size and the terminal one is a mere button. Each of the five carry two denticulate spines. In this specimen the spines are much better preserved and have about a dozen lateral teeth.

The legs are short and attain a length of 6 mm. Of the three coxae the second is distinctly the longest about as long as the other two together, it is much enlarged distally. The first coxa carries dorsally and distally, a stout tubercle. The next three joints are subequal. The first tibia is slightly constricted a short distance from its proximal end. The tarsus is very small, its ventral surface being covered with stiff setae, which, though still small, become distinctly spinous distally. The propodus is large and measures two thirds the length of the first tibia, it is curved and bears small but stout setae dorsally, ventrally at the proximal end of the joint there are four stout spines graduating in size and strength from 1 to 4, more distally is a band of stout spinous setae of which most distal are the strongest. The terminal claw is large and powerful and is accompanied by two strong auxiliaries more than half its size. The heel is not very prominent but is provided with stout setae.

The entire limb is setose, these are for the most part minute but they are larger dorsally on the principal joints and, as is not unusual, they are most abundant on the second tibia.

The type specimen which has been killed with osmic acid is an adult male, and bears the genital apertures on distinct setose swellings at the ventral extremity of the second coxa of the two posterior pairs of legs.

Another specimen is not quite mature and differs in having but three stout spines ventrally on the propodus. The palps are not so strongly developed nor is the proboscis either so long or so slender.

Two other specimens taken at the same time and place are in all probability the young of this species.

One, the larger of the two, has not yet passed the chelate stage. The other is in a post-larval condition. The proboscis is not large, ventrally situated and the cheliferi are short and stout, the chela being directed downwards. The posterior portion of the body is saccate and within this may be seen two lobes which represent the hind pair of legs and the abdomen. The extremity of this latter organ is cleft and projects very slightly from the investing sac.

For the following species I have seen fit to establish a new genus *Heteropallene*. Modern genera are now defined by a number of small characters which, while facilitating their division into small groups, do not render their prompt discrimination less perplexing.

The Pallenidae as defined by Prof. G. O. Sars (6) comprise those Pycnogonids in which:  
 the cheliferi are well developed;  
 the palps are rudimentary or absent;  
 the ovigers present in both sexes.



In the work cited Prof. Sars describes three genera, admits a fourth, and expresses the opinion that the three members of the genus *Pallene* described by Prof. Hoek in the "Challenger"-Collection should be the types of three new genera; this apart from any suggestion with regard to the genus *Phoxichilidium*. I have attempted to make an easy, if superficial, discrimination between the genera and, as is not unusual in such cases, many specimens do not fall into position very readily. I have not attempted to raise those species which do not fall into line to generic rank but I have indicated their position leaving them under their original names.

Ovigers ten-jointed.

No trace of palps present.

Ovigers without terminal claw.

Legs with auxiliary claws . . . . . *Pallene*, 9 species.

Ovigers with terminal claw.

Legs with auxiliary claws . . . . . *Cordylochele*, 4 species.

Legs without auxiliary claws.

Setose tuft at extremity of proboscis . . . . . *Pseudopallene*, 4 species.

Scape of cheliferus two-jointed . . . . . *Pallene laevis* Hoek.

Cephalon segmented from 1st thoracic segment . . . . . *Pallene australiensis* Hoek.

Rudiments of palps present, one joint.

Oviger without terminal claw.

Legs with auxiliary claws . . . . . *Pallenopsis*, 16 species.

Legs without auxiliary claws . . . . . *Heteropallene*, 2 species.

Oviger with terminal claw.

Legs with auxiliary claws . . . . . *Neopallene*, 1 species.

Palps rudimentary, 2 joints. . . . . *Pallene longiceps* Böhm.

Oviger less than ten joints.

Without terminal claw.

Legs without auxiliary claws . . . . . *Pallene lappa* Böhm.

Of Böhm's two species I have not seen either the specimen or the description of *P. longiceps*. *P. lappa* I have seen and am inclined to regard as an immature specimen with the oviger not fully developed. His figures are not good.

### *Heteropallene* gen. nov.

Body robust, with lateral processes of variable length and separated by small intervals.

Cephalon much expanded, proboscis small.

Palps reduced to a single small joint.

Oviger 10-jointed, with a row of denticulate spines and without terminal claw.

Legs, with stout claw and no auxiliaries.

Prof. Hoek's species *Pallene languida* (3) is included in this definition and therefore becomes the type of the genus.

*Heteropallene dubitans.*

## Specific characters.

Body robust, with lateral processes of varying length and separated by narrow intervals.

Cephalon directed downwards, widely expanded.

Ocular tubercle stout, of small elevation, bearing four small and widely separated eyes.

Palps reduced to a single jointed rudiment.

Legs without auxiliary claws.

The body has rather a curious form, it is very robust with the lateral processes long, separated by narrow but varying intervals. The posterior pairs are however very short and are practically fused, the abdomen projecting but a little beyond and embedded between them. The width of the body is greatest across the first two pairs and very much narrower across the posterior pair. In a natural position of the animal the length of the cephalic segment to the rest of the trunk is as 4 to 5.

Immediately in front of the first pair of lateral processes the first segment of the body projects forwards in an angular manner and just behind this angle is a low but broad ocular tubercle bearing four diminutive eyes which are widely separated from each other, especially laterally.

The cephalon is directed downwards at a considerable angle and dilated distally, the conspicuous neck is strengthened by a ridge passing forwards from the "ocular pyramid".

All the lateral processes distally and the antero-lateral angles of the cephalon bear a few small setae.

The proboscis is stout, short and rounded at the extremity, it is almost vertical in direction.

The cheliferi are well developed; a short and stout scape arises from the antero-lateral margins of the cephalon and is setose distally. The chela is strong and setose, well on to the immoveable finger which also possesses a row of five progressively lengthening setae on its inner margin, at its base where it is swollen. The dactylus is longer and more curved and both are beset with a small number of rather closely set teeth.

Rudiments of the palps lie underneath the cheliferi, each is a slightly curved joint lying close to the proboscis.

The ovigers are ten-jointed and rise immediately in front of the first pair of lateral processes. The first joint is extremely small, the next two are much longer and subequal, the fourth and fifth are each of them about twice as long as the third, the sixth is short and bears a few setae, the seventh and eighth are longer and subequal, the ninth is shorter and the tenth longer than the preceding but scarcely as long as the seventh or eighth. There is no terminal claw. The four terminal joints are each provided with a single row of denticulate spines which are rather numerous. These comprise a shaft with upwards of a dozen rather rounded and close set teeth on each side, the entire structure having an oval outline.

The legs are not long and are sparsely covered with setae, but in no definite manner, they are however most conspicuous laterally. The distal fringes are quite normal and do not exhibit any special features. Of the three coxae the second is a little the longest, not so large as the other two together. The femur and first tibia are subequal in length, the second tibia is a little longer. The tarsus is very small and bears a small number of spinous setae ventrally, of these one is much larger than the rest. The propodus is curved, covered sparsely with small setae, ventrally and proximally are two stout spines, and



Fig. 4. *Heteropallene dubitans.*



the rest of the ventral surface is covered with a row of much smaller but still stout spines. The terminal claw is very stout, articulated at the ventral angle of the propodus, but there are no auxiliaries. The animal appears to be fully developed but I have not been able to detect the sexual apertures. The sex therefore remains uncertain.

In size, the length of the animal in its normal position is  $1\frac{1}{2}$  mm, the extreme width of the trunk is just over 1 mm. The extent of the animal as preserved is 7 mm but would probably reach 10 mm if perfectly flat.

*Hannonia typica.*

*Hannonia typica* HOEK (3), p. 92 u. 93; LOMAN (4), p. 383—385.

Three specimens of this species were taken, all adult, two males with ova and the third a female. Dr. HOEK's original description of this species concerns a female only, but further information has been given by Dr. LOMAN, to this latter account I can add nothing new.

Südbucht, No. 230, July 1903.

*Discoarachne brevipes.*

*Discoarachne brevipes* HOEK (3), p. 74—76; COLE (2), p. 243—248; LOMAN (4), p. 379—383.

Two specimens of this species were taken in False Bay. Both are adult, one being a male carrying numerous packets of eggs, and in a few cases the ova have just hatched. The other is a female. In both cases the cheliferi are represented by minute stumps. I am unable to add anything to the descriptions of previous observers.

I am much indebted to the Council of the Marine Biological Association of the United Kingdom and to Dr. E. J. ALLEN the Director of the Plymouth Laboratory for accommodation during the progress of this work. I am also indebted to my friend Mr. L. E. SEXTON for the photographs upon which the illustrations for this paper have been based.

MS closed in 1907.

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Band/Volume: [16](#)

Autor(en)/Author(s): Hodgson T. V.

Artikel/Article: [XII . Pantopoda. 219-228](#)