DESCRIPTION OF TWO NEW SPECIES OF OPHIUROIDEA COLLECTED DURING THE SNELLIUS EXPEDITION

by

AUSTIN HOBART CLARK†

(With an introduction by W. Vervoort)

INTRODUCTION

Mr. Austin Hobart Clark, a personal friend of Dr. H. Boschma and during many years curator of the collections of Echinoderms in the U.S. National Museum (Smithsonian Institution), died on October 28, 1954, before his study of the collection of Ophiuroidea from the Snellius Expedition could be completed. A large part of this collection, identified by Mr. Clark, is now preserved in the Rijksmuseum van Natuurlijke Historie, Leiden; a minor portion of the Ophiurid collection still awaits its revisor. Amongst the identified material there are two new species, the descriptions and drawings of which were finished by Mr. Clark before his decease. These were found amongst papers of the late Mr. Clark in the U.S. National Museum by Dr. Fenner A. Chace, Jr. and kindly placed at our disposal for publication in Dr. Boschma's jubilee volume. Both species are based on single specimens (holotypes), now preserved in the collections of the Rijksmuseum van Natuurlijke Historie, Leiden.

Ophiarachna snelliusi sp. nov. (fig. 1)

Description. — The disk is pentagonal, 11 mm in diameter, and the arms, which are separated at their bases by about twice their width, are slowly and evenly tapering, and 55 mm long.

The disk is densely covered with small granules which continue on the oral side as far as the oral shields and run out over the arm bases as far as the seventh side arm plate. The radial shields are very small, oval, half again as long as broad, situated on the edge of the disk on each side of the extension of the granules over the arm bases.

The oral shields are about as long as broad, triangular, with the inner and the lateral angles, especially the latter, very broadly rounded. The two sides are slightly concave. The distal border is straight in the central third where it adjoins a small semicircular supplementary plate. The adoral shields

are very small, triangular, from two to three times as long as broad, and are restricted to the broadly rounded distal angles of the oral shields. The jaw plates are of moderate size and are covered with from fifteen to twenty spherical granules which are larger than those on the interradial areas except for a few along the outer border of the oral shields. There are six mouth papillae on each side of which the outermost, on the adoral shield, tapers to a long, slender, sharp point; the next is much longer than high with a broadly truncated tip; and the following are stout, pointed, laterally flattened, with finely serrate edges, and gradually increase in size to the innermost. The terminal unpaired papilla is larger than those on either side with convex sides and a rather broadly rounded tip.

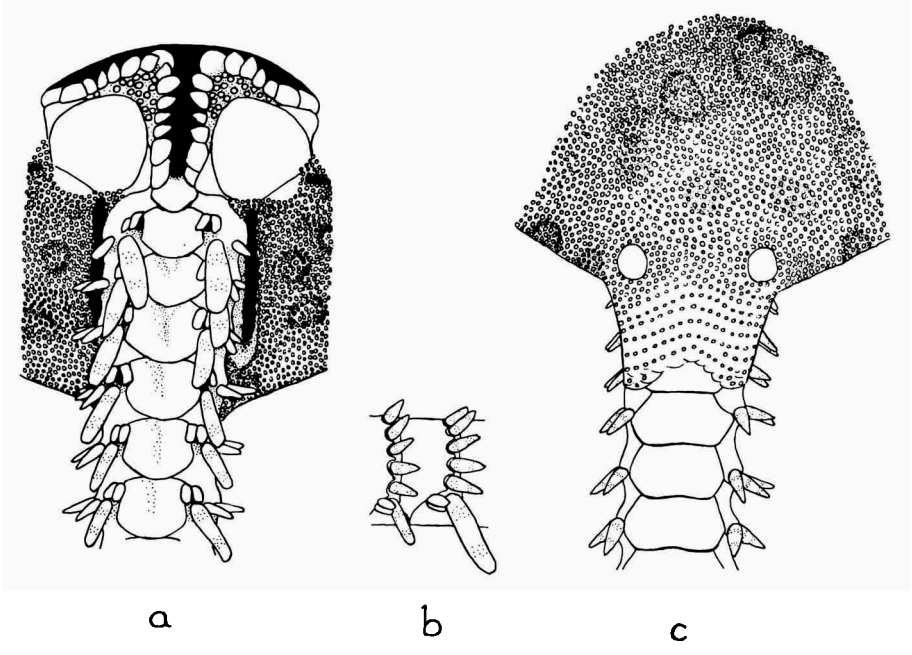

Fig. 1. *Ophiarachna snelliusi* nov. spec. a, portion of oral side of disk and one of the arms; b, lateral aspect of arm; c, portion of adoral side of disk and arm.

The first under arm plate is small and rhombic; the second is a very broad chevron, about half again as wide as long; the third is similar but somewhat larger; and the fourth and following are subpentagonal with the distal angle broadly rounded, the lateral borders convergent proximally; and the proximal border slightly concave, broadly truncated by the outer end of the preceding side arm plates. The succeeding under arm plates become nearly square with parallel lateral edges and a convex distal border.

In the outer part of the arms they become longer and narrower with the lower half of the lateral borders converging to a point, and finally they have the distal border semicircular and the sides straight, converging to a sharp point; terminally they become small and separated. There are pores between the first and second, second and third, and third and fourth under arm plates. The fourth and following under arm plates have a slightly median carination that continues for some distance along the arm.

The first tentacle pore has three tentacle scales, two large and broad, longer than wide, with a broadly rounded tip, the third smaller. The following tentacle pores have two tentacle scales of which the outer is about twice as wide as the inner though of the same length; both have broadly rounded tips.

The side arm plates do not extend on to the aboral surface of the arms. They are inclined at a slight angle to the axis of the arm so that the distal end of one projects above the proximal end of the next following. Their distal ends are straight. The first side arm plate bears two arm spines of which the inner is large, broad and spatulate, strongly flattened, and with a rounded tip, and reaches to the middle of the side of the fourth under arm plate, and the outer is similar but only about half as large. The second side arm plate bears three arm spines, one large like that on the first and two small. Beyond the disk there are six arm spines which extend outward at an angle of about 45° to the axis of the arm. The lowest arm spine is long and rather stout with parallel sides and a broadly truncated tip; it is usually as long as two under arm plates, though sometimes short. The other arm spines are about as long as an arm joint and are subequal.

The upper arm plates are about twice as broad as long with straight and parallel proximal and distal borders and the lateral borders forming a broadly obtuse rounded angle.

The color is light buff, whitish below. The disk has about two dozen irregular grayish spots narrowly edged with dark, which are largest in the center of the disk becoming small toward the periphery. The interradial areas on the oral side have from three to five well separated ring-like spots. The arms are not banded. The arm spines show two cross bands of darker color, one, usually the more prominent, near the tip, the other near the base; the tip is white.

Locality. — Obi latoe, shore and reef; Snellius Expedition, April 23-27, 1930. One specimen.

Notes. — *Ophiarachna snelliusi* differs from *O. affinis* Lütken in its more numerous but much shorter arm spines which have fewer bands; in the less broadly rounded oral shields; in the longer, more pointed, and carinate proximal under arm plates; and in the bare radial shields. From *O. quin-*

quespinosa Koehler it differs in having supplementary oral shields, fewer mouth papillae, and more numerous arm spines which are shorter with a much greater difference between the lowest and the others, which are all subequal. It differs from *O. robillardi* Loriol in the broader oral shields and more numerous, shorter, and stouter arm spines of which the lowest is much enlarged; and from *O. mauritiensis* Loriol in the exposed radial shields, broader oral shields, and shorter arm spines of which the lowest is much larger than the others. From the much larger *O. incrassata* (Lamarck) it is easily distinguished by the shorter and stouter arm spines, the exposed radial shields, the less strongly rounded oral shields, and the longer under arm plates with only three pairs of arm pores.

Ophiochaeta boschmai sp. nov. (fig. 2)

Description. — The disk is rounded pentagonal, not notched at the arm bases, 7 mm in diameter; the arms, which are separated at the their bases by about twice their width are slowly tapering and 30 mm long.

The disk is uniformly and densely covered with very fine granules, which are higher than broad at the base. The radial shields are concealed. The interradial portions of the disk are bordered by a row of eight enlarged and swollen scales which are covered with approximately spherical granules much larger than those of the disk. The interradial areas on the oral side are densely covered with long, slender, sharp spinules.

The oral shields are rounded-triangular, about as long as broad, with the inner angle broadly rounded, the sides slightly convex, the lateral angles rather abruptly rounded, and the outer border straight. There are no supplementary plates. The adoral shields are rather large, triangular, about half again as long as wide, with the lower side concave. They separate the oral shields rather widely from the first under arm plates and their inner ends are widely separated. Along the outer edge of the oral shields and the outer ends of the adoral shields is a row of about sixteen slender spinules resembling those in the interradial areas. The central third of this row is missing on the madreporite.

The jaw plates are of medium size and bear numerous blunt spinules, in an irregular double row along the inner ends of the oral shields and the adoral shields, and in a group of about fifteen on the inner part of the jaw plates. There are eight mouth papillae on each side. The outermost, on the angle of the adoral shields, is triangular, twice as long as the basal width, and sharply pointed. The next, on the inner end of the adoral shields, is much larger, broad, with the tip rounded. The remainder, situated on the jaw plates, are about half the size of the preceding, subequal, narrow, later-

ally flattened with rounded tips. The unpaired terminal papilla resembles the lateral papillae. The teeth have strongly convex sides and a sharply rounded tip.

The first under arm plate is large, broader than the second and of about the same length, with the distal border strongly convex in the central third,

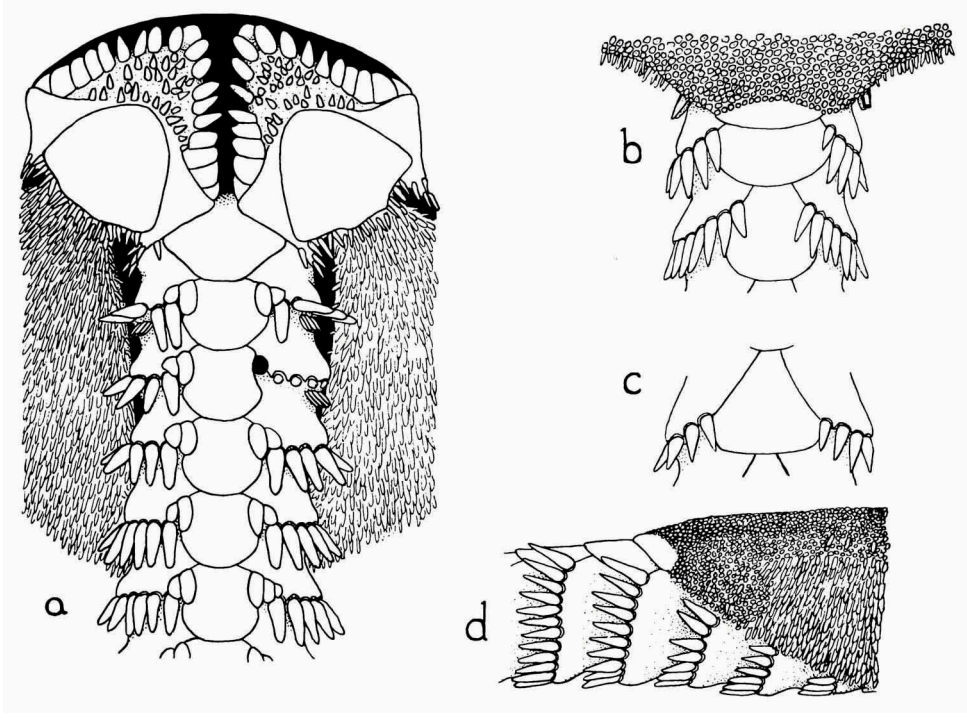

Fig. 2. *Ophiochaeta boschmai* nov. spec. a, portion of oral side of disk and one of the arms; b, portion of adoral side of disk and arm; c, 16th dorsal arm plate; d, lateral aspect of proximal part of arm and part of the disk.

becoming straight in the lateral thirds, and the proximal border with an abrupt and narrow extension between the outer ends of the adoral plates. The following under arm plates are at first about as long as broad, with the distal border strongly and evenly convex, almost a semicircle, the proximal border broadly truncated, and the lateral borders deeply excavated for the reception of the tentacle scales. The central portion is broadly depressed longitudinally. After the proximal third of the arms the under arm plates become narrower with the lower half of the lateral borders straight and converging to a point, and in the distal half of the arms they are not in contact.

There are two tentacle scales of which the inner is large and broad with

a broadly rounded tip, and is about two-thirds as long as the adjacent arm spine. The outer tentacle scale is somewhat narrower and only two-thirds as long as the inner.

The side arm plates are flaring in the distal two-thirds so that each overlaps the proximal end of that succeeding; their distal border is strongly convex.

There are 11 arm spines which are subequal, sharply pointed, at first nearly as long as a side arm plate but soon reaching scarcely the middle of the following side arm plates, and distally still shorter. They are approximately parallel with the longitudinal axis of the arm.

The upper arm plates at first are about as long as broad, strongly convex distally with the lateral borders strongly convergent and the proximal border narrowly truncated, but they soon become triangular with a straight distal border, and in the distal half of the arms progressively more widely separated, in the terminal portion minute and very widely separated. Their surface is flat.

The color is light greenish gray, whitish below. The third and fourth joints of the arms are dark gray, the fifth white. About nine similar bands cross the arms beyond the first.

Locality. — Obi latoe, shore and reef; Snellius Expedition, April 23-27, 1930. One specimen.

Notes. — This new species is easily distinguished from *O. hirsuta* Lütken, which otherwise resembles it closely, by the absence of spinules on the aboral surface of the disk. Aborally it bears a very close resemblance to *Ophiopezella spinosa* (Ljungman) from which it is easily distinguished by the spinules covering the interradial areas orally and the absence of supplementary oral shields.

Ophiochaeta boschmai is evidently closely related both to *Ophiochaeta hirsuta* and to *Ophiopezella spinosa*. Dr. H. L. Clark referred *Ophiochaeta* to the Ophiacanthidae (Mem. Mus. Comp. Zool., vol. 25 no. 4, p. 222, 1915) and *Ophiopezella* to the Ophiodermatidae (tom. cit., p. 304), but Matsumoto referred both genera to the Ophiodermatidae, subfamily Ophiodermatinae, grouping them with *Pectinura, Ophiarachnella,* and *Ophiochasma* (Journ. Coll. Sci., Imp. Univ. Tokyo, vol. 38 art. 2, p. 309, 1917). They are indeed so close that *Ophiopezella* Ljungman, 1871, should probably be regarded as a synonym of *Ophiochaeta* Lütken, 1869.