

On a Collection of Ophiurans from the Vicinity of Kinkwasan, with Description of a New Species.

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With 2 figures in text.

Of the ophiuran fauna of the vicinity of Kinkwasan, Rikuzen, *Asteronyx loveni* MÜLLER & TROSCHER, *Ophiolebes asaphes* CLARK, *Ophiopholis mirabilis* (DUNCAN), *O. aculeata* var. *japonica* (LYMAN), *Ophiothrix marenzelleri* KÖHLER (= *O. hylodes* CLARK), *Stegophiura sculpta* (DUNCAN), *S. sterea* (CLARK), *S. sladeni* (DUNCAN) (= *Ophiura stiphra* CLARK), *Ophiura sarsii* LÜTKEN, *O. flagellata* (LYMAN) and *Ophionereis eurybrachioplax* CLARK have been recorded by CLARK, and *Ophiophragmus japonicus* MATSUMOTO by me. In July, 1915, I made some collection in that vicinity on board the "Tôkwamaru" and obtained representatives of the majority of these species besides two additional ones, one of which appears to be new to science. I here propose to make some notes on them.

1. *Asteronyx loveni* MÜLLER & TROSCHER.

CLARK, Mem. Mus. Comp. Zool., XXV, No. 1, 1915, p. 180;
MATSUMOTO, Journ. Sci. Coll., Tokyo, XXXVIII, Art. 2, 1917,
p. 33.

Five specimens; S. E. E. of Kinkwasan; 104 fathoms.

2. *Astrothrombus chrysanthi*¹⁾, sp. nov.

Two specimens; S. E. S. of Enoshima, N. from Kinkwasan; 43 fathoms.

1) This specific name is derived from the name of the type locality, "Kinkwasan," which means "Gold Flower Mountain."

Diameter of disk 6.5 mm. Length of arm 25 mm. Width of arm at base 1.5 mm.

Disk five-lobed, with indented interbrachial borders. Dorsal surface of disk covered with granules and rounded convex plates of unequal size. The plates are coarser and more close-set along the radii and interradii, where the granules are not so numerous as to form belts around the plates. The more convex ones of the plates are nearly hemispherical. The radial and interradial parts covered by these plates are more elevated than the surrounding parts covered with the granules; so that, the dorsal surface of the disk presents ten radiating ridges alternating with ten radiating furrows. Radial shields partly naked; the naked parts are pear-seed shaped or irregularly oval, rather unequal in size, one third to two fifths as long as the disk radius, about twice as long as wide, widely separated from each other.

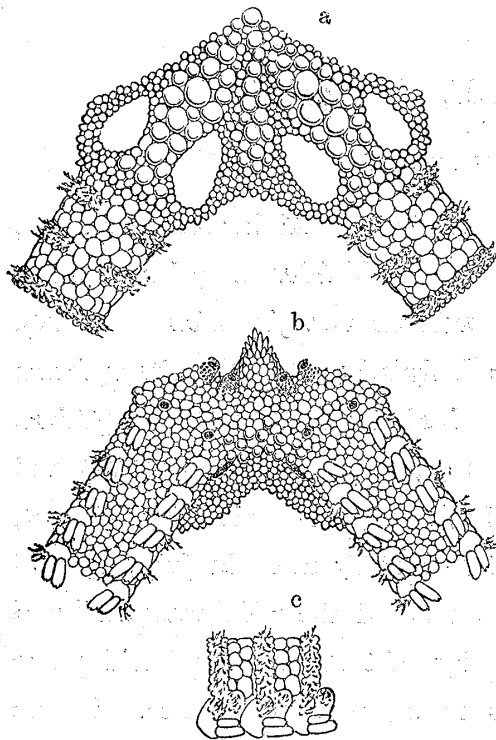


Fig. 1.

Astrothrombus chrysanthi, sp. nov. $\times 8$.

a. From above. b. From below.

c. Lateral view of three arm joints near disk.

Interbrachial ventral surfaces covered with granules similar to those of the dorsal side, but without plates. Genital slits very small, short, situated at the inner, adradial corners of the interbrachial ventral surfaces; those of the same interradius diverging outwards. The areas just inside the interbrachial ventral surfaces are covered with a pavement of coarse, polygonal or rounded, flattened grains of unequal size, and mingled among them are a number of coarse, hemispherical tubercles. A single madreporic shield, situated at the inner angle of an

interbrachial ventral surface, small and rather insignificant. Oral angles constricted off from the outer parts by a shallow groove, covered by a pavement of coarse, polygonal or rounded grains. The grains near the apices of the oral angles show a tendency to be papilla-like. Dental papillæ and teeth alike, spiniform, acute. Oral papillæ absent. Second oral tentacle pores visible from below, situated on either side of the outer end of the oral slit, opening by means of a short cutaneous tube, which contains very fine granules.

Arms stout at the base, gradually tapered outwards. Dorsal and lateral surface annulated with double rows of granules, which bear minute compound hooks. Interannuli covered with coarse, polygonal or rounded, more or less flattened grains, which are arranged irregularly in two, or sometimes three, transverse rows. The hook-bearing annuli of one or two first free arm joints interrupted at the dorsal median parts by coarse, polygonal or rounded, flattened grains similar to those of the interannuli. At the lower lateral end of each interannulus, there is a large, rounded plate, which also bears minute hooks. Ventral surface of arm covered with a pavement of coarse, polygonal or rounded, flattened grains, which are coarser within the disk and finer outwards. First brachial tentacle pores without any naked lateral arm plate and arm spine. Those beyond protected by a small, convex, ridge-like, naked lateral arm plate and by two, or sometimes three, peg-like arm spines with thorny tips. The adradial spine is longer and stouter than the abradial, and slightly longer than, or about as long as, half the corresponding arm joint. The abradial one is shorter than half the same.

Colour in alcohol, light brown or whitish.

This new species is evidently near to both *Astrothrombus rugosus* CLARK¹⁾ from New South Wales and *Astrothorax misakiensis* DÖDERLEIN from the Sagami Sea. The former is stated to have the disk plates and radial shields of very irregular size and two or three arm

1) Mem. Austr. Mus., IV, 1909, p. 548.

spines to each tentacle pore, and the latter to have the disk plates and radial shields of very regular size and arrangement and three to seven arm spines to each tentacle pore. The disk coverings of the present species are not so irregular as in the former, and not so regular as in the latter. In the number of the arm spines, the present species is nearer to the former than to the latter. Moreover, I have some doubts as to the generic distinction of *Astrothorax* from *Astrothrombus*. So that, I am inclined to refer the present species to *Astrothrombus* at least for the present.

3. *Ophiopholis mirabilis* (DUNCAN).

CLARK, loc. cit., p. 268; MATSUMOTO, loc. cit., p. 160.

Numerous specimens; off Ayukawa, 17 fathoms. Numerous specimens; S. E. S. of Enoshima, N. from Kinkwasan; 43 fathoms.

4. *Ophiophragmus japonicus* MATSUMOTO.

CLARK, loc. cit., p. 239; MATSUMOTO, loc. cit., p. 183.

Numerous specimens; off Oginohama, as already reported by me.

5. *Amphipholis pugetana* (LYMAN).

CLARK, loc. cit., p. 242; MATSUMOTO, loc. cit., p. 191.

One specimen; S. E. S. of Enoshima, N. from Kinkwasan; 43 fathoms.

So far as known, this locality is the southern limit of the present species along the western border of the North Pacific.

6. *Ophiothrix marenzelleri* KÖHLER.

CLARK, loc. cit., p. 273 (*O. hylodes*); MATSUMOTO, loc. cit., p. 273.

One specimen; off Ayukawa; 17 fathoms.

7. *Stegophiura sterea* (CLARK).

CLARK, loc. cit., p. 317; MATSUMOTO, loc. cit., p. 258.

Numerous specimens; S. E. S. of Enoshima, N. from Kinkwasan; 43 fathoms. Two specimens; S. E. E. of Kinkwasan; 104 fathoms.

8. *Stegophiura sladeni* (DUNCAN).

CLARK, loc. cit., p. 317; MATSUMOTO, loc. cit., p. 259.

Numerous specimens; S. E. S. of Enoshima, N. from Kinkwasan; 43 fathoms. Numerous specimens; S. W. S. of Enoshima, N. from Kinkwasan; 31 fathoms.

9. *Ophiura sarsii* LÜTKEN.

CLARK, loc. cit., p. 323; MATSUMOTO, loc. cit., p. 272.

Numerous specimens; off Ayukawa; 17 fathoms. Numerous specimens; S. E. S. of Enoshima, N. from Kinkwasan; 43 fathoms. Three specimens; S. W. S. of Enoshima, N. from Kinkwasan; 31 fathoms.

10. *Ophionereis eurybrachioplax* CLARK.

CLARK, loc. cit., p. 289; MATSUMOTO, loc. cit., p. 336.

Three specimens; E. of Kinkwasan; 43 fathoms.

In the very rudimentary condition of the supplementary dorsal arm plates, the present species stands nearest to *Ophiodoris*, of all the known species of *Ophionereis*. The same holds true also of certain internal structures. The peristomial plates are double, the common outline of the oral and dental plates in dorsal view is II-shaped and the teeth are quadrangular, quite as in the majority of the *Ophionereidinae*. The lateral wings of the oral frames are of course well developed, and better developed than in *Ophiodoris pericalles* CLARK (MATSUMOTO, loc. cit., pl. VI, figs. 10 and 11), but less so than in *Ophionereis annulata* LE CONTE (ditto, pl. VII, fig. 1), *O. reticulata* LÜTKEN (ditto, pl. VII, fig. 2) and *Ophiocrasis marktanneri* MATSUMOTO (ditto, pl. VII, fig. 3). The shortest one of the basal vertebræ is not the first as in *Ophiodoris*, but the second as in the other *Ophionereis* and in *Ophiocrasis*. The dorsal side of the vertebræ of the free arm joints is notched inwards more strongly than in *Ophiodoris*, but much more feebly than in the other *Ophionereis* and in *Ophiocrasis*. In short, so far as these characters are concerned, the present species stands between

Ophiodoris and the other *Ophionereis*, as *Ophiodoris* does between the *Ophiochitoninae* and the other *Ophionereidinae*.

Further, the present species reminds us of the *Ophiocomidæ*, though in a minor degree, in the wide arms and dorsal arm plates and in the presence of four, instead of three, arm spines. I have already pointed out that, the notched dorsal side of the vertebræ is a character of a

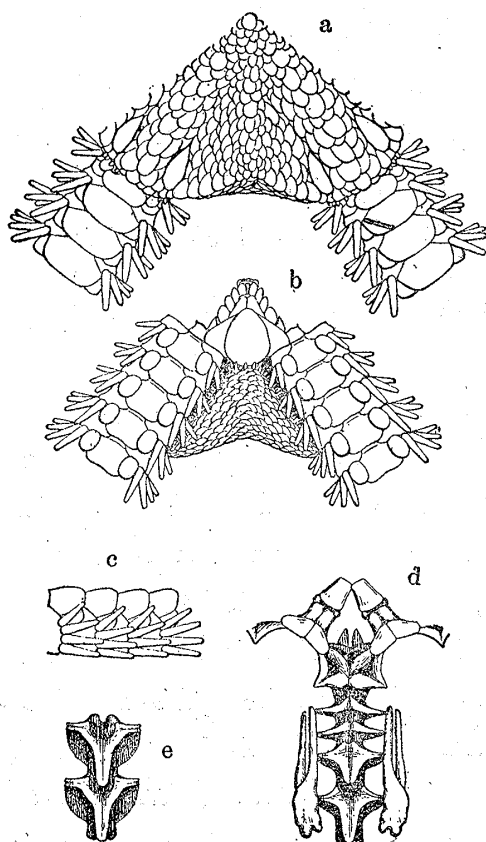


Fig. 2.

Ophionereis eurybrachiplax CLARK.

a. From above. $\times 4$. *b.* From below. $\times 4$.
c. Lateral view of four arm joints near disk.
 $\times 4$. *d.* Dorsal view of the skeleton of two
oral angles and one arm base. $\times 7$. *e.* Dor-
sal view of two vertebræ somewhat near
disk. $\times 6$.

different line of specialisation of the *Ophionereidinae* in contrast to the *Ophiocomidæ*, and that, the less specialised forms of the *Ophionereidinae* in this character, such as *Ophiodoris*, may be nearer to the phylogenetic base of the *Ophiocomidæ* (MATSUMOTO, loc. cit., pp. 380 and 381). So far as this character goes, the present species is also nearer to the *Ophiocomidæ* than the other *Ophionereis* and *Ophiocrasis*.

I have observed on board the "Tôkwamaru" that, the arms of the present species are not so freely mobile in life as those of *Ophiocrasis marktanneri*, though more freely so than those of many other ophiurans. In alcohol, they are rather straight and not so strongly flexed as is commonly the case in the other *Ophionereis* and *Ophiocrasis*. This relatively lesser flexibility of the

arms is correlated with the very well developed dorsal arm plates, the rudimentary supplementary dorsal arm plates and the not very strongly notched dorsal side of the vertebræ.