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Kyoto University
ON SOME OPHIURANS FROM KII AND VICINITIES
WITH DESCRIPTION OF A NEW SPECIES

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With one Text-figure

Several years ago I fortunately received a littoral and sublittoral Ophiuran material from Dr. T. HABE, former member of the Seto Marine Biological Laboratory of Kyoto University, which was collected by him and his colleague, Mr. S. SAKAGUCHI in the vicinity of Kii Peninsula. As a result of my research on them, I could distinguish no less than twenty-four species among them, one belonging to a new form. The Ophiurans dealt with are listed as follows:

Order GNATHOPHIURIDA
Family Amphiuridae
Subfamily Ophiactinae
1. Ophiactis modesta Brock
2. Ophiactis profundi LÜTKEN et MORTENSEN
3. Ophiactis savignyi (MÜLLER et TROSCHEL)
4. Ophiopholis brachyactis CLARK

Subfamily Amphiurinae
5. Amphiopterus astericus CLARK
6. Amphiopterus miyadii MURAKAMI
7. Amphichilus trichoides MATSUMOTO
8. Amphiopterus japonicus (MATSUMOTO)
9. Amphipholis japonica MATSUMOTO

Family Ophiothricidae
10. Ophiothrix koreana DUNCAN
11. Ophiothrix marenzelleri KOEHLER
12. Ophiotrichoides nereidina (LAMARCK)

Order CHILOPHIURIDA
Family Ophiuridae

1) Contributions from the Seto Marine Biological Laboratory, No. 402.

Subfamily Ophiurinae
13. Stegophiura sculpta (DUNCAN)
14. Stegophiura sladeni (DUNCAN)
15. Stegophiura sterea (CLARK)
16. Ophiura kinbergi (LJUNGMAN)

Subfamily Ophiolepidinae
17. Ophiomusium simplex LYMAN
18. Ophiomusium trychnum CLARK
19. Ophiozonella longispina (CLARK)
20. Ophioplocus japonicus CLARK

Family Ophiodermatidae
Subfamily Ophiodermatinae
21. Ophiarachnella gorgonia (MÜLLER et TROSCHEL)

Family Ophiocomidae
Subfamily Ophiocominae
22. Ophiocoma brevipes PETERS
23. Ophiomastix mixta LÜTKEN

Subfamily Ophiopsilinae
24. Ophiopsila squamifera sp. nov.

Among these Ophiurans, Ophiactis modesta, Ophiactis savignyi, Amphipholis japonica, Ophiothrix koreana, Ophiotrichoides nereidina, Stegophiura sculpta, Stegophiura sladeni, Ophiomusium simplex, Ophiozonella longispina, Ophioplocus japonicus, Ophiarachnella gorgonia, Ophiocoma brevipes, Ophiomastix mixta and Ophiopsila squamifera seem to be newly described from the districts. Further, Ophiactis savignyi is an intertropical species and widely distributed in the Indo-Pacific and Atlantic, reaching as far as Misaki northwards in the Japanese waters. Ophiotrichoides nereidina, Ophiura kinbergi, Ophiarachnella gorgonia and Ophiocoma brevipes range from the Indian Ocean to the Pacific Ocean, O. kinbergi being reported from Otaru northwards, O. nereidina and O. gorgonia from Misaki, and O. brevipes from South Izu. Ophiactis modesta, Ophiactis profundi, Amphipholis japonicus, Ophiothrix koreana, Stegophiura sculpta, Ophiomusium simplex and Ophiomastix mixta occur in the Pacific Ocean including the Malaysian waters, O. koreana having known northern limit at Hakodate Bay, O. profundi at off Tsugaru Channel, Sea of Japan, O. japonicus at Mutsu Bay, O. mixta at the Gulf of Tokyo, O. modesta at Misaki, S. sculpta at South Izu and O. simplex at southwest of the Goto Islands. The remainder have only been recorded from the Japanese waters, but Ophioplocus japonicus extends its distribution as far as Hong Kong southwards.

Before going further, I must express my gratitude to Messrs. T. HABE and S. SAKAGUCHI for their kindness in sending me a valuable material.
On some Ophiurans from Kii

Systematics

Order GNATHOPHIURIDA

Family Amphiuridae

Subfamily Ophiactinae

1. *Ophiactis modesta* Brock

Brock, 1888; p. 482; Döderlein, 1896, p. 285, pl. XIV, fig. 1, pl. XV, figs. 5-5b; Matsumoto, 1917, p. 156, fig. 38.

Locality.—Seto, Kii, 1943; one specimen.


2. *Ophiactis profundi* Lütken et Mortensen

Ophiactis profundi: Lütken et Mortensen, 1899, p. 140, pl. VI, figs. 4-6; Köehler, 1922, p. 192, pl. LXIII, fig. 8.

Ophiactis pteropoma: Clark, 1911, p. 134, fig. 50; Matsumoto, 1917, p. 154, pl. III, fig. 9.

Locality.—Off Minabe, Kii, 1943; one specimen.


At first Clark described *Ophiactis pteropoma* as a distinct species from *O. profundi*. Matsumoto (1917) noted that *O. pteropoma* was extremely close to *O. profundi*, from which it only differed in having the arm spines unequal instead of being subequal. Köehler (1922) asserted that it was impossible to maintain a distinction between *O. pteropoma* and *O. profundi*, because the only difference which he could find between the descriptions and figures of the two species consisted in relative length of the dorsal arm plate, and he united *O. pteropoma* with *O. profundi* as synonym. Further, Clark (1918) was convinced that the species *Ophiactis plana*, *O. flexuosa*, *O. perplexa*, *O. profundi* and *O. brachygenys* belonged to a single species. But Mortensen (1924) expressed a discrepancy to it, giving the remarks on their distinctness, and took Köehler's proposition as probable. The specimen at hand, which measures 6 mm across the disk, is of *pteropoma*-type. The arm spines are unequal, among which the dorsal one is the largest, but is much less than twice as long as the ventral one which is a trifle longer than a joint.

1) Judging from the position, probably Hino Misaki Light, Kii.
3. *Ophiactis savignyi* (Müller et Troschel)

*Ophirolepis savignyi* : Müller et Troschel, 1842, p. 95.
*Ophiactis savignyi* : Ljungman, 1867, p. 323 ; Lyman, 1882, p. 115 ; Matsumoto, 1917, p. 158, fig. 39.
*Ophiactis krebsii* : Lütken, 1856, p. 12.
*Ophirolepis sexradiata* : Grube, 1857, p. 343.
*Ophiactis reinhardtii* : Lütken, 1859, p. 161, pl. III, fig. 7.
*Ophiactis inusa* : Martens, 1870, p. 248.
*Ophiactis brocki* : Loriol, 1893, p. 401, pl. XIV, fig. 1.

**Localities.**—Sirahama, Kii, 1943 ; five specimens. Seto, Kii, 1943 ; two specimens.


4. *Ophiopholis brachyactis* Clark

Clark, 1911, p. 117, fig. 44 ; Matsumoto, 1917, p. 163, fig. 42.

**Locality.**—Off Minabe, Kii, 1943 ; one specimen.


Subfamily Amphiurinae

5. *Amphioplus asterictus* Clark

Amphioplus asterictus : Clark, 1915, p. 252, pl. VII, figs. 9–11.
Amphioplus diacritus : Murakami, 1943c, p. 225, fig. 1.

**Localities.**—Hoza Bay, Ise, mud bottom, 1943 ; one specimen. Kowa Bay, Ise, mud bottom, 1943 ; one specimen.

**Distribution.**—Gulf of Tokyo (Clark). Gokasyo Bay (Murakami). Matoya Bay (Murakami).

As compared with Clark's original description and figures of *Amphioplus asterictus*, the author's *A. diacritus* reveals a close resemblance to it in many features. Only differences which the author can find between them are that disk scales of *A. asterictus* is somewhat coarser than those of *A. diacritus*, and that the two proximal sides of oral shield of the former are longer than the distal ones, but their contrast is not so distinct in the latter. Such differences,
however, may not be of specific value. Therefore, it seems to be better to unite \textit{A. diacritus} with \textit{A. asterictus}.

6. \textit{Amphioplus miyadii} \textsc{Murakami}

\textsc{Murakami}, 1943\textsc{c}, p. 227, fig. 2.

\textit{Localities}.—Kanzaki, Ise, mud bottom, 1943; two specimens. Kowa Bay, Ise, mud bottom, 1943; three specimens.

\textit{Distribution}.—Ago Bay (\textsc{Murakami}). Gokasyo Bay (\textsc{Murakami}). Beppu Bay (\textsc{Murakami}). Hakata Bay (\textsc{Murakami}). Nanao Bay (\textsc{Murakami}).

7. \textit{Amphichilus trichoides} \textsc{Matsumoto}

\textsc{Matsumoto}, 1917, p. 175, fig. 45; \textsc{Murakami}, 1934\textsc{c}, p. 229.

\textit{Localities}.—Kanzaki, Ise, mud bottom, 1943; eight specimens. Hōza Bay, Ise, mud bottom, 1943; ten specimens. Kowa Bay, Ise, mud bottom, 1943; two specimens.

\textit{Distribution}.—Sagami Sea? (\textsc{Matsumoto}). Ago Bay (\textsc{Murakami}). Gokasyo Bay (\textsc{Murakami}). Matoya Bay (\textsc{Murakami}). Nanao Bay (\textsc{Murakami}).

8. \textit{Amphioplus japonicus} (\textsc{Matsumoto})

\textit{Ophiophragms japonicus}: \textsc{Matsumoto}, 1915, p. 70; --, 1917, p. 183, fig. 48, pl. IV, fig. 3; --, 1941, p. 333, fig. 2.

\textit{Amphioplus japonicus}: \textsc{Clark}, 1918, p. 271.

\textit{Localities}.—Kanzaki, Ise, mud bottom, 1943; two specimens. Hōza Bay, Ise, mud bottom, 1943; two specimens. Tanabe Bay, Kii, mud bottom, 1943; two specimens.

\textit{Distribution}.—Mutsu Bay (\textsc{Matsumoto}). Off Oginohama, Rikuzen (\textsc{Matsumoto}). Enoura, Suruga (\textsc{Matsumoto}). Mikawa Bay (\textsc{Murakami}). Ise Bay (\textsc{Murakami}). Ago Bay (\textsc{Murakami}). Matoya Bay (\textsc{Murakami}). Beppu Bay (\textsc{Murakami}). Tomioka, Amakusa (\textsc{Murakami}). Off Namai, Kagoshima Gulf (\textsc{Clark, Matsumoto}). Gulf of Thai (\textsc{Keehler}). Amboina (\textsc{Keehler}).

9. \textit{Amphipholis japonica} \textsc{Matsumoto}

\textsc{Matsumoto}, 1915, p. 71; --, 1917, p. 186, fig. 49.

\textit{Locality}.—Shirahama, Kii, 1943; five specimens.

\textit{Distribution}.—Misaki (\textsc{Clark, Matsumoto}). South Izu (\textsc{Murakami}). Tomo,

Family Ophiothricidae

10. *Ophiothrix koreana* Duncan

Duncan, 1879, p. 473, pl. XI, figs. 28–32; Clark, 1911, p. 257, figs. 127–128; Matsumoto, 1917, p. 220, pl. IV, fig. 7.

**Locality.**—Shirahama, Kii, 1943; one specimen.


11. *Ophiothrix marenzelleri* Koehler

Ophiothrix marenzelleri: Koehler, 1904a, p. 103, figs. 76–78; Matsumoto, 1917, p. 220; Koehler, 1922, p. 248, pl. XXXIX, figs. 3–5, pl. C, fig. 4; Matsumoto, 1941, p. 342, fig. 8.

Ophiothrix kyloides: Clark, 1911, p. 263, fig. 130.

**Locality.**—Off Minabe, Kii, 1943; one specimen.


12. *Ophiocrichoides nereidina* (Lamarck)

Ophiura nereidina: Lamarck, 1816, p. 544.

Ophiothrix nereidina: Müller et Troschel, 1842, p. 115; Matsumoto, 1917, p. 224, fig. 61.
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On some Ophiurans from Kii: CLARK, 1938, p. 306.

*Ophiottrichoides nereidina*: CLARK, 1938, p. 306.

*Ophiothrix cataphracta*: MARTENS, 1870, p. 259.

**Locality.**—Seto, Kii, 1943; two specimens.


Order CHILOPHIURIDA

Family Ophiuridae

Subfamily Ophiurinae

13. *Stegophiura sculpta* (DUNCAN)

*Ophioglypha sculpta*: DUNCAN, 1879, p. 455, pl. IX, figs. 6–8, pl. XI, fig. 35.

*Ophiura sculpta*: CLARK, 1911, p. 73.

*Stegophiura sculpta*: MATSUMOTO, 1915, p. 79; -, 1917, p. 258.

**Locality.**—Katsuura Bay, Kii, sand bottom, 1943; one specimen.


The specimen before me is rather of small size, having the disk of 2 mm in diameter. But it is undoubtedly a young specimen of *S. sculpta*, its characters being well in agreement with those of specimens from Izu.

14. *Stegophiura sladeni* (DUNCAN)

*Ophioglypha sladeni*: DUNCAN, 1879, p. 458, pl. IX, figs. 9–11.

*Stegophiura sladeni*: MATSUMOTO, 1915, p. 79; -, 1917, p. 259, fig. 72, pl. V, fig. 6; KOEHLER, 1922, p. 369, pl. LXXXIII, figs. 4–7, pl. LXXXIV, fig. 1.

*Ophiura stiphra*: CLARK, 1911, p. 82, fig. 25.

**Locality.**—Off Minabe, Kii, 1943; one specimen.


15. *Stegophiura sterea* (CLARK)

*Ophioglypha sterea*: CLARK, 1908, p. 293.

*Ophiura sterea*: CLARK, 1911, p. 75, fig. 22.

*Stegophiura sterea*: MATSUMOTO, 1915, p. 79; -, 1917, p. 258, fig. 71.
Locality.—Off Minabe, Kii, 1943; one specimen.


The specimens from three localities are at my hand, showing rather distinct variation in their features. Those from Tsuiyama, which were collected by Dr. Y. Okada, ex-professor of Fisheries Department, Mie Prefectural University, and range from 12 to 14 mm in diameter of disk, are well in accord with Clark’s original description and figures, the contrast of true and secondary arm spines being not conspicuous. The specimen from Suruga Gulf, which bears the disk of 11 mm across, is similar to Matsumoto’s figure in the arm spines, among which the true spines are larger and more pointed than in the foregoing, but in the other characters it does not show any distinctness. However, the specimen from off Minabe, which measures 12 mm across the disk, is most different from Clark’s specimens. The true spines are very distinct and remarkably larger than the secondary ones. The tentacle scales are coarse and bluntly pointed. The radial shields are longer than broad, though they are broader than long in normal one. In these respects, the last specimen recalls S. sterilis Koehler, but the characters of arm spines are quite different between them. In the specimen from off Minabe the secondary arm spines are independent from each other as those of S. sterea, while they are close and tend to form a fringe similar to that in S. sterilis. Therefore, I consider that the specimen from off Minabe is within the range of variation of S. sterea.

16. Ophiura kinbergi (Ljungman)

Ophioglypha kinbergi: Ljungman, 1866, p. 166.
Ophiura kinbergi: Clark, 1911, p. 37, fig. 9; Matsumoto, 1917, p. 271, fig. 73; Koehler, 1922, p. 381.
Ophioglypha sinensis: Lyman, 1871, p. 12, pl. I, figs. 1–2.
Ophioglypha ferruginea: Lyman, 1878, p. 68, pl. III, fig. 76.

Locality.—Yura Bay, Kii, sand bottom, 1943; three specimens.


1) Probably Kisyu.
On some Ophiurans from Kii


Subfamily Ophiolepidinae

17. Ophiomusium simplex Lyman

Ophiomusium simplex: Lyman, 1878, p. 115, pl. I, figs. 10-11; Clark, 1911, p. 109; Murakami, 1944a, p. 255.

Ophiomusium sanctum: Koehler, 1904b, p. 59, pl. XI, figs. 7-9.

Locality.—Off Minabe, Kii, 1943; one specimen.

18. Ophiomusium trychnum Clark

Clark, 1911, p. 109, fig. 40; Matsumoto, 1917, p. 290, fig. 78, pl. V, fig. 7.

Locality.—Off Minabe, Kii, 1943; two specimens.

19. Ophiozonella longispina (Clark)

Ophiozona longispina: Clark, 1908, p. 299; Clark, 1911, p. 33.

Ophiozonella longispina: Matsumoto, 1915, p. 82; Clark, 1915, p. 338, pl. XX, figs. 5-6; Matsumoto, 1917, p. 297, fig. 80, pl. V, fig. 9.

Locality.—Off Minabe, Kii, 1943; two specimens.

20. Ophioplocus japonicus Clark

Clark, 1911, p. 30, fig. 5; Matsumoto, 1917, p. 302, fig. 84, pl. V, fig. 11.

Locality.—Satono, Kii, 1943; one specimen.
Distribution.—Japan (Clark). Ayukawa (Clark). Kominato, Bōsyū (Matsumoto).

Family Ophiodermatidae

Subfamily Ophiodermatinae

21. *Ophiarachnella gorgonia* (MÜLLER ET TROSCHEL)


*Pectinura gorgonia*: LÜTKEN, 1869, p. 33.

*Ophiarachnella gorgonia*: CLARK, 1909, p. 123; MATSUMOTO, 1917, p. 323, pl. VI, fig. 7.


*Pectinura ramsayi*: BELL, 1888a, p. 281, pl. XVI, figs. 1-2.

*Pectinura intermedia*: BELL, 1888b, p. 386.

*Pectinura stearnsii*: IVES, 1891, p. 212, pl. XI, figs. 1-5.

*Pectinura venusta*: LORIOL, 1894, p. 16, pl. XXIII, figs. 3-3h.

**Locality.**—Seto, Kii, 1943; one specimen.


Family Ophiocomidae

Subfamily Ophiocominae

22. *Ophiocoma brevipes* PETERS

PETERS, 1851, p. 466; MATSUMOTO, 1917, p. 343, fig. 95.

**Locality.**—Satono, Kii, 1943; one specimen.


23. *Ophiomastix mixta* LÜTKEN

LÜTKEN, 1869, p. 44; CLARK, 1911, p. 256, fig. 126; MATSUMOTO, 1917, p. 348, fig. 97; MURAKAMI, 1944b, p. 277.

1) As I collected one specimen of this species at Tomioka, May 24, 1944, it seems to be better to add here this locality.
Subfamily Ophiopsilinae

24. *Ophiopsila squamifera* sp. nov.\(^1\)

Disk, which can not be accurately measured for its shrinkage, is roughly 6 mm in diameter; arms all torn away near the disk, but judging from the fragments available, more than seven times as long as the disk diameter. Disk five-lobed, concave at the interradial border, covered with a skin containing small, delicate, rounded scales. Radial shields of small size, less than on half of disk radius in length, much elongate, about three and a half times as long as broad, somewhat enlarged distad, and bluntly pointed at the proximal end. They are well separated from each other. Interbrachial spaces below covered with a naked skin. Genital slit large, reaching from the oral shield to near the periphery of disk.

Oral shields small, elliptical, a little broader than long. Madreporite somewhat larger than the rest, roughly pentagonal in shape, with a broad proximal angle, and about as wide as long. Adoral shields also of small size, elongate, in contact with each other at the median interradial line, curved along the

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1) *Squamifer*, signifying scale-bearing, in reference to the disk skin containing delicate scales.
margin of oral shield, and separating the first side arm plate from the oral shield. Oral plates indistinct. Oral papillae three in number on one side of an oral angle, among which the distal one is rudimentary; the next one is flat, lanceolate, and rather sharply pointed at the tip; the proximal one is similar to, but somewhat smaller than, the foregoing. Dental papillae from five to eight in number, small, conical. Additional two long papillae high up on the jaw. Teeth six in number on a jaw, among which the undermost two are small, with rounded free margin, while the rest are much longer than the foregoing and tetragonal in shape.

First dorsal arm plates rather small, elliptical; the succeeding ones of moderate size, tetragonal, diverging without and broader than long except those near the disk which are about as long as broad, but becoming pentagonal or rhomboidal and longer than broad at the terminal part of arm. They are broadly in contact with each other at the greater part of arm, but become separated from each other towards the extremity. First ventral arm plates very small and broader than long. Following ones pentagonal, with a proximal angle rounded, lateral and distal margin slightly concave. They are longer than broad and in contact with each other throughout the whole length of arm. Side arm plates tall and narrow, about as high as an arm joint, somewhat prominent along the distal ridge, not meeting above or below. Arm spines eight or nine in number for each arm plate near the disk, but falling to three towards the tip of arm; among them the undermost one is the largest and more or less twice as long as a joint, but they become reduced in length as they proceed towards the middle where they are almost as long as a joint; from the seventh above they again increase in length, but the uppermost one is by no means larger than the preceding to it. They are flat and bluntly pointed at the tip, among which the upper two or three are flattest and broadest. Tentacle scales two for each pore, distinct, flat, elongate, but blunt at the end; the abradial one is smaller than the adradial one which is at first less than a joint in length, but soon becomes longer than it and reaches about one and a half times as long as a joint at the middle part of arm; farther out it again diminishes in length.

Colour (dried from formalin), disk brownish black, except the radial shields which are light brown; dorsal side of arm dark brown, with a band of dark shade each six or seven joints; mouth parts and ventral side of arm light brown; arm spines brownish.

Locality.—Hōza Bay, Ise, 1943; one specimen.

The specimen at hand is not in good state of preservation, but I consider that it belongs to a new form for its distinct characters. The new species bears a close resemblance to *O. vittata* CLARK, but the oral shields of the former are elliptical, while in the latter they are diamond-shaped. The disk of *O.
squamifera is covered with a skin containing delicate scales, but in O. vittata it bears no any such scales. The oral papillae of O. vittata are four in number, but in O. squamifera they are three. It is also nearly related to O. pantherina Koehler, but the mouth parts are quite different between them. Moreover, in O. squamifera the oral shields are elliptical in shape, the adoral shields are producing a narrow lobe at the distal end so as to separate the first side arm plate from the oral shield, and the oral papillae are long and narrow except the distal one, but in O. pantherina the oral shields are oval or piriform in shape, the adoral shields do not protrude a distal lobe, and the oral papillae are broad and short. Further, the arm spines of O. squamifera are eight or nine in number, while they are seven in O. pantherina. The new species also recalls O. polyacantha Clark, but the number of arm spines of the latter is more than those of the former, being ten or eleven. Moreover, the mouth parts of O. polyacantha are rather similar to those of O. pantherina.

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