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Kyoto University
A CHECK LIST OF ECHINOIDS FOUND IN THE KII REGION

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With one Text-figure

Introduction

The Echinoderm fauna of the Kii region, Middle Japan, has never been made the object of special investigation. A number of species of the Echinoidea have hitherto been recorded from various places along the Kii Peninsula, but such records are scattered in various works dealing with the embryological or ecological subject, and are, naturally, not all of them quite reliable taxonomically.

Whereas recently a preliminary record on the regular-formed echinoids of Wakayama Prefecture has been given by SAKAGUCHI, basing on the identification by the late echinologist Hayato IKEDA, in “Kisyō Dōsyokubutu”, vol. II, no. 2 (1935), no special work on this group has been given till now, excepting my two short mimeographed papers. I therefore thought that a catalogue of all the known echinoids hitherto recorded or described from the Kii region would be of some value to students interested in these animals.

The echinoids given in the present paper amount to 53 species in all, of which 33 belong to the Regularia and 20 to the Irregularia. Among them, 45 species are seen in materials at hand and thus their occurrence has been confirmed by myself. For minor records and detailed structure of species listed in this paper, the student is further referred to the complete and excellent work of MORTENSEN’s “Monograph of the Echinoidea” (1928–1951).

As might be expected from the geographical position, the echinoid fauna of the Kii region, especially in the southern part, is characterized by its pronounced tropical faces and richness in forms. Although no new species is represented in the whole collection, there are some rare and interesting tropical forms, such as Astropyga radiata, Pseudoboletia maculata, Diadema Savignyi, Echinothrix calamaris, Echinothrix diadema, Clypeaster reticulatus and Peronella minuta, all of which have not hitherto been recorded from Japan proper with certainty. Besides, the following six regular-

1) Contributions from the Seto Marine Biological Laboratory, No. 225.

formed species which have apparently the northern limit in the Kii region are found rather commonly in the littoral region: *Eucidaris metularia*, (?) *Plococidaris verticillata*, *Stomopneustes variolaris*, *Tripneustes gratilla*, *Parasalenia gratiosa* and *Echinostrephus aciculatus*. Only one species *Echinometra Mathaei*, which is very common here, further extends its range to the southern end of the Izu Peninsula and Bōsō Peninsula (139°50'E, 35°N) but not to the interior of the Sagami Sea; it occurs, however, very scarcely there. Another peculiar species, *Colobocentrotus Mertensii* is known only to occur at Hatizyō Island (139°50'E, 33°05'N) in the east, but not so far found at the above localities in Honsyu.

In bays or inlets along the coast of Kii Peninsula, irregular-formed species, such as *Schizaster lacunosus*, *Echinocardium cordatum*, *Peronella minuta*, *Peronella japonica* and *Fibularia acuta*, are collected by dredging everywhere rather commonly.

In preparing this report, Dr. S. KAWAGUTI (Okayama), Mr. S. SAKAGUCHI (Wakayama), Mr. M. OZAKI (Minabe), Mr. H. OGAWA (Sionomisaki) and Mr. S. YAMAMOTO (Sirahama) assisted on various occasions in collecting the material. Their help is herewith gratefully acknowledged, as is that of Dr. S. NISIYAMA of Simane University and Mr. A. MORISHITA of Kyoto University for identifying some specimens and also procuring literature.

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**REGULARIA**

Order CIDAROIDEA

Family Cidaridae GRAY

1. **Goniocidaris (Petalocidaris) biserialis** [DÖDERLEIN]. (I, p. 173)

   *Cidaris (Goniocidaris) biserialis*, YOSIWARA, 1898, p. 248, 1905, Pl. III-3, 4, 5, 6.

   **Nom. Jap.** Togezao-uni.

   **Material examined.** Off Minabe, 100-200 m. 33 specimens (No. E-22, E-48).

   **Range.** Known only from Japanese waters, from Sagami Sea to off Kagesima Bay and also from off Tango (Japan Sea), in depths of ca. 70 to 360 meters.

2. **Goniocidaris (Discocidaris) mikado** [DÖDERLEIN]. (I, p. 178)

   *Cidaris (Goniocidaris) mikado*, YOSHIWARA, 1898, p. 247, 1905, Pl. III-1, 2.

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1) Numbers in parentheses refer to MORTENSEN's Monograph.
2) Register number of specimens stored in the collection of the Seto Marine Biological Laboratory.
Echinoids Found in the Kii Region


Material examined. Off Minabe, 100–200 m. 17 specimens (No. E-38, E-49).

Range. Known only from Japanese waters, from Sagami Sea to off Goto Islands, in depths of ca. 150 to 700 meters.

3. Stereocidaris (Phalacrocidaris) japonica (DÖDERLEIN). (I, p. 280)

Syn. Dorocidaris japonica, DÖDERLEIN, 1885, p. 4.
Cidaris (Stereocidaris) japonica, DÖDERLEIN, 1887, p. 6; YOSHIWARA, 1898, p. 146, 1904, Pl. I-4, 5.
Cidaris (Stereocidaris) tenuispinus, YOSHIWARA, 1898a, p. 57, 1898, p. 147, 1904, Pl. I-8, 9, 10.


Collecting record. Seto (KOMAI & IKARI, 1929, p. 121, as Anomocidaris tenuispina).

Range. Known only from Japanese waters, from off Kyusyu to Tugaru Strait, in depths of ca. 13 to 700 meters.

4. Euclidaris metularia (LAMARCK). (I, p. 386)


Nom. [Jap. Matukasa-uni. (UTINOMI)


Material examined. Seto, at low tide. 2 specimens (No. E-42). Sio-no-misaki, at low tide. 1 specimen (H. OGAWA coll.).

Range. Widely distributed all over the Indo-Pacific. This is strictly a littoral form, but known as occurring down to ca. 570 m.

5. Plococidaris verticillata (LAMARCK). (I, p. 428)

Prionocidaris verticillata, H. L. CLARK, 1921, p. 149.
Cidaris (Leiocidaris) verticillata, YOSHIWARA, 1900, p. 147, 1904, Pl. I-6.

Nom. [Jap. Huziazo-uni. (nom. nov.)


Range. Widely distributed all over the Indo-Pacific, from Zanzibar to Samoa and also to Southern Japan. According to OHSHIMA (1947), this species is very common on the coral reef of the Ryukyu Islands, but I have failed to find on the Kii coast.

6. Prionocidaris baculosa var. annulifera (LAMARCK). (I, p. 437)

Syn. Leiocidaris baculosa, DÖDERLEIN, 1887, p. 23.
Leiocidaris annulifera, Döderlein, p. 24.
Phyllacanthus baculosa, A. Agassiz & H. L. Clark, 1907, p. 15.
Cidaris (Leiocidaris) baculosa, Yoshiwara, 1900, p. 147, 1904, Pl. I-11, II-1.


Range. Malay Archipelago to Japan, as far north as Sagami Sea, in depths of 0–ca. 250 m. This is often taken by shore seine or lobster-net in the Kii region. The young specimen with short spines resembles the above-mentioned littoral form Eucidaris metularia, so that Roxas (1928) and Hayakawa (1948) have mistaken as this species.

Associate. A pedunculate cirriped Trilasmis eburnea Hindes was once found attached to the spine (Hiro, 1938, p. 477).

Order Lepidocentroida
Family Echinothuridae Wyv. Thomson

7. Calveriosoma gracile (A. Agassiz). (II, p. 227)

Syn. Asthenosoma gracile, A. Agassiz, 1881, p. 89.
Asthenosoma longispinum, Yoshiwara, 1897, p. 5, 1898, p. 249, 1905, Pl. III–8, 9.

Material examined. Off Tonda, 80–100 m. One specimen, 130 mm in diameter (No. E–61).

Range. Known only from the Philippines, off Halmahera and from Japan (Sagami Sea), in depths of ca. 160–800 m.


Nom. Jap. Ijima-hukuro-uni. (Ohshima)
Collecting record. Seto (Hiraiwa, 1932, p. 65).

Material examined. Off Tonda, 80–100 m. One specimen, 135 mm in diameter (No. E–62).

Range. Japan (Sagami Sea, Amakusa) to the Moluccan Sea, in depths of ca. 20–120 m.
Echinoids Found in the Kii Region

Order STIRODONTA
Family Stomopneustidae MORTENSEN


*Nom. Jap.* Kuro-uni. (UTINOMI)


*Material examined.* Tōsima, at low tide. 3 specimens, 21 to 55 mm in diameter (No. E-44).

*Range.* Indo-Pacific, from East Africa to Samoa and to southern Japan in the north. MORTENSEN (1938) saw a specimen from Izu-ōsima in Sagami Sea, but he says that "it does not appear to occur as a rule in southern Japanese seas."

Family Arbaciidae GRAY


*Syn.* Coelopleurus maillardi A. AGASSIZ, 1881, p. 60. (pro parte)

*Nom. Jap.* Azuma-uni. (OHISHIMA)


*Range.* Kei Islands to Japan, as far north as the Korea Strait and Sagami Sea, in depths of ca. 70 to 360 meters.

Order AULODONTA
Family Pedinidae (POMEL) GREGORY

11. Caenopedina mirabilis (DÖDERLEIN). (III, p. 99)


*Nom. Jap.* Otome-uni. (nom. nov.)

Collecting record. Off Hino-misaki (originally spelled as Hiro Misaki), 191 fms. (=344 m) (CLARK, 1912, p. 221).

*Material examined.* Off Minabe, 100–200 m. 6 specimens, 12–18 mm in diameter (No. E–24) (UTINOMI, 1952, p. 15).

*Range.* Known only from Japan, from off Kagosima Gulf to off Kinkasan Light, in depths of ca. 21 to 360 meters.

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Family Diadematidae Peters

12. Astropyga radiata (Leske). (III., p. 187) (Fig. 1A)

Syn. (?). Astropyga pulvinata Yoshiwara, 1905, Pl. VI-7, 8, 9.


Collecting record. Seto (Komai et al., 1927, p. 295, as Astropyga?).

Material examined. Off Tonda, depth unlabelled. 2 specimens, both 160 mm in diameter and 55 mm in height (No. E-57, E-60). Recently two additional specimens were obtained alive from off the Laboratory, but unfortunately they were afterwards so putrefied that one could hardly preserve in alcohol due to bad fixation.

Range. Widely distributed all over the Indo-Pacific region, from East Africa to Hawaii in the east and to Japan in the north, in depths of ca. 2 to 60 meters. No locality is given by Yoshiwara for his "Astropyga pulvinata", which is probably this A. radiata.

13. Chaetodiadema japonicum Mortensen. (III., p. 223) (Fig. 1B)


(?) Astropyga radiata, Yoshiwara, 1905, Pl. VI-3, 4. (non Leske).

Nom. Jap. Yawara-gaze. (nom. nov.)

Material examined. Off Tonda, 80-100 m. 3 specimens, 65 to 90 mm in diameter (No. E-58).

Range. Known only from Sagami Sea (50 m) and off Goto Islands (135 m).
14. **Diadema setosum** (Leske). (III, p. 256)


(?) *Diadema Clarki*, Ikeda, 1939a, p. 165.


Collecting record. Seto (Komi et al., 1927, p. 295; Komai & Ikari, 1929, p. 120; Sakaguchi, 1935, p. 16; Onoda, 1936, p. 648).

Material examined. Seto. (No. E-31, E-59) and many living specimens.

Range. Widely distributed all over the Indo-Pacific, from East Africa to Australia and Polynesian Islands and to Japan (Misaki) in the north. Mainly littoral, but goes at least down to ca. 70 m.

Breeding. Usually late in summer, from August to September at Seto.

Parasite. A gastropod *Rosenia tokiokai* Habe is occasionally found on the peristome (Habe, 1952, p. 82).

15. **Diadema Savignyi** (Audouin) Michelin. (III, p. 265)


Material examined. Seto. 2 specimens (No. E-37) (Utinomi, 1949, p. 56). Common in shallow waters at Seto, but not so abundant as *D. setosum*.

Range. Indo-Pacific region, from East Africa to Easter Island in the east and to southern Japan. Exact locality in Japan proper is not so far given, excepting its occurrence in Ogasawara and Ryukyu Islands.


Nom. Jap. Tokkuri-gangaze-modoki. (nom. nov.)

Material examined. Seto, at low tide. 3 specimens, 17–32 mm in diameter (No. E-65) and many living specimens.

Range. Indo-Pacific region, from Red Sea to Hawaii and to southern Japan. Strictly a littoral form, usually living on the coral reef in tropical seas (Nishiyama, 1942). This species, like *E. diadema*, is hitherto known from Ogasawara Islands (after Yoshiwara), Ryukyu Islands (after Ohshima), and Tokara Islands (Tokioka, 1953). In the vicinity of the Laboratory, both species of *Echinothrix* are very common in tide pools, but living deeply concealed underside the rock-cliff in daytime. Anyone has not been aware of its occurrence in common, till Dr. Kawaguti collected for the first time at night spring-tide ebb in December of 1952.

17. **Echinothrix diadema** (Linne). (III, p. 290)


1) Formerly applied to *Echinothrix calamaris.*
Material examined. Seto., at low tide. 6 specimens, 18-30 mm in diameter (No. E-66) and many living specimens.

Range. The same as E. calamaris.

Parasite. A gastropod *Rosenia tokiokai* HABE is found on the test.

Order CAMARODONTA
Family Temnopleuridae A. AGASSIZ


*Collecting record.* Wakanoura (YOSHIWARA, 1898, p. 439). Kada, 10-20 m (SAKAGUCHI, 1935, p. 16, as var. *perezi*). Goza, 3 m (ONODA, 1936, p. 646). Yurawan, 12 m (HABE et al., 1946, p. 8).

*Material examined.* Seto. 7 specimens, 26-40 mm in diameter (No. E-34).

*Range.* Widely distributed all over the Indo-Pacific region, from East Africa to Japan, in depths of 0-ca. 45 m. In the Kii Peninsula this species is apparently common in the northern part but becomes scarce southwards.

*Breeding.* Summer, from June to July at Toba (after SUGIYAMA), while from July to August at Goza (after ONODA).


*Syn.* *Temnopleurus Reynaudi,* DÖDERLEIN, 1885, p. 18; YOSHIWARA, 1898, p. 440, 1906, Pl. VIII-1, 2, 3, 4.

*Nom. Jap.* Hari-sansyō-uni. (nom. nov.)

*Collecting record.* Tanoura and Wakasaura, (YOSHIWARA, 1898, p. 440, as *T. Reynaudi*). Kada (SAKAGUCHI, 1935, p. 15).

*Material examined.* Seto. 8 specimens, 12-30 mm in diameter (No. E-45). This species is rather common hereabout at low tide than *T. toreumaticus*.

*Range.* Widely distributed over the Indo-Pacific, from East Africa to northern Japan (Hakodate), in depths of 0-ca. 565 m.

*Breeding.* July at Seto.


(III, p. 99)


*Nom. Jap.* Kotubu-sansyō-uni. (nom. nov.)

*Material examined.* Tanabe Bay, 12-30 m. 12 specimens, 6-10 mm in diameter (No. E-17).
Range. Japan (formerly from off Gotô Islands and Sagami Sea), Malay Archipelago to Pemba Strait (East Africa), in depths of ca. 12 to 500 meters.


*Salmacis lactea*, DÖDERLEIN, 1885, p. 22; YOSHIWARA, 1900, p. 441, 1906, Pl. VIII-13, 14, 15, 16.


Collecting record. Kada, 10-20 m (SAKAGUCHI, 1935, p. 15, as Salmacis dussumieri).

Range. Distributed from Ceylon to Torres Strait and to Japan (Kagosima), in depths of ca. 10 to 180 meters.


*Salmacopsis pulchellimus*, YOSHIWARA, 1898a, p. 59, 1900, p. 441.


Material examined. Seto. 5 specimens (No. E-29) and many living specimens. Very abundant all along the Kii coast.

Range. Distributed all over the Malayan waters and southern Japan, as far north as Bōsō Peninsula, from the littoral to ca. 60 m.

Breeding. Summer, usually in July at Seto and more or less later than that of *Anthocidaris crassispina*.


Syn. *Pleurechinus variegatus*, MORTENSEN, 1904, p. 84.


Material examined. Seto. 2 specimens, 14–15 mm in diameter (No. E-20). Kada. 6 specimens, 12–14 mm in diameter (No. E-26).

Range. Known only from Japanese waters, from Formosa Channel to Mutu Bay, in depths of 0–ca. 500 m.

Parasite. A Macronalia-like gastropod is found (MORTENSEN, 1943, p. 251).

Family Toxopneustidae TROSCHEL


Material examined. Seto. 5 specimens (No. E-32, E-55) and many living specimens. Kada. 2 specimens (No. E-36). Very common all along the Kii coast.

Range. Widely distributed all over the Indo-Pacific region, from East Africa to Fiji and to Japan, as far north as Sagami Sea. From the littoral down to ca. 90 m.

Breeding. Early summer, from April to July at Seto and from May to August at Goza (after ONODA).

Commensal. A platyctenid ctenophore Coeloplana echinicola TANAKA is rarely found at Seto (TANAKA, 1932). No parasitic gastropod is found.

25. Tripneustes gratilla (LINNÉ). (III, p. 500)

Syn. Hippone variegata, DÖDERLEIN, 1885, p. 27; YOSHIWARA, 1900, p. 386, 1906, Pl. XIII-9, 10, 11, 12.


Material examined. Seto. One specimen (No. E-53) and many living specimens. Very common in the southern part of Kii coast.

Range. Widely distributed all over the Indo-Pacific region, from East Africa to Australia, Hawaii and to southern Japan, as far north as Kii Peninsula. From the littoral to ca. 75 m.

Breeding. Summer, from July to August.

Parasite. A Balcis-like gastropod is found on the test.

26. Pseudoboletia maculata TROSCHEL. (III, p. 532)

Nom. Jap. Madara-uni. (nom. nov.)

Material examined. Seto, at low tide. 4 specimens, 45-60 mm in diameter (No. R-62).

Range. Known from Ceylon, the Philippines, Banda and Timor Seas, in depths of ca. 20-70 m. Its occurrence in Japan has not been recorded as yet.

27. Pseudocentrotus depressus (A. AGASSIZ). (III, p. 541)


Material examined. Seto. 11 specimens (No. E-16, 27, 33) and many living
specimens. Kada. 5 specimens (No. E-25).

Range. Known only from southern Japan, from Mutu Bay to Amakusa, from the littoral to ca. 5 m.

Breeding. Later in autumn, from October to December.

Parasite. Three gastropods, Balcis akauni HABE, Rosenia castanea (DALL) and Rosenia yamamotoi HABE are known to live on this species, the last one occurring usually on the young form (HABE, 1952, p. 78, 81).

Family Strongylocentrotidae GREGORY


Material examined. Seto. 15 specimens (No. E-23, E-47) and many living specimens. Kada. 15 specimens (No. E-54). Range. Known only from Japan, from Hakodate to Kagosima, in depths of 0-ca. 45 m.

Breeding. Winter, from January to April at Sugasima (after SUGIYAMA), while at Seto rather later, from March to April.

Family Parasaeniidae MORTENSEN

29. Parasaenia gratiosa A. AGASSIZ. (III, p. 269)


Collecting record. Goza, Katsuura, Seto (ONODA, 1938, p. 9); Seto (UTINOMI, 1949, p. 56).

Material examined. Seto, at low tide. 5 specimens, 17-30 mm in long diameter (No. E-46).

Range. Widely distributed all over the Indo-Pacific region, from Zanzibar to Palmira Islands and also to southern Japan, from the littoral to ca. 70 meters. At the Kii coast, it occurs rather commonly on the shore rock, together with Echinometra Mathaei. MORTENSEN refers the Japanese specimens to his var. boninensis mainly with reference to the slenderness of primary spines. This determination may be reserved in future research.
Family Echinometridae GRAY


*Nom. Jap.* Tawasi-uni. (UTINOMI)

*Collecting record.* Seto (ONODA, 1936, p. 646, as *Echinostrephus moralis*; UTINOMI, 1949, p. 56).

*Material examined.* Seto, 20 specimens, 20–45 mm in diameter (No. E-18, 28, 43) and many living specimens.

*Range.* Distributed in the Indo-Pacific, from Hawaii to Sulu Islands and to southern Japan (Seto), from the littoral to ca. 50 m.

This species is commonly found, each invariably buried in a hole on the surf-washed or sublittoral rockface, but often dredged from the bottom of the bay. Probably it seems to be able to creep out of the hole for feeding at any time as confirmed in my field observation at night low tide.

*Breeding.* July at Seto.


*Syn.* *Strogylocentrotus tuberculatus,* DÖDERLEIN, 1885, p. 19; YOSHIWARA, 1900, p. 381, 1906, Pl. XI-1, 2.


*Collecting record.* Seto and other localities in Kii Province (KOMAI et al., 1927, p. 295; KOMAI & IRARI, 1929, p. 120; ONODA, 1931, p. 103, 1933, p. 159; SAKAGUCHI, 1935, p. 14, all as *Helicidaris crassispina*). Wakanoura (YOSHIWARA, 1900, p. 381, as *Strogylocentrotus tuberculatus*).

*Material examined.* Seto. 5 specimens (No. E-51) and many living specimens.

*Range.* Very common all around the southern Japanese coast, from Kyusyu to Tokyo Bay. IKEDA (1940) records, however, it from Mutu Bay in the north. Also recorded from Ogasawara Islands, Formosa and Hongkong.

*Breeding.* Early in summer, from May to July at Seto.

*Parasite.* Gastropods, *Balcis auratus* (S. HIRASE) and *B. langfordi* (DALL) are often found between spines (HABE, 1952, p. 77). Besides, there are found two crustaceans in association with this species which colored just like the host; one is a crab *Echinocus petiti nipponicus* MIYAKE (MIYAKE, 1939, p. 90) and the other a shrimp *Athanas kominatoensis* KUBO, although the latter is often found freely.


Echinoids Found in the Kii Region


Collecting record. Seto (KOMAI et al., 1927, p. 295, as E. lucunter; KOMAI & IKARI, 1929, p. 120; SAKAGUCHI, 1935, p. 14; ONODA, 1936, p. 641).

Material examined. Seto. 5 specimens (No. E-50) and many living specimens. Very common in southern part of Kii Peninsula.

Range. Widely distributed all over the Indo-Pacific region, from Red Sea to Paumotu and Hawaiian Islands, and from Australia to southern Japan. It extends to the southern end of Bōsō Peninsula and Izu Peninsula, but has not so far been found at Misaki.

Breeding. Usually August at Seto.

33. Colobocentrotus Mertensii BRANDT. (III, p. 429)


Material examined. Sio-no-misaki, at low tide. 2 specimens (H. OGAWA coll.). One specimen from Ogasawara Islands is preserved in the Laboratory (No. E-40).

Range. Known with certainty only from Ogasawara Islands (Type locality) Formosa, Ryukyu, Tokara Islands, Sibusi (Prov. Ōsumi), Kii Prov. and Hatizyō-zima. At Hatizyō-zima, this echinoid is familiar among islanders under the name of “Hanzaru” (WATANABE, 1940).

IRREGULARIA

Order HOLECTYPOIDA

Family Echinoneidae Wright

34. Echinoneus cyclostomus LESKE. (IV, p. 75)

Nom. Jap. Tamago-uni. (nom. nov.)

Material examined. Ezura, southern coast of Tanabe Bay. A single fossil specimen, 35 mm long and 27.7 mm wide (No. R-157). Any living specimen has not been found there (UTINOMI, 1953, p. 43).

Range. Cosmopolitan. In the Japanese seas it is known to occur only at Formosa (YOSHIWARA, 1900; HAYASAKA, 1948), Yaéyama Islands (OHSHIMA, 1947), Tokara Islands (TOKIOKA, 1953) and Kagosima Bay (MORTENSEN, 1948).

Order CASSIDULOIDA

Family Echinolampadidae GRAY

35. Planilampas sternopetala (A. AGASSIZ & H. L. CLARK). (IV, p. 298)


Material examined. Off Minabe, 100–200 m. 6 specimens, 75–90 mm long (No. R-52) (UTINOMI, 1952, p. 15).

Range. Known only from the Japanese seas, from Ōhara, E. of Bōsō Peninsula to off Kagosima Gulf, in depths of ca. 100–500 m. Hitherto not recorded from the Kii region.

Order CLYPEASTROIDA

Family Clypeastridae DUNCAN

36. Clypeaster reticulatus (LINNÉ). (IV₂, p. 71)


Material examined. Minabe. One denuded test, 40 mm long and 32 mm wide, collected by M. OZAKI on the beach (No. R-154) (UTINOMI, 1952, p. 16).

Range. Widely distributed over the Indo-Pacific, from Red Sea and East African coast to Hawaii and to Formosa. It has not hitherto been recorded from Japan proper.

37. Clypeaster virens DÖDERLEIN. (IV₂, p. 96)

Nom. Jap. Ō-takonomakura. (nom. nov.)

Material examined. Off Minabe, 100–200 m. 14 specimens, 90–120 mm in length (No. E-14, E-15) (UTINOMI, 1925, p. 15).

Range. Known only from southern Japan and also from Indo-China, in depths of ca. 100–300 m.

38. Clypeaster japonicus DÖDERLEIN. (IV₂, p. 99)


Range. Very common in southern Japan, from the littoral to ca. 75 m.

Breeding. Summer, from July to August (after ONODA).

Commensal. KATO (1944, p. 278) reported a polyclad Zygantroplana clepeasta KATO from Misaki as occurring on the test.

Family Fibulariidae DUNCAN

39. Echinocyamus crispus MAZZETTI. (IV₂, p. 185)


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Echinoids Found in the Kii Region


Material examined. Sioya, Hidaka-gun. One denuded test, 7 mm long, 5.5 mm wide and 2.3 mm high, collected by T. YAMAMOTO on the beach (No. R-66).

Range. Widely distributed in the Indo-Pacific, from Red Sea to Hawaiian Islands and to southern Japan (Bonin Islands, Korea Strait), in depths of ca. 20 to 564 meters.

40. *Fibularia* (*Fibulariella*) *acuta* YOSHIWARA. (IV 2 , p. 219)

Nom. Jap. Mame-uni. (OHSHIMA)

Collecting record. Gokasyo-wan and Matoya-wan, 10-30 m (MIYADI & MASUI, 1942, p. 122, 125, as *Fibularia* sp.)

Material examined. Sioya, Hidaka-gun. 10 denuded tests, 6.3–8.5 mm in length, collected by T. YAMAMOTO on the beach (No. R-65).

Range. Recorded only from Japan and Malayan seas, in depths of ca. 10-90 m.

Family Laganidae A. AGASSIZ

41. *Peronella japonica* MORTENSEN. (IV 2 , p. 277)


*Laganum decagonalis*, YOSHIWARA, 1900, p. 390, 1907, Pl. XV-9, 10, 11, 12, 13.

*Peronella Lesueuri*, ONODA, 1938, p. 11; OHSHIMA, 1947, p. 582. (non A. AGASSIZ).


Collecting record. Wakanoura (YOSHIWARA, 1900, p. 390; TOKUNAGA, 1903, p. 8, as *Laganum decagonalis*). Seto (KOMAI et al., 1927, p. 295, as *L. decagonale*; KOMAI & IKARI, 1929, p. 121, as *Peronella lesueuri*). Goza and Katuura (ONODA, 1938, p. 11, as *P. lesueuri*). Yura-wan, 12 m (HABE et al., 1946, p. 8, as *P. lesueuri*).


56 mm long and 49 mm wide in a medium-sized specimen.

Range. Distributed only in southern Japan and Formosa, from the littoral to ca. 50 m. This is the commonest cake-urchin in the littoral all around the Japanese coast.

Breeding. Summer, from July to August (after ONODA).


42. *Peronella pellucida* DÖDERLEIN. (IV 2 , p. 281)


Material examined. Tanabe Bay. 9 specimens (No. E–13). A medium-sized specimen measures 46 mm long, 45 mm wide and 7 mm high.

Range. Recorded only from Japan (from Sagami Sea to SW. of Kyusyu) in depths of 75–550 m.
43. *Peronella minuta* (De Meijere). ([IV]₂, p. 295)

*Nom. Jap*. Mame-yotuana-kasipan. (nom. nov.)

*Material examined*. Off Tonda. 12 specimens, 6.5–12 mm in length (No. E-2).
Off Tōsima at Seto, 15 m. 2 specimens, 7 mm in length (No. E-30).

*Range*. Hitherto recorded only from the Philippines (off Jolo, Sulu Archipelago), in depths of ca. 13–35 m.

44. *Laganum fudsiyama* Döderlein. ([IV]₂, p. 338)


*Collecting record*. Off Seto, 344 m (Albatross Station 4965), off Susami, 439–522 m (Albatross Station 4966, 4967).

*Range*. Common in southern Japanese seas, from Kagosima Gulf to Sagami Sea and also to off Kazusa (Japan Sea), in depths of ca. 50–645 m.

Family Scutellidae Gray

45. *Scaphechinus mirabilis* A. Agassiz. ([IV]₂, p. 375)

*Syn*. *Echinarchinus mirabilis*, Yoshiwara, 1900, p. 392, 1907, Pl. XVI–9, 10; Ikeda, 1940, p. 4.


*Range*. Widely distributed in Japan, from Hakodate to Amakusa.


*Syn*. *Echinarchinus tenuis*, Yoshiwara, 1898a, p. 61, 1900, p. 392.

*Nom. Jap*. Usu-hasunoha-kasipan. (nom. nov.)

*Material examined*. Off Seto, probably 12 m. 5 dead specimens (No. E-1).
Hatake-zima (Tanabe Bay), at low tide. 6 specimens (No. E-3).

A smallest specimen measures 13.5 mm long, 14.8 mm wide and 2.1 mm high, and largest one measures 35.4 mm long, 36.5 mm wide and 4.4 mm high. The genital pores have not appeared outsides in specimens over 24 mm long, though present insides. According to Nisiyama (1940), this may be a variety (or subspecies) of *S. mirabilis*.

*Range*. Distributed only in Japanese waters, from Kagosima to Akkeshi, from the littoral to ca. 12 m.
Echinoids Found in the Kii Region

47. **Astriclypeus Manni** Verrill. (IV, p. 416)

   *Nom. Jap.* Sukasi-kasipan. (Ohshima)
   *Collecting record.* Goza (Onoda, 1938, p. 8).
   *Range.* Recorded only from southern Japan (from Bōsō Peninsula to Kyusyu) in depths of 0-35 m and also from China and Cambodja, Indo-China. This is an inland-water form, as not ever found near Seto on the Pacific coast.
   *Breeding.* Summer, from July to August in the Inland Sea (after Onoda).

Order **SPATANGOIDA**

Family **Pourtalesiidae** Løven

48. **Pourtalesia laguncula** A. Agassiz. (V, p. 147)

   *Nom. Jap.* Tokkuri-bunbuku. (Ohshima)
   *Collecting record.* Off Kii (A. Agassiz, 1881, p. 137).
   *Range.* Known only from Japanese and Malayan deep seas, in depths of ca. 220–1370 m.

Family **Loveniidae** Løven

49. **Lovenia elongata** (Gray). (V, p. 97)

   *Nom. Jap.* Hirata-bunbuku. (Ohshima)
   *Collecting record.* Suigesi (= Suiken, Wakayama City) (Yoshiiwara, 1900, p. 404). Tanabe Bay (Miyadi, 1940a, p. 142).
   *Material examined.* Hatake-zima in Tanabe Bay, in the littoral. 7 specimens (No. E-4).
   *Range.* Widely distributed all over the Indo-Pacific, from Red Sea to southern Japan, as far north as Tokyo Bay. From the littoral down to ca. 90 m.

50. **Echinocardium cordatum** (Pennant). (V, p. 152)

   *Nom. Jap.* Okame-bunbuku. (Ohshima)
   *Collecting record.* Tanabe Bay (Miyadi, 1941, p. 475, 476).
   *Material examined.* Tanabe Bay, 15–20 m. Many specimens, 12–48 mm in length (No. E-6, E-9).
   *Range.* Apparently cosmopolitan, from the littoral to ca. 230 m. It is very common in shallow waters of bays or inlets and usually buried in sand.

Family **Schizasteridae** Løven

51. **Schizaster lacunosus** (Linne). (V, p. 300)

**Nom. Jap.** Bunbukutyagama.

**Collecting record.** Ago-war, 20 m (MIYADI, 1941b, p. 180). Gokasyo-wan, 10–20 m (MIYADI & MASUI, 1942, p. 122, 124). Kowa-wan, 21 m, Hoza-wan, 23 m (MIYADI & HABE, 1946, p. 4, 10, 11). Yura-wan, 12 m (HABE et al., 1946, p. 6).

**Material examined.** Tanabe Bay. 2 specimens (No. E-5). Yasima, Prov. Sanuki, 34 m. 4 specimens (No. E-63).

**Range.** From Japan to East Africa and NE. of Australia. In Japan it is very common on sandy bottoms in depths of ca. 5–90 m.

### Family Brissidae Gray

52. *Brissopsis luzonica* (GRAY). (V₂, p. 397)

**Nom. Jap.** Bunbuku-modoki. (nom. nov.)

**Collecting record.** Off Kii (H. L. CLARK, 1917, p. 204). Osaka Bay (MIYADI, 1940, p. 12).

**Range.** Widely distributed all over the Indo-Pacific, from Red Sea to Hawaii and to southern Japan, in depths of 10 to some 1000 meters.

53. *Brissus (Allobrissus) Agassizi* DÖDERLEIN. (V₂, p. 520)

**Syn.** *Brissus latecarinatus*, OHSHIMA, 1947, p. 579. (non LESKE)

**Nom. Jap.** O-bunbuku.

**Collecting record.** Seto (KOMAI et al., 1927, p. 295; KOMAI & IKARI, 1929, p. 121).

**Material examined.** Seto, at low tide. 3 specimens (No. E-7, E-11) and many living specimens.

**Range.** Known only from Japan, from Fōsō Peninsula to Amakusa. It lives commonly in shallow waters, buried in sand, and goes down to ca. 10 m.

### LITERATURE CITED

Echinoids Found in the Kii Region


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