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Ophioplocus giganteus, a New Species of Ophiuroidea from Okinawa Island, Southwestern Japan

Seiichi Irimura[1] and Hiromi Yoshino[2]

[1] 1–41–1 Okusawa, Setagaya-ku, Tokyo, 158–0083 Japan
[2] Department of Chemistry, Biology, and Marine Science, Faculty of Science, University of the Ryukyus, 1 Senbaru, Nishihara, Okinawa, 903–0213 Japan

Abstract A new species of Ophiuroidea, *Ophioplocus giganteus*, from Okinawa Island is described. The new species is characterized by large size, thick skin, and 4 arm spines.

Key words: *Ophioplocus giganteus* sp. nov., Ophiuridae, Ophiuroidea, Okinawa Island, Taxonomy.

Introduction

Genus *Ophioplocus*, erected by Lyman (1862) for *Ophiolepis imbricata* Müller & Troschel, 1842, was composed of five species in 1975, namely *O. imbricatus* (Müller & Troschel, 1842) from the Indo-west Pacific, *O. esmarki* Lyman, 1874 from Pacific coast of northern America, *O. japonicus* H. L. Clark, 1911 from Japan, *O. bispinosus* H. L. Clark, 1918 from southern Australia, and *O. hancocki* Ziesenhenne, 1935 from the Galapagos Islands. Thomas (1975) synonymized *Ophioceramis* Lyman, 1865 and *Ophioceres* Koehler, 1922 with the genus *Ophioplocus*, so that *Ophioceramis declinans* Koehler, 1904 from the Philippines, *Ophioceres huttoni* (Farquhar, 1899) from New Zeeland, *Ophioceres incipiens* (Koehler, 1922) from Antarctic, and *Ophioceramis januarii* (Lütken, 1856), from Atlantic coast of southern America are also referred to the genus *Ophioplocus*.

Recently, Prof. M. Nishihira, Mr. T. Yoshino and Mr. Y. Fujita collected large, beautiful brittle-stars of the genus *Ophioplocus* in Okinawa Island, southwestern Japan. Close examination of the specimens revealed that they represent a new species distinct from all the congeners mentioned above. The holotype and a paratype are deposited in the National Science Museum, Tokyo (NSMT) and another paratype is deposited in the Department of Chemistry, Biology, and Marine Science, Faculty of Science, University of the Ryukyus (URM).

Genus ***Ophioplocus*** Lyman, 1862

Ophioplocus giganteus sp. nov.

[New Japanese name: Torafu-kumohitode]

(Figs. 1–3)

Material examined. **Holotype**, NSMT E-3748; Cape Maeda, Onna-son, Okinawa Island, 5 m in depth, 15 May 1998, collected by Y. Fujita, scuba. **Paratype 1**, NSMT E-3749; outer reef slope, west off Sesoko Islet, Okinawa Island, 20 m in depth, 13 September 1977, collected by T. Yoshino, scuba. **Paratype 2**, URM-E497; west of Sesoko Islet, Okinawa Island, 10 m in depth, date unknown, collected by M. Nishihira, scuba.

Description. Disk diameter is 35 mm; arm length is ca. 220 mm; width of basal arm is 5 mm. Body is covered orally and aborally with so thick skin that it is difficult to discriminate every disk scales and jaw plates without dissolve the skin.

Disk is round, covered with fine scales, except near the interradial periphery which is ornamented by a conspicuous row of sporadic enlarged scales. Radial shield is covered with fine scales perfectly.

Four oral shields are retrograde, divided into one to three small and round pieces, but remaining one becomes large as an oval madreporite. Adoral shields are long, subquadrate, contacted with each other. Oral plates are long, trapezoid in shape. Oral papillae are six in number, trapezoid or triangular in shape, distal two among them is rather larger than the others. Interbrachial oral disk is covered with fine scales like aboral one. But, they are reduced at proximal area covered with skin. In one of the interbrachial areas, there is one large oval space lacking scales, but only covered by skin. Genital slits are short, about as long as two arm segments; situated on side of fourth and fifth arm segments and carries closely arranged scales.

Arms are long, thick and robust, also covered with a thick skin. Dorsal arm plates are wide, divided into 20–22 polygonal fragments with no supplemental plates, the margin is inconspicuous. But, ones in the middle part of arms are 14–15 fragments, with conspicuous margin and a pair of supplemental plates.

First ventral arm plate is small, rhombic with round corners, and the following one is wider than long, trapezoid with straight distal border. From first to tenth plates are within the ventral disk. First to sixth lateral arm plates have no arm spines, then seventh has a single arm spine, and both eighth and ninth have two arm spines, and tenth plate has three arm spines. Basal free arm segments have four arm spines, but in distal arms they are three. Arm spines are robust, short, as long as the corresponding arm segment, but oral most one is slightly longer than the others. From second to sixth ventral arm plates have three or four tentacle scales, but following ones have two, flat, and large tentacle scales.

Color in life: Dorsal disk is black with yellow patches and lines, and ventral disk is black with a yellow line in each interbrachial area. Aboral side of arms have an an-

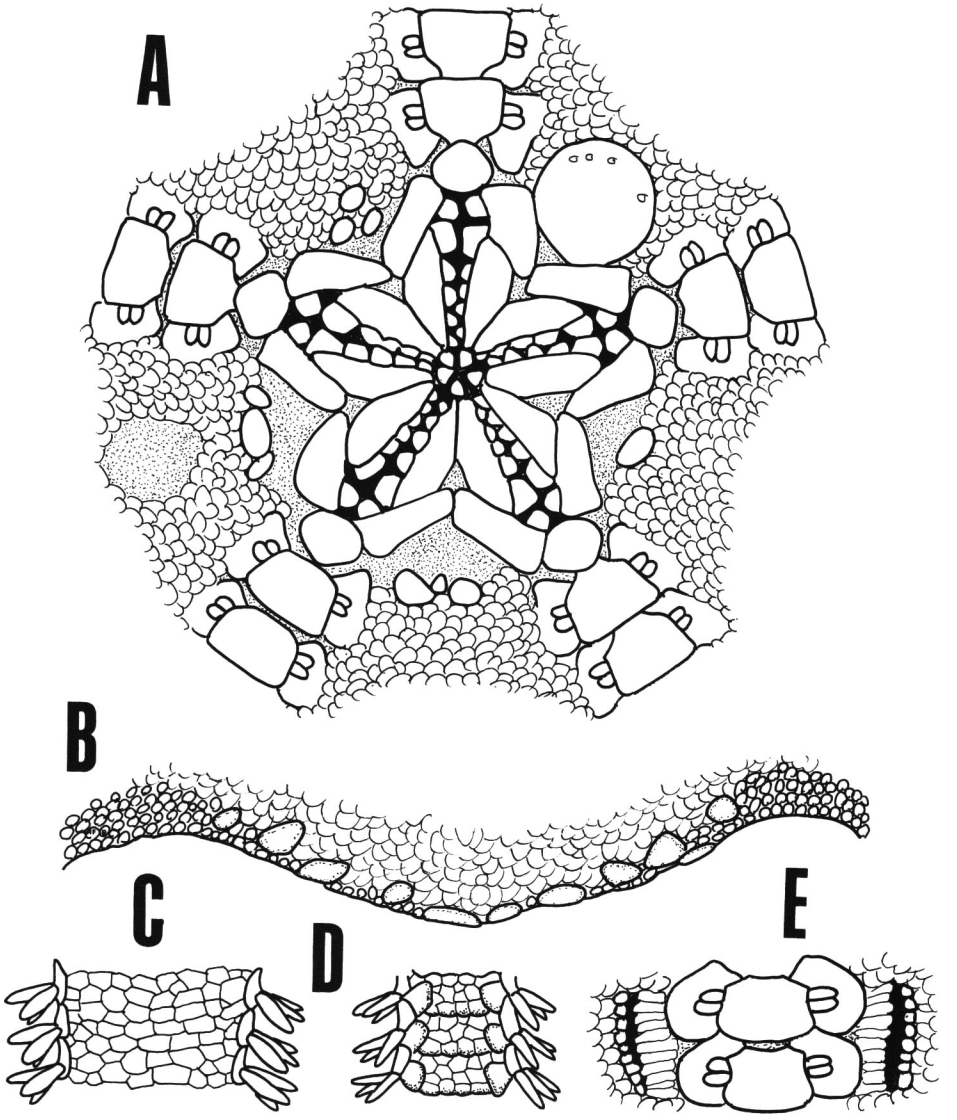

Fig. 1. *Ophioplocus giganteus* sp. nov. Holotype (NSMT E-3748). A: Central part of oral disk, after dissolved skin, B: Marginal aboral disk, C: Basal dorsal arm plates (5–7th arm segments), D: Middle dorsal arm plates (70–73th arm segments), E: Basal ventral arm plates (4–5th arm segments) and genital slits.

nulation by alternating black and yellow bands.

Description of paratype 1. Disk diameter is 14 mm; Arm length is ca. 48 mm. Width of basal arm is 2 mm. Body is covered with skin orally and aborally, but the skin is rather thinner than that of the holotype. Therefore, disk scales are not observ-

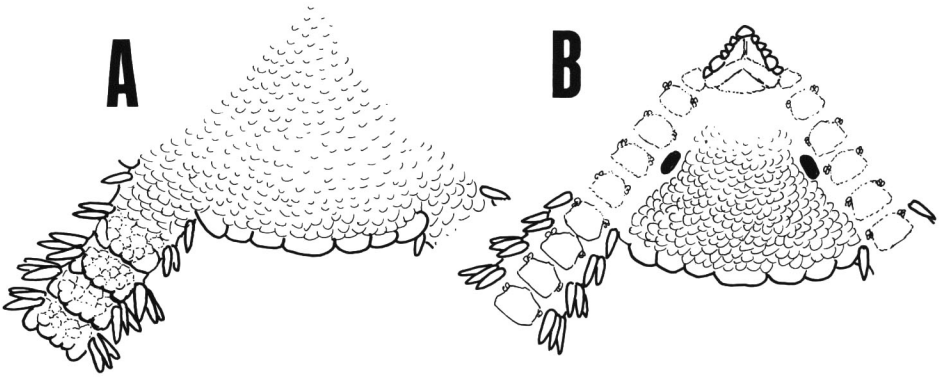

Fig. 2. *Ophioplocus giganteus* sp. nov. Paratype 1 (NSMT E-3749). A: Aboral view, B: Oral view.

able in living or alcoholized specimen, but recognizable in dry condition. Disk is covered with fine scales, among which seven marginal large scales are arranged in a row, the central one is rectangular, larger than the others.

Radial shields are covered by scales. Four oral shields are triangular, slightly longer than wide, but one of them is oval. Genital slits are pore-like, as long as length of one arm segment, situated between third and forth segments. Dorsal arm plates are divided into eight or nine small fragments. Both sides of each dorsal arm plates carry a pair of supplementary arm plates, and borders of arm segment are visible.

First ventral arm plate is small, triangular with round distal border. The following plates are trapezoid. From first to sixth plates are within the disk. First to fifth lateral arm plates have no arm spine, then sixth has a single arm spine, seventh has two spines, and following ones have three arm spines. Spines are the same in length, slightly longer than the arm segment. From second to fifth ventral arm plates have three or four tentacle scales, but following ones have two scales each.

Color in life: Disk is yellow with six black marks on aboral side, and a star mark on oral side. Aboral side of arms has the same band as the holotype.

Description of paratype 2. Disk diameter is 34 mm; arm length is ca. 180 mm; width of basal arm is 6 mm. Body size is near to that of holotype, but arm length is shorter than it. Color pattern is almost same to holotype.

Possible morphological change with growth. There are some morphological differences between well-grown holotype and small paratype 1. Such differences are due to the growth as follows: 1) Number of arm spine increases from three to four, 2) Skin covering the body thickens, 3) Oral shields except madreporite divide, reducing its width, and 4) Marginal disk scales separate from each other and reduce in size.

Distribution. The holotype and paratypes were collected from subtidal zone in Okinawa Island. Because of ophiuroid species in Okinawa area belong to the Indo-West Pacific fauna, this species may be distributed in tropical area outside the type

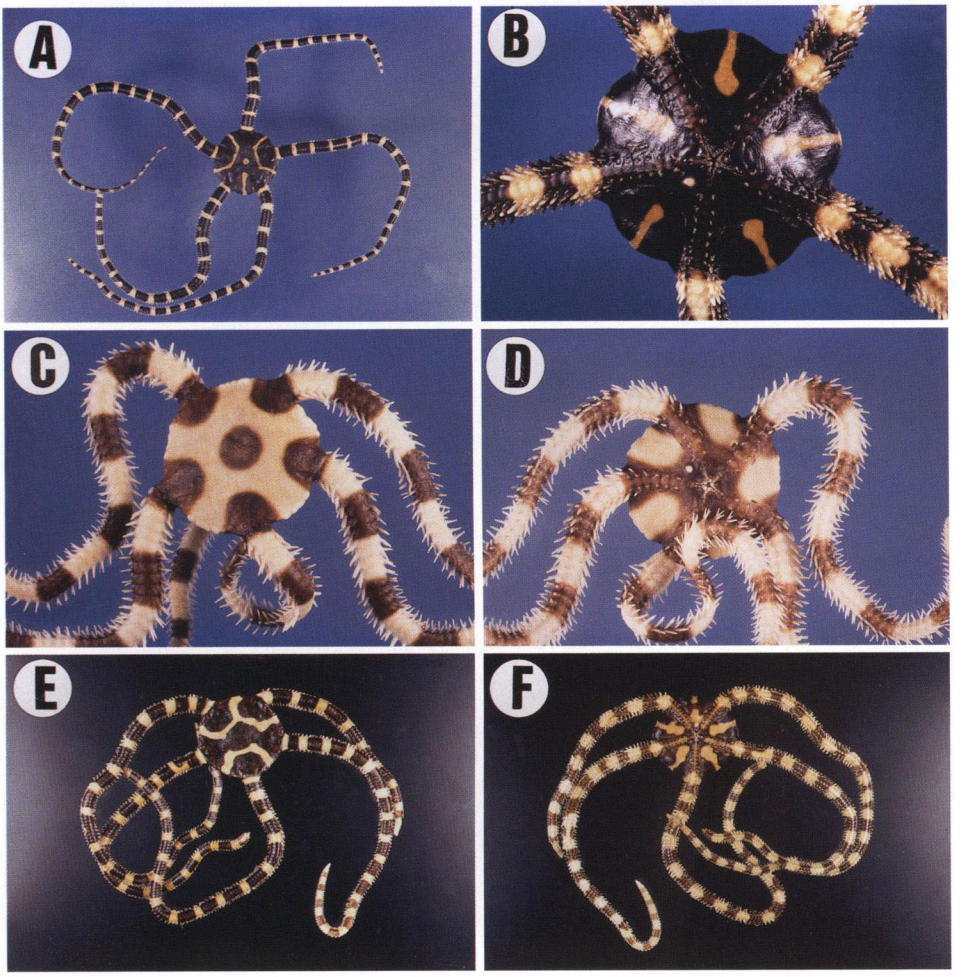

Fig. 3. *Ophioplocus giganteus* sp. nov. Holotype (NSMT E-3748). A: Aboral view, B: Oral view. Paratype 1 (NSMT E-3749), C: Aboral view, D. Oral view. Paratype 2 (URM-E497), E: Aboral view, F: Oral view.

locality.

Affinities. In the known nine species of the genus *Ophioplocus*, there is no species in which the body covered with a thick skin on all over, the size is large, arm spines are four in maturity, there are distinct marginal scales, and color pattern is black and yellow.

This new species is related to *O. imbricatus* (Müller & Troschel, 1842) in having short hole-like genital slits, but distinguished from it by having dorsal arm plates of many polygonal fragments in a rather irregular pattern. The new species is related also to *O. hancocki* Ziesenhenne, 1935 in having dorsal arm plates carrying many

polygonal fragments, but differs from it by short genital slits.

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References

Clark, H. L., 1911. North Pacifiic ophiurans in the collection of the United States National Museum *Bull. U. S. Nat. Mus.*, **75**: 1–302, fiigs. 1–144.

Clark, H. L., 1918. Brittle-stars, new and old. *Bull. Mus. Comp. Zool. Harv.*, **62**: 265–338, pls. 1–8.

Farquhar, H., 1899. Description of a new ophiuran. *Proc. Linn. Soc. N. S. W.*, **24**: 187–189, pl. 15.

Koehler, R., 1904. Ophiures de l'Expédition du Siboga. Ophiures de mer profonde. *Siboga Exped.*, **45a**: 1–176, pls. 1–36.

Koehler, R., 1922. Ophiures. *Australas. Antarct. Exped. 1911–1914. Sci. Rep.* Ser. C, **8**(2): 5–98, pls. 76–90.

Lütken, C. F., 1856. Bidrag til kundskab om Slangestjernerne, II. Oversigt over de vestindiske Ophiurer. *Vidensk. Meddr. dansk Naturh. Foren.*, **1856**: 1–19.

Lyman, T., 1862. Description of new Ophiuridae. *Proc. Boston Soc. Nat. Hist.*, **8**: 75–86.

Lyman, T., 1865. Ophiuridae and Astrophytidae. *Illustr. Cat. Mus. Comp. Zool. Harv. Coll.*, (1): 1–200, pls. 1–2.

Lyman, T., 1874. Ophiuridae and Astrophytidae, old and new. *Bull. Mus. Comp. Zool. Harv.*, **3**: 221–272, pls. 1–7.

Müller, J. & F. H. Troschel, 1842. System der Asteriden. Braunschweig, xx+134 pp, pls. 1–12.

Thomas, L. P., 1975. The systematic relationships of *Ophioplocus*, *Ophioceramis*, and *Ophioceres* (Echinodermata, Ophiuroidea). *Bull. Mar. Sci.*, **25**: 232–247, fiigs. 1–3.

Ziesenhenne, F. C., 1935. A new brittle star from Galapagos Islands. *Allan Hancock Pacif. Exped.*, **2**: 1–4, pl. 1.