

PROCEEDINGS
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NEW STARFISHES FROM THE PHILIPPINES AND
CELEBES.*

BY WALTER K. FISHER.

The following new sea stars were collected during the Philippine cruise of the U. S. Fisheries steamer *Albatross*, 1907-1910.

Dipsacaster imperialis, new species.

Diagnosis.—Differing from *D. nesiotis* Fisher in having broader rays, more delicate, longer, and sharper paxillar spinelets, in averaging 1 or 2 additional true furrow spines to each adambulacral plate, and in having an odd interradial series of actinal intermediate plates, which reach only a little more than half the distance between the outer end of combined mouth plates and inferomarginals. Differing from *D. sladeni* Alcock in respect to the inferomarginal spines which are smaller and do not form a definite transverse series, especially on the proximal plates; in having the distal marginals alternating, instead of opposite, and in having more numerous actinal intermediate plates on the ray, the second longitudinal series extending to the twenty-third or twenty-fourth inferomarginal, and the third extending to the sixteenth. $R=160$ mm., $r=55$ mm., $R=3r-$; breadth of ray at base, 62 mm. Rays broad at base, tapering from arcuate interbrachia, at first rapidly, then more gradually. Paxillae with numerous (80-90) slender, sharp, glassy spinelets in a brush-like group. Three oblique transverse series correspond to each superomarginal plate; the latter 38 to 40 in number, block-like, only a trifle wider than long in middle of ray. Inferomarginals with a tuft of enlarged spinelets on ambitus. Furrow spines 8 or 9, rectangular in section, compressed, bluntly pointed, lanceolate in contour, the edge to furrow. Subambulacral spines 25 to 30, of which 4 to 6 form a regular series back of the furrow series. Madreporic body large, 12 mm. in diameter, situated 14 mm. from inner margin of superomarginal plates, and concealed by about 25 paxillae.

Type.—Cat. No. 37,037, U. S. N. M.

Type locality.—"Albatross" station 5115, Verde Island Passage, north coast of Mindoro, 340 fathoms.

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Cheiraster diomedea, new species.

Diagnosis.—Rays 5, long, slender, with narrow marginals carrying 1 superomarginal and usually 2 inferomarginal spines; abactinal plates with 10 to 15 spinelets on disk, and on ray usually 2 to 7; enlarged central spinules scattered on outer half or two-thirds of ray; adambulacral furrow spines 10 to 12; 1 subambulacral spine except on outer part of ray, where there are 2; 11 to 13 oral, and 1 prominent suboral spine. Papularia small, with about 25 pores, which do not reach farther than opposite middle of third superomarginal. Pectinate pedicellariae on the abactinal surface, between the proximal superomarginals, over the intermarginal suture, on the actinal intermediate plates; fasciculate pedicellariae on the actinal surface of inferomarginals. Related to *Ch. snyderi* Fisher. $R=86$ mm., $r=10$ mm., $R=8.6$ r; breadth of ray at base (between first and second superomarginals, 10 mm.; at middle of ray, 5 mm.).

Type.—Cat. No. 37,035, U. S. N. M.

Type locality.—"Albatross" station 5512, Iligan Bay, north coast of Mindanao, 423 fathoms, gray mud, fine sand; bottom temperature 52.8° Fahr.

Lithosoma penichra, new species.

Diagnosis.—Differing from *L. actinometra* Fisher in having slenderer, longer rays, narrower marginal plates, restricted petaloid papular areas, and more angular furrow margin to the adambulacral plates, the consecutive pairs of tube-feet being separated, beyond base of furrow, as in *Nymphaster*; surface of plates and encircling granules as in *L. actinometra*; width of ray at proximal end of first pair of superomarginals (fifth) which meet medially equal to length of 3 or $3\frac{3}{4}$ superomarginals measured on ambitus (5 in *L. actinometra*). $R=86$ mm., $r=21$ mm., $R=4+r$; breadth of ray at interradius 24 mm., at proximal end of fifth superomarginal, 9.5 mm.

Type locality.—"Albatross" station 5528, between Siquijor and Bohol Islands, Philippines, 439 fathoms, globigerina ooze, bottom temperature 53.3° Fahr.

Nardoa tumulosa, new species.

Diagnosis.—In a general way resembling *N. frianti* Koehler in having prominent, large, hemispherical abactinal plates, but these much fewer and relatively slightly larger than in *frianti*, lower in proportion to width and evenly rounded or dome-shaped. They are confined to the abactinal surface and proximal two-thirds of ray; plates of distal third of ray small, crowded, convex; disk high. R =about 90 mm., r =about 14 mm., $R=6.4$ r; breadth of ray at base, 17 mm.; height of disk, 21 mm.

Type.—Cat. No. 37,028, U. S. N. M.

Type locality.—"Albatross" station 5160, off Tinakta Island, Tawi Tawi Group, Sulu Archipelago, 12 fathoms, sand.

Bunaster lithodes, new species.

Diagnosis.—Very close to *B. ritteri* Döderlein in general appearance, but differing in lacking the curious ball-and-socket granules of that form, and in having abundant, low, bivalved pedicellariae on the papular areas, and a few narrow tongs-shaped pedicellariae on the abactinal plates; outer actinal intermediate plates larger than the inner, and subambulacral spines slightly narrower; granules between the naked areas of plates smaller and more numerous. $R=22$ mm., $r=5$ mm., $R=4.4$ r; breadth of ray at base, 6 mm.

Type.—No. 2498, Museum of Comparative Zoölogy.

Type locality.—Apo Reef, Mindoro Strait, Philippines.

Asterina cristata euerces, new subspecies.

Diagnosis.—Very close to typical *A. cristata* Fisher but differing in having abactinal, spiniform pedicellariae, only 12 to 14 swollen abactinal plates to a ray, 8 furrow spines, and 8 or 9 marginal mouth spines. $R=20$ mm., $r=9$ mm., $R=2.2$ r; breadth of ray at base, 10 mm.

Type.—Cat. No. 37,036, U. S. N. M.

Type locality.—Ulugan Bay (near mouth of Baheli River), Palawan Island, 2 to 5 feet, mud, sand, sea-weeds.

Henricia microplax, new species.

Diagnosis.—Rays 5. $R=45$ mm., $r=7$ mm., $R=6.4$ r; breadth of ray at base, 8 mm. Rays slender, depressed, slightly swollen at base; disk small with an interradiial sulcus near margin. General appearance of abactinal surface similar to that of *H. sanguinolenta*; superomarginal plates forming an inconspicuous series; inferomarginals in a regular conspicuous series; 3 or 4 series of actinal intermediate plates at base of ray; adambulacral spines about 15, besides 3 or 4 on the furrow face of plate.

Type.—Cat. No. 37,006, U. S. N. M.

Type locality.—"Albatross" station 5518, Mindanao Sea, off Point Tagolo, Mindanao, 200 fathoms, gray mud, globigernia, bottom temperature 54° Fahr.

Henricia arcystata, new species.

Diagnosis.—Similar in general appearance to *H. mutans* (Koehler), but with shorter rays, 2 or 3 spinelets on the furrow face of the adambulacral plates (instead of apparently 1), and with a distinct series of T-shaped inferomarginals and crescentic superomarginals. $R=72$ mm., $r=10$ mm., $R=7.2$ r; breadth of ray at base, 9 to 10 mm. Rays slender, depressed, curved at the end, tapering very slightly.

Type.—Cat. No. 37,007, U. S. N. M.

Type locality.—"Albatross" station 5536, between Negros and Siquijor, 278 fathoms, green mud, bottom temperature 53.5° Fahr.

Acanthaster brevispinus, new species.

Diagnosis.—Resembling *A. mauritiensis* de Lorio, but differing in having the abactinal spines of disk reduced to mere spinelets, in having smooth or nearly smooth disk spines on both surfaces and in having only 2 or 3 furrow spinelets, shorter than the length of their plate, instead of decidedly longer. Rays 14 to 16; madreporic bodies, 3 to 5; $R=90$ mm., $r=51$ mm., $R=1.76$ r.

Type.—Cat. No. 37,027, U. S. N. M.

Type locality.—"Albatross" station 5149, off Sirun Island, Sulu Archipelago, vicinity of Siasi, 10 fathoms, coral, shells.

Distolasterias hypacantha, new species.

Diagnosis.—Rays 5. $R=129$ mm., $r=8$ mm., $R=16$ r; breadth of ray at widest part near base, 14 or 15 mm. Resembling *D. mazophora* (Alcock) and *D. euplecta* Fisher, from both of which it differs in having, on the proximal half of ray, a series of small spines between the adambulacral spines and the inferomarginal spines (of which there are 2). On abactinal surface, between the two superomarginal series, are 3 series of spines proximally, and only 1, the carinal, distally; only 1 kind of major pedicellariae present, slender and lanceolate in form; rays pentagonal in section, the width of the lateral face proximally being about two-thirds that of either dorsal face (between superomarginal and carinal row of spines) while distally all four are nearly equal; disk very small, sunken below the dorsal surface of rays; rays constricted at base. *D. dubia* (H. L. Clark) has shorter, relatively stouter rays, stouter abactinal skeleton, larger major pedicellariae, broader and more flattened outer inferomarginal spines, deeply furrowed on the actinal side.

Type.—Cat. No. 37,032, U. S. N. M.

Type locality.—"Albatross" station 5417, between Cebu and Bohol, 165 fathoms, gray mud and sand, bottom temperature 54.4° Fahr.

Tarsaster distichopus, new species.

Diagnosis.—Rays 5. $R=48$ mm., $r=5$ mm., $R=9.6$ r; breadth of ray at base, 6.5 mm. Disk very small, convex; rays long, slender, bluntly pointed; abactinal surface prominently arched, with very slight midradial carinal ridge; actinal surface nearly plane, the sides of ray as defined by the 2 series of marginals, nearly perpendicular, but sloping inward toward the furrow slightly. Differing from *T. stoichodes* Sladen in having 1 adambulacral spine, 1 spine on the midradial plates, prominent unguiculate forcifiform pedicellariae in the furrow, and biserial tube-feet.

Type.—Cat. No. 37,031, U. S. N. M.

Type locality.—"Albatross" station 5664, Macassar Strait ($4^{\circ} 43' 22''$ S., $118^{\circ} 53' 18''$ E.), 400 fathoms, hard bottom, bottom temperature 43.3° Fahr.

Pedicellaster chirophorus, new species.

Diagnosis.—Rays 5. $R=27$ mm., $r=4$ mm., $R=7r\pm$; breadth of ray at base, 4.5 mm. Rays slender, tapering, disk small; plates cruciform, in regular series, each bearing a short thorny spinelet and 1 to 3 ovoid forcipiform pedicellariae. Adambulacral armature: a transverse row of 3, then 2 spinelets 2 or 3 times longer than those of the adjacent actinal and marginal plates, and here and there along the ray a large unguiculate pedicellaria usually borne on or near the furrow margin; these are 1 to 1.2 mm. long, have usually 3 curved claws or teeth, and resemble 2 minute clasped hands (with 3 short fingers).

Type.—Cat. No. 37,030, U. S. N. M.

Type locality.—"Albatross" station 5656, Gulf of Boni, Celebes ($3^{\circ} 17' 40''$ S., $12^{\circ} 36' 45''$ E.), 484 fathoms, gray mud, bottom temperature 41.2° Fahr.

Odinia magister, new species.

Diagnosis.—Differing from *O. pacifica* Fisher in having a perfectly smooth integument on the genital region, in having more numerous, stouter and shorter spines (6 or 7) on the largest lateral fans beyond the genital region, and in having a differently formed articulating surface to the first pair of ambulacral plates of the ray. Disk and number of rays unknown. Rays 350 to 360 mm.; breadth at base measured at fifth adambulacral plate (the first one which is not joined to its vis-a-vis of the adjacent ray) 10 mm. Size very large; genital region occupying about one-fourth total length of ray, and crossed by about 10 costae, the first 4 or 5 being very irregular and hard to distinguish; lateral spines 5 to 7, 4 and 3 distally; only 1 subambulacral spine, proximally flattened and grooved at tip; pedicellariae all small; none on the integument of genital region; no integumentary prickles or spinelets.

Type.—Cat. No. 37,026, U. S. N. M.

Type locality.—"Albatross" station 5258, off southern Panay, $10^{\circ} 27' 45''$ N., $122^{\circ} 12' 30''$ E.); marked intermediate haul in list of dredging stations.

