

ZOOLOGY.—A new starfish (*Lydiaster americanus*) from the Gulf of Mexico, representing a section of the subfamily *Goniasterinae* hitherto known only from the Indo-Pacific region.¹

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One of the most interesting of the new starfishes described in 1909 by Professor Koehler from the collections of the Royal Indian Marine Survey Ship *Investigator* was *Lydiaster johannae* which, with the closely allied genus *Circeaster* described at the same time, represented a hitherto unknown type of *Goniasterinae*. *Lydiaster johannae* was dredged only in a single locality off the southwestern coast of Ceylon in 401 fathoms, while the two species of *Circeaster* were found off the western coast of Ceylon and southern India in from 912 to 1053 fathoms. Thus, so far as known up to the present time, these two genera are confined to the Arabian Sea. The only genus closely related to these two, *Mariaster*, occurs off southern Japan.

But it appears that *Lydiaster* also inhabits the Gulf of Mexico, being represented in this region by a remarkable new species, in some respects intermediate between *Lydiaster* and *Circeaster*. This may be known as

***Lydiaster americanus*, sp. nov.**

Five arms; R = 100 mm.; r = 35 mm.; R:r = 2.9:1; superomarginals 24.

General form pentagonal, with relatively narrow, evenly tapering arms, the length of which, measured actinally along the curve from a point directly below the commencement of the enlarged plates, is equal to the distance from the same point to the center of the interbrachial arc opposite. The diameter of the arms at the base (at the level of the distal border of the fifth superomarginal) is 19 mm. In the outer half the arms bend gradually upward, so that their terminal portion makes an angle of about 60 degrees with the plane of the disk.

Compared with *L. johannae* the interbrachial arcs are more nearly straight and the arms, which are narrower, appear to arise more abruptly.

The abactinal surface, which is somewhat swollen, is covered with small polygonal plates which are mostly subequal in size and irregular in arrangement; they vary from about 1 mm. to about 2 mm. in diameter, being usually about 1.5 mm.; just before the base of the arms the

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plates become shorter radially, so that they appear to be transversely elongated; on the arms they slowly increase in size, though not in regularity, the largest being something over 3 mm. in diameter; in the distal half of the arm only one row of plates separates the superomarginals, and the last four or five superomarginals are in contact along the mid-dorsal line of the ray.

Each of the abactinal plates is bordered by a ring of flattened granules, there being from 20 to 24 about the largest; in the central portion of the abactinal surface each plate bears from two to six rounded granules, each inserted in a small pit; toward the periphery these become less numerous and less prominent, though they occur nearly to the marginals; the plates on the abactinal surface of the arms are somewhat more flattened than those of the disk, and the isolated granules are less common in their central portion; most of the plates on the disk bear spatulate pedicellariae with usually strongly dentate jaws, each sunk in a deep depression, but on the rays, except for one or two very small and imperfectly formed, these are lacking.

The papular areas, which are confined entirely to the disk, are very large; the only regions free from papulae are the center of the disk and low triangles about three times as broad as high based upon the superomarginals, in which areas also the plates decrease in size toward the border and do not bear pedicellariae. The papulae are smaller and less abundant in the mid-line of each ray than elsewhere, and this causes the mid-radial plates in the peripheral half of the disk to appear somewhat prominent.

The marginal plates of both series are 24 in number; but the inferomarginals are somewhat longer than the superomarginals, so that, although the two series correspond in the interbrachial arcs, in the distal part of the arms they alternate in position. The interbrachial arc as defined by the superomarginals is straight, as defined by the inferomarginals gently concave.

In abactinal view the superomarginals, which are markedly tumid, are seen to increase very slightly in width to the fifth, at the base of the rays, thence decreasing gradually distally; in lateral view they decrease regularly in height from the center of the interbrachial arc, where they are twice as high as the inferomarginals, to the distal third of the arm, where the plates of the two series are of about the same height. In the interbrachial arc the outer third of the superomarginals is vertical, and the inner two-thirds bends inward so that the inner half, which is flat, extends at an angle of about 45 degrees over the dorsal (abactinal) margin; on the arms the inner half becomes more nearly horizontal; here also the inner border of the superomarginals is straight, but on the arms it becomes slightly convex or angular. On the average the superomarginals, as viewed abactinally, are about twice as deep as long, those at the arm bases being somewhat longer, those toward the arm tips slightly shorter.

Each superomarginal carries on its surface numerous widely spaced deciduous granules arranged in the interbrachial arc roughly in five

alternating rows of seven or eight each, becoming less numerous distally; the granular area is confined to the median portion of the plate, though in the interbrachial arc it may reach the proximal border; in the interbrachial arc nearly all the superomarginals bear near their actinal border a very small deeply sunken spatulate pedicellaria; a narrow border of flattened squarish granules surrounds each superomarginal.

The inferomarginals are essentially similar to the superomarginal; viewed actinally they are seen to decrease in size from the center of the interbrachial arc to the arm bases, thence much more gradually to the arm tips; in the interbrachial arc in lateral view the inferomarginals are only half as high as the superomarginals (2.5 mm.), but they rapidly increase in height so that on the outer half of the arm the plates of the two series are nearly equal. The inner portion of the inferomarginals is everywhere horizontal, and the inner border is everywhere convex. A border of small squarish granules similar to that on the superomarginals is found on the inferomarginals, and the same granular ornamentation occurs on their surface, though the granules are rather more numerous. In the interbrachial arc the inferomarginals usually carry small excavate spatulate pedicellariae just within the upper border, and one or two additional on the ventral (actinal) surface; pedicellariae of both series occur irregularly to the terminal portion of the arms.

The actinal intermediate areas are extensive; the row of actinal intermediate plates adjacent to the adambulacrals, which extends to the sixteenth superomarginal (the distal third of the arm), is regular and the next row is regular to the arm bases; a partial third row may be traced, but within the triangular area between this and the inferomarginals the plates, which decrease in size, tend to become arranged in columns perpendicular to the inferomarginals.

In the center of each of the actinal intermediate plates is a large pedicellaria which resembles those on the adambulacrals, and is more or less proportionate in size to the plate; on the larger plates this is surrounded by several large rounded tubercles, beyond which are the lower tubercles forming the bordering series of the plates; on the smaller plates only the latter occur.

The adambulacrals are oblong, from one-third to one-half again as broad as long, with a very slightly curved furrow margin which is not quite parallel to the groove, the proximal end being slightly more distant. The furrow series consists of five stout subequal truncated spines, mostly rounded-quadrate in section, the most proximal of which is so situated that it overlaps the most distal of the preceding series. Behind the furrow spines is a series of three or four tubercles, the most distal abruptly the largest, and behind these a long, low, *Hippasteria*-like bivalved pedicellaria placed somewhat diagonally with its distal end slightly nearer the mid-radial line. Beyond the pedicellaria is a series of two or three large tubercles, and beyond these a series of several smaller tubercles which, with similar tubercles, at right angles to the two ends of this series, delimit the borders of the plate.

The mouth plates are triangular and inconspicuous, about twice as

long as broad; the furrow margin is about equal to the edge adjoining the first adambulacral; the furrow series consists of seven short blunt spines, stouter than those on the adambulacrals, of which the innermost is broad, flat, and trapezoidal; just behind the two terminal spines in this series are two large tubercles; the remaining portion of the surface of the mouth plates is covered with about 18 spaced polygonal tubercles resembling those on the actinal intermediate plates, but somewhat larger.

The color in alcohol is white.

Type.—Cat. No. 10872, U. S. N. M., from "Albatross" Station 2395, Gulf of Mexico, in 347 fathoms.

ANTHROPOLOGY.—*The Greenland Eskimo: Pastor Frederiksen's researches.* JAMES MOONEY, Bureau of American Ethnology.

The great Arctic island of Greenland is held by Denmark, having been first colonized by the Norse about the year 1000, and re-occupied from Denmark in 1721, the first colony having become extinct long before, possibly through inroads of the Eskimo. Since the second occupation Lutheran and Moravian missionaries, under the auspices of the home government, have labored with such devotion and success among the aborigines that of approximately 10,000 Eskimo of pure or mixed blood all but a few hundreds along the most remote coasts are civilized, Christianized, self-supporting, and able to read and write in their own language, while living on the best of terms with the handful of colonists. So carefully has the Danish government safeguarded their interests that famine, intemperance, and foul diseases which are so rapidly destroying the race in Alaska and British America are virtually unknown in Greenland, as well as wars and rumors of wars with their white neighbors. Since 1861, with a few breaks, there has been published at Godthaab (Nûngme) on the west coast, a small monthly journal, the *Atuagagdliutit* or "Reading Miscellany," entirely in the Eskimo language, which for press-work, illustrations, and literary content is fairly equal to anything of the same size in this country. Another mission monthly journal, the *Avangnamiok*, is published under the supervision of Rev. V. C. Frederiksen, resident missionary at Holstensborg, one of the northernmost outposts of