

REDISCOVERY OF THE GIANT SEA-
STAR *LUIDIA SUPERBA* A. H. CLARK
IN THE GALAPAGOS ISLANDS

Maureen E. Downey and
Gerard M. Wellington

ABSTRACT—Recently, three very large specimens of the starfish *Luidia superba* Clark were collected in shallow water in the Galapagos Islands. This collection not only represents a rediscovery of the species, but also establishes a record for the largest five-armed starfish known. Their size, distribution, and stomach contents are given and compared with those of other species of *Luidia*.

Three very large specimens of a starfish, *Luidia superba* A. H. Clark (1917), were collected in Tagus Cove, Isabela Island, Galapagos, by the junior author in April 1977. The holotype, the only previously reported specimen of the species, was collected by the ALBATROSS in 1888 off the coast of Colombia, in 66 m. It was well-described by A. H. Clark.

The three specimens from Tagus Cove measure: R = 415 mm, r = 45 mm, width of arm = 60 mm, longest spine = 15 mm; R = 410 mm, r = 40 mm, width of arm = 42 mm, longest spine = 15 mm; and R = 315 mm, r = 37 mm, width of arm = 40 mm, longest spine = 14 mm. Clark's specimen measures: R = 205 mm, r =

30 mm, width of arm = 30 mm, longest spine = 9 mm. It is unfortunate that this specimen is the holotype, as it has six arms, which is evidently not normal, since the Galapagos specimens have only five arms.

While other seastars of great size, including other species of *Luidia*, have been collected, these specimens are undoubtedly the largest five-armed specimens known. *Luidia magnifica* Fisher, from Hawaii, has 10 arms, and a specimen of this species in the National Museum of Natural History (E3099) measures R = 380 mm, r = 50 mm. F. J. Bell (1889) reported a specimen of *L. savignyi* (nine arms) from Mauritius which measured R = 370 mm, which was the largest known starfish at that time.

When the junior author was a Peace Corps Volunteer in the Galapagos (1973–75), conducting a comprehensive survey of the coastal marine environments for the Ecuadorian Department of National Parks and Wildlife and the Charles Darwin Research Station (Wellington, 1975), he was shown a photograph of a large seastar, taken by the DeRoy family in the Bahia Stephens area of San Cristobal Island, in 3-to-4-m depth. The DeRoys stated that they had also seen similar specimens in shallow water at Conway Bay, and reported dredging fragments of arms in deep water off Academy Bay, both on Santa Cruz Island. The junior author sent a copy of the photograph and an inquiry to the senior author, but despite diligent searches, was unable to collect any specimens. In the spring of 1977, he returned to the Galapagos on a field trip, and a night dive was undertaken in Tagus Cove, Isabela Island. It was on this dive that the seastars were observed crawling on the sand surface. The three specimens of *Luidia superba* were collected during daylight hours, their presence revealed as impressions in the sand, at a depth of 9–18 m. The species is common in the area (density conservatively estimated at 1/10 m²), but apparently lives buried under 10–12 cm of sand during the day.

One would expect a starfish of this size



Figure 1. *Luidia superba* A. H. Clark being collected at 18 m on sand bottom, Tagus Cove, Isabela, Galapagos Islands.

to be an efficient predator. *Luidias* are generally voracious, and Eichelbaum (1910), reporting on the stomach contents of *L. sarsi*, counted 53 ophiuroids, one heart urchin, and numerous fragments of asteroids and ophiuroids from the stomach of one specimen. Specimens of *L. clathrata* in the National Museum of Natural History with a major radius (R) of only 140 mm contain whole tests of the sand-dollar, *Melitta quinquesperforata*, with a diameter of 50 mm. It was therefore somewhat disappointing to find the stomachs of two of the Galapagos specimens completely empty, and only a few spines from an irregular echinoid in the stomach of the third specimen. However, there is no doubt that they are efficient predators. The infauna at Tagus Cove is extremely rich in both numbers and diversity. High nutrient level cool water reaches the surface here via upwelling of the Equatorial Undercurrent (Pak and Zaneveld, 1972). This "optimum" environment probably accounts for the unusually large size of *Luidia superba* here. This

gigantism is also reflected in other components of the biota, e.g., another seastar, *Pauliella horrida galapagensis*, and a sea pen both reach sizes well above average (pers. obs.).

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ADDRESSES: (M.E.D.) *National Museum of Natural History, Smithsonian Institution, Washington, D.C.*; (G.M.W.) *Department of Biological Sciences, University of California, Santa Barbara, California.*