



## ***Narcissia ahearnae*, a new species of sea star from the Western Atlantic (Echinodermata: Asteroidea: Valvatida)**

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### **Abstract**

*Narcissia ahearnae*, new species, is described from off the east coast of Florida and the Bahamas, in depths of 53–135 m. It is distinctive in having conspicuous undulating carinal ridges extending from the center of the disc along the upper surfaces of the arms.

**Key words:** *Narcissia ahearnae*, Asteroidea, Valvatida, Ophidiasteridae

### **Introduction**

In the course of a submersible diving program in the Bahama Islands in April and August 1987, two specimens of a distinctive red sea star were collected by the *Johnson-Sea-Link* submersible. They were identified by John E. Miller, then of Harbor Branch Oceanographic Institution, as a probable new species of the genus *Narcissia* (Family Ophidiasteridae). On a visit to the National Museum of Natural History in 1990, Mr. Miller found two additional specimens mixed in with catalogued lots of *Narcissia trigonaria* Sladen, a common western Atlantic species. A fifth specimen was found in the collection of the University of Miami Marine Laboratory. Finally, Mr. Miller recognized two live specimens, photographed *in situ* by Mr. Troy Engen in the British West Indies, as belonging to the same species. Upon taking another career path, Mr. Miller turned over to me his notes on this new species. In recent years, I have reviewed the holdings of the Museum of Comparative Zoology, Harvard University, and the Natural History Museum, London, and found no further specimens of this beautiful new species. Type material is deposited in the Harbor Branch Oceanographic Museum (HBOM); National Museum of Natural History, (USNM), Smithsonian Institution; and the Rosenstiel School of Marine and Atmospheric Science, University of Miami (UM).

### **Order Valvatida Perrier, 1884**

### **Family Ophidiasteridae Verrill, 1870**

### **Genus *Narcissia* Gray, 1840**

Diagnosis: Disc high, more or less pyramidal, arms five, long, trigonal in cross-section, tapering; abactinal plates in 7–17 irregular series; papulae isolated, single or in pairs; mouth plates with large, blunt, compressed spines; alveolar pedicellariae small, with elongate, spoon-shaped valves, usually abundant but not found in *N. ahearnae*. (Partly after Clark and Downey, 1992).

Type species: *Narcissia canariensis* (d'Orbigny, 1839)

Remarks: According to A.M. Clark (1993), there are three valid species of *Narcissia*, all known only from shelf and slope depths, in excess of about 30 meters. In the eastern Pacific Ocean, *N. gracilis* A.H. Clark, 1916, occurs off Lower California, the Gulf of California, Colombia, Malpelo Island (Downey, 1975) and the Galapagos Islands (Maluf, 1995) in 56–90 meters. In the eastern Atlantic, *N. canariensis* (d'Orbigny, 1839) ranges from the Canary and Cape Verde Islands to the Congo in 37–155 meters. In the western Atlantic *N. trigonaria* Sladen, 1889, is distributed from North Carolina to northeastern Brazil in 37–210 meters. Mortensen (1933) described a variety *helenae* of this last species from St. Helena.

### Key to species in the genus *Narcissia*

1. Carinal ridge conspicuous, undulating in vertical and horizontal planes from center of disc to mid-point of arms. Red to scarlet in life. Western Atlantic ..... *Narcissia ahearnae* new species
- Carinal ridge conspicuous or inconspicuous, straight, never undulating ..... 2
2. Papular pores mostly single. First subambulacral row of spines not similar to furrow spines..... 3
- Papular pores mostly paired. First subambulacral row of spines similar to furrow spines. Cream blotched with rust red in life. Western Atlantic..... *Narcissia trigonaria* Sladen, 1889
3. Subambulacral spines granuliform, in two rows of four. Color in life bright scarlet, paler below. Eastern Atlantic ..... *Narcissia canariensis* (d'Orbigny, 1839)
- Subambulacral spines truncated, in three rows of three. Color in life orange red. Eastern Pacific .....  
..... *Narcissia gracilis* A. H. Clark, 1916

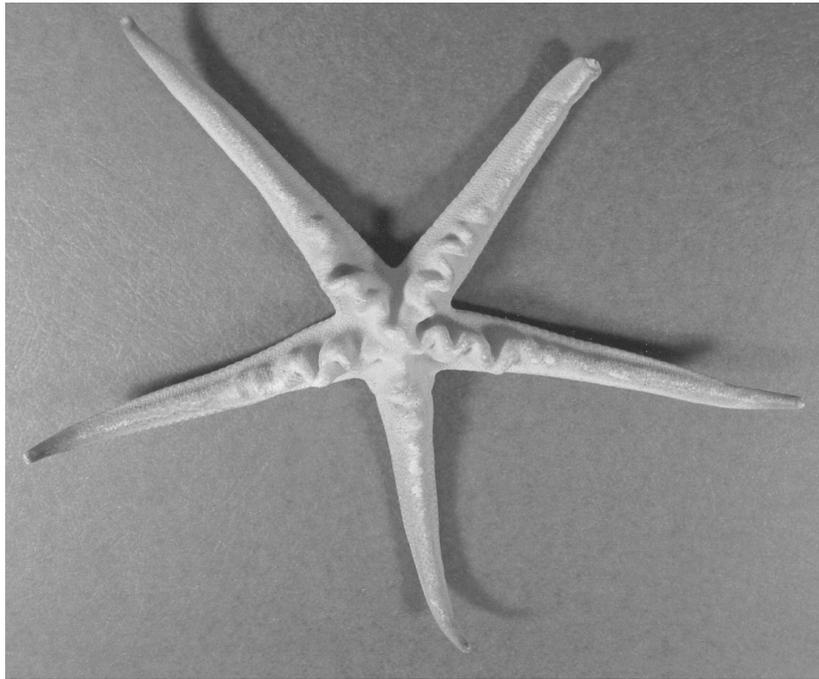
### *Narcissia ahearnae*, new species

Figures 1–4

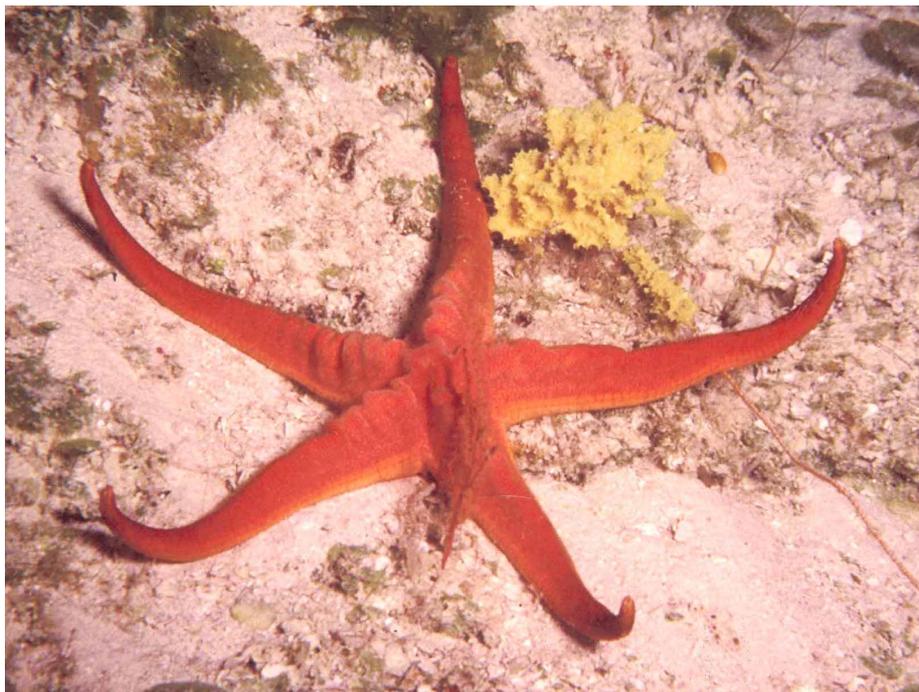
Diagnosis: Conspicuous, thick, carinal ridge, undulating in horizontal and vertical planes, at least from center of disc to mid-point of arms. Color red to scarlet, lighter below. Western Atlantic.

Material Examined: HOLOTYPE, Catalogue No. HBOM 073:00531, Harbor Branch Oceanographic Museum, 5600 U.S. 1 North, Fort Pierce, Florida 34946. *R/V Seward Johnson, Johnson-Sea-Link I* Dive 2011, Off Cockburn Town, San Salvador, The Bahamas, 24°03.72'N, 74°32.91'W, 130 meters, 25 April 1987, 1 specimen, collected by M. Adams. PARATYPES: (1) Catalogue No. HBOM 073:00532, Harbor Branch Oceanographic Museum, *R/V Seward Johnson, Johnson-Sea-Link I* Dive 1984, Off Freeport, Grand Bahama Island, The Bahamas, 26°32.89'N, 78° 45.29'W, 87 meters, 8 April 1987, 1 specimen, collected by M. Adams. (2) USNM E12440, 1/3 mile NE of Goat Island, east Andros Island, The Bahamas, 26 February 1971, 54 meters, coral rubble, 1 specimen, collected by Sue Abbott. (3) USNM E09736, *R/V Silver Bay*, off Cape Canaveral, Florida, 27°26'N, 78°57'W, 135 meters, 25 October 1961. (4) UM Catalogue No. 40.487, Eleuthera Island, The Bahamas, top of ledge, 53 meters, 11 September 1972, 1 specimen.

Description: Abactinal surface brick red to scarlet in life (figure 2), actinal surface lighter in color. Disk high, pyramidal, arms five, long, slender, more or less triangular in cross-section. At base, height of arm sometimes equals breadth of arm, but more commonly height is up to 1.5x arm breadth. Carinal ridge (Figure 1) in all specimens elevated, conspicuously undulating in horizontal and vertical planes from center of disk along arms approximately to mid-point of each arm. Ridge 3–4mm thick, composed of carinal plates along with several series of abactinal plates. Marginal plates conspicuous when specimen viewed from above, forming and defining ambitus; marginals covered with granules. Anus slightly off-center, protected by several spatulate spines. Madreporite typical of genus, placed approximately one-third of distance from apex to interradial margin.



**FIGURE 1.** *Narcissia ahearnae* new species, Holotype. Longest arm 110 mm.

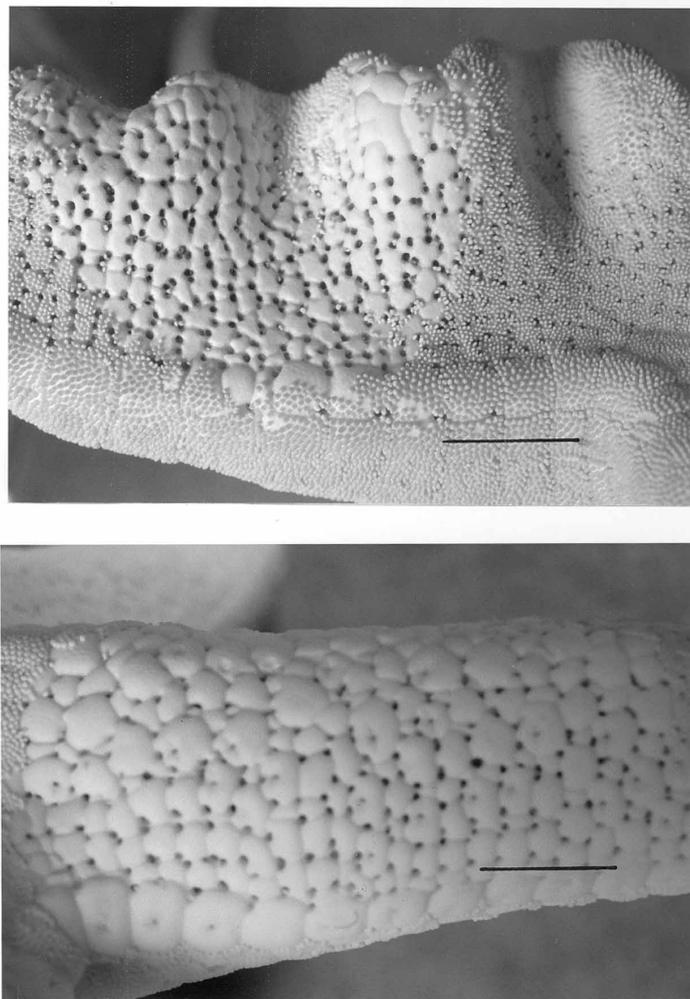


**FIGURE 2.** *Narcissia ahearnae*, new species, Paratype (1) HBOM 073:00532, photographed *in situ* from the *Johnson-Sea-Link* submersible, Grand Bahama Island, 87 meters. Longest arm 153 mm.

Abactinal plates vary greatly in size, not typically in any regular series; at about mid-point of arm about 17 plates traverse abactinal arm surface. Granules on abactinal plates evenly but closely spaced, discrete, not forming a mosaic; granules usually short, peg-shaped, about 330  $\mu\text{m}$  high and 200  $\mu\text{m}$  in diameter, tapering distally to a blunt to sharp point. Some granules rounded distally, but most are pointed. Papulae single or paired, extremely numerous abactinally in radii and interradii, about seven papulae per  $\text{mm}^2$  (Figure 3, Upper). Papulae also present in small numbers among actinolateral plates. No pedicellariae found.

**TABLE 1.** Dimensions, proportions, and other information on type series of *Narcissia ahearnae*.

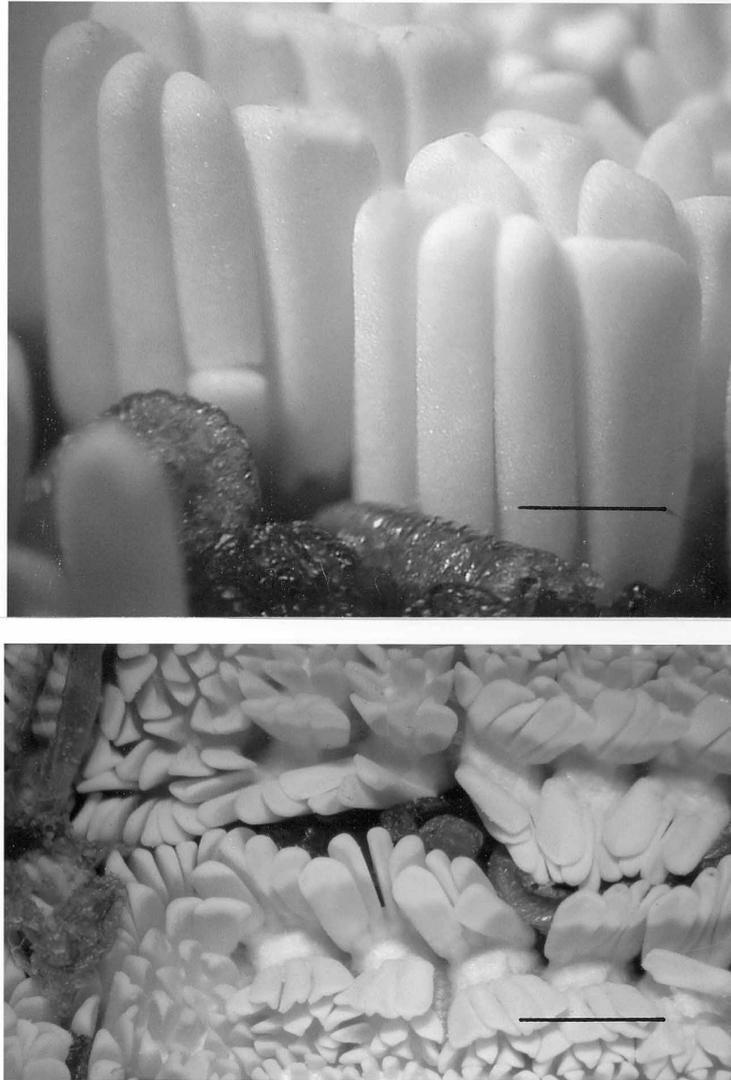
Specimen	Arm length (longest), mm	R/r	Inferomarginal plates per arc
Holotype, HBOM 073:00531	110	7.3/1	111
Paratype (1) HBOM 073.00532	153	7.3/1	134
Paratype (2) USNM E12440	135	6.1/1	N/A
Paratype (3) USNM E09736	90	5/1	118
Paratype (4) UM 40.487	93	6.2/1	N/A



**FIGURE 3.** Upper, base of an arm of Holotype of *Narcissia ahearnae* new species, showing marginal plates, abactinal plates, and papular pores. Lower, base of arm of *N. trigonaria* Sladen, showing marginal plates, abactinal plates, and papular pores. Scale line in both figures, 5 mm.

Actinal plates in six rows near arm base, rows disappearing rapidly along length of arm; a single row extends to distal extremity of arm. Granules on actinal plates similar to those on abactinals. Adambulacral furrow spines (Fig. 4, Upper) four, flattened, blade-like, not tapering, approximately 1.5 mm long and 0.3 mm wide; distal tips slightly thickened; oralmost spine in each group of four slightly wider than others. Towards mouth, furrow spines (Fig. 4, Lower) become broader, sometimes almost discoidal, with distal ends thicker. Subambulacral spines in two to three rows of four each, similar to adambulacral furrow spines in length, but slightly wider.

Depth Range: In Florida and Bahama Islands 53–135 meters. At Grand Cayman, British Virgin Islands, observed but not collected at 113–126m (T. Engen, personal communication).



**FIGURE 4.** *Narcissia ahearnae* new species. Upper, two groups of four adambulacral spines on adjoining adambulacral plates. The mouth lies to the right of the figure. Scale line, 400  $\mu\text{m}$ . Lower, groups of adambulacral spines near mouth. Mouth is on left side of the figure. Scale line, 2 mm.

**Distribution:** Known from off Cape Canaveral in Florida, The Bahamas, and Grand Cayman, British Virgin Islands.

**Ecology:** All Florida and Bahamas specimens were found on hard substrates with a thin veneer of fine sediment. T. Engen (personal communication) found two specimens in the Grand Cayman Islands on a “steep slope with much sediment and sand”.

**Etymology:** This species is named for Cynthia Ahearn, Museum Specialist and Collections Manager of Echinoderms at the National Museum of Natural History, Smithsonian Institution, in recognition of her achievements in curation of the echinoderm collection, her research on echinoderms, and in facilitating the research of so many visitors over the years. In regard to visitors, Cynthia and her husband John have opened their home and hearts to numerous short-term and long-term visitors to the Museum, and provided them with substantial assistance in other ways. Without this unfailing generosity on the part of the Ahearns, most of these visitors would not have been able to travel to Washington and study the echinoderm collections. Reverend John E. Miller, who first recognized this beautiful new species, heartily concurs in the selection of this species-name.

**Remarks:** *Narcissia ahearnae* differs markedly from its three congeners in possessing a prominent, ele-

vated, undulating carinal ridge. The coterminously distributed western Atlantic species *N. trigonaria* has a perfectly straight carinal ridge, and the color is consistently “cream blotched with rust red” (Walenkamp, 1976; Clark and Downey, 1992). In addition, in *N. trigonaria*, the marginal plates are inconspicuous, pedicellariae are very common, the abactinal granules are flattened and angular, forming a mosaic pattern, and there are about three papular pores (Figure 3, Lower) per square mm, while in *N. ahearnae* marginal plates are conspicuous, pedicellariae are absent or rare, the abactinal granules are peg-like and pointed, not forming a mosaic, and there are about seven papular pores per square mm.

This distinctive new species is an interesting addition to the shelf echinoderm fauna of the western Atlantic. It is expected that further investigations will greatly expand the known distribution range of this species.

## Acknowledgements

It is a pleasure to thank then Chief Scientist John E. Miller (formerly of Harbor Branch Oceanographic Institution), and colleagues Gordon Hendler (Los Angeles County Museum of Natural History) and Porter M. Kier (retired; formerly of the National Museum of Natural History, Smithsonian Institution), for their friendship and collegiality during the series of more than 100 submersible dives we made in the Bahamas and southern Caribbean from 1983 to 1989. These dives revealed much about the bathyal echinoderms of the region. I am grateful to Laura Siemon, formerly of the Harbor Branch Oceanographic Institution, for assistance with collections and related data, and to Nancy Voss, Curator of the Marine Invertebrate Museum, Rosenstiel School of Marine and Atmospheric Science, University of Miami, Florida, for information on collections in her care. I thank NMNH Research Collaborator Doris J. Vance for photographing specimens, and for help in various other ways. Harbor Branch Oceanographic Institution, Inc., kindly provided access to data and images. I am also grateful to two reviewers for their constructive comments. This is Contribution No. 674 from the Smithsonian Marine Station at Fort Pierce, Florida.

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