

**THE CORAL SIDERASTREA
RADIANS
AND ITS POSTLARVAL
DEVELOPMENT**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649486342

The Coral Siderastrea Radians and Its Postlarval Development by J. E. Duerden

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J. E. DUERDEN

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BY

J. E. DUERDEN.



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WASHINGTON, U. S. A.
PUBLISHED BY THE CARNEGIE INSTITUTION,
DECEMBER, 1904.

210819

CARNEGIE INSTITUTION OF WASHINGTON,
PUBLICATION No. 20.

STARBUCK LIBRARY

Press of GIBSON BROS.,
WASHINGTON, D. C.

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PREFACE.

The researches of the late Prof. H. de Lacaze-Duthiers (1873, 1897), Prof. G. von Koch (1882, 1897), and Prof. H. V. Wilson (1888) have made us acquainted with many of the early stages in the development of corals. They have served to establish such fundamental facts as the ectodermal origin of the madreporarian skeleton and the sequence of the primary mesenteries and septa, results which must ever possess an importance to the student of the Anthozoa. But for an understanding of many of the problems of adult coral morphology, especially those associated with the relationships of the mesenteries and septa, it has long been desirable that developmental stages later than those studied by the authors mentioned should be investigated. While resident in the West Indies I have followed day by day the postlarval growth of the coral *Siderastrea radians* (Pallas) for a third of a year, and secured the development of the tentacles and septa as far as the third cycle, and that of the mesenteries to the completion of the second cycle. The results are herein set forth.

In many respects the mature polyps of *S. radians* are of peculiar morphological interest, but have never been fully described. An account is therefore first given of the external characters and internal anatomy of the adult colony, and afterwards of the development of the young polyp from the free-swimming larva. The manner of appearance and the relationships of the tentacles, mesenteries, and septa are considered at some length, their establishment being the principal object of the investigation.

The work was commenced while Curator of the Museum of the Institute of Jamaica, continued as Bruce Fellow at the Johns Hopkins University, Baltimore, and concluded at the American Museum of Natural History, New York. For facilities afforded in carrying out the investigations I am under obligations to the Board of Governors of the Institute of Jamaica, Prof. W. K. Brooks, of the Johns Hopkins University, and Prof. H. C. Bumpus, of the American Museum of Natural History. The research has been assisted by an appropriation from the Carnegie Institution.

J. E. D.

UNIVERSITY OF MICHIGAN, ANN ARBOR, MICH., U. S. A.,
11TH NOVEMBER, 1904.

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THE CORAL *SIDERASTREA RADIANUS* AND ITS POSTLARVAL DEVELOPMENT.

By J. E. DUERDEN.

INTRODUCTION.

The following are the more important references to and synonyms of this well-known species of coral:

- Madrepora radiana*, Pallas, Elench. Zooph., 1766, 323.
Madrepora astroites, Linnæus, Sys. Nat., ed. XII, 1767, 1276.
Madrepora galaxea, Ellis & Solander, Nat. Hist. Zooph., 1786, 168, pl. 47, fig. 7.
Astrea galaxea, Lamarck, Syst. Anim. & Vert., 1801, 371; Le Sueur, Mém. Mus. Hist. Nat. Paris, t. VI, 1800, 285, pl. xvi, fig. 13; Lamouroux, Expos. Méth., 1821, 60, pl. XLIX, fig. 7.
Astrea radiana, Oken, Lehrb. Naturgesch., 1815, bd. 1, 65; Milne-Edwards & Haime, Hist. Nat. Cor., 1857, t. 11, 506; Gregory, Quart. Journ. Geol. Soc. Lond., vol. 11, 1855, 277.
Astrea (Siderastrea) galaxea, de Blainville, Dict. Sci. Nat., 1830, tom. LX, 3351; Man. Actin., 1834, 370.
Astrea astroites, Ehrenberg, Corall. roth Meer, Abhandl. kongl. Akad. Wiss. Berlin, 1823, 319.
Siderina galaxea (pars), Dana, Zooph. Wilkes Expl. Exped., 1846, 218, pl. x, figs. 12, 12a, 12c.
Siderastrea galaxea, Milne-Edwards & Haime, Ann. Sci. Nat., 1850, tom. XIII, 159; Pourtales, Deep-Sea Corals, Ill. Cat. Mus. Comp. Zool., no. IV, 1871, 81; Florida Reefs, Mém. Mus. Comp. Zool., 1880, vol. VII, pt. 1, pl. XL, figs. 14-21, pl. XV, figs. 1-12; Quesel, Reef Corals, Challenger Reports, 1886, vol. XVI, 113; Heilprin, Proc. Acad. Nat. Sci. Phila., 1890, 305.
Siderastrea radiana, Verrill, Bull. Mus. Comp. Zool., vol. 1, 1864, 55; Vaughan, Bull. U. S. Fish Commission 1900, vol. 2, 1901, 309, pl. xv, pl. xvi, fig. 2; Samm. der Geol. R.-Museums in Leiden, 1901, Ser. 11, bd. 11, 61; Verrill, Trans. Conn. Acad. Science, vol. 25, 1901, 153, pl. XXX, fig. 1.

The generic term has been thoroughly discussed in the recent papers of Gregory (1895, p. 278), Vaughan (1900, p. 154), and Verrill (1901, p. 88). Vaughan, fortunately for coral taxonomy, shows that the name *Astraea*, first used binomially as a coral genus by Lamarck in 1801, can not be retained in madreporarian terminology, having been employed by Bolten in 1798 for a group of gastropod shells. In this conclusion he is supported by Verrill. The next generic name available is the *Siderastrea* of de Blainville, 1830. The specific term *radiana* of Pallas (1766) has priority of the *galaxea* of Ellis & Solander (1786), and Vaughan holds that the *Madrepora astroites* of the twelfth edition of Linnæus is the same as *M. radiana* of Pallas.

The species is very common throughout the West Indies, and is recorded