

SUPPLEMENT TO  
**Report on the Sponge Fishery of Florida and the  
Artificial Culture of Sponges.\***

By

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SINCE the Report on the subject of the Artificial Culture of Sponges was published, some further information of importance relating to the subject has been courteously supplied by the Acting Commissioner of the United States Commission of Fish and Fisheries. This information is in the form of a letter to the United States Commission from Mr. Ralph M. Monroe, of Coconut Grove, Biscayne Bay, Florida, to whom the Acting Commissioner refers as "an intelligent and energetic man, whose statements, we think, can be given entire credence," wherein this gentleman gives a detailed account of some experiments conducted by himself at Biscayne Bay, during the years 1889, 1890 and 1891.

The letter, which is published by permission of the Acting Commissioner, is as follows:—

"COCOANUT GROVE, DADE CO., FLORIDA,  
*March 20th, 1895.*

"U. S. Fish Commission, Washington, D. C.

"DEAR SIRS,—Agreeably to request made by you for a brief report on my experiments in sponge culture, I am pleased to submit the following:

Having had my attention called to the possibilities of sponge culture by Mr. J. Fogarty, of Key West, a gentleman of much experience as a buyer and packer of the article, and who had a few years previously successfully grown a few samples from cuttings, I began work in the same line in November, 1889, at Biscayne Bay, a place admirably

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adapted to such experimenting, far more so than any other place on the coast, having a greater range of bottom from the oozy marls of the inner lagoons to the hard outer coral reef, waters of all degrees of density, from the Gulf Stream to fresh, and currents to suit. Being already well provided with a vessel, boats, sponge hooks, and water glasses, the question of suitable material for attaching to and sinking the cuttings to the bottom gave some trouble, although apparently a simple problem. Saplings of white wood which were plentiful, fairly proof against worms, and heavy enough to retain their place in strong tide-ways, were finally chosen. They were about 12 feet in length, with a cross piece at one end to prevent rolling over. The cuttings were fastened to them by various contrivances, wedged into holes with pegs, wires around the pole, etc., but the quickest, if possibly not the best, as it afterwards turned out, was short pieces of brass wire doubled and driven into the pole with a peculiar grooved punch, which could be done rapidly. At other stages of the experiment I used bamboo stakes, long double lines of twisted wire connected by cross pieces of white wood, with the cuttings inserted between the strands, also flat pieces of coral rock with drilled holes and wooden wedges. Galvanized iron in any form did not answer, especially wire, as it quickly corroded. Most of the first plantings were lost by its use, and I am also inclined to condemn brass wire on account of the possible poisonous effects of the salts formed on it, although some of the best results were obtained when it was used. Having prepared the sinkers and hooked up sufficient sponge for several days' work, placing them in nets hung from the side of the schooner, the process was as follows: Take the poles or other sinker material in a small boat, two kedge anchors, a small long line, and the sponge in buckets in which the water was changed every few minutes (in this connection, it has been generally understood that exposure to air and sun for even a few minutes was fatal to a sponge, and at first I was very careful in this respect: subsequently I found that several hours of such exposure did not hurt them to any extent: stagnant water, however, will kill them in a very short time), a cutting board and knife, the latter very thin and re-sharpened often, owing to the calcareous matter embedded in the sponge. Having reached the locality which was at first selected by the natural sponge growth already on it, the two kedges are let go at either end of the long line, and by hauling along this line the plantings could be kept quite regular, and when finished were marked by range stakes set up on the adjacent dry banks. The depth of water ranged from eight feet to less than one foot at low tide, at which latter depth many fine sponges are found. By the use of a water glass the plantings could be easily observed at any time without disturbing them. In cutting the sponge it was done as

nearly as possible in a line with the radial circulating canals, and that each piece should have on it a part of the outer cuticle. As many were not cut this way, and lived, it may not be at all necessary. Each piece was about one inch square on top and somewhat more in length, coming to a point, averaging 25 to a sponge. In cutting care was taken not to express the natural juices or milk, and quickly attaching to the sinkers, were immediately put into the water. The poles held on an average 12 pieces placed 12 inches apart, and with one assistant I was able to plant about 200 cuttings per day. With a more suitable boat having a well to keep the sponge in, and another assistant, I could easily plant from 600 to 800.

This work was continued with intervals from November, 1889, until June 11, 1891, with various results, under all the conditions of bottom, depth, current, etc. With but few exceptions, the sponge survived the cutting process and began a good healthy growth, to be afterwards lost or destroyed in various ways. In many cases, notably one lot planted back of Elliott's Key in 4 feet of water on hard bottom, 75 per cent. lived and in 6 months had doubled in size; these were mostly taken up before reaching maturity, as a gale would have swept them away, and did so with those that were left. Mature specimens were gotten from many of the other plantings, but the average loss from defective fastenings and other causes was greater. The results can be summed up as follows:

**Material for anchoring cuttings:** While very many things other than those used suggested themselves in the progress of the work, I kept strictly within the limits of what was economic and practical, therefore poles and stone seemed best suited, preferably the former arranged so as to be elevated a short distance above the bottom to avoid smothering with silt, and to avoid the coral, etc., which is apt to grow in with the sponge. Fastenings of just the right character have yet to be invented.

**Location:** Anywhere within the bays and lagoons free from heavy sea, too strong current, and too much fresh water, and in moderate depths for easy handling and observation.

**Growth:** This is faster in strong currents, but shape is apt to be poor and quality harsh. This point, however, is not fully determined. Under favourable conditions the cuttings doubled their size in 6 months; consequently, 18 months to 2 years will produce marketable sponge. The sheepswool was the only one of the useful kinds experimented on, although a few cuttings of velvet, grass, and others, seemed to thrive and do equally well. It is quite possible that with State protection to the planters, and better methods to be determined upon by further experiment, sponge culture might be quite profitable. My belief is, gained in oyster culture from spawn, that a similar method with sponge will

eventually prove the correct one, but until more is known of sponge biology it would be useless to suggest methods, notwithstanding the fact that several points in connection with it have been to my mind quite clearly demonstrated. Unfortunately, having had to turn my attention to matters of more immediate pecuniary return, the subject has remained in abeyance.

Very respectfully yours,

(Signed) RALPH M. MONROE."