The Origin of the Florida Sponge Fishery

W. N. WITZELL

. . . I drink no more than a sponge.
— Francis Rabelais, 1495–1553

What has holes, and still holds water?
— Children's riddle

Introduction

Sponges were used domestically by Key West, Fla., pioneers soon after the town was settled in 1822 (Collins, 1887). Fortunately, around 1852, it was discovered that Florida sponges were able to compete with imported sponges from the Mediterranean, and they soon became commercially successful (Moore, 1910). These Florida-caught sponges were shipped to markets in New York and sold for domestic cleaning and personal hygiene, as upholstery stuffing and packing material, and for cleaning military cannons.

Sponging quickly became the most important fishery in Key West and, next to the manufacture of fine cigars, was the second most important industry in the Florida Keys (Townsend, 1900). Key West maintained the Florida sponge monopoly until 1870 when vessels began fishing along the west Florida coast (Rathbun, 1887). The sponge fishermen during this early period were almost all Bahamian citizens of African descent (Cobb, 1904), who fished Florida waters for both sponges and sea turtles and enjoyed the economic opportunities in America that did not exist in the Bahamas at that time (Moore, 1910; Witzell, 1994).

The traditional Florida sponge fishery flourished for years and remained important, both culturally and economically, until 1905. Then the introduction of hard helmet diving at Tarpon Springs forever changed the fishery (Collins, 1887; Rathbun, 1887; Schroeder, 1924). This paper describes the origin of the Florida sponge fishery from 1852 until the advent of helmet diving in 1905.

Biology

Thousands of sponge species are found throughout the world thriving in habitats ranging from shallow tropical seas to the deep polar abyss. The sizes, shapes, colors, and appearances of the various species are as diverse as their habitats, where they provide shelter to hosts of small fish, worms, shrimps, crabs, and mollusks. Tropical sponges also provide an important food source for hawksbill sea turtles, *Eretmochelys imbricata*, (Witzell, 1983). Live commercial Florida sponges appear like slimy dark brown or black lumps that were said to "resemble heads of decayed cabbage" (Ruge, 1889), and are firmly attached to the rocky substrate in shallow coastal waters by fibrous connective tissue.

Sponges are primitive multicellular colonies that resemble strange terrestrial plants. There are three principal components of a sponge: small chambers, a system of canals, and a fibrous skeleton that makes up most of the body. The fibers are joined together in a complex framework that supports the soft, loosely connected tissues and are pierced by many small pores (Fig. 1). These pores open into chambers that are lined with layers of flagellated cells that are constantly in motion. This motion creates a vacuum that sucks water into the chambers and is expelled through the osculum at the top. Microscopic

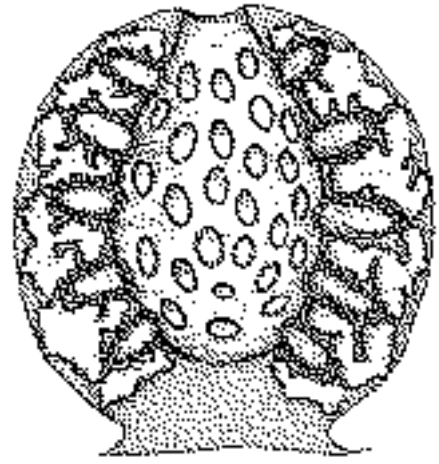

Figure 1.—Section through a sponge showing the small chambers, canals, and fibrous skeleton (Galtsoff, 1969).

W. N. Witzell is with the Miami Laboratory, Southeast Fisheries Science Center, National Marine Fisheries Service, NOAA, 75 Virginia Beach Drive, Miami, FL 33149.

particles of planktonic food and oxygen are brought in with the water and are ingested by the cells in the chambers. All sponges require large quantities of water to live, and a specimen 15 cm in diameter may pump over 375 liters/hour.

Sponges are able to reproduce sexually through the production of eggs and sperm or asexually by budding and regeneration. In shallow waters, sponges are able to restore themselves when damaged by violent surf and strong currents, and a large specimen may be cut into pieces that will grow into individual sponges under proper conditions. It is owing to this regenerative power that sponges were experimentally cultivated.

The skeleton of a good commercial Florida sponge is compressible, resilient, tough, and capable of absorbing large quantities of water. Water absorption is determined by comparing the dry and wet weights. A good sponge is capable of holding water 25–31 times greater than its dry weight. There were apparently several Florida sponges that met these requirements and were commercially used in the early fishery, the most important species being the sheepswool, *Hippiospongia lachne*. The other sponges were a combination of many unidentifiable species commonly called yellow, grass, velvet, and glove sponges.

Sponge Fishery

The sponge fishing grounds were originally described as two separate geographical types, covering three separate fishing grounds (Fig. 2): the keys fishery and the bay fishery (Collins, 1887; Rathbun, 1887; Brice, 1898). The keys fishery extended south from Key Biscayne to Key West and included all the Florida Keys and associated reefs, bays, and sounds. The bay fishery is located in two areas: Anclote Keys to Cedar Keys, and north of the Cedar Keys to St. Mark's in Apalachee Bay. The depths typically fished in this early fishery ranged from 2 to 15 m over coralline hard bottom or coral reefs, covering an area of just over 3,000 square miles. The Florida sponge fishery was conducted year round, weather permitting, but the principal season was during the calmer summer months. The larger vessels from Key West made 2-month trips three or four times a year to the bay grounds, and smaller vessels made several 1-month trips to the keys grounds (Cobb, 1904). Bay boats based in Tarpon Springs and Apalachicola averaged five trips a year, each lasting 2 months.

The sponge fishery vessels (Fig. 3) were beamy, shallow draft, center-board schooners and typically ranged from 5 to 35 tons (Collins, 1887; Rathbun, 1887). The Key West sponge fleet consisted of 86 vessels in 1879, increasing to 119 in 1895, and were reportedly the pride of Key West because they were trim and fast (Rathbun, 1887). The vessels built at Key West were designed to travel in the shallow Florida waters and were framed with a local red wood called "maderia" and planked with yellow pine. The spars were either hard pine, spruce, or white pine. Each vessel, depending on size, carried a number of small 4–5 m skiffs (Fig. 4). These skiffs had the greatest beam and lowest freeboard amidships, which made it easier for the "hooker," the man who hooked the sponges from the bottom with a special hooking device.

The vessels sailed to the sponge grounds, and the skiffs were deployed at dawn. Two men were usually in each skiff, one sculled the skiff across the shallows and the hooker watched for sponges. In calm water the hooker could easily see the sponges on the bottom, but when the wind disturbed the surface

Figure 2.—Florida Bay and Keys sponge fishing grounds.

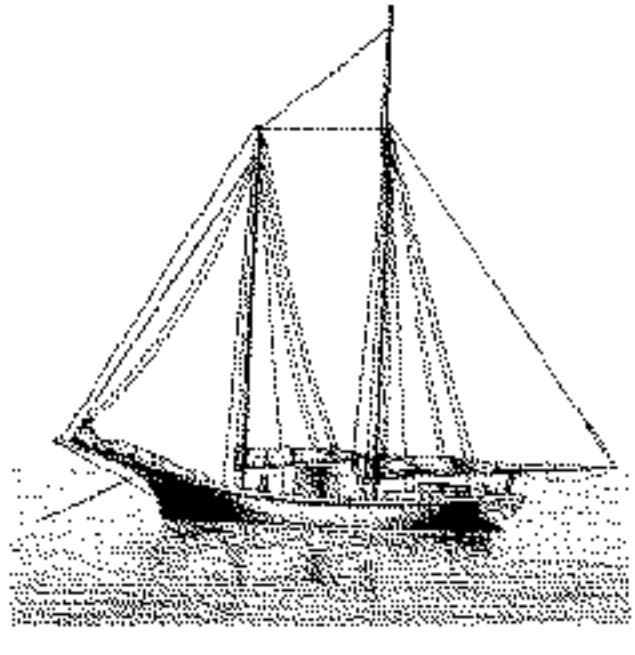

Figure 3.—Typical Florida sponge vessel (Collins, 1887).

he would dump some nurse shark liver oil onto the water to smooth out the surface and improve his visibility. For deeper, or murky water, the hooker had a water tight box fitted with a glass bottom that he used for seeing underwater. The glass box was introduced in 1870 and soon became extensively used throughout the fishery. The hooker carried a 3–7 m wooden pole with a three-pronged iron claw (Fig. 5) attached to the end. With this device, the hooker cautiously hooked the sponge, carefully detached it from the substrate, and brought it to the surface for the sculler to unhook and store in the skiff bottom. The dexterity with which these fishermen wielded these long heavy poles to grapple grapefruit-sized sponges under several meters of water must have been remarkable. The sheepswool sponge was supposedly the most difficult to detach from the rocky substrate, while yellow sponges were the easiest to detach. When a small sponge was attached to a large one it was pulled off and thrown back in the water. It was believed that these sponges did not reattach, but rolled around on the ocean floor with the currents and were called "rolling Johns" (Rathbun, 1887).

The hooker spent long hours on his knees peering through the glass box while his partner slowly sculled the skiff (Fig. 6). A large sponge was often fastened to the hooker's chest to act as a cushion while he leaned on the gunwale. In spite of this, the long hot hours, days, and weeks of this awkward position often resulted in painful injuries (Moore, 1910). The hard labor under a scathing Florida sun, combined with the ubiquitous mosquitoes and gnats, must have been torturous. The fisherman's only recourse was to cover up as much as possible and wear wide-brimmed hats.

The sponge fishermen started work at dawn, returned to the vessel at noon to unload and have lunch, then fished until dark when they returned to unload again and have supper. The cook maintained the vessel in the vicinity of his skiff fleet, prepared the sponges on deck for processing, and prepared meals on a stove that was boxed up on deck between the masts. The sponge fishermen undoubtedly took every opportunity to ensure a profitable trip by maximizing fishing effort, and they apparently fished sea turtle nets nearby while sponging (Witzell, 1994).

Figure 4.— Typical Florida sponge skiff (Collins, 1887).

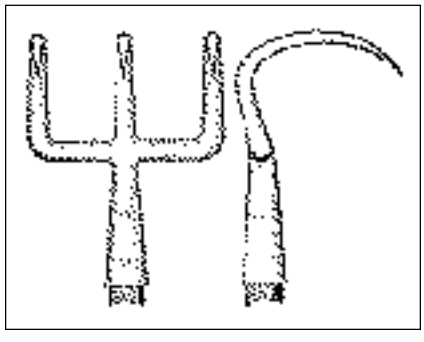

Figure 5.—Three pronged iron sponge claw (Moore, 1910).

Figure 6.—Florida sponge skiff with sculler at the oar and the hooker looking for sponges through the glass box (Cobb, 1904).

Fresh sponges placed on the deck of the vessel quickly died and began to decompose, oozing a pungent "gurry" that constantly drained across the decks and through the scuppers. Consequently, although these vessels were quite handsome, their foul odoriferous nature undoubtedly made them unwelcome guests at many anchorages (Rathbun, 1887). Once a week, usually Friday evening, the vessel would stand inshore and unload the catch into shallow enclosures called sponge "crawls" (Fig. 7). Here the sponges soaked while the previous week's catch was beaten with a short wooden club called a "bruiser" and cleaned. The sponges were then strung on rope and hung on the vessel's rigging to dry. A watchman was detailed to watch these crawls during the vessel's absence to thwart thievery. The watchman's lonely vigil on some remote key likely was filled with long hours of abject boredom, punctuated with the summer heat and biting insects. Each crew member was assessed $0.35 /trip to pay the watchman's fee (Cobb, 1904).

A successful sponge expedition depended on the abundance of quality sponges, good weather, clear water, and the expertise and stamina of the hookers. The sponge fishery was adversely affected by "poisoned waters" which appeared off the Florida west coast in 1844, 1854, 1878, and 1880. This was described as long streaks of noxious discolored water that drifted lengthwise with the tide killing fish and sponges (Collins, 1887; Rathbun, 1887). Initial theories suggested that this was either swamp water from the mainland or due to volcanic gas, but today it sounds suspiciously like red tide. Additionally, natural and man-made disasters made the expeditions challenging, such as the September 1897 hurricane which sank many Key West sponge boats or the prowling Spanish warships that forced the fleet to land their catches at Tarpon Springs (Cobb, 1904).

The vessels landed their catch at Key West (Fig. 8) and sorted the sponges into piles according to size and grade. The dealers would then assemble on the wharf to examine the various lots and then submit a written bid to the vessel owner, who sold them to the highest bidder (Fig. 9, 10). Since the vessel owners furnished the complete outfit, including provisions, they were entitled to half of the gross profits. The rest was divided equally among the crew, with the captain and cook receiving an extra bonus.

Figure 7.—Sponge crawls and sponge fleet at Anclote Keys (Cobb, 1904).

Figure 8.—Landing sponges for auction at Key West (Cobb, 1904).

The auction winner hauled the sponges off in a cart to a large airy warehouse where they were cleaned, trimmed, and thoroughly dried (Fig. 11, 12, 13). They were then graded and packed into bundles for shipment to New York, Philadelphia, and St. Louis. Unfortunately, several dealers became greedy and were accused of unethical practices that were secretly conducted behind closed warehouse doors. These consisted of "liming" and "sanding." Liming was a bleaching process which consisted of soaking the sponges in a solution of lime and seawater to improve their appearance in the marketplace. Although this was a good marketing strategy, the process injured the struc-

Table 1.—Reported Florida sponge landings and value.

Year	Weight (kg)	Value ($U.S.)
1904	144,880	376,185.00
1903	171,422	447,346.00
1902	157,349	344,422.00
1901	179,426	492,740.00
1900	189,661	567,685.00
1899	138,075	367,914.00
1897	150,389	286,040.00
1896	107,190	273,012.00
1895	138,856	386,871.00
1890	166,367	438,682.00
1889	143,591	381,087.00

tural integrity of the sponge and they quickly fell apart when used. Sanding was a fraudulent practice that involved soaking sponges in a saturated solution of seawater and fine sand in order to increase the weight of the sponge bales to be sold in the northeast. Sanding could increase the weight, and subsequent value, of a bale from 25% to even 100%. Needless to say, both of these illegal acts were eventually exposed and discontinued (Rathbun, 1887). Dealers also had a tendency to fill the center of the processed sponge bales with inferior grade sponges that could not have been sold otherwise.

Decline of the Sponge Fishery

The Florida sponge fishery increased steadily from its inception and quickly became the dominant fishery in Key West (Table 1). Florida sponges were also exported to overseas markets as early as 1870 (Stevenson, 1896). However, by 1887 there were fears of overfishing, and experiments were successfully conducted involving artificially propagating sponges from cuttings (Collins, 1887; Rathbun, 1887; Brice, 1898). A small cutting, properly attached to the bottom in a suitable habitat, would supposedly produce a marketable-sized sponge in a year. Although there seemed to be much interest and limited success in propagating sponges, no commercial enterprise was ever formally initiated and the fishermen slowly moved into deeper water in search of new grounds. Sponging was so intense that in 1899 the surplus catch of exceptionally large sheepswool sponges were sold to the U.S. and British armies and navies for cleaning guns (Smith, 1901).

The fishery seemed to have plateaued near the turn of the century, as supplies could not meet demand, and Florida enacted legislation that prohibited diving for sponges or taking sponges less than 4 inches in diameter, protected prospective sponge cultivators, and placed a $25 fee for non-U.S. citizen sponge fishermen (Brice, 1898). In spite of this legislation to protect the fishery, Smith (1898) felt that the inshore sponge grounds were heavily overfished. Fortunately, the introduction of Mediterranean hard-hat diving in 1905 at Tarpon Springs opened deeper sponge beds unavailable to hooking, and the Florida sponge fishery flourished until the sponge blight in 1939.

Florida's sponge fishery never fully recovered from the 1939 sponge blight

Figure 9.—Silent sponge auction at Key West (Cobb, 1904).

Figure 10.—Silent sponge auction at Anclote Keys (Cobb, 1904).

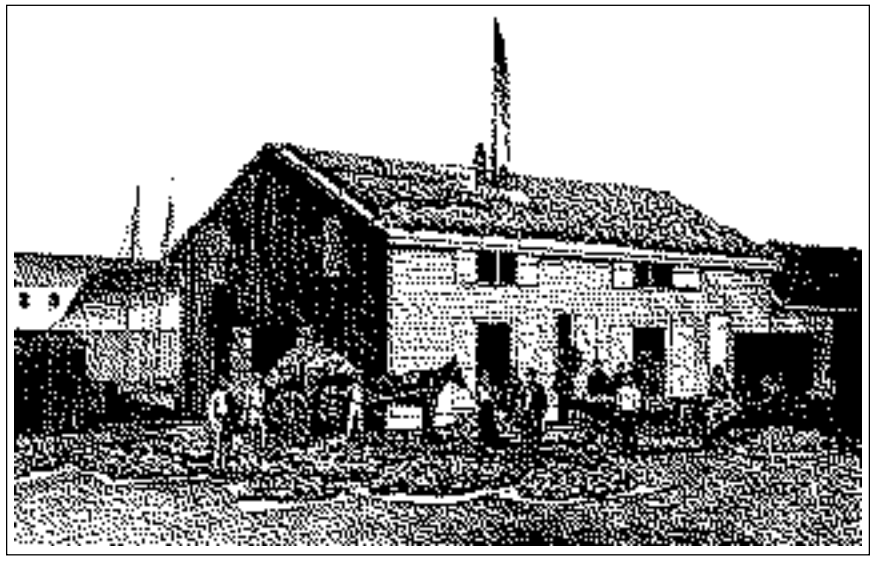

Figure 11.—Sponges drying after auction (Rathbun, 1887).

Figure 12.—Sponges drying at Key West sponge yard (Cobb, 1904).

Figure 13.—Warehouse where sponges are cleaned and baled for shipping to the northeast markets (Rathbun, 1887).

before the introduction of artificial sponges in the 1950's which affected the sponge market. Today, some Florida sea sponges are still harvested by hook and sold to specialty bath shops, tourists, and to home improvement centers as paint applicators.

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