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Identification and Description of the Common Sponges of Jeffreys Ledge as an Aid in Field Operations

by

Kevin McCarthy

April 2004

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by

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Foreword

In November 2003, Jackie Riley, the librarian at the Northeast Fisheries Science Center's Woods Hole Laboratory, came across several old unpublished documents, and asked me whether we should keep or toss each one. This brief document is one of the "keepers."

The information in this document is based on the pre-1978 cumulative in-situ observations and photographic records of diver-scientists with the long-defunct Northeast Fisheries (Science) Center, Manned Undersea Research and Technology Program (MURT), which was effectively the forerunner of NOAA's current National Undersea Research Program. The author, Kevin McCarthy, was a junior member of the MURT dive team when he authored this document in February 1978.

At a surface level, this document is only a rough identification guide to some northern sponges. At a deeper level, it is apparently the earliest known species-of-occurrence list for sponges at Pigeon Hill – which is now a long-term environmental monitoring station on Jeffreys Ledge in the Gulf of Maine. In our current era of concern over biological diversity and the effects of climate change on such, these older species-of-occurrence lists are becoming valuable benchmarks for measuring change.

Interestingly, this document notes – based on in-situ observations and photographic records – the occurrence of six species of sponges not otherwise listed as occurring at Pigeon Hill in the most authoritative publication on such matters: "Ecosystem Definition and Community Structure of the Macrobenthos of the NEMP Monitoring Station at Pigeon Hill in the Gulf of Maine" (*NOAA Technical Memorandum NMFS-F/NEC*-14; 1982; 143 p.).

Jon A. Gibson, Biological Sciences Editor
Northeast Fisheries Science Center
Woods Hole, Massachusetts
December 16, 2003

Background

The sponges are a significant constituent of the benthic invertebrate community on Jeffreys Ledge, an underwater ridge in the southern Gulf of Maine. At the Pigeon Hill study area on Jeffreys Ledge, the encrusint forms of sponges often cover 30-60% of the available rock substrate. A number of the sponge species cannot be identified from photographs alone, and will need to be collected for identification in the lab based on spicule size and composition.

The growth forms of sponges may vary considerably with environmental factors such as available substrate, currents, etc. The coloration and distinct form of many of the sponges on Pigeon Hill are distinct enough, though, to enable field identifications. Without collecting and more careful examination, however, the following identifications and descriptions are tentative, and should be considered as such.

Species Identifications

The following species have been observed and/or photographically documented on Jeffreys Ledge: *Apoysilla glacialis*, *Halichondria panicea*, *Haliclona oculata*, *H. palmata*, *Iophon nigricans*, *Phakellia ventilabrum*, *Polymastia infrapylosa*, *P.* spp., *Subertechinus hispidus*, *Tedania suctoria*, *Tentorium semisuberites*, *Trichostemma hemisphericum*, and *Weberella bursa*.

Species Descriptions

***Apoysilla glacialis*:** Usually found on the vertical surfaces and overhangs of boulders. Encrusting growth form. Bright yellow coloration. Surface is covered with numerous tent-like projections (conulose surface). Oscula are not readily apparent.

***Halichondria panicea*:** The crumb of bread sponge. Generally forms irregular masses. Yellow to brown coloration. Often is green tinged due to presence of algae, probably symbiotic. The oscula are on papillae which often form tubular chimneys 1-2 cm in height.

***Haliclona oculata*:** The eyed finger sponge. Usually found on horizontal rock surfaces as isolated individuals. Erect, solitary, often reaching heights of approximately 25 cm. Yellow to brown coloration. Forms upright bushy colonies composed of many close-set, finger-like branches supported on a slender stalk. Numerous small oscula are scattered over the surface.

***Haliclona palmata*:** This species has not been photographically documented; however, from visual observations, it is suspected to occur on Jeffreys Ledge. It appears much the same as *H. oculata*, but has flatter, more-laminate branches. It does not attain the large size of *H. oculata*, and is purple in color.

***Iophon nigricans*:** Found encrusting the brachiopod *Terebratulina septentrionalis*. Color is brownish white to pink, turning black when preserved in alcohol.

***Phakellia ventilabrum*:** Found as erect, solitary individuals. Cup shaped, often with a short slender stalk. The color is pale yellow to brown. The oscula are minute and are scattered over the entire surface. Fibers can usually be seen near the surface. There is a strong possibility that not all of the large vasiform sponges on Jeffreys Ledge are this species.

***Polymastia infrapylosa*:** A globose species, ranging from approximately 5 to 10 cm in diameter. Yellow in color. Minute oscula are scattered over the surface on raised papillae. This *Polymastia* species can be recognized by its characteristic pylose edge.

***Polymastia* spp.:** Several *Polymastia* types are very common on Jeffreys Ledge; however, at present their species identification remains uncertain. Their general body form and coloration are much like those of *P. infrapylosa*. On some species, the papillae are fine and net-like, and there is a plush of brown spicules. *P. mammilaris*, *P. andrica*, and *P. robusta* are three tentative species identifications.

***Subertechinus hispidus*:** A semihemispherical species, ranging from approximately 2 to 7 cm in diameter. Numerous conspicuous oscula are located in an apically oriented depression. The color of this apical region is yellow to light brown. With exception of this apical region, the entire surface is covered with a plush of dark brown spicules (hispid surface). The sponge is capable of contraction so that all that is seen is the outer covering of the spicules. This sponge is very common on Jeffreys Ledge and has been previously misidentified as *Craniella gravida*. Based on photographs alone, Dr. W. Hartman (Yale University) tentatively identified this species as *S. hispidus*.

***Tedania suctoria*:** This species' characteristic appearance makes it difficult to confuse it with any other sponge that we have observed on Jeffreys Ledge. Encrusting growth form. Brick red coloration. The surface is covered with many conspicuous ostia and oscula. Without spicule preparations, this species could not be positively identified. Based on photographs alone, Dr. W. Hartman (Yale University) tentatively identified this species as a variant growth form of *T. suctoria*.

***Tentorium semisuberites*:** A small globose species, erected into a column approximately 2 cm in diameter and 2-3 cm long. Summit is rounded with several small oscula tubes. Surface is capable of contraction, and is smooth when expanded and uneven when contracted.

***Trichostemma hemisphericum*:** A globose species, ranging from approximately 5 to 10 cm in diameter. Yellow in color. Related to, and difficult to distinguish from, *Polymastia*. The papillae are more knob-like than those of *Polymastia*. The summit of each papilla may have a pinhole-like osculum; however, it is extremely difficult to see without magnification.

***Weberella bursa*:** A *Polymastia* relative. Some of the sponges of Jeffreys Ledge with the same general growth form and coloration as *Polymastia*, but with fine net-like papillae, may be *W. bursa*.

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