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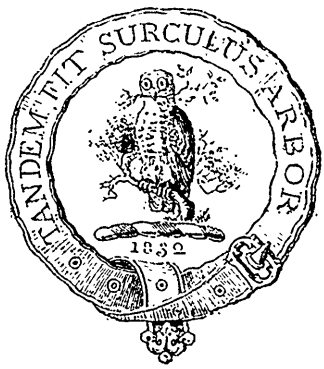

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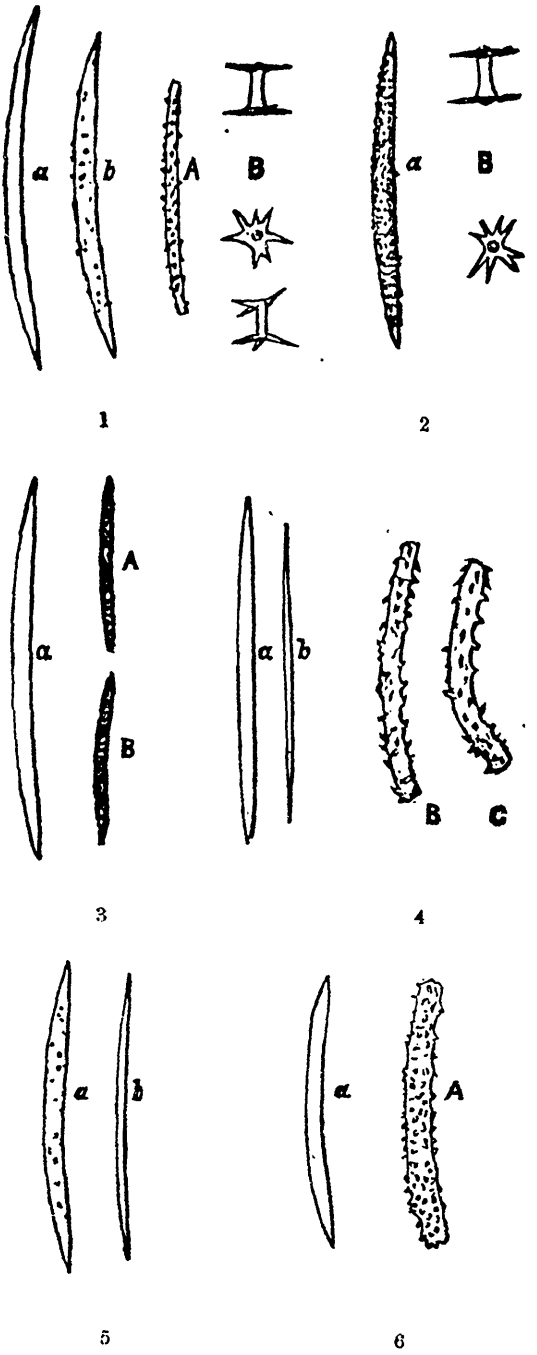

Figs. 1 & 5. *Spongilla stagnalis.*
" 2. " *asperrima.*
" 3. " *Dawsoni.*

Fig. 4. *Spongilla flexispina.*
" 5. " *Ottawaensis.*

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ON SOME CANADIAN SPECIES OF SPONGILLÆ.

By George M. Dawson.

The *Spongillidæ* or fresh-water representatives of the marine sponges, though very widely distributed, are not yet known to be represented by a great number of species. It is probable that a systematic exploration of the great North American systems of lakes and rivers might bring many new forms to light. With the exception of *S. Lordii*, Bowerbank, from the sources of the Columbia River, the only Canadian spongilla which appears to have been described, is *S. Dawsoni*, of the same author, a form inhabiting the St. Lawrence River near Montreal, and other neighbouring waters.

Having become interested in the examination of a fine species from the Lake of the Woods, obtained in connection with the work of the British North American Boundary Commission, I have been induced, at the same time, to examine a number of other specimens in the collection of Principal Dawson. Among these, and including the Lake of the Woods form, I find four species which I believe to be undescribed. These are here defined, and though I have not the whole of the literature of the subject at hand, provisionally named.

The descriptions, from the poor state of some of the specimens, are necessarily not in all cases complete; but will, I believe, at least serve for the recognition of the species, with the aid of the figures.

The first spongillas studied—*S. fluviatilis* and *S. lacustris*—belong to two distinct types; and it has been found, on extend-

ing the knowledge of the genus, that all new forms fall naturally into one or other of these. To this rule the forms now under consideration offer no exception, though representing both groups; *S. stagnalis* and *S. asperrima*, belonging to the fluviatilis type, *S. flexispina* and *S. Ottawaensis*, to that of lacustris.

In the first series, are included those spongillas in which the gemmule, or reproductive capsule, is built up of birotulate spicula, placed side by side, and arranged with their axes radially. In the second, the capsules are more leathery, but covered, when mature, with straight or curved spicula, arranged at right angles to the radial lines.

For details concerning the classification and morphology of the *Spongillidæ*, reference should be made to Dr. Bowerbank's and Mr. Carter's Memoirs.

I append first Dr. Bowerbank's description of *S. Dawsoni*, as given in his monograph on the *Spongillidæ*.*

Spongilla Dawsoni, Bowerbank. "Sponge sessile?, branching; surface smooth, oscula and pores inconspicuous. Dermal and interstitial membranes abundantly spiculous; spicula fusiformi-acerate, entirely spined; spines numerous, short, and conical. Skeleton-spicula acerate or subfusiformi-acerate. Ovaria spherical: dermal spicula numerous, disposed in flat fasciculi, or groups of spicula parallel to each other; groups irregularly dispersed; spicula acerate or subcylindrical, entirely spined; spines numerous, obtuse, and ill-defined. Sarcode aspiculous. Colour, in the dried state, emerald-green."

Hab., River St. Lawrence, Montreal; a lake near Brockville.

Dr. Bowerbank further adds, with reference ro this species:

"The dermal and interstitial membranes abound with tension-spicula, and especially the dermal one, in which they seem to attain their fullest degree of development. Their normal form is fusiformi-acerate; but, from the abundant production of the spines at their terminations, they frequently appear to be cylindrical rather than acerate. They are disposed on these tissues rather unevenly, abounding in some spots, while they are comparatively scarce in others."

"The spicula of the skeleton are of about the same proportions as those of the European species. They are usually of the regular acerate form, but occasionally become subfusiform."

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* Proc. Zool. Soc. London, Nov. 1863, and *Canadian Naturalist*, 1864.

The spongilla is sessile, and branches much, well-grown specimens much resembling fully developed examples of *S lacustris*.

Length of skeleton-spicula 0.013. Dermal and interstitial spicula, 0.0015 to 0.0017 inch.

Fig. 3.—*a*, ordinary skeleton-spiculum. A. and B., ordinary capsular and dermal spicula.

Spongilla stagnalis, sp. nov. Sponge encrusting, forming patches several inches in diameter, and from half an inch to an inch thick; greenish; lobular, somewhat hispid. Oscula simple, key-hole shaped, or double; large, 0.25 to 0.50 in. Scattered, sub-crateriform. Skeleton-spicula acerate and fusiformi-acerate, slightly arcuate, 0.011 to 0.013 in. long. Most of the stouter spicula medially spined, the apices always naked; spines small, sparsely distributed. Ovaria, sub-globose, diameter, 0.025 in. Rotulæ, about equal in size, flat, very deeply and irregularly dentate, diameter about equal to length of shaft of spiculum, or 0.0005 in.; the rays not acute. Shaft, thick, cylindrical, generally with a boss at each end.

Hab. North-west Angle Inlet, Lake of the Woods; River St. Lawrence near Montreal.

The two forms of skeleton spicula seem to pass into each other, and in specimens from both localities, are very irregular in size. The birotulate spicula—especially in the Lake of the Woods specimens—are very apt to be deformed. A number of small, entirely spined, straight, obtuse spicula, about one-third the length of the skeleton-spicula, were found with the others, after treatment with acid. They were searched for in all parts of the sponge, but finally found enclosed in some of the gemmules, and apparently in connection with the young sponge.

This species, which is nearest the European type *S. fluviatilis*, of Johnston, was found in great abundance at the first mentioned locality, in July, 1873. It was growing on floating logs and branches, and many specimens were filled with large gemmules. It is probably the species the existence of which was suspected by Dr. Bowerbank, who says, in the conclusion of his notice of *S. Dawsoni*:—"In the preparation of these spicula for examination, I found a few birotulate ones, having the rotulæ very deeply divided. These spicula were no part of the sponge in course of description, but were undoubtedly from the gemmules of another species inhabiting the St. Lawrence."

Fig. 1.—*a.* and *b.*, ordinary skeleton-spicula. B., birotulate spicula. The middle figure shows one end of a spiculum, of about the ordinary form; the lower figure, a type of deformed spiculum which is common. All the above drawn from Lake of the Woods specimens. Fig. 5. represents skeleton-spicula of a specimen from the St. Lawrence.

Spongilla Baileyi, Bowerbank. This species appears to be indicated by a single birotulate spiculum, in the Lake of the Woods collection. It was originally described by Dr. Bowerbank, from specimens obtained at West Point, N. Y.

Spongilla asperrima, sp. nov. Sponge sessile, encrusting, thin; surface slightly undulated; oscula rather large, scattered; skeleton-spicula, fusiformi-acerate, slightly arcuate, stout, densely spined, with the exception of the extreme apices; length, 0.01 to 0.009 in. These mixed with a few smooth and more slender. Spines minute, acute. Ovaria sub-globose, diameter nearly 0.02; spicula birotulate, short; rotulæ equal in size, flat, very deeply divided, about 0.0005 in., equal to, or greater than, the length of the shaft; radii not acute; shaft with a distinct boss at each end.

Hab., River St. Lawrence, near Montreal.

This species much resembles that from the Lake of the Woods, of which, it is possible, it may turn out to be a variety. It differs chiefly in its thicker, coarser and much more densely spinous skeleton-spicula, and in the external form of the sponge. Not possessing any intermediate forms, I have referred them, for the present at least, to different species. The spicula are not unlike *S. Parfitii*, as figured by Bowerbank,* but differ from them about as much as from those of the Lake of the Woods. Many of the skeleton-spicula are deformed, having crutch-like or bent ends.

Fig. 2., *a.*, ordinary skeleton-spiculum. B., one of the ordinary birotulate spicula.

Spongilla flexispina, sp. nov. Specimens not large enough to show the general form, or appearance of the surface. Skeleton-spicula acerate to subfusiformi-acerate, very slightly arcuate to nearly straight, smooth, not very acute, length about 0.0115 in. Dermal and interstitial spicula subcylindrical, irregularly and

* Brit. Spongiadæ, Vol. III., Plate LXXXVI.

often abruptly bent, entirely spined, length nearly 0.003 in.; spines scattered, rather large, conical, acute, generally retrorse near the ends of the spicula. Ovarian spicula scarcely distinguishable from the interstitial and dermal.

Hab., River St. Lawrence, near Montreal.

This species is of the type of the European *S. lacustris*, but differs sufficiently from that species. It also differs markedly from *S. Dawsoni* and *S. Ottawaensis*. Its ovarian and dermal spicula are intermediate in size between those of the last named species.

Fig. 4.—*a.*, ordinary skeleton-spiculum. *b.*, a second form of skeleton-spiculum, smaller and perhaps not fully developed. B., C., ovarian and dermal spicula.

Spongilla Ottawaensis, sp. nov. Specimens do not show the external form. Colour in the dried state, green. Skeleton-spicula acerate, slightly arcuate, often rather abruptly and bluntly pointed, smooth, length, 0.011 to 0.008 in. Ovaria sub-globose, rather irregular, large, diameter 0.04 in.; spicula cylindrical, stout, slightly and regularly arcuate, entirely and rather densely spined, length 0.0034; spines rather prominent, somewhat obtuse. Dermal and interstitial spicula like the ovarian, but slightly more delicate.

Hab., L'Orignal, on the Ottawa River.

The skeleton-spicula are shorter than those of *S. Dawsoni*; the ovarian etc. spicula much larger than those of that species, and larger also than those of *S. flexispina*. They somewhat resemble those of *S. lacustris*, but are distinctly truncate at the extremities. The specimens are small, but densely filled with large ovaria.

Fig. 6.—*a.*, ordinary skeleton-spicula. A., ovarian spicula.