NOTES ON THE FRESH-WATER SPONGE *TROCHOSPONGILLA PHILLOTTIANA* AND ITS VARIETIES.

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In 1926, the writer described (5) as a new species a fresh-water sponge which had been collected by Professor Y. T. Chu from near the dam at East Lake (Tung Hu) near Ningpo in Chekiang Province, China. This sponge was designated *Trochospongilla tunghuensis*. I stated in that article that this specimen was closely related to *T phillottiana* which had been originally described (1) by Dr. N. Annandale in 1907 from the Museum tank in Calcutta, India, and had been recorded (2 and 3) again as having been collected by him in 1908 in a jungle pool near Kawkareik, Amherst District, Lower Burma. In 1911, Dr. Annandale redescribed (4) his *T phillottiana* and recorded it as occurring at both of the above named localities.

In 1928, I recorded (6) the finding of a sponge very closely related to *T tunghuensis* in Lake Biwa near Kyoto in Japan. In this same article I also stated that a somewhat similar sponge, which Dr. A. G. Vorstmann had called (8) *T phillottiana*, had been sent me from Java. It had been collected by her at Rawah Bening (Zuid Kediri).

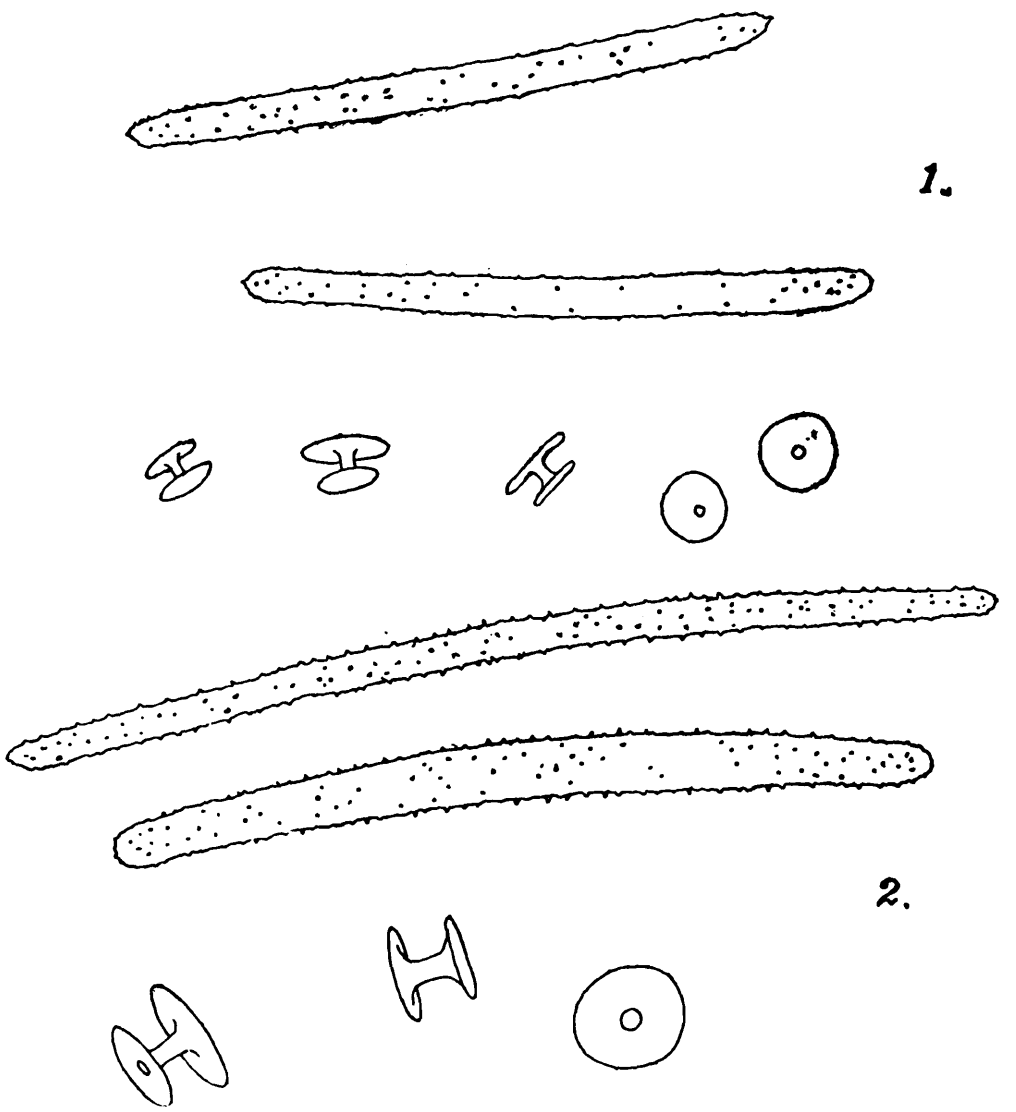
In all of my earlier studies of these sponges mentioned above, I had used for comparison with the other forms a specimen of *Trochospongilla* from Kawkareik, Lower Burma, which had been sent to me by Dr. Annandale labelled as *T phillottiana*. In my manuscript article on the "Fresh-water Sponges of the Dutch East Indies," now in the hands of the Editor of "*De Treubia*," I have noted and commented upon the discrepancy between Dr. Annandale's published dimensions of the spicules of his sponge from the Museum tank in Calcutta and my measurements of the one which he sent me as *T phillottiana*. I, at first, thought these differences due to errors in calculations, but finally suspected that there might be a difference in the sponges from the two places. In order to make sure of this, I requested the Indian Museum to let me have a small cotype of the Museum tank sponge. Just recently this has been secured through the kindness of the authorities of the Indian Museum, and I have found that the dimensions of the spicules of the Kawkareik sponge are decidedly less than those of the Museum tank type. The dimensions of the two sponges are as follows :—

	Skeleton spicules		Gemmule spicules rotules		
	long	thick	long	upper	lower
Indian *cotype* Calcutta (54691)	160—190μ	7—10μ	10—12μ	15—19μ	18—24μ
Annandale's measurements	177μ		15μ		22μ
Kawkareik sponge (53671) ..	98—118μ	6—8μ	7—8μ	10—11μ	11—13μ

A small cotype of this species from the Berlin Zoological Museum (53672) contains skeleton spicules averaging possibly a little thicker than our

number 54691; they frequently may reach 13μ in diameter. Otherwise the spicule measurements of numbers 54691 and 53672 are about the same.

In general form the gemmule spicules of the Calcutta specimens and of the Kawkareik specimens are very similar but the shafts of the latter are shorter and the upper and lower rotules are decidedly smaller in every way, as the measurements given above show. The skeleton spicules of this sponge are also smaller than those of the cotype, though they are comparatively thicker and possibly a little more heavily spined. In fact, they have the appearance at times of having their ends slightly enlarged because of the abundance of small spines. The skeleton spicules of the Kawkareik sponge are much more uniformly equal in diameter throughout their entire length than are those of the Calcutta



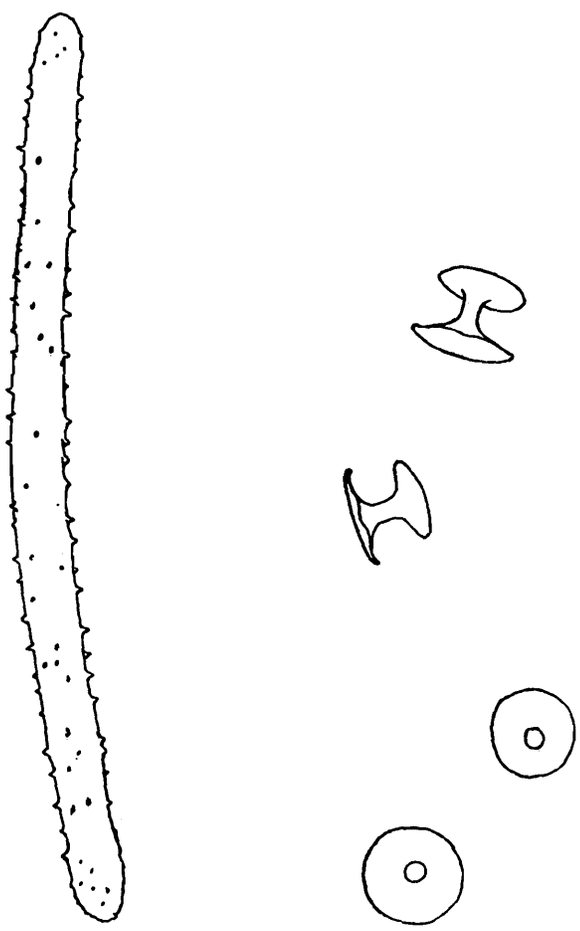
TEXT-FIGS. 1 AND 2.—These two figures are drawn to the same scale and show the differences in size between the sponges from the Museum tank (larger) *T. phillottiana* (fig. 2) and from the Kawkareik (smaller) *T. phillottiana* var. *minima* (fig. 1).

sponge, which sometimes taper somewhat toward their ends but very rarely form points. On account of these decided differences between both kinds of spicules, I propose to call the Kawkareik sponge *T phillottiana* var. *minima*. Text-figures 1 and 2, drawn to the same scale, will clearly show the differences in size.

Since making a careful study of the cotype of *T. phillottiana*, I am convinced that my *T tunghuensis* from near Ningpo, China, is so closely related to this species that it is entitled to only varietal rank and I now propose to call it *T. phillottiana* var. *tunghuensis* (fig. 5). The Japanese sponge from Lake Biwa is very similar in form and dimensions to the China sponge. While there are other minor differences between the spicules of the China and Japan sponges and the Calcutta one, yet the most prominent one is the fact that a very large number of the skeleton spicules in the former (China and Japan ones) are sharp-pointed, though a few round-ended ones do occur, while in the latter (Indian ones) the ends are altogether rounded with only a very rare one sharpened.

TEXT-FIG. 3.—This figure shows a slightly exaggerated, much enlarged, view of the upward curve of the rotules of the gemmule spicules of *T. phillottiana* var. *tunghuensis*. While this curve is also present in *T. phillottiana*, it does not seem to be so marked.

Other differences between the gemmule spicules are that the basal disks of the Calcutta sponge bear plainly marked lines (not shown in



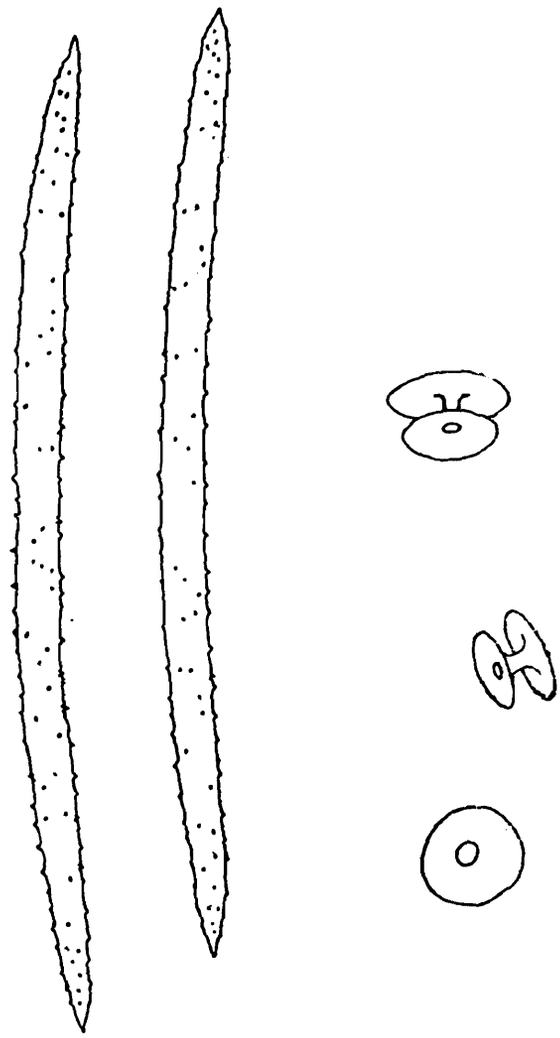
TEXT-FIG. 4.—*T. phillottiana* var. *javanensis*, showing rounded ends of skeleton spicules.

the drawing) radiating from the centre of the disk; these are either entirely absent or only now and then very poorly developed and hardly

visible in the China and Japan sponges. Then, too, the disks of the Indian sponge are somewhat flatter than those of the China and Japan sponges, though in all of them the rotules are often curved up around their edges into saucer-like structures (fig. 3).

Spicules of *T. phillottiana* var. *tunghuensis* have also been found in Soochow and Nanking in Kiangsu Province, in preparations of other sponges. It is evidently a very minute form and must be quite inconspicuous.

The Java sponge (fig. 4) which we have named (7) *T phillottiana* var. *javanensis* has its gemmule spicules closely resembling those of the China form with upward curved edges to its disks, but its skeleton spicules more closely resemble those of the Indian sponge for they all have rounded ends but average a little longer and a little thicker than those of the Calcutta type.



TEXT-FIG. 5.—*T. phillottiana* var. *tunghuensis*. In this sponge the skeleton spicules are prevailingly sharp-pointed. There are a few spicules with rounded ends.

The measurements of one slide each of the China, Japan and Java forms are given below for the sake of comparison :—

	Skeleton spicules		Gemmule spicules rotules		
	long	thick	long	upper	lower
Java (type) (53826) ..	150—190μ	9—14μ	10—12μ	18—20μ	22μ
China (type) (53666) ..	146—160μ	7—10μ	10—12μ		18—22μ
Japan (53506)	140—156μ	8μ	12μ	16—17μ	18—19μ

The distribution of this related group of sponges is most interesting : from Calcutta, southern Burma (Amherst District), up to the Yangtze River Valley in China, and across to Lake Biwa near Kyoto in Japan. Doubtless further careful collecting by students of this group will reveal its presence in many places between these present four localities where it has already been found. It is a minute form and is likely to be overlooked unless it is sought for by an experienced sponge-hunter.

I am indebted to Mr. Li, artist in the Anatomy Department of the Peiping Union Medical College, for the drawings which accompany this article. Figure 3 has been drawn by Mr. Ling of the Biology Department of Yenching University.

BIBLIOGRAPHY.

(1). 1907. Annandale, N.—*Journal and Proceedings of Asiatic Society of Bengal,* Vol. 3, No. 1, p. 22.
(2). 1908. Annandale, N.—*Journal and Proceedings of Asiatic Society of Bengal,* Vol. 4, No. 4.
(3). 1908. Annandale, N.—*Records of the Indian Museum,* Vol. 2, p. 157.
(4). 1911. Annandale, N.—*Fauna of British India, Fresh-water Sponges, Hydroids and Polyzoa,* pp. 117-118.
(5). 1926. Gee, N. Gist.—*China Journal of Science and Arts,* Vol. 4, No. 4, p. 181.
(6). 1928. Gee, N. Gist.—*Lingnan Science Review,* Vol. 5, No. 4, p. 350.
(7). Gee, N. Gist.—MSS article on Fresh-water Sponges of Dutch East Indies. (Now in hands of Editor of *De Treubia*).
(8). 1928. Vorstmann, A. G.—*De Tropische Natuur,* No. 7, p. 116.

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