STUDIES ON THE FAUNA OF SURINAME AND OTHER GUYANAS: No. 57

FRESHWATER SPONGES OF SURINAME

by

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This paper is the first contribution to the knowledge of the freshwater sponges of Suriname. Four species have been identified up till now: *Metania spinata* (Carter, 1881), *Trochospongilla paulula* (Bowerbank, 1863), *Radiospongilla crateriformis* (Potts, 1882), and *Drulia uruguayensis* Bonetto & Ezcurra de Drago, 1969. Since in most instances slides were the only available source of data, details on external structure cannot be supplied.

The author is indebted to Dr. D. C. GEIJSKES of the Rijksmuseum van Natuurlijke Historie, Leiden, who kindly provided a great deal of the material for study, as well as to Dr. W. VERVOORT, Leiden, and to Drs. P. LEENTVAAR, R.I.N., Leersum, who also sent specimens. The author also acknowledges the authorities and members of the staff of the Invertebrates Department of the British Museum. Special thanks are due to Miss SHIRLEY STONE who facilitated the study of South American material, and to Prof. J. BENOIT, Invertebrates Department of the Musée Royal de l'Afrique Centrale, Tervuren, who provided African material of great interest.

The author is Fellow member of the Research Career of the Consejo Nacional de Investigaciones Científicas y Técnicas.

The material studied will be deposited in the Rijksmuseum van Natuurlijke Historie, Leiden.

Metania spinata (Carter, 1881) Fig. 41

Tubella spinata CARTER, 1881; TRAXLER, 1895; WELTNER, 1895; GEE, 1931; GEE, 1931; Gee, 1933; PENNEY, 1960.
Metania spinata, PENNEY & RACEK, 1968.

Megascleres smooth, fusiform, slender and slightly curved amphioxea. — Microscleres fusiform, slender and spined amphioxea, with largest central spines. Very numerous in all parts of the symplasm. — Gemmules large, ovoid. Pneumatic layer thick, with polygonal air spaces. Gemmoscleres embedded in this layer radially,

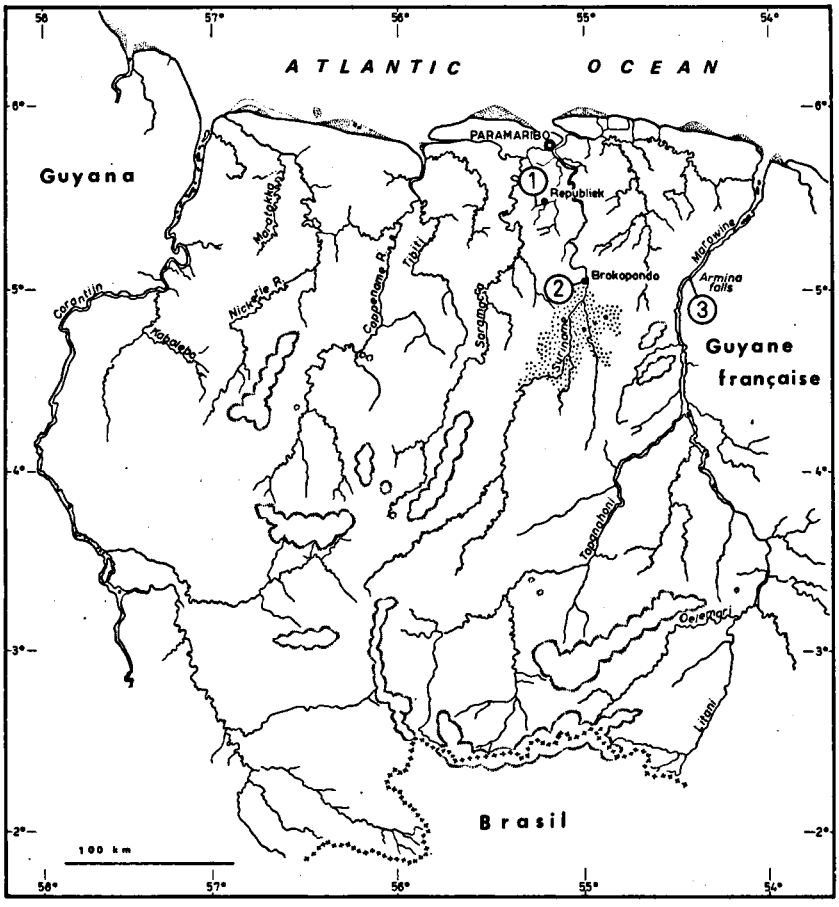

Fig. 40. Sketch map of SURINAME with localities. – 1: Swamp near Para river, tributary of the Suriname river. 2: Brokopondo, north of the man-made Brokopondo Lake. 3: Armina falls, Marowijne river.

projecting their terminal ends beyond the surface of pneumatic coat. Foramen tubular, foraminal tube straight, surrounded by slanting gemmoscleres. — Around the gemmules there are megascleres feebly curved to almost straight, ci'indrical amphioxea, abruptly sharpened on the tips, throughout their length covered with conspicuous spines. — Gemmoscleres tubelliform, with the lower rotule polygonal or irregularly circular, with slightly recurved and entire margin.

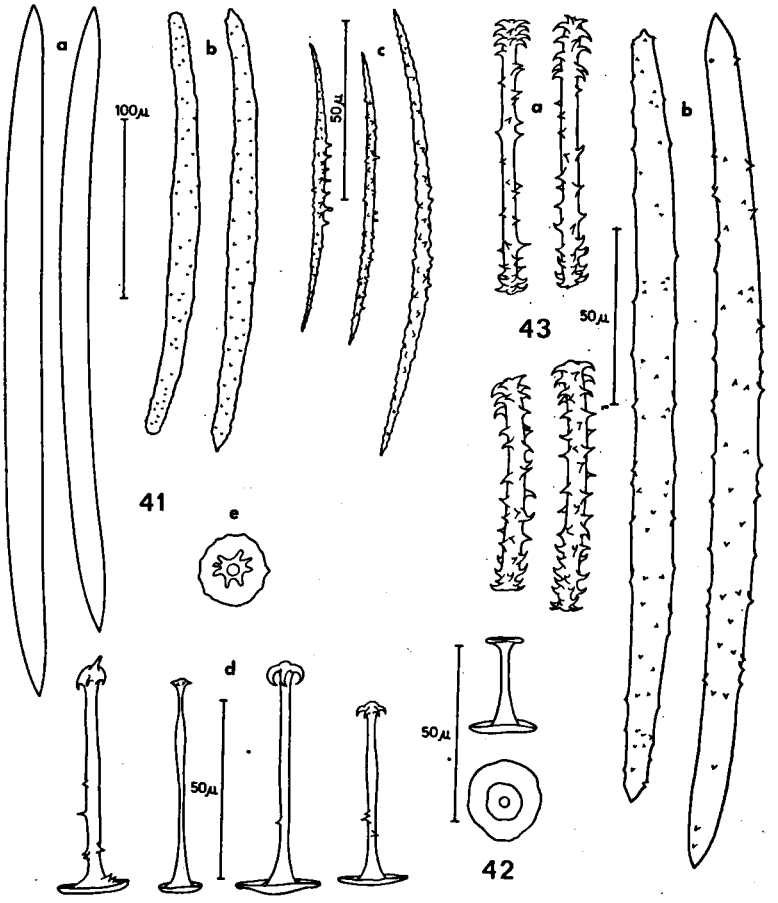

Fig. 41. *Metania spinata* (Carter). – a: Smooth megascleres. b: Rough megascleres. c: Microscleres. d: Gemmoscleres. e: Detail of lower rotule of gemmosclere.
Fig. 42. *Trochospongilla paulula* (Bowerbank). – Gemmosclere with detail of rotule.
Fig. 43. *Radiospongilla crateriformis* (Potts). – a: Gemmoscleres. b: Megascleres.

Radial striations of this rotule often well developed. Upper rotule invariably knoblike, bearing a varying number of large, recurved marginal spines or represented by a rounded knob with some little spines. Shaft proportionally long and thin, generally with a little

enlargement near the upper end, smooth or bearing a few small spines.

Smooth megascleres 300–390 μ in length; width 17–22 μ. Spined megascleres 115–140 μ in length; width 7 μ. Microscleres 70–105 μ long. Length of largest axis of gemmules 850 μ, of the smallest axis 540 μ; length of foraminal tube 100 μ. Gemmoscleres 50–62 μ in length; diameter of lower rotule 15–25 μ; diameter of shaft 3–5 μ.

Collected by D. C. GEIJSKES from floating stem in swamp of the Coropina Kreek, Para river, tributary of the lower Suriname river, near Republiek, July 1955.

Comparative material studied: *Metania vesparioides* (Annandale, 1908, Great Pond at Mudon, near Moulmeer, Amherst District, Burma. *Metania reticulata* (Bowerbank, 1863), Amazon river. *Metania mello-leitao* (Machado, 1945), Tapirapé river, Brazil. *Metania lissostrongyla* (Burton, 1938) (now *M. vesparia*), lake Tumba, Congo.

Up till now the knowledge of *Metania spinata* (Carter) was limited to its original description and to TRAXLER's work, dealing with material from San Pablo, Brazil. It was originally described as *Tubella spinata* Carter and then transferred to *Metania* Gray by PENNEY & RACEK (1968), when redefining the genus. They include in *Metania* only two South American species: *M. reticulata* (Bowerbank, 1863), and *M. spinata* (Carter, 1881), excluding *Tubella mello-leitao* Machado, 1945, from the Tapirapé river, tributary of the Araguaia river in central Brazil. The examination of the Holotype of this species demonstrates that it belongs to *Metania*, and that it is closely related to *M. reticulata*.

A study of specimens belonging to *M. spinata*, *M. reticulata*, *M. mello-leitao*, *M. vesparioides* and *M. vesparia* (von Martens), demonstrated the validity of *M. spinata*. As a matter of fact, this species can be clearly differentiated from the other South American species of the genus (*M. reticulata* and *M. mello-leitao*) because of its gemmoscleres (much longer, with an almost smooth axis), as well as its megascleres (much longer and thinner). It seems more closely related to *M. vesparioides*, because of the megascleres and gemmoscleres structure, though the latter are much smoother in *M. spinata*.

Unfortunately, since we have hardly any material of this last species (mainly gemmules), we cannot say more about its relation to *M. vesparioides*. A comparative study between these two species and

M. innominata Burton, 1938, would also be of great interest. They apparently constitute a quite homogenous group, represented in South America, Africa and India. The difference with the rest of the *Metania* species would be the conformation of the megascleres. We cannot agree, so far, with PENNEY & RACEK (1968) in considering *M. vesparioides* as a probable *M. vesparia* subspecies.

Trochospongilla paulula (Bowerbank, 1863) Fig. 42

Spongilla paulula BOWERBANK, 1863.
Tubella paulula, BONETTO & EZCURRA, 1962; BONETTO & EZCURRA, 1964; BONETTO & EZCURRA, 1967.
Trochospongilla paulula, PENNEY & RACEK, 1968 (and synonymy); VOLKMER-RIBEIRO & ROSA-BARBOSA, 1972; BONETTO & EZCURRA, 1973.
Trochospongilla latouchiana ANNANDALE, 1907; PENNEY & RACEK, 1968 (and synonymy).

Megascleres slender, feebly curved, smooth, fusiform amphioxea. — Microscleres absent. — Gemmules spherical, pneumatic layer well developed, granular, foramen tubular with a short tube. — Gemmoscleres embedded radially, birrotulates with a slender and smooth shaft. Rotules irregularly circular and of unequal diameter, the upper one considerably smaller than the lower, both recurved in the same direction.

Megascleres 230–250 μ in length; width 8–12 μ. Diameter of gemmules 250–270 μ. Gemmoscleres 24–27 μ in length; diameter of lower rotule 18–25 μ, of upper rotule 8–12 μ; diameter of shaft 3–4 μ.

Collected by D. C. GEIJSKES from floating stem in swamp of the Coropina Kreek, Para river, near Republiek, July 1955.

Trochospongilla paulula (Bowerbank) is widely spread in South America. It has been found in tributaries of the Amazonas (VOLKMER-RIBEIRO & ROSA BARBOSA, 1972), in the upper and middle reaches of the Paraná river (BONETTO & EZCURRA, 1962, 1964, 1967, 1973) and in central Uruguay river (BONETTO & EZCURRA, 1967). A thorough study on the variability of the species has recently been performed by BONETTO & EZCURRA (1973). They demonstrate the necessity of synonymizing *Trochospongilla latouchiana* Annandale. In this way, *T. paulula* represents – among the Porifera, and ac-

cording to the known literature – the first species with a continuous distribution from Australia to India and China, Africa and South America.

Radiospongilla crateriformis (Potts, 1882) Fig. 43

Meyenia crateriformis POTTS, 1882.
Ephydatia crateriformis var. *arndti* CARVALHO, 1942.
Ephydatia crateriformis paranensis BONETTO & EZCURRA, 1964b.
Radiospongilla crateriformis, PENNEY & RACEK, 1968 (and synonymy).

Megascleres fusiform, abruptly pointed amphioxea, sparsely and completely microspined, except at tips. — Microscleres absent. — Gemmoscleres slender amphistrongyla, with a varying number, generally abundant, of straight or recurved conical spines, which form several radiating rows at the ends of the spicules.

Megascleres 205–250 μ in length; width 8–11 μ. Gemmoscleres 55–75 μ in length; width 3–6 μ.

Collected by P. LEENTVAAR near the dam of lake Brokopondo, Suriname river, 1964.

Ephydatia crateriformis (Potts) was included in *Radiospongilla* Penney & Racek. The presence of this species in South America has already been pointed out by CARVALHO (1942) for the São Paulo State, as well as for the middle Paraná river, in Santa Fe (BONETTO & EZCURRA, 1964). CARVALHO describes a new form, *E. crateriformis* var. *arndti* which was not recognized by PENNEY & RACEK (1968). BONETTO & EZCURRA distinguish a subspecies *paranensis*, based on the differences shown by the Paraná river material.

The Suriname material presents intermediate characteristics between the form described by CARVALHO and subsp. *paranensis*. In fact, the conformation of the gemmoscleres is quite the same as in *E. crateriformis paranensis*; on the other hand, the megascleres are rather similar to the "tornotas" type of CARVALHO, since they have abruptly finished tips, instead of the gradually sharpened ones as are typical in subsp. *paranensis*. For this reason I do not consider it wise to sustain the validity of the subspecies from the Paraná river.

Drulia uruguayensis Bonetto & Ezcurra, 1969 Fig. 44

Drulia uruguayensis BONETTO & EZCURRA, 1969; Bonetto & Ezcurra, 1970.

Megascleres stout, smooth, slightly curved and fusiform amphioxea with pointed tips. — Microscleres scarce, thin and pointed amphioxea, slightly curved, microspined in their tips and with larger

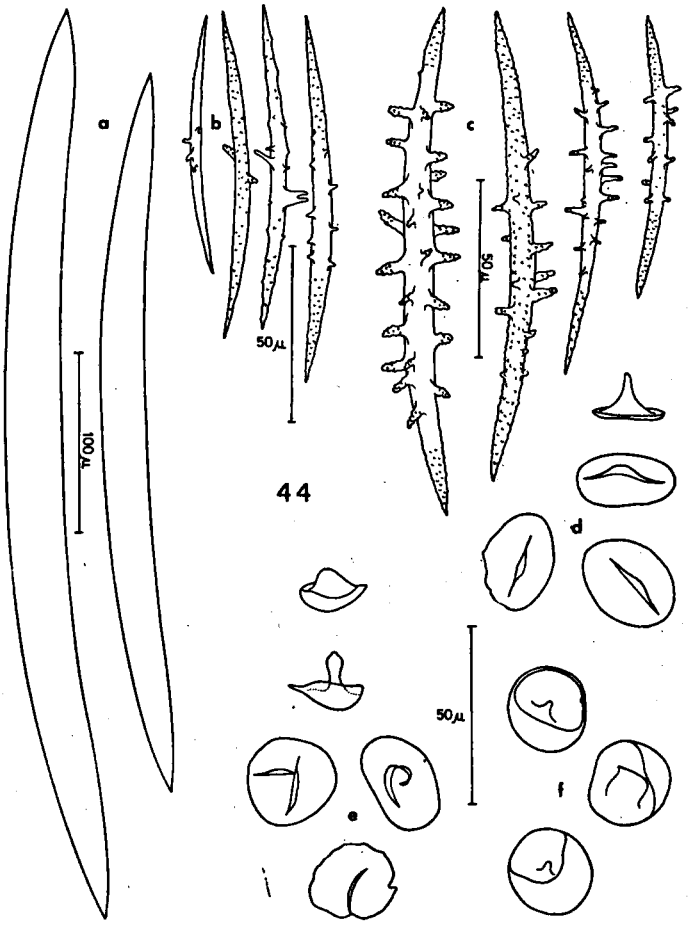

Fig. 44. *Drulia uruguayensis* Bonetto & Ezcurra. – a: Megascleres, material from the Armina falls. b: Microscleres, from the Armina falls. c: Microscleres, from the Brokopondo dam. d: Gemmoscleres, material from the Armina falls. e–f: Gemmoscleres from the Brokopondo dam.

microspined projection in the central part. — Gemmoscleres parmuliform, with circular or irregular margins, conical or longitudinally umbonated, some of them very modified, with the rims variably curved toward the upper and inner parts of the spicules.

It is a sponge forming incrustations; its colour, when dry, is light hazel. Oscula inconspicuous, hispid surface, due to the projection of the numerous fascicles of spicules. Closed and thick skeletal texture. — The gemmules are developed toward the lowest part of the sponge. Unevenly spherical, whitish-yellowish when dry. Smooth external surface. Circular foramen surrounded by a short lengthening of the gemmular wall. The pneumatic layer is absent. The gemmoscleres lie in one layer.

Armina fall material: Megascleres 400–670 μ in length; width 35–70 μ. Microscleres 75–100 μ long, 5–6 μ wide. Diameter of gemmoscleres 12–15 μ. – Brokopondo dam material: Megascleres 370–480 μ in length; width 25–30 μ. Microscleres 80–140 μ long, 5–6 μ wide. Diameter of gemmoscleres 12–25 μ.

Collected by D. C. GEIJSKES in the Armina falls, Marowijne river, Oct. 1952, and by P. LEENTVAAR near the dam of lake Brokopondo, 1964.

Drulia uruguayensis had so far only been found in the waters of the middle reach of the Uruguay river (type locality), and in the tributaries of the upper Paraná river. It is important to stress that the material from Suriname shows some differences regarding the specimens already studied.

As to the external conformation, the specimens from Armina falls show the same kind of development as those studied from the Iguazú falls and other tributaries of the upper Paraná river (BONETTO & EZCURRA, 1970). They gave a skeletal texture much more closed, forming incrustations, as is typical for species of lotic habitats. The material has much bigger and stouter microscleres than those known until now. The specimens from Brokopondo lake have very modified gemmoscleres. These variations coincide with those observed in the material of the upper Paraná. They may be caused by unfavourable environment and be of little taxonomic value for the moment.

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