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Title: Towards a knowledge of chytrids. Part 3.
(*Spirospora paradoxa* nov. gen. - nov. spec.
(Plate 28, Fig. 21-24) ONLY)

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Towards a knowledge of chytrids. Part 3. (Spirospora paradoxa nov.gen.-nov.spec. (Plate 28, Figs 21-24) ONLY)

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Translated by : J.E. Wightman

Although my experiences of this organism are extremely inadequate, I would like nevertheless to communicate them in order to direct attention to it, and to stimulate further investigation of it.

Growing out from the cysts of a Vampyrella, one finds a pear-shaped, short-stemmed (or stemless) bladder which consists of a wide, spherical upper part and a funnel-shaped lower part. In the upper hemisphere of this bladder is a raspberry-like bunch of rounded, egg-shaped, more-or-less irregular (amoeboid?) colourless bodies of uniform granulated plasma, which the lower half of the bladder releases. (Plate 28. Fig. 21). These naked plasma portions of 6-8μ x 4μ dia. immediately appear more numerous and of smaller size; also their rounded form changes more and more into oblong ovals (Pl. 28: Figs. 23.1). A contractile vacuole (c.v.) is clearly visible in the end part of the elongated oval portion, and in the middle, a round vacuole-like spot which may be the cell nucleus (n?). These elongated ovals 8μ x 3-4μ thick, divide quite clearly and suddenly in the middle to give two equal-sized rounded-cube cells of 4μ dia. (Pl. 28 Fig. 23.2). By means of this last division the number of cells is doubled, and becomes quite considerable. These are the bodies which develop into zoospores. At this stage one can see the flagella growing out as short thread-like stubs, which develop a weak shaking, rocking movement as soon as they appear. With progressive zoospore development this movement grows more and more in intensity and one can see clearly the undulatory lashing of the flagella. This continues for more than an hour (under the cover-slip) until the zoospores have reached their definitive form-structure. The developed zoospores are elongated oblongs about 5μ x 3μ wide, somewhat obliquely truncated and rounded at each end, and appearing biscuit-shaped due to a dent on both sides of the centre.

Moreover in the longitudinal axis, they are bent together in a buckle-shape (seen as kidney-shaped from the side and in cross-section) and toroidally spiralled as well. They consist of dense, white glistening plasma which has only a few diminutive globules. There are two flagella which grow out of the concave surface in the middle of the body. One clings transversely around the body, so-to-speak, in the transverse channel, like the transverse-groove flagellum of the Peridinae so that it looks like two wriggling flagellum stubs on the concave sides of the body with the other lying bow-shaped, curving backwards from the body and functioning as a trailing flagellum (Pl.28 Fig.23.3). In the globule-impoverished plasma behind the indentations, a round vacuolar spot (contractile vacuole?) appears from time to time.

Before the zoospore liberation, the zoospores in the sporangium move even more violently until eventually the upper part of the extramatricular sporangium is completely swollen up, and then the wide spore mass flies asunder; not only that in the upper region, but also the whole space of the pear-shaped sporangium.

One sees then, that the zoospores have a similarity to the Peridinae, especially with respect to the flagellum formation and movement. They swim in a spiral course, zig-zagging in it, but not straying far from their point of origin. Their appearance is not of the typical Chytridiacae neither is their movement. Further is not known of them.

The lower half of the extramatricular sporangium, which particularly

in this region is sharply contoured, does not swell up at its opening, but remains in the form of a wide funnel, later sessile up on its host cell (Pl 28, fig.24).

In the Vampyrella-cyst, only the glistening red-brown ingested remains of Vampyrella and the granular crumblike by-products of the Vampyrella pigment are visible, but no plasma body. (Pl.28 Fig.21), The contents of the Vampyrella-cyst seem completely disorganized, except for the exhausted unusable remnants. The spore-forming plasma of the parasite is, on the other hand, entirely free from pigment.

For the most part, no intra-matricular part of the parasite can readily be seen in the lumen of the Vampyrella-cyst. After the application of iodic acid containing iodine/potassium iodide solution (gefalteter) the extramatricular stalk of the sporangium stains an intense blue (Isolichenin and appears inside the Vampyrella-cyst as a spindle-shaped, somewhat corrugated, simple continuation with a thick, apparently swollen wall. The colour of the remnants in the Vampyrella-cyst lumen changes to a dirty green immediately on application of the reagent. The remaining wall of the extramatricular sporangium stays colourless while the zoospore portions in its interior show a yellow-brown plasma pigmentation (Pl.28: fig.22).

I cannot say what the parasite looked like before the development of the zoospores. The peculiarities of this organism which is probably new, are such that they do not allow a classificaiton to be made with certainty from the observations made to date. It is not even certain whether it only takes food by osmosis and is then a fungus, or whether a naked condition does not exist in the beginning, in which it takes nourishment like animals, before fructification causes the undigested food remnants to be pushed out within the host cell, and when it is surrounded by a membrane, then representing a monadin. From this parasite on Vampyrella, the first is the most likely. However, on 18th July 1909 at Iglo, I found an Aphelidium-type organism (Pl. 28: Fig.25) in an organic substrate of an indefinable nature, possibly a Nostoc-ball. Its zoospores showed a construction like the previously-treated Vampyrella parasites (Pl.28:Fig.23b) and it seems likely from that, that we have here a closely related organism which manifests itself as a monadin.

The Vampyrella cysts on which the Spirospora are found compare morphologically with those of Spirospora spirogyrae (Cienk), whose flat, double-contoured cyst wall appears surrounded by a fragile, colourless case like a chestnut husk; characteristic of this Vampyrella type. These cysts were found here among Vaucheria, on whose threads they were sessile (especially the dying ones) whilst Spirogyra, to all appearances were not present.

At Iglo, May. 1913

Godollo, Christmas 1925

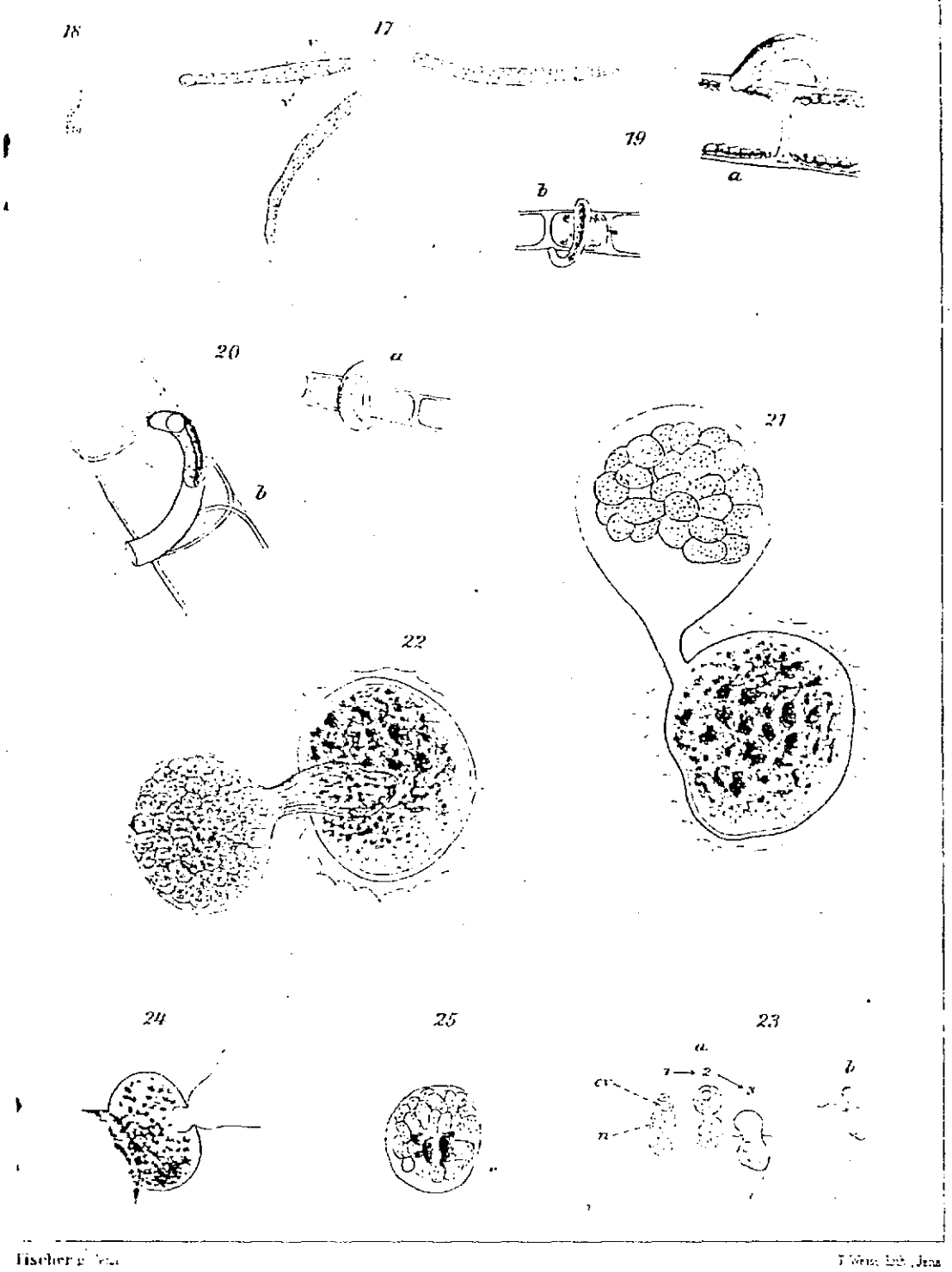

Fig. 21—25. *Spirospora paradoxa* nov. gen. nov. spec.

Fig. 21. Zoosporangium auf der Zoocyste von *Vampyrella spirogyrae* mit in die Schwärmeranlagen zerfallenem Inhalt. Vergr. 1000.

Fig. 22. Ein solches Sporangium, nachdem die Schwärmeranlagen sich in die Schwärmer geteilt hatten und diese sich bereits lebhaft bewegten, mit Jodjodkalium behandelt. Die gelbbraun gefärbten Schwärmer kontrahiert und deformiert. Intramatrikal ein keulenförmiger Wurzelteil sichtbar, dessen gequollen erscheinende Wand Blaufärbung zeigt. Vergr. 500.

Notice

Please note that these translations were produced to assist the scientific staff of the FBA (Freshwater Biological Association) in their research. These translations were done by scientific staff with relevant language skills and not by professional translators.