

Nowakowskiella moubasheriana sp. nov., a new cladochytrioid fungus from Poland

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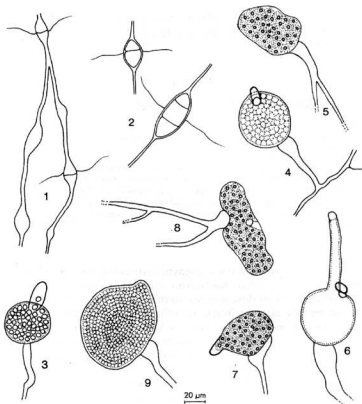
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H a s s a n, S.K.M.: *Nowakowskiella moubasheriana* sp. nov., a new cladochytrioid fungus from Poland, Acta Mycol. 19 (1): 77-82, 1983.

A new exooperculate species of *Nowakowskiella* has been described. The type strain has been isolated from the water sample taken from the small bog in the ash forest in the National Kampinos Park near Warsaw. The fungus developed on bits of onion skin the rhizomycelial growth and formed numerous zoosporangia and resting spores. It is considered by the author to be a new species of *Nowakowskiella* related to *N. macrospora* Karling, and named *N. moubasheriana* sp. nov.

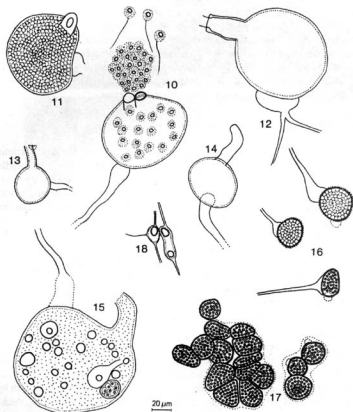
In the course of the study of saprophytic chytrids in Poland a range of diverse forest water bodies and flows has been investigated by baiting the samples by bits of onion skin. One of these samples, taken from the big pool on the swampy ground near the high-way Warszawa - Nowy Dwór at Dębina at November 1981 after one month of incubation yielded with a flourishing growth of abundant rhizomycelium with zoosporangia and resting spores. Examination of the course of zoospore development, liberation and morphology showed that the strain represented a previously undescribed species of the exooperculate cladochytrioid fungus. Taking into consideration the lack of septa in the continuous elements of rhizomycelium it has been decided, that the new species is a member of the genus *Nowakowskiella*. The fungus under consideration is described under the name *Nowakowskiella moubasheriana*, sp. nov. The name is given in the honour of Professor A. H. M o u b a s h e r, mycologist of the Botany Department, Faculty of Science, Assiut University, Egypt.

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Figs. 1-9. *Nowakowskiella moubasheriana*

1 - branched rhizomycelium with mostly aseptate spindle organs, 2 - spindle organs with thin transverse septa and laterally arising rhizoids. 3-6 - spherical to broadly pyriform apophysate terminal zoosporangia, 7 - zoosporangium with small papilla-like lateral neck, 8 - transversally swollen zoosporangium, 9 - zoosporangium with low lateral papilla



Figs 10-18. *Nowakowskiella moubasheriana*

10 - exo-operculate sporangium during zoospore liberation, 11-13 - zoosporangia with strictly lateral necks, 14 - zoosporangium with apical curved neck, 15 - extreme zoosporangium with lateral curved neck, 16 - brownish thickwalled resting sporangia,

17 - smooth hyaline resting spores, 18 - young thalli with pigmented globule and first rhizoids

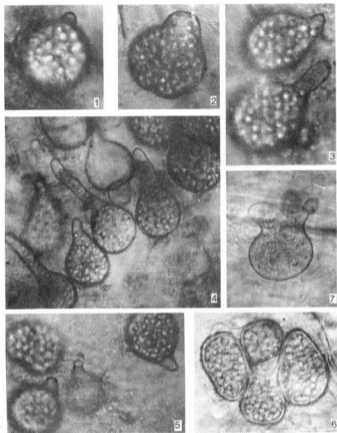
Nowakowskiella moubasheriana Hassan sp. nov.

Rhizomycelium profusum, extensum, ramosum, 1-3 µm in diametro, filiforme, aseptatum, cum organis fusiformibus aseptatis vel rarior septatis, numerosis. Sporangia plurima, variabilia, apophysata, plerumquae sacciformia vel pyriformia vel sphaerica, 40-96 µm in diametro, saepe collum plus minusquae elongatum habentia, ad 86 µm longa; operculum externum. Zoosporae sphaericae, 9-10 µm in diametro, cum flagellis posterioris 45 longis et globulo refractivo pallido-luteo-chloratho, 5-6 µm in diametro. Sporae perdurantes apophysatae, globosae, laeve vel verrucosae, solitare vel angulatae, aggregatae, sine apophysis, laeve, 20-34 µm in diametro. Fungus aquaticus saprophyticus cellulosolyticus.

Nowakowskiella moubasheriana Hassan sp. nov.

Rhizomycelium profuse, moderately branched, rather fine, tenuous portions 1-3 µm in diameter, thin-walled, with mostly aseptate, thin-walled spindle organs 11-30 µm long and 8-16 in diameter (Fig. 1), sometimes spindle organs with 1 or 2 very thin transverse septa, and then bigger, 28-52 µm long and 18-23 in diameter (Fig. 2); rhizoids very thin, abundantly branched, arising from the tenuous portions as well as from the spindle organs. Zoosporangia mostly terminal and apophysate, usually more or less rounded, from spherical to broadly pyriform, 45-54 µm in diameter and up to 60 µm long, (Figs. 1-6 when measured without the neck), but very often bigger and elongated transversely to apophysis (Figs. 7-15), and then 50-122 µm in diameter and 48-109 µm long, in the extreme case (Fig. 8) even 96 µm in diameter and only 37 µm high; the neck mostly lateral (Figs. 7, 9, 11, 12, 13 and 15), but often apical, rather long, up to 76 µm, and wide 9-14 (-24) µm in diameter, usually isodiametric and straight, but sometimes locally swollen or curved (Figs. 12, 14, 15); sometimes the neck is shorter, papilla-like, (Figs. 6, 7, 11); operculum external, dish-like, shallow, thin-walled, up to 12 µm in diameter (Fig. 10). Apophysis thin-walled, from very elongated, narrow and indistinct, up to 8 µm in diameter, to nearly spherical or pyriform, 16-18 µm in diameter and about 21 µm long or sometimes transverse, over 30 µm in width by ca 10 µm high (Fig. 12). Sporangia sometimes becomes light brownish, thick-walled, verrucose and dormant (Fig. 16), usually over 30 µm in diameter. Zoospores slowly ooze out and form a globular mass at exit orifice, spherical, 9-10 µm in diameter, with large, 5-6 µm in diameter, slightly yellowish to dirty-greenish, anterior, plastic refractive globule and flagellum up to 40 µm long; sometimes part of zoospores leave the sporangium singly and swim away immediately. Apart from the verrucose, apophysate resting sporangia, smooth, angular, hyaline resting spores of unknown origin, up to 30 µm in the greatest dimension, are formed collectively inside (?) the very thin-walled evanescent containers (Fig. 17).

Plate I



20 μ m

Nowakowskiella mombasheriana

1 - spherical sporangium with prominent papilla, 2 - young sporangium with very wide papilla, 3, 4 - different types of sporangia, note very short to long necks, 5 - sporangia with distinctly visible opercula, 6 - resting spores, 7 - young irregular zoosporangium

Saprophytic in sphagnum-bog water near Dębina near Warsaw (type locality), isolated in November 1981 on onion skin bait, Poland.

Type: slide no 25705 deposited in the Herbarium of the Institute of Botany, Warsaw University, Warszawa, Poland.

Iconotype: Figs. 1-18 in the present paper and Plate I.

The yellowish or dirty-greenish pigmentation of the zoospore globule appears early in the zoospore development, from the beginning of the formation of these globules inside the ripening sporangium (before zoospore cleavage). This colouring persists during the whole period of the zoospore motility. After the zoospore comes to rest on the substrate and encysts, the globule even grows attaining about 8 μm in diameter or dividing. The young thallus (Fig. 18) consists of the rounded or elongated primordium equipped with usually two opposite rhizoidal axes and thinner and shorter lateral thread-like rhizoids. During the next stage of development this primordium becomes the spindle organ and the pigmented globule disappears.

The most marked feature of this species is the big zoospore attaining 10 μm in diameter and containing an extremely large refractive globule. Zoospores of comparable dimensions form only two previously described species: *N. ramosa* Butler (6,6-8,8 μm in diameter with the globule up to 3 μm in diameter) and *N. macrospora* Karling (10-12 μm in diameter with a globule 3-5 μm). Resting spores of *N. ramosa* are very similar to resting sporangia of *N. moubasheriana*, but they are formed by budding from the cells of pseudoparenchyma – structure lacking in my fungus. Moreover – *N. ramosa* differs from the species described here sharply by its tubular, coarse, occasionally septate rhizomycelium (Butler 1907, Sparrow 1960, Karling 1977). Taking into account the general appearance and structure of the rhizomycelium *N. macrospora* is more similar to the fungus under consideration. The two fungi differ in the following characters: zoospores of *N. macrospora* are bigger, with mostly basal, disc-like, hyaline and relatively smaller refractive globule and contain few smaller grains in the basal part of the body; its spindle organs are always aseptate, operculum is usually shallowly sunken and apiculate or hat-shaped and resting sporangia are smooth and darker (Karling 1945, 1977, Sparrow 1960). *N. macrospora* is rather common in Poland and has been recorded from Warsaw and surroundings previously by the author as well as earlier by Rogoś (1979) and comparison of these findings with the fungus described in the present paper permit to conclude, that they are clearly distinct, although closely related.

Acknowledgment

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Novakowskiella moubasheriana sp. nov.

. Streszczenie

Autor wykrył w wodzie zatorfionego zagłębienia gruntu w łągu Kampinoskiego Parku Narodowego koło Dębiny nowy gatunek błonnikolubnego grzyba wodnego – *Novakowskiella moubasheriana* Hassan, sp. nov. Grzyb ten jest zbliżony do *N. ramosa* Butler (1907) i – szczególnie – do *N. macrospora* Karling (1945), gatunków notowanych wcześniej z Warszawy i okolic przez autora oraz Rogoś (1979), lecz różni się wyraźnie pigmentacją ziarna lśniącego zoospory oraz szczegółami morfologii plechy i zarodni.