

NOTES ON MYXOMYCETES VI

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(*Doorwerth*)

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This is the second paper dealing with Myxomycetes collected by me in the Netherlands, mostly in the neighbourhood of Doorwerth. Specimens of the species dealt with are preserved either in my private collection or in that of the Botanical Museum and Herbarium of the State University, Utrecht (in the last named case the numbers are followed by a "U"), or in both.

Lycogala Micheli

Lycogala conicum Pers.

2031, 6-8-1957; 2321 U, 6-10-1957; 2849, 1-8-1958; all from much decayed beech stumps on the "Duno", Doorwerth.

The plasmodia of 2031 and 2849 were bright carmine pink. The collections are all typical of the species, having the small conical aethalia with the branched scales on top, the slender pseudo-capillitium provided with small warts, and the spores showing a fine-meshed reticulation.

Lycogala flavofuscum (Ehrenb.) Rost.

134 U, 26-6-1952; 148 U, 1-8-1952; 212, 3-9-1952; 363, 12-7-1953; 437, 10-9-1953; 455 U, 8-11-1953; 549 U, 12-7-1954; 690, 12-7-1954; 1095, 23-7-1955; 1886, 1-7-1957; 2454, 3-11-1957; all from Heelsum, Doorwerth and Oosterbeek, from dead wood forming part of living beeches, except 690, which was found on a wounded birch.

Where the plasmodium was seen, it was found to be white. The collections are all typical of the species in the smooth brittle cortex, the profuse, thick, but hardly wrinkled, spinulose pseudo-capillitium and in the fine-meshed reticulation of the spores.

Lycogala epidendrum (L.) Fries var. *epidendrum*

84 U; 97 U; 662; 1001; 1011; 1017; 1049; 1063; 1099; 1170; 1174; 1178; 1188; 1502; 1517; 1538; 1898; 1918; 1919; 1955; 1965; 1969; 1987; 2006; 2009; 2457; 2604; 2651; 2652; 2706; 2726; 2735; 2750; 2752; 2754; 2758; 2768; 2769; 2772; 2805; 2966; 2980; 3145; 3163; 3300; 3301; 3346; 3922; 3979; 3987; 3992; 4102; 4012; 4019; 4020; 4052; 4065; 4128; 4120; 4136; 4162; 4190; 4203; 4204; 4323; 4555; 4684; 4723; 4865; 4878; 4891; 4893; 4914; 4915; 4923; 4924; 4925; 4936; 4951; 4971; 4985; from Doorwerth; 2832 Leg. Dr. C. E. B. Bremekamp, from Hilversum; 4898 Leg. Drs. G. H. Boerema, on peat-gratings Wageningen; with the exception of the last-named one, all from dead wood and bark or from sand at the base of tree stumps.

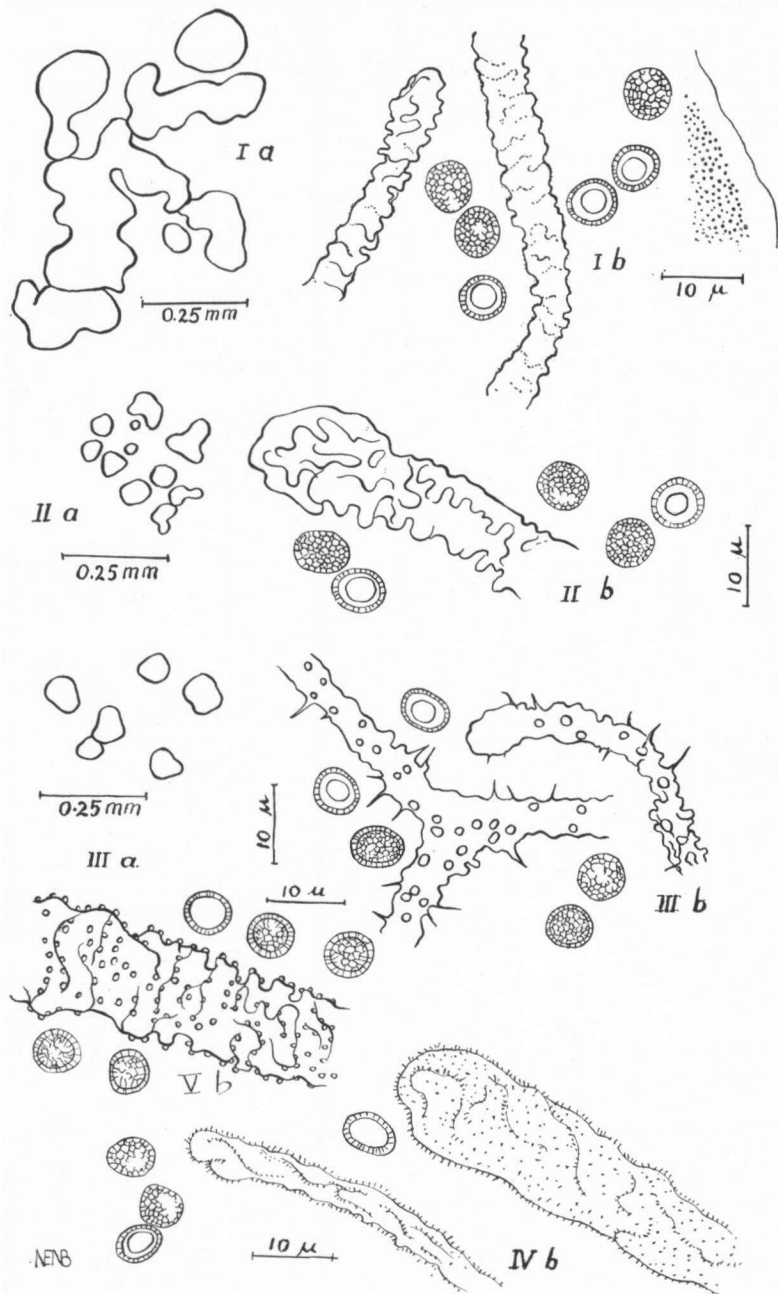


Fig. 1. *Lycogala epidendrum* (L.) Fries var. *epidendrum*; a, cortex scales; b, capillitium and spores, some of the spores in optical section; Ib also showing a part of a papillate cortex. I, 1969; II, 662; III, 4120; IV, 4893; V, 4684.

Lycogala epidendrum shows a great deal of variation in the size and colour of the aethalia; in the scales of the cortex (Fig. 1 - Ia, IIa, IIIa) and in its thickness; in the capillitium, which may be smooth, warted, spinulose or, rarely, spinose (Fig. 1; Ib, IIb, IIIb, IVb, Vb) and in the colour of the spores; when fresh the spores seen in mass vary in colour from salmon pink to grey without a trace of pink, the latter in aethalia which developed from carmine-tinted plasmodia; however, all seem to turn more or less beige in the long run. The reticulation of the spores is often rather difficult to see; therefore I stain them with a red school ink, composed of an anthrachinone and of a triphenyl methane component (data kindly furnished by the manufacturers) which brings out the reticulation very satisfactorily. The spores are $6.5-8\ \mu$ in diam. and the reticulation covers seven-eighths to three-quarters of the surface. The plasmodium too is variable in colour, viz. from very pale ochre (rare) to salmon and carmine tinted. From the pale and orange-red plasmodia rise beige aethalia, from the carmine plasmodia

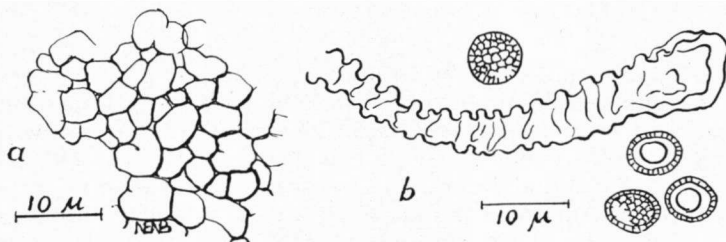


Fig. 2. *Lycogala epidendrum* (L.) Fries. no. 4204; a, detail of cortex scale, showing the minute tessellation; b, capillitium and spores, two of the spores in optical section.

dark grey ones. Usually the cortex is smooth under the scales, but in the numbers 1969, 1170, 2750 and 2754 it is warted. The scales, though differing in size and shape from more or less rounded to brached, are usually smooth, but in 1063, 1919, 2651, 2805 and 4065 there are some rather large papillae on them.

The numbers 1011, 1538, 2980, 4190, 4204 and 4555 tend very much to *Lycogala exiguum* Morgan; they are small and dark, scattered or solitary, with scales showing a minute "tesselation", the "cells" composing it measuring $3-10\ \mu$ in diam. However, as the spores are $6.5-7\ \mu$ in diam. i.e. not particularly small, and as they are reticulate (those of 1011 have a rather large gap in the reticulation, but in this gap traces of the reticulation are present in the form of bands and warts), I take these specimens to be small examples of *L. epidendrum* var. *epidendrum* (Fig. 2).

Lycogala epidendrum (L.) Fries var. *tesselatum* Lister

Decaying beech stumps, Duno, Doorwerth: 1869, 10-6-1957; 2010, 3-7-1957; 4950, 27-7-1961.

Although Dr. G. W. Martin gives this variety as a synonym of *L. exiguum* Morgan (Tax. notes on Myxomycetes II, Mycologia 30:459.

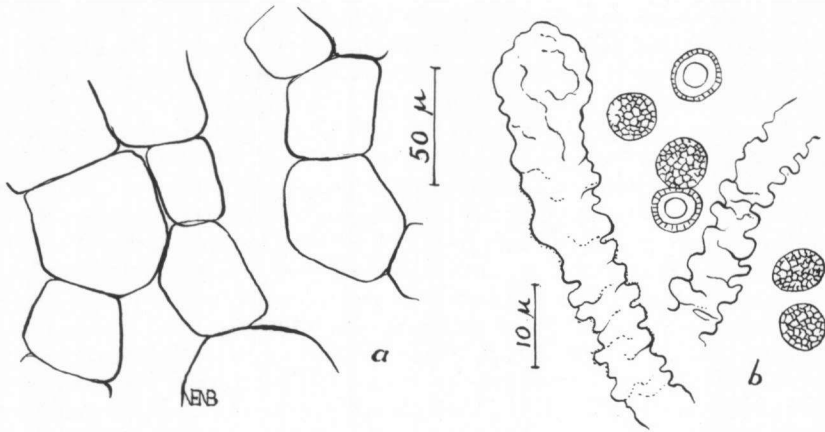


Fig. 3. *Lycogala epidendrum* (L.) Fries var. *tessellatum* Lister; a, tessellation of the cortex scales; b, capillitium and spores, two of the spores in optical section.

1947), I cannot place my beautifully "tessellate" (Fig. 3) specimens here, because the diagnosis of *L. exiguum* given by Martin does not fit, whereas Lister's diagnosis of *Lycogala epidendrum* var. *tessellatum* in the third edition of the monograph and in Penzig (*Myxomycetes Buitenzorg*: 77. 1898) actually does. In *L. exiguum* (see Martin l.c. and also in the *North American Flora* vol. I, part 1, 1948) the tessellate appearance of the scales is present in Morgan's (probable) type, but in other specimens it is not always evident. However, according to Dr. Martin, all American specimens which have tessellate scales are *L. exiguum*. Specimens of *L. exiguum* may be known by the scattered or gregarious aethalia, which are small, 2–5 mm in diam. and appear dark from the covering of dark scales, which are often tessellate. The spores are somewhat smaller than those of *L. epidendrum*, viz. 5–6 μ (not 6–7 μ) in diam., and show faint markings consisting of lines and warts, whereas in *L. epidendrum* they are delicately reticulate.

My specimens exceed the size limit given for *L. exiguum*, measuring up to 10 mm in diam. (the size limits given by Lister for the var. *tessellatum* are 2–10 mm) and even attain 13 mm in the longest diameter in specimens deformed by mutual pressure. They occur in colonies, like those of *L. epidendrum*, some aethalia being free and some closely appressed. The aethalia are rather dark, as they often are also in *L. epidendrum* var. *epidendrum*, but under the microscope the cortex scales show the very curious tessellation, so different from the smooth surface of the rounded or branching scales seen in *L. epidendrum* var. *epidendrum*. The "cells" composing the tessellation are 20–70 μ in diameter, i.e. nearly as described by Lister for the var. *tessellatum* (20–50 μ). The spores are not conspicuously smaller, 6, or mostly 6.5 μ in diam. as opposed to 6.5–8 μ in my specimens of *L. epidendrum* var. *epidendrum*; and they are reticulate as in the latter. Neither is the pseudo-capillitium less wrinkled than it is there, as it should be

in *L. exiguum*. A specimen from West Africa preserved in the British Museum (B.M. 2842) and identified by Lister as var. *tesselatum*, is much like my specimens (spores about $6\ \mu$ in diam.).

I therefore conclude that Lister's *Lycogala epidendrum* var. *tesselatum* differs from the var. *epidendrum* in the tessellate plates, the "cells" of which measure $20\text{--}70\ \mu$ in diameter, and form a more or less reticulate pattern on the cortex, and that it is not identical with *L. exiguum*, from which it differs in the larger size, the more wrinkled pseudocapillitium and especially in the reticulate spores (Fig. 3).

Lycogala species

1715, 20-10-1956; on pine needles, Doorwerth.

The collection consists of one small, pale rosy aethalium of about 4 mm diam. As this was nearly all used up, and since I have not yet found any more specimens, I will not describe it, although it apparently represents a new species. It was peculiar in having a thin, transparent, colourless, evanescent cortex, showing the pink colour of the underlying fresh spores, and, like that of *Lycogala flavofusum*, having its shape determined by gravity (Fig. 4a). The capillitium is much wrinkled and minutely warted to smooth, $5\text{--}10\ \mu$ in diam. The spores are about $6.5\ \mu$ in diam. and, like those of *Lycogala epidendrum*, reticulate over the greater part of their surface (Fig. 4).

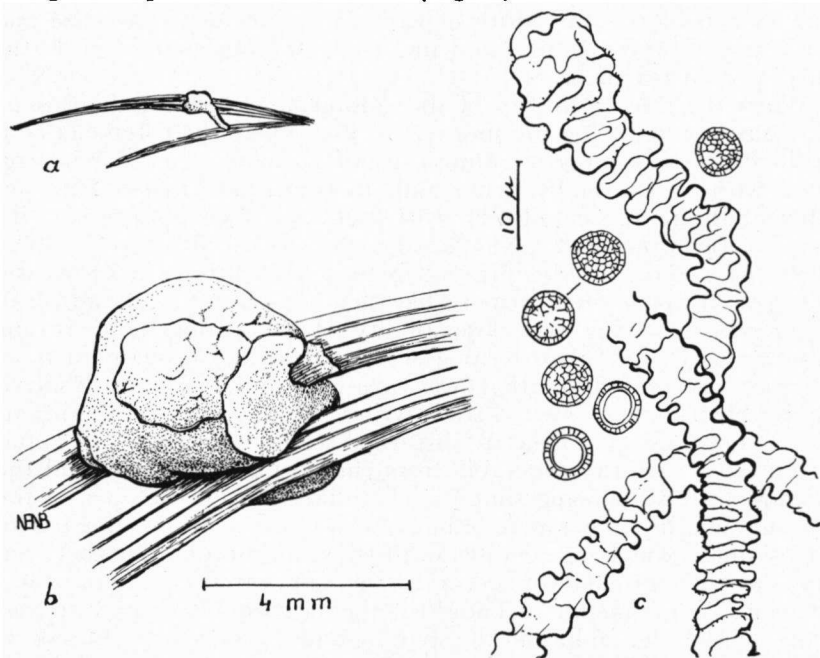


Fig. 4. *Lycogala* species, no. 1715; a, the aethalium on pine needles; b, part of the same further enlarged; c, capillitium and spores, two of the spores in optical section.

Enerthenema Bowman*Enerthenema papillatum* (Pers.) Rost.

On dead wood and bark, also in cultures on bark from living trees. 22; 23 U; 76 U; 131; 135 U; 259; 261; 292; 1039; 1194 U; 1206 U; 1247; 1253; 1619; 1775; 1950 U; 2056; 2115; 2153; 2154; 2172; 2184; 2210; 2245; 2262; 2301; 2638; 2713; 3315; 3337; 3424; 3430; 3431; 3433; 3437; 3442; 3453; 3466; 3467; 3549; 3564; 3566; 3579; 3584; 3585; 3586; 3631; 3632; 3634; 3644; 3645; 3652; 3686; 3691; 3694; 3740; 3775; 3855; 3860; 3865; 3908; 4082; 4143; 4637; 4638; 4797. Plasmodium watery white.

This species is very variable; the sporangia are scattered, gregarious or crowded, pale brown to nearly black; the capillitium lax (Fig. 5 I) or profuse (Fig. 5 V and VI), nearly smooth and only branched at the tips (Fig. 5 I and II), or thick, black, branched, irregularly spinose or rugged, especially at the tips (Fig. 5 III and IV); the columella attaining the apex and expanded there, carrying a plate of peridium (Fig. 5 I, II, and III), or tapering to the apex (Fig. 5 IV and V), or ending abruptly in about the centre of the sporangium (Fig. 5 VI); the disc large (Fig. 5 I and III), small or absent (Fig. 5 IV, V and VI); the spores 9–13 μ in diameter (14 μ in 3564), pale or dark, conspicuously or inconspicuously warted, brown or violaceous brown. The numbers 23, 292, 3579, 3585, 3586, 3908, 4637, 4638 and 4797 have pale spores and could therefore be labelled as var. *carneo-griseum* Meylan, though there seems little point in doing so, as they show the same width of variation as regards spore size and thickness of the capillitium and the size of the apical discs as do the dark-spored specimens.

When the disc at the tip of the columella is present, there is no difficulty in identifying the species. In cases where the columella ends in the centre of the sporangium, a situation which seems to be correlated with an unusually dense and, to complicate matters further, often anastomosing capillitium with but short free tips, rather like those of *Comatricha laxa* (Nos. 3430, 3431, 3433, 3437, 3442, 3855, 3860 and 3865), the identification is more difficult, as in such cases the general appearance is more like that of a *Comatricha* than of an *Enerthenema*, showing the close affinity of the two genera. In the numbers 3433 and 3855, I came across individuals in which a trace of a disc was combined with a *Comatricha*-like capillitium, which solved the problem for me. True, LISTER writes (Monograph, third edition: 150): "If young sporangia are disturbed while developing, the capillitium often varies considerably from the normal character, and the threads, instead of being simple and radiating from the apex of the sporangium, become much branched and spring from all parts of the columella which may end below the summit; all conditions between this and the normal form occur in the same group of sporangia." Of course it is difficult to know whether a specimen was disturbed while developing, and as all the sporangia of a group sometimes show the deviation, I have given figures of various specimens to illustrate some of the forms. (Fig. 5) All the depicted sporangia, save the first (no. 1775) which is 2.4 mm, are 0.9–1.2 mm high; the figures were

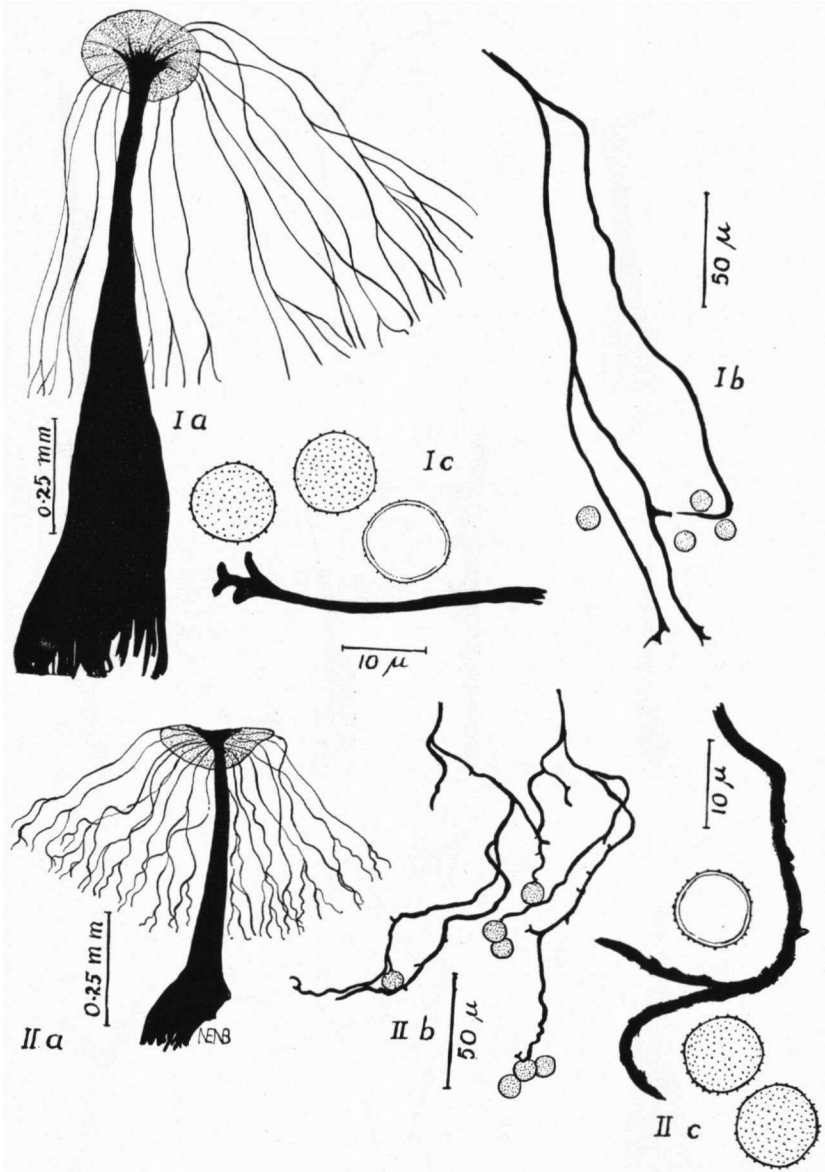


Fig. 5. *Enerthenema papillatum* (Pers.) Rost. I, no. 1775; II, no. 1950. a, sporangium after removal of the spores; b, capillitium and spores further enlarged; c, free ends of the capillitium and spores still further enlarged.

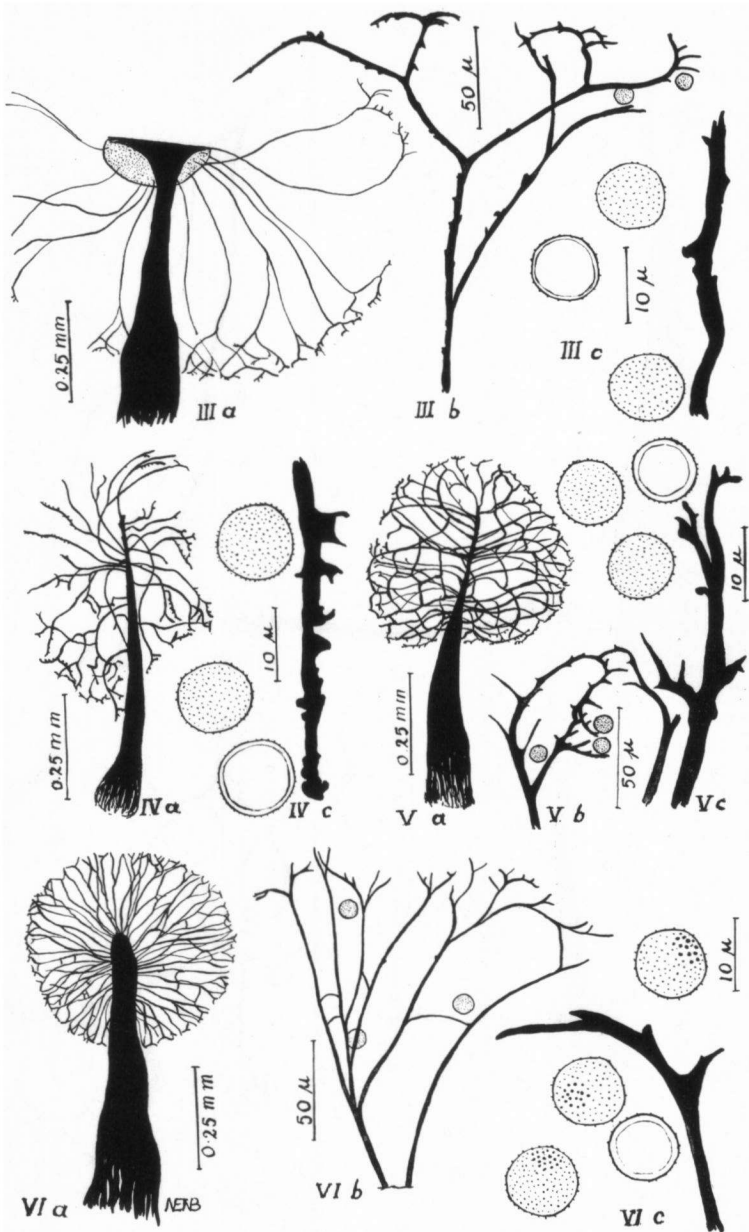


Fig. 5bis. *Enerthenema papillatum* (Pers.) Rost. III, no. 3337; IV, no. 3632; V, no. 3430; VI, no. 3442. a, sporangium after removal of the spores; b, capillitium and spores further enlarged; c, free ends of the capillitium and spores still further enlarged.

made with the aid of a camera lucida and the corresponding parts drawn to scale.

TWO NEW SPECIES OF COMATRICHA PREUSZ

Comatricha solitaria nov. spec. Sporangia solitaria vel sub-solitaria, stipitata, erecta, parva, altitudine tota circ. 0.6 mm. Hypothallus inconspicuus vel nullus. Stipes sporangium altitudine circ. dimidia parte excedens, niger, opacus, basi fibrosus, in sporangium immersum. Sporangium globosum, 0.35 mm, diam., saturate brunneum; peridium evanescens; columella usque ad medium sporangium porrecta et ibi in ramulos plures divisa. Capillitium sul nigrum, laxius, e filamentis crassis et rigidis, dichotome ramificatis, vix reticulatim connectis compositum. Sporae per saturam saturate brunneae, lucem orientem versus visae griseo-brunneae, globosae, circ. 13 μ diam. in typo, in speciminibus aliis interdum 14–16 (18) μ diam., minute verruculosae. Plasmodium hyalinum, incolor.

Habitat provinciam Geldriam, in loco "Doorwerth" dicto, ubi in cortice arborum vivorum lecta est.

Sporangia solitary or nearly so, stipitate, erect; hypothallus inconspicuous or lacking. Small; total height 0.3–0.8 mm. Stipe about 1½ times the height of the sporangium, black, opaque, fibrous at the base, penetrating into the sporangium. Sporangium globose, up to 0.35 mm in diam., dark brown, peridium evanescent, columella reaching the centre of the sporangium and giving rise to several branches at the tip. Capillitium nearly black, rather lax, thick, rigid, branching dichotomously, practically without anastomosing. Spores dark brown in mass, greyish brown by transmitted light, globose, about 13 μ in the type, 14–16 (18) μ in diam. in the other specimens, minutely warted. Plasmodium watery white (Fig. 6).

Netherlands: Province of Gelderland, Doorwerth; type specimen 4691, on bark of living Lime, consisting of 3 sporangia, 4-11-1960; other gatherings, each consisting of 1 sporangium (mounted in Hoyer's chloral hydrate medium) from Lime, 4317, 11-8-1960; Oak, 4023, 24-6-1960; Robinia, 4066, 11-7-1960; Elm, 4884, 5-5-1961; and one consisting of five sporangia from Chestnut, 5006, 15/16-10-1961; all developed on bark from living trees (Doorwerth) in moist chamber.

This small solitary *Comatricha* looks much like a small form of *Enerthenema papillatum*, in which there is no end plate, or like *Comatricha cornea*; from the first it may be known by the mode of branching, from the second by the fibrous stem, from both by the large spores. See fig. 6.

In my list of Myxomycetes from the Netherlands (Acta Bot. Neerl. 10: 84. 1961) I mentioned this species as "*Comatricha* species close to *C. acanthoides* Alexopoulos", from which it differs in the denser Capillitium and the warted, not spinose, spores.

Commatricha longipila nov. spec. Sporangia nunc in globos parvos congregata, nunc omnia sparsa, stipitata, 1.5–2.0 mm alta. Hypothallus orbicularis, brunneus, parvus et vix conspicuus. Stipes

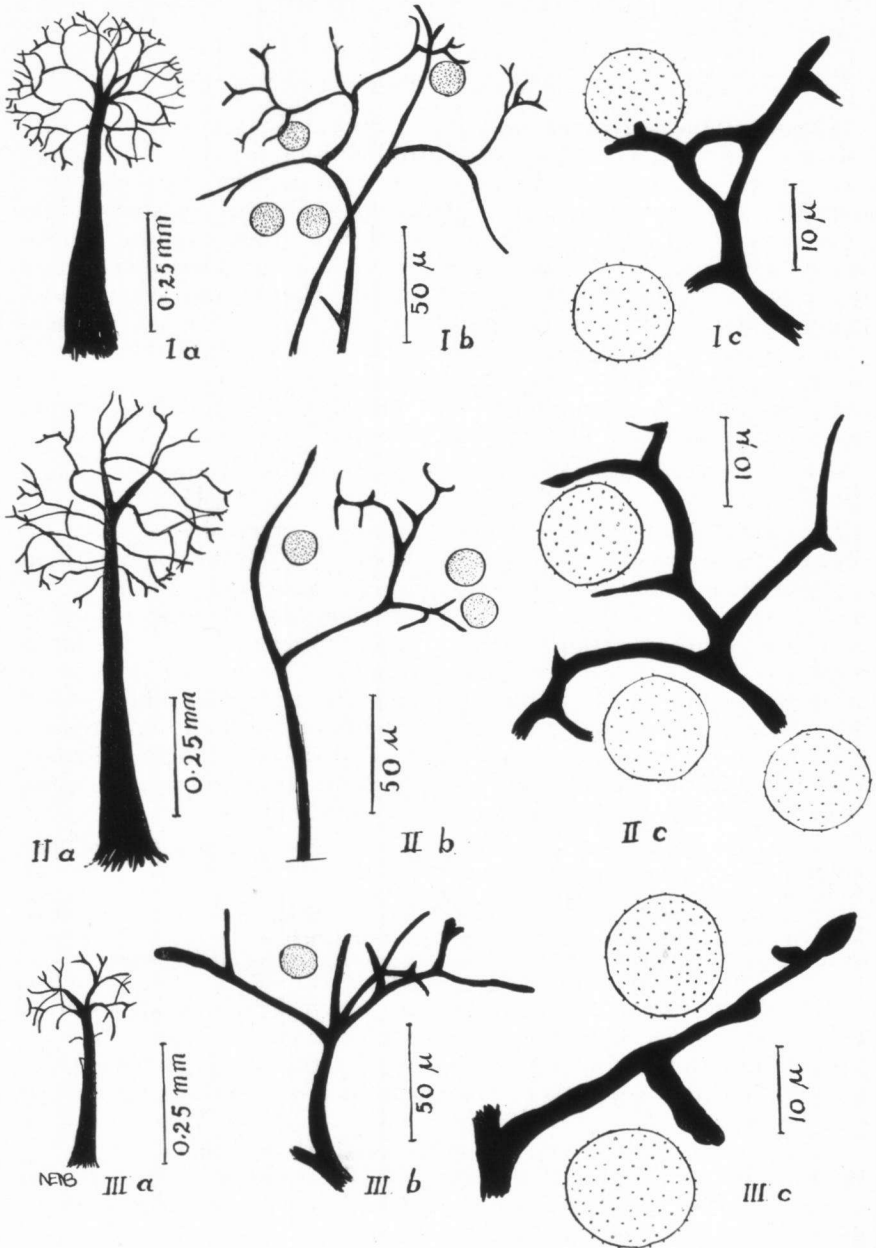


Fig. 6. *Comatrixha solitary* nov. spec. a, sporangia showing the capillitium after removal of the spores; b, capillitium and spores further enlarged; c, free ends of the capillitium and spores still further enlarged. I, type specimen 4691; II, 4032; III, 4317.

niger, altitudine circ. dimidia parte sporangii vel brevior, apicem versus attenuatus. Sporangia teretia, minora tamen interdum subglobosa, obtusa, 1.0–1.25 mm alta, brunnea. Peridium evanescens, collare parvo ad basin sporangii interdum remanente. Columella apicem versus attenuata, sporangium summum fere attingens. Capillitium brunneum, laxum, e filamentis gracilibus, peripheriam versus sensim tenuioribus et tenuissime exeuntibus compositum; ramificationes filamentorum parallelae, in locis paucis connectae, partibus apicalibus liberis peripheriam versus directis longis, rarissime ad peripheriam hic inde in reticulum valde interruptum connectis, partibus extremis insuper interdum pannis incrassatis sparsis. Sporae per saturam brunneae, lucem orientem versus visae dilute brunneae rubro suffusae, 6.5–7.0 μ diam. Plasmodium hyalinum, incolor, deinde nigrum et nitidum, stipitatum.

Habitat provinciam Gelriam, in loco "Wolfheze" dicto, in cortice arborum vivorum lecta est.

Sporangia in small groups or scattered, stipitate; total height 1.5–2.0 mm. Hypothallus small, round, brown, inconspicuous. Stipe black, about one third of the total height or less, tapering upward. Sporangia cylindrical, small ones sometimes subglobose, obtuse, 1.0–1.2 mm high, brown. Peridium evanescent, save for an occasional small collar round the base of the sporangium. Columella tapering, nearly attaining the summit of the sporangium. Capillitium brown,

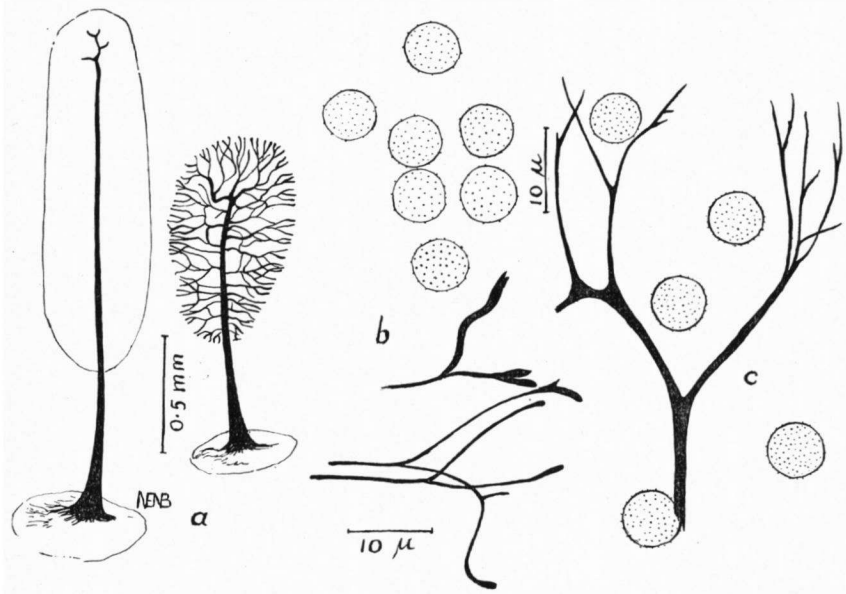


Fig. 7. *Comatrixia longipila* nov. spec. a, sporangium in outline and one showing the capillitium and columella; b and c, spores and free ends of the capillitium further enlarged; a and b from 4050 and c from the type specimen 4839.

lax, delicate, gradually tapering outwards, the extremities exceedingly fine, the branches parallel, with few anastomoses, and long free ends pointing outwards, very rarely united here and there just below the surface to an extremely fragmentary net, with long free ends pointing outwards; the very fine extremities are occasionally minutely notched in the upper part. Spores in mass brown, by transmitted light pale, reddish brown, globose, minutely spinulose, $6.5-7 \mu$ diam. Plasmodium watery white, then passing through a shiny black-stalked phase (Fig. 7).

Netherlands: province of Gelderland; type specimen 4839, 8-4-1961, developed on the bark obtained from a living oak, Wodans-eiken, Wolfheze, in a moist chamber. From the bark of the same tree more specimens were obtained, viz. nos. 4839a, 4839b etc., till the culture was stopped in July. 4050 was obtained on dead coniferous wood from the Duno, Doorwerth, also in a moist chamber.

This species differs from *Comatricha laxa* in the very lax capillitium with the long free tips pointing outwards, from *C. subcaespitosa* in the straight not flexuose capillitium threads and from both in the smaller and paler spores.