Article No. 4

MYXOMYCETES FROM THE TUCHOLSKI LANDSCAPE PARK, POLAND

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Summary: 69 species of myxomycetes and one acrasian are reported from the Tucholski region of north-east Poland, of which eleven are new published records for Poland.

In September 1995 a joint fungus foray by members of the British Mycological Society and mycologists from the Universities of Lodz, Warsawa, Poznan, Szczecin, Brunschwieg, Wien and Kiev was centred on the Suszal Field Station of the University of Lodz, near Rytel, and the Raçiazki Miyn Forest Hostel, near Tuchola. The meeting enabled a range of semi-natural and planted forest communities to be sampled. Little collecting of myxomycetes had previously been carried out in north-east Poland. As well as field collections, bark from living trees was taken for moist chamber culture. In spite of the recent history of atmospheric pollution in the region a satisfactory number of corticolous species developed in culture, indicating a significant recovery from the worst periods of acid deposition on bark.

Sixty-nine species of myxomycetes and one species of acrasian were recorded. Several species are not listed as Polish in the publications of Krzemieniewska (1960) and Stojanska (1983) and may therefore be additions to the Polish myxoflora. They are indicated by * in the list. Voucher material is held in the herbaria of both authors. Synonyms are given where earlier Polish publications use a different name.

COLLECTING SITES

Tucholski Landscape Park

1 – Suszal Field Station, University of Lodz, near Rytel,: *Pinus sylvestris* forest and bog with *Andromeda* and *Ledum*.
2 – Raçiazki Miyn Forest Hostel area: *Pinus* forest, mixed forest, *Alnus* swamp, grassland and gardens.
3 – Swit Forest Reserve, Brda River: *Fagus* forest with *Pinus* and *Carpinus*.
4 – Tuchola town: parks, gardens and roadsides.
5 – Ustronia Nature Reserve: mixed forest with *Sorbus torminalis, Carpinus, Fagus, Quercus* and *Pinus*.
6 – Kregi Kamienne Nature Reserve, Odry: *Pinus* forest and Callunetum around stone circles and ancient burial mounds.
7 – Zolwiniec Nature Reserve: *Fagus* and *Pinus* forest.

Zaborski Landscape Park

8 – Bachorze: lakeside and roadside vegetation.
9 – Jezioro Gacno Wikic: *Pinus* forest, *Ledum* bog and lakeshore.
10 – Jezioro Ostrowite: *Pinus* forest and *Carex/Phragmites* swamp in lake.
11 – Jezioro Blotko: *Pinus* forest and bog with *Andromed, Ledum* and *Vaccinium.*

LIST OF SPECIES

ACRASIOMYCOTA
ACRASIOMYCETES
ACRASIALES

Pocheina rosea (Cienk.) Loeblich & Tappan [*Guttulina rosea* Cienk.]
Sites 4 and 6. On bark of living *Juniperus* and *Tilia* in moist chamber culture. Widespread throughout Europe on acid-barked trees or those affected by acid deposition from the atmosphere. Originally described from Poland, from dead wood, but almost certainly recently fallen bark.

MYXOMYCOTA
CERATIOMYXOMYCETES
CERATIOMYXALES

Ceratiomyxa fruticulosa (Müll.) T. Macbr.
Sites 1, 3, 7 and 10. On rotten *Pinus* trunks and stumps. Widespread and very common in all parts of Europe.

C. porioides (Alb.& Schwein.) J. Schröt.
Sites 3 and 7. On stumps of *Pinus* and *Fagus*. A rare species, often treated as variety of *C. fruticulosa*, sparsely recorded throughout the warmer parts of Europe and thus commonest in the Mediterranean region.

MYXOMYCETES
ECHINOSTELIALES

***Echinostelium brooksii** K.D. Whitney
Site 6. On bark of living *Juniperus communis* L. in moist chamber culture. A widespread and common species in Europe on trees in open situations.

***E. colliculosum** K.D. Whitney & H.W. Keller
Sites 2 and 7. On bark of living *Alnus* and *Quercus*. Common and widespread throughout Europe.

***E. minutum** de Bary
Sites 3 and 7. On bark of living *Quercus*. Common throughout Europe.

CRIBRARIALES

Cribraria argillacea (Pers.) Pers.
Sites 7 and 9. On rotten wood of *Pinus*. Common everywhere in coniferous forests.

C. aurantiaca Schrad.
Sites 1, 3, 5, 6, 7 and 11. On rotten wood of *Pinus*. Common everywhere in coniferous forests.

C. cancellata (Batsch) Nann.-Bremek. [*Dictydium cancellatum* (Batsch) T. Macbr.]
Sites 1, 3, 7 and 9. On rotten wood of *Pinus*. Common everywhere in coniferous forests.

C. persoonii Nann.-Bremek. [*vulgaris* Schrad. in part]
Site 7. On rotten wood of *Pinus*. Widespread but much less common than the three preceding species. Most older records of *C. vulgaris*, including those from Poland, probably belong here.

C. pyriformis Schrad.
Site 1 and 5. On rotten wood and sawdust of *Pinus*. Widely distributed in Europe inconiferous forests and common in those dominated by pines.

C. rufa (Roth) Rostaf.
Sites 1, 5 and 6. On rotten wood of *Pinus*. Common throughout Europe in coniferous forests and plantations.

Lindbladia tubulina Fr. [*effusa* (Ehrenb.) Rostaf.]
Sites 3 and 7. On litter and sawdust of *Pinus*. Frequent in cool coniferous forests.

LICEALES

Licea kleistobolus G.W. Martin [*Kleistobolus pusillus* Lippert]
Site 3. On bark of living *Pinus*. Widespread and common, especially on smooth bark without epiphytes.

L. minima *Fr.*
Site 2. On bark of living *Tilia*. Common throughout Europe; also occurs on fallen conifer branches.

***L. operculata** (Wing.) G.W. Martin [*Orcadella operculata* Wing.]
Site 2. On bark of living *Tilia*. Frequent in Europe but less common than the other species of the genus listed here.

***L. parasitica** (Zukal) G.W. Martin [*Hymenobolina parasitica* Zukal]
Sites 2 and 8. On bark of living *Populus* and *Tilia*. Widespread and common in temperate forests, especially associated with lichens and bryophytes, but not a parasite.

L. variabilis Schrad.
Sites 9, 10 and 11. On small, fallen *Pinus* branches which have lost their bark. Widespread and common in coniferous forest regions.

RETICULARIALES

Lycogala epidendrum (L.) Fr.
Sites 1 and 7. On rotten wood of *Pinus*. This is the small, dark segregate which has a red plasmodium and grey to olivaceus spore mass. It is most common in the warmer regions of the word but is widespread and common in Europe.

L. terrestre Fr.
Sites 1, 2, 3, 5, 7 and 11. On rotten wood of many tree species. This is the commoner, larger, often paler segregate of the *epidendrum* complex with pink plasmodium and pink spore mass.

***Reticularia intermedia** Nann.-Bremek.
[*Enteridium intermedium* (Nann.-Bremek.) M.L. Farr]
Site 5. On fallen branch of *Fagus*. Uncommon in Europe and probably overlooked as the sporocarps are more ephemeral than those of other members of the genus.

R. lycoperdon Bull [*E. lycoperdon* (Bull.) M.L. Farr]
Site 2. On dead, standing trunk of *Alnus* in swamp woodland. A common and widespread species, characteristic of dead standing trees but also found on prepared wood in window and door frames of buildings.

R. jurana Meylan [*E. splendens* (Morg.) T. Macbr.
Site 1. On fallen branches of angiosperm trees. Widespread and common in Europe, sometimes recorded as *E. rozeanum* (Rostaf.) Wing.

Tubifera ferruginosa (Batsch.) J.F. Gmel.
Sites 1, 3, 6, 7 and 11. On rotten logs of *Pinus*. Common throughout Europe.

TRICHIALES

Arcyria cinerea (Bull.) Pers.
Sites 2, 3, 5 and 7. On dead wood and bark of living *Quercus* and T*ilia*. Common throughout Europe.

A. denudata (L.) Wettst.
Sites 2, 3, 5 and 5. On fallen trunks and stumps, especially of *Fagus*. Common throughout Europe.

A. incarnata (Pers.) Pers.
Sites 1, 3, 7, 10 and 11. On fallen branches of *Pinus* and *Quercus*. Common throughout Europe.

A. obvelata (Oeder) Onsberg [*A. nutans* (Bull.) Grev.]
Sites 3 and 11. On fallen wood of *Pinus*.

A. oerstedtii Rostaf.
Site 6. On rotten *Pinus* wood. Generally uncommon but widespread. As with the previous species this is found equally frequently on *Pinus* and *Fagus* wood.

A. pomiformis (Leers) Rostaf.
Sites 1, 3, 5, 6 and 7. On small, fallen branches and, more commonly, on the bark of living trees, especially *Quercus*. Common throughout Europe.

A. stipata (Schwein.) Lister
Site 3. On rotten wood of *Fagu*s. Generally uncommon and scattered across Europe.

Hemitrichia calyculata (Speg.) M.L. Farr [*H. clavata* (Pers.) Rostaf. in part]
Site 3. On rotten wood of *Fagus*. This is the commoner segregate from *H. clavata* and is the only one found at low elevations at lower latitudes. Common throughout Europe.

Metatrichia vesparium (Batsch) Nann.-Bremek.
[*Hemitrichia vesparium* Batsch) T. Macbr.]
Sites 2, 3 and 5. On rotten wood of *Fagus*. Widespread throughout Europe but mostcommon in the warmer regions.

Trichia decipiens (Pers.) T. Macbr.
Sites 3 and 5. On rotten wood of all kinds. Common throughout Europe. None of this material can be assigned to the var. *olivacea* (Meylan) Krzem., usually regarded as a variety of the present species but differing in a number of apparently constant characters, including spore ornamentation and circumscissile dehiscence.

***T. flavicoma** (Lister) Ing
Site 7. In leaf litter of *Fagus*. A rare taxon, related to the very common lignicolous species, *T. botrytis* (J.F. Gmel.)Pers.

T. persimilis P. Karsten
Sites 3 and 5. On fallen trunks which are in an early stage of decomposition. Very common in Europe. This species is often synonymised with *T. favoginea* (Batsch) Pers., to include *T. affinis* de Bary as well. These three taxa are distinct ecologically and morphologically and can readily be separated in the field in Europe. This species has small, irregular spore reticulations, *affinis* has large, regular reticulations but narrow elaters and favoginea has similar spores to affinis but broader elaters. *T. persimilis* is found on hard wood, *affinis* on very soft wood and mosses and *favoginea*, which is the rarest of the three, is found on wood which is more decomposed than that supporting *persimilis* but less than that with *affinis*. The colour of the spore mass is also different. *T. affinis* has pale, bright lemon-yellow spores, *favoginea* has pale ochraceous yellow spores and *persimilis* has dull, ochraceous yellow spores. All three, clearly closely related, taxa, are attacked by the hyphomycete *Polycephalomyces tomentosus* (Schrad.) Kobayasi.

T. scabra Rostaf.
Site 3. On rotten *Fagus* trunks. Widespread in old forest throughout Europe.

T. varia (Pers.) Pers.
Sites 1, 2, 3, 5, 6 and 7. On very rotten wood. Common and widespread.

STEMONITIDALES

Comatricha laxa Rostaf.
Site 2. On fallen branches. Frequent and widespread in Europe.

C. nigra (Pers.) J. Schröt.
Sites 1, 3, 7, 9 and 11. On fallen wood of all kinds and on the bark of living Pinus. This is one of the commonest myxomycetes everywhere.

C. pulchella (C. Bab.) Rostaf.
Site 2. On herbaceous litter. Common and widespread across Europe.

Enerthenema papillatum (Pers.) Rostaf.
Sites 1, 2, 3, 5, 6, 7 and 11. On fallen sticks and branches of *Pinus* and *Quercu*s and on bark of living *Alnus, Quercus* and *Tilia*. Common throughout Europe.

***Macbrideola cornea** (G.List.& Cran) Alexop.
[*Comatricha cornea* G. List. & Cran]
Site 11. On bark of living *Pinus*. Usually associated with bryophytes on bark this species is characteristic of more humid sites and is thus commoner in western Europe or in mountain valleys.

***Paradiacheopsis cribrata** Nann.-Bremek.
Site 2. On bark of living *Tilia*. This species is less common in Europe than the next two and is more likely to found on less acid bark.

P. fimbriata (G.List. & Cran) Hertel [*Comatricha fimbriata* G.List. & Cran]
Sites 2, 5, 7, 8 and 11. On bark of living *Alnus, Juniperus, Pinus, Populus, Quercus* and *Tilia*. One of the commonest myxomycetes on the bark of trees which is either naturally acid or has been acidified by atmospheric deposition.

***P. solitaria** (Nann.-Bremek.) Nann.-Bremek.
Sites 2, 6 and 7. On bark of living *Alnus, Juniperus, Quercus* and *Tilia*. Common inEurope on bark in older forests than the preceding and usually on less acid bark.

Stemonitis axifera (Bull.) T. Macbr.
Site 3. On fallen *Fagus* branch. A common species throughout Europe.

S. flavogenita E. Jahn
Site 1. On *Pinus* stump. Equally common as the last species and usually developing from a yellow plasmodium, unusual for this genus.

S. fusca Roth
Sites 1, 2, 3, 5, 6, 7 and 10. On stumps and fallen trunks. This large and conspicuous species is common throughout Europe.

***S. herbatica** Peck
Site 3. In *Fagus* leaf litter. This is the largest litter-inhabiting *Stemonitis*, but as with the other members of the genus it needs very careful examination to ensure correct determination. Widespread but never common.

S. virginiensis Rex
Site 3. On fallen *Fagus* branch. Generally rare in Europe and characterised by its lilac brown colour and the peculiar perforated ridges on the spores, only visible with the scanning electron microscope.

Stemonitopsis hyperopta (Meylan) Nann.-Bremek. [*Stemonitis hyperopta* Meylan]
Sites 1, 7 and 10. On very rotten logs of *Pinus*. A typical species of the northern coniferous forests of Europe, much less common further south and always with conifer wood.

S. typhina (F.H. Wigg.) Nann.-Bremek. [*Comatricha typhoides* (Bull.) Rostaf.]
Sites 1, 2, 3, 5, 6 and 7. On very rotten, usually damp, wood of broad-leaved trees. Very common across Europe.

PHYSARALES

Badhamia lilacina (Fr.) Rostaf.
Site 11. On *Sphagnum* on surface of bog. Characteristic of *Sphagnum* bogs in northern and western Europe but not common elsewhere.

Craterium minutum (Leers) Fr.
Site 2. On *Alnus* leaf litter. A common and widespread species.

Diachea leucopodia (Bull.) Rostaf.
Site 3. In *Fagus* leaf litter. Widespread in the warmer parts of Europe, thinning out northwards.

Didymium clavus (Alb.& Schwein.) Rabenh.
Site 7. In *Fagus* leaf litter. Widespread but not common.

D. difforme (Pers.) Gray
Site 2. In *Acer* leaf litter. One of the commonest litter species and surprisingly restricted to this one site during the foray.

D. melanospermum (Pers.) T. Macbr.
Site 1. In *Pinus* needle litter. Again, fewer records than expected for this common species.

D. minus (List.) Morgan
Sites 1,2 and 7. On herbaceous litter, especially stems. Widespread in Europe but never common.

Fuligo septica (L.) F.H. Wigg. var. **flava** (Pers. R.E.Fr.
Sites 2, 5, 6, 7 and 10. On rotten trunks and branches. Very common everywhere. This variety has yellow calcareous nodes within the sporocarp and is generally more yellow than the typical variety, which is much less common in Europe.

Lamproderma scintillans (Berk.& Br.) Morg.
Site 7. In *Fagus* leaf litter. Frequent throughout Europe.

Leocarpus fragilis (Dicks.) Rostaf.
Sites 1, 2, 3, 5, 6, 7, 9, 10 and 11. In leaf litter, especially of *Pinus*. Very common and conspicuous as its yellow plasmodium emerges from the soil and forms the characteristic clusters of chestnut sporocarps at the surface.

P. album (Bull.) Chevall. [*P. nutans* Pers.]
Sites 1, 2, 3, 5, 7, 10 and 11. On fallen wood of all kinds, occasionally in leaf litter. Very common everywhere.

Physarum cinereum (Batsch) Pers.
Site 3. In *Fagus* leaf litter and on living grass plants. A fairly common species in Europe, often producing its heaped sporocarps on living grasses in lawns.

P. leucophaeum Fr.
Sites 1, 2, 3 and 7. On fallen branches, especially of broad-leaved trees. Common throughout Europe.

P. psittacinum Ditmar
Site 3. On *Fagus* stump. An uncommon species in Europe, usually associated with ancient woodland. This is one of the most beautiful myxomycetes, with iridescent blue sporangia on vivid orange stalks.

P. robustum (List.) Nann.-Bremek. [*P. nutans* Pers. var. *robustum* List.]
Site 1. On rotten *Pinus* branch. This species is not always separated from *P. album* but is quite distinct. It is widespread but not common in Europe.

P. virescens Ditmar
Sites 7 and 9. On terrestrial mosses, such as Dicranum undulatum Brid. The small, heaped yellow sporocarps, which are green as they begin to mature, are characteristic of moss shoots on the floor of humid forests.

P. viride (Bull.) Pers.
Sites 7, 9 and 10. On small, fallen branches of Pinus. Common and widespread.

COMMENTS ON THE LIST

None of the species reported are rare in Europe and most are probably frequent throughout Poland. They represent, as may be expected, typical assemblages of *Pinus* and *Fagus* forest species, together with many cosmopolitan species with no obvious preferences for special forest types. However, three of the species found in this study are included in the Red List of threatened slime moulds in Poland (Stojanowska & Drozdowicz, 1992.) *Badhamia lilacina* and *Licea kleistobolus* are listed as extinct and *Reticularia intermedia* as of indeterminate threatened status. Clearly the first two are not extinct and it is unlikely that the last species is as rare as the records suggest. Of particular interest is the number of corticolous species which developed in moist chamber form bark of living trees. Considering the recent history of atmospheric pollution in Central Europe the fifteen species listed here indicate a marked improvement in conditions. Much of the pinetum is of planted origin and is not ancient and therefore some of the rarer species associated with the boreal conifer biome appear to be absent. Nevertheless this list has extended our knowledge of the distribution of Polish myxomycetes into another region of the country and indicates how effective a short, but intensive period of collecting can be.

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