MOULDY MYXOMYCETES **Bruce Ing**

Collectors of myxomycetes frequently find their specimens covered with growths of mould: This can be annoying as it makes identification of the myxomycete more difficult and renders the specimen unsuitable for the collection. Apart from the familiar `stilbum' on *Trichia,* most of the parasitic moulds found are not identified and are usually consigned to the dustbin without further study, This is a pity ,as much could be learned from accurate determination of host and parasite. .A provisional list was given by Ing (1967) but valuable and detailed treatments are to be found in Gams (1971) and Samuels (1973). These latter works have been used extensively in the compilation of this note.

To encourage the identification of these Hyphomycetes, and their nectriaceous perfect states found on myxomycetes, keys are offered, with lists of hosts. For the perfect stages a list with. these synonyms used in foray lists and other general works is given. Throughout the account an asterisk (*) indicates that the state in question has been reliably reported from the British Isles. Nomenclature of myxomycetes follows Martin & Alexopoulos (1969) and Ing (1968).

Key to Conidial States

I Phialides with swollen base, some reduced to small denticles without a basal septum, grouped around the conidiophore (Fig.l.) Conidia ovoid, hyaline, 2.8-4.2(-5.5) x 1.7-3.0(-3.7) pm .....*Aphanocladium album**

= Phialides cylindrical, basal part hardly inflated .....2.

2 — Fructification a synnema Fi 2. (Stilbella) .....6.

— No synnemata .....3.

3 — Conidiophores branched irregularly and sparsely, always near the base; phialide wall scarcely thicker than that of vegetative hyphae (Fig.3.) .....(Acremonium).....9.

— Conidiophores branched at middle or towards tip, typically with whorls of phialides .....4.

4 — Conidiophores verticillately branched, each branch terminating in a phialide with a pleurophialide below (Fig.4.) .....*Sesquicillium microsporum* *

— Ultimate branches of conidiophore bearing whorls of phialides .....5.

5 — Whorls of phialides compacted, Penicillium-like, conidia united in slime heads (Fig.5.) .....(Gliocladium) .....10.

— Whorls of phialides divergent (Fig.6.) .....(Verticillium) 11. 6.— Conidia cylindrical to ellipsoidal, 4.7-5.3 x 2.0-2.2 pm .....*Stilbella orbicularis**

— Conidia globose or oval, smaller .....7.

7 — Conidia globose, 0.7-1.0 pm diam.....*Stilbella tomentosa**

— Conidia oval .....8.

8 — Conidia 1.0-1.5 x•0.75-1.0 pm .....*Stilbella tomentosa**

— Conidia 3.0-5.0 x 1.5-2.0 pm .....*Stilbella ovalispora**

9 — Conidia elliptical, (-5)7.5-9.5(-14) x 3.0-4.0 µm .....*Acremonium* sp.* [stat. con. *of Nectria candicans]*

— Conidia ellipsoidal to rod-shaped, 6.5-9.5(-17— x 2.0-3.0 pm ..... - [stat. con. of *Nectria violacea] .....Acremonium fungicolum**

10 — Conidia 2.5-3.7 x 1.6-1.9 pm .....*Gliocladium album**

— Conidia (4-)5.0-6.0(-7.5) x 1.5-2.0 pm .....*Gliocladium* sp. [stat. con. of *Nectria sporangiicola]*

11 — Thick-walled dictyochlamydospores present; conidia 2.9-3.3 x 1.9-2.2pm .....*Verticillium catenulatum **

— Chlamydospores absent .....12.

12 — Conidia subglobose, 2.2-2.9 pm diam.....*Verticillium lindauianum*
Conidia oval to elongate .....13.

13 — Conidia 3.9-5.7 x 2.1-2.7 *pm* .....*Verticillium rexianum **

— Conidia 3.0-5.8 x 0.8-1.1 pm .....*Verticillium insectorum**

***Acremonium fungicolum** (Sacc.) Samuels Conidial state of *Nectria violacea.*
Diplosporium album Bon. var. *fungicola* Sacc.
Found only on *Fuligo septica;* affected *Fuligo* was described as *var..violacea* (Pers.) R.E.Fr.

*Acremonium sp. Conidial state of *Nectria candicans.* Recorded from *Amaurochaete atra, A. ferruginea, Badhamia* sp., *Diachea subsessilis, Diderma globosum, D. simplex, D. spumarioides, Didymium megalosporum, D. melanospermum, Fuligo intermedia, F. musco.rum, F. septica, Mucilago crustacea, Physarum didermoides, Stemonitis flavogenita, S. fusca, Trichia floriformis.*
Records of the previous species on myxomycetes other than *Fuligo septica* should probably be referred here (e.g. Petch, 1941; Ing, 1967).

***Aphanocladium album** (Preuss) W. Gams *Acremonium album* Preuss

Recorded from *Arcyria cinerea, Comatricha nigra, Cribraria aurantiaca, C. rufa, C. vulgaris s.l., Didymium nigripes,* and *Trichia affinis, T. varia.* The records for this species were confused with the next in Ing (1967).

*Gliocladium album (Preuss) Petch
Recorded from *Arcyria cinerea. Badhamia* sp., *Comatricha nigra, Cribraria aurantiaca, C. cancellata, C. rufa, Didymium squamulosum, Physarum leucophaeum, P. nutans, Stemonitis fusca, Trichia affinis, T. varia.*

Gliocladium sp. Conidial state of *Nectria sporangiicola.* May be identical with G. *africanum* Eichelbaum (fide Samuels).
Reported from *Physarum polycephalum* and, as *africanum,* from *Physarum nutans*

***Sesquicillium microsporum** (Jaap) Veenbaas-Rijks & W. Gams
Verticillium botryoides Sacc.
Recorded from *Craterium leucocephalum, Didymium m elanosperm um, Leocarpus fragilis* and *Physarum spp.*

*Stilbella orbicularis (Berk. & Br.) W. Gams
Stilbum orbiculare Berk. & Br.
Originally thought to be confined to *Lindbladia tubulina,* and therefore rare, but according to Gams (1971) found also on *Cribraria argillacea, Fuligo* sp. and *Trichia spp.* Records of S. *tomentosa* on C. *argillacea* (Ing, 1967) may belong here.

***Stilbella ovalispora** (A.L.Smith) B.Ing stat. et comb. nov.
?conidial state of *Nectria hirsuta.*
Stilbum tomentosum Schrad. var. *ovalisporum* A.L.Smith, *Trans. Br. mycol. Soc. 2: 26.* 1903.
Stilbella tonaentosa (Scrad.) Bres. var. *ovalispora* (A.L.Smith) Rogerson The ascigerous state of S. *tomentosa is* known to be *Byssostilbe stilbigera* (Petch, 1945),. whereas according to Samuels (1973) the present taxon is associated with *Nectria hirsuta.* It seems reasonable to consider it as a distinct species, especially since it is readily separated from *tomentosa* by its spore size. Smith (1903) re-marked that the larger spores almost amounted to a specific distinction. Petch (1945) in his study of the species *sensu lato* found the form with larger spores to be far commoner.

Records of myxomycetes parasitised by *Stilbella* are uncertain as the variety was rarely recorded separately in foray reports. However the following hosts are definitely known to be attacked by *ovalispora: Hemitrichia serpula, Perichaena corticalis, Trichia persimilis, T. varia.*

Stilbella tomentosa (Schrad. per Grev.) Bres.
Conidial state of *Byssostilbe stilbigera.*
Stilbum tomentosum Schrad.
Tilachlidium tomentosum (Schrad.) Lindau
This has long been regarded as a very common species, but as it has been confused with *orbicularis* and *ovalispora* the list of myxomycetes parasitised by it may need revision. At present the list is: *Comatricha pulchella, Cribraria argillacea, C. aurantiaca, C. rufa, Diderma effusum, Perichaena corticalis, P. depressa, Trichia affinis, T. botrytis, T. decipiens, T. favoginea, T. floriformis, T. lutescens, T. persimilis, T. varia, T. verrucosa.* It is hoped that colleagues will carefully identify both *Stilbella* and the myxomycetes before submitting records for foray reports.

***Verticillium catenulatum** (Kamyschke ex Barron & Onions) W. Gams *Spicaria simplex* Petch
Paecilomyces simplex (Petch) Brown & G. Smith
Known so far only from *Trichia affinis.* The mould produces conspicuous

aggregations of thick-walled chlamydospores.

*Verticillium insectorum (Petch) W. Gams *Oospora trichiae* Petch

Known so far from *Trichia verrucosa;* it also occurs on insects.

Verticillium lindauianum Bubak.
Recorded from *Didymium melanospermum, Fuligo septica* and *Physarum cinereum.*

***Verticillium rexianum** (Sacc.) Sacc. Conidial ,state of *Nectria myxomyceticola.* V. *niveostratosum* Lindau
Cephalosporium verticicolum Petch
C. acremonium Corda (in part).

This is a very common species, found on: *Arcyria cinerea, A. denudata, A. nutans, Ceratiomyxa fruticulosa, Comatricha nigra, C. typhoides, Cribraria argillacea, C. aurantiaca, C. cancellata, Fuligo septica, Lycogala epidendrum, Physarum compressum, P. nutans, Stemonitis axifera, S. flavogenita, S. fusca, S. nigrescens, Trichia botrytis, T. florifarmis, T. varia.*

Key to Perithecial States
(adapted from Samuels, 1973)

1 — Ascospores filiform, multicellular, fragile .....
.....*Byssostilbe stilbigera*
[associated with *Stilbella tomentosa]*
Ascospores elongate — fusiform,ciliate, 50-60µm
.....*Rhynchonectria longispora**
— Ascospores oblong, cylindrical or elliptical, 2-celled .....:.....:. 2.
2 — Perithecia violet or purple .....*Nectria violacea**
[associated with *Acremonium fungicolum]*
— Perithecia hyaline, white, yellow or brownish .....3.
3 — Average length of ascospores more than 9pm .....
.....*Nectria hirsuta.*
[possibly associated with *Stilbella ovalispora]*
- Average length of ascospores less than 9pm .....4.
4 — Average length of ascospores less than 6µm; pointed hairs on perithecial wall
[associated with *Verticillium rexianum] .....Nectria myxomyceticola.*
Average length of ascospores more than 6 but less than 9pm; hairs on perithecial wall with rounded apex, or absent .....5.
5 — Perithecial hairs with rounded apices; ascospores (5-)6-7.5(-8.7) x 2-3 pm
[associated with *Acremonium* sp.] .....*Nectria candicans*,*
Perithecial wall smooth; ascospores (7-)8-9(-9.5) x 3 pm.
[associated with *Gliocladium* sp.] .....*Nectria sporangiicola.*

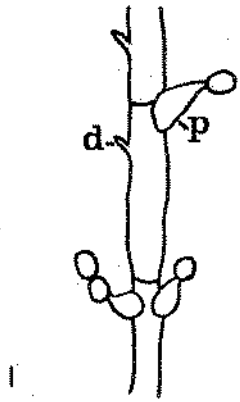
Byssostilbe stilbigera (Berk. & Br.) Petch Perfect state not yet found in Europe.

*Nectria candicans (Plowr.) Samuels *Hypomyces candicans* Plowr. *Nectriopsis candicans* (Plowr.) Maire

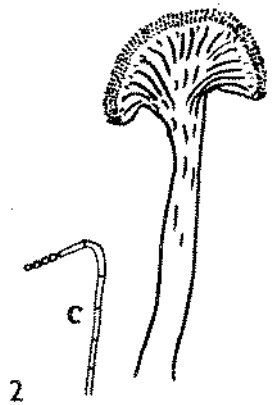
Nec tria hirsuta Samuels
Perfect state known only from U.S.A.

Nectria myxomyceticola Samuels *Hvpomyces exiguus* Pat.
Perfect state known from North and South America.

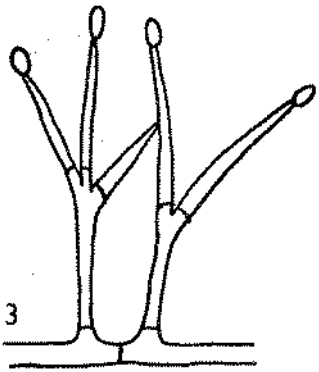
Nectria sporangiicola Samuels ' 'Perfect state known only from U.S.A.



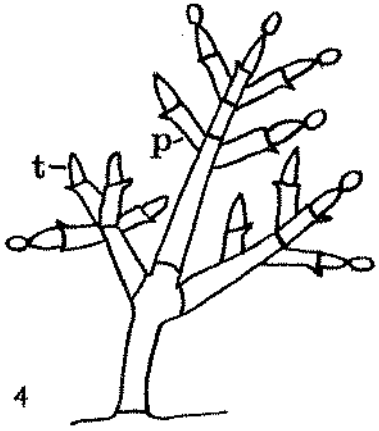
1



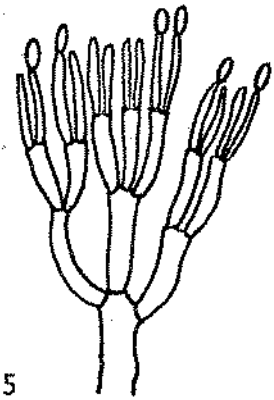
2



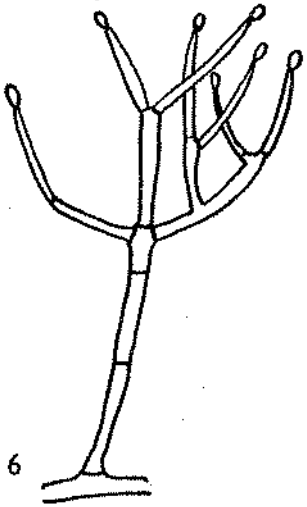
3



4



5



6

*Nectria **violacea (Fr.)** Fr.

Hypomyces violaceus (Fr.) Tul. *Nectriopsis violacea (Fr.)* Maire *Hyphonectria violacea (Fr.)* Petch

**Rhynchonectria longispora* (Phil. & Plowr.) v. Hohn. Recorded by Petch (1938) as attacking *Cribraria* sp., but not noted since. Conidial state not described.

Among several other fungi which are found growing on myxomycetes are species of *Mucor, Aspergillus, Penicillium, Harposporium, Scopulariopsis, Sporotrichum* and *Dendryphiella.* None of these is specifically myxomyceticolous, but a. species of *Dendrodochium* has been isolated recently from *Fuligo septica* and may be specific.

References

Gams, W. 1971. *Cephalosporium-artige Schimmelpilze (Hyphomycetes).* Stuttgart. Ing, B. 1967. .Myxomycetes as food for other organisms. *Proc. S. Lond. ent. nat. Hist. Soc.* **1967:** 18-23.

Ing, B. 1968. *A Census Catalogue of British Myxomycetes*. British Mycological Society Foray Committee.

Martin, G.W. & Alexopoulos, C.J. 1969. *The Myxomycetes.* Iowa.

Petch, T. 1938. British Hypocreales Trans. Br. mycol. Soc. 21 243-305.

Petch, T. 1941. Further notes on British Hypocreales. *Trans. Br. mycol. Soc. 25:* 166-178.

Petch, T. 1945. *Stilbum tomentosum Schrad.Trans. Br. mycol. Soc.* 28: 101-109. Samuels, G.J. 1973. The myxomyceticolous species of *Nectria. Mycologia* **65:** 401-420.

Smith, A.L. 1903. Notes on a species of *Stilbum. Trans. Br. mycol. Soc.* 2: 25-26.

Mr Bruce Ing
Is always `sprucing'
In words often devious
He is myxo-mischievious!

E.R.W.

The above found its way from the capacious rain-coat pocket of E.R.W. into the Editor's note-book during the Liverpool foray so be warned there is a chiel amang ye takin' notes!