

Mycosylva reticulata, a new psychrophilic hyphomycete

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Abstract: A new synnematous hyphomycete, *Mycosylva reticulata* Samson & Hintikka sp. nov. is described. It has been isolated from pellets of small rodents in northern Finland and differs from the type culture of *M. clarkii* Tulloch mainly by the reticulate ornamentations of the conidia, the presence of ramoconidia and the olive green colour of the synnematal heads. *Mycosylva clarkii* and *M. reticulata* are psychrophilic, showing optimal growth at 15°C. The relationship of the genus *Mycosylva* to *Myceliophthora*, *Hormoconis*, *Pycnostysanus* and *Heydenia* is discussed.

INTRODUCTION

During attempts to obtain psychrophilic basidiomycete mycelia from forest soil and litter in Finland an interesting hyphomycete was isolated from pellets of small rodents. The fungus produced typical synnemata on agar media. Recently a similar fungus was isolated from animal droppings in England and described in a new genus as *Mycosylva clarkii* by Tulloch (1973). After comparison with the type culture of *M. clarkii* it was shown that the Finnish isolate differed sufficiently to warrant its description as a new species.

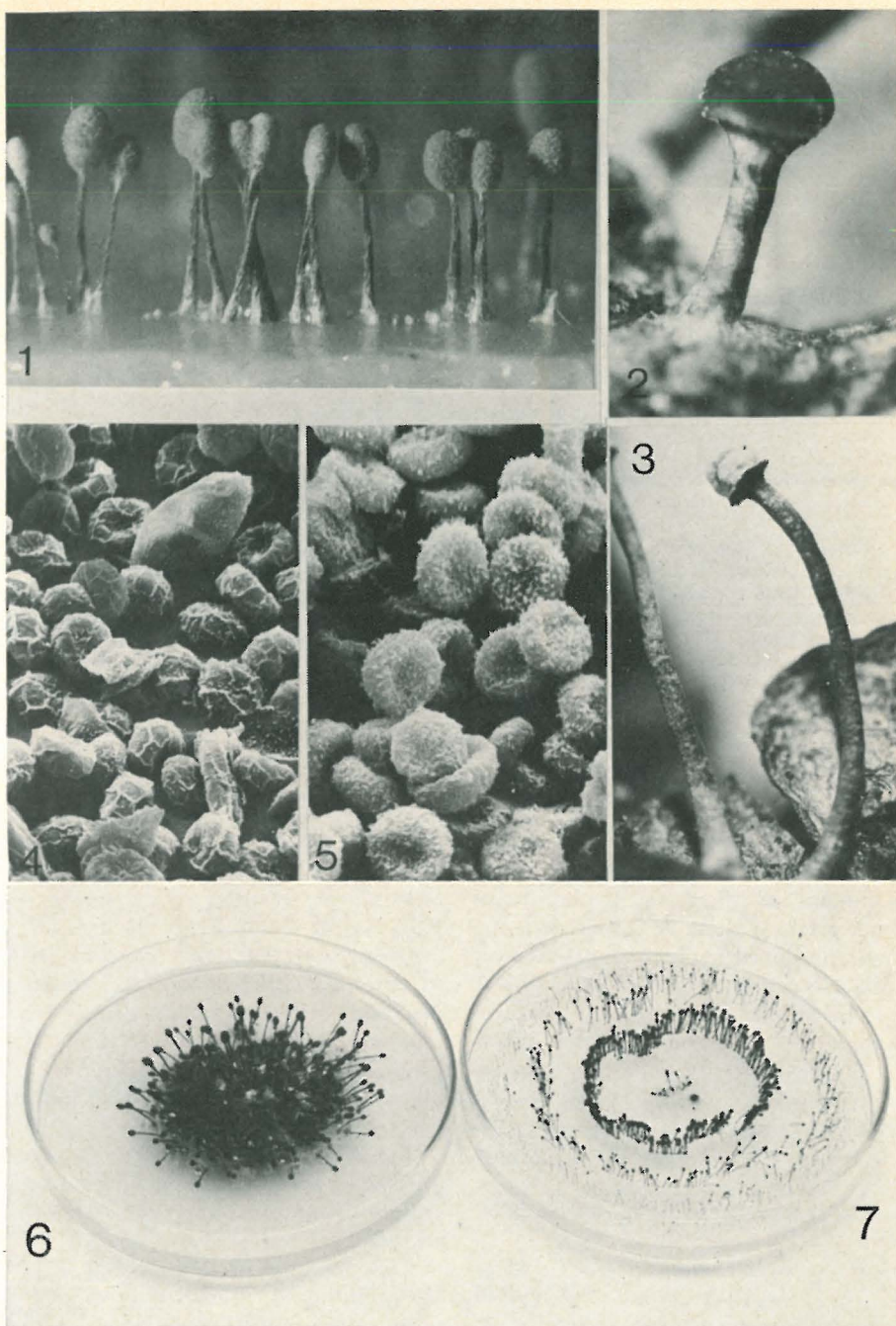
Mycosylva reticulata Samson & Hintikka, spec. nov.

Coloniae in agar maltosa 15°C lente crescunt; e strato velutino synnemata numerosa in orbis concentricos disposita, in medio dense aggregata oriuntur. Synnemata capitata, 4–6 mm alta; stipes fere niger, cylindricus, 3.5–5.5 mm longus, 100–350 µm crassus, e hyphis parallelis fuscis, levibus vel asperulis, 3–5 µm crassis compositus; capitulum primum flavidum, deinde obscure viride vel olivaceum, 600–1500 × 600–1000 µm. Capitula e hyphis fertilibus composita, hya-

linis, primum levibus, deinde granulis flavis incrustatis et plus minusve pigmentatis, 1.7–2.5 µm in diam. Cellulae conidiogenae mono-vel polyblasticae, globosae vel ellipsoideae, intercalares, laterales vel terminales, 3–6 × 2.5–4 µm. Conidia holoblastica, in catenis brevibus acropetalibus connexa, continua, globosa vel ellipsoidea, flavo-brunnea vel brunnea, primum levia, deinde reticulata, 3.5–4.0 × 3.0–3.5 µm. Hyphae fertiles in ramoconidia cylindrica longitudinis variabilis secedunt, 7.5–12.0 × 2.0–2.5 µm, asperula vel reticulata.

Typus CBS 448.71, isolatus ex excrementis parvorum rodentiorum in silva mixta boreali, collina Kaihuanvaara, in Fennia septentrionali.

Colonies grow slowly on malt agar at 15°C, attaining a diameter of about 3.5 cm within one month, consisting of a dense felt from which numerous synnemata arise usually in concentric rings, densely grouped towards the centre of the colony. Synnemata capitata, 4 to 6 mm high, stalk dark almost black, cylindrical, 3.5–5.5 mm long and 100–350 µm thick, consisting of parallel hyphae, which are dark, smooth-walled to slightly roughened, 3–5 µm wide, apically splaying



Figs. 1—7. — Fig. 1: *Mycosylva reticulata* on malt agar, +15°C (35 x). Fig. 2: *Heydenia americana*, fruitbody with peridium (20 x). Fig. 3: *Heydenia alpina* (7 x). Fig. 4: *Mycosylva reticulata* and Fig. 5: *M. clarkii*, SEM micrographs (3000 x). Fig. 6: *M. reticulata* on PDA and Fig. 7 on 1 % malt agar at 15°C (0.5 x).

out to form a subglobose to ellipsoidal head; head yellowish at first near Martius Yellow to Picric Yellow (Ridgway, 1912, Pl. 4), later

becoming dark green near Dark Citrine to Olive Green (Ridgway, Pl. 16), 600—1500 × 600—1000 μm. The heads consist of fer-

tile hyphae, which are hyaline and smooth-walled at first, becoming encrusted with yellow granula and later slightly to dark pigmented, 1.7—2.5 μm in diameter. Conidiogenous cells mono- or polyblastic, globose to ellipsoidal, intercalary, lateral or terminal, $3\text{--}6 \times 2.5\text{--}4.0 \mu\text{m}$. Conidia holoblastic, produced in short acropetal chains, one-celled, globose to ellipsoidal $3.5\text{--}4.0 \times 3.0\text{--}3.5 \mu\text{m}$, yellow brown to brown, smooth when young, later becoming ornamented with reticulate structures, which are readily seen under the light microscope. The fertile hyphae break apart into ramoconidia of variable size and shape, mostly cylindrical, $7.5\text{--}12.0 \times 2.0\text{--}2.5 \mu\text{m}$, roughened to reticulate.

Colonies on oatmeal-agar at 15°C show a zonate growth, synnemata are produced in concentric rings about 1 cm apart. Colonies on PDA agar similar to those on malt agar (Figs. 1, 6 and 7), but synnemata usually longer, up to 7 mm in length.

Influence of temperature: Optimal growth occurs at 15°C ; no growth was observed at temperatures above 25°C . In cultures grown at 25°C in an incubator, the conidia germinate on malt agar and little mycelium is visible after 14 days. The colonies consist only of sterile mycelium. At 4°C growth is very slow. Typical synnemata are however produced after one month.

Culture examined:

CBS 448.71 = type culture of *Mycosylva reticulata*, isolated from pellets of small rodents in a mixed boreal forest (*Betula pubescens*, *Picea excelsa*), Kaihuanvaara hill, Rovaniemi Commune, northern Finland.

Discussion:

The cultural appearance and the synnematal habit of *Mycosylva reticulata* is similar to that of *M. clarkii* Tulloch (type culture = CBS 608.73 = IMI 163,345). In the two species the same influence of temperature is observed: both are psychrophilic with an optimal growth at 15°C . *M. reticulata* differs, however, from *M. clarkii* by the olive green colour of the synnematal heads, the production of ramoconidia and the reticulate conidia (Fig. 4 and 5). In *M. reticulata* the heads are Dark Citrine to Olive Green (Ridgway, Pl. 16), while they are Lettuce Green to Spinach Green (Ridgway, Pl. 5) in *M.*

clarkii. In the latter species the conidia are smooth-walled to finely roughened, and arise from more or less cylindrical conidiogenous cells. In *M. reticulata* these cells are globose to ellipsoidal. Another morphological difference between *M. clarkii* and *M. reticulata* are the fertile hyphae, which are straight in *M. reticulata*, while they are twisted in *M. clarkii* (Fig. 8).

TULLOCH (1973) considered *Mycosylva clarkii* as being related to *Chrysosporium luteum* (Cost.) Carmichael. This fungus was described as the type species of the genus *Myceliophthora* Cost. and can be distinguished from the typical *Chrysosporium* species by narrow apiculate conidia, produced in short chains. In *Chrysosporium* species the conidia are produced singly with a broad truncate base. A generic delimitation between *Myceliophthora* and *Chrysosporium* seems therefore desirable (VON ARX, 1973).

The polyblastic conidiogenous cells and the catenate conidia of the two species of *Mycosylva* resemble also those of the genera *Hormoconis* von Arx & de Vries apud von Arx (1973) (type species: *Hormodendron resinae* Lindau = *Cladosporium resinae* (Lindau & de Vries) and *Cladosporium* Link ex Fr. The synnemalous nature of *Mycosylva* distinguishes it from both genera.

Among the stilbaceous fungi, *Mycosylva* may be related to the genus *Pycnostysanus* Lindau as accepted by MORRIS (1963) and BARRON (1968). However the systematic position of *Pycnostysanus* seems uncertain, because the type species, *P. resinae* Lindau, has been confused with some other species with the same epithet. The genus *Pycnostysanus* was described by LINDAU (1903), who placed it later (1910) in synonymy with *Stysanus resinae* (Fr.) Lindau together with *Rhacodium resinae* Fr., *Sporocybe resinae* Fr. and *Myxotrichum resinae* Fr. The latter species is placed by Ellis (1970) in the genus *Alysidium* Kunze ex Schm. Since conidium ontogeny in the above mentioned species is similar and can easily result in a confusion of these fungi, the taxonomy urgently needs revision.

By the synnematal habit and the psychrophily, *Mycosylva* resembles the genus *Heydenia* as described and illustrated by FRESenius (1852). *Heydenia alpina* Fres. and *H. americana* Sacc. & Ellis (1882) are reported as alpine (HEIM, 1934, NICOT, 1970 and BEL-

LER & ROUX, 1971) and are only known from herbarium specimens collected on plant material. The species are characterized by hard, stipitate, synnema-like fruit bodies, which widen disk-like at the apex (Fig. 2 and 3). The heads of young fruit bodies are covered by a thin peridium, thus resembling stipitate pycnidia. Since the studied specimens did not allow examination of conidium ontogeny, attempts were made to isolate *H. americana* in pure culture from fresh specimens, collected by Prof. E. Müller (Zürich) on *Juniperus*

nana at the Bernina Pass (Switzerland). However, on agar media as well as on sterilized plant material only sterile mycelium and no synnemata or conidia could be observed. According to FRESenius (1852) the conidia were formed in chains directly from the fertile hyphae. This feature could not be demonstrated in the specimens studied. In some specimens scars on the fertile hyphae were observed probably left by the production of blastic conidia.

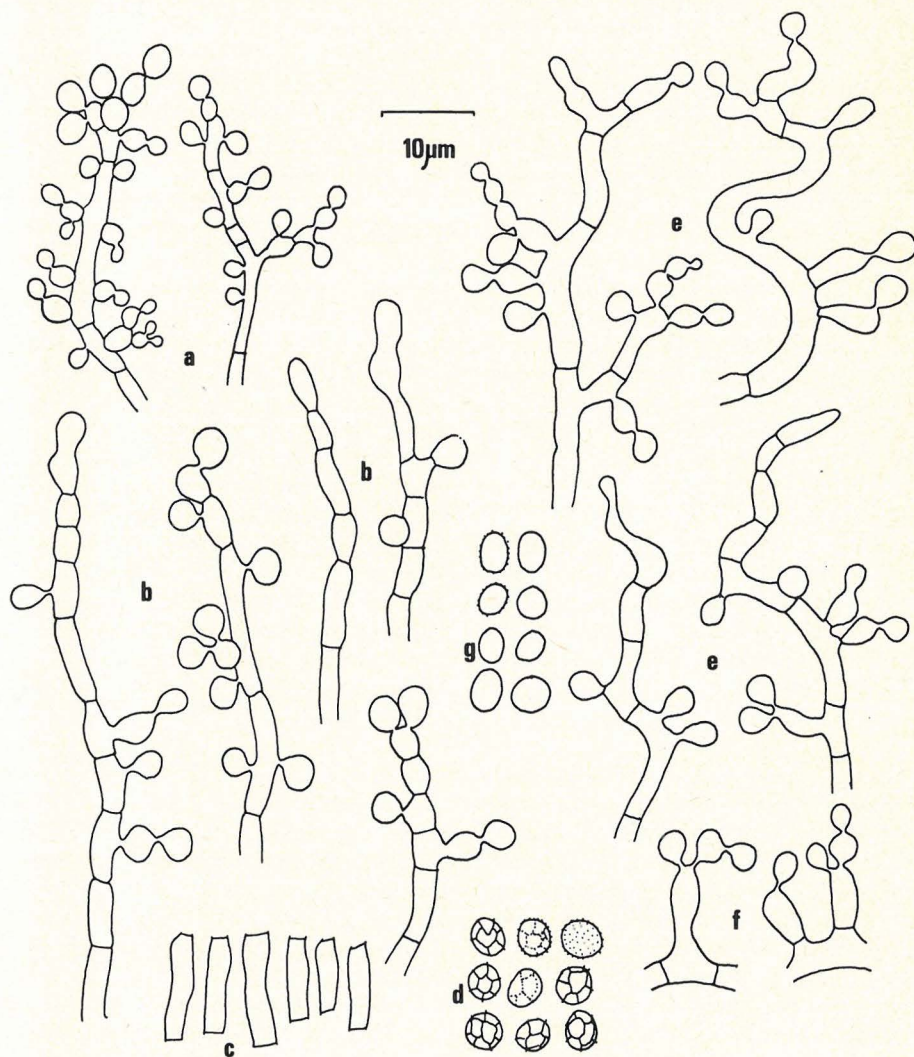


Fig. 8. a—d *Mycosylva reticulata*. a: young conidial structures. b: conidial structures on straight fertile hyphae. c: ramoconidia. d: conidia. e—g *Mycosylva clarkii*. e: conidial structures on twisted fertile hyphae. f: conidiogenous cells. g: conidia.

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