

**Contribution to the study of the genus
Scutellinia (*Pezizales*) II:
Type study of *Scutellinia uliginosa* and *S. phymatodea***

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Jeannerot B. (2011): Contribution to the study of the genus *Scutellinia* (*Pezizales*) II: Type study of *Scutellinia uliginosa* and *S. phymatodea*. – Czech Mycol. 63(2): 163–175.

The author revises and illustrates the types of *Scutellinia uliginosa* L.R. Batra and *S. phymatodea* S.C. Kaushal & R. Kaushal, two rare species, based on Indian material. The two names are concluded to be synonyms and *S. uliginosa* is the correct name of the species. New criteria for identification of this species are proposed, and the history and taxonomic status are discussed.

Key words: Ascomycota, taxonomy, nomenclature, *Pyronemataceae*, *Scutellinia* sect. *Minutae*.

Jeannerot B. (2011): Příspěvek ke studiu rodu *Scutellinia* (*Pezizales*) II: revize typů *Scutellinia uliginosa* and *S. phymatodea*. – Czech Mycol. 63(2): 163–175.

Autor reviduje typy vzácných druhů *Scutellinia uliginosa* L.R. Batra and *S. phymatodea* S.C. Kaushal & R. Kaushal. Tato jména se ukázala být synonymní a *S. uliginosa* je správným jménem druhu. Jsou navrženy nové znaky pro jeho určování a je diskutována jeho historie a taxonomie.

INTRODUCTION

In the ongoing studies of *Scutellinia* (Cooke) Lambotte on a worldwide scale the types and other material of the putative species *S. phymatodea* S.C. Kaushal & R. Kaushal and *S. uliginosa* L.R. Batra have been studied. Several overlooked characters came to light and it is concluded that these names represent one species, *S. uliginosa*. This species should be considered a member of sect. *Minutae* with *S. minutella* Svrček & J. Moravec as the most similar taxon.

This contribution honours Jiří Moravec for his important works on discomycetes and proposing *S. phymatodea* to be a new species.

MATERIAL AND METHODS

Handcut sections of exsiccata were rehydrated in distilled water and placed in a Cotton Blue solution with lactophenol that subsequently was heated to the boiling point. Then the samples were rinsed, cut into several parts and mounted in chloral hydrate. Drawings were made freehand. The spore sizes were measured in Cotton Blue. This measure framework was adopted after several comparative tests on the same collection in water and in Cotton Blue. The results were so similar that it was considered unnecessary to measure in water. Photographs were handled with Mesurim Pro software. Measurements are given without including the ornamentation on the basis of 25 spores per collection, preferably using free spores in the mounts or alternatively using spores in mature asci.

Abbreviations used. TV – top view, SWV – spore wall view, bw – base width, h – height, Q – ratio length/width, X – average, n – number of spores measured (accumulated collections).

RESULTS

Scutellinia uliginosa Batra, in L.R. Batra, *Mycologia*, 52(3): 526 (1960).

Type locality. India, Uttar Pradesh, Rajpore, near Mussoorie, 1200 m alt., on swampy ground, 20 Oct. 1952, L.R. Batra LRB 145. Holotypus CUP – IN 32, revised.

= *Scutellinia phymatodea* S.C. Kaushal & R. Kaushal, in Kaushal & al., *Bibliotheca Mycologica* 91: 594 (1983) [*S. phymatodeus*]. Type locality. India, Himachal Pradesh, Revalsar, Mandi, on wet soil, 11 Oct. 1971, S.C. Kaushal. Isotypus BRNM 62411, revised.

Additional collections examined. Pakistan, Wah Gardens, on the ground, 28 Feb. 1973, Shahnaz Rukh as *Scutellinia* sp. (BPI 573636). Taiwan, Nantou, Meifeng, 2250 m alt., on damp soil, 19 Dec. 1996, Y.Z. Wang, as *S. phymatodeus*, WAN 375 (TNM F5398).

Illustrations. Figs. 1–5

Description. Apothecia rehydrated 2–6 mm diam., gregarious, sessile, shallowly cupulate to discoid, outer surface and margin covered by very short hairs. Ectal excipulum of a textura globulosa-angularis, made up of thin-walled cells, cyanophilous; medullar excipulum a textura angularis made up of hyaline hyphae laid out horizontally towards the hymenium. Margin with yellow-brown to brown setose hairs, uniformly coloured, apices obtuse to sharply pointed, with 0–5 septa, generally 0–2, very short to short, 60–280 × 8–20 µm, generally 60–140 × 8–15 µm; hair bases narrow, very often simple and rarely bifurcate, with a fairly thick wall, 2–4 µm compared to the diameter of the hair, generally darker than the rest of the hair. Receptacular hairs very sparse, shorter and with a simple base. Asci cylindrical, 180–260 × 10–17 µm, with a crozier, octosporous, with 2 to 8 mature spores, remaining spores aborted but visible. Paraphyses simple, gradually widened to a clavate top, 5–8 µm wide. Ascospores 15.2–19.9 × 8.6–12.6 µm, X = 16.7 × 10.3 µm

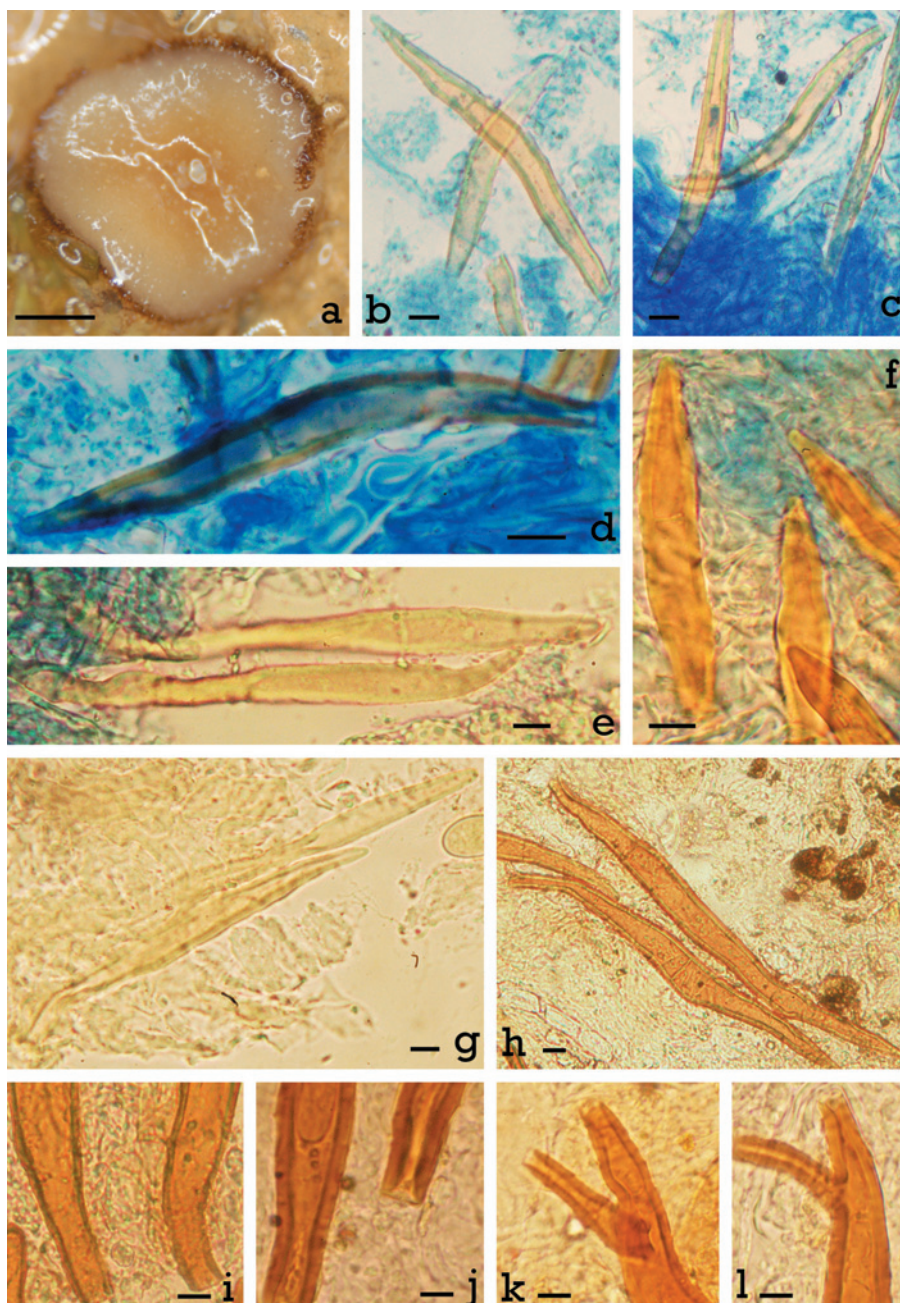


Fig. 1. *Scutellinia uliginosa*. **a:** rehydrated apothecium (TNM 5398) (bar = 0.5 mm), **b–h:** hairs (b, c, d: BPI 573636, f: BRNM 612411, e, g: CUP-IN 32, h: TNM 5398) (bar = 10 µm), **i–l:** base of hairs (i: CUP-IN 32, j, k, l: TNM 5398) (bar = 5 µm).

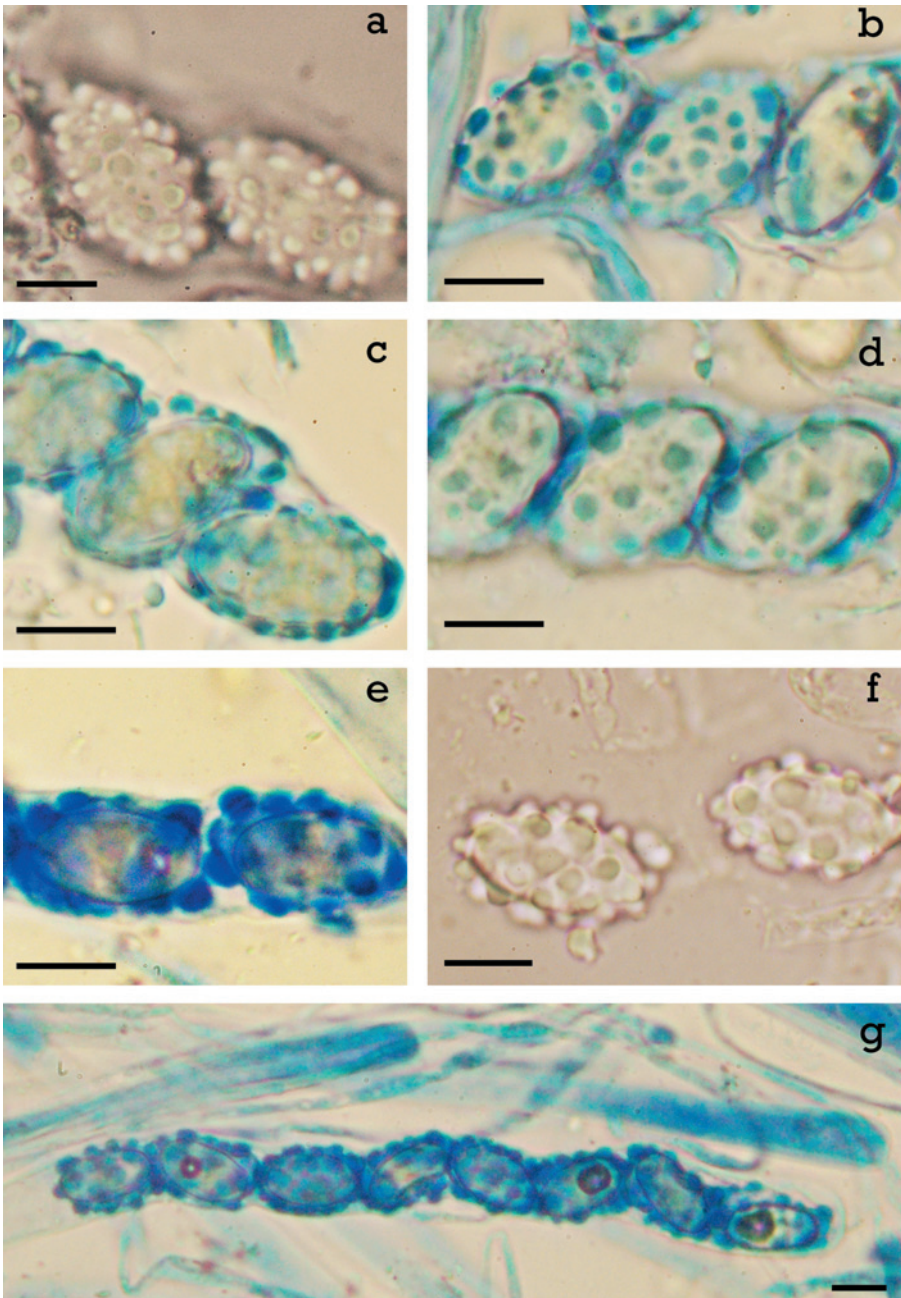


Fig. 2. *Scutellinia uliginosa*. **a–f:** spores (bar = 10 µm). **a–d:** CUP-IN 32 (a: TV in water, b: TV in heated CB, c: SWV in heated CB, d: TV in CB), **e–f:** TNM 5398 (e: SWV in heated CB, f: in water), **g:** ascus in heated CB (TNM 5398) (bar = 10 µm). For abbreviations see Material and Methods.

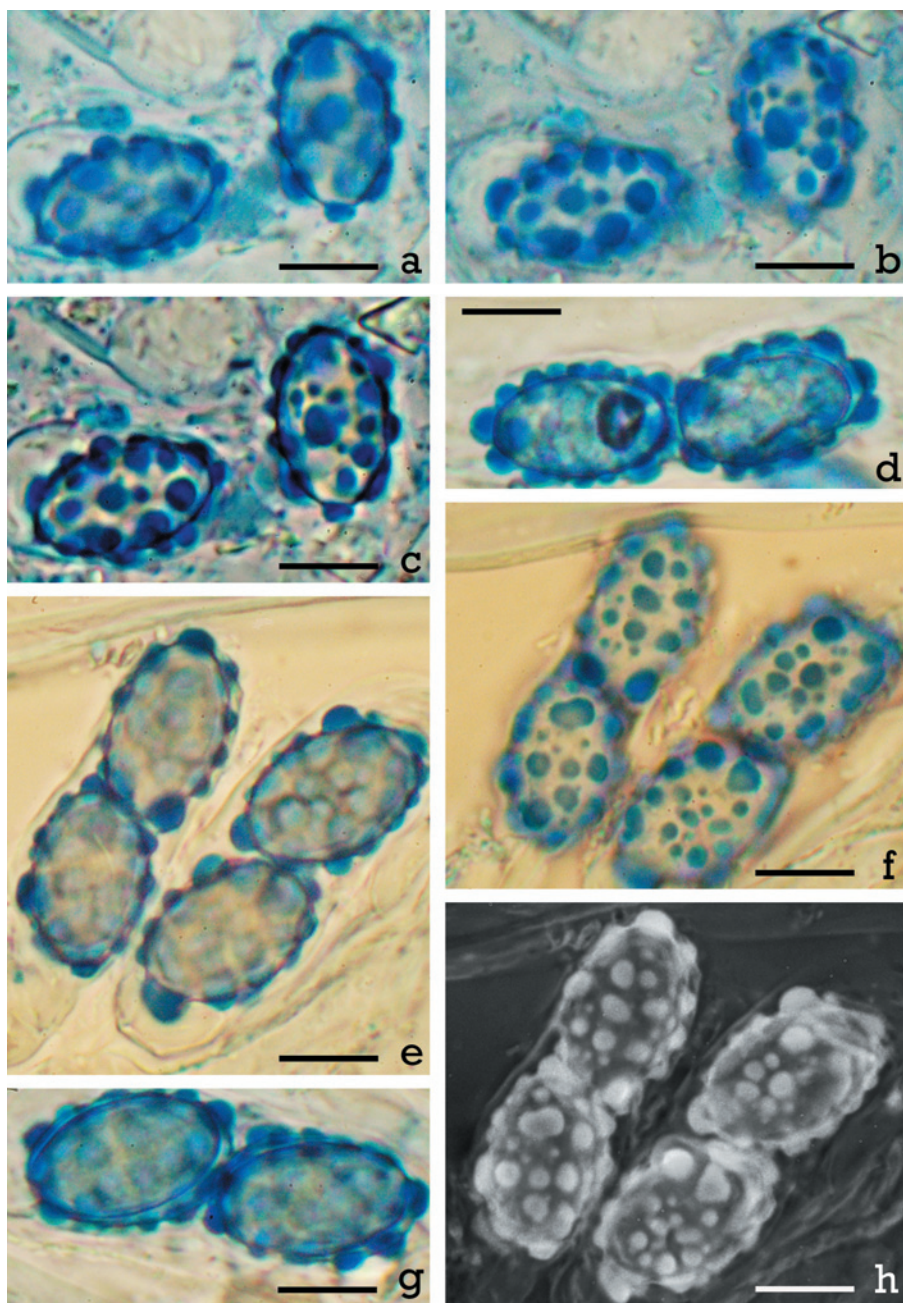


Fig. 3. *Scutellinia uliginosa*. **a-h:** spores (bar = 10 μ m). **a-d:** BPI 573636 (a: SWV in CB, b: TV in CB, c: a and b compilation, d: SWV in heated CB), **e-h:** BRNM 612411 (e: SWV in CB, f: TV in CB, g: SWV in heated CB, h: with negative filter in Photoshop). For abbreviations see Material and Methods.

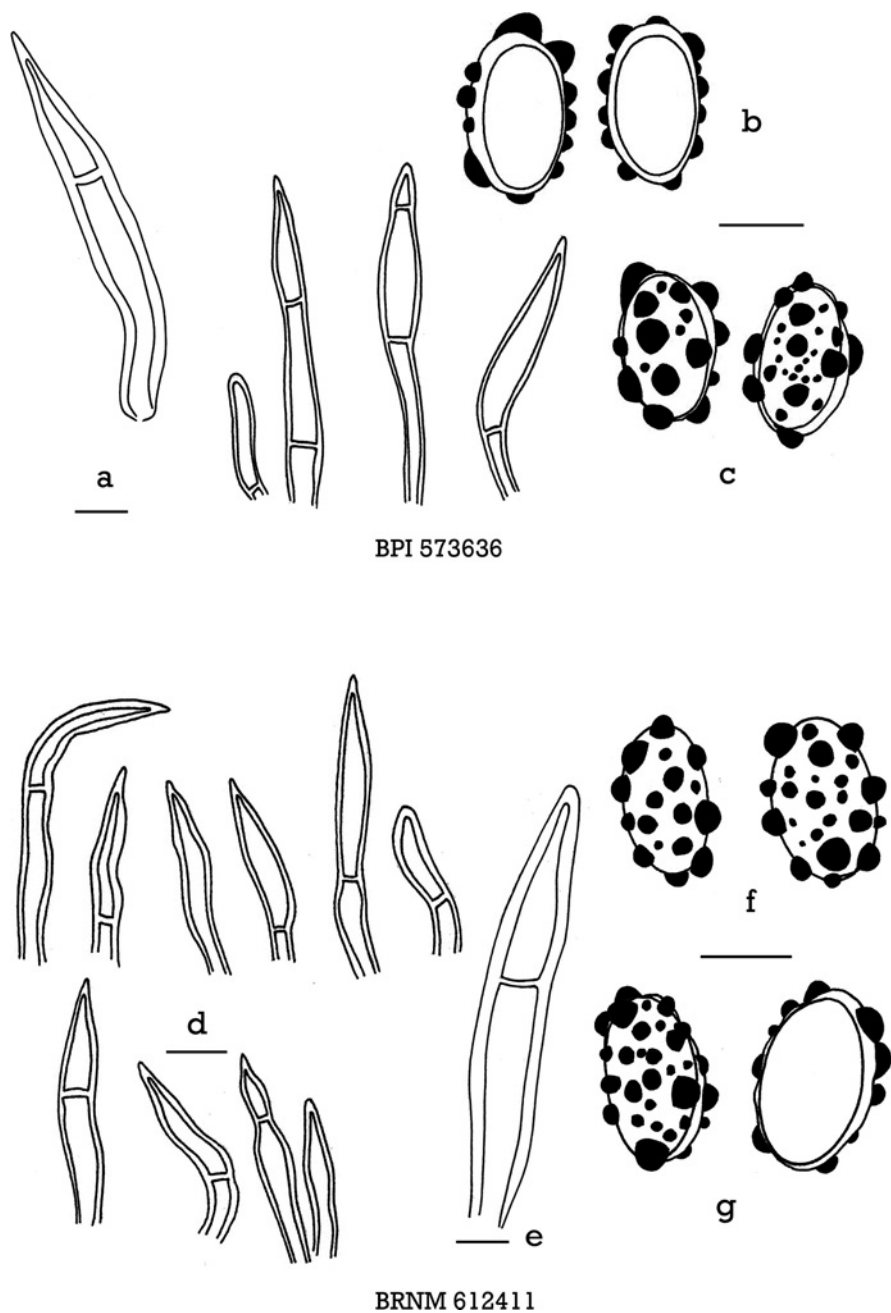


Fig. 4. *Scutellinia uliginosa*. BPI 573636, **a**: hairs (bar = 10 µm), **b**: spores heated in BC (SWV), **c**: spores heated in BC (TV) (bar = 10 µm); BRNM 612411, **d**: hairs (bar = 20 µm), **e**: hair (bar = 10 µm), **f**: spores in BC, **g**: spores heated in BC (SWV and TV) (bar = 10 µm). For abbreviations see Material and Methods.

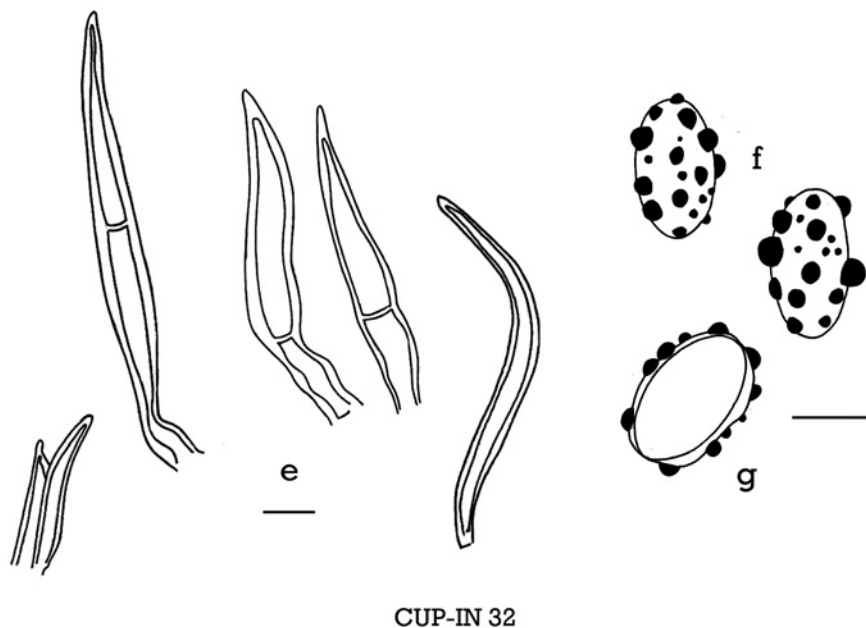
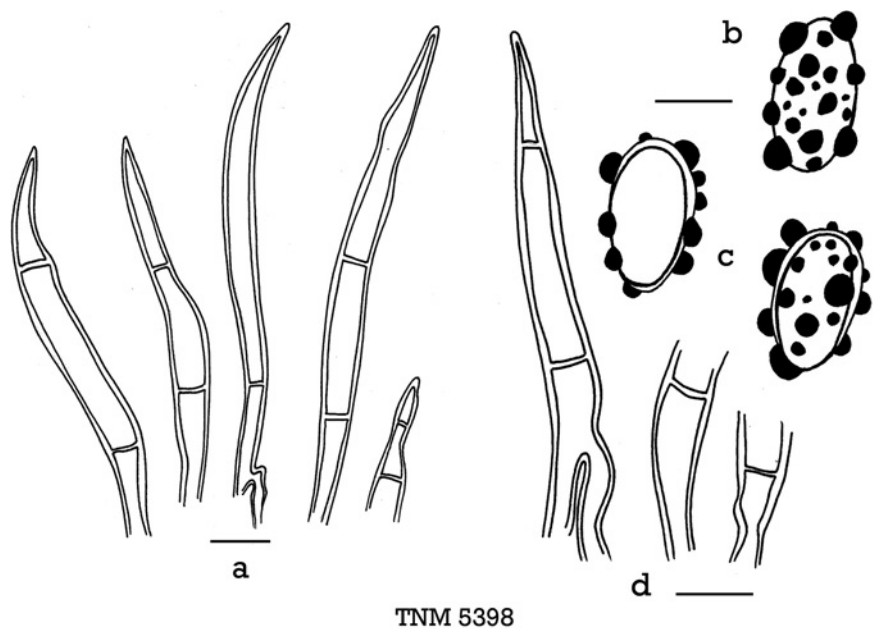


Fig. 5. *Scutellinia uliginosa*. TNM 5398, **a**: hairs (bar = 20 μ m), **b**: spore in BC (TV), **c**: spores heated in BC (SWV and TV) (bar = 10 μ m), **d**: base of hairs (bar = 20 μ m); CUP-IN 32, **e**: hairs (bar = 10 μ m), **f**: spores in BC, **g**: spore heated in BC (SWV) (bar = 10 μ m). For abbreviations see Material and Methods.

(n = 100), QX = 1.64 (from 1.42 to 1.92), broadly ellipsoid to ellipsoid, with one or two large guttules at maturity. Spore wall ornamentation consisting of big spherical and isolated warts; the spore wall clearly loosens in heated Cotton Blue; SWV: the warts are regularly placed and measure 1–4(5) (lb) × 1–3.5 (h) µm; TV: these warts are spherical, sometimes with an uneven diameter, 1–4.5 µm, typically 2–3 µm.

Habitat. The examined collections represent gregarious apothecia and have all been collected on wet soil. The epithet chosen by Batra (1960) refers to this humid condition.

Historical review

Scutellinia phymatodea was described from India by Kaushal et al. (1983) from a collection dating from 1971. The authors included a key to all known *Scutellinia* species in India. The proposed name was based on advice from Jiří Moravec, who had studied the material (Cao & Moravec 1988).

When Schumacher (1988) began his great review of the genus *Scutellinia* and published a list of invalid names, synonyms and species to exclude, he doubted whether it belongs to the genus *Scutellinia*: “I request the type of PAN, but received no answer to my enquiry. The description suggests a species unknown to me and probably not a member of the genus *Scutellinia*”. In his monograph (Schumacher 1990: 101), he ranges this species under nomina incerta with the following precision: “= ? *Scutellinia* sp.”

We can also notice that in his two publications, Schumacher (1988, 1990) corrected the world list to make the epithet agree with *Scutellinia phymatodea*.

Cao & Moravec (1988) described a new species, *S. fujianensis*. They compared it to *S. phymatodea*, shortly described. In the same way, Moravec (1996) classified the species in the genus *Scutellinia*, under the epithet of *phymatodea* by publishing a new species from New Zealand, *Scutellinia totaranuiensis* J. Moravec. Wang (1998) found it in Taiwan in 1996 and described it under the corrected name of *Scutellinia phymatodea*, remembering shortly Schumacher's doubts: “Schumacher did not examine the type specimen and doubted whether it is a species of *Scutellinia*”.

In 1960, in his preliminary study of the Discomycetes from India, Lekh R. Batra (Batra & Batra 1960) described a new species: *Scutellinia uliginosa* L.R. Batra. He published the Latin diagnosis the same year in *Mycologia* (Batra 1960). This species was included again by Kaushal et al. (1983) in their key in which they comment, without having studied the collection: “this species is known from type locality only”.

Schumacher (1988) was able to study the type deposited into the herbarium of Cornell University, Ithaca (CUP – IN 32) and considered that it was a species belonging to the genus *Melastiza* Boud.: “This is *Melastiza* species close, if not identical, to *M. flavorubens* (Rehm) Pfister & Korf.” This exclusion of the genus *Scutellinia* is confirmed in his monograph (Schumacher 1990): “*Scutellinia uliginosa* Batra = *Melastiza* aff. *flavorubens* (Rehm) Pfister & Korf (vide Schumacher 1988)”.

Several features which *Scutellinia uliginosa* shared with *S. phymatodea* drew my attention: the place where it had been collected, Uttar Pradesh, very close to the place of the Indian and Pakistani collections of *S. phymatodea*, the hair size, but above all the shape and the ornamentation of the spores. Batra’s drawings (1960), which are added to his description and his diagnosis, show some spores very close in nature to those of *S. phymatodea*. These common features lead me to review the *Scutellinia uliginosa* type (CUP – IN 32) in order to check its affinities with *S. phymatodea* or to exclude it definitely from the genus *Scutellinia*, as Schumacher had done (1988, 1990).

In the conclusion of this study, we consider these two species as synonymous. According to the rules of nomenclature, the correct name chosen is the oldest one: *S. uliginosa* L.R. Batra.

DISCUSSION

Scutellinia uliginosa is a rare species if judged by the few collections known nowadays, but maybe this is not a true picture of the situation, since very few studies have been published on this group of fungi from the region in question. The four examined collections came from India, Pakistan and Taiwan, all situated in the tropical region (Fig. 6), indicating that the species has a very wide distribution.

The most important taxonomic characteristics which have been underlined not only by the original authors (Batra 1960, Kaushal et al. 1983) but also by later workers (Kullman, revision exsiccata note; Cao & Moravec 1988; Moravec 1996; Wang 1998) are short hairs, generally 0–2-septate, with a simple or bifurcate base, the size of the spores, and their ornamentation formed by large, spherical warts.

Data from publications and the author’s observations are summarized in Tab. 1.

The reported data set corresponds to the original ones, except for some spore measures which have been given by the authors with ornamentation, but the loosening spore wall has never been reported before. This character is, nevertheless, obvious and I have been able to observe it on the four examined collections. It seems that none of the previous workers tested this feature.

Tab. 1. Comparative table of the morphological characters of *S. uliginosa* as originally reported and from observations on the type material reported herein.

Coll.	Description by	Hairs (μm)	Hair bases	Spores (μm)	Ornamentation	Additional notes
CUP-IN 32	Batra (1960)	100–200 \times 10–12	simple or rarely forked	20–25 \times 11–12 (includ- ing ornamentation)	warts 1–2 μm thick	0–1 septa (hairs) 8-spored asci uniguttulate spores
CUP-IN 32	Kullman (note in collection, 1975)			17–20 \times 10–12.5 X = 18.5 \times 11.5		
CUP-IN 32	Jeannerot (this study)	50–150 \times 10–15	simple or rarely forked	17.5–19.9 \times 10.1–12.6 X = 18.9 \times 11.1	warts 0.5–3.2 in diame- ter and 1–3 (bw) \times 1.5–2.7 (h) μm Outer wall loosening when heated in CB	0–1 septa (hairs) 8-spored asci
PAN 2430 (Holotypus)	Kaushal et al. (1983)	140 \times 12.5	base attenu- ated, never forked	18–23.5 \times 12.5–15 (in- cluding ornamentation) 15–18 \times 9–10.5 (with- out ornamentation)	warts 3.3–4.25 μm in diameter and 2.25–3 μm high	0–1 septa (hairs), 2–4-spored, biguttulate spores
BRNM 32411 (Isotypus)	Cao & Moravec (1988)	140 \times 12.5	simple or rarely forked (bifur- cate) base	15–16.5(18) \times 9–13	warts 1–6(7.5) μm in diameter and 1–3(4) μm high	simple or rarely septate hairs
BRNM 32411 (Isotypus)	Moravec (reexamina- tion – 1996)	45–135 \times 10.8–12(16.3)		15–16.5(18) \times 10.8–12(13)	large and spherical tu- bercles	extremely short apothecial hairs
BRNM 32411 (Isotypus)	Jeannerot (this study)	60–110 \times 8–10.5	base attenu- ated, simple	15.9–18.2 \times 9.4–12.5	warts 1–3.5 μm in diame- ter and 1–4 (bw) \times 1–2.5 (h) μm Outer wall loosening when heated in CB	0–1(2) septae, frequently only 4 mature spores per asci
TNM 5398	Wang (1996)	160–280 \times 8–10	not forked	17–18 \times 10–11	warts 2–4 μm wide, 2–4 μm high	
TNM 5398	Jeannerot (this study)	60–280 \times 8–20	mono–bifur- cate base	15.2–17.5 \times 8.6–10.4	warts 1–3.5 μm in diame- ter and 2–3.1 (bw) \times 2–2.7 (h) μm Outer wall loosening when heated in CB	8-spored asci
BPI 573636	Jeannerot (this study)	60–110 \times 8–12	simple base, rarely bifurcate	15.8–17.6 \times 9.5–11.1	warts 1–3 μm in diame- ter and 2–5 (bw) \times 1–3 (h) μm Outer wall loosening when heated in CB	asci with 4 or 8 mature spores

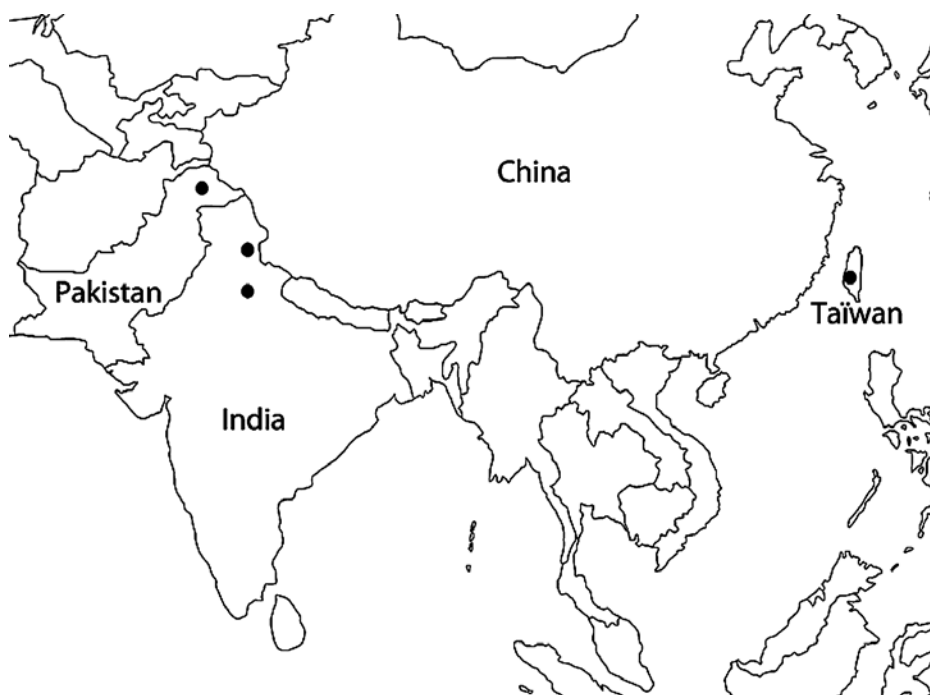


Fig. 6. Map of the collecting sites for *Scutellinia uliginosa* (well-known collections).

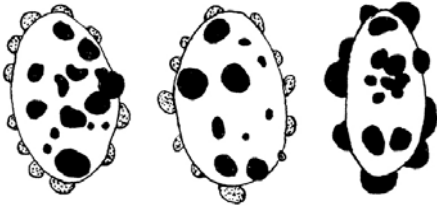
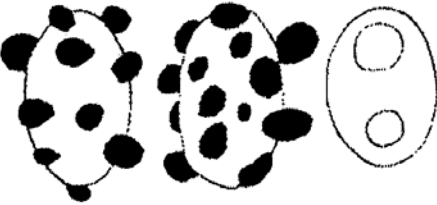
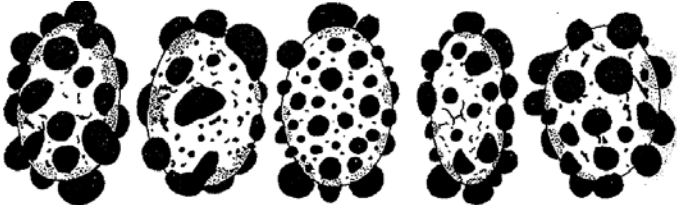
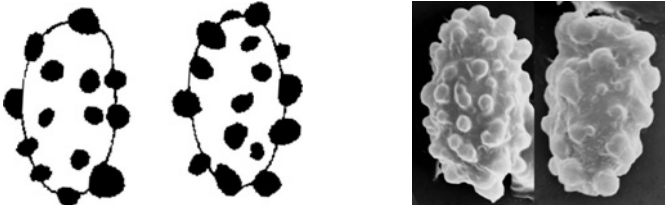
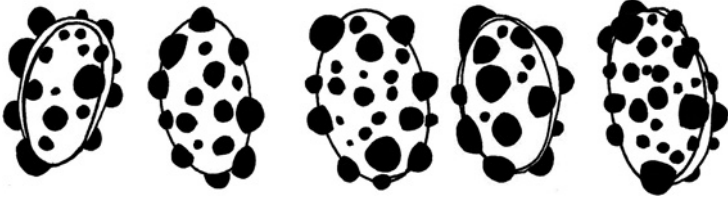
Systematic position of *S. uliginosa*

Cao & Moravec (1988) stated: “*S. fujianensis* and also *S. phymatodeus* and other related species have an outstanding position in the genus. It is difficult to place them within a section of the genus, particularly for the fact that the new recent taxonomy of *Scutellinia* given by Schumacher in his unpublished monograph is not yet known to us”.

Later on, Moravec (1996) tried to establish a parallel between the taxon and *S. ahmadii* (Cash) S.C. Kaushal by taking into consideration some similarities in the length of the hairs: “*Scutellinia phymatodeus* and also *Scutellinia ahmadii* (Cash) S.C. Kaushal, (...), represent species with the shortest apothecial hairs within the genus *Scutellinia*”.

Since Schumacher’s monograph (Schumacher 1990), the loosening of the sporal wall is a defining criterion in the description of sect. *Minutae*, more precisely in the *Minutae* series. This section groups species with short, flexuose hairs and ellipsoid spores together. The *Minutae* series, whose type is *S. minutella* Svrček & J. Moravec, concerns taxa with verrucose to pustulo-cristate ornamentation, and loosening outer spore wall, except for *S. macrospora* (Svrček) Le Gal.

Tab. 2. Spores of *S. uliginosa* as reported in the literature.

References	Sporal representations
Batra (1960: 175)	
Kaushal et al. (1983: 594)	
Cao & Moravec (1988: 190)	
Wang (1998: 121) SEM photos kindly lent by Y.Z. Wang	
Jeannerot (this study)	

Scutellinia uliginosa seems to fulfil these criteria. As a matter of fact, the hairs and the spore sizes remind us of some species such as *S. minutella* or *S. torrentis* (Rehm) T. Schumach. The hair base, simple or rarely bifurcate, the rarely septate hairs, predominantly situated on the margin and, obviously, the loosening of the outer spore wall allow us to propose placement of *S. uliginosa* in sect. *Minutae*, ser. *Minutae*. Although the review of this section is in progress, *S. uliginosa* can already be separated from the other taxa based on spore ornamentation formed of isolated large, spherical warts. It is worth stressing that some spores have smaller but also spherical warts, among the larger ones, as also reported by Batra (1960) and Cao & Moravec (1988) (Tab. 2).

ACKNOWLEDGEMENTS

First of all, I am anxious to thank all the people who allowed me to study the different collections previously quoted: Yei-Zeng Wang (TNM) in particular, Amy Rossman (BPI), Vladimír Antonín (BRNM), Katie Hodge (CUP), and my friend Gilles Corriol (BBF).

I also thank Pierre-Arthur Moreau for his bibliographic help, Nicolas Van Vooren for reviewing the French manuscript and Marie-Pierre Sauffier for her assistance on the English translation.

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