Thaxteriellopsis lingicola and its Moorella anamorph*

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Abstract. A Moorella anamorph referable to M. speciosa Rao and Rao, is described for Thaxteriellopsis lingicola Sivanesan, Panwar and Kaur. The connection is established from a study of single ascospore cultures of the fungus established for several (6) South Indian collections. Both the teleomorph and anamorph are described and brief notes are given of characters of this fungus in culture.

Keywords. Thaxteriellopsis lingicola; Moorella speciosa; teleomorph; anamorph.

1. Introduction
During the survey of microfungi under the project 'Fungi Flora of South India', several collections of a Loculoascomycete with setose ascomata were made. Single ascospore cultures of the fungus produced an anamorph referable to the hyphomycete genus Moorella. The Moorella anamorph was also found in association with the Loculoascomycete on the natural substrate. The teleomorph was identified as Thaxteriellopsis lingicola Sivanesan, Panwar and Kaur, and the anamorph as Moorella speciosa Rao and Rao.

The monotypic genus Thaxteriellopsis was erected by Sivanesan et al (1976) with T. lignicola collected from Mount Abu, India as the type. It is characterized by non-ostiolate, setose, cupulate ascomata, superficial on a subictidium, with bitunicate asci containing hyaline or subhyaline ascospores, which are transversely multisepitate. Some of the ascospores, in addition, develop one longitudinal or oblique septum, rarely two in one or two of its cells.

In all the collections studied, the fungus agrees in all details with the type description of T. lignicola except for the difference in the number of the septa in ascospores. The transversely multisepitate ascospores, with one or two longitudinal and oblique septa in some, typical of T. lignicola were seen only in one collection from the Silent Valley, Kerala (Herb. FSI 3363). In the remaining collections the ascospores were predominantly transversely 5-septate. The present study shows that in T. lignicola the ascospores are initially 5-septate; the centrum is hyaline to white, as seen in most of the collections. As the ascospores mature, additional transverse, longitudinal and oblique septa develop; the centrum becomes light brown, as seen in the single collection from the Silent Valley. The additional

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transverse, longitudinal and oblique septa develop in any sequence and are formed within any cell, without any regular pattern, in the originally 5-septate ascospores.

2. Description of the fungi


Colonies on the substrate conspicuous, superficial, widely effused, black, consisting of velvety growth of anamorph, interspersed with scattered to gregarious ascocarps of teleomorph. Surface mycelium composed of septate, branched, dark brown, creeping hyphae 4-7μ wide, constricted at septa when cells are short and swollen, smooth when the cells are long cylindrical. Immersed mycelium consisting of septate, branched, light brown or dark brown hyphae ca. 5μ wide.

Ascomata superficial, connected to the creeping mycelium by septate, brown pendant hyphae ca. 5μ wide, originating from the lower half of the ascoma, some seated on a stroma directly on the substrate, black, cupulate, in water becoming spherical to broadly spherical or obconic-spherical, 200-300μ high, 250-370μ diam., non-ostiolate, with numerous dark brown, septate, unbranched setae, with rounded ends, mostly on the upper half of the ascoma. Setae up to 250μ long, 4.5-5-6.0μ wide. Wall of the ascomata somewhat fleshy, 35-50μ thick, pseudoparenchymatous, composed of 6-9 layers, made up of polygonal cells, 5-20 × 5-13μ ; cells of ‘ostioiar’ region comparatively smaller, 5-10 × 3-5μ ; each cell with a large oil droplet, oozing out in teased mounts ; outer layers dark brown, gradually becoming light brown to hyaline towards the inner layers ; cells of the inner layers flattened.

Asci in a basal hymenium, bitunicate, long-cylindrical to cylindric-clavate, short-pedicellate, 90-150 × 15-30μ, generally 8-spored ; sometimes fewer-spored.

Pseudoparaphyses present, attached both to the roof and the basal hymenium, septate, hyaline, branched, ca. 1.5μ wide.

Ascospores irregularly tristichous, 23-50 × 5.5-13 (-16)μ, initially with 5 transverse septa. Mature ascospores with additional transverse, longitudinal and oblique septa, up to 6-12-transversely septate and often with up to 3 longitudinal and/or oblique septa, clavate to clavate-fusiform or fusiform ; generally the second and third cells from apex broadening, tapering towards the rounded ends, curved to straight, thin-walled, slightly constricted at septa in large spores, faintly striate, hyaline to smoky brown in mass.

Conidiophores erect, straight or slightly bent, arising directly from creeping mycelium, septate, smooth, up to 420μ long, blackish brown and 7-11μ wide at base, gradually becoming pale brown and 4-7μ wide at apex, bearing up to six whorls of branches at intervals, with one to six branches per whorl ; branches 1-4-celled, 4.5-7-5μ wide. Conidiophore often terminating in an apical whorl of branches or a conidiogenous cell. Terminal cell of each branch conidiogenous. Conidiogenous cells hyaline, light brown to brown, flask-shaped to globose or cylindrical, often proliferating, polyblastic, denticulate. Conidia helicoid, tightly coiled 1-½ times, borne on short cylindrical denticles ca. 1μ long, 3-10 septate, generally 6-septate, 11-15μ diam. ; filaments 4-6μ wide, hyaline, finally becoming smoky brown with faint striations.
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Figures 1-11. Thaxteriellopsis lignicola and its Moorella anamorph. 1. Vertical section of ascoma (Herb. FSI 3359) × 200. 2. Predominantly 5-septate ascospores (Herb. FSI 3151) × 700. 3. Mature ascospores showing longitudinal and oblique septa (Herb FSI 3363) × 480. 4. Part of a conidiophore with conidiogenous cells and a conidium initial (Herb. FSI 3151) × 1200. 5. Conidia from natural substrate (Herb. FSI 3363) × 750. 6. Germinated ascospore (Herb. FSI 2128) × 375. 7. A conidiogenous cell with a developing conidium (from culture, Herb. FSI 3151) × 1200. 8. A short conidiophore with a solitary terminal conidium (from culture, Herb. FSI 3151) × 1065. 9, 10, 11. Mature brown conidia from a 6-month-old culture (Herb. FSI 3151) × 1600.
Collections examined:

All collections by G. Sekar.

Karnataka State


Kerala State


Tamil Nadu State


3. Cultural studies

Ascospores germinate on potato dextrose agar within 8 h at 25-30°C. Germ tubes are produced from any one or all the cells of ascospores (figure 6), more frequently from the end cells. Single sporE isolations on potato dextrose agar are slow growing, attaining 1 cm. diameter in 10 days. The colonies are olive green to oivaceous brown, velvety, with compact margin, restricted in growth, with aerial mycelium and dark brown submerged mycelium. The conidiogenous cells are either intercalary or terminal on hyphae, or on a simple conidiophore (figures 8 and 16). Typical dark brown erect conidiophores with whorls of branches bearing conidiogenous cells are produced after three months in culture. Conidia are produced on narrow, cylindrical denticles, ca. 1 μ long and are loosely or tightly coiled or just bent and curved. Conidium size is comparable to that on the natural substrate, but some may be a little larger. In a long standing culture, conidia (figures 9-11 and 19) become brown, up to 12-septate and measure up to 23 μ diameter with filaments 9 μ wide, constricted at the septa.

4. Discussion

Thaxteriellopsis is a member of the Loculoascomycetes and belongs to the Pleosporales; in having Pleospora type of centrum. It is closely related to Thaxteriella, as pointed out by Sivanesan et al (1976), and possibly to Tubufia. The anamorph
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of Thaxteriellopsis, as shown here, is Moorella and that of Thaxteriella and Tubeufia are Helicoma and Helicosporium respectively. It is interesting to note that all the three teleomorphs mentioned above have somewhat fleshy ascomata, with usually hyaline ascospores and their anamorphs are dematiaceous hyphomycetes producing helicoidal conidia on denticles. This is the first time a Moorella anamorph is connected with a teleomorph.

Barr (1980) notes that the illustration and description of Thaxteriellopsis lignicola are suggestive of Boerlagiomyces Butzin. However, even if this were to be confirmed by further study of the types, the generic name Thaxteriellopsis will have to be retained according to the rules of priority. The name Thaxteriellopsis lignicola is therefore used here for the teleomorph of our fungus.

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References

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