

The genus *Savoryella* from freshwater habitats, including *S. grandispora* sp. nov.

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The species of *Savoryella* from freshwater are discussed and a key is provided. *Savoryella grandispora* sp. nov. from Malaysia is described and illustrated with interference contrast micrographs.

Key Words—aquatic fungi; Malaysia; *Savoryella*.

Introduction

The genus *Savoryella* Jones & Eaton was recently monographed by Jones and Hyde (1992) and included 5 species: *S. appendiculata* Hyde & Jones ex Jones & Hyde, *S. lignicola* Jones & Eaton, *S. longispora* Jones & Hyde, *S. paucispora* (Cribb & Cribb) Koch and *S. verrucosa* Minoura & Muroi. Hyde (1993) described a further species, *S. aquatica* Hyde, from wood submerged in fresh water in Australia. *Savoryella* species occur on wood in the sea, in brackish waters, in mangroves and in fresh water (Hyde, 1993). In a study of the fresh water fungi of streams in Malaysia a further species of *Savoryella* was collected. This taxon differs from other species in that it has large ascospores. *Savoryella grandispora* Hyde, sp. nov. is therefore described in this paper. A discussion and key to *Savoryella* species from fresh water follows.

Taxonomy

Key to freshwater species of *Savoryella*

1. Ascospores longer than 46 μm ...1. *S. grandispora*.
1. Ascospores shorter than 46 μm ...2
 2. Ascospore wall strongly verrucose...4. *S. verrucosa*.
 2. Ascospore wall not so...3.
3. Ascospores light-brown, 24–36 \times 8–12 μm ...3. *S. lignicola*.
3. Ascospores dark-brown, 29–38 \times 13.5–17 μm ...2. *S. aquatica*.

1. *Savoryella grandispora* Hyde, sp. nov. Figs. 1–7
Etym: from *grandispora*, in reference to the large ascospores found in this taxon.

Ascomata 260–325 μm longa, 130–150 μm diam, immersa, semi-immersa vel superficiales, coriacea, pyriformes, nigra, ostiolata, papillata, periphysata, solitaria. Paraphyses filiformes, septatae, paucae. Asci 160–200 \times 24–30 μm (\bar{x} = 183.3 \times 26.7 μm , n = 10), oc-

tospori, clavati, leptodermi, pedunculati, truncati, cum apparatu apicali. Ascosporae 46–58 \times 14–16 μm (\bar{x} = 51.5 \times 15.2 μm , n = 30), ellipsoideae, biseriatae, 3-septatae.

Holotypus: Malaysia: Lentang River, on submerged wood, Oct. 1991, K. D. Hyde 836, BRIP 20918.

Ascomata 260–325 μm long, 130–150 μm diam, immersed, semi-immersed or superficial, coriaceous, pyriform, black, ostiolate, papillate, axis horizontal, oblique or vertical to the host surface, periphysate, mostly solitary (Fig. 7). Neck short, hyaline, bending upwards (Fig. 7). Peridium thin, of textura angularis in surface view and brown. Paraphyses hypha-like, filamentous, septate, few (Fig. 5). Asci 160–200 \times 24–30 μm (\bar{x} = 183.3 \times 26.7 μm , n = 10), 8-spored, clavate, thin-walled, short pedunculate, apically thickened and truncate with a ring and pore/plug (Figs. 4, 6). Few mature asci are contained within the ascoma as they mature successively. Old asci are often present. Ascospores 46–58 \times 14–16 μm (\bar{x} = 51.5 \times 15.2 μm , n = 30), ellipsoidal, biseriatae, hyaline when immature, central cells light-brown when mature, end cells hyaline, constricted at the septa, smooth-walled (Figs. 1–3).

Habitat: Saprobic on submerged wood.

Known distribution: Malaysia.

Other material examined: Malaysia: Lentang River, on submerged wood, Oct. 1991, K. D. Hyde 838, BRIP 20919.

2. *Savoryella aquatica* Hyde, Aust. Syst. Bot. 6: 162. 1993.

Habitat: Wood submerged in fresh water.

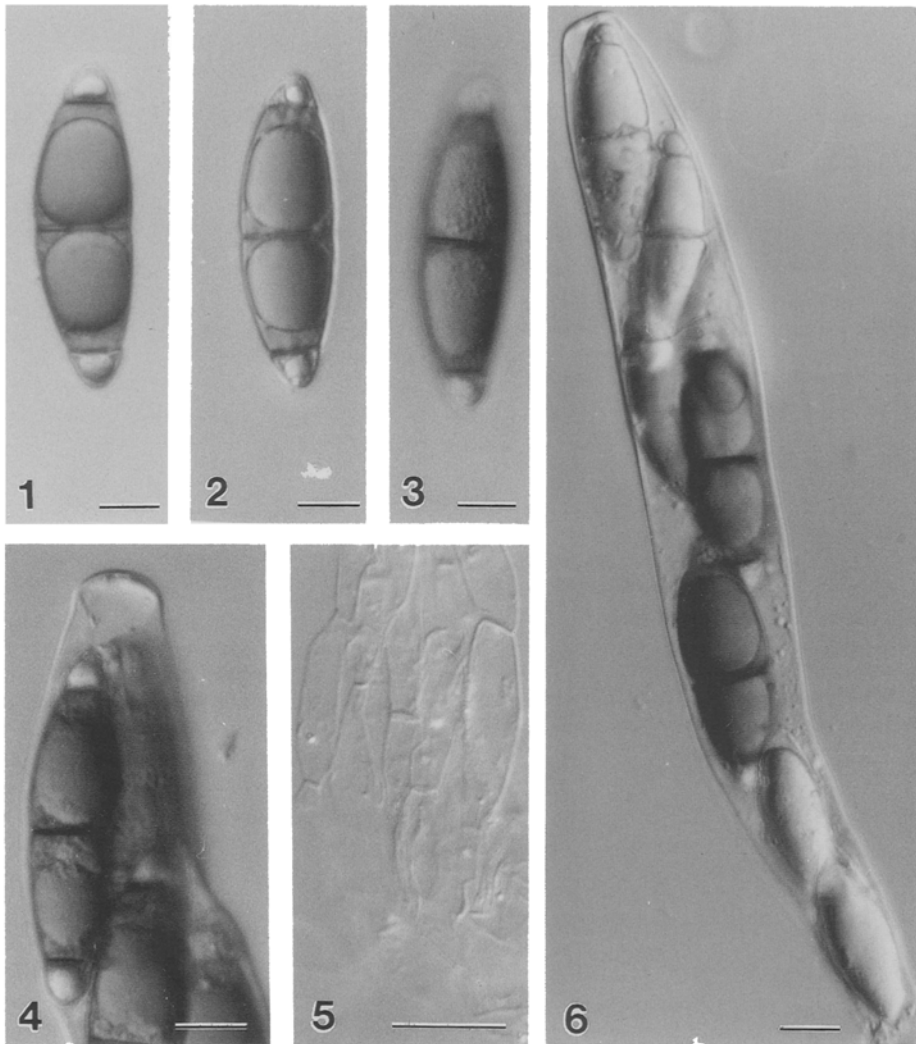
Known distribution: Australia.

3. *Savoryella lignicola* Jones & Eaton, Trans. Br. Mycol. Soc. 52: 161. 1969.

Habitat: Wood submerged in marine, brackish and fresh water.

Known distribution: Worldwide.

S. lignicola is known from marine, brackish water



Figs. 1–6. Interference contrast micrographs of *Savoryella grandispora*. 1–3. Ascospores. 4. Apical apparatus of ascus. 5. Paraphyses. 6. Ascus with mature and immature ascospores. Bar lines = 10 μm .

and freshwater habitats and appears to have a wide salinity tolerance (Eaton and Jones, 1971; Hyde and Jones, 1988; Jones and Hyde, 1992; Hyde, 1993). Although they are similar in ascospore size and shape, we cannot be sure that these fungi from such diverse habitats are the same species and cultural or other studies may reveal more than one species. Alternatively, *S. lignicola* may have a wide salinity and temperature range, as is reported in another aquatic ascomycete, *Nais inornata* Kohlmeyer (Shearer and Crane, 1978). The following is a new record for Malaysia.

Material examined: Malaysia: Lentang River, on submerged wood, Oct. 1991, K. D. Hyde 837, BRIP 20920-ascospore measurements in this Malaysian collection were slightly smaller to those of the Holotype ($22\text{--}34 \times 9\text{--}12 \mu\text{m}$ vs. $24\text{--}36 \times 8\text{--}12 \mu\text{m}$).

4. *Savoryella verrucosa* Minoura & Muroi, Trans. Mycol. Soc. Japan 19: 132. 1978.

Habitat: on wood submerged in fresh water.

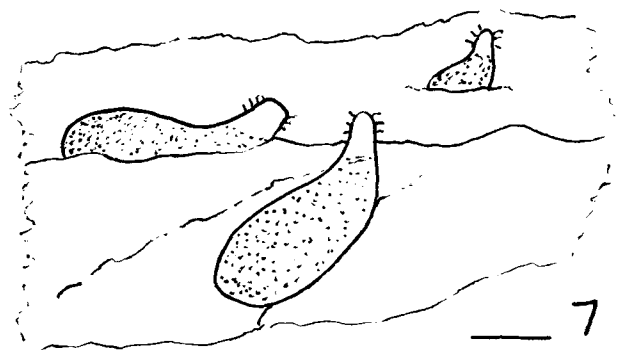


Fig. 7. Diagrammatic representation of ascomata and habit of *Savoryella grandispora*. Bar line = 100 μm .

Known distribution: Japan.

S. verrucosa has not been reported since its publication in 1978 and it appears that only poor type material is deposited. New collections of this fungus are required for critical examination.

Discussion

Members of the genus *Savoryella* have only been collected from wood submerged in aquatic ecosystems (Jones and Eaton, 1969; Kohlmeyer and Kohlmeyer, 1979; Hyde and Jones, 1988; Jones and Hyde, 1992; Hyde, 1993). The fungi have the ability to digest lignocellulose (Mouzouras, 1986).

Four species have now been described from fresh water. *S. grandispora* differs from the other three species in having larger ascospores. It differs from *S. aquatica* in having longer ascospores (46–58 μm ; vs. 29–38 μm), which are light-brown as compared to dark-brown. It differs from *S. lignicola* in having larger ascospores (46–58 \times 14–16 μm vs. 24–36 \times 8–12 μm) and from *S. verrucosa*, which has smaller ascospores and a verrucose wall (Jones and Hyde, 1992).

Ascotaiwania lignicola Sivanesan & Chang recently described from wood submerged in fresh water is quite similar to *Savoryella* (Sivanesan and Chang, 1992). However, it differs in having multi-septate ascospores and a large apical ring to the ascus. Both taxa have ascospores with hyaline end cells and the relationship between these genera needs examining.

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