TIRISPORA MANDOVIANA SP. NOV. FROM CHORAO MANGROVES, GOA, THE WEST COAST OF INDIA

V. Venkateswara Sarma & K.D. Hyde

Abstract

Tirispora mandoviana sp. nov., is described based on a specimen from dead mangrove wood of Rhizophora mucronata collected at Goa, India. This species differs from Tirispora unicaudata in the larger size of its ascomata and asci, and smaller ascospores. Tirispora mandoviana is illustrated with interference contrast micrographs. A comparison with other mangrove fungi with related characters is given.

Key Words—ascomycete, mangrove fungi, Rhizophora mucronata, Tirispora mandoviana.

Introduction

Several new genera and species of marine and mangrove fungi have been reported from the west coast of India (Borse 1987, Borse & Hyde 1989, Hyde & Borse 1986a, b, Hyde et al. 1992, Patil & Borse 1982, Raghukumar et al. 1988). During a survey of marine and manglicolous fungi of Goa, on the west coast of India, a new ascomycete was encountered on intertidal wood of Rhizophora mucronata Blume. This species is similar to species of Aniptodera, but has a single appendage at one spore pole and is therefore a species of Tirispora E.B.G. Jones & Vrijmoed (Halosphaeriales). The new species is described, illustrated with interference contrast micrographs and compared with the closely related genera Ophioidea, Halosarphiea and Aniptodera.

Materials and Methods

Mangrove vegetation is widely distributed in Goa along the two estuarine river systems, Mandovi on the north and Zuary in the south of Goa, India. Samples of dead and decomposing material of Rhizophora mucronata were collected in polythene bags from the Chorao mangrove (latitude 15°27' to 15°38'N, longitude 73°42' to 75°50'E), at the river Mandovi and returned to the laboratory for examination. Kohlmeyer & Kohlmeyer’s (1979) direct examination method was followed. Materials were observed directly after they were brought to the laboratory as well as after incubation of 7 to 10 days in moist chambers.

Taxonomy

Tirispora mandoviana V.V. Sarma & K.D. Hyde, sp. nov.

Etymology: with reference to the river Mandovi on which Chorao mangroves are distributed.


Ascomata 264–420 μm high x 250–430 μm diam., globose to subglobose, superficial or semi-immersed, hyaline to pale brown, solitary, ostiolate, papillate (with long necks). Necks 220–466 μm long, 60–90 μm wide, periphysate. Peridium 15–22 μm thick, hyaline to light brown, of 5–8 layers of elongated, compressed cells. Pseudoparenchyma compressed in mature ascomata and catenophyses not seen. Ascii 80–115 x 19–31 μm, 8-spored, clavate, pedicellate, unitunicate, persistent, thin-walled, with an indistinct apical pore. Ascospores 15–22 x 8–12 μm (mean = 18 x 10 μm, n = 50), ellipsoidal, bicelled with large oil globules, hyaline, thick-walled, with a single appendage at one pole, 2–4.5 μm wide and 1.5–3.5 μm high, apical, cap-like, appressed, arranged randomly in relation to the apex of the ascus. Figures 1–14.
HOLOTYPUS: INDIA, Goa, Chorao mangrove, on intertidal twig of *Rhizophora mucronata*, 9 Nov. 1998, V.V. Sarma (HKU(M) 8299).

### Table 1. A comparison of *Tirispora* and similar species.

<table>
<thead>
<tr>
<th>Species</th>
<th><em>Tirispora mandoviana</em></th>
<th><em>Tirispora unicaudata</em></th>
<th><em>Ophiodeira monosemeia</em></th>
<th><em>Halosarpeia marina</em></th>
<th><em>Aniptodera haispora</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Placement of Ascomata in relation to host subrate</td>
<td>Superficial or semi-immersed</td>
<td>Superficial</td>
<td>Immersed under a thin black stroma</td>
<td>Mostly immersed</td>
<td>Immersed or semi-immersed or superficial</td>
</tr>
<tr>
<td>Colour</td>
<td>Hyaline to pale brown</td>
<td>Pale to dark brown</td>
<td>Light brown</td>
<td>Sub-hyaline, light brown or fuscous</td>
<td>Light brown to pale grey</td>
</tr>
<tr>
<td>Cateno-Physes</td>
<td>Not seen</td>
<td>Present</td>
<td>Absent</td>
<td>Present</td>
<td>Not seen</td>
</tr>
<tr>
<td>Apical pore</td>
<td>Indistinct</td>
<td>Thickened at apex with a pore</td>
<td>Absent</td>
<td>Thickened at apex with a refractive pore</td>
<td></td>
</tr>
<tr>
<td>Persistent/ Deliquescent</td>
<td>Persistent</td>
<td>Persistent</td>
<td>Deliquescent</td>
<td>Persistent</td>
<td>Persistent</td>
</tr>
<tr>
<td>Ascospore Size (μm)</td>
<td>15–22 × 8–12</td>
<td>24–32 × 8–12</td>
<td>15.8–20.7 × 5.9–7.7</td>
<td>18–23 × 9–12</td>
<td>14–22 × 10–12</td>
</tr>
<tr>
<td>Wall Characters</td>
<td>Thick-walled</td>
<td>Thick-walled</td>
<td>Thin-walled</td>
<td>Thin-walled</td>
<td>Thick-walled</td>
</tr>
<tr>
<td>Appendage Characters</td>
<td>Single</td>
<td>Single</td>
<td>Single</td>
<td>Double</td>
<td>Absent</td>
</tr>
<tr>
<td>Host</td>
<td><em>Rhizophora mucronata</em></td>
<td><em>Acanthus ilicifolius</em></td>
<td><em>Rhizophora mangle</em></td>
<td><em>Rhizophora mangle</em></td>
<td>On intertidal mangrove wood</td>
</tr>
</tbody>
</table>

### Discussion

The monotypic *Tirispora* is represented by *Tirispora unicaudata* E.B.G. Jones & Vrijmoed and was described by Jones et al. (1994). It has superficial, pale to dark brown ascomata, persistent asci with a ring and apical plate, and thick-walled ascospores with unipolar appendages. *Tirispora mandoviana* also has similar features. It, however, differs from *T. unicaudata* in having larger, hyaline to pale brown ascomata, larger asci, and smaller ascospores. Hence a new species of *Tirispora* is proposed.

Another taxon with bicelled ascospores having unipolar appendages is *Ophiodeira monosemeia* Kohlm. & Volkm.-Kohlm. (Kohlmeyer & Volkmann-Kohlmeyer 1988). *Ophiodeira monosemeia* also lacks catenophyses.
and has long necks similar to those found in *Tirispora mandoviana*. *Tirispora mandoviana*, however, differs from *O. monosemeia* in that ascomata do not form under a black stroma and are not laterally inserted. Furthermore, asci and ascospores of *T. mandoviana* are larger than those of *O. monosemeia*. Ascii of *T. mandoviana* are also persistent, while those of *O. monosemeia* are deliquescent.

*Tirispora mandoviana* is very similar to *Aniptodera* in having hyaline to pale brown ascomata, asci with an apical ring and pore, and thick-walled ascospores, but differs as it has unipolar appendages. *Aniptodera haispora* Vrijmoed, K.D. Hyde & E.B.G. Jones most closely resembles *T. mandoviana* and has almost the same dimensions of ascomata, asci and ascospores, but differs in lacking unipolar appended ascospores. Although some species of *Aniptodera* (e.g. *A. lignatilis* K.D. Hyde and *A. mangrovei* K.D. Hyde) have polar appendages, their placement in this genus is tentative (Vrijmoed et al. 1994). It has been suggested that *Aniptodera* should be retained for ascomycetes that have non-appendaged ascospores as originally described for the type species *Aniptodera chesapeakeensis* Shearer & J.L. Crane (Jones et al. 1994).

*Tirispora mandoviana* also resembles *Halosarphelia marina* (Cribb & J.W. Cribb) Kohlm. in having persistent asci with a pore, ascomata with long necks and ascospores of almost the same dimensions. *Tirispora mandoviana*, however, differs in having unipolar ascospore appendages. Other species in the genus *Halosarphelia*, *H. unicaudata* (E.B.G. Jones & Camp.-Als.) R.G. Johnson, E.B.G. Jones & S.T. Moss and *H. cincinnatula* Shearer & Crane also have ascospores with one apical appendage, but ascospores are filiform and multi-septate, and ascii are deliquescent and lack an apical pore.

Jones et al. (1994) considered that *Tirispora* differed from *Halosarphelia* as the asci have a pore and ascospores are thick-walled with a unipolar appendage. In the type species of *Halosarphelia*, *H. fibrosa* Kohlm. & E. Kohlm., asci lack a pore or ring and ascospores are thin-walled, with bipolar appendages. There are, however, many species in *Halosarphelia* which deviate from this generic description (e.g. *H. ramagirienis* S.D. Patil & Borse has persistent asci with a refractive lens-shaped apical plate, *H. marina* has persistent asci with an apical pore where the plasmalemma retracts from the ascus wall below the apex) (Farrant 1986).

The foregoing account shows the heterogeneous nature of the genera *Halosarphelia* and *Aniptodera* which are in need of further investigation (Jones et al. 1994). Until such results are available, we place the new species, tentatively, in *Tirispora*, based on the presence of superficial, hyaline to pale brown ascomata, persistent asci with an apical pore, and thick-walled, one-septate ascospores with unipolar appendages.

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References


Figures 1-6. Micrographs of *Tirispora mandoviana* (from holotype). **Figs 1, 2.** Ascoma, note the double necks in Fig. 2. **Fig. 3.** Asci in a group. **Fig. 4.** Tip of ascoma neck (enlarged), showing periphyses. **Figs 5, 6.** Asci. Bars: 1 & 2 = 100 μm, 3 = 50 μm, 4–6 = 10 μm. **Fig. 6.** An abnormal ascus with wall torn at the tip.