
Intertidal fungi from the Philippines, with a description of *Acrocordiopsis sphaerica* sp. nov. (Ascomycota)

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Fifty intertidal fungi are reported from three locations in the Philippines. Twenty-one of these taxa are new records for the Philippine Islands. *Acrocordiopsis sphaerica* sp. nov., is described and illustrated, and is compared with *A. patilii*.

Key words: fungal biodiversity, mangrove fungi, saprotroph, taxonomy.

Introduction

Gacutan and Uyenco (1983) and Jones, Uyenco and Follosco (1988) have reported 7 and 31 marine fungi, respectively, from the Philippines. Recently Jones *et al.* (1996) described a new genus (*Tirisporella beccariana* (Ces.) E.B.G. Jones, K.D. Hyde and Alias) from material collected in Malaysia and the Philippines. The fungus had previously been reported from *Nypa fruticans* as *Sphaeria beccariana* (Cesati, 1880). Thus a total of 36 marine fungi have been reported from the Philippines. Three subsequent collecting trips have been made to the Philippines and these are documented here, along with the description of a new species of *Acrocordiopsis*.

Materials and Methods

Material was collected at two sites in Boracay, the Visayas. Site I was an exposed area with considerable erosion of the shoreline and with trees of *Rhizophora apiculata*, *Sonneratia* sp. (equal numbers) and some *Avicennia* sp. Site II was a brackish water site with old channel ways closed in by the creation of fish ponds. Dominant tree species were *Nypa fruticans*, *Rhizophora*

Table 1. Marine fungi from intertidal drift and attached mangrove wood from three localities in the Philippines.

Fungi	Collection sites					Total
	Taklong	Boracay		Pagbilao		
		I	II		Nypa stand	
• <i>Periconia prolifica</i> Anast.	7	30	12	28	5	82
<i>Savoryella lignicola</i> E.B.G. Jones and R.A. Eaton	-	2	2	13	7	24
• <i>Verruculina enalia</i> (Kohlm.) Kohlm. and Volkm.-Kohlm.	1	5	2	7	6	21
<i>Lignicola laevis</i> Höhnk	1	12	1	5	-	19
* <i>Trichocladium alopallonellum</i> (Meyers and Moore) Kohlm. and Volkm.-Kohlm.	-	3	5	2	7	17
*• <i>Lignicola longirostris</i> (Cribb and J.W. Cribb) Kohlm.	6	5	1	1	2	15
• <i>Aniptodera marina</i> (Cribb and J.W. Cribb) Kohlm.	1	5	1	6	2	15
• <i>Hypoxylon oceanicum</i> Schatz	-	-	-	13	1	14
• <i>Antennospora quadricornuta</i> (Cribb and J.W. Cribb) T.W. Johnson	3	6	3	1	-	13
<i>Monodictys</i> sp.	-	-	1	12	-	13
<i>Clavatospora bulbosa</i> (Anast.) Nakagiri and Tubaki	1	3	6	1	1	12
* <i>Trichocladium achrosporium</i> (Meyers and Moore) Dixon	-	1	3	8	-	12
• <i>Lulworthia grandispora</i> Meyers	5	2	1	1	1	10
* <i>Xylomyces</i> sp.	-	5	4	1	-	10
*• <i>Antennospora salina</i> (Meyers) Yusoff, E.B.G. Jones and S.T. Moss	-	3	2	3	-	8
<i>Zalerion varium</i> Anast.	-	2	-	-	5	7
<i>Cirrenalia</i> sp.	-	1	-	4	1	6
• <i>Halocyphina villosa</i> Kohlm. and E. Kohlm.	2	-	1	1	2	6
<i>Nia vibrissa</i> Moore and Meyers	-	-	-	-	6	6
<i>Zalerion maritimum</i> (Linder) Anast.	-	-	2	-	4	6
<i>Aniptodera chesapeakensis</i> Shearer and Crane	-	1	-	1	3	5
<i>Humicola</i> -like sp.	-	-	-	-	5	5
Ascomycete sp. 1	-	2	-	2	-	4
Ascomycete sp. 2	1	-	-	3	-	4
• <i>Savoryella paucispora</i> (Cribb and J.W. Cribb) Koch	-	1	-	3	-	4

Table 1. (continued).

Fungi	Collection sites				Total	
	Taklong	Boracay		Pagbilao		
		I	II	Nypa stand		
*• <i>Heliascus kanaloanus</i> Kohlm.	-	-	-	3	-	3
<i>Leptosphaeria</i> sp.	2	-	-	1	-	3
• <i>Tricladium linderi</i> Crane and Shearer	-	-	-	3	-	3
<i>Corollospora</i> sp. (immature)	-	-	-	-	2	2
<i>Leptosphaeria</i> sp.	-	-	-	1	1	2
*• <i>Adomia</i> sp.	-	-	1	-	-	1
*• <i>Aigialus parvus</i> Schatz and Kohlm.	-	-	1	-	-	1
• <i>Aniptodera mangrovei</i> K.D. Hyde	-	1	-	-	-	1
* <i>Arenariomyces trifurcatus</i> Höhnk	-	1	-	-	-	1
Bicelled Ascomycete	-	-	-	-	1	1
• <i>Cirrenalia tropicalis</i> Kohlm.	-	-	1	-	-	1
*• <i>Cucullosporella mangrovei</i> (K.D. Hyde and E.B.G. Jones) K.D. Hyde and E.B.G. Jones	-	1	-	-	-	1
• <i>Dactylospora haliotrepha</i> (Kohlm. and E. Kohlm.) Hafellner	1	-	-	-	-	1
* <i>Dendryphiella salina</i> (Suth.) Pugh and Nicot	1	-	-	-	-	1
*• <i>Lignincola tropica</i> Kohlm.	1	-	-	-	-	1
*• <i>Marinosphaera mangrovei</i> K.D. Hyde	-	1	-	-	-	1
<i>Pestaliopsis</i> sp.	-	-	-	-	1	1
* <i>Tetraploa aristata</i> Berk. and Br.	-	-	1	-	-	1
<i>Torpedospora radiata</i> Meyers	1	-	-	-	-	1
Empty perithecia	-	43	3	-	-	46

* = New records for the Philippines; • = Tropical species.

apiculata, *Bruguiera* sp. and *Sonneratia* sp. There was a substantial litter zone from which collections were made.

Taklong is a small island in the Visayas with fully saline conditions and no freshwater input. Tree species were *Rhizophora mucronata* (dominant), *Sonneratia* sp., *Avicennia* spp. and *N. fruticans*. *Rhizophora mucronata* trees were small and poorly developed when visited in 1986, but have now grown and the species is really establishing itself in this new nature reserve (Apr. 1995). The Pagbilao, Luzon site is a well-established mangrove and extensive in area along the tributary of the river Palsabangon (Jones *et al.*, 1988).

Mangrove driftwood and decayed wood still attached to trees were collected, returned to the laboratory, incubated and examined for fungi (Jones and Hyde, 1988).

Results and Discussion

Table 1 lists the marine fungi collected during 1986 when 44 species were recorded of which 14 are new records for the Philippines: 27 ascomycetes, 15 mitosporic fungi and 2 basidiomycetes. The most frequently collected fungi were *Periconia prolifica* (82 collections), *Savoryella lignicola* (24), *Verruculina enalia* (21) and *Lignincola laevis* (19). Twenty-eight species are regarded as tropical, while the remainder are cosmopolitan in their distribution (Table 1, 2).

Many of the fungi collected can be regarded as typical of the intertidal mangrove habitat, e.g. *Halocyphina villosa*, *Heliascus kanaloanus*, *Hypoxylon oceanicum*, *Savoryella lignicola*, *S. paucispora* and *Verruculina enalia* (Hyde and Jones, 1988; Kohlmeyer and Volkmann-Kohlmeyer, 1991). However, a number of ocean fungi have also been collected, e.g. *Antennospora quadricornuta*, *A. salina*, *Periconia prolifica* and *Clavatospora bulbosa*. This reflects the sandy, high salinity features of the sampling sites at Takalong and Boracay.

Table 2. Marine fungi from intertidal and attached decayed wood at site I, Boracay, Philippines on driftwood.

Fungi	Number of collections
<i>Savoryella lignicola</i>	1
<i>Aniptodera chesapeakensis</i>	1
*• <i>Trematosphaeria mangrovei</i> Kohlm.	1
<i>Zalerion varium</i>	1
<i>Sphaerulina</i> sp.	1
*• <i>Lophiostoma mangrovei</i> Kohlm.	2
• <i>Lignincola tropica</i>	1
• <i>Dactylospora haliotrepha</i>	2
• <i>Tirisporella beccariana</i> (Ces.) E.B.G. Jones, K.D. Hyde and Alias	1
*• <i>Biatriospora marina</i> K.D. Hyde and Borse	1
*• <i>Acrocordiopsis sphaerica</i>	1
*• <i>Acrocordiopsis patilii</i>	1
*• <i>Salsuginea ramicola</i> K.D. Hyde	1
• <i>Verruculina enalia</i>	1
*• <i>Quintaria lignatilis</i> (Kohlm.) Kohlm. and Volkm.-Kohlm.	1
Total samples examined	17

* = New records for the Philippines; • = Tropical species.

The more limited collections made in 1995 (Table 2) yielded a number of interesting species, e.g. *Biatrispora marina*, *Lophiostoma mangrovei*, *Quintaria lignatilis* and *Tirisporella beccariana*, with 7 new records for the Philippines. This brings the total number of marine fungi reported from the Philippines to 57. However, more intensive collections will yield a greater number of species, as the number of incompletely identified fungi indicates (Tables 1, 2).

Acrocordiopsis sphaerica Alias and E.B.G. Jones, sp. nov. (Figs. 1-5, 7, 8)

Ascomata <2mm diam., conica vel semiglobosa, basaliter applanata nigra, gregaria, nigra, carbonacea, epapillata, ostiolata. *Pseudoparaphysibus* 0.5-1.5 μm , numero, filiformis, reticulatis, septatis. *Asci* 180-270 \times 19.5-34 μm , octospori, bitunicati, cylindrici, pachydermatici, stipitati, apparatu apicali praediti. *Ascospores* 18-27 \times 15-24 μm , bicellularis, sphaerica vel ellipsoideae, hyalinae vel subhyalinae.

Holotype: PHILIPPINES, Boracay, on mangrove drift wood (*Sonneratia* sp.), Apr. 1995, E.B.G. Jones (IMI 379983).

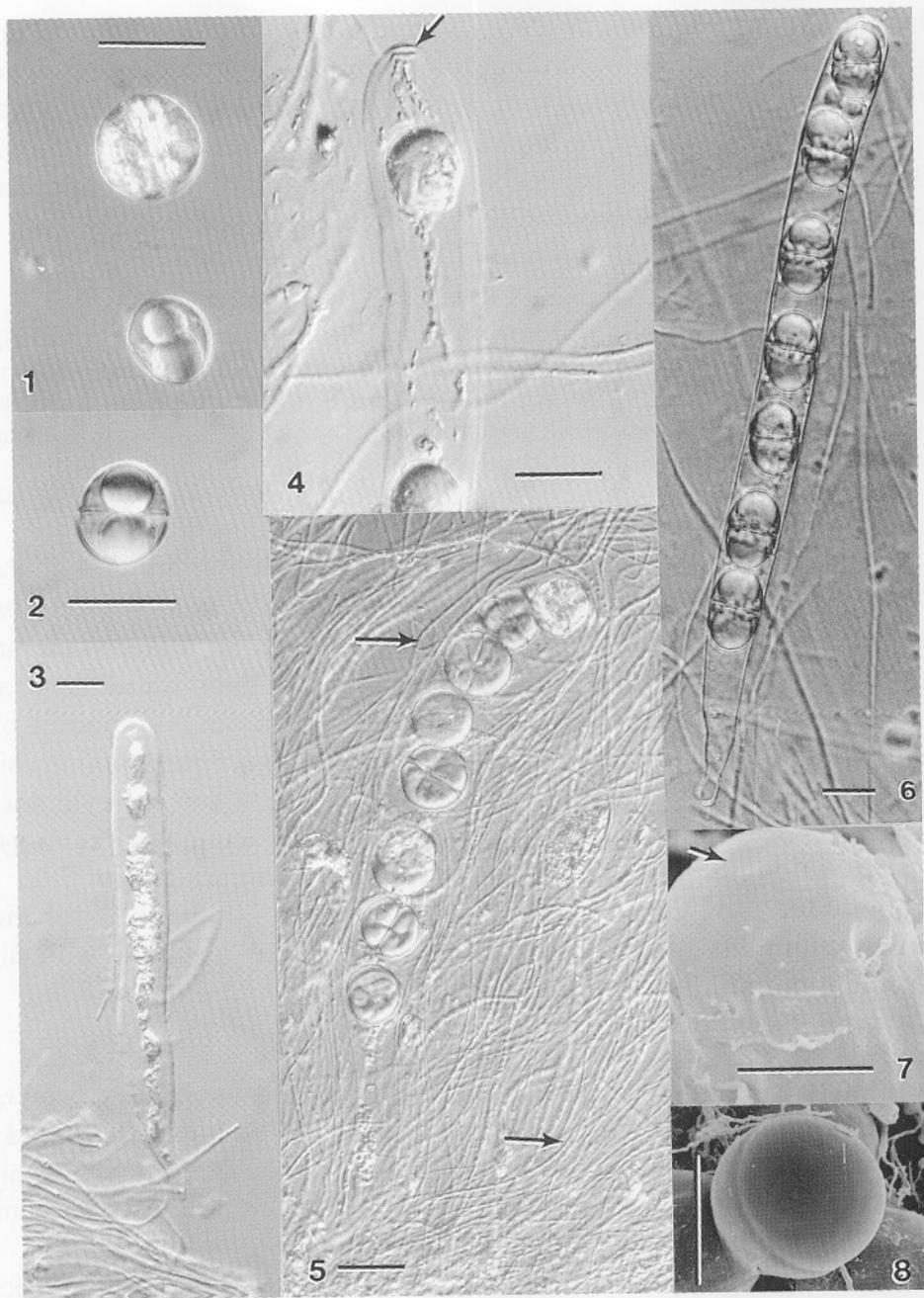
Ascomata up to 2 mm diam., conical or semi-globose, seated on black stromata, gregarious, black, carbonaceous, superficial, axis vertical, base flattened, epapillate, ostiolate. *Peridium* thick, composed of 3 layers: an outer layer of thick-walled, melanized cells, a middle layer of thick-walled cells, and an inner layer of isodiametric cells. The base of the peridium is composed of 2 layers. *Pseudoparaphyses* 0.5-1.5 μm diam., numerous, filiform, anastomosing and septate (Figs. 3-5). *Asci* 180-270 \times 19.5-34 μm , 8-spored, cylindrical, bitunicate, thin-walled, pedicellate, growing at the base and along the ascoma wall, with an apical thickening, and an ocular chamber (Figs. 3-5, 7). *Ascospores* 18-27 \times 15-24 μm (\bar{x} = 22.8 \times 20.3 μm , n = 30), bicelled, spherical or broadly ellipsoidal, hyaline, becoming yellowish at maturity, without a sheath or appendages (Figs. 1, 2, 5, 8).

Substrate: Mangrove driftwood.

Known distribution: Boracay mangrove (Philippines).

Borse and Hyde (1989) described the monotypic genus *Acrocordiopsis*, a tropical mangrove fungus, from India and Brunei. The fungus was referred to the Melanommatales and characterized by large conical ascomata with a thick carbonaceous wall, narrow hamathecial tissue, cylindrical asci with an ocular chamber and an apical thickening (Borse and Hyde, 1989).

Acrocordiopsis sphaerica differs from *A. patilii* in a number of respects: peridial wall three layered in *A. sphaerica*, with asci that are longer and broader than in *A. patilii*, ascospores are spherical to broadly ellipsoidal in *A. sphaerica*, larger in diameter and not constricted at the septum, while in *A. patilii* ascospores are narrower and slightly constricted at the septum (Table 3).



Figs. 1-5, 7, 8. *Acrocordiopsis sphaerica* (from holotype). Light micrographs. **1, 2.** Hyaline, 1-septate ascospores with prominent oil globule in each cell. **3, 4.** Young and mature asci, the latter with released ascospores. Note the apical ascus pore (arrowed). **5.** Ascus surrounded by thin filamentous paraphyses (arrowed). **7, 8.** Scanning electron micrographs. **7.** Tip of ascus with pore (arrowed). **8.** 1-septate ascospore. **Fig. 6.** *Acrocordiopsis patilii*. **6.** Ascus with 1-septate ascospore. Bars: 1-6, 8 = 20 μm , 7 = 10 μm .

Table 3. Measurements of the ascomata, asci and ascospores of *Acrocordiopsis patilii* and *A. sphaerica*.

	Ascomata (mm)	Asci (μm)	Ascospores (μm)
<i>A. patilii</i>	1-3 diam. \times 1-2 high	150-250 \times 12-16	16-25 \times 10-16
<i>A. sphaerica</i>	1-2 high	180-270 \times 19.5-34	18-27 \times 15-24

Acrocordiopsis patilii has also been collected in India by Chinnaraj (1993), while Borse and Hyde (1989) report that the fungus is often found in the upper parts of the intertidal region. In the Philippines both species appeared in the upper intertidal zone.

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