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Aquatic and Aero-Aquatic Hyphomycetes Occurred in Central Cameroon, Western Africa

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Abstract: A field survey was conducted to investigate diversity of aquatic and aero-aquatic fungi in a reservoir and its upper streams in central Cameroon, western Africa. Twenty-four species of hyphomycetes were identified from 15 genera based on various types of conidia in foam samples collected during 1996-1997. Four species, namely *Anguilospora logisima*, *Campylospora parvula*, *Helicomycetes* sp. and *Triscelophorus acuminatus*, were found being abundant in the samples. Thirteen species were less abundant, including *Anguilospora filiformis*, *A. pseudolongissima*, *Campylospora chaetocladia*, *Clavariopsis* sp., *Condylospora flexuosa*, *Condylospora spumigena*, *Condylospora* sp., *Flagellospora curvula*, *Kamatia indica*, *Lunulospora cymbiformis*, *Paraulocladium fabisporum*, *Scutisporous brunneus*, and *Triscelophorus konajensis*. The other species including *Alatospora acuminata*, *Clavariopsis aquatica*, *Condylospora gigantea*, *Speirospis scopiformis*, *Tetracladium setigerum*, *Triscelophorus magnificus* and *Weisneriomyces conjundrosporus* were found occasionally. Nine species reminded as unidentifiable species according to documented references available.

Key words: Aquatic hyphomycetes, foam sampling, reservoir and streams, Cameroon

Introduction

Aquatic hyphomycetes were firstly reported occurring in submerged decaying leaves from fast running streams in unpolluted areas, especially in temperate countries (Ingold, 1975; Chauvet, 1990; Sridhar and Bärlocher, 1993). These fungi can be examined using foam samples (Bärlocher, 1987; Marvanova and Bärlocher, 1989; Sridhar and Kaveriappa, 1989; Descals *et al.*, 1995). Examination of conidia from foam samples is a fundamental approach to identification of aquatic hyphomycetes. Their occurrence and distribution depend upon environmental factors including temperature, soil acidity, altitude, and vegetative cover of upper land (Suberkrop, 1984; Shearer and Webster, 1985). Thus, the diversity of aquatic hyphomycetes differs greatly between geographical areas. With similar morphology, aero-aquatic hyphomycetes usually occur in relatively still water and may coexist with aquatic hyphomycetes in water bulbs (Ingold, 1975). However, reports on the occurrence of aquatic and aero-aquatic hyphomycetes are few in African countries (Dixon, 1959; Le-John, 1965; Ferreir *et al.*, 1980) and unavailable in Cameroon, covered largely with heavy tropical forests. This paper is to first report the diversity of aquatic hyphomycetes in central Cameroon.

Materials and Methods

Foam samples were collected from a reservoir and its six upper streams at Nkobison, 5-10 km away from Yaounde, the capital city of Cameroon. The streams flow all over the year and run through an area at an altitude of 600-750 m with a cover of evergreen tropical forests and little human inhabitation. Water temperature varies annually from 20 to 24°C and pH ranges from 5.0 to 5.4. One foam sample (50 ml) was bimonthly taken at random from each of eight sites in the area of the reservoir and streams from August 1996 to July 1997. The foam sample was fixed with equal volume of Formalin-acetic acid-ethanol solution (Sridhar and Kaveriappa, 1989) and placed in the laboratory for precipitation of conidia. The conidia were then stained with cotton blue and microscopically examined for fungal identification using related classification literature.

Results and Discussion

Based on the morphological characteristics of conidia examined (Fig. 1, No. 1 to 34), all fungi were categorized to hyphomycetes, including 24 species identified (in Table 1).

Table 1: Aquatic hyphomycetes identified in foam samples and their relative abundance

Fungal species	Abundance	No. in Fig. 1
<i>Alatospora acuminata</i> Ingold	*	5
<i>Anguilospora filiformis</i> Graathead	**	1
<i>Anguilospora longissima</i> Sacc. and Sydow	***	2
<i>Anguilospora pseudolongissima</i>	**	4
<i>Campylospora chaetocladia</i> Ranzoni	**	3
<i>Campylospora parvula</i> Kuzuna	***	18
<i>Clavariopsis aquatica</i> de Wildman	*	19
<i>Clavariopsis</i> sp.	**	20
<i>Condylospora flexuosa</i> Nawawi and Kuthubutheen	**	27
<i>Condylospora gigantea</i> Nawawi and Kuthubutheen	*	25
<i>Condylospora spumigena</i> Nawawi	**	13, 25
<i>Condylospora</i> sp.	**	30
<i>Flagellospora curvula</i> Ingold	**	8
<i>Helicomycetes</i> sp.	***	15
<i>Kamatia indica</i> Rao & Subhedar	**	16
<i>Lunulospora cymbiformis</i> Miura	**	22
<i>Paraulocladium fabisporum</i> Kuthubutheen and Nawawi	**	17
<i>Scutisporous brunneus</i> Kuthubutheen and Nawawi	**	26
<i>Speirospis scopiformis</i> Kuthubutheen and Nawawi	*	6
<i>Tetracladium setigerum</i> (Grove) Ingold	*	14
<i>Triscelophorus acuminatus</i> Nawawi	***	9
<i>Triscelophorus konajensis</i> Sridhar and Kaveriappa	**	10, 11
<i>Triscelophorus magnificus</i> Peterson	*	12
<i>Weisneriomyces conjundrosporus</i> Kuthubutheen & Nawawi	*	7

*** abundant; ** commonly distributed; * rare

Of those 23 were aquatic species. Aero-aquatic species included *Helicomycetes* sp. only (Fig. 1, No. 15). Nine types of conidia (Fig. 1, No. 21, 23, 24, 28, 29, 31, 32, 33 and

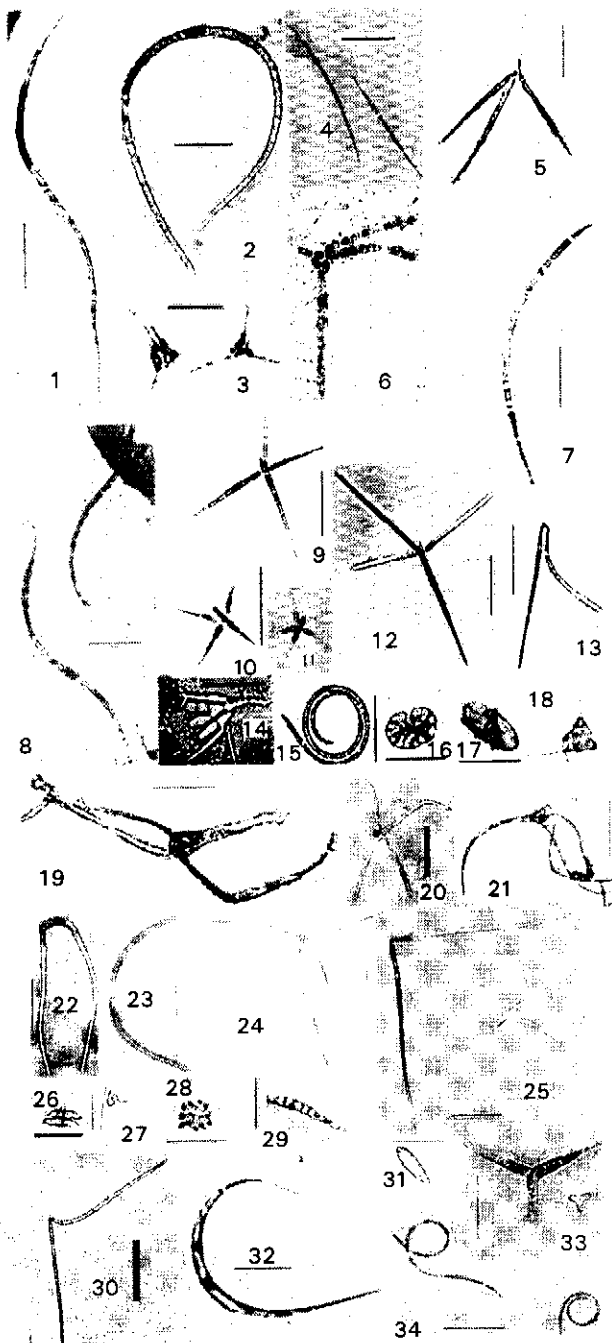


Fig. 1: Morphology of conidia of aquatic and aero-aquatic hyphomycetes in Cameroon. See Table 1 for reference to species names for each number. Bars in Scale: 25µm. See Table 1 for reference to species names for each number. No. 21, 23, 24, 28, 29, 31, 32, 33 and 34 represent unidentified species. Bars in scales: 25µm

34) were unidentifiable based on references available but apparently fell in aquatic or aero-aquatic hyphomycetes. Most aquatic hyphomycetes species found in this survey also occur in tropical Asia, e.x., Malaysia, India and Singapore (Sridhar and Kaveriappa, 1987; Kuthubutheen and Nawawi, 1994; Tubaki *et al.*, 1993), but other species have

also been reported in Europe and North America (Bärlocher 1987; Chauvet, 1990; Descals *et al.*, 1995).

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