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A new Species of *Rhizomucor* from India

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Summary. — A new species of *Rhizomucor* (Lucet & Const.) Wehmer ex Vuill., *Rh. nainitalensis* sp. nov., is being reported here. The main characteristic of the species is the variable shape and size of its sporangiospores. The temperature requirements for growth, sporulation and zygospore production have also been studied.

Introduction

Rhizomucor was introduced by Lucet & Constantin (1899) and accepted as a separate genus by Wehmer (1907), Vuillemin (1931), Hesseltine & Ellis (1973) and Schipper (1978). The three accepted species, viz., *Rh. pusillus*, *Rh. miehei* and *Rh. tauricus*, are traditionally described in *Mucor*.

The genus *Rhizomucor* is characterised as follows: thermophilic nature; sporangiophores branched, originating from aerial mycelium — either from short aerial hyphae or from distinct stolons with simple and/or weakly branched rhizoids; sporangia multispored, borne terminally in an upright position, globose, dark, distinctly columellate, nonapophysate; sporangiospores subglobose; zygospores globose, with blunt projections and formed in the aerial mycelium between non-ornamented, isogamous and opposite suspensors.

The present isolate apparently is a *Rhizomucor*, but differs from the three already known species, mainly by having sporangiospores of varying shapes and sizes.

Description

Rhizomucor nainitalensis sp. nov. — Fig. 1, a—c.

Coloniae celeriter crescentes in SMA et agaro-avena ad temp. 48° C, initio nivales, demum cinerascentes ad cinereo bubalinae, 2—3(—5) mm altae; rhizoida leniter evoluta; sporangiophora sympodialia vel irregulariter ramosa, 9—12(—15) μm in diametro, brunneola, interdum regulatim tumida, sporangia atro-brunnea, sphaerica, 35—55 μm diametro; columellae obovoideae ad parum pyriformes, 25—35 × 22—30 μm, pallido-brunneae, laevigatae, colla debiliter effecta vel nulla; sporangiosporae formis variis (subglobosae, ellipsoideae, oblongae, reniformes, etc.), hyalinae, parietibus tenuibus levibusque, 3—6 μm diametro vel majores; chlamydospora nulla; fungus homothallicus; zygosporae abundanter formatae ad 38° C in mycelio aeriali, globosae ad parum

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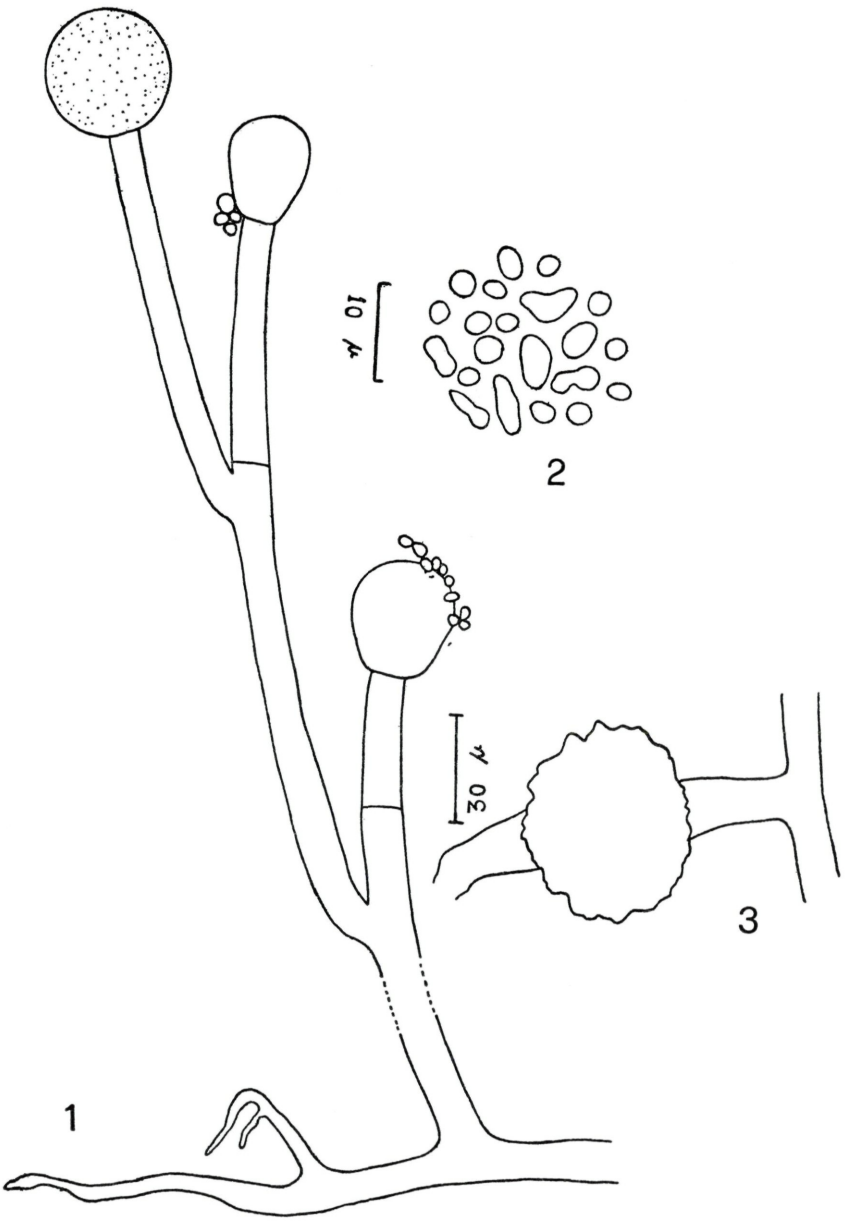
compressae, nigrae, 45—55 μm diametro (verrucis inclusis). In ligno valde decomposito *Querci* in sylva ad locum Pungote, Nainital, U. P., India. Cultura typica deposita in sectione botanica universitatis kumaonensis, ad locum Nainital, U. P., India, sub numero M 110.



Figs. 1—3. 1. Sporangiophore showing branching, sporangium, columellae and rhizoids, 2. Sporangiospores, and 3. Zygospore

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Colonies growing fast on SMA[1] and oat-meal agar[2] at 48° C, at first snow-white, later on greyish to greyish-buff, 2—3(—5) mm high. Rhizoids weakly developed; sporangiophores sympodially to irregularly branched, 9—12(—15) μm in diameter, brownish, sometimes regularly swollen. Sporangia dark brown, spherical, 35—55 μm in diameter. Columellae obovoid to slightly pyriform, 25—35×22—30 μm, light brown, smooth, collars poorly defined to none. Sporangiospores of varying shapes (subglobose, ellipsoidal, oblong, kidney-shaped, dump-bell shaped, etc.), hyaline, thin and smooth walled, 3—6 μm or more in diameter. Chlamydospores absent, homothallic. Zygospores formed abundantly at 38° C in the aerial mycelium, globose to slightly compressed, black, 45—55 μm in diameter (including warts).

Habitat: Isolated from heavily decomposed oak log in the forest of Pungote, Nainital, U. P., India. Type culture deposited in the Botany Department, Kumaun University, Nainital, U. P., India under No. M 110.

1. Dextrose, 40 gm; Asparagine, 2 gm; KH_2PO_4, 0.5 gm; $MgSO_4.7H_2O$, 0.25 gm; Thiaminehydrochloride, 0.5 mg; Agar-agar, 20 gm; Distilled water, 1 l.
2. Oat-meal, 30 gm; Agar-agar, 20 gm; Yeast extract, 0.5 gm; Distilled water, 1 l.

Effect of temperature (table 1): The growth of the mycelium was observed to be very rapid at 48° C. One day after inoculation the colony covers already half the area of a petri dish. At 38° C the growth of the mycelium takes place after three days but about one week is required to colonize the culture medium in a petri dish at 25 ° C.

Table 1. Effects of temperature on growth, sporulation and zygospore production of *Rh. nainitalensis* sp. nov., after 10 days of incubation on SMA

	Incubation temperatures		
	25° C	38° C	48° C
Growth	+	++	+++
Sporulation	+	+++	+++
Zygospore production	+	+++	—

Growth: +++ = maximum; ++ = good; + = poor; — = none.

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