

THERMOPHILOUS FUNGI ISOLATED FROM THE AIR AT PAVIA

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RESUMEN

Se presentan los resultados de un año de investigación sobre hongos termófilos en el aire de la ciudad de Pavia (Italia).

Se detectan ocho especies, las más frecuentes son: *Aspergillus fumigatus* Fres., *Thermomyces lanuginosus* Tsiklinsky, y *Rhizomucor pusillus* (Lindt) Schipper.

SUMMARY

The results of a year survey of thermophilous fungi in the air at Pavia (Italy) are given.

Eight species were determined: *Aspergillus fumigatus* Fres., *Thermomyces lanuginosus* Tsiklinsky, and *Rhizomucor pusillus* (Lindt) Schipper were the most frequent fungal species recovered.

INTRODUCTION

Thermophilous fungi are a small but interesting group of fungi that grows at high temperatures and generally known to exist in soil and isolated from organic debris near the soil surface or in self-heating masses (5).

They have been isolated from the nesting materials of animals (1, 10), from a heated aquatic habitat (4) and from some Antarctic and sub-Antarctic soil (3). Physiology, natural occurrence and economic importance of this group of fungi have been summarized by Cooney and Emerson (2). Thermophilous fungi have been isolated from the air of a few localities of the world (6, 7, 9, 11).

In this contribution occurrence of thermophilous fungi in the air of Pavia isolated by the agar plate method is reported.

METHODS

Four plates of 16 mm diameter were exposed 3 days per week for 4 hours at 12.00 hr. Potato-dextrose agar was used and the plates were incubated at 45°C for 3 days.

An average of 30 plates were exposed per month

from February 1980 to March 1981. All sampling was carried on the roof of the Botanical Garden of the University of Pavia approximately 12 m above ground level.

RESULTS AND DISCUSSION

The species isolated during the year are summarized in Table 1. Bacteria and Actinomyces present were not considered.

Eight species of thermophilic and thermotolerant fungi distributed in six genera were recorded.

More than 254 isolates were obtained by exposure of Petri plates, and half of these (58.2%) comprised *Aspergillus fumigatus* (30.2%) and *Thermomyces lanuginosus* (28%). *Humicola grisea* (15.7%) and *Rhizomucor pusillus* (16%) were the most common thermophilous fungi isolated.

The isolated of *A. fumigatus* were in mostly thermotolerant. Other species that appeared sporadically throughout the sampling year were *Thermomyces stellatus*, *Absidia corymbifera*, *Scytalidium thermophilum*.

Many fungus species occurred more frequently in late autumn and in late winter. *Aspergillus fumigatus* and *Rhizomucor pusillus* spores are dominant in autumn and in winter; *Humicola grisea* and *Thermomyces lanuginosus* spores are more numerous in spring and in summer.

The dominant thermophilous fungal species isolated from the air at Pavia have been reported also in the air-spora at Cambridge (7), in the air surrounding

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coal spoil tips (6) and in the air at Bombay (11).

Evans records that the periods of high spore occurrence in the air correspond closely with the periods of maximum occurrence in the soil.

Most of the thermophilous fungi isolated in the air at Pavia have mostly been found associated with freshly-harvested and dried rice seeds (8). The high frequency of these fungi in the air at Pavia is probably to correlate at large rice culture in the country.

Table 1 - Monthly and total incidence of Thermophilous fungi isolated from the air at Pavia

Species isolated at 45°C	G	F	M	A	M	J	J	A	S	O	N	D	Total colonies	%
<i>Absidia corymbifera</i> (Cohn) Sacc. & Trotter	--	1	--	--	--	2	1	--	1	--	2	1	8	3.1
<i>Aspergillus fumigatus</i> Fresenius	11	5	--	--	14	--	2	--	3	20	6	16	77	30.2
<i>A. nidulans</i> (Eidam) Wint.	--	--	--	--	--	--	--	--	--	1	--	--	1	0.4
<i>Humicola grisea</i> Traaen	4	--	16	6	2	--	2	--	7	--	3	--	40	15.7
<i>Rhizomucor pusillus</i> (Lindt) Schipper	2	7	--	--	7	--	--	--	7	7	3	8	41	16
<i>Thermomyces lanuginosus</i> Tsiklinsky	16	--	21	1	2	--	3	15	11	--	--	2	71	28
<i>T. stellatus</i> (Bunce) Apinis	2	--	--	--	--	--	--	--	--	--	2	1	5	1.9
<i>Scytalidium thermophilum</i> (Cooney & Emerson) Austwick	3	1	--	1	2	--	2	3	--	--	--	--	12	4.7
Total colonies	38	14	37	8	27	2	10	18	29	28	16	28	255	100.0

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