

AEROMYCOFLORA OF DOON VALLEY: A QUALITATIVE ASSESSMENT

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ABSTRACT

Sixty seven genera of viable aerofungi belonging to 181 spp. were trapped from the air of Dehradun valley. Of these, *Alternaria*, *Aspergillus*, *Penicillium* and *Curvularia* with 26, 19, 11 and 11 spp. were the most dominant. September-October and March-April were found to be two peak periods of fungal load. Site wise and Season wise variations in the aeromycoflora were well marked and hitherto, many new fungi have been reported from the air of Dehradun.

Keywords: Aeromycoflora, site, season, qualitative, Doon valley.

INTRODUCTION

Periodic aeromycological surveys have their value in epidemiological studies, allergy, spore calendar preparations, allergic desensitization for fungal antigens, decomposition, biodeterioration of plant and animal produce; nosocomial infections, mycoses, mycotoxins, disease forecasting and control (Agarwal and Shivpuri, 1974; Nair, 1977; Subramanian, 1983; Pitt, 1994; Janaki *et al*, 1999; Potdar *et al*, 2000; Verma, Singh and Singh, 2001; Joshi *et al*; 2003; Singh *et al*, 2004; Gola *et al*, 2005; Pandey, Goswami and Singh, 2006; Singh and Vats, 2006; Singh *et al*, 2006) justifying more of such studies in different geographical areas including the present one which was taken up because of vast changes in (1) human, vehicular and floating populations, (2) life styles, (3) infrastructure, (4) industrial and tourism activities, (5) meteorology and physiognomy of the area since 1984 (Kumar, 1984) which might increase chances of new genology of aerofungi as affected by factors like altitude, biozones, water bodies, pollution and methods of fungal isolation (Perveen, 2006).

MATERIALS AND METHODS

Dehradun a flat floored structural valley is situated in the southern part Dehradun district of Uttarakhand. The city, a part of Garhwal Himalayas has a human population of about 30 lakhs and a vehicular population of 2,4,5,044 is situated between 28°30' and

38°32' N. latitude and 77°39' and 78°18' E longitude and lies at 637 msl. The valley is nearly 70 km long and 25 km wide with vegetation which belongs to hot and dry zone. Climate is variable and varies from tropical to severe cold depending upon the altitude of the area. In summers, maximum temperature goes to 44.5°C and minimum 16.7°C while in winters mercury goes to 23.6°C as maximum and dips to 5.4°C as minimum. Rainfall may range from moderate to scanty; relative humidity is around 76%. Soil ranges from Podosoils to Brown forest soil (Singhal, 1966; Singhal, 1996; Perveen, 2006; Purohit and Purohit, 2006).

The chosen sites for aeromycological forays comprise Mohand, Sahastradhara, Reserve forest, ISBT, Ghantaghar, Garhi Cantt and Robbers cave.

Petriplate culture method (Turner, 1966) was employed to trap and isolate fungi from the above sites. Sterilized petriplates (9 m diameter) containing Sabouraud Agar medium were exposed simultaneously (3 per site) for 15 minutes at regular intervals for a year. The exposed plates were incubated in an inverted position at 27±1°C for 4-5 days. CFU's of fungi were counted, isolated and identified following standard books.

RESULTS AND DISCUSSION

The pertinent data have been presented in Table 1, from which following conclusions could be drawn:

1. A total of 67 genera having 181 viable species of aerofungi were isolated on Sabouraud Dextrose Agar medium.
2. Dominant fungi in decreasing order were *Alternaria* > *Aspergillus* > *Penicillium* = *Drechslera* = *Curvularia* followed by *Chaetomium* and *Mucor*.
3. Site wise trend of dominance on eastern side of the valley touching plain area was *Alternaria* > *Aspergillus* > *Penicillium* / *Cladosporium* while at north-west side of the valley, trend of dominance was *Aspergillus* > *Alternaria* > *Penicillium*.
4. Seasonal variations in distribution comprised (a) fungi which occurred in all the three seasons (b) fungi which occurred in two seasons (c) fungi which occurred in one seasons and (d) fungi which were rare.
5. In accordance with the studies of Kumar (1984), two peak periods of fungi were

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S.No.	Name of Fungi	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
123.	<i>M. hiemalis</i>	+	+	+	+	+	+			+	+	+	+
124.	<i>M. janseni</i>		+									+	
125.	<i>M. racemosus</i>	+								+			
126.	<i>M. varians</i>	+	+	+	+			+		+		+	+
127.	<i>Nigrospora</i> state of <i>Khuskia oryzae</i>											+	+
128.	<i>Oidiodendron</i> sp.			+					+		+		
129.	<i>O. chlamydosporicum</i>			+	+	+	+	+			+		
130.	<i>Papularia sphaerosperma</i>												+
131.	<i>Penicillium canadense</i>					+		+		+			+
132.	<i>P. citrinum</i>	+	+	+	+	+	+	+	+	+	+	+	+
133.	<i>P. cyclopium</i>	+	+	+	+		+	+	+	+		+	+
134.	<i>P. granulatum</i>							+	+	+			
135.	<i>P. herquei</i>	+						+				+	
136.	<i>P. janthinellum</i>		+									+	+
137.	<i>P. jenseni</i>	+	+					+	+	+	+		
138.	<i>P. pallidum</i>		+					+		+		+	
139.	<i>P. purpurogenum</i>		+								+		
140.	<i>P. restrictum</i>	+	+								+	+	+
141.	<i>P. rubrum</i>			+	+	+	+	+		+	+		
142.	<i>Periconia britannica</i>	+	+	+							+		+
143.	<i>P. jabalpurensis</i>										+	+	
144.	<i>Phialophora fastigiata</i>											+	
145.	<i>Phoma humicola</i>		+									+	
146.	<i>Rhizoctonia solani</i>					+	+						
147.	<i>Rhizopus nigricans</i>	+	+	+	+			+	+	+	+	+	+
148.	<i>R. oryzae</i>							+					
149.	<i>Scytalidium thermophilum</i>										+		
150.	<i>Spegazzinia</i> sp.			+									
151.	<i>S. parkini</i>	+	+										+
152.	<i>Spicaria divaricata</i>										+		+
153.	<i>Sporormia intermedia</i>						+						
154.	<i>Sporobolomyces</i> sp.											+	
155.	<i>Sporidesmium</i> sp.								+	+			
156.	<i>Septoria</i> sp.	+											
157.	<i>Stemphylium</i> state of <i>Pleospora herbarum</i>												+
158.	<i>Streptomyces</i> sp.			+				+					
159.	<i>Syncephalastrum</i> sp.		+			+			+		+	+	+
160.	<i>Syncephalis reflexa</i>			+	+	+	+						
161.	<i>Taeniolina</i> sp.											+	
162.	<i>Tilachlidium</i> sp.										+	+	
163.	<i>Theilavia terricola</i>						+						
164.	<i>Theilaviopsis</i> state of <i>Ceratocystis moniliformis</i>												+
165.	<i>Torula clanigens</i>		+	+									
166.	<i>T. graminis</i>									+	+		
167.	<i>T. herbarum</i>		+								+		
168.	<i>Trichoderma album</i>	+	+	+		+			+	+			
169.	<i>T. lignorum</i>										+	+	

S.No.	Name of Fungi	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
170.	<i>T. koningi</i>			+					+	+		+	
171.	<i>Trichothecium roseum</i>						+						+
172.	<i>Triscelophorus sp.</i>									+			
173.	<i>Tripospermum myrti</i>		+										
174.	<i>Ulocladium alternareae</i>		+				+						
175.	<i>U. chlamydosporum</i>		+	+			+						
176.	<i>U. consortiale</i>		+	+			+	+					
177.	<i>Verticellium cellulosa</i>									+			
178.	<i>V. glaucum</i>		+	+	+	+	+		+	+		+	
179.	<i>V. puniceum</i>						+	+				+	
180.	<i>V. sulphurellum</i>						+						
181.	<i>V. terrestre</i>						+	+					

Genera = 67; Species = 181

Trend of Dominance: Alt (26) > Asp (19) > Pen (11) = Drech (11) = Cur (11) > Chaet (7) = Mucor (7)

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AEROMYCOFLORA OF DOON VALLEY: A QUALITATIVE ASSESSMENT

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