

Biodiversity of water borne conidial fungi in Narmada river

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Abstract

Present study was undertaken to find out the number of water borne conidial fungi in river Narmada at Amarkantak region. The dominant water borne conidial fungi *Lunulospora curvula* and *Triscelephorus monosporus* were found 90% of fungi were found in leaves. Total of 35 fungi were recorded from foam, leaves, and twig analysis.

Keywords: Fungi, Narmada river, Biodiversity

INTRODUCTION

The holy river Narmada, considered heart of central India, Plan from East to west of the country. It originates from a small pond of Amarkantak (81° East and 22°37' North latitude, eastern flanks of the Miko hills in Shahdol district, Madhya Pradesh).

The river flows as a narrow stream flanked by linear chains of hills on either side up to 8.0 km. Kapildhara and then gradually transverses into a general shaped valley and finally turns to wider basin beyond Karanjia. It passes through Marbal rocks and flows westwards between Vindhyan and Satpura chains of mountains and finally enters the Gulf of Bombay.

Bank of river is surrounded by variety of dry deciduous and semi-evergreen forests, significant amount of plant litter accumulated during autumn every year, which provides natural medium for multiplication of a large number of water borne conidial fungi. Survey conducted at Jabalpur (Narmada river) and yielded water borne conidial fungi (Agrawal *et al.*^{1,2}). Therefore the present study was undertaken with an object to find out number of water borne fungi in Narmada river at Amarkantak.

MATERIAL AND METHODS

Collection of Samples

Submerged decaying, skeletonized, dark brown to black leaves and twigs were collected from barriers of water flow and litter bed of water bodies in presterilized polythene bags and brought to the laboratory.

Laboratory Processing: Foam and scum analysis

A drop of fixed foam and scum sample were placed on a clean slide and mounted in lactophenol-cottonblue solution and

examined under the low and high power of compound microscope. The entire slide was scanned slowly to detect conidia of fresh water hyphomycetes.

Plant Residue analysis

The leaves and twigs were washed thoroughly in tap water and distilled water individually to remove adhering mud invertebrates and any other debris and placed in separate bottles containing 100 ml of distilled water and a pinch of antibiotic (chlorophenicol) to control bacterial growth. They were incubated at room temperature 20 ± 20°C overnight to several days. The bottles were continuously aerated with Aerator[®]

Starting from the beginning day, the water samples and incubated plant materials were examined regularly under a low power of compound microscope.

Identification

Fungi were identified with the help of various monographs, reviews and other relevant research papers. (Sworth *et al.* 1973., Von Arx 1981, Barnett and Hunter 1972, Ellis, 1971, 1976, Ingold 1942, 1975 a). Help regarding the identification of these fungi were also taken from various mycologists of country and abroad.

RESULT AND DISCUSSION

Total of 35 fungi were recorded from various substrates viz; foam / scum sample, submerged decaying leaves and twigs (Table 1) out of these 8 fungi *Anguillospora crassa*, *Helicodendron trigliziensis*, *Isthmotricladia brittanica*, *Camposporium antennatum*, *Cetatosporella deviate*, *Dictyosporium elegans*, *Pithomyces penicillatae*, *Stemphyllium terricola* from leaves only and fungi *Campylospora chactocladia*, *Dactyllela submerse*, *Stemphyllium valparadisicum*, *Aniptodera chesapeakeensis* from twigs and 5 fungi *Dactyllela aquatica*, *Flabellospora crassa*, *Laridospora appendiculata*, *Pyramidospora densa*, *Tetraploa aristrata* from foam only. Similarly 4 fungi *Helicosporium griseum*, *Lunulospora curvula*, *Triscelephorus monosporus*, *Beltrania rhombica*, were recorded from all three methods. 10 fungi i.e. *Clavariopsis aquatica*, *Dendrosporium lobatum*, *Pyramidospora casurinae*, *Speiopsis gemmeforae*, *Tricladium splendens*, *Triscelephorus acuminatus*, *Tetracladium*

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marchalianum, *Varicosporium helicospodium*, *Wiesneriomyces indica*, *Chaetospermum carneum* were recorded from foam and leaf litter analysis both fungi i.e. *Helicoma conicodinatum*, *Savoryella marmadae* sp. were isolated from foam and twig analysis.

The data represented in Table 1 – clearly indicate the decaying submerged leaves were the most suitable substrates harboring maximum number of fungi. It was followed by foam and twig litters. Similar observation were also recorded by Shearer and Webster (1985 a,b, 1981) occurrence of high number of fungi on leaf litter may volume ratio can trap and be colonized by a variety of species besides these, the leaves having soft tissue which can easily be degraded in comparison to twig having hard tissue. The presence of wood in stream may be important in long term maintenance of population of these fungi. (Shearer and Webster, 1991). According to Ingold (1975a) the foam analysis technique is believed to give reasonable complete list of water fungi occurring in a given stream. This can also suggested that the use of different method under

integrated programme may also be very important to study the mycoflora of given region.

Distribution of Waterborne Conidial Fungi

The ecophysiological status of the river varied significantly at different places. The highest number of fungi 32, 30 were recovered from the sample collected from maika Bagicha and son Bhadra as showing in Table – 2 Difference in the number of fungi at these sampling sites was might be because of pollution due to extensive use of water by people for bathing and other purpose. Availability abundance and variety of plant litter beside very moderate temperature through out the year at Amarkantak are believed to be the main reasons for the occurrence of a large number of these fungi and their conidia. Wood Eggenschwiler and Barlocher (1983) claimed that average conidial concentration in streams is slightly related to riparian vegetation, not so much to its species richness.

Table 1. Distribution of Water Borne Conidial Fungi in Various Sampling Sites at Amarkantak

S.No.	Name of Fungi	Amarkantak		
		M	S	K
1	<i>Anguillospora Crassa</i>	-	+	-
2	<i>Campylospora Chaetoclada</i>	+	+	+
3	<i>Clavariopsis aquatica wild</i>	+	+	-
4	<i>Dactylella aquatica</i>	+	+	-
5	<i>D. Submersa</i>	+	+	-
6	<i>Dendrosporium labatum</i>	+	+	-
7	<i>Flabellospora crassa</i>	+	+	-
8	<i>Helicodendron trigliensis</i>	+	+	-
9	<i>Helicosporium griseum</i>	+	+	+
10	<i>Isthmotricladia brittanica</i>	+	+	-
11	<i>Laridospora appendiculata</i>	+	-	-
12	<i>Lunulospora Curvula</i>	+	+	+
13	<i>Pyramidospora casurinae</i>	-	+	+
14	<i>Pyramidospora densa</i>	+	+	-
15	<i>Speiropsis gemmeferae</i>	+	+	-
16	<i>Tricladium splendens</i>	+	+	+
17	<i>Triscelophorus acuminatus</i>	+	+	+
18	<i>T. monosporus</i>	+	+	+
19	<i>Tetracladium marchalianum</i>	+	-	-
20	<i>Varicosporium helicospodium</i>	+	+	-
21	<i>Vermispora odinae sp.nov.</i>	+	-	+
22	<i>Beltrania rhombica</i>	+	+	+
23	<i>Camposporium antennatum</i>	+	+	+
24	<i>Ceratosporella deviate</i>	-	+	-
25	<i>Dictyosporium elegans</i>	+	+	+
26	<i>Helicoma conicodinatum</i>	+	+	-
27	<i>Oncopodiella indica</i>	+	+	-
28	<i>Pithomyces penicillatae</i>	+	+	+
29	<i>Stemphyliomma valparadisicum</i>	+	+	+
30	<i>S. Terricola</i>	+	+	+
31	<i>Tetraploa aristrata</i>	+	+	-
32	<i>Wiesneriomyces indica</i>	+	+	+
33	<i>Chaetospermum carneum</i>	+	+	+
34	<i>Savoryella namadae sp. nov.</i>	+	-	-
35	<i>Aniptodera chesa peakensis</i>	+	-	-

+=Presence of species; -=Absence of species; M=Maika Bagicha; K=Kapildhara; S= Son Bhadra

Table 2. Conidial Fungi Recovered from Various Submerged Decaying Plant.

S.No.	Name of Fungi	Different substrate		
		Foam	Leaf	Twig
1	<i>Anguillospora Crassa</i>	-	+	-
2	<i>Campylospora Chaetoclada</i>	-	-	+
3	<i>Clavariopsis aquatica wild</i>	+	+	-
4	<i>Dactylella aquatica</i>	+	-	-
5	<i>D. Submersa</i>	-	-	+

6	<i>Dendrosporium labatum</i>	+	+	-
7	<i>Flabellospora crassa</i>	+	-	-
8	<i>Helicodendron trigliensis</i>	-	+	-
9	<i>Helicosporium griseum</i>	+	+	+
10	<i>Isthmotricladia brittanica</i>	-	+	-
11	<i>Laridospora appendiculata</i>	+	-	-
12	<i>Lunulospora Curvula</i>	+	+	+
13	<i>Pyramidospora casurinae</i>	+	+	-
14	<i>Pyramidospora densa</i>	+	-	-
15	<i>Speiopsis gemmeferae</i>	+	+	-
16	<i>Tricladium splendens</i>	+	+	-
17	<i>Triscelophorus acuminatus</i>	+	+	-
18	<i>T. monosporus</i>	+	+	+
19	<i>Tetracladium marchalianum</i>	+	+	-
20	<i>Varicosporium helicosporium</i>	+	+	-
21	<i>Vermispora odinae</i>	+	-	-
22	<i>Beltrania rhombica</i>	+	+	+
23	<i>Camposporium antennatum</i>	-	+	-
24	<i>Ceratosporella deviate</i>	-	+	-
25	<i>Dictyosporium elegans</i>	-	+	-
26	<i>Helicoma conicodinatum</i>	+	-	+
27	<i>Oncopodiella indica</i>	-	+	+
28	<i>Pithomyces penicillatae</i>	-	+	-
29	<i>Stemphyliomma Valparadisiacum</i>	-	-	+
30	<i>S. terricola</i>	-	-	-
31	<i>Tetraploa aristrata</i>	+	-	-
32	<i>Wiesneriomyces indica</i>	+	+	-
33	<i>Chaetospermum carneum</i>	+	+	-
34	<i>Savoryella narmadae sp. nov.</i>	+	-	+
35	<i>Aniptodera chesa peakensis</i>	-	-	+

+ = Presence of spore and mycelium; - = Absence of sporulation and mycelium

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