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SUCCESSION OF MYCOFLORA ON LEAF LITTER OF *CAREYA ARBOREA* ROXB., *TERMINALIA PANICULATA* ROTH, *GREWIA MICROCOS* LINN. AND *XYLIA XYLOCARPA* (ROXB.) THEOB. IN KAIGA FOREST

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The present study deals with the succession of mycoflora on leaf litter of *Careya arborea* Roxb., *Terminalia paniculata* Roth, *Grewia microcos* Linn. and *Xylia xylocarpa* (Roxb.) Theob. in Kaiga forest of Western Ghats. A total of 81 genera of fungi were isolated from the litter of the four species studied. Thirty-two genera of fungi were found exclusively on *Careya arborea*. Among the various classes of fungi, Deuteromycetes were the most dominant group.

Keywords : Litter; Mycoflora; *Careya arborea; Terminalia paniculata; Grewia microcos; Xylia xylocarpa.*

Introduction

Litter forms an important constituent of the forest floor. Leaf litter contains considerable amount of nutrients and bound energy which are released during its decomposition. Because of its importance in nutrient cycling and in supporting the saprophagic components of ecosystems, studies on succession and decomposition has gained paramount importance. The succession of mycoflora on leaf litter has not been studied so far in Western Ghats. Hence, four common plant species of Kaiga forests were taken up for the present investigation.

Materials and Method

Six kg each of nearly senescent and fallen leaves of *Careya arborea* Roxb., *Terminalia paniculata* Roth, *Xylia xylocarpa* (Roxb.) Theob. and *Grewia microcos* Linn. were collected from forests around Nuclear Power Corporation Project in Kaiga. The succession studies were carried out using the mesh bag technique[1]. Each lot of the collected leaf litter was equally divided into 12 parts of 500 g and placed in nylon bags of mesh size 1 cm^2 measuring 20 x 40 cm. The bags with leaf litter of particular species were placed on the forest floor below the corresponding plant species. To prevent the bags from being disturbed they were anchored to a peg with nylon thread. In the first week of each succeeding month one litter bag of each species was brought to the laboratory for further studies.

Identification of leaf litter fungi was done by plating the litter in Petriplates with three layers of wet blotters placed on a moistened absorbant cotton and incubated at room temperature for a month with alternate cycles of 12 hours of artificial light and darkness. The light

source was fluorescent day light emitting 1900 luxes of light. First observation was made after seven days of incubation and subsequent observation of the same litter was done every week up to a period of one month.

Results and Discussion

The present study revealed that the population of fungi colonizing decomposing leaf litters vary significantly on different species and on the same species at different times of the year. The maximum number of fungi were recorded on the leaf litter of *Careya arborea* Roxb. *Xylia xylocarpa* (Roxb.) litter harboured least number of fungi when compared with the other three (Table 1).

The fungi isolated from the leaf litter of the four plant species belong to 81 genera (Table1). Of these, the fungi imperfecti were represented by 62 genera (77%), Ascomycetes by 10 (12%), Phycomycetes by 5 (6%), Myxomycetes by 3 (3%) and Basidiomycetes by only one genus. It is pertinent to point out that only in *Terminalia paniculata* leaf litter a single Basidiomycetes fungus, *Mycena* sp., was observed, which produced fruiting bodies during February-May 1991.

The primary colonizers on *Careya* litter were *Mucor* sp., *Penicillium* sp., *Aspergillus* sp., *Beltrania rhombica*, *Circinotrichum* sp., *Cylindrocladium* sp., *Pestalotia* sp., *Drechclera* sp. *Gaeumannomyces* sp., *Eutypa* sp., and *Phoma sp.* The frequent secondary colonisers were *Nigrospora* sp., *Trichoderma* sp., *Botryodiplodia theobromae*, *Tharoopama* sp. and *Cercospora careyae*. *Meliola indica*, commonly called "black mildews", was the most dominant fungus during February to April. Over this fungus some hyperparasitic fungi like *Isthmospora* sp. and *Spiropes* sp. were also present. The onset of the rainy season brings about a decrease in the population of *Meliola indica*. The dominant tertiary colonizers include *Wiesineryomyces javanica*, *Graphium* sp., *Tripospórium* sp. *Torula caligans*, *Pyrenochaeta* sp., *Cladosporium herbarum*, *Herpotrichiella* sp., *Zanclospora indica*, *Arthrobotrys* sp., *Gliocephalis* sp., *Helicoma* sp., *Nectria* sp., and *Mortierella* sp. The members of the Myxomycetes appeared at advanced stages of decomposition. The maximum number of fungi harbouring *Careya* leaf litter were members of Deuteromycetes and their number increased during January and reached the peak during February.

The fungi isolated from *Terminalia paniculata* leaf litter belonged to 32 genera. The primary colonizers of the litter were *Gyrothrix* sp., *Selenosporella* sp., and *Penicillium* sp. The most frequent fungi were *Beltraniella* sp., *Fusarium* sp. and *Beltrania* sp. which could be isolated on all the occasions of sampling. *Mycena* sp., *Drechsclera* sp., *Alternaria alternata*, *Botryodiplodia thiobromae*, *Corynespora* sp., *Helicosporium* sp., and *Tetraploa* sp. were the most frequent secondary colonizers. *Nectria cinnabarina*, *Ab-*

Table 1. Different fungi isolated from leaf litter of *Careya arborea, Terminalia paniculata, Xylia xylocarpa* and *Grewia microcos* from Kaiga forest of Western Ghats.

Sl. No.	Fungi	Host Plants			
		Careya Arborea	Terminalia paniculata	*Grewia microcos*	*Xylia xylocarpa*
Myxomycetes					
1	*Stemonitis* sp.	+	+	-	-
2	*Cribraria* sp.	-	+	-	-
3	*Comatricha* sp.	-	+	-	-
Phycomycetes					
4	*Mucor* sp.	+	-	-	-
5	*Rhizopus* sp.	+	-	-	-
6	*Mortierella* sp.	+	-	-	-
7	*Absidia* sp.	-	+	-	-
8	*Cunninghamella* sp.	-	+	-	-
Ascomycetes					
9	*Asterina* sp.	+	+	+	+
10	*Nectria* sp.	+	+	-	-
11	*Eutypa* sp.	+	-	-	-
12	*Chactomium* sp.	+	-	-	-
13	*Gaeumannomyces* sp.	+	-	-	-
14	*Lophodermium* sp.	+	-	-	-
15	*Emericella nidulans*	+	-	-	-
16	*Meliola indicum*	+	-	-	-
17	*Herpotrichiella* sp.	+	-	-	-
18	*Wentiomyces* sp.	-	-	+	-
Basidiomycetes					
19	*Mycena* sp.	-	+	-	-
Deuteromycetes					
20	*Fusarium* sp.	+	+	+	+
21	*Cladosporium* sp.	+	+	+	+
22	*Memnoniella* sp.	+	-	+	+
23	*Selenosporella* sp.	-	+	+	+
24	*Alternaria alternata*	-	+	+	+
25	*Drechsclera* sp.	+	+	-	+
26	*Penicillium* sp.	+	+	-	+
27	*Cylindrocladium* sp.	-	-	+	+
28	*Phoma* sp.	+	+	+	-
29	*Codinaea assamica*	-	-	+	+
30	*Stachybotrytis*	-	-	+	-
31	*Pestalotia* sp.	+	+	-	-
32	*Colletotrichum* sp.	-	-	+	-
33	*Carcospora* sp	+	-	-	+
34	*Gyrothrix* sp.	+	+	-	+
35	*Beltrania* sp.	+	+	-	-

36	*Corynespora* sp.	-	+	+	-
37	*Botryodiplodia theobromae*	+	+	-	-
38	*Chlamydomyces* sp.	+	-	+	-
39	*Chaetopsina* sp.	+	+	-	-
40	*Tetraploa* sp.	-	+	+	-
41	*Helicosporium* sp.	-	+	+	-
42	*Tuberculariа* sp.	-	+	+	-
43	*Circinotrichum* sp.	+	+	-	-
44	*Zygosporium* sp.	+	-	-	-
45	*Aspergillus* sp.	+	-	-	-
46	*Spriopes* sp.	+	-	-	-
47	*Isthmospora* sp.	+	-	-	-
48	*Beltraniella* sp.	-	+	-	-
49	*Acarocybella* sp.	-	+	-	-
50	*Nigrospora* sp.	+	-	-	-
51	*Dinemasporium* sp.	-	-	-	+
52	*Monacrosporium* sp.	-	-	+	-
53	*Trichoderma viride*	+	-	-	-
54	*Thozetellopsis* sp.	+	-	-	-
55	*Trichothecium* sp.	-	-	+	-
56	*Pseudobotrytis terristris*	-	-	-	+
57	*Myrothecium* sp.	-	-	+	-
58	*Streptomyces* sp.	-	+	-	-
59	*Periconia* sp.	-	-	+	-
60	*Graphium* sp.	+	-	-	-
61	*Arthrobotrys*	+	-	-	-
62	*Weisneriomyces javanicus*	+	-	-	-
63	*Zanclospora indica*	+	-	-	-
64	*Tripospermium* sp.	+	-	-	-
65	*Ardhachandra selenoides*	-	+	-	-
66	*Hansfordia* sp.	+	-	-	-
67	*Pestalotiopsis funera*	+	-	-	-
68	*Tharaoopama* sp.	+	-	-	-
69	*Torula caligans*	+	-	-	-
70	*Monodictys* sp.	-	+	-	-
71	*Chloridium* sp.	-	+	-	-
72	*Pyrenochaeta* sp.	+	-	-	-
73	*Chaetomella* sp.	+	-	-	-
74	Helicoma sp.	-	-	-	-
75	*Paceilomyces* sp.	+	-	-	-
76	*Gliocephalis* sp.	+	-	-	-
77	*Menispora* sp.	+	-	-	-
78	*Diplodina* sp.	-	-	+	-
79	*Curvularia* sp.	+	+	-	+
80	*Menisporopsis theobromae*	-	-	-	+
81	*Ellisiopsis*	+	-	-	-

sidia sp., *Cunninghamella* sp., *Stemonitis* sp., Comatricha sp., *Cribraria* sp., *Chaetopsina* sp., *Ardhachandra selenoides, Chloridium* sp., *Monodietys* sp., *Phoma* sp., *Circinotrichum* sp. and *Tubercularia vulgaris* were the tertiary colonizers. Myxomycetes and phycomycetes fungi mostly appeared at the advanced stages of decomposition. Some of the myxomycetes fungi like *Comatricha* sp., and *Cribraria* sp., Phycomycetes fungi like *Absidia* sp., and *Cunninghamella* sp., the Ascomycentes fungi like *Nectria cinnabarina, Chaetomium* sp., and *C. hispidula* and Deuteromycetes fungi like *Acarocybella sp., Ardhachandra selenoides, Monodictys* sp., *Chaetomella* sp., *Tubercularis vulgaris* and *Streptomyces* sp. were isolated exclusively from this host.

Deuteromycetes were the dominant fungi colonizing the leaf litter, followed by Myxomycetes and Ascomycetes. The number of species of fungi starts increasing from December and reaches its peak in the month of April.

Twenty-two genera of fungi were isolated from *Grewia microcos* litter. The frequent primary colonizers were *Çodinaea* sp, *Memnoniella* sp. *Stachybotrytis* sp, *Fusarium* sp. and *Corynospora cassicola*. Among these *Collectotrichum* sp. was found to be the most frequent species on the litter, followed by *Fusarium* sp. and *Corynospora cassicola*. Among the secondary colonizers of litter, *Chlamydomyces* sp., *Cylindrocladium* sp., *Alternaria alternata, Myrothecium* sp., *Tetraploa ellisii, Trichothecium* sp., *Cladosporium oxysporium, Monacrosporium* sp., *Periconia hispidula, Phoma* sp., *Helicasporium* sp., *Tubercularia* sp., *Asternina* sp. and *Wentiomyces* sp. were more frequent.

The fungi isolated from *Xylia xylocarpa* litter belonged to 16 genera. The most frequent colonizer of the litter during the entire period of study was *Dinemasporium* sp., followed by *Collectotrichum* sp. The primary colonizers included *Memnoniella* sp. and *Menisporopsis* sp. The secondary colonizers were *Asterina* sp., *Codinaea* sp., *Fusarium* sp., *Pseudobotrytis terrestris, Drechsclera* sp., *Cladosprium oxysporium* and *Selenosporella* sp. Fungi like *Cylindrocladium* sp., *Penicillium* sp. and *Cercospora* sp. acted as tertiary colonizers.

The preponderance of fungi imperfecti on decomposing leaf litters has been reported by several workers[2]. The present investigation has also revealed that the members of fungi imperfecti are strong colonizers of litters, showing better adaptability and higher percentage distribution compared to the members of Phycomycetes, Myxomycetes, Basidiomycetes and Ascomycetes.

The concept of fungal succession on plant litter and other substrat has now become well established[3,4]. The sequence of this succession upon natural substratum reflects a complex interaction of nutritional relationship between each fungus and the substratum,

together with competiton between individual fungi[2]. The secondary saprophytes of litters comprised several genera of fungi imperfecti and sometimes a few genera of Phycomycetes. Occasionally, Myxomycetes appeared along with these fungi or later. The succession of fungi on leaf litters reported here, by and large, agrees with the general scheme of fungal succession on litter proposed by Hudson[3]. However, in this study, some Deuteromycetes fungi were found colonizing litters during all the stages of decay and Basidiomycetes, barring one exception, were totally absent. The predominance of fungi imperfecti on leaf litters may be related to their high sporulating ability and fast growth. Majority of the genera belonging to this group are recognised as very active cellulose decomposers[5].

In the present study the number of saprophytic fungal species were observed to increase gradually with the ageing of senescent plant parts, reaching its maximum during February-April. The reason for this is attributed to low relative humidity and high atmospheric temperature.

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