

Studies of Aeromycoflora of *Cassia tora* L.

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Abstract: Aeromycoflora of *Cassia tora* plants were studied during June to December from seedling to senescent stage. During the present investigation total 28 fungal species (162 colonies) were recorded. It was also observed that out of 28 species, 17, 19, 19, 14, and 05 fungi were recorded from different stage viz. seedling, pre-flowering, flowering, fruiting, and senescent stage respectively. Result also indicates that maximum numbers of fungi were observed during flowering and fruiting stage while minimum numbers of fungi were observed during seedling and senescent stage.

Keywords: Aeromycoflora, *Cassia tora*, Seasonal Variation, Fungal spores

1. Introduction

Aerobiology involves the study of airborne microorganisms and bioparticles present in the air. Aerobiological studies are widely used to determine the fungal spectrum in the air (Isabel et.al). The number of fungal airspora and their diversity vary with time of day, weather, season, geographical location and the presence of local spore sources (Lacey 1981). Members of all the fungal groups in terrestrial habitats, regardless of their origin, may be found in the bioaerosols during their dispersal phase. Once the spores become airborne, they may colonize new suitable substrates exposed to the air (Mohammed H et.al). As a result, the fungal spores are ubiquitous, and they mediate numerous processes with a crucial role in the maintenance and function of any natural ecosystem. According to Lacey (1981), airborne fungal spores are originally created from plant, animal, and soil sources; however, some authors believed that airborne spores are mainly a contribution from vegetation.

2. Materials and Methods

The present investigation was carried out at Govt. Autonomous science college Raipur (C.G) *Cassia tora* L. plants were grown in the Botanical Garden of Govt. Autonomous Science College Raipur. The aeromycoflora of different stages i.e. Seedling, Preflowering, Flowering, fruiting and senescent stage of *Cassia tora* plant was observed at with the help of Gravity Petri plate Methods. Six petriplates (containing PDA Media) were exposed above the ground level for 5-10 minutes in the experimental field in each stage two months for each stage (Table 1). The plates were brought in to the laboratory and incubated at $26 \pm 1^\circ \text{C}$ for 5-6 days for incubation period. The colonies were counted, isolated and identified with the help of available literatures and references.

3. Results and Discussions

28 fungi (162 colonies) were isolated during the present investigation. Out of total aeromycoflora 17, 19, 19, 14, 5 fungal species were isolated from seedling, pre-flowering, flowering, fruiting and senescent stage respectively. Maximum numbers of fungi (19) were isolated from Pre-

flowering and flowering stage, while minimum number of fungi (14, 5) from fruiting and senescent stage. It was also observed that fungal population increased from seedling to fruiting stage and then decrease. During present study among the total fungal species 4 species of Zygomycotina-*Cunninghamella blakesleena*, *Rhizopus* sp., *Mucor* sp., *Syncephalastrum racemosum*, 11 species of Ascomycotina were recorded in which 9 species of *Aspergillus* sp and one species of *Penicillium* sp. and *Chaetomium* sp., While in Deuteromycotina 13 fungal species were recorded 2 species of *Cladosporium* sp. 3 species of *Curvularia* sp. species of *Drechslera* sp. *Bispora* sp. and *Helminthosporium* sp. *Nigrospora oryzae*, *Pithomyces* sp. Mycelia sterilia black and yellow and one unidentified sp. (Table no.2). During seedling stage Total Number of colonies 42 were recorded out of total colonies 2, 18, 22 from Zygomycotina, Ascomycotina and Deuteromycotina were present during Pre-flowering stage total Number of colonies 38 out of total No of colonies 3, 17, 18 from Zygomycotina, Ascomycotina, and Deuteromycotina. During Flowering stage 42 colonies out of which 2, 20, 20 from zygomycotina, Ascomycotina, Deuteromycotina, were recorded. During fruiting stage total No. of colonies 26 were recorded, out of which 1, 10, 15 from Zygomycotina, Ascomycotina and Deuteromycotina were recorded. Similarly in senescent stage out of 14 total no of colonies 0, 9, 5 from zygomycotina Ascomycotina and Deuteromycotina were recorded. Related work also reported by Dickimonc (1967), Tiwari and Sahu (1989), Tiwari and Jadhav (1997), Uddin(2005) and Tiwari and saluja(2009).

Most frequent fungi were *Aspergillus fumigates*, *A. flaus*, *A.niger*, *A.nidulans*, *A. ochroceus*, *Asp. versicolor*, *Cladosporium oxysporium*, *Cladosporium cladosporioides*, *Curvularia clavata*, *Curvularia lunata*, *Drechslera*, *Helminthosporium*, *Nigrospora oryza* recorded during the course of study. On the contrary least frequent fungi were *Cunninghamella blakesleena*, *Rhizopus* sp. *Mucor* sp., *Syncephalastrum racemosum*, *Aspergillus awamori*, *Asp. lunschensis*, *Chaetomium* sp., *Penicillium* sp. *Curvularia senegalensis* *Bispora* sp., *Pithomyces* sp., *Mycelia sterilia black*, Mycelia sterilia yellow, unidentified. Out of total colonies (162), Deuteromycotina was (49.38%) Ascomycotina (45.67%), Zygomycotina (4.97 %) were recorded during present time (Figure. No 3). The result also indicate that maximum percentage contribution of

Aspergillus fumigates (35.71), *Aspergillus nidulans* (21.42), *Cladosporium cladosporioides*, *curvularia clavata* *Curvularia lunata* while the mini mum percentage contribution of *Bispora*, *Cunninghamella blakesleena*, *Mucor sp.* *Syncephalastrum*, *Mycelia sterile black*.

It was also observed that some fungi were present in more than two stage but not present in all stage like *Rhizopus sp.*, *Aspergillus flavus*, *A. fumigatus*, *Penicillium sp.*, *Cladosporium oxysporum*. Similarly some fungi were present more than one stage but not in all stage- *Cunninghamella blakesleena*, *Syncephalastrum racemosum*, *Aspergillus awamori*, *A.ochraceus.*, *A. terreus.*, *A. lunchensis.*, *Cladosporium cladosporioides.*, *Curvularia senegalensis.*, *Drechslera sp.*, *Bispora sp.*, *Mycelia Sterila black*. It was also observed that some fungi like *Mucor sp.*, *Chaetomium sp.*, *Mycelia sterilia yellow*, unidentified sp.(a) were restricted only one stage.

Table 1: Observed stage and period of *Cassia tora*

S.No	Stage	Period
1	Seedling	June-July
2	Preflowering	Aug- September
3	Flowering	Oct - Nov
4	Fruiting	Dec- Jan
5	Senescent	Feb- March

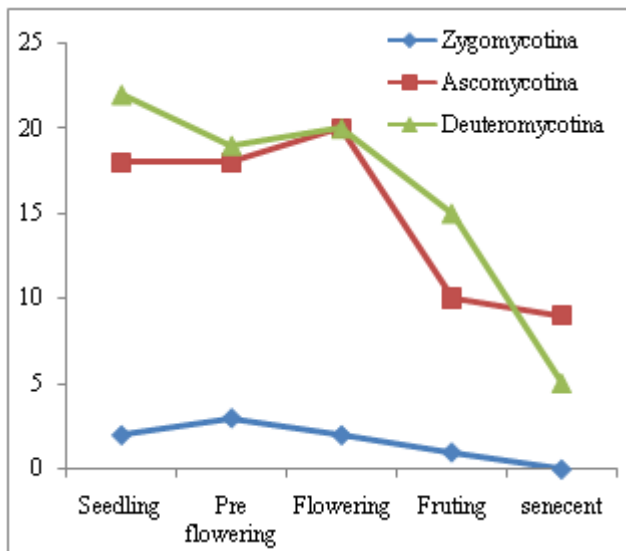


Figure 1: Number of colonies of aeromycolfora over *cassia tora* at different stage

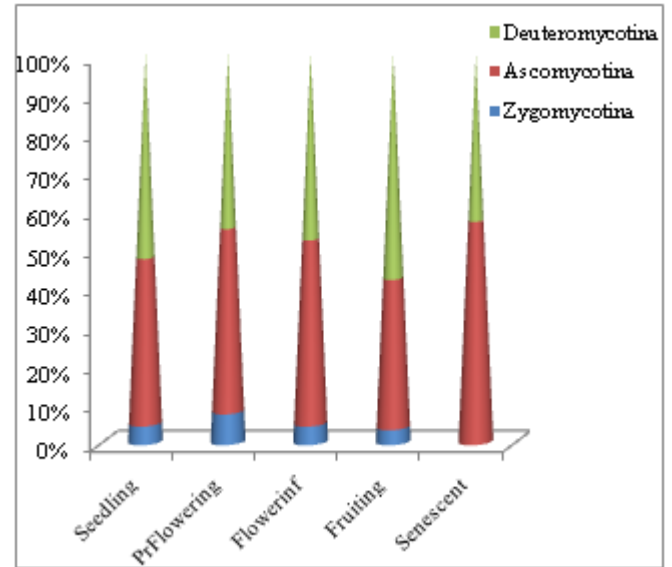


Figure 2: Percentage Contribution aeromycolfora over *cassia tora* at different stage

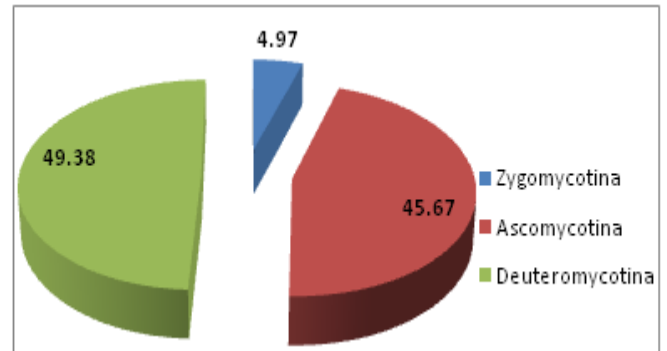


Figure 3: Percentage Contribution of fungal colonies over *cassia tora*

Table 2: Total number of Colonies, Frequency and Contribution over *cassia tora* at different stage

Name of fung	Name Of Fungi			Seedling			P.F			F			FU			SE		
	C	F	A	C	F	A	C	F	A	C	F	A	C	F	A			
Zygomycotina																		
<i>Cunninghamella blakesleeana</i>	1	50	2.380952	1	50	2.631579												
<i>Rhizopus sp.</i>				1	50	2.631579	1	50	2.380952	1	50	3.846154						
<i>Mucor sp</i>							1	50	2.380952									
<i>Syncephalastrum racemosum</i>	1	50	2.380952	1	50	2.631579												
Ascomycotina																		
<i>Aspergillus awamori</i>				2	50	5.263158	1	50	2.380952									
<i>Asp.flavus</i>	3	100	7.142857	2	50	5.263158	1	50	2.380952									
<i>Asp.fumigatus</i>	4	100	9.52381	2	50	5.263158	6	100	14.28571				5	100	35.71429			
<i>Asp.niger</i>	2	50	4.761905	3	100	7.894737	3	100	7.142857	2	50	7.692308						
<i>Asp. nidulans</i>							3	100	7.142857	4	100	15.38462	3	100	21.42857			
<i>Asp. ochraceus</i>							2	50	4.761905	3	100	11.53846						
<i>Asp.terreus</i>	2	50	4.761905	3	50	7.894737												
<i>Asp. versicolor</i>	3	100	7.142857	1		2.631579	2	50	4.761905				1	50	7.142857			

<i>Asp.lunchensis</i>	2	50	4.76	3	50	7.894737											
<i>chaetomium sp.</i>																	
<i>Penicillium sp.</i>	2	50	4.761905	1		2.631579	2	50	4.761905	1	50	3.846					
Deuteromycotina																	
<i>Cladosporium oxysporum</i>	5	100	11.90476	3		7.894737	3	100	7.142857								
<i>Cladosporium cladosporioides</i>	6	100	14.28571	2		5.263158				2	50	7.692308					
<i>Curvularia clavata</i>	2	50	4.761905	3		7.894737	4	100	9.52381	4	100	15.38462	3	100	21.42857		
<i>Curvularia lunata</i>	3	100	7.142857	2		5.263158	1	50	2.380952	1	50	3.846154	2	50	14.28571		
<i>Curvularia senegalensis</i>				1		2.631579	2	50	4.761905								
<i>Drechsler sp.</i>							2	50	4.761905	3	100	11.53846					
<i>Bispora sp.</i>				1		2.631579	1	50	2.380952								
<i>Helminthosporium sp.</i>	1	50	2.380952				3	100	7.142857	1	50	3.846154					
<i>Nigrospora oryzae</i>	1	50	2.380952	3		7.894737	3	100	7.142857	1	50	3.846154					
<i>Pithomyces sp.</i>	2	50	4.761905	3	50	7.894737				1	50	3.846154					
<i>Mycelia sterilia black</i>	2	50	4.761905				1	50	2.380952								
<i>Mycelia sterilia yellow</i>										1	50	3.846154					
<i>Unidentified(a)</i>										1							

P.F= per flowering, F= flowering, FU = fruiting, SE = Senescent C= no. of Colonies, A=Contribution F= frequency

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