Think India Journal
ISSN: 0971-1260 Vol-22, Special Issue-31
National Conference ETDAB-2019
Held on 23th & 24th December 2019
Organized by: Deptt. of Botany, Deogiri College, Aurangabad, M.S

Diversity of endophytic fungi from *Dalbergia sisso*.

Dipali B. Tribhuvan* and Aparna S. Taware

dipalitribhuvan2011@gmail.com

INTRODUCTION

The term "Endophyte", introduced by de Bary (1866) (6). Endophytic fungi have been known as a potential source of bioactive metabolite (4). endophytes are live internal tissues of host plants. fungal endophytes are beneficial for plants by promoting plant growth (3). endophytic fungi producing secondary metabolite substances that can be used by inhibit the growth of pathogens. There is a complex relationship between endophytic fungi and their host plants. Some these substances proved useful for novel drug discovery (5). These secondary metabolites showed antifungal and antibacterial activity against plant pathogens. endophytic fungi play an important role of natural ecosystems. The recently found that endophytic fungi have the unique substances represent a huge diversity.

Dalbergia sissoo (shisham) is an important tree grown mainly for its valuable timber (rosewood) (10**).** Shisham is also an important timber wood for furniture, fuel, screen for direct sunlight, provides cover or protection and feed for livestock (11**).** In the present study *Dalbergia sisso* was investigated for the endophytic fungal diversities.

MATERIAL AND METHOD

Plant sample

Endophytic fungi were isolated from fresh, healthy leaves and stems of *Dalbergia sisso* collected from different location of Aurangabad.

Isolation

leaf and stem samples were collected from 8 different location of Aurangabad regions.
samples were rinsed gently in running tap water to remove dust and debris. after washing, leaves and stems were cut into small pieces under aseptic conditions.
Plant material was treated with 70% ethanol for 1 min followed by immersion in 0.01% Hgcl2 and again in 70% ethanol for 30 seconds . They were finally rinsed with sterile distilled water.
sterilized leaves and stems were cultured in Petri dishes containing potato dextrose agar (PDA) medium and incubated at 27±2°C for 5-7 days.
Fungi growing out of the plant explants were sub cultured on separate PDA slants.

Identification: The fungi were identified based on the cultural characteristics and direct microscopic observations of the fruiting bodies and spores of fungi using standard manuals (12).

Calculation of colonization Frequency and Dominance:

Colonization frequency (%) of an endophyte species was equal to the number of segments colonized by a single endophyte divided by the total number of segments observed ×100 (5).

The dominance of endophytes were calculated as the percentage of colony frequency of a given endophyte divided by the sum of the percentage of colony frequency of all endophytes ×100 (9).

Result and Discussion:

Dalbergia sisso samples were collected from 8 different locations such as Babasaheb Ambedkar Marathwada University campus, Osmanpura, Samarth nagar, Harsul, Himayat bagh, Nagar raod,

Mukundwadi, Chawani of Aurangabad region and total 20 different endophytes were isolated (**Table no. 1**). the total of fungal endophytes were mentioned in **(fig no.1).** Colony frequency and Percent contribution of each isolates were observed as follows *Periconia* (3.47%, 3.70%), *Helminthosporium* (1.39%, 1.48%), *Cheatomium globosum* (2.08%, 2.22%), *Phoma Sp.* (10.42%, 11.11%), *B1L2* (1.39%, 1.48%), *Colletotrichum* (3.47%, 3.70%) *Fusarium sp*.(5.56% 5.93%), *Aspergillus flavus* (6.94%,7.41%), *Aspergillus fumigatus* (2.78% , 2.96%), *Aspergillus niger* (2.08%, 2.22%), *Alternaria sp*.(9.03%,9.63%), *Alternaria sp.*1(4.17%,4.44%), *Aspergillus sp.*1(4.86%,5.19%), *Aspergillus sp.2*(6.94%, 7.41*), Aspergillus sp.3*(5.56%, 5.93%), *Aspergillus sp.*4(6.25%,6.67%) , Nrs1(UI) (0.69%,0.74%), Bamu(UI) (1.39%,1.48%), Hbl2(UI) (13.89%, 14.81%), Ars2(UI) (1.39%,1.48%) respectively. Out of these, five genera were dominant i.e. *Phoma sp., Alternaria sp., Aspergillus flavus, Aspergillus sp.2* and Hbl2 (UI) (**Table no.2**). In present investigation, Hbl2 (UI) showed highest colonization frequency and dominance in the plant. In earliar research Prathyusha *et al*., (5) noted that, *Mycelia sterilia* was predominant among frequent fungal endophytes with colonization frequency of 15%**.** *A. flavus* and *Colletorichum sp.* were dominant in only some medicinal plant species reported by Ajay *et al* (8). Gang, (1) also recorded dominance of *Phomopsis* different species. *Aspergillus flavus* as the dominant species of *Acacia nilotica* Meenabiga and Rajagopal (7). Other genera i.e. *Cladosporium, Colletotrichum, Fusarium* were rarely isolated Romina and Priscila (2**).**

Name of	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6	Location 7	Location 8

Think India Journal
ISSN: 0971-1260 Vol-22, Special Issue-31
National Conference ETDAB-2019
Held on 23th & 24th December 2019
Organized by: Deptt. of Botany, Deogiri College, Aurangabad, M.S

Endophytes	Leaf	Stem	Leaf	Stem	Leaf	Stem	Leaf	Stem	Leaf	Stem	Leaf	Stem	Leaf	Stem	Leaf	Stem
Periconia	3	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
Helminthosporium,	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-
Cheatomium globosum	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-
Phoma Sp.	1	1	-	-	2	1	3	-	-	-	1	2	-	3	-	1
B1L2(UI)	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
Colletotrichum	2	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-
Fusarium sp.	-	-	-	3	-	2	-	-	-	-	1	-	-	-	2	-
Aspergillus flavus	4	-	-	-	-	-	-	-	-	2	-	1	-	3	-	-
Asp. fumigatus	-									3		1				
Aspergillus niger	-				1	1	1									
Alternaria sp.	-	2	2					3					3		1	2
Alternaria sp.1	-	2									4					
Aspergillus sp.1	-	1			2				3	1						
Aspergillus sp.2	-	1		4		3			1			1				
Aspergillus sp.3	-		2				1						1	1		3
Aspergillus sp.4	-		5					1			3					
Nrs1(UI)	-	1														
Bamu(UI)	-						2									
Hbl2(UI)	-	3		1				1	3	1		2		5		4
Ars2(UI)	-				2											

Table no.1 : Diversity of endophytic fungi isolated from different parts of *Dalbergia sisso* in Aurangabad region

SR. NO.	Name of Endophytes	CF	Dominance
1	*Periconia*	3.47	3.70
2	*Helminthosporium,*	1.39	1.48
3	*Cheatomium globosum*	2.08	2.22
4	*Phoma Sp.*	10.42	11.11
5	*BIL2 (UI)*	1.39	1.48
6	*Colletotrichum*	3.47	3.70
7	*Fusarium*	5.56	5.93

8	*Aspergillus flavus*	6.94	7.41
9	*Aspergillus fumigatus*	2.78	2.96
10	*Aspergillus niger*	2.08	2.22
11	*Alternaria sp.*	9.03	9.63
12	*Alternaria sp.1*	4.17	4.44
13	*Aspergillus sp.1*	4.86	5.19
14	*Aspergillus sp.2*	6.94	7.41
15	*Aspergillus sp.3*	5.56	5.93
16	*Aspergillus sp.4*	6.25	6.67
17	*Nrsl (UI)*	0.69	0.74
18	*Bamu (UI)*	1.39	1.48
19	*Hbl2(UI)*	13.89	14.81
20	*Ars2(UI)*	1.39	1.48

Table No.2- Statistical analysis of endophytic fungi

References

1) Gang Tao, Zuoyi Liu2, Bingda Sun, Ying Zhu, Lei Cai and Xing zhong Liu (2012) Occurrence and diversity of endophytic fungi in *Bletilla ochracea* (Orchidaceae) in Guizhou, China .African Journal of Microbiology Research Vol. 6(12), pp. 2859-286.

2) Romina Gazis, Priscila Chaverri (2010) Diversity offungalendophytesinleavesandstemsofwild rubber trees (Hevea brasiliensis) inPeru. Fungal ecology vol.240-254.

3) Ajay Kumar Gautam (2013) Diversity of fungal endophytes in some medicinal plants of Himachal Pradesh,India. Archives of Phytopathology and Plant Protection.

4) Natanong Yodsing , Somdej Kanokmedhakul , Wiyada Mongkolthanaruk , Tadanori Aimi, Totsaporn Srisapoomi and Sophon Boonlue (2018) Diversity of Endophytic Fungi Isolated from Thai Medicinal Plants (*Casearia grewiifolia*) in Khon Kaen, Thailand, and Their Bioactive Compounds. Chiang Mai Journal of Science vol. 45(1) 45-59.

5) Prathyusha P., Rajitha Sri A. B. and Satya Prasad K. (2015), Diversity and enzymatic activity of foliar endophytic fungi isolated from medicinal plants of Indian dry deciduous forest Scholars Research Library 7 (8):244-251

6) Xiang Sun and Liang-Dong Guo (2012), Endophytic fungal diversity: review of traditional and molecular techniques. An International Journal on Fungal Biology Mycology vol 3:1, 65-76.

7) Meenambiga S.S. and Rajagopal K. (2016) Diversity of endophytic fungi from *Acacia nilotica* linn., and screening their bio-activity against oral pathogens. International Journal of Pharma and Bio Sciences 7(3) (B) 282 – 290.

8) Ajay Kumar Gautama, Mona Kant and Yogita Thakur (2013) Isolation of endophytic fungi from Cannabis sativa and study their antifungal potential. Archives of Phytopathology and Plant Protection, Vol. 46, 627–635,

9) Kumaresan V. and Suryanaryanan T.S. (2002) Endophytic assemblage in young, mature and senescent roots of *Rhizophora apiculata* ,evidence for the role of endophyte in mangrove lilter degradation.Fungal Diverse vol 9,81-91.

10) Rehman A., Sahi S.T, Khan M.A. and Mehboob S. (2012) Fungi associated with bark, twigs and roots of declined Shisham (*Dalbergia sissoo* roxb.) trees in Punjab Pakistan. Pak. J. Phytopathol., Vol. 24(2) 152-158.

11) Narendra Kumar and S. M. Paul Khurana (2016) Bio management of wilting of a valuable timber and medicinal plant of Shisham (*Dalbergia sissoo* roxb.) - A review. International Journal of current microbiology and applied sciences Volume 5 pp. 32-54.

12) Barnett HL., Berry Hunter (1972) The illustrated genera of imperfect fungi ,printed in the united states of America.