



DIVERSITY IN HOST SUSCEPTIBLE OF *FLAVODON FLAVUS* FROM AURANGABAD DISTRICT, MAHARASHTRA [INDIA]

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ABSTRACT:

Eighty four fruiting bodies were collected from different areas of Aurangabad district to investigate the biodiversity of host susceptible to *Flavodon flavus*, which belong to family Irpicaceae from order Polyporales belonging to class Agaricomycetes. The shapes of fruiting bodies are in different form resupinate to effused-reflexed to pileate. *Flavodon flavus* causes white rot break down lignin and cellulose and commonly cause rotted wood which occurs on living tree, dead trees, wood logs, and coarse woody debris. In present investigation eighty-four fruiting bodies were collected which shows twenty different susceptible host.

Keywords: Fruiting bodies, Aurangabad, *Flavodon flavus*, Polyporales, White rot.

INTRODUCTION:

Randomly survey and collection of fruiting bodies of *Flavodon flavus* done from the different forest area, crop field, roadside and saw mills. Aurangabad district located between 19° and 20° North Latitude and 74° and 76° East Longitude, comprises nine tehsil Aurangabad, Gangapur, Kannad, Khultabad, Paithan, Phulambri, Sillod, Soygaon and Vaijapur. The total geographic area of Aurangabad district is 10107 sq.kms, out of forest area is 770.93 sq.kms i.e. 7.61%, which is rich in plant biodiversity.

Wood decaying fungi damage wood of live trees and decay becomes major cause of destruction of trees, these wood rotting fungi under favorable condition produce fruiting bodies remain dry and dormant over long period of low rainfall and after heavy rainfall growth of fruiting body occurs. *Flavodon flavus* causes white rot break down lignin and cellulose (Blanchette, 1980; Setliff & Eudy, 1979). Hyphae of the white rot fungi are concentrated

in the ray cells and vessels although, other cells are invaded very earlier penetration of cell walls (Wilcox, 1970; Liese, 1970). White rot fungi have cellulose and lignase enzyme system secreted at hyphal tips and on lateral surfaces. These enzymes assist cell wall penetration and enlarge bore holes to perforation. Along the young hyphae, lysed furrows are produced. The degradation products of various cell wall layers are completely absorbed by the hyphae. White rot fungi successively depolymerise cell wall substances only to extent that the products can be utilized consecutively for metabolism (Cowling, 1961).

This species is explored and reported by Curry (1874), Hennings (1901), Lloyd (1898–1925), Theissen (1911) and Bakshi (1971) in their classic treatment as *Irpex flavus*. While, modern morphological treatments like Roy & De (1996), Natarajan & Kolandavelu (1998), Leelavathy & Ganesh (2000), Sharma (2000 & 2012) and Das et al. (2019) as *Flavodon flavus* were given in national and regional mycobiota.

Taxonomic history of present species is overviewed (www.indexfungorum.org), the generic status *Flavodon* was introduced by Ryvardeen (1973) to accommodate the Klotzsch's (1833) species *Irpex flavus*. At least seven different generic names are associated with present species and this may be due to its highly variable morphology. But, there is very unique chemical feature of this species (along with its relatives) when come in contacts with KOH its yellow color immediately turns into brown. This feature was first recorded by Mass Geestreranus (1967) who questioned the status of *Irpex flavus* prior to the taxonomic treatment of Ryvardeen (1973). Above all, molecular phylogenetic studies undertaken by Simmons et al (2016) by using two gene markers nuclear ITS rDNA and 28S rDNA proofs the its uniqueness and the monophyletic nature of the genus *Flavodon*.

MATERIALS AND METHODS:

In present investigation the fruiting bodies of wood rotting macrofungi were collected 20 to 25 days after heavy rainfall during month of July to November from various region of Aurangabad district. The specimen of fruiting bodies were collected in brown paper bags, noting the host name, locality, date of collection, colour of specimen and type of attachment suggested by Gilbertson and Ryvardeen (1986), Measurements or range of measurement of fruiting bodies done as started by Ryvardeen and Johanson (1980), colour identification is done by chart of Methuen Handbook of colour (Kornerup and Wanscher, 1978). Fresh fruiting bodies are sun dried and kept in brown paper packet as per international mycological herbarium guidelines. Morphological and microscopic character was recorded, fresh material from field and dried material in laboratory. Macroscopic observations carried

out by using Cosmo Compound Light Microscope under 10X objective. The freehand thin section cutting of fruiting bodies done by chopping method with the help of sharp razor blades, stained and studied in 10% KOH, Lactophenol, Cotton Blue and Melzer's reagent and microscopic observations were made under 40X and 100X Magnification (Olympus CX 41) in laboratory.

TAXONOMIC DESCRIPTION

Flavodon flavus (Klotzsch) Ryvardeen

Norw. Jl Bot. **20**(1): 3(1973); *Irpex flavus* Klotzsch, *Linnaea* **8**(4): 488 (1833).

Fruit body annual, solitary to gregarious, 1.5–92.7 × 0.5–39.6 × 0.1–0.8 cm, resupinate to effused-reflexed to pileate, when pileate attached with a broad lateral base, usually with numerous small imbricate pilei, variously connate, leathery when fresh, tough on drying, inseparable. Pileus 1.5–23.9 × 0.5–1.9 cm, up to 0.8 cm thick at base, semicircular, applanate, often imbricate, broadly attached; upper surface tomentose when young, glabrous when matured, zonate, grayish yellow to yellowish white when young turns olive grey to ochraceous white when older. Margin 1–2 mm wide, distinct, sterile, acute, entire, wavy to lobed, pale yellow to ochraceous Fertile surface variable, poroid to lamellate, irregular, irpicoid to hydroid, more or less meruloid near margin in few specimens, pores or lamellate or teeth 1–2 per mm, grayish yellow to grayish green to lemon yellow to ochraceous. Context 1–3 mm wide, tough, indistinctively duplex with upper yellowish white cottony layer and while lower dense, compactly fibrous olive yellow layer. Tubes 1–5 mm long, grayish green to olive yellow; dissepiments thick, lacerate.

Hyphal system dimitic; generative hyphae 2–5 µm wide, simple septate, thin- to thick-walled, branched, smooth to slightly crystalline, hyaline; skeletal hyphae 3–6 µm wide, thick-walled to almost solid, wall up to 2 µm thick, hyaline to pale yellow. Cystidia & other sterile element present, Cystidia 18–25 × 4–6 µm, cylindrical clavate, apically incrustated. Basidia 13.5–19 × 3–7.5 µm, clavate cylindrical, 4-sterigmate, septate at base, smooth, hyaline. Basidioles 10–18 × 2.5–5 µm, septate at base, thin-walled, smooth, hyaline. Basidiospores 4–(5.22)–7 × 2.5–(3.41)–4 µm, Q = 1.31–(1.53)–2, broadly ellipsoid, thin-walled, smooth, hyaline, acyanophilic, inamyloid.

DISCUSSION & CONCLUSION:

Macro and micro morphological characters of above cited specimens are well agreed with above taxonomic treatment with few negligible and acceptable variations. This is highly variable species so far its outlook ecological life forms are concerned and it can be easily observed in the fruiting bodies appearances ranging from resupinate to effused-reflexed to pileate forms which are depends on the attachment position with the host wood. Similarly, fertile surface also exhibit almost all the available configurations like poroid to lamellate, irregular, irpicoid to hydroid, more or less meruloid to even smooth (as among polypore's and corticoid forms of wood-rotting macrofungi). Widely effused to reflex fruiting bodies with yellowish colored irpicoid to tooth to sinuous fertile surface makes its identification easy. In reflexed parts minutely hairy upper sterile surface becomes weakly to distinctly zonate whereas microscopically dimitic hyphal system and thick-walled apically encrusted skeletal hyphae projected into the hymenia forming skeleton cystidia makes it unique.

During several survey eighty four macrofungi collected (Table 1) from twenty different hosts (Table 2 & Plate 1) comes under eleven families (Table 2) which suffered from **white rot** by it; thus its occurrences is deserve to **Abundant** category of occurrences in the study areas which has wide range of host. The dominating host diversity is *Acacia nilotica*, *Azadirachta indica*, *Leucaena leucocephala*, *Senna siamea*. Leguminosae has maximum number of genera (40) are infected by *Flavodon flavus* followed by Meliaceae (18), Mimosaceae (10), Moraceae (04), Rutaceae (04), Anacardiaceae (03), Annonaceae (01), Burseraceae (01), Combretaceae (01) and Oleaceae (01). It can be conclude that dominant families infected by *Flavodon flavus* are seen in Leguminosae, Meliaceae and Mimosaceae. The most frequently attacked hosts range of *Flavodon flavus* are *Acacia nilotica*, *Azadirachta indica*, *Leucaena leucocephala* and *Senna siamea*.

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Plate 1: Host of *Flavodon flavus*



Acacia nilotica (L.) Delile.



Albizia lebbeck (L.) Benth.



Annona squamosa L.



Azadirachta indica A.Juss.



Boswellia serrata Roxb. ex Colebr.



Butea monosperma (Lam.) Taub.



Citrus medica L.



Dalbergia sissoo DC.



Delonix regia (Hook.) Raf.



Ficus amplissima Sm.



Ficus benghalensis L.



Leucaena leucocephala (Lam.) de Wit



Mangifera indica L.



Melia azedarach L.



Nyctanthes arbor-tristis L.



Peltophorum pterocarpum (DC.)
K. Heyne



Prosopis juliflora (Sw.) DC.



Santalum album L.



Senna siamea (Lam.) H.S. Irwin
& Barneby



Terminalia bellirica (Gaertn.) Roxb.

Table 1: List of Host Infected by *Flavodon flavus* (Klotzsch) Ryvardeen.

Sr. No	Host Name	Location	Collection Date	Altitude	Latitude & Longitude	Code
01	<i>Acacia nilotica</i> (L.) Delile.	Bharadi, Taluka Sillod.	24/08/16	639m	20°22'32"N 75°32'50"E	GVU/MVP-279
		Loanwadi, Taluka Sillod	01/09/16	628m	20°17'10"N 75°33'25"E	GVU/MVP-305
		Andhari, Taluka Sillod	01/09/16	623m	20°15'59"N 75°29'51"E	GVU/MVP-320
		Digoan, Taluka Kannad	19/09/14	630m	20°21'03"N 75°26'59"E	GVU/MVP-379
		Shelgoan, Taluka Kannad	24/09/16	631m	20°21'54"N 75°24'56"E	GVU/MVP-398
		Karanjkhed, Taluka Kannad	27/09/16	717m	20°20'57"N 75°17'23"E	GVU/MVP-421
		Palshi, Taluka Kannad	27/09/16	697m	20°18'30"N 75°17'14"E	GVU/MVP-424
		Bildha, Taluka Phulambri	04/10/16	671m	20°02'47"N 75°24'02"E	GVU/MVP-464
		Sangvi (Bu), Taluka Gangapur	06/10/16	523m	19°54'34"N 75°01'54"E	GVU/MVP-491
		Hadas Pimpalgoan, Taluka Vaijapur	06/10/16	508m	19°55'48"N 74°57'29"E	GVU/MVP-493
		Hadas Pimpalgoan, Taluka Vaijapur	06/10/16	506m	19°55'49"N 74°57'28"E	GVU/MVP-497
		Bidkin, Taluka Paithan	12/10/16	508m	19°41'32"N 75°18'34"E	GVU/MVP-526
		Pachod, Taluka Paithan	12/10/16	484m	19°34'13"N 75°37'28"E	GVU/MVP-562
		Ghatnandra, Taluka Sillod	16/10/16	661m	20°27'16"N 75°24'12"E	GVU/MVP-570
		Vakdi, Taluka Soygoan	16/10/16	288m	20°32'11"N 75°22'29"E	GVU/MVP-588
		Amthana, Taluka Sillod	19/10/16	642m	20°25'12"N 75°28'22"E	GVU/MVP-610
		Amthana, Taluka Sillod	19/10/16	642m	20°25'13"N 75°28'22"E	GVU/MVP-611
		Charnerwadi, Taluka Sillod	19/10/16	667m	20°27'02"N 75°28'26"E	GVU/MVP-622
		Hasnabad, Taluka Sillod	20/10/16	640m	20°14'38"N 75°30'24"E	GVU/MVP-640
		Pishore, Taluka Kannad	23/10/16	677m	20°17'59"N 75°20'54"E	GVU/MVP-647
Mhegoan, Taluka kannad	23/10/16	719m	20°17'02"N 75°14'21"E	GVU/MVP-662		
Ghatnandra, Taluka Sillod	12/10/19	661m	20°27'13"N 75°24'21"E	GVU/MVP-743		
Korhala, Tq.Sillod	06/11/19	736m	20°27'48"N 75°29'24"E	GVU/MVP-763		
02	<i>Albizia lebbeck</i> (L.) Benth.	Aaland, Taluka Phulambri	04/10/16	620m	20°12'02"N 75°33'29"E	GVU/MVP-451
		Asegoan, Taluka Gangapur	06/10/16	539m	19°53'19"N 75°11'14"E	GVU/MVP-478

03	<i>Annona squamosa</i> L.	Charnerwadi, Taluka Sillod	19/10/16	665m	20°26'56"N 75°28'26"E	GVU/MVP-613
04	<i>Azadirachta indica</i> A.Juss.	Bharadi, Taluka Sillod	27/08/16	637m	20°22'35"N 75°32'48"E	GVU/MVP-286
		Loanwadi, Taluka Sillod	01/09/16	622m	20°17'20"N 75°30'34"E	GVU/MVP-317
		Vakod, Taluka Kannad	02/09/16	640m	20°22'12"N 75°24'07"E	GVU/MVP-330
		Saw Mill Sillod, Taluka Sillod	25/09/16	610m	20°17'41"N 75°38'57"E	GVU/MVP-404
		Pishore, Taluka Kannad	27/09/16	694m	20°18'23"N 75°18'20"E	GVU/MVP-432
		Asegoan, Taluka Gangapur	06/10/16	539m	19°53'19"N 75°11'14"E	GVU/MVP-476
		Ranjangoan pol, Taluka Gangapur	06/10/16	542m	19°53'50"N 75°07'03"E	GVU/MVP-484
		Aadgoan, Taluka Kannad	08/10/16	650m	20°19'30"N 75°26'41"E	GVU/MVP-515
		Tidka, Taluka Soygoan	16/10/16	334m	20°29'58"N 75°23'25"E	GVU/MVP-575
		Gondegoan, Taluka Soygoan	16/10/16	322m	20°33'52"N 75°20'55"E	GVU/MVP-597
		Undengoan, Taluka Sillod	19/10/16	677m	20°27'03"N 75°40'09"E	GVU/MVP-626
		Sarola, Taluka Kannad	20/10/16	644m	20°17'56"N 75°24'53"E	GVU/MVP-633
		Kannad, Taluka kannad	23/10/16	638m	20°13'56"N 75°07'50"E	GVU/MVP-677
		Modha, Taluka Sillod	04/10/19	606m	20°19'19"N 75°36'09"E	GVU/MVP-733
Kasod, Tq.Sillod	06/11/19	635m	20°22'23"N 75°32'57"E	GVU/MVP-762		
Tidka, Tq. soygaon	09/11/19	330m	20°30'26"N 75°23'16"E	GVU/MVP-777		
05	<i>Boswellia serrata</i> Roxb. ex Colebr.	Soygoan forest, Takuka Soygoan.	07/09/14	569m	20°28'21"N 75°23'58"E	GVU/MVP-88
06	<i>Butea monosperma</i> (Lam.) Taub.	Chincholi (li), Taluka Kannad	10/09/14	652m	20°22'52"N 75°22'28"E	GVU/MVP-103
		Fardapur, Taluka Sillod	24/07/16	386m	20°35'02"N 75°41'50"E	GVU/MVP-202
		Soygoan forest, Takuka Soygoan.	16/10/16	523m	20°28'30"N 75°24'01"E	GVU/MVP-572
07	<i>Citrus medica</i> L.	Sangvi (Bu), Taluka Gangapur.	06/10/16	523m	19°54'34"N 75°01'54"E	GVU/MVP-490
		Katpur, Taluka Paithan	12/10/16	451m	19°31'10"N 75°32'10"E	GVU/MVP-544
		Nanegoan, Taluka Paithan	12/10/16	451m	19°32'03"N 75°29'52"E	GVU/MVP-548
		Dadegoan, Taluka Paithan	12/10/16	467m	19°33'10"N 75°32'59"E	GVU/MVP-553

08	<i>Dalbergia sissoo</i> D C.	Nagad, Taluka Kannad	21/09/14	332m	20°27'12"N 75°10'15"E	GVU/MVP-170
		Nachalvel, Taluka Kannad	20/10/16	640m	20°18'44"N 75°25'45"E	GVU/MVP-635
		Mhegoan, Taluka kannad	23/10/16	719m	20°17'02"N 75°14'21"E	GVU/MVP-661
09	<i>Delonix regia</i> (Hook.) Raf.	Mhegoan, Taluka kannad	23/10/16	719m	20°17'04"N 75°14'26"E	GVU/MVP-659
		Kannad, Taluka kannad	23/10/16	625m	20°15'46"N 75°08'32"E	GVU/MVP-670
10	<i>Ficus amplissima</i> Sm.	Loanwadi, Taluka Sillod	01/09/16	631m	20°17'20"N 75°30'55"E	GVU/MVP-314
11	<i>Ficus benghalensis</i> L.	Kingaon phata, Taluka Khultabad	08/09/16	654m	20°04'58"N 75°21'03"E	GVU/MVP-362
		Charnerwadi, Taluka Sillod	19/10/16	665m	20°26'56"N 75°28'26"E	GVU/MVP-614
		Ghatnandra, Taluka Sillod	12/10/19	661m	20°27'13"N 75°24'21"E	GVU/MVP-744
12	<i>Leucaena leucocephala</i> (Lam.) de Wit	Chincholi li, Taluka Kannad	14/09/14	644m	20°22'33"N 75°23'14"E	GVU/MVP-374
		Aadgoan, Taluka Kannad	26/09/16	640m	20°19'35"N 75°26'51"E	GVU/MVP-412
		Aaland, Taluka Phulambri	04/10/16	620m	20°12'02"N 75°33'29"E	GVU/MVP-450
		Hadas Pimpalgoan, Taluka Vaijapur	06/10/16	506m	19°55'45"N 74°57'08"E	GVU/MVP-498
		Karanjgoan, Taluka Vaijapur	06/10/16	510m	19°56'15"N 74°55'04"E	GVU/MVP-500
		Aadgoan, Taluka Kannad	08/10/16	650m	20°19'30"N 75°26'41"E	GVU/MVP-516
13	<i>Mangifera indica</i> L.	Puranwadi, Taluka Kannad	14/09/14	711m	20°22'00"N 75°11'28"E	GVU/MVP-141
		Hasta, Taluka kannad	23/10/16	733m	20°17'08"N 75°14'41"E	GVU/MVP-668
		Kasod, Tq.Sillod	06/11/19	635m	20°22'23"N 75°32'57"E	GVU/MVP-761
14	<i>Melia azedarach</i> L.	Chauka, Taluka Phulambri	04/10/16	728m	20°00'40"N 75°23'30"E	GVU/MVP-458
		Shelgaon, Taluka Kannad	08/10/16	646m	20°20'31"N 75°25'32"E	GVU/MVP-518
15	<i>Nyctanthes arbor-tristis</i> L.	Ajanta forest, Taluka Sillod	20/08/16	481m	20°33'7"N 75°42'2"E	GVU/MVP-265
16	<i>Peltophorum pterocarpum</i> (DC.) K.Heyne	Takli(A), Taluka Kannad	06/08/16	650m	20°24'32"N 75°22'34"E	GVU/MVP-240
		Palshi, Taluka Kannad	27/09/16	697m	20°18'30"N 75°17'14"E	GVU/MVP-427
		Bildha, Taluka Phulambri	04/10/16	671m	20°02'47"N 75°24'02"E	GVU/MVP-461
17	<i>Prosopis juliflora</i> (Sw.) DC.	Umapur, Taluka Gangapur	06/10/16	532m	19°53'58"N 75°07'35"E	GVU/MVP-489

		Dr.BAMU, Taluka Aurangabad	03/11/16	569m	19°53'53"N 75°18'38"E	GVU/MVP- 710
18	<i>Santalum album</i> L.	Ajanta forest, Taluka Sillod	30/10/16	568m	20°39'45"N 75°48'56"E	GVU/MVP- 689
19	<i>Senna siamea</i> (La m.) H.S.Irwin & Barneby	Dr.BAMU, Taluka Aurangabad	31/08/14	578m	19°54'50"N 75°18'44"E	GVU/MVP- 80
		Chincholi (li), Taluka Kannad	19/08/16	646m	20°22'55"N 75°22'20"E	GVU/MVP- 251
		Bhadji, Taluka Khultabad	08/09/16	717m	20°01'20"N 75°13'48"E	GVU/MVP- 359
		Gadhana, Taluka Khultabad	22/09/16	702m	20°02'23"N 75°15'33"E	GVU/MVP- 397
		Ajanta forest, Taluka Sillod	30/10/16	565m	20°32'49"N 75°42'14"E	GVU/MVP- 698
		Dr.BAMU, Taluka Aurangabad	03/11/16	574m	19°54'25"N 75°18'50"E	GVU/MVP- 702
20	<i>Terminalia bellirica</i> (Gaertn.)Roxb.	Bahulkheda, Tq. soygaon	09/11/19	331m	20°32'16"N 75°30'50"E	GVU/MVP- 781

* GVU/MVP-Gore Vijay Udhav/Mali Vasant Pandi

Table 2: Family wise distribution of *Flavodon flavus* Susceptible Hosts

Sr. No	Family	Susceptible Hosts
01	Anacardiaceae	<i>Mangifera indica</i> L.
02	Annonaceae	<i>Annona squamosa</i> L.
03	Burseraceae	<i>Boswellia serrata</i> Roxb. ex Colebr.
04	Combretaceae	<i>Terminalia bellirica</i> (Gaertn.)Roxb.