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Macro Fungal Diversity of *Agaricomycetes* from Amgaon Tahsil, Gondia District (M.S.) India

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ABSTRACT

The present study reports total 25 *Agaricomycetes* fungal taxa collected from Amgaon Tahsil which spread over 13 families and 18 genera. Taxa belonging to Geastraceae and Polyporaceae (5 species each) are dominantly distributed.

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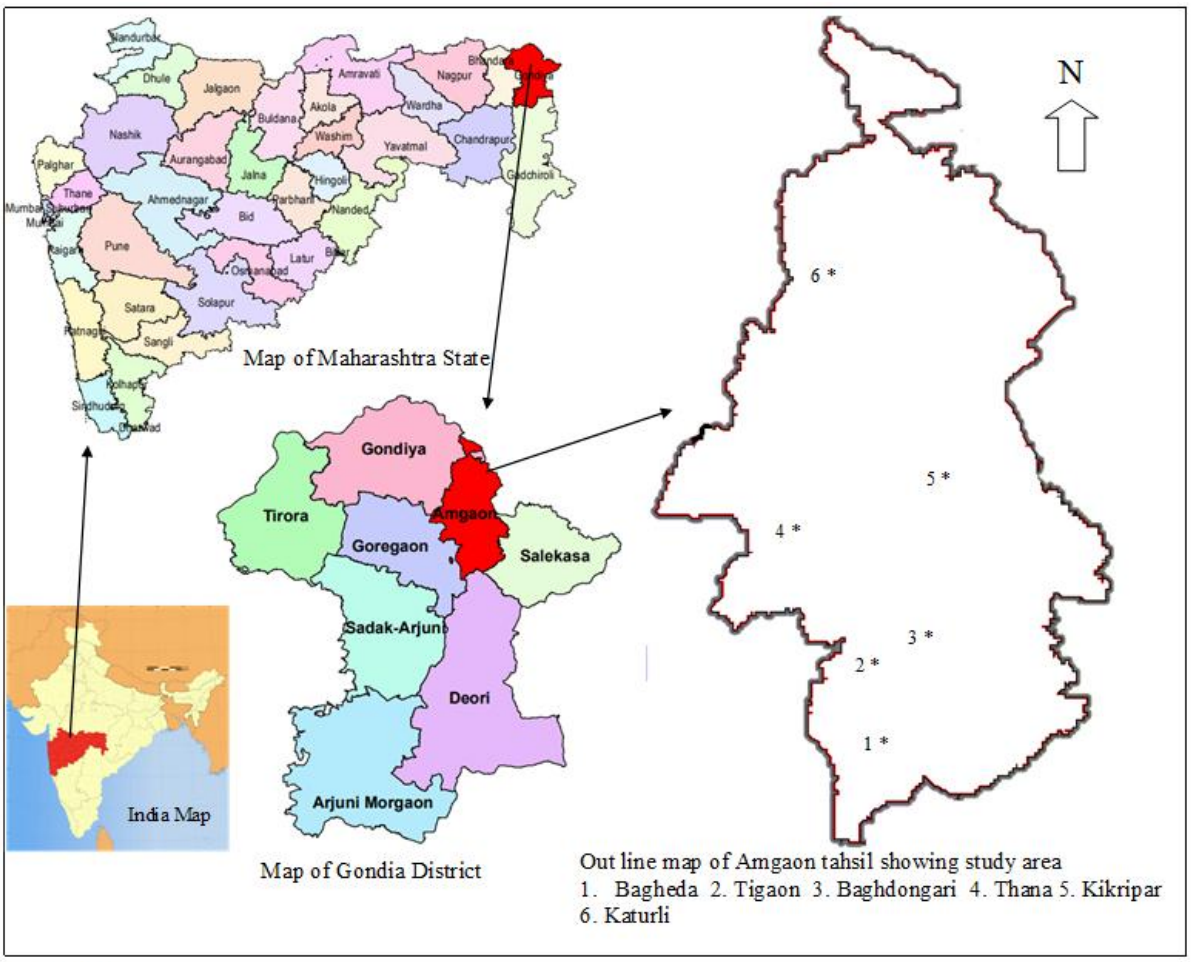
INTRODUCTION

Economically Agaricomycetes is one of the groups of Basidiomycota, it is characterized by the presence of clamp connection and formation of basidiospores in specialized basidium. On basidium, four basidiospores are formed at the tips of sterigmata. These include mushrooms, toadstools, puffballs, coralloid fungi, boletes, earthstars, and bird's nest etc. These fungi have the vital role in decomposing of organic matter in ecosystems [1-2].

Study area: Amgaon Tahsil is one of the eight Tahsil of Gondia district. The Amgaon Tahsil is bounded by Balaghat district of Madhya Pradesh on the north side and on West, South, and East by Gondia, Goregaon and Salekasa Tahsil of Gondia district respectively. The total area covered by Tahsil is 32112.21 Sq. Hectors. Out of which 6266.144 Sq. Hectors fall under forest area. Forest is the dry deciduous type. Rain falls during June to September. In the sense of mycological study, Gondia district is not studied. Recently, Mendhe and Khobragade (2017) reported macrofungal diversity for the same district. Most of the area is yet to be discovered [3]. The present research work aims to study fungal taxa belonging to Agaricomycetes fungi.

MATERIALS AND METHODS

A survey was undertaken at different localities of Amgaon Tahsil namely Baghdongari, Bagheda, Katurli, Kikripar, Thana and Tigaon (Map 1). Specimens were collected (During June 2016 – October 2017), dried, preserved and deposited at Department of Botany, Bhawabhuti Mahavidyalaya Amgaon. Agaricomycetes fungi were identified with help of documented and published literature [4-23].



Map 1: Study Area

RESULTS AND DISCUSSION

Total 25 specimens were identified as Agaricomycetes belonging to six orders, 13 families, and 18 genera. Distribution of no. of families, genera, and species per order are given **(Table 1)** and shown by the chart (**Fig 24**). Out of which eleven specimens were identified up to species level and rest of the specimens on the generic level. Dominantly distributed fungal species belonging to family Geastraceae and Polyporaceae (with 5 species each), Agaricaceae (4 species), Ganodermataceae (2 species), Auriculariaceae, Gloeophyllaceae, Hymenogastraceae, Marasmiaceae, Physalacriace, Schizophyllaceae, Steccherinaceae, Stereaceae and Strophariaceae (with single species each) **[Table 2 and Fig. 25].** Among these Agaricomycetes, fungal species only 5 species are known as edible (*Agaricus campestris*, *Coprinus comatus*, *Coprinus* sps, *Marasmius trichotus* and *Oudemansiella* sps). Out of 25 fungal species, 6, 7 and 12 species reported in the present study from the humid

soil, leaf litter and wood respectively (**Fig. 26)**. All these reported species enumerated as follows.

Enumeration of taxa

1. *Agaricus campestris* L. Ex. Fr.

Family: Agaricaceae

Locality: Thana

Accession No. : BMV 1965

Diagnostic characters: cap flattened whitish in color, smooth and fibrous. Gills long, pink. Stem white. Flesh is whitish and creamy. Spores ovulate, purple-brown. Odor is pleasant

2. *Auricularia* sps

Family: Auriculariaceae

Locality: Tigaon

Accession No. : BMV 1970

Diagnostic characters: Basidioma gelatinous, auriform, stipitate, resupinate, lobed, brownish color. Internal hyphae smooth to reticulate, hymenial surface cylindrical to clavate, basidiospores white to ochraceous. **[Fig. 1]**

3. *Chlorophyllum molybdites* (G. Mey. : Fr.) Massee.

Family: Agaricaceae

Locality- Bagheda

Accession No. : BMV 1975

Diagnostic characters: Pileus white with brown squamules, annulus double- crowned, spores green, broad-truncate, cheilocystidia clavate and very rare clamp connections. **[Fig. 2]**

4. *Coprinus* sps

Family: Agaricaeae

Locality: Kikripar

Accession No. : BMV 1957

Diagnostic characters: The presence of pavement cells (Brachybasidia), Basidiospores darkly pigmented, flesh fragile, smooth, Lamellae deliquescent to subdeliquescent, Pileus with folded margin. **[Fig. 3]**

5. *Coprinus comatus* (O. F. Mull.)Pers

Family: Agaricaceae

Locality: Bagheda

Accession No. : BMV 1956

Diagnostic characters: cap up to 8 cm wide, height above 12 cm. at maturity cap bell-shaped and early stage elongated, color white, stipe hollow and cylindrical and bottom widened, gills white to pink. Spores black-brown, taste mild. **[Fig. 4]**

6. *Ganoderma lucidum* (Curtis) P.Karst.

Family: Ganodermataceae

Locality: Thana

Accession No. : BMV 1964

Diagnostic characters: Cap up to 25-30 cm, fan-shaped, shiny. Redish color when mature, flesh brownish and soft when immature and hard at maturity. **[Fig. 5]**

7. *Ganoderma* sps

Family: Ganodermataceae

Locality: Baghdongari

Accession No. : BMV 1979

Diagnostic characters: cap up to 15 cm, irregularly knobbed, fan-shaped, shiny, dark red color, whitish patches linings on the periphery of the cap. Woody, cocky, thick, basidia short and clavate.; Spores ovulate, brown, truncate at apex. **[Fig. 6]**

8. *Geastrum striatum* DC.

Family: Geastraceae

Locality: Bagheda

Accession No. : BMV 1954

Diagnostic characters: Fruiting body greyish-brown, star-shaped 5 to 7 rays. Endocardial stalk with apophasis is collar-like or ringlike. Basidiomes unexpanded, hypogeous, encrusted with adhering debris, basidiome expanded, the whitish layer of crystalline material, peristome strongly and plicate. **[Fig. 7]**

9. *Geastrum* steps

Family: Geastraceae

Locality: Bagheda

Accession No. : BMV 1953

Diagnostic characters: Fruiting body splits into four segments, small up to 3.5 cm diameter at maturity, thick-walled, tapering towards tips, tips acute., Endometrium up to 10 mm, with purple color, stalk with 1-2 mm tall, Fruiting bodies found in groups. **[Fig. 8]**

10. *Gloeophyllum* P. Karst.

Family: Gleophyllaceae

Locality: Baghdongari

Accession No. : BMV 1962

Diagnostic characters: Basidiocarp sessile, solitary or imbricate, coriaceous to corky, margin acute, pileus yellowish to red-brown, hyphae clamped, hyaline to pale brown, few dark browns.

11. *Hebeloma* sps

Family: Hymenogastraceae

Locality: Baghdongari

Accession No. : BMV 1961

Diagnostic characters: Cap 2- 3 cm, convex, bell-shaped, sticky, reddish-brown, Gills attached to the stem, brown in color, Stem up to 4 cm, 2-3 mm thick attached with small basa bulb, whitish, flesh brownish in cap and whitish in the stem. **[Fig. 9]**

12. *Hypholoma* steps

Family: Strophariaceae

Locality: Tigaon

Accession No. : BMV 1971

Diagnostic characters: Cap white, 2-3 cm in diameter, concave at the center, surface smooth, thin-walled, hyaline, fruiting body with central stipe, Stem flexuous, deeply sulcate striate at the top, white and hollow inside, fungi grew in clusters and with the gregarious habit. **[Fig. 10]**

13. *Lepiota bettinae* Dorfelt, Z. Mykol.

Family: Geastraceae

Locality: Baghdongari

Accession No. : BMV 1973

Diagnostic characters: Pileus up to 1 cm, hemispherical, at maturity convex to plane, squamules reddish brown, margin smooth and fringed, lamellae free, white, stipe about 2 cm, cylindrical, hollow, flesh thin, basidia clavate. **[Fig. 11]**

14. *Lepiota* sps I

Family: Geastraceae

Locality: Tigaon

Accession No. : BMV 1972

Diagnostic characters: Fruiting body solitary, basidiomata large, reddish color, pileus convex, rounded, rough, with brownish patches, stipe rounded, hollow, bulbous, smaller than pileus. **[Fig. 12]**

15. *Lepiota* sps II

Family: Geastraceae

Locality: Baghdongari

Accession No. : BMV 1974

Diagnostic characters: Cap white to cream base color, at center reddish-brown scales, cap ranges from 1-5 cm, stipe smooth, pale white-tinged flesh color, Transient ring membranous and deciduous, flesh thin and white. **[Fig. 13]**

16. *Lenzites* sps

Family: Geastraceae

Locality: Bagheda

Accession No. : BMV 1976

Diagnostic characters: Cap up to 6-10 cm across, bracket-shaped, flattened convex, hairy, radially ridged, reddish brownish color, Gills reddish, sharp and tough, flesh extremely tough and corky. **[Fig. 14]**

17. *Marasmius trichotus* Corner, Beih.

Family: Marasmiaceae

Locality: Kikripar

Accession No. : BMV 1960

Diagnostic characters: Pileus up to 20 cm diam., broadly conical to convex, smooth with erect hairs, pale orange, Lamellae adnexed to adnate, narrow, non marginate, Stipe 10 to 85 mm long and up to 1 mm in dia., cylindrical, hollow, hispid, apex brown. Basidiospores ellipsoid, narrow, smooth, hyaline, thin-walled. **[Fig. 15]**

18. *Oudemansiella* sps

Family: Physalacriaceae

Locality- Baghdongari

Accession No. : BMV 1963

Diagnostic characters: Cap up to 8 cm across, convex, white, semi-translucent and slimy membrane, stem up to 100 mm tall and 10 mm wide, striate above a substantial membranous ring, flesh thin and white, Cystidia thin-walled, cylindrical. **[Fig. 16]**

19. *Polyporus mori* Mick Ex. Fr.

Family: Polyporaceae

Locality: Bagheda

Accession No. : BMV 1955

Diagnostic characters: Fruiting bodies about 2- 12 cm in diameter, kidney or fan-shaped, fruiting bodies have shot stem, Cap surface dry, orange-reddish color, context thin, tough and white, tubes elongated, pores large up to 2 mm wide, angular. **[Fig.17]**

20. *Polyporus versicolor* (L.) Fr.

Family: Polyporaceae

Locality: Thana

Accession No. : BMV 1966

Diagnostic characters: Cap surface has concentric zones of different colors. Flesh thick, leathery, rigid and hard, cap rust brown to darker brown, flat, up to 8 x 5 x 0.5- 1 cm, rounded with fine hairs. **[Fig. 18]**

21. *Polyporus* sps

Family: Polyporaceae

Locality: Katurli

Accession No. : BMV 1967

Diagnostic characters: Cap with central stipe, lacking half part of poleus, convex to infundibuliform, scaly, tomentous, white to brown, pulp compact, basidiopsores hyaline, smooth, cylindrical, slightly curved, thin walls. **[Fig. 19]**

***22. Pycnoporus cinnabarinus* (Jacq.) P. Karst.**

Family: Polyporaceae

Locality: Bagheda

Accession No. : BMV 1977

Diagnostic characters: Cap 4-15cm wide and up to 1.5 cm thick, sessile, corky, slightly mementoes to globose, deep- red and orange color. Pore Surface, orange-red, fading less than the cap surface, pore 2-4 per mm specimens retain red and orange color for a long time, typically found near moist places. **[Fig. 20]**

23. *Schizophyllum commune* Fries

Family: Schizophyllaceae

Locality: Kikripar

Accession No. : BMV 1959

Diagnostic characters: Cap up to 1-4.5 cm wide**,** Pileus fan-shaped, thin, dry horizontally attached to the matrix, margin lobed, cottony, whitish, deeply split at the margin.Gills produce basidiospore on the surface. **[Fig. 21]**

24. *Steccherinum* Gray.

Family: Steccherinaceae

Locality- Baghdongari

Accession No. : BMV 1978

Diagnostic characters: Cap Orange yellow or ochre-colored, caps up to 0.3-4.5cm wide and 0.3-1.5 cm long.Margin whitish, hairy, crustlike, resupinate.Ochre-colored spine up to 1.5 mm. **[Fig. 22]**

25. *Stereum* Hill ex Pers.

Family: Stereaceae

Locality: Kikripar

Accession No. : BMV 1958

Diagnostic characters: Fruiting body up to 3 cm long, fan-shaped, irregular, light yellow to brown color, under surface smooth, yellowish to brown, flesh tough. **[Fig. 23]**

PHOTOGRAPHS

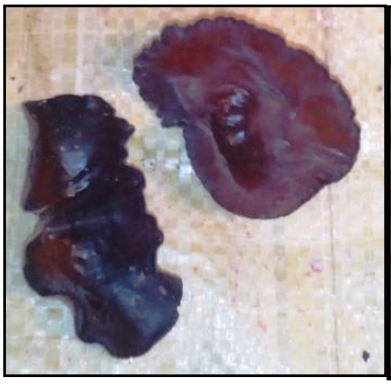


Fig. 1 *Auricularia* Bull.ex Juss

Fig. 2 *Chlorophyllum molybdites*

Fig. 3 *Coprinus* sps

Fig. 4 *Coprinus comatus*

Fig. 5 *Ganoderma lucidum*

Fig. 6 *Ganoderma* sps

Fig. 7 *Geastrum striatum*

Fig. 8 *Geastrum* sps

Fig. 9 *Hebeloma* sps

Fig. 10 *Hypholoma* sps

Fig. 11 *Lepiota bettinae*

Fig. 12 *Lepiota* sps I

Fig. 13 *Lepiota* sps II

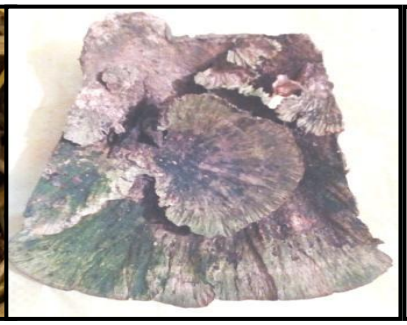


Fig. 14 *Lenzites* sps

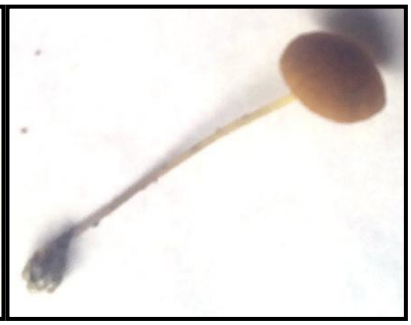


Fig. 15 *Marasmius trichotus*

Fig. 16 *Oudemansiella* sps

Fig. 17 *Polyporus mori*

Fig. 18 *Polyporus versicolor*

Fig. 19 *Polyporus* sps

Fig. 20 *Pycnoporus cinnabarinus*

Fig. 21 *Schizophyllum commune*

Fig. 22 *Steccherinum* sps

Fig. 23 *Stereum* sps

Table 1: Distribution of fungal taxa

Sr. No.	Order	No. of families	Genus	No. of species
1	Agaricales	6	8	9
2	Auriculariales	1	1	1
3	Geastrales	1	2	5
4	Gloeophyllales	1	1	1
5	Polyporales	3	5	8
6	Russulales	1	1	1
Total	6	13	18	25

Table 2: Family wise distribution of fungal species

Sr. No	**Family**	**No. of Species**	**Sr. No**	**Family**	**No. of Species**
1	*Geastraceae*	5	8	*Marasmiaceae*	1
2	*Polyporaceae*	5	9	*Physalacriaceae*	1
3	*Agaricaceae*	4	10	*Schizophyllaceae*	1
4	*Ganodermataceae*	2	11	*Steccherinaceae*	1
5	*Auriculariaceae*	1	12	*Stereaceae*	1
6	*Gloeophyllaceae*	1	13	*Strophariaceae*	1
7	*Hymenogastraceae*	1			

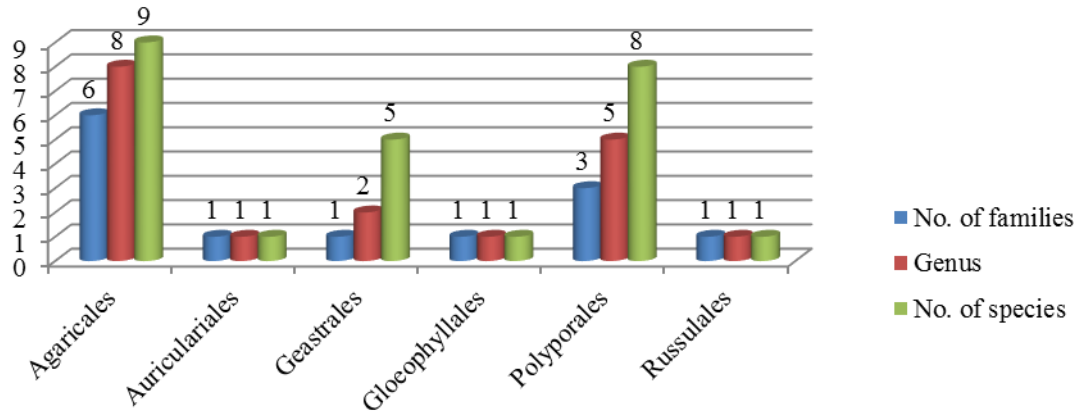


Fig. 24 Distribution of Families, Genus & No. of species

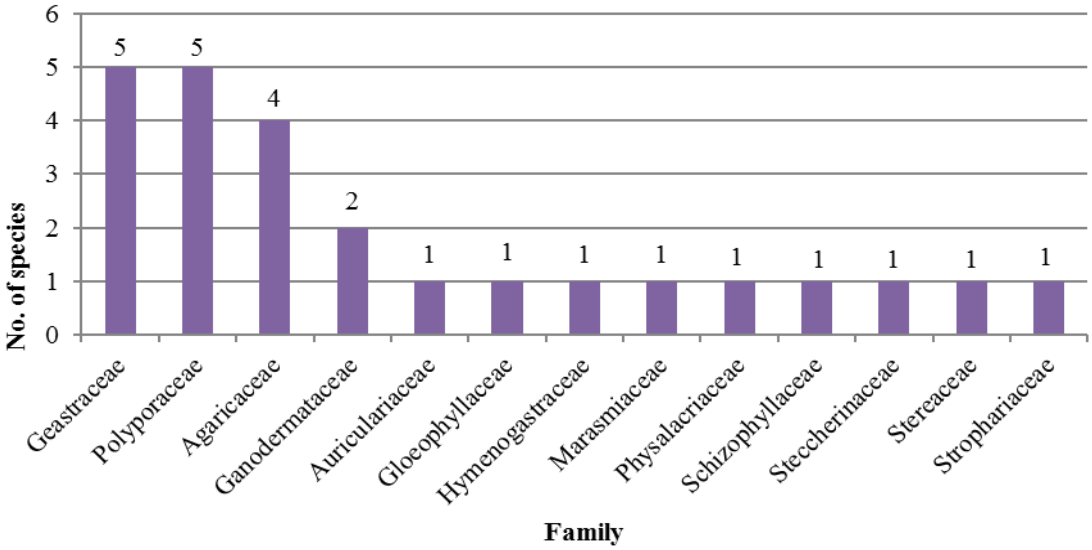


Fig. 25 Distribution of fungal species per family

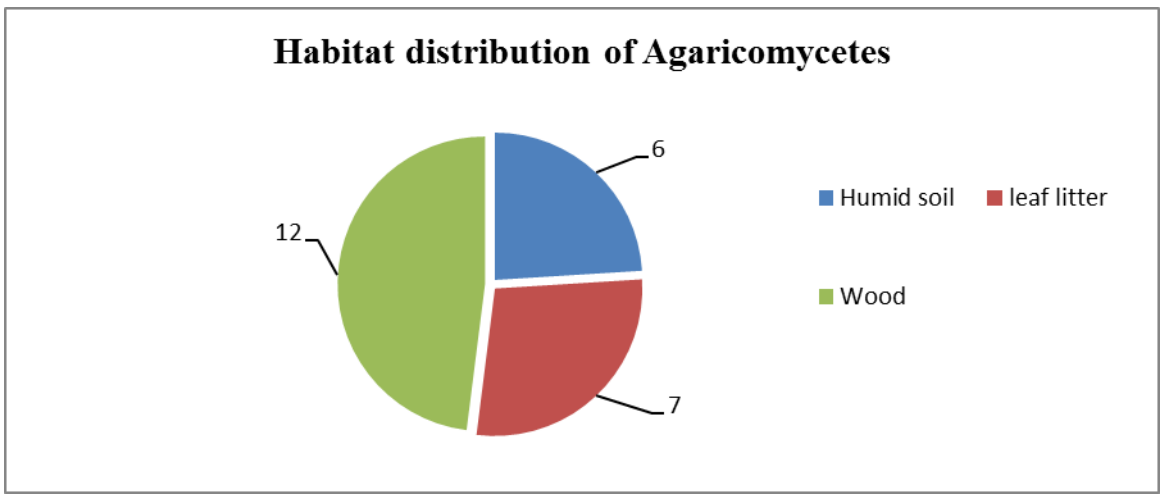


Fig. 26 Habitat wise distribution of no. of fungal species

CONCLUSION

The study area has rich fungal diversity and it has much scope for scientific communities for further study.

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CONFLICT OF INTEREST

We have no conflict of interest to declare.

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