RESEARCH ARTICLE

Studies of the fungi *Lenzites acuta* Berk. from Western Maharashtra, India

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ABSTRACT

Wood rotting fungi are an important component of forest ecosystems. Especially white rote fungi belong to the order basidomycetes that participates in the biodegradation of lignin in nature, which is essential for global carbon recycling. In present paper an attempt was made to isolate the wood rotting fungi from different host plants from the forest of Western Maharashtra, India. Out of sixty five samples examined the white rot fungi, *Lenzite sacuta* Berk. of genus Lenzites Fr. were isolated for further studies. The morphological, macro chemical and cultural features of the species are described in this paper.

Keywords: Wood rotting fungi, Western Maharashtra, morphological and cultural features, *Lenzites*

INTRODUCTION

The genus Lenzites Fr. was first described by Fries in 1835 with *Lenzites betulina*(Fr.) as type species. It is important wood rotting fungi, acosmopolitan genus, causing white rot. The study of wood rotting fungi is fundamental to understand the fungal diversity in forests.Wood rotting fungi are those fungi that have the ability to decompose wood causing rot. A good number of these fungi produce large and conspicuous fruiting bodies. They comprise 10% of total fungal diversity, of which 16-41% have been described to date (Rossman 1994, Muller et al., 2007). Polyporoid and corticoid fungi are some of the most common and important wood inhabiting fungi in forest. These species account for the majority of the fruiting bodies found on wood debris (de Vries 1990). Some fungi attack living trees, otherinvades dead or felled timber and slash on the forest floor.

Wood decaying basidiomycetescolonize and degrade wood using enzymatic and mechanical processes (Lyngdoh and Dkhar, 2014). Brown rot fungi preferentially attack and rapidly depolymerize structural carbohydrates (celluloses and hemicelluloses) in the cell wall leaving the modified lignin behind. White rot fungi can progressively utilize all major cell wall components, including both carbohydrates and lignin (Jasalavich et al., 2000).

Wood rotting fungi are an important component of forest ecosystem (Wang, et al., 2011). In the last decade these fungi emerged as an important component of forest ecosystem due to their decomposition role in the recycling of wood and wood debris, and attracted the attention of research community towards their potential application in pollutant purification, soil remediation and antibiotic production. Hence our current study is focused on isolation of such wood rotting fungi from the forest of Western Maharashtra, India.

MATERIAL AND MATERIALS

For present study, specimens (fruiting bodied) of Lenziteswhere collected from different sites of the Western Ghats and Satpura ranges, in the state of Maharashtra. The specimens where conveniently collected in the paper bags, noting the host, locality, colour of the material and date of the collection as suggested by Gilbertson and Ryvarden(1986).From the collection few specimens were used for spore prints, sporocarp culture and a few for macro and micro morphological characters of the basidiocarp. Micro structure has been studied from the sections of fruiting body. Martin's (1934) staining method was used. Lactoglycerin with 1% cotton blue were used for semi permanent slides, which were sealed with a nail polish (Beneke, 1958). Melzers reagent (IKI) prepared as per the method of Singer (1982) was used for testing the amyloidity and dextrinoidity.

Sporocarp culture was obtained by aseptically transferring a piece of fruiting bodies into to the sterile 2% Malt Extract Agar (MEA) Medium containing 10 ppm Novobiocin and incubated at 25^0c for 4-6 weeks in B.O.D. Isolates were sub cultured and transferred to the fresh slant for every fortnight. The pure cultures were obtained and stored on 2% MEA slant. Culture characteristics of the specimens were described using the terminology of Rayner (1975) and Stalpers (1978), on the basis of characters such as chemical tests for detection of enzymes; growth rate; characteristics of mat; other macroscopic characters; hyphal characters; propagative structures etc. The species were identified with their species code on the basis of a key proposed by Stalpers (1978).

The type of rot was identified by spraying 1% benzidine solution in 90% ethanol (Hintikka and Laine, 1970), on decaying wood sample. Oxidase reactions in culters were determined by growing fungi on malt agar medium containing Gallic acid and Tannic acid separately (Gilbertson and Ryvarden, 1986).

RESULTS AND DISCUSSION

For the present study the Specimens collected from different sites were critically examined with respect to their external and internal Morphological characters of basidiocarp, cultural charecters and macro chemical tests. The observations of the study are as discussed as follows,

***Lenzites acuta* Berk.** Journ. Bot. 1: 146, 1842.(Plate No.4.1.5,4.1.7 and 4.2.3; Fig. No.7)

1. Morphological Characters.

FRUITBODY annual to perennial, broadly attached, dimidiate with a contracted base, in some cases almost stipitate, semicircular to flabelliform, single or imbricate brown to gray, hard, woody to corky coriaceous when fresh, flexible when dry; strongly attached 13-15 cm

long x 9-10 cm broad x 1-1.5 cm thick at the base; PILEUS semicircular more or less angulate, dimidiate, flat, upper surface usually whitish, uneven, finely velutinate concentrically zonate, slightly sulcate, distinctly radially wrinkled, dotted warty, fine nodulate, nodules usually scattered near the base more rough than the margin with asperulate of agglutinated hyphae, zones of cream to brown and grey colour alternating with each other first white, cream, pale ochraceous to clay or tan coloured, then leather or dirty brownish coloured; MARGIN sharp, wavy, sometime folded bent downwards. PORE SURFACE flat to oblique orange buff, yellowish creamy to brown coloured, mostly with a yellowish tint, this colour seems to persist even when the upper surface has become white and dirty grey, pore surface extremely variable in some specimens poroid 2-4 mm wide, mostly angular mixed with daedaloid to sinuous lamellae up to 3.5 mm wide, in other specimen purely lamellate 3.5 mm wide, 10-11 lamellae per cm, lamellae straight or wavy especially towards the base where they are deeper tubes of lamellae up to 7-9 mm deep; CONTEXT white cream to yellowish coloured, 3-5 mm thick.

HYPHAL SYSTEM trimitic; Generative hypahe hyaline, thin walled, with clamps, 1.5-3.0 µm in diameter; Skeletal hypahe, straight thick walled to solid upto 5-7 µm in diameter; Binding hyphae hyaline thick walled solid highly branched, sword like, long side branches up to 4.5-5.5 µm in diameter; CYSTIDIA absent but thick-walled skeletal hyphae project into the hymenium; HYPHAL PEGS present conical to cylindrical; BASIDIAclavate 4 sterigmata 14.7-16.4 x 5.8-6.4 µm BASIDIOSPORES hyaline cylindrical, smooth, thin walled and non-amyloid 6-9 x 2-3 µm (L/B 3).

SPECIMEN EXAMINED Benzidine test positive, white rot on dead wood. Two specimens collected from Karnala RPO-128 on Mangiferaindica L and RPO-40 Garugapinnata one specimen RPO-07 from Toranmal on Pongamiaglabra.

Fig.-1 Pileus and Hymenial surface of *lenzites acuta*

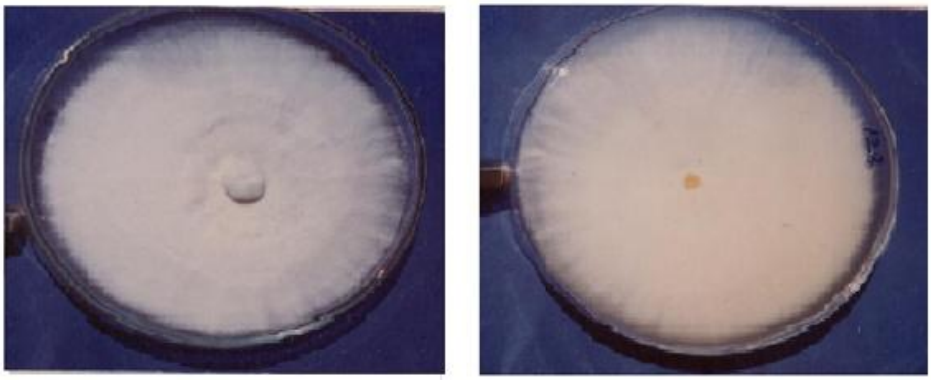

Fig.-2 Upper and Lower surface of the culture of *lenzites acuta*

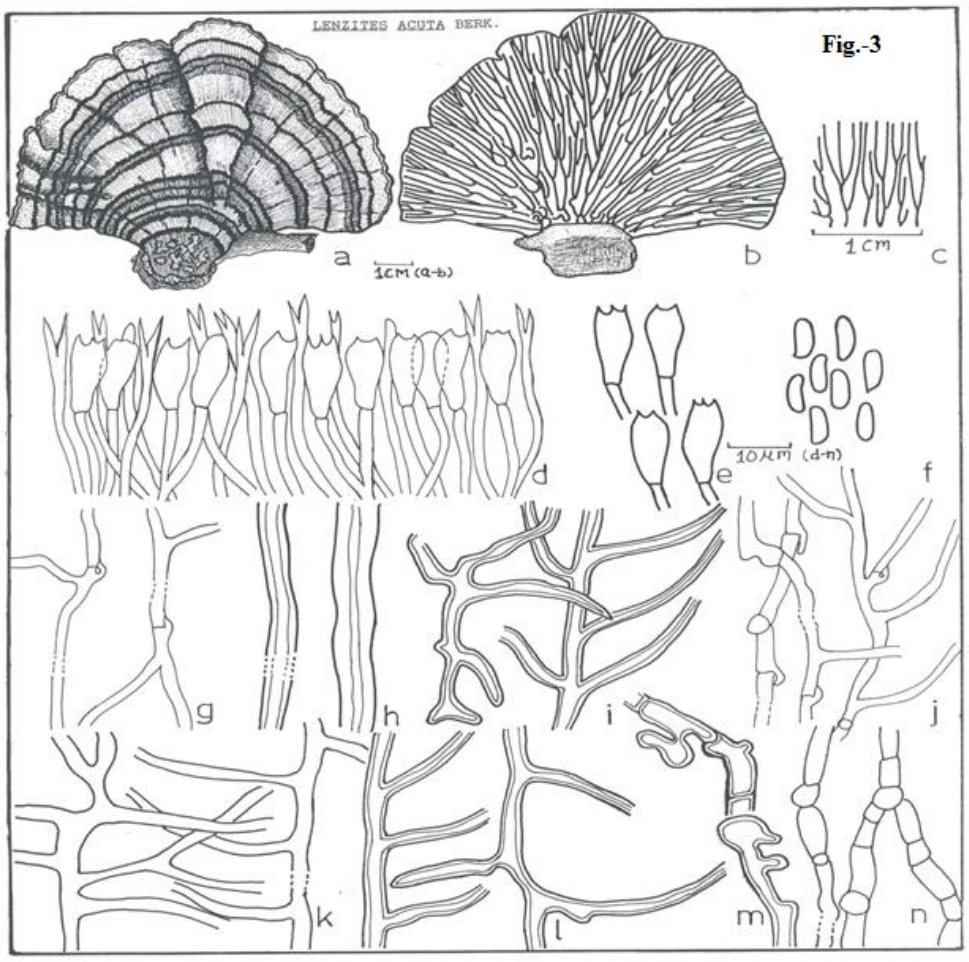

Fig.- 3 Lenzitesacuta
e. Upper surface **b**. Lower surface**c.** Nature and number of pores per cm.
d. Hymenium Basidia **f**. Basidiospores**g.** Generative hyphae **h.** Skeletal hyphae
i. Binding hyphae **j.** Generative hyphae in culture. **k**. Aerial hyphae in culture
l. Submerged hyphae in culture; **m.** Interlockinghyphae inculture;
n. Swellings (in culture)

2. CULTURE CHARACTERS

GROWTH CHARACTERS Growth rapid 45-50 mm in two weeks; Advancing zone white even apprised to raised; Mat pure milky white, silky, cottony to wooly, velvety on upper surface mat zonatehyphal growth radial margin circular equal, hyphal growth distinctly radial; Reverse bleached to creamy to yellowish coloured, fruitbody formation occurs after three weeks, odour none. Tests for extracellular oxidase are strongly positive on Gallic acid and Tannic acid agars diffusion zones strongfor α–napthol, Guaicol, Syringaldazine, P-cresol reactions strong.

HYPHAL CHARACTERS Advancing zone hyphae hyaline thin walled, branched, septate with clamps 1.5-2.5 µm in diameter; Aerial hyphae hyaline thinwalled branched 2.5-4 µm in diameter, submerged hyphae hyaline, thick walled to semisolid, branched 3.7-5 µm in diameter, some are irregularly swollen with intercalary and terminal swellings up to 5.5 µm.

SPECIES CODE:1,2,6,7,12,13,14,15,20,21,22,25,26, (29),30,37,(38),39,45,(47),52,53,64,75,89.

CONCLUSION

The observations of the present study reveals that the species of the Polyporaceae family are more common wood inhabiting fungi than the other families in the forest.As white rot fungi *lenzitesacuta* can be used for degrading lignin and wide range of environmental pollutants, so it can be used for bioremediation. Further study should be undertaken to prove its efficiency as biological delignification agent in commercial industries.

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