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Deciphering the Morphotaxonomy of Poroid Fungi: A Study on Microporous, Hexagonia, Schezophyllum, and Lenzite

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Abstract:

Exploring Taxonomy and Morphological Characteristics in Microporous, Hexagonia, Lenzite, and Schezophyllum: A Comprehensive Study of Poroid Fungi"This comprehensive study delves into the taxonomy and morphological intricacies of Microporous, Hexagonia, Lenzite, and Schezophyllum, collectively examining their classification within the fascinating realm of poroid fungi. Employing advanced taxonomic methodologies and detailed morphological analyses, we unravel the intricate characteristics that define these fungi species. Our research aims to contribute to a deeper understanding of their ecological roles, evolutionary relationships, and potential applications. Through meticulous investigation, this study provides a valuable resource for mycologists, ecologists, and researchers interested in the diverse world of poroid fungi.

Introduction:

Fungi play a pivotal role in the forest ecosystem, exhibiting diverse impacts, both positive and negative. Various fungi species thrive in diverse climatic conditions (Bilgrami et al., 1991) and constitute the second-largest group of terrestrial organisms, found in allecosystems worldwide**.**

Classifying biodiversity is crucial as it provides essential insights into the variety of life forms, their interrelationships, and their roles in ecosystems. This knowledge is vital for effective management and conservation of our biological heritage. Autotrophic producers, especially woody plants, foster high diversity across trophic levels and specializations, supporting a myriad of consumers and decomposers.

Decaying wood stands out as a distinctive terrestrial habitat where Animalia, Plantae, Fungi, Protista, and Prokaryota coexist and interact (Schigel, 2009). Wood-decay fungi play a pivotal role in indigenous forests by decomposing fallen wood as well as the heartwood and sapwood of living trees. Fungi, equipped with efficient enzymes for cellulose and lignin degradation, are the primary agents responsible for wood decay. Various fungi utilize different constituents for their metabolism, highlighting the broad spectrum of fungal diversity involved in this process.

Wood, as a food source, is accessible only to fungi capable of breaking down its components. This intricate relationship underscores the significance of fungi, as outlined by Seidl (2009), in the natural decay processes within forests. Understanding and appreciating the role of theseorganisms are paramount for sustainable ecosystem management and the preservation of biodiversity.

Material and method:

Basidiocarps were individually collected and sealed in polythene bags. Thin sections from different parts of each basidiocarp were sliced, stained with cotton blue,congorent red and mounted in lactophenol. Microscopic observations were conducted at 40× magnifications.

Results AndDiscussion:-

***Hexagoniatinius*:**

Basidiocarps solitary, sessile, dimidiate with a narrow base, applanate to flabelliform, slightly concave, measuring 4.0–12.0 × 3.0–8.0 × 0.2–0.3 cm, exhibiting a corky-coriaceous texture. The upper surface varies from pale brown to dark brown, some displaying a greyish-black color at the center. The surface is uneven, showing concentric striations to zonation. The margin is entire and thin, while the hymenial surface appears greyish, with hexagonal pores numbering 10–12 per cm.

Hyphal system: Trimitic. Generative hyphae: Hyaline, thin-walled, branched, clamped, 1.5–3.0 µm wide. Skeletal hyphae: Subhyaline to yellowish-brown, straight or flexuous, thick-walled to solid, occasionally septate towards the apex, 3.0–6.0 µm wide. Binding hyphae: Hyaline to subhyaline, thick-walled to solid, highly branched, mostly short and coralloid, some freely branched but short and flexuous, 1.5–3.2 µm wide. Reddish-brown, thin-walled to slightly thick-walled cuticular cells with irregular projections in the crustose area at the base of the pileus surface. Basidia: Narrow clavate, 4-sterigmate, 15.0–22.0 × 8.0–10.0 µm. Subhyaline to pale-brown cystidioid hyphae formed at apical ends of skeletal hyphae, more common in sterile pore

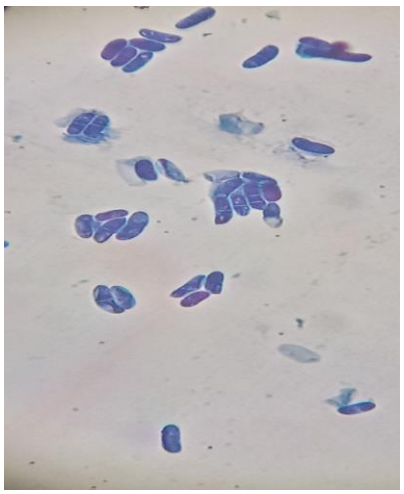
mouths. Basidiospores: Hyaline, thin-walled, cylindrical, 10.0–15.0 × 4.0–6.0 µm.

Hexagonia tinius

(A)Basidiocarp

(B) Upper Surface

(C) Lower Surface,



(D) Basidiospores

Lenzitebetulina:

1. Morphological Characters.

Fruitbody: Annual to perennial, broadly attached, dimidiate with a contracted base, sometimes 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 color alternating with each other first white, cream, pale ochraceous to clay or tan-colored, then leather or dirty brownish colored; Margin sharp, wavy, sometimes folded bent downwards.

Pore Surface: Flat to oblique, orange-buff, yellowish-creamy to brown-colored, mostly with a yellowish tint, this color 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 specimens 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-colored, 3-5 mm thick.Hyphal System: Trimitic; Generative hyphae hyaline, thin-walled, with clamps, 1.5-3.0 µm in diameter; Skeletal hyphae straight, thick-walled to solid, up to 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.

Basidiospores: Hyaline, cylindrical, smooth, thin-walled, and non-amyloid, 6-9 x 2-3 µm.

Lenzite betulina:


(A) Basidiocarp


(B) Pore surface


(C) Basidiospore

***Schezophyllum commune*:**

The fruiting body on finger millet straw was 1-4 cm wide, fan-shaped, and laterally attached to the substratum. Its upper surface was covered with small white hairs, while the under surface consisted of gill-like folds, split down the center, with a shallow groove, giving it the classification of polypores. The fungus, resembling the split gill fungus of the genus Schizophyllum, exhibited longitudinally split gills (lamellae) on the lower side. Close inspection revealed distinctively "split" or "doubled" folds on the under surface, characteristic of the split gill fungus found on decaying wood.

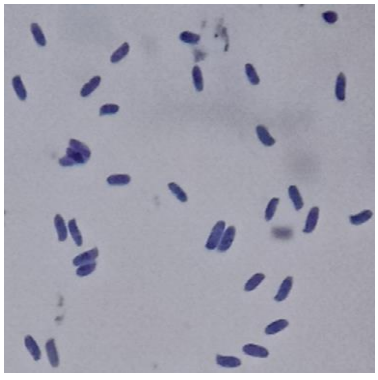
The cap, shell-shaped and often wavy with lobes, resembled a stem, concentrating tissue at the point of attachment. collected from decaying wood, contained generative hyphae with septae and clamp connections. Skeletal hyphae were centrally swollen and broad, while binding hyphae were comparatively thick-walled and branched. Basidiocarps confirmed the presence of skeletal and binding hyphae.

Microscopic examination of the isolate on a slide culture revealed hyaline, septate hyphae with clamp connections, and spicules indicative of a basidiomycete. The elliptical and smooth spores, measuring 4 x 2µ, were observed, and the spore print exhibited a white color. Notably, cystidia was found to be absent in the examined specimen.

Schezophyllum commune:


(A) Basidiocarp


(A) Basidiocarp


(A) Basidiocarp

***Microporous xanthopus*:**

Basidiomata: Annual, centrally to eccentrically stipitate. Pileus circular to dimidiate in young specimens, glabrous and shiny when fresh, hard on dry species, up to 5.4 cm in diameter, 3 mm thick in the center, untomentose; margin acute, slightly wavy; pileus upper surface shiny with numerous distinct to indistinct concentric zones, ranging from yellow to brown to deep reddish-brown.

Pore Surface: White to cream, pores circular, very small, barely visible to the naked eye, 1-2 pores per mm. Pore tube yellowish-brown, up to 1 mm long. Context up to 1 mm thick.

Stipe: Cylindrical, finely velutinate to deep reddish-brown, up to 2.4 cm long, 5 mm in diameter.

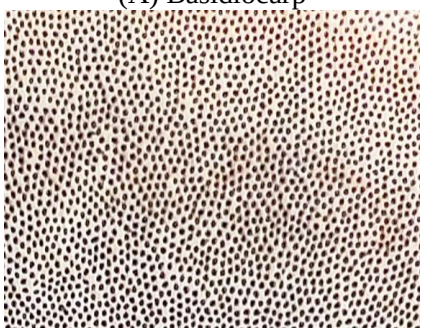
Hyphal System: Trimitic, generative hyphae with clamps, 3-4 µm in diameter, challenging to observe in dried specimens, hyaline and richly branched. Thick-walled clamped hyphae present in aerial specimens. Cystidia or other sterile hymenial elements absent.

Basidiospores: Allantoid to elliptical, smooth, thin-walled, non-amyloid in Melzer's reagent.

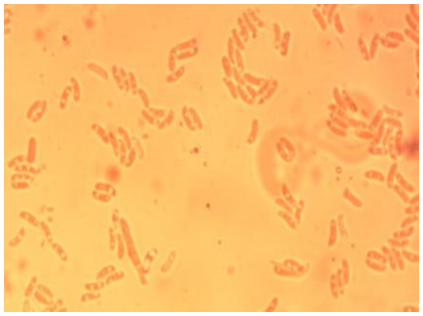
Microporous xanthopus:

(A) Basidiocarp

(B) Stipe



(C) Pore surface



(C) Pore surface

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