Available online at http://www.ijims.com
ISSN: 2348 – 0343

Studies on Ear Fungus-Auricularia from the Woodland of Nameri National Park, Sonitpur District, Assam.

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Abstract

Auricularia is the genus of the order Auriculariales with more than 10 species. It is also called ear fungus due to its morphological similarities with human ear and has considerable mythological importance. Auricularia auricula is the type species of the order Auriculariales. Different species of Auricularia are edible and some have medicinal importance and still investigations are going on other species to find out their medicinal properties. Extensive woodland of Nameri National Park provides ideal condition for the growth of different species of Auricularia. In this context the present study has been undertaken to study the taxonomy and diversity of different species of Auricularia and bring together information of its ethenomycological uses. As a result of field and laboratory study four different species of Auricularia were collected of which 3 species were identified and one species remain unidentified.

Key Words: Auricularia, Taxonomy, Diversity, Nameri National Park.

Introduction

Auricularia belongs to the order Auriculariales is the largest genus of jelly fungi. They are among the most common and widely distributed members of macrofungi, which generally occurs as saprophytes on wood, logs, branch and twigs causing severe degrees of white rotting of forest trees. However some species are found on the trunks of living trees as parasites[1]. They shows great variation of fruit bodies in size, shape, colour and texture .The fruitbody of different species are edible and highly priced in different parts of the globe. The fleshy basidiocarp is gelatinous, elastic, smooth, translucent, velvety and veined. When water become deficient, the basidiocarp dries up and become horny; on wetting, it quickly regains its shape and within few hours starts discharging basidiospores[2].

Auricularia auricula the type species of the genus Auricularia was first mentioned in the scientific literature as Tremella auricula by Linnaeus in 1753 in his book Species Plantarum. It is a common fungus in damp environment and is found throughout the year, but is most common in autumn[3].

Auricularia auricula-judae has been used as fork medicinal fungus and is used in the treatment of different diseases throughout the globe. It is used as a poultice to treat inflammations of the eye[4].Experiments in the 1980s concluded that two glucans isolated from this species showed potent antitumor properties when used on mice artificially implanted with Sarcoma 180 tumours[5].

Myth and legend have connected this species with Judas Iscariot, who is supposed to have hanged himself upon an elder (Sambucus) tree, after betraying Jesus Christ to the Pharisees [6].It is said that in consequence this tree, which became known as the Judas tree, frequently bears growth which strongly resembles a human ear; this became known as Juda's ear, becoming changed through time to Jew's ear[7].

Material and method

Nameri National Park is located in the foothills of Eastern Himalaya in the Sonitpur district of Assam about 35 km from north of Tezpur. It is one of the richest floristic areas located in between 27°00'36" N latitude and 92°47'24" E longitude with wide range of ecosystem and species diversity. Nameri share its northern boundary with the Pakui Wildlife Sanctuary of Arunachal Pradesh. Nameri National Park and Pakui Wildlife Sanctuary together constitute an area of about 1000 km square.

For the study of diversity of Auricularia regular survey was conducted in between 2012 to 2013, in the different regions of the park. During the study visually conspicuous fruiting bodies of Auricularia were photographed, collected in plastic bags and brought for laboratory works. The collecting materials were soon preserved in a liquid preservative of 2% formalin. Prior to the collection various ecological parameters were considered. In the laboratory detail macromorphological and micromorphological investigation was carried out. Spot test reactions were also carried out by applying 10% KOH solutions on the surface of the fungus to observe the possible colour changes during the test. The data obtain from the study were compared with available literatures and references to identify the different species.

Ethnobotanical information was gathered by asking open ended questionnaire to the different tribal community people as well as to the herbalist living in and around the park.

Results

As a result of study 4 species of Auricularia were recorded from different natural habitat of the area. Out of the 4 species 3 are identified as Auricularia auricula, Auricularia auricula-judae, Auricularia polytricha, and one species remain unidentified. The collected Auricularia species are discussed below -

1. Auricularia auricula (Hooker) Underwood.

Common name: Jew's ear

Substrata: Decaying Bambusa sp.

Habit: Saprophytic

The fruiting body is wavy and irregular, slightly gelatinous with ear-shaped; 7-9 cm; stipe absent; solitary; some parts are transparent; attached by its lateral portion of the body (Fig 1). The fertile lower surface is gelatinous, hairless, and brown to dark tan, ribbed or veined. The upper sterile surface is silky, veined, irregular, pinkish brown and rubbery. Numerous minute brown coloured hairs are distributed throughout the upper surface minutely hairy. The colour of the cup becomes darker with age. It was attached to the substrata by the back surface of the cup.KOH negative on entire surfaces. Spores elongated 12-16µm; colourless; hyphae colourless and septate.

2. Auricularia auricula-judae (Bull.) J.Schrot.

Common name: Jelly ear

Substrata: Decaying branches of unknown tree

Habit: Saprophytic

The fruit body of Auricularia auricula-judae is about 5 to 8 cm; cup shaped; gelatinous, elastic and attached to the substrata by the back surface of the cup (Fig 2). The outer surface is bright reddish to purple colour; lower surface is smooth and lighter in colour than the upper surface with irregular vein and wrinkles. The fruiting bodies occurred in groups; attached laterally to the substratum. The species has a tough, gelatinous, elastic texture when fresh, but it dries hard and brittle[8]. Spores are long, sausage shaped, 10-14 µm, hyaline. Basidia cylindrical, colourless and septate.KOH negative on all surface.

It is edible and the nutritional content of 100 gm of dried fungus of Auricularia auricula-judae includes 293 kcal, 10.6 g of protein, 0.2 g of fat, 65 g of carbohydrate, 375 mg of calcium, 185 mg of iron and 201 mg of phosphorous[9,10] .Dried specimens may be ground up into a powder and used to absorb excess liquid in soups and stews, as it rehydrates into tiny fragments[11].

3. Auricularia polytricha (Mont.) Sacc.

Common name: Cloud ear fungus

Substrata: Delonix regia

Habit: Saprophytic and parasitic

The fruit body of Auricularia polytricha is about 6 to 8 cm; fan shaped, smooth, curved, gelatinous, elastic; loosely attached laterally; occurs in group; upper surface dark brown in colour; lower surface darker in colour; stipe absent (Fig 3).Hymenium smooth; basidiospores hyaline, 8-10µm,septate; Basidia cylindrical, hyaline, 2-3septate; hyphae smooth, hyaline, septate. KOH negative on the entire surface.

It may be effective in reducing LDL cholesterol and aortic atherosclerotic plaque, as demonstrated in a study on rabbits[12] .

4. Auricularia sp.

Common name: Unknown

Substrata: Albizzia procera

Habit: Saprophytic and parasitic

The fruit body is 5-8 cm; cup or ear shaped, smooth, papery, curved, and non-gelatinous; stipe absent, occur singly; attached to the substratum by its backside (Fig 4). Lower surface is veined. Upper surface light brown in colour whereas the lower surface is yellowish in colour. Basidiospore hyaline, smooth, septate, reniform and 10-12µm.Basidia hyaline, elongated and 3-4 septate; sterigmata12 × 6µm.KOH black on all surfaces.

Discussion

Nameri National Park with extensive woodland, adequate rain, dampness and suitable temperature provides ideal eco-climatic condition for the luxurious growth of different species of Auricularia. The work facilitates in understanding species composition of Auricularia along with its habitat specificity from the region. Auricularia auricula-judae was the most diverse and widely distributed species and was reported from several timber yielding plants of the park including Albizzia lucida, Bombax ceiba, Morus roxburghii and Trewia nudiflora. Except Auricularia polytricha all the species are distributed throughout the year. They are more common in spring and summer then the monsoon season. Auricularia auricula-judae showed great variation in colour changes of their fruiting bodies. In summer season their colour is darker then the winter season. Auricularia polytricha seems to cause white rotting of different forest trees such as Delonix regia, Albizzia procera and Sapium baccatum. Auricularia auricula-judae was found to use by the ethnic Bodo and Kachari communities inhibiting in the buffer region of the park. The older women's general collects it after taking proper precaution and added it to their diet list. They use it in soups along with other ingredients as well as in salads. Since these people collect and eat only well identified species of it, no poisoning effects were recorded from the area. They generally use it in the treatment of eye irritation and cold. They also use it as tonic along with ginger and basil leaves in sore throat after proper sterilization by moist stream for several hours. Local herbalist prefers it to use along with hot water in the treatment of jaundice.

Acknowledgement

The author is thankful to the Principal of Nowgong College, Nagaon for providing laboratory facilities to work for the study.

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Figures

Fig 1: Auricularia auricula

Fig 2: Auricularia auricula-judae

Fig 3: Auricularia polytricha

Fig 4: Auricularia sp.