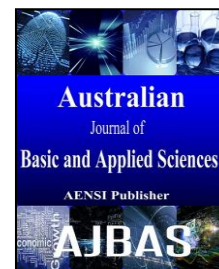




AUSTRALIAN JOURNAL OF BASIC AND APPLIED SCIENCES

ISSN:1991-8178 EISSN: 2309-8414
Journal home page: www.ajbasweb.com



Study Of Jelly Mushroom - *Tremella Fuciformis* In 24- Parganas (N), West Bengal, India

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ARTICLE INFO

Article history:

Received 28 May 2016

Accepted 29 July 2016

Published 17 August 2016

Keywords:

Jelly or Snow mushroom, Ecology, Taxonomy, Anatomy, *Tremella fuciformis*.

ABSTRACT

Background: Surveys were conducted in the jungles, logs present beside the canals, saw mills during July – August, 2015 in 24 Parganas (N) for searching the mushroom - *Tremella fuciformis* called jelly fungus or snow fungus. *Tremella fuciformis* belongs to the family Tremellaceae, order Tremellales, class Tremellomycetes and phylum Basidiomycota **Objective:** Our present investigation is to study the occurrence, ecology and taxonomical description of this mushroom which is medicinally and pharmaceutically important mushroom. It has some important socioeconomic effects in China and Japan. **Result:** Our description become matched with Berkeley who first reported this mushroom from the Amazon in 1856, described in Hooker's Jour. Bot. p.277. In India the work on ecology, taxonomy, pharmaceutical of *Tremella fuciformis* is very limited. **Conclusion:** To our knowledge, it is the first report of this important mushroom from 24 Parganas (N), West Bengal, India.

INTRODUCTION

Tremella fuciformis mushroom is chiefly saprophytic and occasionally parasitic on other fungi. It is called jelly fungus, because of the gelatinous jelly like nature of its basidiocarp and also known as snow fungus. It belongs to the family Tremellaceae, order Tremellales, class Tremellomycetes and phylum Basidiomycota (Kirk et al., 2008). It is very important mushroom for its enormous medicinal value. *Tremella fuciformis* is very useful for its neuroprotective (Park et al., 2007), anti tumorigenic (Ukai et al., 1992), anti sarcomic (Ukai et al., 1972), antioxidant and anti-inflammatory activities (Li et al., 2014). Antioxidant and moisture-preserving activities (Wang et al., 2015), antitumor activities (Ukai et al., 1992), free-radical degradation (Zhang et al., 2014), protective effect against radiation-induced damage (Wenqing, 2011) are main activities of the Polysaccharides obtained from *Tremella fuciformis*. It can be genetically modified (Shin et al., 2013) by *Agrobacterium*-mediated transformation. *Tremella fuciformis* is also used for the production of beauty products for women in China and Japan as it reportedly increases moisture retention in the skin and prevents senile degradation of micro-blood vessels in the skin, reducing wrinkles and smoothing fine lines.

Edward(1921) reported this species ranging from Brazil through the West Indies into the southern United States as far north as North Carolina. Farlow in his "Notes of Fungi" reported this mushroom in 1908 and mentioned that the *Tremella fuciformis* was first reported from the Amazon in 1856, described in Hooker's Jour. Bot. p.277, later from Cuba *T. fuciformis* was recorded in Jour. Linn. Soc. 10:340, 1869. In

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To Cite This Article: Gosh, S.K., S. Mitra and S. Mukherjee, Study Of Jelly Mushroom - *Tremella Fuciformis* In 24- Parganas (N), West Bengal, India *Aust. J. Basic & Appl. Sci.*, 10(12): 457-461, 2016

North America *T. fuciformis* has been reported by Atkinson (1901). This species also reported from China (Wu, 1914), Japan and other portion of world like South and Central America, parts of North America, sub-Saharan Africa, southern and eastern Asia, Australia, New Zealand, and the Pacific Islands. In India, Usha *et al.* (2014) reported the occurrence of this mushroom from Karnataka without any description but there is no report of this mushroom from West Bengal.

Therefore, the main objectives of this work are to record its' occurrence and ecology in 24 Parganas(N), West Bengal and also its' taxonomy.

MATERIAL AND METHODS

Study area:

24 Parganas (N) (Fig: 1) is a district within state West Bengal, country India. This district is present within latitude 23° 15' North - 22°11' North and longitude 89° 5' East - 88° 20' East. The average annual rain fall of this district is 1,579 mm with maximum temperature 41°C and minimum is 10°C. This district has 4,094 sq. km area bordered by Nadia by north, Bangladesh by north and east, 24 Parganas(S) and Kolkata by south, Howrah and Hooghly by west.

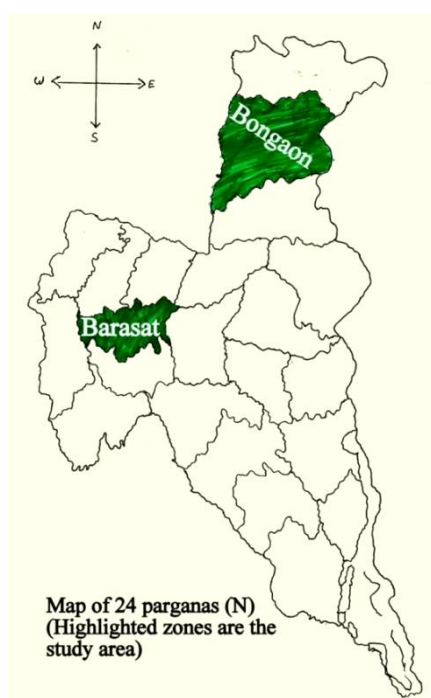


Fig. 1: Map of 24 Parganas(N) with study area (green portion)

Survey and data collection:

Surveys were conducted in the jungles, logs present beside the canals, saw mills in the study areas during July – August 2015. The habitat and morphological characteristics of the macro fungus were noted. Fruit bodies were collected from the substrates with care to avoid damage. Sample specimens were packed in biodegradable plastic bags and carried in the laboratory for works. Identification was made on the basis of ecological morphological and microscopic observation of the specimens consulting with published Journals, Manuals and Books.

Sample dissection:

Transverse section of the sample was observed under compound light microscope with oil immersion lens and photographed by digital camera.

RESULTS AND DISCUSSION

Morphology and Taxonomy:

Tremella fuciformis Berk., Hooker's Journal of Botany and Kew Garden Miscellany 8: 277 (1856).

Occurrence:

The fruit bodies of this fungus were collected from Barasat, and some places of Bongaon, 24 Parganas (N) in between July – August from rotting wood of mango (*Mangifera indica*) and other old logs of angiosperms.

External morphology:

Fruit body was attached with log surface; it is jelly like; the mushroom spreads and makes a colony. Fruit body is complexly lobed; lobe margin sometimes dentate. Immature white or snow coloured basidiocarp become changed into creamy white at maturity. Diameter of the colony varies 4.5-12.5 cm and length of branches varies between 1-4 cm. (Fig:2)



Fig. 2: Fruit body of *Tremella fuciformis*

Anatomy:

The TS (Fig3) of young basidiocarp shows that it is made up of thin septate hyphae with binucleate cells. Some hyphae show the clamp connection (Fig: 4). Hymenium layer is present at the outer surface of the branches; this is basically impregnated within the gelatinous mass; basidium elongated or club shaped, consists of hypobasidium and epibasidium; size of the basidia varies from 24.5- 28.0 μm ; Paraphyses and cystidia are present; hypobasidium (Fig:5) 4 celled; each hypobasidium gives rise to one epibasidium; basidiospore is present in each epibasidium

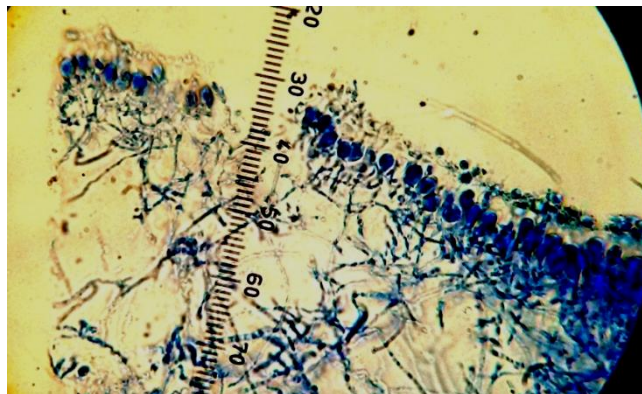


Fig. 3: T.S of the *fruit body* (basidiospore and basidium ;10 \times 100x

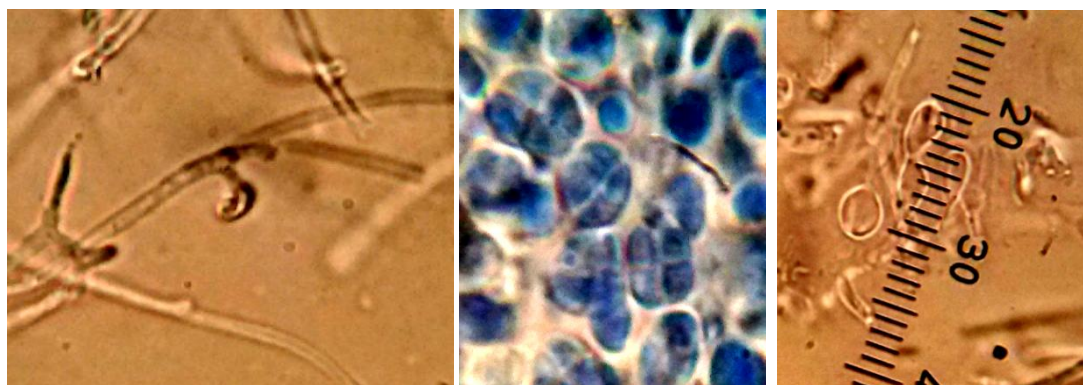


Fig. 4: The clamp connection in hyphae of *Tremella fuciformis*.

Fig. 5: The 4 celled hypobasidium.

Fig. 6: The yeast like budding in the basidio spore of *Tremella fuciformis*.

Basidiospore:

Spore elliptic-globose; smooth, diameter of the spore varies 4.5 – 6.0 μm . spore shows the yeast like budding (Fig: 6)

Identification:

Our observation and description are matched with the description of Berkeley, Hooker's Jour. Bot. 8:277.1856; Linn. Soc. Bot. Jour. 10: 340.1868; Edward Annals of the Missouri Botanical Garden, Vol. 8, No. 4 (Nov., 1921), pp. 361-396; Wu, B.X. Research on the tonic *Tremella fuciformis*, Journal of Natural History, 1914; 1(1): 48-51; Mehrotra and Aneja (2010) and C.J Alexopoulos *et al.* (2010). Hence this specimen of mushroom is *Tremella fuciformis* Berk.

Conclusion:

This work gives a clear description (Ecological, morphological and anatomical) of *Tremella fuciformis* grown in 24-Parganas (N). It will help other to easily identify this mushroom which has immense medicinal importance. Its molecular identification and commercial cultivation are open for interested workers.

This valuable research work may contribute to the knowledge of the ecology and identification of this medicinally important mushroom.

ACKNOWLEDGMENT

Authors acknowledge Principal, R.K.M.V.C. College to provide lab facilities to carry out this research work.

REFERENCES

- Alexopoulos, C.J., C.W. Mims and M. Blackwell, 2010. Introductory Mycology, pp: 660-661.
- Edward, A.B., 1921. Some North American Tremellaceae, Dacryomycetaceae, and Auriculariaceae, Annals of the Missouri Botanical Garden, 8(4): 361-396.
- Farlow, W.G., 1908. Notes on fungi, Rhodora, 10(109): 9-17.
- Kirk, P.M., P.F. Cannon and D.W. Minter, et al., 2008. *Dictionary of the fungi* [M]. 10th edition CABI Oxon.
- Li, H., H.S. Lee, S.H. Kim, B. Moon and C. Lee, 2014. Antioxidant and anti-inflammatory activities of methanol extracts of *Tremella fuciformis* and its major phenolic acids, J. Food Sci., 79(4): 460-468.
- Mehrotra, R.S. and K.R. Aneja, 2010. An Introduction to Mycology, pp: 495-497.
- Park, K.J., S.Y. Lee, H.S. Kim, M. Yamazaki, K. Chiba and H.C. Ha, 2007. The Neuroprotective and Neurotrophic Effects of *Tremella fuciformis* in PC12h Cells, Mycobiology, 35(1): 11-5.
- Ruixia, W., C. Hui and Z. Jingsong, 2015. Scientific explorations of the snow fungus (*Tremella fuciformis* Berk.) in republican China: A brief review, Indian Journal of History of Science, 50(2): 340-344.
- Shin, D.I. and H.S. Park, 2013. Mechanical wounding of yeast-like conidium cells of *Tremella fuciformis* makes them susceptible to Agrobacterium-mediated transformation, Biosci Biotechnol Biochem, 77(10): 2157-9.
- Ukai, S., K. Hirose, T. Kiho, C. Hara and T. Irikura, 1972. Antitumor activity on sarcoma 180 of the polysaccharides from *Tremella fuciformis* Berk, Chem. Pharm. Bull. (Tokyo), 20(10): 2293-4.

Ukai, S., H. Kiriki, K. Nagai and T. Kiho, 1992. Synthesis and antitumor activities of conjugates of mitomycin C-polysaccharide from *Tremella fuciformis*, *Yakugaku Zasshi*, 112(9): 663-8.

Usha, N. and G.R. Janardhana, 2014. Diversity of macrofungi in the Western Ghats of Karnataka (India), *Indian Forester*, 140(5): 531-536.

Wang, X., Z. Zhang and M. Zhao, 2015. Carboxymethylation of polysaccharides from *Tremella fuciformis* for antioxidant and moisture-preserving activities, *Int. J. Biol. Macromol*, 72: 526-30.

Wenqing, X., S. Xiu, Y. Fujun, H. Ying, L.I. Ruifeng, X. Dan and J. Chengfeng, 2011. Protective effect of polysaccharides isolated from *Tremella fuciformis* against Radiation-induced Damage in Mice, *Journal of Radiation Research*, 53(3): 353-360.

Wu, B.X., 1914. Research on the tonic *Tremella fuciformis*, *Journal of Natural History*, 1(1): 48-51.

Zhang, Z., X. Wang, M. Zhao and H. Qi, 2014. Free-radical degradation by $Fe^{2+}/Vc/H_2O_2$ and antioxidant activity of polysaccharide from *Tremella fuciformis*, *Carbohydr. Polym*, 112: 578-82.