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***Leucocoprinus birnbaumii* (Corda) Singer: A new report of macrofungus from North Maharashtra region, Maharashtra State, India.**

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Abstract: Present paper deals with the taxonomic account of macrofungus *Leucocoprinus birnbaumii* (Corda) Singer, growing in clump in the cavity of dead trunk base of *Eucalyptus lanceolatus*, L. tree belonging to the family myrtaceae (Angiosperm) from Nandurbar, Maharashtra State, India. The Fungus was examined and identified by its complete morphological and microscopical description of the basidiocarps and rhizomorph of the fungus and it constitute a new report from the North Maharashtra region of Maharashtra State, India.

Keywords: Macrofungus, Agaricaceae, *Leucocoprinus birnbaumii*, taxonomy, new report, Nandurbar, North Maharashtra, (India).

INTRODUCTION:

The genus *Leucocoprinus*, Pat. 1888 [1], belonging to the family Agaricaceae and distinct from other genera of the tribe Leucoprinae, Singer, 1975 [2]. *Leucocoprinus birnbaumii* was first published as *Agaricus luteus* Bolton, 1788 [3] unfortunately, the name *Agaricus luteus* had already been published for a different fungus, nonetheless, many popular American books continued to use the name *Lepiota lutea* until the 1980s. [4]. Corda 1839 [5] described the *Agaricus luteus*, based on specimens as *Agaricus birnbaumii* from Prague, where it was found growing in a greenhouse by a garden inspector named Birnbaum, and hence the specific epithet as *birnbaumii* honors to Czech gardener. Birnbaum [6]. The species *birnbaumii* was transferred to the genus *Leucocoprinus* establishing its scientific name as *Leucocoprinus birnbaumii* in 1961. Singer, 1962 [7]. This macrofungus is commonly known as ‘Yellow parasol, flower-pot parasol’ [8], ‘Yellow pleated parasol’ [9], ‘Yellow house-plant mushroom’ [10], ‘Plant-pot dapperling’ [11], ‘Lemon -yellow lepiota’ [12]. The yellow colour of this mushroom is due to

alkaloids known as Birnbaumins and these alkaloids are known to cause gastric ulcers when consumed [14]. The genus *Leucocoprinus* is cosmopolitan in distribution and contains about 40 species [13].

In India 24 species of the *Leucocoprinus* are reported from different regions (18 from Kerala, 2 species each from Maharashtra and West-Bengal, one each from Madhya Pradesh and Uttar Pradesh. Present study reports *Leucocoprinus birnbaumii*(Corda) Singer, as a new record from North Maharashtra region, Maharashtra, as there was no record in the past. A review of literature shows that, it has been reported from Nepal, India, Manjula et al, 1983 ,[15]. Kerala Vrinda, et al., 2003,[16]. Kerala, Arun kumar et al., 2009,[17]. Poland, Wladyslaw, W. and Dariusz, K. 2010, [18]. Washington, Birkebak, JM.,2010 [19]. Colombia, Ana E. Franco-Molano, et al. 2010 [20]. Karnataka, Pushapa, H and Purushothama, KB, 2011, 2012 [21],[22]. West-Bengal, Dutta, et al., 2011, [23]. Madhya Pradesh, Parihar, et al., 2012, [24]. Kerala, Farrok, et al., 2013,[25]. Maharashtra, Senthilarasu, G. 2014 [26]. Brazil, Nascimento, CC., and Alves, MH. 2014 [27]. Maharashtra, Borkar, et al., 2015,[28]. Asam, Gogoi, G. and Prakash, V. 2015 [29]. South-west India, Ammantanda, et al., 2016,[30]. Korea, Soon Ja Seok, et. al., 2016.[32]. Gujrat State, Vasava et al., 2017 [33]. Central India, (M.P.) Verma, RK and Pandro, V. 2018 [34]. Egypt, El-Fallal, A.A. et. al, 2019 [35]. Sri-Lanka, Adikaram et al., 2020 [36]. Rajsthan, Chouhan et al., 2021 [37].

MATERIALS AND METHODS:

Collection site: The study material was collected at the same place during the rainy season (September, 2011, October 2016 and Aug, 2020) from Nandurbar, Maharashtra State, India. Nandurbar is geographically ranging from 21.37⁰N to 74.25⁰E and is a part Deccan plateau situated in northern part of Maharashtra State, standard protocol was followed for the study of macroscopic and microscopic characters as given by Atri. et al; 2017 [38]. The colour terminology used is that of Kornerup and Wanscher, 1978 [39]. The collected fresh specimens were preserved in a liquid preservative (25:5:70) ml rectified alcohol + formalin + distilled water) Hawksworth, et al; 1995 [40]. The morphological and ecological features were noted. Photographs were taken in the field and laboratory. Fresh specimens were brought to the laboratory for microscopic observation by cutting free hand sections staining in Lactophenol Cotton blue. Micromorphological features were noted at the magnification of x100, x400 and x1000 with the aid of a light/ student microscope. Reagent such as Melzer's reagent was used to study amyloidity of basidiospores and other tissues [41]. Camera lucida diagrams were also made and Microphotographs were taken. The spore shape quotient (Q=L/W) was calculated considering the mean value of length divided by the width of 30 basidiospores. Some good specimens were deposited at Department of Botany G. T. Patil college, Nandurbar. Maharashtra. With SFN 20.

During the present investigation, authentic names basionym and synonym of the taxa
 =*Agaricus birnbaumii* Corda Iconis Fungorum hucvsque cognitorum 3:48 (1839).
 = *Agaricus luteus* Bolton, A history of fungusses, Growing about Halifax 2:50, (1788)

- = *Lepiota lutea* (Bolton) Godfrin Bull. Soc. Mycol. Fr. 13: 33 (1897)
 = *Leucocoprinus luteus* (Bolton) Locq. Bull. Mens. Soc. Linn. Loyn 14: 93 (1945).
 = *Agaricus flammula* Alb. & Schwein (1805).
 = *Lepiotaflammula* (Alb. & Schwein) Gillet, (1874).
 = *Agaricus flus-sulphuris* schnizl, (1851).
 = *Bolbitius biranbaumii*, Sacc and Traverso in syll. Fung. 19:151,(1910).
 = *Lepiota flus-sulphuris* (Schnizl) Mattir (1918)
 = *Leucocoprinus flos-sulphuris* (Schnizl) Cejp, (1948)
 = *Lepiota aurea* Masee. Bull. Misc. Inf, Kew:189 (1912).
 = *Lepiota psedolicmophora* Rea. Brit. basidiomyc. (Cambridge) : 74,(1922).
 = *Lepiota coprinoides* Beeli, (1936).

Classification : Fungi,Basidiomycota,Agaricomycotina,Agaricomycetes,Agaricomycetidae
 Agaricales, Agaricaceae, Leucocoprinus, L. birnbaumii.

Description of species : Basidiocarps grow alone or in clusters of 3-5 around the base and in the rotting hardwood cavity of the tree trunk (Fig. 2). They are basely connate; small to medium sized, lepiotoid to coprinoid, concolorous, bright yellow to Sulphur yellow, but fade with age; pileus hemispherical to parabolic, truncated, pileat, pruinose with a blunt umbo becoming convex in age, up to 7-5 cm, in diameter., margin fragile, crenate, striate to sulcate floccose squamulose, thin; surface dry., gills (Lamellae) edge sterile, free from the stipe, crowded, picric yellow, concolorous, delicate., lamellulae of three different lengths. Flesh yellow., Stipe central, elongated tapering towards the apex and becoming broad towards base, brightly yellow,15-19 cm long and1-3cm in diameter., annulus membranous, evanescent concolorous with stipe, attached to upper third of the stipe pad of pale yellowish cottony mycelium (rhizomorph) of the base in the substratum. Spore print white (Fig.3). Basidiospores hyaline, ovoid to ellipsoid, dextrinoid, truncated apex with distinct germ-pore, 1-4 guttules (iolglobules), 6.4-9.6 x 4.8-6.4 μm wide (Q= 1.36) (Fig.4 and Fig.d). Basidia surrounded by pseudoparaphyses, bearing four sterigmata (Fig. a,b)., brachybasidia like 16-28.8 μm long and 4.8-6.4 μm wide, cheilocystidia dimorphic clavate, ventricose or irregular (Fig.c)., pleurocystidia absent ., clamp connections absent.

Habitat and ecology : Solitary or in clump around or inside the cavity of dead hard wood.(Fig.1)

Edability: Poisonous, Lange, 1993 [42]., Breitenbach and Kranzlin1995 [43]., Noordeloose et a; 2001.,[44].

Collection examined: India, Maharashtra state, Nandurbar district, G. T. Patil College campus, around and inside the rotting hardwood of *Eucalyptus lanceolatus*, L. (Angiosperm) plant. Sept. 2011, 2016 and 2020. Leg. B. B. Mangle.

Chemical color reaction: Schaeffer's reaction is negative [45].

Comments / Discussion: This mushroom is a decomposing mushroom, grows on dead organic matter (Birkeback 2010) [19]. In current study; it was found growing naturally on dead trunk base of *Eucalyptus lanceolatus*, L. tree. The present collection is rare in occurrence. Therefore, it is being reported for first time from this region. Moreover, it provides new host record i.e., on rotting hard- wood of *Eucalyptus lanceolatus* tree.

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CONFLICT OF INTERESTS: The author declares that there is no conflict of interest.



Fig 1: Sporophores
(Closed cap)



Fig 2: Sporophores
(open cap)

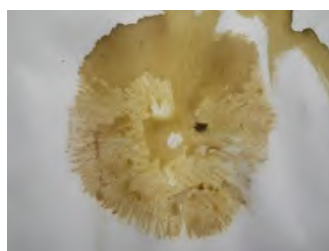


Fig 3 : Spore print

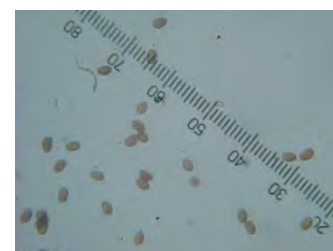


Fig 4: Basidiospores

Fig a) Basidium with Sterigmata	Fig. b) Basidium	Fig. c) Cheilocystidia	Fig. d) Basidiospores

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MONITORING OF AMBIENT AIR QUALITY OF NANDURBAR, MAHARASHTRA, INDIAN

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Abstract : Ambient air quality of Nandurbar city was monitored during the year 2021. Criteria pollutants selected for the monitoring was, sulphur dioxide (SO₂) & nitrogen dioxide (NO₂) and PM10 (Particulate Matter having aerodynamic diameter less than or equal to 10 μm) for the period of November 2021 to September 2021. Sampling was done for successive periods of about 4 hours for sulphur dioxides (SO₂), nitrogen dioxide (NO₂) and 8 hours for Respirable suspended particulate matter (PM10) for 24 hours. The results reported pertain to an eight hour successive continuous air sampling exercise carried out at each of the four selected locations in Nandurbar city. The value of PM10 (Particles ≥ 10μ, PM 10μg/m³) was noted to be crossing the permissible limit and exceeded the National Ambient Air Quality Standard (NAAQS) at all locations. The concentration of SO₂ and NO₂ was within the National Ambient Air Quality Standard (NAAQS, National Ambient Air Quality Standards, November 18, 2009) at all the locations.

Keywords : Ambient air quality, particulate matter, NAAQS, sulphur dioxide

Introduction :

The ambient air quality monitoring was carried out at three different locations in Nandurbar city during the period of 21st October 2021 to 30st November 2022. The parameters like Respirable suspended particulate matter (RSPM) i.e. PM₁₀ (particulate matter having diameter or equal to 10μm), PM_{2.5} (particulate matter having diameter or equal to 2.5 μm), SPM (suspended particulate matter having size greater than 10 μm) were estimated by gravimetrically (1-5). Also, the gases concentration presence in air such as Sulphur dioxide (SO₂), Nitrogen dioxide (NO₂), was estimated with help of air gas sampler

machine. The eight and four hour continuous air sampling was done for the collection of RSPM and gas samples at each location respectively (6-14). Following locations which have been shortlisted for Ambient Air Quality Monitoring under NAMP.

Materials and methods :

Respirable Suspended Particulate Matter (PM₁₀) was measured by Cyclonic Flow Technique. Nitrogen oxides were measured by Modified Jacobs and Hochheiser Method (Sodium Arsenite method). Sulphur oxides were measured by Modified West and Gaeke Method (15).

Sr. No.	Location Finalized	Latitude	Longitude
1	Maharashtra Oil Extraction, MIDC Nandurbar (Industrial), Station Code: S1	21 ⁰ 22'44" N	74 ⁰ 15' 28" E
2	Nandurbar Municipal Corporation, Nandurbar (Commercial), Station Code: S2	21 ⁰ 22'4.8" N	74 ⁰ 14' 31" E
3	Dhule Chaufuli, Nandurbar (Residential/ Commercial), Station Code: S3	21 ⁰ 21'43" N	74 ⁰ 15' 3.6" E