

RESEARCH ARTICLE

Distribution of *Lentinus tuberregium* (Fr.), an indigenous edible medicinal mushroom in Tamil Nadu, South India

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Abstract

Lentinus tuberregium, a common wood rot edible and medicinal mushroom distributed through the tropics was collected from different regions across Tamil Nadu, South India. It is characterized by large robust pale yellow to yellow hard basidiocarp with stout stipe arising from sclerotia and moreover the context is thin at margin and thick at centre and the spores are cylindric and hyaline. The study reveals that this species is usually found on the mango tree substrate and occur below the altitude of 600 m.

Keywords: *Lentinus tuberregium*, distribution, occurrence, medicinal mushroom, South India.

Introduction

The genus *Lentinus* is a white rot fungus, which has attracted the attention of many mycologists for many years (Hibbett, 1992; Hibbett and Vilgalys, 1993; Hibbett *et al.*, 1993, 1995). Some of them are known to be edible with well known medicinal properties (Hibbett, 1992). The primary taxonomic character like basidiospore shape, size, structure and pileal surface are being used in the identification of *Lentinus* spp. *Lentinus tuberregium* is a common tropical wood rot mushroom found in the tropical countries. Use of mushrooms is quite common from antiquity across many cultures. It has been an article of diet and commerce for many centuries. Many mushrooms were used for food without clear knowledge on their edibility. Especially *Lentinus tuberregium* is one such wild edible mushroom well known for its medicinal values in Malaysia and Africa. It is known to be edible and a source of food throughout central Africa (Watling, 1993), in eastern peninsular Malaysia, it is a valuable medicine against diarrhea (Burkhill, 1966; Sumaiyah *et al.*, 2007) especially effective in children (Chang and Lee, 2004; Lee *et al.*, 2006) and it has been used in many herbal preparation for coughs, indigestion and dysentery (Chang and Lee, 2007). But in India it is known just as an edible mushroom from several parts of the country: Kanyakumari (Johnsy *et al.*, 2011; Davidson *et al.*, 2012), Orissa (Susthrishanta, Unpublished data) and few other parts of Western Ghats and Eastern Ghats (Kaviyarasan *et al.*, 2009; Kumar, 2009). Microscopically it shows cylindric spores with cylindric to fusoid, elongated cystidia and trichodermial to fusoid pileal elements. Considering the above facts, *Lentinus tuberregium*, a common wood rot edible mushroom collected from Kolli Hills, South India was identified based on morphological tools. Its distribution in Eastern Ghats and Western Ghats, especially in Tamil Nadu was studied during our mushroom biodiversity studies in South India.

Materials and methods

Collection of mushroom: The mushroom species was collected from different regions of both Eastern and Western Ghats of Tamil Nadu at different collection seasons usually one week after rains and the collections were made following Largent (1986).

Macroscopic examination: Macroscopic characters of fresh specimens were noted after the collection. Photographs of the fresh specimens were taken both in the collection place as well as in the laboratory (Atri *et al.*, 2003; Kaviyarasan *et al.*, 2009). Spore print was taken to know the colour of the spore. Kornerup and Wanscher's (1978) book was followed to determine colour of the fresh specimens. The terms for the descriptions was that of Largent (1986) and in some cases using Vellinga (1998). Specimens were tagged with collection number and dried in electric drier and were preserved in sealed polythene bags along with naphthalene balls in order to protect from insect and pest attack. The preserved specimen was deposited in the Herbarium of Madras University Botany Laboratory (MUBL) with accession number (MUBL No. 3622, 3701, 3702, 3703 and 3704).

Microscopic examination: The preserved specimen was revived in 3-5% KOH solution. Stains such as cresyl blue, cotton blue and 1% aqueous phloxine were used. Amyloidity reaction of spores and tissues were studied by using Melzer's reagent (100 g of chloral hydrate, 1.5 g Iodine and 5 g of KI in 100 mL of distilled water). The basidiospore shape was determined according to the Q-coefficient (length-width ratio) of at least 20 randomly selected but mature basidiospores (Bas, 1969). The measurement does not include the apiculus and were made in KOH at 2000X with a calibrated optical micrometer in a trinocular Labomed (CXL plus) microscope.

The line diagrams were drawn with the aid of POM prism type camera lucida. The length in the basidia measurements does not include sterigmata. Identification of the specimen was done using standard identification keys (Singer 1975, 1986; 1983 a, b, 1986; Pegler 1977, Samantha *et al.*, 2010).

Results and discussion

The species collected from Kolli hills has been described here with morphological and microscopic characters. For the other species, the collection site, date of collection and the substrate alone is mentioned. Further, few of its common synonyms were provided out of 28 synonyms provided by Pegler (1986).

***Lentinus tuberregium* (Fr.) Fr., Epicrisis: 392 (1838).**

Agaricus tuberregium Fr., Syst. Mycol. 1: 174 (1821).

Lentinus cyathus Berk. Br., in Trans. Linn. Soc., Bot. Ser. 2,1: 399 (1879).

Pleurotus tuberregium (Fr.) Singer in Lilloa 22: 271 (1951).

Panus tuberregium (Fr.) Corner in Beih. Nova Hedw. 69:98, fig. 27-28 (1981).

Basidiocarp robust, caespitose. Pileus 3-15(-20) cm dia., tough leathery to rigid sub infundibulliform (uplifted) to deeply depressed; surface pale ochraceous cream colour, (4A2-4A1), smooth at centre velvety due to mass of loosely arranged hyphae especially at the centre, glabrous, fleshy; margin entire during young later inrolled. Lamellae deeply decurrent, pale ochraceous cream colour, crowded, thin up to 1 mm wide with lamellulae of different lengths; edge entire. Stipe central to eccentric, 2.5-5(-7) × 1.7-2.5 cm, slightly tapering downwards, solid, hard, woody velvety, pale ochraceous yellow (4A2), inserted. Partial veil absent. Context hard, thick, pale yellow, up to 8 mm thick at disc, inamyloid, heterogenous with a dimitic hyphal system of hyaline, thin walled, often branched, uninflated, generative hyphae 2-4.6 µm dia. and skeletal hyphae 2-5.8 µm, thick walled, with narrow lumen, pale yellow, often consisting of a short to long skeletal elements. Spores 6.54-8.72 × 3.27-3.49 (7.65±0.79 × 3.38±0.10) µm, Q = 2.26, cylindric, hyaline, thin walled. Basidia 20.72-32.18 × 4.36-6.54 µm, narrowly clavate bearing four sterigmata, sterigmata thin, short. Lamella edge sterile from the outset with emergent tapering, skeleto-ligative hyaline terminal branches 4.3-5.12 µm dia., eventually forming short fascicles. Cheilocystidia abundant 25.3-42.4 × 4-4.8 µm, hyaline, thin walled, elongated cylindric to fusoid. Hyphal pegs absent. Pleurocystidia 30.5-34.91 × 4.36-5.45 µm, narrow, hyaline, thin walled. Hymenophoral trama irregular 27.27-54.55 µm broad, with thin walled generative hyphae, 2-3.8 µm dia.

Subhymenial layer poorly developed. Pileal surface more or less trichodermial palisade, 84.54-225.44 µm thick, semi erect to erect, tapering, hyaline, 3.81-6.54 µm dia., together with narrow generative hyphae. All hyphae having clamp connections (Fig. 1 and 2).

Fig. 1. Habit–*Lentinus tuberregium*.



Located on dead mango tree stumps, caespitose, Solakkadu, Kolli hills, TN, India on 5th January, 2006 collected by M. Kumar (Herb. MUBL No. 3622).

Located on dead unknown tree trunk, caespitose, Keeriparai, Tamil Nadu, India on 8th June, 2005 collected by S.S. Davidson (Herb. MUBL No. 3701).

Located on fallen mango tree trunk, caespitose, Senbarai, Javadi hills, TN, India on 2nd June, 2006 collected by M. Kumar (Herb. MUBL No. 3702).

Located on dead mango tree logs and *Albizia lebbbeck* tree logs, caespitose, Guindy National Park, Chennai, TN, India on 11th January, 2008 collected by M. Kumar (Herb. MUBL No. 3703).

Located on unknown dead tree trunks, caespitose, Covai Kutralam, TN, India on 24th November, 2006 collected by M. Kumar (Herb. MUBL No. 3704) (Fig. 3).

All these collection is characterized by large robust pale yellow to yellow basidiocarp with stout stipe arising from sclerotia. Moreover the context is thin at margin and thick at centre, hard and spores cylindric, hyaline. This is similar to *Lentinus tuberregium* (Fr.) mentioned by Pegler (1983b). This study reveals that this species is one of the very common large robust species of *Lentinus* in southern India especially Tamil Nadu. Moreover its occurrence in substrate across the state is almost the same in all the collection regions revealing that its usual substrate may be mango trunk. Previous studies on this species from India and other countries have not mentioned its substrate so it is very hard to interpret its relationship with the above mentioned substrate at this time.

Fig. 2. *Lentinus tuberregium*. a. habit, b. spores, c. basidia, d. pleurocystidia, e. cheilocystidia, f. Pileal elements, g. clamp connections.

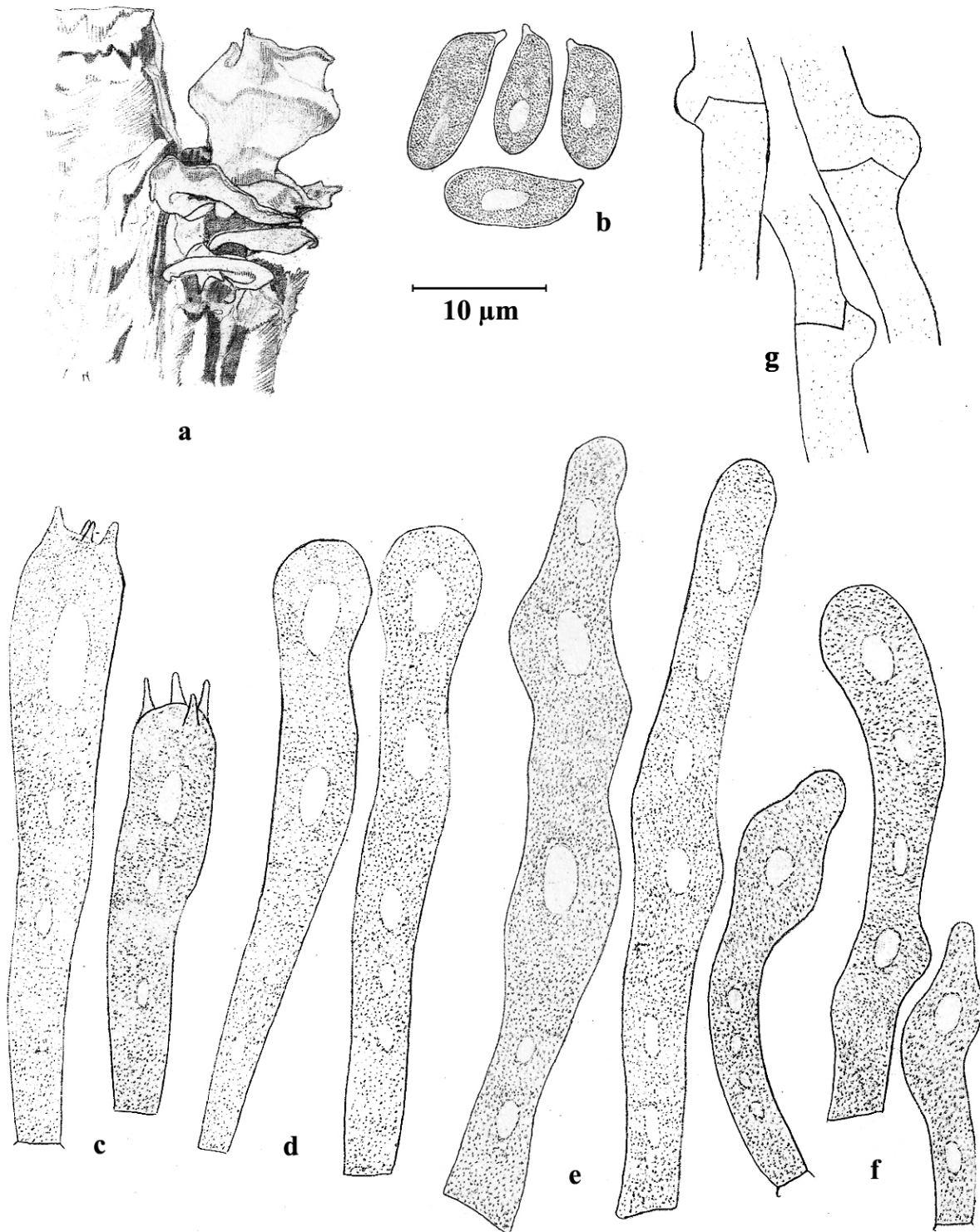


Fig. 3. *Lentinus tuberregium* collected at different regions.

a. Javadi hills; b. Keeriparai, c. Guindy national park, d. Covai kutralam.

Conclusion

Further work is being carried out on its relationship with the substrate which will reveal its host specificity. Apart from the host as far as its occurrence in different ranges concerns it was not observed in high altitude. In all the collections it was collected below the altitude of 600 m MSL. But this statement requires conformation from further studies as this study was restricted to only southern India. In southern India It is restricted to lower altitude.

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