



Diversity of agaric mycota of Western Ghats of Karnataka, India

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Abstract

The morpho-taxonomy of 15 agaric species belonging to *Agaricales* collected from dipterocarp forests of Western Ghats of Karnataka is briefly described, discussed and their geographic distribution in India is presented. Of these, *Crepidotus payettensis* is reported for the first time from India. *Cyptotrampa asprata*, *Hygrocybe acutoconica*, *H. alwisii*, *Oudemansiella furfuracea*, *Hypholoma subviride* and *Lactocollybia epia* are reported for the first time from Karnataka State. The taxonomy of *Oudemansiella furfuracea* and *Hypholoma subviride* contravening to the current name in Index Fungorum is discussed. In addition, a checklist of agarics comprising of 121 species in 55 genera reported from Western Ghats of Karnataka is also provided on the basis of published sources. Overall, 132 species in 60 genera belonging to *Agaricales*, *Polyporales* and *Russulales* are presented in this paper.

Key words – *Basidiomycetes* – bibliography – dipterocarp forests – mushroom taxonomy– tropical fungi

Introduction

The Western Ghats is recognized as one of the world's eight 'hottest hotspots' of high level of biological diversity and endemism (Myers et al. 2000). It falls in a tropical climate and represents non-equatorial tropical evergreen forests, and harbors unique fungal diversity in addition to globally threatened flora and fauna. Several species of agarics recorded as well as new species described from Kerala (Farook et al. 2013), Maharashtra (Senthilarasu 2014), and Tamil Nadu (Natarajan et al. 2005a) have not been recorded else where so far. In Karnataka State, about 38,284.3 km² forest area constitutes 20 % its geographical area. Although the dense forests of Western Ghats that covers about 60 % of the forest area of Karnataka harbors huge number of fungal species, much of the geographic area has not yet been mycologically explored particularly for agaric fungi. Swapna et al. (2008), Pushpa & Purushothama (2011, 2012), Karun & Sridhar (2013, 2014, 2015), Karun et al. (2014), Ghate et al. (2014), Ghate & Sridhar (2015) and Greeshma et al. (2015) fragmentally reported the agaric mycota of Karnataka State, yet the extent of its diversity in Western Ghats of Karnataka remains poorly known. Agarics in the neighbouring states of Kerala and Maharashtra have recently been compiled and published by Farook et al. (2013) and Senthilarasu (2014), respectively. In this paper, the agaric species encountered from dipterocarp forests of Kodagu and Shimoga districts of Western Ghats of Karnataka are reported. In addition, due to need of a compiled data on the number

of species confined to Western Ghats as well as Karnataka, a check list of agaric species so far reported from this region is presented based on validly published sources.

Materials & Methods

Collection trips were made to dense wet evergreen dipterocarp forests of Kadamakal Reserve Forest in Kodagu district and dipterocarp forests of Sirsi of Uttara Kannada district during monsoon and post monsoon seasons. Kadamakal Reserve Forest near Manaduka, Kothanaduka and Uppangala is in the foothills of the Ghats and lies at 12°30' N, 75°39' E at an altitude comprised between 400 and 600 m asl. Annual rainfall is about 5,200 mm with a marked dry season of 3-4 months. The natural vegetation belongs to the *Dipterocarpus indicus* Bedd. – *Kingiodendron pinnatum* (DC.) Harms – *Humboldtia brunonis* Wall. type of low elevation moist evergreen forests (Pascal 1988). Although several hundred plant species have been observed in the forest itself, it is less rich and diverse than other tropical rain forests in South East Asia or South America. Half of the species present in the Kadamakal Reserve Forest are endemic to the Western Ghats and about 80 % of the trees belong to these endemic species (Pascal & Pélissier 1996). Sirsi located at Uttara Kannada district lies at 14.62°N, 74.85°E at an average elevation of 590 m asl. The forests near Sirsi are moist deciduous forests dominated by *Vateria indica* L.

The morphotaxonomic characters were adopted from Largent (1977) and Singer (1986). Color terms and notations in parentheses are those of Kornerup & Wanscher (1978). All measurements and colors reported for microscopic features were observed from dried material rehydrated in 10% KOH, stained in 2% phloxine, cotton blue, cresyl blue and Melzer's reagent. The measurements excluding the apiculus and ornamentation were made on 50 basidiospores. The mean spore measurements are given in parentheses followed by the range of spore measurements with extreme values in parentheses. The spore quotient (Q) was obtained by mean length divided by mean width ratio of a spore in profile view. All exsiccata were deposited at Herbarium of Madras University Botany Laboratory (MUBL) and also in personal collections (Macrofungal Collection of India, MCI).

The checklist on gilled mushrooms reported from Western Ghats of Karnataka is prepared based on validly published reports and the agarics reported from other regions of Karnataka are excluded from the list. Index Fungorum (www.indexfungorum.org) and Species Fungorum (www.speciesfungorum.org) websites are generally followed for the nomenclature and currently accepted name, respectively. However, the disputed genera and species are discussed and names accepted by modern authors are adopted for a couple of species. The names of the species and author citations as reported in the cited publications are replaced by currently accepted names with author citations. The checklist is organized alphabetically by order, family, genus and species. The most uncommon species enlisted without description in the validly published reports are excluded from the list. Several corrections are made where orthographic variants found in the cited publications.

Taxonomy

Anthracophyllum nigratum (Lév.) Kalchbr. *Grevillea* 9: 137 (1881)

Fig. 1a

Pileus 2–10 mm diam., reniform to dimidiate; surface uniformly tomato red (8C8), becoming dark on drying, dry, smooth; margin regular, smooth, incurved, radially faintly striate. Lamellae adnate, radiating from the point of attachment, violet brown (10F4), drying black, narrow, subdistant with lamellulae of three lengths. Stipe rudimentary, substipitate, lateral, 1 × 1 mm, concolorous with the pileus. Context very thin, pale brown, consisting of tightly interwoven, thin-walled, hyaline hyphae, containing numerous, black incrusting particles, becoming dark green in alkali solution. Basidiospores (5±0.5 × 3±0.2), (4)4.5–6(6.5) × (2)2.5–3.5 µm, Q = 1.6, oblong, hyaline, inamyloid, thin-walled, smooth, with few refractive guttules. All hyphae bearing clamp-connections.

Specimens examined – India, Karnataka State, Kodagu district, Uppangala Forest, on fallen twigs, scattered, gregarious, 23 June 2001, coll. Senthil. (Herb. MUBL 3436), 11 August 2010, (MCI 1349).



Fig. 1 – a, *Anthracophyllum nigratum* on dead twigs. b-c, *Chlorophyllum molybdites* basidiomes under natural conditions. b, Surface view. c, Gill view. d, *Crepidotus payettensis*. e, *Cyptotrama asprata* on a dead twig.

Notes – The genus *Anthracophyllum* Ces. erected by Cesati (1879) from Sri Lankan material collected by Beccari in the Peradenia Royal Botanic Gardens is characterized by unique hymenophores possessing brownish to red pigments and carbonaceous granules that become bluish green in alkali solution. Several species assigned to *Anthracophyllum* were earlier described in *Xerotus* Fr. (Segedin 1994). The species are confined to pantropical, subtropical, and Australasian localities. In India, *A. nigratum* and *A. lateritium* (Berk. & M.A. Curtis) Singer have been reported. *Anthracophyllum nigratum* is a common xerophytic and paleotropical species found on dead twigs in damp areas, easily distinguished by small, dimidiate to reniform basidiomes having violet brown to black hymenophore containing carbonaceous granules that become green in alkali solution, and highly branched, diverticulate hyphae in the cuticular layer, with all hyphae bearing numerous clamp-connections. Another common species *A. lateritium* (Putzke 2002) macroscopically resembles *A. nigratum* in similar sized and shaped basidiomes, but differs microscopically in having larger basidiospores ($9.5\text{--}12.5 \times 5.5\text{--}8.0$ vs $4\text{--}6.5 \times 2\text{--}3.5$ μm). Sathe & Kulkarni (1980) earlier reported *A. nigratum* from Castle Rock, Uttara Kannada of Karnataka.

Known distribution – **ASSAM**, Khasi Hills (Berkeley 1854 as *Xerotus lobatus* Berk.; Bresadola 1920); **KARNATAKA**, Uttara Kannada, Castle Rock (Sathe & Kulkarni 1980); **TAMIL NADU**, Nilgiri Hills (Montagne 1856 as *Xerotus perrottetii* Mont.); Kodaikanal, Tiger Shola (Manjula 1983); **MAHARASHTRA**, Khandala (Bhide et al. 1987); Mahabaleshwar; Mulshi (Senthilarasu 2014).

Coprinellus disseminatus (Pers.) J.E. Lange [as '*disseminata*'], *Dansk bot. Ark.* **9** (no. 6): 93 (1938)

Pileus 3–10 mm diam., at first ovoid, then conic to campanulate, membranous; surface uniformly violet grey (17C2), often light yellow (4A4) at the disc, glabrous, smooth; margin regular, sulcate striate almost to the disc. Lamellae adnexed, moderately crowded, narrow, ≤ 2 mm broad, whitish soon becoming 'henna' dark brown (7E8), non-deliquescent, with lamellulae of different lengths. Stipe 12–30 \times ≤ 1 mm, slender, cylindrical, equal, hollow; surface white, glabrous, almost translucent, arising from white, mycelial threads. Context thin. Basidiospores ($7.3\pm 0.7 \times 4\pm 0.2$), (5.5)7–8(9) \times 3.5–4.5 μm , Q = 1.8, ellipsoid, broadly ovate in face view with a thick, complex wall, truncated by an apical germ-pore, dark brown, deeply pigmented, pigment easily removed by conc. H_2SO_4 , smooth. Clamp-connections absent.

Specimens examined – India, Karnataka State, Kodagu district, Uppangala Forest, on stump, caespitose to connate, 24 June 2001, coll. Senthil. (Herb. MUBL 3475).

Notes – The coprinoid species earlier treated in the genus *Coprinus* s. l. (Redhead et al. 2001) is polyphyletic. Based on new amendments on morphological characters and molecular studies several coprinoid species have been segregated from *Coprinus* s. l. and assigned to three new genera *Coprinellus* P. Karst., *Coprinopsis* P. Karst. and *Parasola* Redhead, Vilgalys & Hopple of the family *Psathyrellaceae* Vilgalys, Moncalvo & Redhead (Redhead et al. 2001). The morphological features adopted to delimit the genera are the colour of the immature lamellae, type of pileipellis, presence or absence of pileocystidia, veil tissue, central stipe strand, pleurocystidia and ozonium, di-, tri- or tetramorphous basidia, and nature of deliquescence (Redhead et al. 2001, Moncalvo et al. 2002). Consequently, all the coprinoid species that were earlier assigned in *Coprinaceae* Overeem & Weese were distributed in two families *Agaricaceae* Chevall. (*Coprinus* Pers.) and *Psathyrellaceae* (*Coprinellus*, *Coprinopsis* and *Parasola*).

The genus *Coprinellus* is defined by deliquescent or non-deliquescent basidiomes having white immature lamellae, hymeniderm or cystoderm pileipellis with pileocystidia, granular veil tissue, di-, tri- or tetramorphic basidia, and absence of central stipe strand. The pleurocystidia and ozonium may or may not present. *Coprinellus disseminatus* is a non-deliquescent, tiny, fragile, coprinoid mushroom growing gregariously on rotting stumps, and buried, decaying woods and roots. The characteristic features of *C. disseminatus* are the convex, gray pileus with light yellow disc, presence of dark brown and deeply pigmented, ellipsoid to broadly ovate spores with an apical truncate germ pore. Swapna et al. (2008) earlier reported this species as *Coprinus disseminatus* (Pers.) Gray from Shimoga of Western Ghats of Karnataka.

Known distribution – This species has earlier been reported as *Coprinus disseminatus* from different regions of India. **KARNATAKA**, Shimoga (Swapna et al. 2008); Bangalore (Pushpa &

Purushothama 2012); **KERALA**, Nilambur, Chandhkkunnu; Thrissur, Peechi (Mohan 2011 as *Coprinus disseminatus* var. *disseminatus* (Pers.) Gray); **MAHARASHTRA**, Pune (Sathe & Rahalkar 1975, Sathe & Deshpande 1982); **PUNJAB**, Bir Bhadson and Samana (Atri & Kaur 2002); **SIKKIM**, Barsey Rhododendron Sanctuary (Das 2009); **UTTAR PRADESH**, Lucknow (Ghosh et al. 1967); **JAMMU & KASHMIR**, Dachigam National Park (Watling & Gregory 1980); **WEST BENGAL**, Calcutta (Banerjee 1947 as *Psathyrella*); Darjeeling (Roy & Samajpati 1978, Rai et al. 2005); Sundarbans mangrove forest (Dutta et al. 2013); lateritic region of West Bengal (Pradhan et al. 2013).

Chlorophyllum molybdites (G. Mey.) Masee, *Bull. Misc. Inf.*, Kew: 136 (1898) Fig. 1b, c

Pileus 90–170 mm diam., fleshy, plane with a shallow umbo; surface rust brown (6E8) at the disc, pale orange (5A3) elsewhere, brownish grey (5D2) at extreme margin; margin sulcate striate for a short distance, becoming eroded. Lamellae free, remote from the stipe, pale yellow (3A3), becoming green, ≤ 20 mm broad, moderately crowded, with lamellulae of five different lengths. Stipe 90–140 \times 10–13 mm, cylindrical, expanding below, ≤ 30 mm diam.; surface whitish, then oak brown (5D6), silky and glabrous. Annulus superior, attached to the upper third of the stipe, later mobile, thick, fleshy, double. Context of pileus ≤ 12 mm thick at the disc, floccose, pale pinkish, cinnamon. Basidiospores (10.9 \pm 0.8 \times 7.4 \pm 0.5), (6)9–11.5(12.5) \times (4.5)6–8(8.5) μm , Q = 1.5, ellipsoid, apically truncated by a broad germ pore, wall smooth, apparently 3 layered, greenish in KOH, dextrinoid, usually containing a single, large, verdigris green guttule. Clamp-connections present.

Specimens examined – India, Karnataka State, Kodagu district, Uppangala Forest, on soil, solitary, scattered, 25 June 2001, coll. Senthil. (Herb. MUBL 3470), Manaduka Forest, 11 August 2010, (MCI 1394).

Notes – Species of *Chlorophyllum* Masee form large, fleshy, basidiomes that are easily recognized in the field and quite often misidentified with another fleshy species of *Macrolepiota* s.str. *Chlorophyllum* differs macroscopically in having smooth stipe and microscopically having hymenidermal pileipellis and basidiospores without or with a germ pore caused by a depression in the episporium rather than coloured, banded, squamulose stipe, trichodermal pileipellis and a germ pore caused by a hyaline covering as in *Macrolepiota* s.str. Based on molecular phylogeny several species that were previously described in *Macrolepiota* Singer, *M. abruptibulba* (R. Heim) Heinem., *M. alborubescens* (Hongo) Hongo, *M. bohémica* (Wichanský) Krieglst. & Pázmány, *M. globosa* Mossebo, *M. neomastoidea* (Hongo) Hongo, *M. olivieri* (Barla) Wasser and *M. rachodes* (Vittad.) Singer were transferred to *Chlorophyllum* (Vellinga 2002). *Chlorophyllum molybdites* a tropical and subtropical species has been widely reported from different regions of India. The distinguishing characters of *C. molybdites* are the larger basidiomes having scaly pileus, free, whitish lamellae, becoming greenish with age, movable, thick annulus, elongated, thick, smooth stipe and larger, three layered, greenish, dextrinoid spores with a broad germ pore. *Chlorophyllum rachodes* (Vittad.) Vellinga a closely related species differs from *C. molybdites* in having whitish to brownish lamellae, not becoming green with age and a thick stipe with abruptly bulbous base. *Chlorophyllum molybdites* is being reported for the first time from Western Ghats of Karnataka.

Known distribution – **KARNATAKA**, Bangalore (Pushpa & Purushothama 2012); Mangalore, Konaje village (Greeshma et al. 2015); **KERALA**, Ernakulam; Thrissur; Idukki; Thiruvananthapuram (Sankaran & Florence 1995, Florence & Yesodharan 1997, 2000, Bhavanidevi 1998, Mohan 2003, Florence 2004, Pradeep & Vrinda 2007, Mohan 2011, Vrinda & Pradeep 2011); **MAHARASHTRA**, Pune (Sathe & Rahalkar 1976, Sathe & Deshpande 1980, Sathe & Deshpande 1982); Kolhapur (Patil & Thite 1978); Amravathi (Hedawoo 2010); **TAMIL NADU**, Chennai, Madras University Campus (Natarajan & Manjula 1981); **Uttar Pradesh**, Lucknow (Ghosh et al. 1976); Allahabad (Singh & Mehrotra 1974).

Crepidotus payettensis Hesler & A.H. Smith., North American species of *Crepidotus*: 88 (1965)

Fig. 1d

Pileus 10–25 mm diam., dimidiate to flabelliform, thin; surface light orange (5A4) near attachment, brownish orange (6C8) elsewhere, moist, smooth, glabrous; margin regular, entire, translucent striate to sulcate striate. Lamellae adnate, apricot yellow (5B6), ≤ 5 mm broad, moderately

spaced with lamellulae of three lengths; edge concolorous, entire. Stipe absent. Attachment lateral, basal mycelium present. Context white, thin, neither duplex nor gelatinized. Basidiospores ($6.8 \pm 0.5 \times 5.5 \pm 0.4$), (5.5) $6-7.5$ (8.5) \times (3.5) $4.5-6$ (6.5) μm , $Q = 1.23$, subvoid to broadly ellipsoid, with a brown, thickened wall, bearing distinct echinulae, with single large, refractive guttule. Clamp-connections present.

Specimens examined – India, Karnataka State, Kodagu district, Uppangala Forest, on twigs, scattered, gregarious, 20 June 2002, coll. Senthil. (Herb MUBL 3488).

Notes – The diagnostic features of *C. payettensis* are the dimidiate, sessile basidiomes having brownish orange, smooth pileus lacking fibrillose hairs, subvoid to ellipsoid basidiospores and presence of clamp-connections. *Crepidotus payettensis* is a North American species described by Hesler & Smith (1965). The present collection can be placed in the section *Fulvidi* Hesler & Smith (lacking pleurocystidia) of the subgenus *Dochmiopus* (Pat.) Pilát (having ellipsoid spores and presence of clamp connections) of *Crepidotus* and the phenotypic characters agree with the description of *C. payettensis* (Hesler & Smith 1965). Although this is a temperate species, this has also been reported from Guangdong Province of China (Bi et al. 1993). *Crepidotus kauffmanii* Hesler & A.H. Sm. (Hesler & Smith 1965) closely resembles *C. payettensis* in all the characters but differs in basidiomes having light buff to fawn to tawny olive pileus, bearing dense avellaneous to wood brown to vinaceous cinnamon fibrils and presence of brown, incrustated epicuticular hyphae, whereas, *C. payettensis* has smooth pileus with repent cuticular layer consisting of thin-walled, hyaline hyphae. *Crepidotus payettensis* is being reported for the first time from India.

Known distribution – Karnataka State, Kodagu district, Uppangala Forest

Cyptotrama asprata (Berk.) Redhead & Ginns, Can. J. Bot. 58(6): 731 (1980)

Fig. 1e

Pileus ≤ 16 mm diam., convex, shallowly, narrowly depressed at the center; surface uniformly golden yellow (4A5), covered by concolorous, crowded, furfuraceous to granular squamules. Lamellae adnate, white, crowded, ≤ 2 mm broad, with lamellulae of three different lengths. Stipe 20×2 mm, equal, cylindrical; surface concolorous with the pileus to pale yellow (5A4), covered by concolorous, superficial squamules. Veil fugacious, white. Context thin, white. Basidiospores ($7.9 \pm 0.7 \times 4.8 \pm 0.8$), (7) $8-9$ (9.5) \times (4) $4.5-5$ (6) μm , $Q = 1.6$, oblong-limoniform with an attenuate apex, hyaline, thin-walled, containing a single, large refractive guttule.

Specimens examined – India, Karnataka State, Kodagu district, Uppangala Forest, on twigs, solitary, 27 June 2001, coll. Senthil. (Herb. MUBL 3450).

Notes – *Cyptotrama asprata* is a pantropical, saprophytic species growing on twigs or wood and widely distributed in tropical regions. The diagnostic features of the present collection are the convex, uniformly golden yellow pileus and stipe, covered by dark orange, furfuraceous to granular squamules, presence of oblong-limoniform spores with an attenuate apex. Further, the pileal surface is a disrupted trichodermial palisade formed by branching chains of cylindrical-clavate to globose elements with thick, golden brown wall. The spore size is very variable in *C. asprata* (Redhead & Ginns 1980). The dimension of the basidiospores of the present collection falls well within the range ($7.5-10 \times 5-7.5$ μm) reported by Pegler (1977) as *Xerulina asprata* (Berk.) Pegler. *Cyptotrama asprata* is being reported for the first time from Karnataka.

Known distribution – **KERALA**, Idukki, Pampadumshola, Malapuram, Chandhakkunnu, Wayanad, Kuruva (Mohan 2011); **TAMIL NADU**, Kodaikanal (Manjula 1983).

Cystoagaricus trisulphuratus (Berk.) Singer, Mycologia 39(1): 87 (1947)

Fig. 2b

Pileus $10-30$ mm diam., convex; surface reddish orange (7A8), covered by thick, small, flocculose, imbricate, appressed squamules, concolorous with the pileus; margin at first involute, strongly appendiculate, with velar remnants. Lamellae free, pale pinkish, becoming dark vinaceous brown (8D4), ≤ 5 mm broad, crowded. Stipe $10-55 \times 1-3$ mm, equal, cylindrical, fistulose; surface concolorous with the pileus below the annulus, light orange (5A4) above, covered by the pulverulent veil. Annulus superior, attached to the upper quarter of the stipe, floccose, fugacious. Context $1-2$ mm thick at the disc. Basidiospores ($5.3 \pm 0.5 \times 3.7 \pm 0.2$), (4) $5-6$ (7) \times (3) $3.5-4$ (4.5) μm , $Q = 1.4$, ellipsoid, adaxially applanate, fairly thick-walled, bistre brown.

Specimens examined – India, Karnataka State, Kodagu district, Manaduka Forest, soil, solitary, scattered 23 June 2001, coll. Senthil. (Herb. MUBL No. 3474), Sirsi, 10 October 2012, (MCI 1372).

Notes – *Cystoagaricus trisulphuratus* (*Psathyrellaceae* Vilgalys, Moncalvo & Redhead) earlier reported as *Agaricus trisulphuratus* Berk. in *Agaricaceae* Chevall. can easily be distinguished in the field itself by small basidiomes having reddish orange pileus and stipe with well developed, concolorous, detersile universal veil on both the pileal and stipe surfaces and indistinct, floccose annulus at the apex of the stipe. *Cystoagaricus trisulphuratus* differs from its morphologically closest taxon *Agaricus crocopeplus* Berk. & Broome (*Agaricaceae*) in the absence of distinct annulus, brown spores with slightly irregular outline and presence of clamp connections.

Known distribution – **KARNATAKA**, Bangalore (Pushpa & Purushothama 2012 as *Agaricus trisulphuratus* Berk.); Mangalore (Ghate et al. 2014); Konaje Village (Greeshma et al. 2015 as *Agaricus crocopeplus*); **KERALA**, Malappuram; Thiruvananthapuram; Alapuzha; Palakkad; Kollam (Pradeep & Vrinda 2007 as *Agaricus trisulphuratus*); Wayanad, Thirunelly; Nilambur, Chandhakkunnu (Mohanan 2011); **MAHARASHTRA**, Pune (Sathe & Deshpande 1982); Mulshi (Senthilarasu 2014); Ratnagiri (Borkar et al. 2015 as *Agaricus trisulphuratus*); **PUNJAB**, Patiala, Punjabi University (Saini et al. 1991, Atri et al. 2001), Fatehgarh Sahib, Aam Khas Bagh (Atri et al. 2001); **TAMIL NADU**, Chennai (Natarajan & Manjula 1981); Villupuram, Pichandikulam Forest; Oorani Forest (Mani & Kumaresan 2009); **UTTAR PRADESH**, Dehra Dun (Bakshi 1974); **WEST BENGAL** Calcutta (Bakshi 1974 as *Agaricus trisulphuratus*); (Pradhan et al. 2013 as *Agaricus trisulphuratus*).

Hygrocybe acutoconica (Clem.) Singer, Lilloa 22: 153 (1951) [1949]

Fig. 2a

Pileus 15–70 mm diam., conical, becoming convex, then expanding to plane, but retaining an acute umbo; surface high red (9A8) at the center, reddish orange (7A8) elsewhere when young, Persian orange (6A7) to deep orange (6A8) in the center, yolk yellow (4B8) elsewhere at maturity, smooth, silky fibrillose, striate at the margin; margin splitting irregularly with age. Lamellae adnexed, at first butter yellow (4A5), then yellowish white (3A2), ≤12 mm broad, subdistant. Stipe 40–80 × 4–7 mm, slender, cylindric to compressed; surface uniformly melon yellow (5A6) to chrome yellow (3A8), becoming whitish towards the base at maturity, smooth. Basidiospores (8.5±0.7 × 4.6±0.4), (7)7.5–9.5(10.5) × 4–5(6) μm, Q = 1.84, broadly ellipsoid, hyaline, inamyloid, thin-walled, often containing numerous, minute, refractive guttules.

Specimens examined – India, Karnataka State, Kodagu district, Manaduka Forest, on ground, solitary to scattered, gregarious, 2 June 2002, coll. Senthil. (Herb. MUBL 3425).

Notes – *Hygrocybe acutoconica* is a very distinctive species by its small to medium sized, non blackening basidiome having red to deep orange, acute pileus, yellow to yellowish white, adnexed lamellae and yellow to orange yellow stipe with white base. The fresh specimens of *Hygrocybe cuspidata* (Peck) Murrill differs from *H. acutoconica* in having blood red, viscid pileus. However, when faded, species of *H. cuspidata* are not distinguishable from *H. acutoconica* even in herbarium specimens unless the red colour is retained by the pileus (Hesler & Smith 1963). The spore dimensions of Karnataka collections fall within the range of Kerala collections (Leelavathy et al. 2006) but smaller (9–15 × 5–9 vs 7–10.5 × 4–6 μm) than the collections described as *Hygrophorus acutoconicus* var. *acutoconicus* (Clem.) A.H. Sm. by Hesler & Smith (1963). *Hygrocybe acutoconica* is being reported for the first time from Western Ghats of Karnataka.

Known distribution – **KERALA**, Thiruvananthapuram (Vrinda et al. 1995 as *H. konradii* R. Haller Aar.); Malappuram, Calicut University Campus (Leelavathy et al. 2006 as *H. acutoconica* var. *acutoconica* (Clem.) Singer); Wayanad, Chandhanathodu (Mohanan 2011 as *H. acutoconica* var. *acutoconica*).

Hygrocybe alwisii (Berk. & Broome) Pegler, Kew Bull., Addit. Ser. 12: 66 (1986)

Fig. 2d

Pileus 20–65 mm diam., conic, becoming convex, retaining umbo; surface uniformly yellowish white (2A2), smooth. Lamellae adnexed, whitish. Stipe 50–70 × 3–7 mm, cylindric, white, smooth. Basidiospores dimorphous: macrospores (7.3±0.5 × 6.5±0.2), (6)7–8(9) × (5)5.5–6.5(8), μm, Q = 1.12, subglobose to broadly ellipsoid, hyaline, thin-walled with single, large refractive guttule;

microspores ($5.5\pm 0.5 \times 4.2\pm 0.3$), $4-6(6.5) \times 3-4(4.5)$ μm , $Q = 1.3$, ellipsoid to broadly ellipsoid, similar to macrospores.

Specimens examined – India, Karnataka State, Kodagu district, Manaduka Forest, on ground, solitary to scattered, 22 June 2001, coll. Senthil. (Herb. MUBL 3426), 11 August 2010, (MCI 1374).

Notes – The small to medium sized, shiny, white basidiomes of *H. alwisii* are easily recognized in the field. *Hygrocybe alwisii* macroscopically resembles *H. incolor* Pegler (Pegler 1976) in almost similar sized and coloured basidiome, but differs microscopically in having dimorphous spores and basidia. *Hygrocybe alwisii* is being reported for the first time from Karnataka State. The species reported without taxonomic description as *H. alwisii* by Ghate & Sridhar (2015) from mangrove forests of Mangalore, Karnataka appears to be a different species.

Distribution – **KERALA**, Thiruvananthapuram; Malappuram; Wayanad; Palakkad; Kollam (Vrinda et al. 1996, Leelavathy et al. 2006, Pradeep & Vrinda 2007, Mohanan 2011); **MAHARASHTRA**, Pune, Pune University Campus; Mulshi (Senthilarasu 2014).

Hygrocybe astatogala (R. Heim) Heinem., Bull. Jard. Bot. Étât Brux. 33(2): 436 (1963) Fig. 2c

Pileus 45 mm diam., acutely conical, with pointed umbo, ≤ 40 mm high; surface uniformly deep red (10C8) to brownish red (10D8), yellowish white (4A2) at extreme margin, covered by appressed, blackish fibrils, shiny, viscid when wet, pellucid striate; margin crisped, becoming eroded, blackening. Lamellae free to adnexed, pale yellow (3A3), becoming black, crowded with lamellulae of different lengths, finely eroded. Stipe 100×7 mm, cylindrical, slightly tapering towards apex; surface whitish to yellowish white (2A2, 3A2) below, grayish yellow (2B3, 2B4) to dull yellow (3B3) above, smooth, becoming black on bruising or on injury. Pileus context ≤ 4.5 mm thick near stipe, yellowish, becoming black. Basidiospores ($9.3\pm 0.4 \times 6.4\pm 0.1$), $(7)8-10(10.5) \times (5.5)6-7$ μm , $Q = 1.46$, ellipsoid to broadly ellipsoid, hyaline, thin-walled with numerous guttules.

Specimens examined – India, Karnataka State, Uttara Kannada district, Sirsi, dipterocarp forest, on soil, solitary, 10 October 2012, coll. Senthil. (MCI 1375).

Notes – *Hygrocybe astatogala* is a bright coloured species that can easily be identified in the field by small to medium sized basidiomes having conic to conico-convex, bright red to reddish brown, shiny pileus, yellow lamellae, yellow to yellowish orange stipe, pileus and stipe covered by blackish fibrils and all the tissues becoming black on bruising. *Hygrocybe astatogala* has usually subglobose spores. However, the shape of the spore is dependent on type of the substratum (Monks 1989, Young & Mills 2002). The present collection has ellipsoid to broadly ellipsoid spores similar to *H. astatogala* reported from Kerala (Leelavathy et al. 2006) and Maharashtra (Senthilarasu 2014). *Hygrocybe conica* (Schaeff.) P. Kumm. the closest nigrescent species macroscopically differs in lacking blackish fibrils on pileus and stipe and *H. acutoconica* differs in non blackening basidiomes lacking blackish fibrils.

Known distribution – **KARNATAKA**, Mangalore, Konaje Village (Greeshma et al. 2015); **KERALA**, Malappuram, Calicut University Campus (Leelavathy et al. 2006); Wayanad, Begur, Kuruva; Trissur, Peechi (Mohanan 2011); **MAHARASHTRA**, Mahabaleshwar, Lingamala Falls (Senthilarasu 2014); Sindhudurg; Raigad; Thane; Ratnagiri (Borkar et al. 2015 as *Hygrocybe conica*).

Hypholoma subviride (Berk. & M.A. Curtis) Dennis, Kew Bull. 15(1): 134 (1961) Fig. 2e

Pileus 5–25 mm diam., convex, expanding to plane, broadly umbonate; surface uniformly spring green (30C7) when young, grayish orange (5B4) at the disc, spring green (30C7) elsewhere at maturity, smooth, dry, glabrous; margin regular, decurved, not-striate. Lamellae adnate, moderately close, spring green (30C7) to pale yellow (4A3), becoming yellowish brown, narrow, ≤ 2 mm broad, with few lamellulae of two lengths. Stipe 5–15 \times 1–2 mm, equal, cylindric, hollow; surface concolorous with the lamellae, slender, smooth. Context thin, pale. Basidiospores ($5.7\pm 0.5 \times 3.4\pm 0.3$), $(4.5)5-6(7.5) \times (2.5)3.5-4(4.5)$ μm , $Q = 1.6$, elongate to ellipsoid, yellowish brown, smooth, apically truncated by a broad germ-pore, with a thick complex wall, with one to few refractive guttules.



Fig. 2 – Basidiomes in their natural habitat. a, *Hygrocybe acutoconica*. b, *Cystoagaricus trisulphuratus*. c, *Hygrocybe astatogala*. d, *Hygrocybe alwisii*. e, *Hypholoma subviride*.

Specimens examined – India, Karnataka State, Kodagu district, Uppangala Forest, tree trunk, dead wood, completely decayed wood, caespitose to connate, 22 June 2001, coll. Senthil. (Herb. MUBL No. 3477), 11 August 2010 (MCI 1382).

Notes – The species of *Hypholoma* (Fr.) P. Kumm. (*Strophariaceae* Singer & A.H. Smith) earlier placed in *Naematoloma* P. Karst. are small to medium sized mushrooms distributed from temperate to tropical regions, growing gregariously on dead wood logs, stumps, decayed woods, tree trunks, and soil near logs, among Sphagnum mosses, swamps, and marshes (Singer 1986). The valid name of *H. subviride* is in dispute. Current name of *H. subviride* is *H. fasciculare* (Huds.) P. Kumm. (www.indexfungorum.org). However, examination of several collections from Brazil by Cortez & Silveira (2007) revealed, *H. fasciculare* morphologically clearly distinguished from *H. subviride* in having larger pileus (10–70 mm, Cortez & Silveira 2007; 20–80 mm, Bessette et al. 1997) and stipe (30–100 × 4–10 mm Cortez & Silveira 2007; 50–120 mm × 3–10 mm, Bessette et al. 1997), little developed veil on pileal surface and having a blackish, faint annular zone at the stipe apex. Further, the phylogenetic analysis by Moncalvo et al. (2002) and Ramírez-Cruz et al. (2013) resulted that these two species are distinct but closely related. Hence the name *H. subviride* is retained here.

The characteristic features of this collection are the smaller, brightly coloured basidiomes having spring green pileus with grayish orange disc, spring green to yellowish lamellae with concolorous stipe, and spores with truncate germ pore. This species is being reported for the first time from Western Ghats of Karnataka.

Known distribution – **KERALA**, Ernakulam, Perumbavoor, Iringole Kavu (Mohanan 2011); **TAMIL NADU**, Nilgiris, Lovedale; Naduvattum (Natarajan & Raman 1983 as *Naematoloma subviride* (Berk. & M.A. Curtis) A.H. Sm.).

Lactocollybia epia (Berk. & Broome) Pegler, Kew Bull., Addit. Ser. 12: 77 (1986) Fig. 3a

Pileus 10–20 mm diam., convex, expanding to plane; surface uniformly white, smooth, glabrous; margin entire, translucent striate. Lamellae adnate, white, crowded with numerous lamellulae. Stipe 10–25 × 1–2 mm, central to eccentric; surface white, smooth. Context thin, white. Basidiospores (7.0±0.4 × 3.7±0.2), (6)6.5–7.5(8) × (3)3.5–4.5 µm, Q = 1.89, elongate, broadly amygdaliform, hyaline, thin-walled, smooth, inamyloid, containing a few refractive guttules.

Specimens examined – India, Karnataka State, Kodagu district, Uppangala Forest, scattered on tree trunk and twigs, 27 June 2002, coll. Senthil. (Herb. MUBL 3432), Manaduka, 11 August 2010, (MCI 1380).

Notes – *Lactocollybia* Singer is a common tropical genus and the species are mostly distributed in southern hemisphere, extended to North America and grows gregariously or scattered on living tree trunks, barks and at the base of the stumps. The diagnostic features of *L. epia* are the small, uniformly whitish basidiomes having amygdaliform spores and abundant gloecystidia on the sides of the lamellae and presence of extensive gloecosystem in the pileal context and gill trama. The spore dimensions of the Karnataka collections are almost similar to *L. microspora* Singer (5.5–7 × 3–5 µm, Cortez & Sulzbacher 2009) and *L. aequatoriales* Singer (6–9 × 2.5–4.5 µm, Cortez & Sulzbacher 2009) and smaller than the collections of *L. epia* from East Africa (7.5–11.5 × 3.2–6 µm, Pegler 1977 as *L. angiospermarum* Singer), South Africa (6.2–9 × 4.2–5 µm, Reid & Eicker 1998), Sri Lanka (7.5–9.5 × 3.5–5 µm, Pegler 1986) and Brazil (7.5–11 × 4.2–5 µm, Cortez & Sulzbacher 2009). *Lactocollybia microspora* and *L. aequatoriales* differ from *L. epia* in having ellipsoid spores. *Lactocollybia piliicystis* D.A. Reid & Eicker and *L. variicystis* D.A. Reid & Eicker closely resemble *L. epia* in growth habit and having small amygdaliform spores. However, *L. epia* microscopically differs from the formers in having cylindrico-clavate cheilocystidia rather than lageniform cheilocystidia with long neck. *Lactocollybia epia* is being reported for the first time from Western Ghats of Karnataka.

Known distribution – **KERALA**, Wayanad, Begur, Kuruva; Thirunelli, Brahmagiri (Mohanan 2011); **MAHARASHTRA**, Pune, Pune University Campus; Agarkar Research Institute Campus; Mulshi (Senthilarasu 2014); **UTTAR PRADESH**, Varanasi (Tewari & Singh 1973 as *L. angiospermarum*).

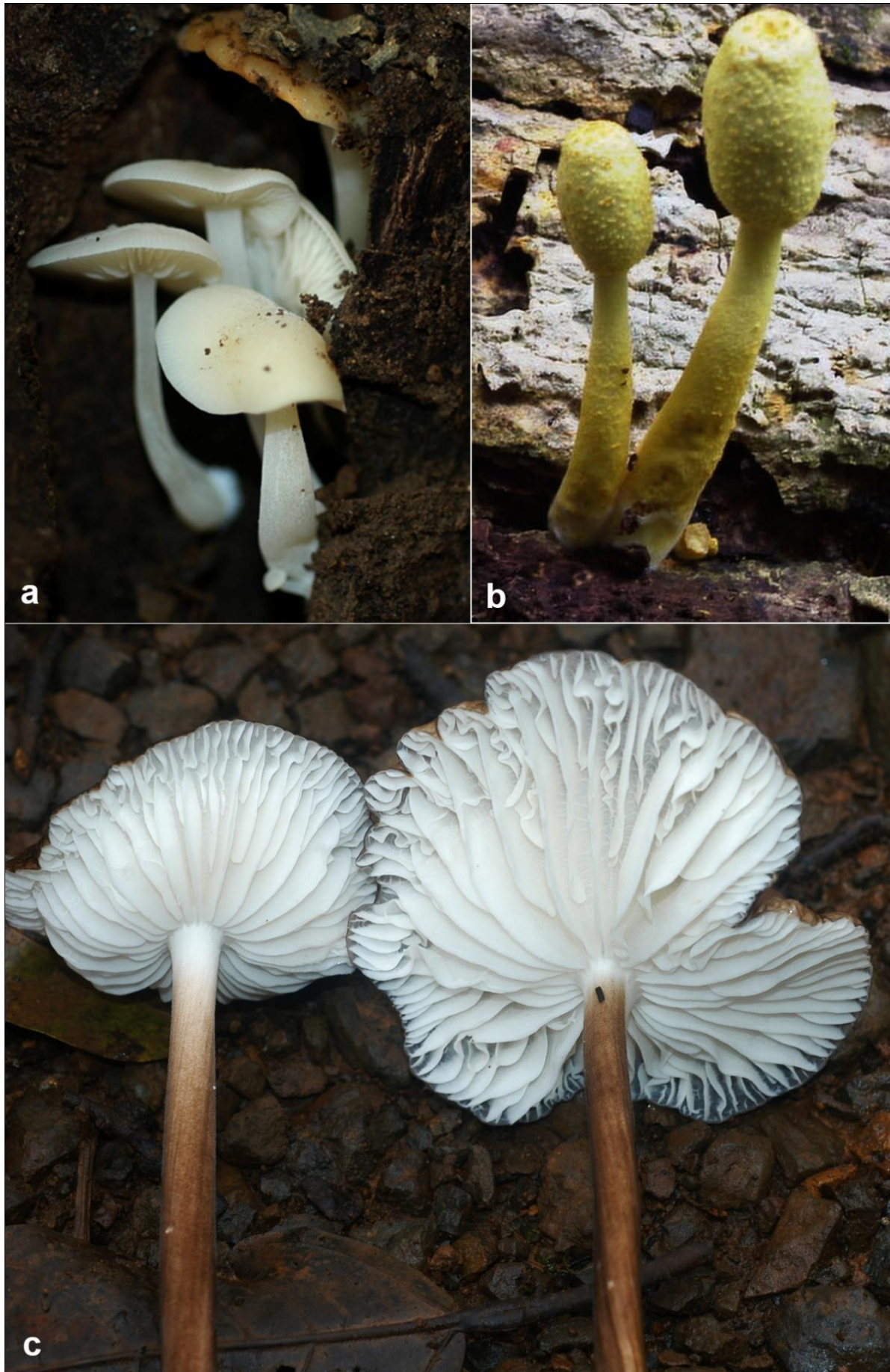


Fig. 3 – Basidiomes in their natural habitat. a, *Lactocollybia epia*. b, *Leucocoprinus birnbaumii*. c, *Oudemansiella furfuracea*.

Leucocoprinus birnbaumii (Corda) Singer, Sydowia 15 (1-6): 67 (1962) [1961]

Fig. 3b

Pileus 20–35 mm diam., ovoid then conical; surface prime butter yellow (4A5) at the disc, prime rose yellow (1A6) elsewhere, bearing loose scattered, deep yellow (1A6) floccose squamules; margin thin, sulcate striate, half-way to the disc. Lamellae free, sulphur yellow (1A5), crowded, with lamellulae of different lengths. Stipe 70–95 × 7–9 mm, cylindrical, expanding to clavate bulbous base ≤10 mm diam.; surface concolorous with the pileus, smooth. Annulus membranous, fugacious. Context thin, concolorous with the pileus. Basidiospores (9.8±0.8 × 6.2±0.3), (8)9–10(11) × 5.5–7(7.5) μm, Q = 1.58, ellipsoid, truncated at the apex by a small but distinct germ pore, hyaline, dextrinoid, strongly metachromatic, with a complex wall.

Specimens examined – India, Karnataka State, Kodagu district, Uppangala Forest, on wood, solitary, scattered, 8 June 2002, coll. Senthil. (Herb. MUBL No. 3473).

Notes – *Leucocoprinus birnbaumii* that grows on buried wood in soil or well decayed wood can easily be distinguished in the forest by small to medium sized, bright yellow basidiomes covered by concolorous, minute, flocculose squamules. *Leucocoprinus birnbaumii* is a common species distributed throughout the tropical and subtropical regions. *Leucocoprinus straminellus* (Bagl.) Narducci & Caroti resembles *L. birnbaumii* in having similar sized and coloured basidiomes (light yellow pileus with concolorous stipe), however, the former differs from *L. birnbaumii* in having smaller basidiospores without germ pore and the pileus covering by globose elements rather than a repent epicutis of radially arranged, parallel, thin-walled, branched chains of, hyaline hyphal elements as in *L. birnbaumii*. Another yellow species *Leucoagaricus sulphurellus* (Pegler) Akers (Akers et al. 2000) earlier described as *Leucocoprinus sulphurellus* Pegler that morphologically resembles *L. birnbaumii* can be distinguished by yellow pileus lacking sulcate striate margin, pileus and gills that become blue to green on bruising, and ellipsoid to ovoid, weakly dextrinoid, smaller basidiospores (5.1–6.5 × 3.8–4.3 μm, Akers et al. 2000) with small germ pore.

Known distribution – **ANDHRA PRADESH**, Krishna, Machilipatnam [Berkeley 1867 as *Agaricus allicinus* Schumach. (as *allicens*)]; **KARNATAKA**, Bangalore, Janabharathi (Pushpa & Purushothama 2011, 2012); Dakshina Kannada, Mangalore, cashew plantation (Karun & Sridhar 2014); **KERALA**, Ernakulam, Perumbavoor, Iringole Kavu; Wayanad, Brahmagiri (Mohanan 2011); Calicut, Puthiyangadi; Wayanad, Kalpetta; Malappuram, Calicut University Campus (Kumar & Manimohan 2009); Malappuram; Ernakulam; Thiruvananthapuram; Kozhikode; Wayanad; Idukki; Kollam (Sankaran & Florence 1995, Vrinda et al. 2003, Florence 2004, Vrinda & Pradeep 2011); **MAHARASHTRA**, Pune, Pune University Campus (Senthilarsu 2014); **ODISHA**, Cuttack (Dhancholia & Sinha 1990); **TAMIL NADU**, Chennai (Natarajan 1977 as *Leucocoprinus cepaestipes* (Sowerby) Pat.); Tambaram, Madras Christian College Campus, Raj Bhavan Campus (Natarajan & Manjula 1981); Uttar Pradesh, Saharanpur (Hennings 1901 as *Lepiota cepaestipes* var. *lutea* (Bolton) Sacc.); **WEST BENGAL**, South 24 Pargana, Kumirmari Island (Dutta et al. 2011); Sundarbans mangrove forest (Dutta et al. 2013); lateritic region of West Bengal (Pradhan et al. 2013).

Oudemansiella furfuracea (Peck) Zhu L. Yang, G.M. Muell., G. Kost & Rexer, Mycosystema, 28(1): 7 (2009)

Fig. 3c

Pileus 30–120 mm diam., plane, broadly subumbonate; surface camel brown (6C4) at the center, light brown (6D8) elsewhere, viscid, smooth; margin regular, translucent striate. Lamellae adnate with decurrent tooth, ≤10 mm broad, whitish, moderately spaced with lamellulae of four lengths; edge concolorous, smooth. Stipe 100–350 × 5–15 mm, cylindrical, equal, hollow; surface leather brown (6E6) above, whitish below, longitudinally striate, pruinose, with a tapering, subterranean, pseudorrhiza ≥70 mm long. Context thick, ≤5 mm broad, whitish. Basidiospores (14.1±0.9 × 11.1±0.8), (12.5)13.5–15(16.5) × (9)10–12.5(13) μm, Q = 1.2, broadly ellipsoid, hyaline, smooth, with slightly thickened wall, containing a single large oil guttule.

Specimens examined – India, Karnataka State, Kodagu district, Uppangala Forest, on ground, solitary to scattered, 21 June 2001, coll. Senthil. (Herb. MUBL 3438), 11 August 2010, (MCI 1379).

Notes – The *Xerula-Oudemansiella* complex has been phenotypically and phylogenetically critically rearranged in recent years (Wang et al. 2008, Yang et al 2009, Petersen & Hughes 2010). Initially, only three genera, *Oudemansiella* Speg. (Spegazzini 1881), *Mucidula* Pat. (Patouillard

1887) and *Xerula* Maire (Maire 1933) were proposed for *Xerula-Oudemansiella* complex based on *Agaricus platensis* Speg., *A. mucidus* Schrad.: Fr. and *A. longipes* Bull., respectively. Later, Moser (1955) merged *Mucidula* and *Xerula* into *Oudemansiella* and this assessment was followed by several authors who treated *Xerula* as a subgenus/section under *Oudemansiella* (Cléménçon 1979, Singer 1986, Pegler & Young 1987, Rexer & Kost 1989a, b, Yang & Zang 1993, Yang 2000, Mizuta 2006). However, Dörfelt (1979, 1980a, 1980b, 1981, 1983, 1984) elevated *Xerula* to generic level and retained *Oudemansiella* and *Xerula* as separate genera. Further, he significantly emended the genus *Xerula* and several species from *Oudemansiella* were transferred to *Xerula*. This concept was adopted by several mycologists (Boekhout & Bas 1986, Redhead et al. 1987, Petersen & Halling 1993, Petersen & Methven 1994, Corner 1994, 1996, Boekhout 1999, Halling & Mueller 1999, Contu 2000, Petersen 2000, Mueller et al. 2001, Petersen & Hughes 2005, Horak 2005, Petersen & Nagasawa 2006, Petersen & Baroni 2007, Petersen 2008a, 2008b, 2008c).

Recent phylogenetic analysis also confirmed that *Xerula* and *Oudemansiella* are separate genera. Further, the sections of *Oudemansiella* were critically reviewed (Wang et al. 2008, Yang et al. 2009, Petersen & Hughes 2010). Petersen & Hughes (2010) proposed eight genera including four new genera *Ponticulomyces* R.H. Petersen, *Hymenopellis* R.H. Petersen, *Protoxerula* R.H. Petersen, *Paraxerula* R.H. Petersen, *Dactylosporina* (Cléménçon) Dörfelt, *Mucidula* Pat., *Oudemansiella* Speg. and *Xerula* Maire based on morphological and molecular analysis. However, Vellinga (2010) stated that “recognition of non-monophyletic genera are problematic”. The recent phylogenetic analysis (Hao et al. 2014, Qin et al. 2014) also confirmed that *Xerula*, *Paraxerula*, *Oudemansiella* (comprising of *Ponticulomyces*, *Hymenopellis*, *Protoxerula*, *Dactylosporina*, *Mucidula* and *Cribbea* A.H. Sm. & D.A. Reid) and a recently described new genus, *Cibaomyces* Zhu L. Yang, Y.J. Hao & J. Qin (Hao et al. 2014) are distinct genera. As a result of all these studies the species of *Oudemansiella-Xerula* complex are distributed in *Xerula* s.str., *Paraxerula*, *Oudemansiella* s.l and *Cibaomyces*. Therefore, in this study, the present species is assigned as *Oudemansiella furfuracea* rather than *Hymenopellis furfuracea* (Peck) R.H. Petersen.

Oudemansiella furfuracea grows in caespitose or solitary to scattered on buried dead wood and is characterized by visid pileus, long radicated, furfuraceous stipe, lacking annulus, smooth spores, and ixohymeniderm pileipellis that lacking pileocystidia. The very closest taxon *Oudemansiella radicata* (Relhan) Singer differs from *O. furfuracea* in having smooth stipe.

Known distribution – **KERALA**, Thrissur, Peechi; Munnar, Pambadumshola (Mohan 2011 as *Xerula furfuracea* (Peck) Redhead, Ginns & Shoemaker).

Termitomyces clypeatus R. Heim, Bull. Jard. Bot. État Brux. 21: 207 (1951)

Fig. 4a

Pileus 50–70 mm diam., convex, with central, prominent, spiniform perforatorium; surface dark brown (6F7) at the center, cinnamon brown (6D6) elsewhere, dry, smooth, glabrous; margin decurved, entire, soon radially cracked, exposing white context. Lamellae free, ≤8 mm broad, white, crowded with lamellulae of different lengths. Stipe 70–125 × 8–10 mm; surface white, smooth, solid, cylindric, expanding below with swollen base, 15–20 mm diam., radicated, pseudorrhiza well developed. Annulus absent. Context ≤9 mm thick at the disc. Basidiospores (7.1±0.71 × 4.4±0.47), (5)6–7.5(8) × (3.5)4–4.6(5) μm, Q = 1.58, short ellipsoid, smooth, hyaline, inamyloid, thin-walled, with a single large guttule.

Specimens examined – India, Karnataka State, Kodagu district, Manaduka Forest, on ground, solitary, 23 June 2001, coll. Senthil. (Herb. MUBL 3457), Uppangala Forest, 11 August 2010, (MCI 1384).

Notes – The characteristic features of the present collection are the medium sized basidiomes having brownish, smooth, glabrous pileus with sharp spiniform perforatorium at the disc, and smooth stipe with long hypogean white pseudorrhiza. The species of *Termitomyces* are mainly differed by their morphological characters. *Termitomyces clypeatus* phenotypically closely resembles the other *Termitomyces* species *T. heimii* Natarajan, *T. mammiformis* R. Heim, *T. aurantiacus* (R. Heim) R. Heim and *T. striatus* (Beeli) R. Heim in having medium sized basidiomes (pileus >50 to <100 mm diam.) with white to cream to pale greyish pseudorrhiza. However, *T. striatus* has white to cream to greyish white pileus, and *T. aurantiacus* has golden orange to reddish brown pileus. *Termitomyces*

heimii and *T. mammiformis* differ from *T. clypeatus* in having squamulose pileus and stipe, persistent, double ringed annulus and leathery, hollow pseudorhiza. Further *T. heimii* has coarse, obtuse perforatorium, and *T. mammiformis* has scrobiculate, mammiform perforatorium, whereas, *T. clypeatus* has smooth, spiniform perforatorium.

Known distribution – **KARNATAKA**, Bangalore (Pushpa & Purushothama 2012); Dakshina Kannada, Mangalore, Konaje village, Areca plantations; Kodagu, B'Shettigeri; V. Badaga; Kottoli; Mythadi; Virajpet (Pahlevanlo & Janardhana 2012, Karun & Sridhar 2013); **KERALA**, Nilambur, Chandhakkunnu; Trissur, Peechi and Kuthiran; Palode, Arippa; Wayanad, Bavali road (Mohanan 2011); Malappuram; Trissur; Kollam; Wayanad; Thiruvananthapuram; Ernakulam; Palakkad (Leelavathy et al. 1983, Pradeep & Vrinda 2007, Varghese et al. 2010); **HIMACHAL PRADESH**, Solan (Sharma et al. 1977); **MAHARASHTRA**, Kanakeshwar (Patil et al. 1979); **TAMIL NADU**, Chennai, Madras University Campus (Natarajan 1975); **WEST BENGAL** (Pradhan et al. 2012, Dutta & Acharya 2014); Sundarbans mangrove forest (Dutta et al. 2013); Santiniketan (Bhattacharya et al. 1986); lateritic region of West Bengal (Pradhan et al. 2013).

Termitomyces microcarpus (Berk. & Broome) R. Heim, Arch. Mus. Hist. Nat. Paris, ser. 6 **18**: 128 (1942) Fig. 4b

Pileus 5–19 mm diam., initially conic, 7–9 mm high, becoming convex, finally appanate, often umbonate with a papillate projection; surface yellowish white (4A2) at the disc, white elsewhere, smooth, glabrous; margin decurved, soon plane, crisped, becoming rimose to eroded with age. Lamellae adnexed, white, ≤ 1 mm wide near the disc, moderately crowded with lamellulae of different lengths. Stipe 60–80 \times 1–2 mm, cylindric, slightly tapering towards apex, solid, slender, lacking pseudorhiza; surface white to yellowish white (4A2), smooth, glabrous. Annulus absent. Context thin, ≤ 1 mm thick at the disc. Basidiospores (5.4 \pm 0.4 \times 3.5 \pm 0.3), (4.5)5–5.5(6) \times 3–3.5(4.5) μ m, Q = 1.54 short ellipsoid, smooth, hyaline, thin-walled, with a single large guttule.

Collections examined – India, Karnataka, Kodagu district, Manaduka Forest, soil, gregarious to caespitose, June 2002, Senthil. (MUBL 3458), Uttara Kannada, Sirsi, December 2012, (MCI 1387).

Notes – *Termitomyces microcarpus* is one of the smallest species in the genus *Termitomyces* growing gregariously and can be distinguished by white basidiomes having papillate projection at the disc and lacking long, hypogaeal pseudorhiza. *Termitomyces microcarpus* closely resembles *T. medius* R. Heim & Grassé, *T. entolomoides* R. Heim, *T. radicans* Natarajan and *T. tylerianus* Otieno in having similar sized, small basidiomes (5–35(45) mm diam. pileus). However, *T. microcarpus* differs from its closest allies in lacking long hypogaeal pseudorhiza. In addition, *T. medius* has grayish cream pileus, *T. tylerianus* has yellow to pale yellow pileus with brown center, *T. radicans* (Natarajan 1977) has orange white to orange grey pileus with brown perforatorium and *T. entolomoides* has blackish grey center with bluish tinted pileus.

Known distribution – **ANDHRA PRADESH**, Nellore (Pegler & Vanhaecke 1994); **GUJARAT** (Lahiri et al. 2010); **HIMACHAL PRADESH**, Kasuli (Pegler & Vanhaecke 1994, Kumari et al. 2012); **KARNATAKA**, Bangalore (Pushpa & Purushothama 2012); Kodagu, Sampaje; Kottoli; Bramhagiri wild life sanctuary; Dubare (Karun & Sridhar 2013); **KERALA**, Nilambur, Chandakkunnu; Thrissur, Peechi; Kuthiran; Wadakkancherry, Potta (Mohanan 2011); Ernakulam; Trissur; Malappuram; Idukki; Thiruvananthapuram, Vellayani; Kollam; Wayanad (Sathe & Daniel 1980 as *Podabrella microcarpa* (Berk. & Broome) Singer, Leelavathy et al. 1983, Pegler & Vanhaecke 1994, Sankaran & Florence 1995, Florence & Yesodharan 1997, 2000, Mohanan 2003, Florence 2004, Pradeep & Vrinda 2007, Varghese et al. 2010); **Madhya Pradesh**, Gwalior (Chaubey et al. 2010); **MAHARASHTRA**, Pune (Patil et al. 1979); Agharkar Research Institute Campus (Senthilarasu 2014); Thane; Sindhudurg; Ratnagiri (Borkar et al. 2015); **MEGHALAYA**, Shillong, Bishupur (Pegler & Vanhaecke 1994); **PUNJAB**, Chandigarh (Rawla et al. 1983, as *T. microcarpus* f. *santalensis* R. Heim); Ludiana (Pegler & Vanhaecke 1994); Patiala, Punjabi University Campus (Atri et al. 1995); **TAMIL NADU**, Chennai, Madras University Campus (Natarajan 1975); Tirunelveli, Mundanthurai sanctuary (Natarajan & Raman 1981 as *T. microcarpus* f. *elongatus* R. Heim), Villupuram, Pichandikulam Forest (Mani & Kumaresan 2009 as *Termitomyces* sp. 2); Kanyakumari, Vellambi

hills (Sargunam et al. 2012); **TRIPURA**, Agartala (Pegler & Vanhaecke 1994); **Uttarakhand**, Pauri; Kanda; Dehradun (Semwal et al. 2014); **WEST BENGAL**, (Pradhan et al. 2012, Dutta & Acharya 2014); Sundarbans mangrove forest (Dutta et al. 2013); Santiniketan (Bhattacharya et al. 1986); lateritic region of West Bengal (Pradhan et al. 2013).



Fig. 4 – Basidiomes in their natural habitat. a – *Termitomyces clypeatus*. b, *T. microcarpus*.

Table List of gilled fungi reported from Western Ghats of Karnataka

Order/Family/Species	Place of collection	Reference
Agaricales Underw.		
Agaricaceae Chevall.		
<i>Agaricus bambusophilus</i> Heinem.	Jodpala, Kodagu	Natarajan & Purushothama (1994/1995)
<i>A. heinemanniensis</i> K. Natarajan & Purush.	Merkanja, Sullia	Natarajan & Purushothama (1994/1995)
<i>A. osecanus</i> Pilát	Jodpala, Kodagu	Natarajan & Purushothama (1994/1995) as <i>A. nivescens</i> F.H. Møller
<i>A. ustulatus</i> With.	Merkanja, Sullia	Natarajan & Purushothama (1994/1995)
<i>Chlorophyllum bharatense</i> Sathe & S.M. Kulk.	Londa	Sathe & Kulkarni 1980
<i>C. rachodes</i> (Vittad.) Vellinga	Shimoga	Swapna et al. 2008 as <i>Macrolepiota rachodes</i> (Vittad.) Singer (<i>Macrolepiota rhacodes</i> O.V.)
<i>C. shimogaense</i> Sathe & S.M. Kulk.	Shimoga	Sathe & Kulkarni 1980
<i>Coprinus calyptratus</i> Peck	Shimoga	Swapna et al. 2008
<i>C. sterquilinus</i> (Fr.) Fr.	Shimoga	Swapna et al. 2008
<i>Coprinopsis patouillardii</i> (Quél.) G. Moreno	Heggala-Thora, Virajpet, Kodagu	Karun & Sridhar 2015 as <i>Coprinus patouillardii</i> Quél.
<i>Cystolepiota seminuda</i> (Lasch)	Shimoga	Swapna et al. 2008

Order/Family/Species	Place of collection	Reference
Bon		
<i>Lepiota citrophylloides</i> Sathe & S.M. Kulk.	Castle rock	Sathe & Kulkarni 1980
<i>Leucoagaricus variisporus</i> Sathe & S.M. Kulk.	Baghmandla	Sathe & Kulkarni 1980
<i>L. sublittoralis</i> (Kühner ex Hora) Singer	Londa	Sathe & Kulkarni 1980 as <i>Leucoagaricus wichanskyi</i> var. <i>macrospora</i> Sathe & S.M. Kulk.
<i>Leucocoprinus cretaceus</i> (Bull.) Locq.	Shimoga	Swapna et al. 2008 as <i>Leucocoprinus crataceus</i> O.V.
<i>L. fragilissimus</i> (Ravenel ex Berk. M.A. Curtis) Pat.	Agumbe	Sathe & Kulkarni 1980
<i>Macrolepiota procera</i> (Scop.) Singer	Londa	Sathe & Kulkarni 1980
<i>Micropsalliota arginophaea</i> Heinem.	Guthigar, Suillia	Natarajan & Purushothama (1994/1995)
<i>M. bambusicola</i> (Heinem.) Heinem.	Kodagu	Natarajan & Purushothama (1994/1995)
<i>M. brunneola</i> Heinem.	Jodpala, Kodagu	Natarajan & Purushothama (1994/1995)
<i>M. brunneosperma</i> (Singer) Pegler	Londa	Sathe & Kulkarni 1980
<i>M. subarginea</i> Heinem.	Madenadu, Mercara	Natarajan & Purushothama (1994/1995)
Amanitaceae R. Heim ex Pouzar		
<i>Amanita angustilamellata</i> (Höhn.) Boedijn	Uppangala Forest, Kodagu	Natarajan et al. 2005b as <i>A. vaginata</i> (Bull.) Lam.
<i>A. antillana</i> Dennis	Uppangala Forest	Natarajan et al. 2005b
<i>A. bresadolana</i> Neville & Poumarat	Uppangala Forest	Natarajan et al. 2005b as <i>A. cinerea</i> Bres.
<i>A. hemibapha</i> (Berk. & Broome) Sacc.	Manaduka	Natarajan et al. 2005b as <i>A. hemibapha</i> var. <i>cystidiosa</i>
<i>A. sampajensis</i> Sathe & S.M. Kulk.	Sampaje	Sathe & Kulkarni 1980
Bolbitiaceae Singer		
<i>Conocybe pubescens</i> (Gillet) Kuhner	Makutta Reserve forest, Virajpet, Kodagu	Karun & Sridhar 2015
Cortinariaceae R. Heim ex Pouzar		
<i>Cortinarius causticus</i> Fr.	Uppangala Forest	Natarajan et al. 2005b
<i>Hebeloma indicum</i> (K.A. Thomas, Peintner, M.M. Moser & Manim.) B.J. Rees	Uppangala Forest	Natarajan et al. 2005b as <i>Anamika indica</i> K.A. Thomas, Peintner, M.M. Moser & Manim.
Entolomataceae Kotl. & Pouzar		
<i>Eccilia excentrica</i> Natarajan & Purush.	Guthigar, Suillia; Jodpala, Kodagu	Natarajan & Purushothama 1989
<i>Entoloma cuboideum</i> Hesler	Uppangala Forest, Kodagu	Senthilarasu & Natarajan 2003
<i>E. elevatum</i> Corner & E. Horak	Uppangala Forest, Kodagu	Senthilarasu & Natarajan 2003
<i>E. farlowii</i> (Singer) Hesler	Manaduka, Kodagu	Senthilarasu & Natarajan 2003
<i>E. foetidum</i> Hesler	Uppangala Forest, Kodagu	Senthilarasu & Natarajan 2003
<i>E. grayanum</i> (Peck) Sacc.	Uppangala Forest, Kodagu	Senthilarasu & Natarajan 2003 as <i>E. grayanum</i> var. <i>grayanum</i> (Peck) Sacc.
<i>E. mephiticum</i> (Murrill) Hesler	Uppangala Forest, Kodagu	Senthilarasu & Natarajan 2003
<i>E. olorinum</i> (Romagn. & J. Favre) Noordel.	Shimoga	Swapna et al. 2008 as <i>Entoloma olonirum</i> O.V.
<i>E. vittalii</i> Senthil., Kumaresan & S.K. Singh	Manaduka, Uppangala Forest	Senthilarasu et al. 2010b
Hydnangiaceae Gäum. & C.W. Dodge		
<i>Laccaria laccata</i> (Scop.) Cooke	Guthigar, Merkanja, Suillia	Natarajan & Purushothama 1986 as <i>L. laccata</i> var. <i>pallidifolia</i> (Peck) Peck
Hygrophoraceae Lotsy		

Order/Family/Species	Place of collection	Reference
<i>Hygrocybe manadukaensis</i> Senthil., Kumaresan & S.K. Singh	Manaduka Forest, Uppangala Forest	Senthilarasu et al. 2010c
<i>H. natarajanii</i> Senthil. & Kumaresan	Manaduka Forest, Uppangala forest	Senthilarasu et al. 2010a
Inocybaceae Jülich		
<i>Astrosporina amygdalina</i> E. Horak	Uppangala Forest	Natarajan et al. 2005b
<i>A. avellana</i> E. Horak	Uppangala Forest	Natarajan et al. 2005b
<i>Crepidotus epibryus</i> (Fr.) Quél.	Baghmandla	Sathe & Kulkarni 1980
<i>C. variabilis</i>	Kodagu	Karun et al. 2014
<i>Inocybe calospora</i> Quél.	Uppangala Forest	Natarajan et al. 2005b as <i>Astrosporina calospora</i> (Quél.) E. Horak
<i>Tubaria pallidispora</i> J.E. Lange	Shimoga	Swapna et al. 2008 as <i>T. pallideospora</i> O.V.
Lyophyllaceae Jülich		
<i>Termitomyces aurantiacus</i> (R. Heim) R. Heim	Kodagu	Pahlevanlo & Janardhana 2012 as <i>T. cylindricus</i> S.C. He
<i>T. clypeatus</i> R. Heim	Kodagu	Pahlevanlo & Janardhana 2012, Karun & Sridhar 2013
<i>T. eurrhizus</i> (Berk.) R. Heim	Kodagu	Pahlevanlo & Janardhana 2012, Karun & Sridhar 2013
<i>T. globulus</i> R. Heim & Gooss.-Font.	Kodagu	Pahlevanlo & Janardhana (2012); Sudheep (2011)
<i>T. heimii</i> Natarajan	Londa, Kodagu,	Sathe & Kulkarni 1980, Pahlevanlo & Janardhana 2012, Karun & Sridhar 2013
<i>T. indicus</i> Natarajan	Kodagu	Pahlevanlo & Janardhana (2012)
<i>T. mammiformis</i> R. Heim	Kodagu	Pahlevanlo & Janardhana (2012)
<i>T. medius</i> R. Heim & Grassé	Merkanja, Suillia	Natarajan & Purushothama 1986
<i>T. microcarpus</i> (Berk. & Broome) R. Heim	Kodagu	Pahlevanlo & Janardhana 2012, Karun & Sridhar 2013
	Kittur	Sathe & Kulkarni 1980 as <i>Podabrella microcarpa</i> (Berk. & Broome) Singer
Marasmiaceae Roze ex Kühner		
<i>Anthracoephyllum nigratum</i> (Lév.) Kalchbr.	Castle rock Gavase	Sathe & Kulkarni 1980
<i>Gymnopus androsaceus</i> (L.) Della Maggiora & Trassinelli	Shimoga	Swapna et al. 2008 as <i>Marasmius androsaceus</i> (L.) Fr.
<i>G. quercophilus</i> (Pouzar) Antonín & Noordel.	Shimoga	Swapna et al. 2008 as <i>Marasmius quercophilus</i> Pouzar
<i>Marasmius hellebori-corsici</i> Romagn.	Shimoga	Swapna et al. 2008 as <i>Maramius hellabori</i>
<i>M. rotula</i> (Scop.) Fr.	Shimoga	Swapna et al. 2008
<i>M. ustilago</i> Singer	Suillia	Natarajan & Purushothama 1986
<i>Megacollybia platyphylla</i> (Pers.) Kotl. & Pouzar	Belinele Forest, Subramanya	Natarajan & Purushothama 1986 as <i>Oudemansiella platyphylla</i> (Pers.) M.M. Moser
<i>Trogia subviridis</i> Corner	Anegundi Reserve Forest, Suillia	Natarajan & Purushothama 1986
<i>T. lilaceogrisea</i> Corner	Nadugallu Forest, Subramanya	Natarajan & Purushothama 1986
<i>T. infundibuliformis</i> Berk. & Broome	Kidu Forest, Subramanya, Maggula and V'Badaga, Kodagu	Natarajan & Purushothama 1986, Karun et al. 2014
<i>Xeromphalina tenuipes</i> (Schwein.) A.H. Sm.	Koynadu, Kodagu	Natarajan & Purushothama 1986
Mycenaceae Overeem		
<i>Mycena metata</i> (Secr. ex Fr.) P. Kumm.	Shimoga	Swapna et al. 2008
<i>M. pura</i> (Pers.) P. Kumm.	Shimoga	Swapna et al. 2008

Order/Family/Species	Place of collection	Reference
Omphalotaceae Bresinsky		
<i>Marasmiellus musacearum</i> Singer	Peraje, Kodagu	Natarajan & Purushothama 1986
<i>M. sanctae-marthae</i> Singer	Merkanja, Suillia; Peraje, Kodagu	Natarajan & Purushothama 1986
<i>M. troyanus</i> (Murrill) Dennis	Merkanja, Suillia; Peraje, Kodagu	Natarajan & Purushothama 1986
Physalacriaceae Corner		
<i>Flammulina velutipes</i> (Curtis) Singer	Shimoga	Swapna et al. 2008
<i>Physalacria indica</i> Chandrash. & Natarajan	Mercara	Chandrashekara & Natarajan 1979
<i>Xerula pudens</i> (Pers.) Singer	Londa	Sathe & Kulkarni 1980 as <i>Oudemansiella longipes</i> (P. Kumm.) M.M. Moser
Pleurotaceae Kühner		
<i>Hohenbuehelia nigra</i> (Schwein.) Singer	Kidu Forest, Subramanya	Natarajan & Purushothama 1986
<i>Pleurotus euosmus</i> (Berk.) Sacc.	Pattankudi	Sathe & Kulkarni 1980
<i>P. flabellatus</i> Sacc.	Kodagu, Augumbe	Pegler 1976
<i>P. ostreatus</i> (Jacq.) P.Kumm.	Agumbe Shimoga	Sathe & Kulkarni 1980 Swapna et al. 2008
<i>P. pulmonarius</i>	Kodagu	Karun et al. 2014
Pluteaceae Kotl. & Pouzar		
<i>Pluteus salmonaeus</i> Sathe & S.M. Kulk.	Castle rock	Sathe & Kulkarni 1980
Psathyrellaceae Vilgalys, Moncalvo & Redhead		
<i>Coprinellus disseminatus</i> (Pers.) J.E. Lange	Sampaje, Shimoga	Sathe & Kulkarni 1980, Swapna et al. 2008 as <i>Coprinus disseminatus</i> (Pers.) Gray
<i>C. micaceus</i> (Bull.) Vilgalys, Hopple & Jacq. Johnson	Shimoga	Swapna et al. 2008 as <i>Coprinus micaceus</i> (Bull.) Fr. (as <i>C. micalius</i>) O.V.
<i>Parasola plicatilis</i> (Curtis) Redhead, Vilgalys & Hopple	Shimoga	Swapna et al. 2008 as <i>Coprinus plicatilis</i> (Curtis) Fr.
Strophariaceae Singer & A.H. Sm.		
<i>Agrocybe karnatakensis</i> Sathe & S.M. Kulk.	Londa	Sathe & Kulkarni 1980
<i>A. musicola</i> Natarajan & Purush.	Guthigar, Ajjavara, Suillia	Natarajan & Purushothama 1989
<i>Gymnopilus braendlei</i> (Peck) Hesler	Jodpala, Kodagu	Purushothama & Natarajan 1989
<i>G. earlei</i> Murrill	Peraje, Kodagu	Purushothama & Natarajan 1989
<i>G. hispidus</i> (Masse) Murrill	Koynadu, Kodagu	Purushothama & Natarajan 1989
<i>G. junonius</i>	Kodagu	Karun et al. 2014
<i>G. luteus</i> (Peck) Hesler	Koynadu, Kodagu	Purushothama & Natarajan 1989
<i>G. palmicola</i> Murrill	Nettana, Subramanya	Purushothama & Natarajan 1989
<i>Melanotus phaeophyllus</i> (Berk.) Pilát	Sampaje	Sathe & Kulkarni 1980
<i>Psilocybe coprophila</i> (Bull.) P. Kumm.	Heggala-Thora, Virajpet, Kodagu	Karun & Sridhar 2015
<i>P. fimetaria</i> (P.D. Orton) Watling	Heggala-Thora, Virajpet, Kodagu	Karun & Sridhar 2015
Tricholomataceae R. Heim ex Pouzar		
<i>Clitocybe odora</i> (Bull.) P. Kumm.	Shimoga	Swapna et al. 2008
<i>C. rivulosa</i> (Pers.) P. Kumm.	Shimoga	Swapna et al. 2008
<i>Collybia purpureo-grisea</i> (Petch) Pegler	Sampaje	Sathe & Kulkarni 1980 as <i>Marasmiellus purpureoalbus</i> (Petch) Singer
<i>Hygroaster agumbensis</i> Sathe &	Agumbe	Sathe & Kulkarni 1980 as <i>H.</i>

Order/Family/Species	Place of collection	Reference
S.M. Kulk. <i>Infundibulicybe geotropa</i> (Bull.) Harmaja <i>Pseudoclitocybe cyathiformis</i> (Bull.) Singer	Shimoga	<i>augumbense</i> O.V. Swapna et al. 2008 as <i>Clitocybe geotropa</i> (Bull.) Quél. Swapna et al. 2008
Polyporales Gäum. Polyporaceae Fr. ex Corda <i>Lentinus sajor-caju</i>	Kodagu	Karun et al. 2014 as <i>L. dicholamellatus</i> Manim.
<i>Panus natarajanianus</i> Senthil.	Sirsi	Senthilarasu 2015 as <i>P. natarajanus</i> Senthil.
<i>P. similis</i> (Berk. & Broome) T.W. May & A.E. Wood	Kodagu, Manaduka Forest, Kothanaduka Forest	Sathe & Kulkarni 1980 as <i>Lentinus velutinus</i> Fr.; Pegler 1983, Senthilarasu 2015, Karun et al. 2014 as <i>P. conchatus</i> (Bull.) Fr.
Russulales Krisel ex P.M. Kirk, P.F. Cannon & J.C. David Russulaceae Lotsy		
<i>Lactarius ignifluus</i> K.B. Vrinda & C.K. Pradeep	Uppangala Forest, Kodagu	Natarajan et al. 2005b as <i>Russula emeticella</i> (Singer) Romagn.
<i>Russula albonigra</i> (Krmh.) Fr.	Uppangala Forest, Kodagu	Natarajan et al. 2005b
<i>R. amoena</i> Quél.	Uppangala Forest, Kodagu	Natarajan et al. 2005b
<i>R. azurea</i> Bres.	Uppangala Forest, Kodagu	Natarajan et al. 2005b
<i>R. delica</i> Fr.	Uppangala Forest, Kodagu	Natarajan et al. 2005b as <i>R. delica</i> var. <i>puta</i> Romagn.
<i>R. koleggiensis</i> K. Das, S.L. Mill., J.R. Sharma & J. Hemenway	Koleggi, Uttara Kannada	Das et al. 2008
<i>R. pectinata</i> Fr.	Uppangala Forest, Kodagu	Natarajan et al. 2005b
<i>R. pectinatoides</i> Peck	Uppangala Forest, Kodagu	Natarajan et al. 2005b
<i>R. pseudodelica</i> J.E. Lange	Uppangala Forest, Kodagu	Natarajan et al. 2005b
<i>R. rosea</i> Pers.	Uppangala Forest, Kodagu	Natarajan et al. 2005b
<i>R. senecis</i> S. Imai	Uppangala Forest, Kodagu	Natarajan et al. 2005b
<i>R. subfoetens</i> W.G. Sm.	Uppangala Forest, Kodagu	Natarajan et al. 2005b
<i>R. variegatula</i> Romagn. ex Bon	Manaduka Forest, Kodagu	Natarajan et al. 2005b
Incertae sedis		
<i>Panaeolus fimicola</i> (Pers.) Gillet	Makutta Reserve forest, Virajpet, Kodagu	Karun & Sridhar 2015
<i>Hygrotrama bicolor</i> Sathe & S.M. Kulk.	Agumbe	Sathe & Kulkarni 1980
<i>Volvariella volvacea</i> (Bull.) Singer	Shimoga	Swapna et al. 2008 as <i>V. volvosa</i> O.V.
Excluded species		
<i>Coprinus geophilus</i>	Shimoga	Swapna et al. 2008
<i>Lepista atrodisca</i>	Shimoga	Swapna et al. 2008
<i>Panus torulosus</i> (Bull.) Fr.	Sampaje	Sathe & Kulkarni 1980
<i>Termitomyces tylerianus</i> Otieno	Kodagu	Karun et al. 2014
<i>Clitocybe infundibuliformis</i> (Schaeff.) Quél.	Kodagu	Karun et al. 2014
<i>Lentinus patulus</i> Lév.	Kodagu	Karun et al. 2014

O.V. orthographic variant

Discussion

Fungal taxa that are documented and or newly described from Western Ghats reflect the mycodiversity of the tropics where this biota is one of the largest components. In this paper including the checklist, we present 132 agaric species in 60 genera belonging to *Agaricales*, *Polyporales* and *Russulales* collected and reported from Western Ghats and its foot hills of Karnataka State. *Agaricales* has the highest number of species (117) followed by *Russulales* (13), whereas, *Polyporales*

is represented by only three species. This agaric diversity in Karnataka region is similar with the recent agaric checklist of Kerala where 579 species of the 615 species reported belonging to *Agaricales* and 21 species to *Russulales* (Farook et al. 2013). Similarly, the highest number of agaric species have been reported in *Agaricales* (123) followed by *Polyporales* (4) and *Russulales* (3) from Maharashtra (Senthilarasu 2014). In Karnataka, higher numbers of species reported belong to *Russula* (12), followed by *Termitomyces* (9), and *Entoloma* (8). The genera *Amanita*, *Hygrocybe* and *Micropsalliota* are represented by five species each and *Agaricus*, *Chlorophyllum* and *Pleurotus* are represented by four species each. Around 58 % genera are represented by only one species. However, the most species-rich genera in Kerala are *Hygrocybe* (41), *Entoloma* (41), *Lepiota* (39), *Marasmius* (27), *Leucocoprinus* (22) and *Pluteus* (22). *Russula* and *Termitomyces* are represented by 17 and 15 species respectively. About 7.1 % of genera are represented by only one species (Farook et al. 2013). The most represented genera in Maharashtra are *Agaricus* (18) followed by *Marasmius* (13), *Mycena* (8), *Lepiota* (7), *Pleurotus* (6), *Termitomyces* (6), *Amanita* (5) and *Inocybe* (5). Around 13.2 % genera are represented by only one species (Senthilarasu 2014). The highest numbers of new species have been described from Kerala (138) and Maharashtra (21) when compared to Karnataka where only 17 species have been described (Chandrasekara & Natarajan 1979, Sathe & Kulkarni 1980, Natarajan & Purushothama 1986, 1989, 1994/1995, Reddy et al. 2005, Senthilarasu et al. 2010a,b,c, Senthilarasu 2015).

By compiling the two checklists (Farook et al. 2013, Senthilarasu 2014) with the present checklist, overall, 866 macrofungal species belonging to 133 genera in six Orders *Agaricales*, *Boletales*, *Cantharellales*, *Gomphales*, *Polyporales* and *Russulales* have been reported with *Entoloma* (53), *Hygrocybe* (45), *Lepiota* (44), *Marasmius* (39), *Agaricus* (36), *Russula* (28), *Pluteus* (24), *Amanita* (23), *Inocybe* (23), *Leucocoprinus* (23), *Micropsalliota* (23), *Conocybe* (20) and *Leucoagaricus* (20) the most species-rich genera. Most species have relatively narrow distribution ranges and, only 2 % of species (25) have shown inter-state, wide distribution. The commonly distributed species in the three states are: *Chlorophyllum molybdites*, *C. rachodes*, *Leucocoprinus birnbaumii*, *L. fragilissimus*, *Macrolepiota procera*, *Conocybe pubescens*, *Hygrocybe alwisii*, *H. astatogala*, *Termitomyces clypeatus*, *T. eurhizus*, *T. heimii*, *T. mammiformis*, *T. microcarpus*, *Gymnopus androsaceus*, *Lactocollybia epia*, *Megacollybia platyphylla*, *Trogia infundibuliformis*, *Oudemansiella furfuracea*, *Pleurotus flabellatus*, *P. ostreatus*, *Volvariella volvacea*, *Coprinus disseminatus*, *Cystoagaricus trisulphuratus*, *Parasola plicatilis* and *Lentinus sajor-caju* (Table not provided). However, it can not be taken into account that the remaining species are geographically restricted. This paper indicates lack of significant mycological explorations, as well as the need for more long-term fungal studies in Western Ghats of Maharashtra and Karnataka where these specialized habitats are typically plant species-rich, and can also have a rich mycobiota of an extraordinary diversity or a habitat of rare species. Further, the ecological plasticity of the common species has to be investigated for better understanding of the ecological adaptations.

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