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Diversity of agarics (gilled mushrooms) of Maharashtra, India

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Abstract

A total of 13 species belonging to 10 genera in 9 families collected from Pune and Western Ghats of Mahabaleshwar and Mulshi have been described. Among them, *Amanita flavofloccosa* is being repoted for the first time from Western Ghats. The remaining species are being reported for the first time from Maharashtra state. Further, 14 species already reported from Maharashtra were also collected from different regions in the present study. In addition, a checklist of gilled mushrooms of Maharashtra is provided on the basis of published reports. A total of 178 species in 68 genera (including 21 new species and two new genera *Chlorolepiota* and *Singerina*) belonging to 23 families and 5 orders (*Agaricales*, *Boletales*, *Cantharellales*, *Polyporales* and *Russulales*) have been described from Maharashtra. Twenty six new species and 7 new varieties that are contravening particular Articles of the Code are excluded.

Key words – *Agaricomycetes* – checklist – macrofungi – taxonomy – Western Ghats

Introduction

Maharashtra is the third largest state of India next to Rajasthan and Madhya Pradesh covering an area of 307, 713 km^2 adjoined by Karnataka to the south, Goa to the southwest, Andhra Pradesh to the southeast and Chhattisgarh to the east. In west, it is borded by Arabian Sea and the northwest by Gujarat and the Union territory of Dadra and Nagar Haveli and north by Madhya Pradesh. It lies at 18°57′36″N 72°49′12″E, and altitude ranges from 0–1800 m above mean sea level and the forests cover less than one fifth of the state and confined to the Western Ghats and eastern Vidarbha region. It receives an annual rain fall of about 4000 mm in the western region of Western Ghats and about 700–1250 mm in Vidarbha region brought by south west monsoon and the dry zone occurs in between western and Vidarbha region. The forests of Western Ghats and Vidarbha region are rich in mycobiota. The diversity of agarics (gilled mushrooms) occurring in Maharashtra was largely studied by Trivedi (1972) in Vidarbha region and Sathe & Rahalkar (1975) and Sathe & Deshpande (1980b) in western region. However, there are no reports on agaric diversity of Maharashtra for the past two decades since studies were started in the period of Massee (1901) and ended two decades back. Recently, Hedawoo & Mohite (2008) and Hedawoo (2010) studied the diversity of edible, non edible and medicinal mushrooms of Amravati & Melghat regions. However, taxonomic descriptions of the species were not provided in those studies. The National Fungal Culture Collection of India (NFCCI, WDCM 932) has been established at Agharkar Research Institute (ARI) to conserve the germ plasm of diverse group of fungi occurring in different substrates. Therefore, the study on the diversity of mushrooms

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occurring in Western Ghats has been initiated again at NFCCI (Senthilarasu et al. 2010a, b, c, 2012, Senthilarasu & Singh 2012, 2013, Senthilarasu 2013a, b). During the period between 2008 and 2012, several collections were made from Agharkar Research Institute campus, Pune University campus, and the Western Ghats of Mahabaleshwar and Mulshi. In this paper, a total of 13 agaric species that are new to Maharashtra state have been described. Fourteen species already reported from Maharashtra were also collected from different regions in the present study and presented in the checklist. In addition, a checklist of agarics occurring in Maharashtra state is provided.

Materials & Methods

In general, the morphotaxonomic features of Largent (1977) and Singer (1986) are mainly followed. The microscopic details were studied from thin sections made from dried specimen, revived in 10% KOH, and stained in 2% phloxine, cotton blue, cresyl blue and Melzer's reagent. Approximately 50 basidiospores from sections were measured excluding the apiculus and ornamentation. The spore quotient (Q) was obtained by mean length divided by mean width ratio of a spore in profile view. The range of spore measurements with extreme values in parentheses precedes the mean spore measurement in parentheses. The colour terms and notations are from Kornerup & Wanscher (1978). Exsiccata were deposited at Ajrekar Mycological Herbarium (AMH), Agharkar Research Institute, Pune, India and preserved in personal collections (Macrofungal Collection of India, MCI). The checklist on gilled mushrooms of Maharashtra is prepared on the basis of validly published reports. The Index Fungorum (www.indexfungorum.org) and Species Fungorum (www.speciesfungorum.org) websites are followed for the nomenclature and currently accepted name respectively. The names of the species and author citations as reported in the cited publications are replaced by currently accepted names with author citations. All the new species that are contravening particular Articles in the Code are excluded and presented at the end of the list. The checklist is organized alphabetically by family, genus and species. Several corrections are made where orthographic varients found in the cited publications.

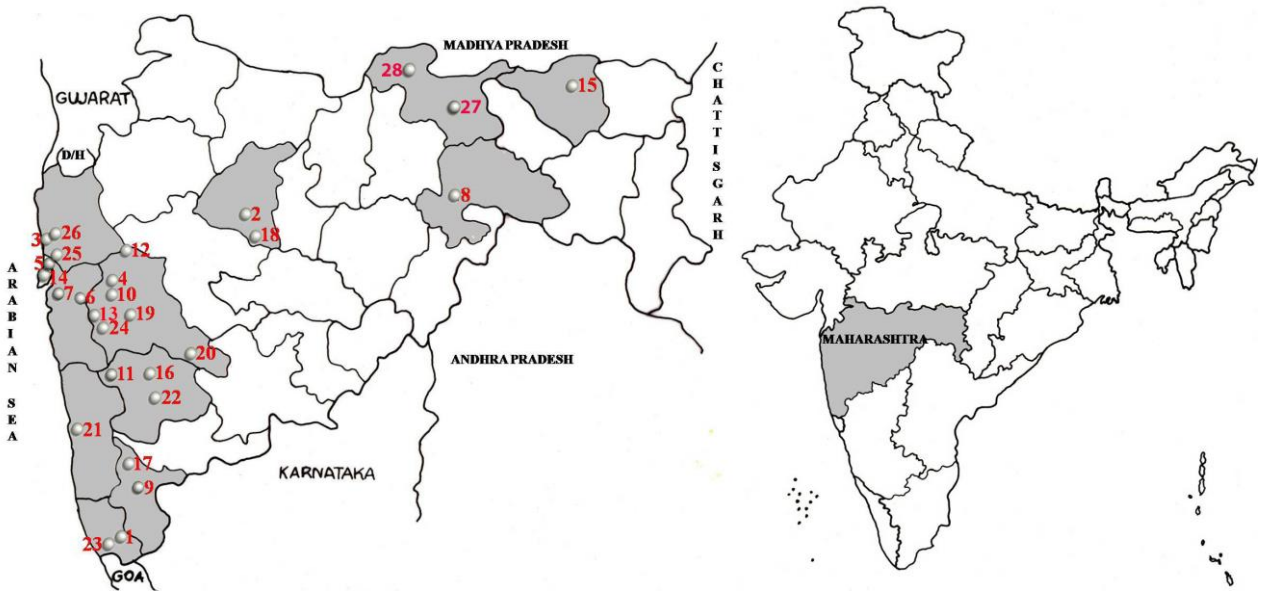

Fig. 1a – Place of collection in Maharashtra state. **1b** – Map of Maharashtra in India: 1, Amb = Amboli. 2, Aur = Aurangabad. 3, Bas = Bassein. 4, Bhi = Bhimashankar. 5, Bor = Borivili. 6, Kan = Kanakeshwar. 7, Kar = Karnala. 8, Kha = Khandala. 9, Kol = Kolhapur. 10, Lon = Lonavala. 11, Mah = Mahabaleshwar. 12, Mal = Malshej Ghat. 13, Mul = Mulshi. 14, Mum = Mumbai. 15, Nag = Nagpur. 16, Pai = Panchgani. 17, Pan = Panhala. 18, Pha = Phaltan. 19, Pun = Pune. 20, Pur = Purandhar. 21, Rad = Radhanagari. 22, Sat = Satara. 23, Saw = Sawantwadi. 24, Sin = Sinhgad. 25, Tha = Thane. 26, Thu = Thungareshwar. 27, Amr = Amravathi. 28, Mel = Melghat. Not to scale.

Results & Discussion

Amanita flavofloccosa Nagas. & Hongo, Trans. Mycol. Soc. Japan 25(4): 367 (1984) Figs. 2a, b

Pileus 55–100 mm diam., plano-convex to applanate, shallowly, broadly depressed at the disc; surface moist, becoming sticky when wet, uniformly pale orange (5A3) to light orange (6A4-6A5) covered by numerous, more or less concentrically arranged, brownish orange (7C4) to reddish brown (9E8), appressed to recurved, plate like squamules to granula verrucae, becoming darker with age (9D5-9D6); margin non striate, appendiculate with velar remnants concolorous to scales (9E8). **Lamellae** free, cream to pale yellow (4A3), changing to reddish brown (8D8) on bruising, crowded, 4–12 mm wide. **Stipe** elongated, 120–175 × 6–9 mm, cylindrical, gradually widening below 7–15 mm diam., at the base, initially with subbulbous base; surface concolorous (5A3, 6A4-6A5) to the pileus above, covered by reddish brown (9D8) squamules, changing to Venetian red (8D8) on bruising, white to yellowish white (4A2) to orange white (5A2) below, covered by numerous, concolorous squamules, sticky, solid to stuffed. **Annulus** persistent, membranous, pendent, grooved above, squamulose below, yellowish white (4A2) to orange white (5A2), attached to the upper quarter of the stipe. **Volva** friable, forming patches adhering to the base, concolorous to the annulus. **Odour** strong, unpleasant, nauseating. **Pileus context** thick, up to 9 mm wide near the stipe, white. **Basidiospores** (6.5)7–10(13) × (5.5)6–8(9), (8.67±1.3 × 6.9±0.74) µm, Q = 1.25, subglobose to broadly ellipsoid, hyaline, weakly amyloid, thin-walled with single large guttule.

Collections examined – India, Maharashtra, Pune, Pune University campus (18°31′18.4″N 73°49′53.6″E), *Dalbergia* and *Gliricidia* plantations, on ground, solitary to scattered, 16.08.2012, G. Senthilarasu. (MCI 1354).

The species of *Amanita flavofloccosa* are easily recognizable in the field by medium to large sized basidiomes having orange pileus covered by numerous, concentrically arranged concolorous squamules, elongated, squamulose stipe, with pendent annulus and friable volva. The presence of amyloid basidiospores and non-striate, appendiculate pileal margin, ovoid to elongated, fusiform inflated cells in the universal veil are the distinguishing features well enough to assign this species in the section *Lepidella* Bas (Bas 1969) of the subgenus *Lepidella* (Roze) Vaselý emend. Corner & Bas (Corner & Bas 1962) of *Amanita* Pers.

Amanita aureofloccosa Bas (Pegler 1977) differs from *A. flavofloccosa* in having golden yellow to orange yellow to buff, umbonate pileus, stipe with subterranean bulbous base, covered by dense furfuraceous layer of squamules and more or less globose spores. *Amanita albofloccosa* Sathe & S.D. Deshp. (Sathe & Deshpande 1980b) described from Pune, differs from *A. flavofloccosa* in having smaller pileus (35–40 vs 55–100 mm diam.), pale yellow surface covered with cinnamon brown scales, slenderer stipe (4–5 vs 6–9 mm), floccose annulus and smaller, globose to subglobose basidiospores (7.3–9.6 × 6.4–7.7 vs 6.5–13 × 5.5–9 µm). The morphotaxonomic characters of *A. flavofloccosa* reported from Chennai, Tamil Nadu (Purushothama & Natarajan 1987) nearly similar to the present collection excluding the spores that are globose to subglobose rather than subglobose to ellipsoid in shape. However, this species is being reported for the first time from Western Ghats.

Hygrocybe alwisii (Berk. & Broome) Pegler, Kew Bull., Addit. Ser. 12: 66 (1986) Fig. 2c

Pileus 20–80 mm diam., conic, expanded to convex, finally applanate, retaining an umbo, subumbonate; surface uniformly white to yellowish white (2A2), tinted with brownish orange (6C5-7C5) at the disc, slightly viscid, smooth, with a silky sheen; margin entire, becoming rimose, nearly half way to the disc to eroded. **Lamellae** free to adnexed, whitish to orange white (5A2), thick, up to 7 mm broad at the disc, waxy, moderately closed with lamellulae of four lengths, edge concolorous with the sides. **Stipe** 30–75 × 5–8 mm, equal, slightly attenuated upwards, cylindric, stuffed, becoming fistulose; surface white, smooth, viscid liquid oozed out on injury. **Pileus context** up to 3 mm thick at the disc, white. **Basidiospores** dimorphous: macrospores (6.5)7–9(9.5) × (4.5)5.5–7.5(8.5), (7.7±0.8 × 6.4±0.8) µm, Q = 1.12, subglobose to broadly ellipsoid, hyaline,

thin walled with a single large refractive guttule; microspores (3.4)4–5.5(6) × (2.9)3.5–4(4.5), (4.8±0.5 × 3.6±0.3) µm, Q = 1.3, ellipsoid to broadly ellipsoid, similar to macrospores.

Collections examined – India, Maharashtra, Pune, Pune University campus (18°31′18.4″N 73°49′53.6″E), *Dalbergia* and *Gliricidia* plantations, on ground, solitary to scattered, 01.08.2012, G. Senthilarasu. (MCI 1250), Mulshi (18°26′01.2″N 73°25′47.5″E), on ground, solitary to scattered, evergreen forest, 30.07.2010, (MCI 1248).

The distinguished features of *H. alwisii* are medium to large, white basidiomes, having conic to applanate, rimose to eroded pileus, adnexed to free lamellae, dimorphous spores and pseudocystidia. The present collection resembles in all morphotaxonomic characters with *H. alwisii* reported by Leelavathy et al. (2006) in Kerala. However, the present collection slightly differs from Kerala collection in having shorter stipe (30–75 vs 65–120 mm) and narrower macrospores (6.5–9.5 × 4.5–8.5 vs 7–10.5 × 6–10 µm).

Hygrocybe astatogala (R. Heim) Heinem., Bull. Jard. bot. État Brux. 33(2): 436 (1963) Fig. 2e

Pileus 10–35 mm diam., conical, up to 32 mm high, subumbonate; surface uniformly deep red (10C8) to brownish red (10D8) to reddish brown (9D8), yellowish white (3A2-4A2) at extreme margin, covered by appressed, blackish fibrils, pellucid striate; margin entire, becoming eroded, blackening. **Lamellae** free to adnexed, whitish, becoming pale yellow (3A3) to pastel yellow (3A4), becoming black, crowded with 7 different lengths of lamellulae, up to 4 mm wide, finely eroded. **Stipe** 80–150 × 6–9 mm, cylindrical, slightly attenuated towards apex, compressed, fistulose; surface whitish below, pale yellow (1A3) to pastel yellow (1A4) to yellowish orange (4A7) above, covered by shiny, blackish fibrils. **Pileus context** up to 3 mm thick near stipe, yellowish, becoming black. Basidiospores (7)7.5–9(10) × (6)6.5–7(7.5), (8.43±0.8 × 6.7±0.3) µm, Q = 1.24, ellipsoid to broadly ellipsoid, hyaline, thin walled with numerous guttules.

Collections examined – India, Maharashtra, Mahabaleshwar, Lingamala forest (17°55′17.2"N 73°39′18.3"E) on ground, solitary to scattered, 16.07.2010, G. Senthilarasu. (MCI 1231).

The conic, deep red to reddish brown pileus covered by blackish fibrils, pale yellow to yellowish orange, elongated stipe, turning whole basidiomes to black on bruising are the distinguished characters. Leelavathy et al. (2006) and Mohanan (2011) reported this species from Western Ghats of Kerala. The Kerala collection of *H. astatogala* reported by Leelavathy et al. (2006) slightly differs in having larger basidiomes (10–90 mm diam. pileus) than the present collection.

Laccaria fraterna (Sacc.) Pegler, Aust. J. Bot., Suppl. Ser. 13(2): 332 (1965) Fig. 2d

Pileus 10–30 mm diam., plano-convex, shallowly depressed, dry, hygrophanous; surface raspberry red (10D7) to cardinal red (10D8), paler on drying, smooth; margin undulating, striate. **Lamellae** subdecurrent to decurrent, concolorous to the pileus, moderately distant with lamellulae of five different lengths. **Stipe** 10–50 × 2–6 mm, slightly tapering towards base, slightly compressed at the apex, stuffed becoming hollow; surface white below, reddish brown (10D6) to raspberry red (10D7) above, smooth, arising from white basal mycelial tomentum. **Pileus context** thin, cream. **Basidiospores** (6.5)9–10.5(12) × (5.5)8–9(10), (9.6±0.78 × 8.3±0.63) µm, Q = 1.14, subglobose to short ellipsoid, apiculus prominent, up to 3.5 × 2 µm, echinulate, spines up to 2 µm long, hyaline, thin walled. Basidia bisporic, bearing two large sterigmata.

Collections examined – India, Maharashtra, Panchgani (17°00′00"N 73°49′12"E), on ground, solitary to scattered, mycorrhizal, associated with eucalypts, 05.11.2008, G. Senthilarasu. (AMH 9245, 9269), Mulshi, 16.07.2010, (MCI 1235).

Laccaria fraterna is a mycorrhizal species and widely distributed in Panchgani and Mulshi forest areas wherever eucalypts plantations are present. *Laccaria laccata* (Scop.) Cooke differs from *L. fraterna* in greyish orange to pinkish white to pinkish brown basidiomes and having tetrasporic basidia.

Fig. 2 – a, b *Amanita flavofloccosa*, basidiomes under natural conditions in Pune University campus. a, surface view. b, Gill view. c, *Hygrocybe alwisii* basidiome under natural conditions in Mulshi. d, *Laccaria fraterna*. e, *Hygrocybe astatogala* basidiome under natural conditions in Mahabaleshwar.

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

Pileus 10–30 mm diam., convex, becoming plano-convex, subumbonate; surface dull white to yellowish white (2A2-3A2-4A2), to dull yellow (3B3) to ivory (4B3), smooth, glabrous; margin translucent striate, crisped, becoming eroded. **Lamellae** adnate, white to yellowish white (2A2-3A2), up to 2 mm wide, moderately crowded with numerous lamellulae of five different lengths. **Stipe** 7–35 × 1–2 mm, thin, central to excentric, tubular, equal, slightly tapering towards apex, subbulbous at the base; surface concolorous with the pileus, smooth, shiny, arising from a white to brown basal tomentum. **Pileus context** thin, up to 1 mm wide near the stipe, white. **Basidiospores** (5.5)6.5–8(8.5) × (3)3.5–4.6, (7.3±0.7 × 4.0±0.3) µm, Q = 1.8, elongate, amygdaliform, hyaline, thin-walled, smooth, inamyloid, containing few refractive guttules.

Collections examined – India, Maharashtra, Pune, Pune University campus (18°31′18.4″N 73°49′53.6″E), on base of the tree trunk, solitary to scattered to gregarious, 20.07. 2011, G. Senthilarasu. (MCI 1287), 26.07.2012 (MCI 1301), ARI campus (18°52′N 73°83′E), tree trunk, 22.06.2009, (MCI 1088), Mulshi (18°26′01.2″N 73°25′47.5″E), on wood, twigs, 06.08.2009 (MCI 1091).

Lactocollybia epia is a common species and widely distributed in Pune University Campus and Mulshi forest areas. This species is easily recognized in the field by dull white to yellowish white, small basidiomes having adnate lamellae, central to excentric, shorter and slender stipe arising from basal tomentum.

Lentinus sajor-caju (Fr.) Fr., Epicr. syst. mycol. (Upsaliae): 393 (1838) [1836-1838] Fig. 3c

Pileus 45–105 mm diam., soft coriaceous, drying hard and rigid, cyathiform to deeply infundibuliform; surface variable in colour, at first whitish, becoming yellowish white (4A2) to pale yellow (4A3) to greyish yellow (4B3) or pale orange (5A3) to light orange (5A4) to brownish orange (6C5), dry, glabrous, smooth with appressed reddish brown (8D8) squamules especially

Fig. 3 – a, b *Lactocollybia epia*, basidiomes under natural conditions in Pune University campus. a, surface view. b, gill view. c, *Lentinus sajor-caju* basidiomes under natural conditions in Mulshi. d, e *Lepista sordida*, basdiomes under natural conditions in ARI campus. d, gill view. e, surface view.

towards the centre, finely radially striate to translucent striate, entire, becoming rimose to eroded; margin incurved to straight, thin, undulating to lobed. **Lamellae** decurrent to deeply decurrent, whitish, up to 1 mm thick, wavy, crowded with numerous lamellulae. **Stipe** central to slightly excentric, short, 10–20 × 5–6 mm, cylindric, solid; surface white, becoming blackish at the base. **Annulus** fugaceous. **Pileus context** thin, whitish. **Basidiospores** (5)6.5–7(8.5) × 2–2.5(3), (6.7±0.3 × 2.5±0.3) µm, Q = 2.0, cylindric, hyaline, thin-walled with few refractive guttules.

Collections examined – India, Maharashtra, Mulshi, (18°26′01.2″N 73°25′47.5″E), solitary to gregarius, on wood, 15.09.2011. Coll. G. Senthilarasu. (AMH 9569).

Lentinus sajor-caju can easily be recognized in the field by its large, thin, whitish to cream pileus with pale brown disc, lacking or with small squamules at the center, short stipe with annulus or annular ridge. The characters of present collection agree with the description provided by Pegler (1983).

Lepista sordida (Schumach.) Singer, Lilloa 22: 193 (1951) [1949] Figs. 3d, e

Pileus 20–55 mm diam., broadly convex, deeply infundibuliform, acutely umblicate; surface greyish lilac (15C2-15C3) to dull violaceous (16B2-16B3) with reddish brown umbo (9D4), strongly hygrophanous to greyish orange (6B3), greyish red (8C3), glabrous, smooth; margin incurved becoming applanate, finally uplifted and lobate, pellucid-striate to striate. **Lamellae** sinuate-adnate to subdecurrent, greyish lilac (15C2-16B2) to dull lillac (15C3),

becoming greyish Magenta (13D3-14D3), 2–5 mm broad, crowded with lamellulae of 6 different lengths, often eroded. **Stipe** 20–50 × 2–6 mm, cylindric, equal, often sinuous, solid becoming fistulose; surface concolorous with the pileus, smooth, longitudinally fibrillose with basal tomentum. **Pileus context** thin, up to 1 mm thick, pale violet (15A3). **Basidiospores** (5)5.5–6(6.5) × (3)3.5–4.5, (5.83±0.2 × 4.0±0.4) µm, Q = 1.45, ellipsoid, hyaline, thin-walled, finely rugulose, guttulate.

Collections examined – India, Maharashtra, Pune, ARI campus (18°52′N 73°83′E), on ground, solitary to caespitose, 11.10.2011, G. Senthilarasu. (MCI 1269).

The small to medium sized basidiomes of *Lepista sordida* are easily recognizable in the field by their grayish lilac to dull lilac, umblicate, hygrophanous pileus, concolorous lamellae and stipe that is often sinuous. *Lepista sordida* closely resembles *L. nuda* (Bull.) Cooke (Pegler 1977) in having similar coloured basidiomes. However *L. nuda* differs clearly in having non hygrophanous, non striate, large pileus, non sinuous, large, thick stipe and slightly larger basidiospores (6–9 vs 5–6.5 µm). The distinguished features of *L. nudoidea* Sathe & S.D. Deshp. (Sathe & Deshpande 1980b) described from Panchgani, Maharashtra are lilac basidiomes having non hygrophanous, non striate pileus and verrucose basidiospores. The morphotaxonomic characters of *L. nudoidea* are almost similar to *L. nuda* excluding the basidiomes size and slightly smaller spores (4.8–7.3 vs 6–9 µm).

Leucocoprinus fragilissimus (Berk. & M.A. Curtis) Pat., Essai Tax. Hyménomyc. (Lons-le-Saunier): 171 (1900) Fig. 4a

Pileus 10–15 mm diam., plane; surface light yellow (4A4) to butter yellow (4A5) at the disc, covered by minute, brownish yellow (5C8) squamules, white elsewhere, thin; margin translucent striate to sulcate striate, forming conspicuous ridges and furrows up to the disc, undulating to eroded. **Lamellae** free, white, thin, ≤1 mm wide, moderately spaced with lamellulae of two different lengths. **Stipe** 15–30 × 1–2 mm, thin, cylindric with a bulbous base, slightly attenuated towards apex; surface light yellow (4A4) to butter yellow (4A5), smooth, hollow. **Annulus** membranous, attached to the upper third of the stipe, concolorous to the stipe, fugacious. **Pileus context** thin, concolorous with the pileus. **Basidiospores** (9.5)11–13(14) × (7)7.5–8(8.5), (12.3±0.4 × 7.8±0.2) µm, Q = 1.57, ellipsoid to elongate ellipsoid, truncated at the apex by a small but distinct germ pore, hyaline, dextrinoid, strongly metachromatic in cresyl blue, with a complex wall.

Collections examined: India, Maharashtra, Pune, ARI campus (18°52′N 73°83′E), on ground, solitary to scattered, 04.08.2012, G. Senthilarasu. (MCI 1311).

Leucocoprinus fragilissimus is recognizable in the filed by slender and delicate basidiomes having translucent, strongly sulcate striate, yellowish, applanate pileus, free, thin, moderately spaced lamellae and slender yellow stipe having evanescent annulus. *Leucocoprinus birnbaumii* (Corda) Singer differs from *L. fragilissimus* in having hemispherical to parabolic, yellow pileus covered by concolorous, floccose squamules, sulcate striate half way to the disc and elongated and thicker stipe (50–95 × 2–9 mm).

Leucocoprinus birnbaumii (Corda) Singer, Sydowia 15(1-6): 67 (1962) [1961] Fig. 4b

Pileus 15–35 mm diam., hemispherical to parabolic; surface pale yellow (2A3) to pastel yellow (1A4) to prime butter yellow (4A5) at the disc, prime rose yellow (1A6) elsewhere, bearing loose scattered, concolorous, minute, floccose squamules; margin sulcate striate, half-way to the disc. **Lamellae** free, pale yellow (2A3) to sulphur yellow (1A5), thin, up to 5 mm thick at the disc, ventricose, crowded, with lamellulae of three different lengths; edge smooth, sun yellow (2A5). **Stipe** 50–95 × 2–9 mm, cylindric, clavate, with a prominent swollen base, up to 11 mm diam., hollow, surface concolorous with the pileus, floccose above the annulus, smooth below. **Annulus** membranous, somewhat evanescent, concolorous with the stipe, attached to upper third of the stipe. **Pileus context** thin, soft, concolorous with the pileus. **Basidiospores** (7.5)8–10.5(11) × (5)5.5–

6.5(7), (9.3±0.8 × 6.0±0.4) µm, Q = 1.5, ellipsoid, truncated at the apex by a small but distinct germ pore, hyaline, dextrinoid, strongly metachromatic in cresyl blue, with a complex wall.

Collections examined – India, Maharashtra, Pune, Pune University campus (18°31′18.4″N 73°49′53.6″E), on humus, solitary to connate, 21.07.2009, G. Senthilarasu. (MCI 1032).

The characteristic features of *Leucocoprinus birnbaumii* are the hemispherical to parabolic, yellowish, sulcate striate pileus, covered by concolorous floccose squamules, free lamellae and elongated, concolorous stipe with bulbous base. *Leucocoprinus cepistipes* (Sowerby) Pat. differs from *L. birnbaumii* in having white pileus with pale brown disc, white to cream lamellae and concolorous stipe.

Parasola plicatilis (Curtis) Redhead, Vilgalys & Hopple, in Redhead, Vilgalys, Moncalvo, Johnson & Hopple, Taxon 50(1): 235 (2001) Fig. 4c

Pileus 10–40 mm diam., plane, orbicular, membranous; surface brownish orange (6C4-7C5) to light brown (6D8) to burnt Sienna (7D8) at the disc, greyish (6B1), orange grey (6B2) to brownish grey (6C2) to greyish brown (6D3) towards margin; margin radially plicate striate up to the disc. **Lamellae** adnexed to adnate, greyish (6B1), becoming black, thin, moderately crowded, non deliquescent. **Stipe** 20–75 × 1–2 mm, thin, tubular; surface white, glabrous. **Pileus context** thin. **Basidiospores** (9)11–12.5(13) × (7)7.5–9(10), (12.15±0.6 × 7.56±0.3) µm, Q = 1.6, lenticular to subrhomboid in face view, ellipsoid to elongate ellipsoid in side view, thick walled with truncate germ pore, black.

Collections examined – India, Maharashtra, Pune, ARI campus (18°52′N 73°83′E), on fallen twigs, solitary to gregarious, 20.10.2010, G. Senthilarasu. (MCI 1011).

The distinguished features are orange grey to brownish grey to greyish brown, thin pileus with brownish disc having radially plicate striate margin, non deliquescent lamellae and slender, white, tubular stipe.

Pleurotus djamor (Rumph. ex Fr.) Boedijn, Rumphius Memorial Volume: 292 (1959) Figs. 4d, e

Pileus 10–80 × 10–55 mm diam., spathulate to flabelliform to dimidate, shallowly to deeply, broadly depressed towards the base; surface colour variable, rust brown (6E8) to henna brown (7E8) near attachment, light brown (6D6) elsewhere or uniformly dull white to yellowish white (2A2-3A2) to pale yellow (3A3-4A3) to orange white (5A2) to pinkish white (7A2-8A2), smooth, glabrous; margin initially involute, entire to incised, faintly striate. **Lamellae** decurrent, extends up to the base of the stipe or near attachment to the substrate; surface initially white to yellowish white (3A2-4A2) to pale yellow (3A3), becoming pinkish white (7A2-8A2) to pale red (7A3-8A3) to pastel red (9A4) near margin, crowded with lamellulae of five different lengths, often forked near attachment, up to 5 mm broad; margin entire. **Stipe** absent or reduced, 5–20 × 3–10 mm, lateral, cylindric, equal to slightly tapering towards base; surface white, smooth, solid arising from white to yellowish white (4A2) mycelium. **Pileus context** thin, up to 5 mm thick, white. Basidiospores (5.5) 6–7.5(8) × (3)3.5–4(4.5), (7.3±0.2 × 3.4±0.3) µm, Q = 2.14, cylindric, smooth, hyaline, thin walled.

Collections examined – India, Maharashtra, Pune (18°31′13″N 73°51′24″E), on rotten wood, imbricate, 21.09.2012, G. Senthilarasu. (MCI 1300).

The distinguished characters are imbricate, astipitate to reduced stipitate basidiomes having brown to yellowish white to pinkish white pileus, decurrent, yellowish white to pinkish white lamellae.

Pleurotus cystidiosus O.K. Mill., Mycologia 61: 881–893 (1969) Fig. 4f

Pileus 30–80 × 20–70 mm diam., flabelliform to dimidate to convex, shallowly to broadly depressed near attachment; surface uniformly yellowish white (4A2) to pale yellow (4A3) to grayish yellow (4B4), smooth, glabrous; margin entire, not striate, incurved. **Lamellae** decurrent, white to yellowish white (4A2), crowded with numerous lamellulae of six different lengths, up to 7 mm broad, sometimes forked near margin, intervenose near attachment with the stipe. **Stipe** short,

15–30 × 7–20 mm, excentric to lateral, fleshy, terete, equal; surface concolorous to the pileus, smooth, sometimes faintly reticulate near attachment with the lamellae, solid. **Pileus context** thick, up to 25 mm wide near stipe, white. **Basidiospores** (11)11.5–13.5(14) × (4)4.5–5(6), (12.3±0.4 × 4.9±0.3) µm, Q = 2.51, cylindric, smooth, hyaline, thin walled.

Collections examined – India, Maharashtra, Pune, ARI campus (18°52′N 73°83′E), on tree trunk, caespitose, 02.09.2009, G. Senthilarasu. (MCI 989).

The characteristic features are medium to large, fleshy fruit bodies having white to yellowish white pileus, excentric to lateral stipe and presence of pleuro- and cheilocystidia. The formation of anamorph, *Antromycopsis* Pat. & Trab. in culture is the distinguished character to assign this species in the subgenus *Coremiopleurotus*. The macro- and microcharacters of this species are similar to *Pleurotus cystidiosus* reported by Natarajan & Raman (1983). However, the present species slightly differs in having non striate pileus and excentric to lateral stipe.

Trogia infundibuliformis Berk. & Broome, J. Linn. Soc. Bot. 14(73): 45 (1873) [1875] Fig. 4g

Pileus 7–35 mm diam., plane, becoming deeply infundibuliform, perforated, splitting radially almost to the disc, membranous; surface light brown (7D4-8D4), darker towards center, brownish orange (7C3) at the margin, smooth, glabrous, translucent striate to rimose, splitting up to the disc; margin undulate, incurved to decurved. **Lamellae** subdecurrent to deeply decurrent, brownish orange (7C3) to dull red (8C3) to grayish brown (8D3), distant with lamellulae of 3 different lengths, ≤1 mm wide. **Stipe** 5–12 × 1–4 mm, very short, arising from white discoid base, excentric to central, tubular, tough; surface concolorous with the pileus, slightly pinkish at the apex, pruinate above, smooth below. **Pileus context** very thin, concolorous with the pileus. **Basidiospores** 6–7(7.5) × (3)3.5–4.5(5), (6.6±0.3 × 3.7±0.2) µm, Q = 1.78, ellipsoid to elongate ellipsoid, hyaline, thin walled, inamyloid.

Collections examined – India, Maharashtra, Mahabaleshwar (17°55′17.2"N 73°39′18.3"E), solitary to scattered, on twigs, 30.08.2012, G Senthilarasu. (AMH 9568).

Trogia infundibuliformis is distinguished by its small to medium sized basidioms having infundibuliform, perforated, membranous, splited pileus, decurrent, distant lamellae and central to excentric stipe arising from white, discoid base. *Trogia cantharelloides* (Mont.) Pat. (Pegler 1983) differs from *T. infundibuliformis* in having crowded lamellae and smaller spores (3.7–5.5 × 2.3–3 vs 5.5–7.5 × 3–5 µm).

A total of 13 species belonging to 10 genera in 9 families (*Agaricaceae–Leucocoprinus birnbaumii*, *L. fragilissimus*; *Amanitaceae–Amanita flavofloccosa*; *Hydnangiaceae–Laccaria fraterna*; *Hygrophoraceae–Hygrocybe alwisii*, *H. astatogala*; *Marasmiaceae–Lactocollybia epia*, *Trogia infundibuliformis*; *Pleurotaceae–Pleurotus cystidiosus*, *P. djmor*; *Polyporaceae–Lentinus sajor-caju*; *Psathyrellaceae–Parasola plicatilis*; *Tricholomataceae–Lepista sordida*) have been described and discussed. An ectomycorrhizal fungus *Lacccaria fraterna* is widely distributed in Panchagani and Mulshi forest areas wherever eucalyptus plantations are present. A lignicolous and litter fungus *Lactocollybia epia* is widely distributed in Pune University Campus and Mulshi forests and fruits every year during July to August. Although, *Hygrocybe alwisii* grows solitarily, this species is also distributed in Pune University campus and Mulshi forest areas. Besides, 14 species already reported from Maharashtra were also collected from different regions in the present study and listed in the Table 1. Among them, *Macrolepiota procera* was collected from Mahabaleshwar, Mulshi and Bhimashankar. *Schizophyllum commune* and *Anthracophyllum nigritum* were widely distributed in Mahabaleshwar and Mulshi. *Hymenopellis radicata* was collected from Bhimashankar and Lonavala.

In the checklist, a total of 178 species in 68 genera belonging to 23 families and five orders (*Agaricales*, *Boletales*, *Cantharellales*, *Polyporales* and *Russulales*) have been reported from Maharashtra. The species of *Panaeolus* and *Volvariella* are placed in *incerte sedis* and the later genus has been placed outside the pluteoid clade in a study by Justo et al. (2010, 2011). However, for most of the species, only name has been listed without descriptions in the publications.

Table 1 Checklist of species of gilled fungi occurring in Western Ghats of Maharashtra

Taxa	Distribution	References
Agaricaceae Chevall.		
Agaricus abruptibulbus Peck	Pun	Sathe & Rahalkar 1976, Sathe & Deshpande 1982
Agaricus arvensis Schaeff	Nag	Trivedi 1972
	Pun	Sathe & Rahalkar 1976, Sathe & Deshpande 1982
	Sat	Chavan & Barge 1977
Agaricus bisporus (J.E. Lange) Imbach	Pun	Sathe & Rahalkar 1976; Sathe & Deshpande 1982 as *A. bisporus* var. *albidus* (J.E. Lange) Singer
Agaricus bitorquis (Quél.) Sacc.	Pun	Sathe & Rahalkar 1976, Sathe & Deshpande 1982 as *Agaricus rodmanii* Peck
Agaricus brunnescens Peck	Pun	Sathe & Deshpande 1980b
Agaricus campestris L.‖	Pun	Sathe & Rahalkar 1975, Sathe & Deshpande 1982; Parandekar 1964 as *Psalliota campestris* L. Quél.,
	Pun	MCI 967
	Nag	Trivedi 1972
	Mah	Sathe & Deshpande 1980b
	Amr	Hedawoo 2010
Agaricus micromegethus Peck	Pun	Sathe & Rahalkar 1976, Sathe & Deshpande 1982 as *Agaricus micromegatha*
Agaricus pattersoniae Peck	Pun	Sathe & Rahalkar 1976, Sathe & Deshpande 1982
Agaricus placomyces Peck	Pun	Sathe & Rahalkar 1976, Sathe & Deshpande 1982
	Amr	Hedawoo 2010
Agaricus scitulus Massee	Aur	Sathe & Sasangan 1977, Sathe & Deshpande 1982 as *Anellaria scitula* (Massee) Sacc.
Agaricus semotus Fr.	Pun	Sathe & Deshpande 1982
Agaricus subedulis Heinem.	Pha	Sathe & Deshpande 1980b
Agaricus sylvaticus Schaeff.	Pun	Sathe & Rahalkar 1976, Sathe & Deshpande 1982
Agaricus sylvicola (Vittad.) Peck	Pun	Sathe & Rahalkar 1976, Sathe & Deshpande 1982
Agaricus vaporarius Schrank	Pun	Sathe & Deshpande 1982
Agaricus woodrowii Massee	Pun	Massee 1901, Woodrow 1903, Uppal et al. 1935, Manjula 1983
	Pan	Thite & Kulkarni 1976
Agaricus xanthodermus Genev.	Mah	Sathe & Deshpande 1982
Agaricus xantholepis (F.H. Møller) F.H. Møller	Pun	Sathe & Deshpande 1980b
Chlorolepiota mahabaleshwarensis Sathe & S.D. Deshp.	Mah	Sathe & Deshpande 1979, Sathe & Deshpande 1980b, Sathe & Deshpande 1982; Massee 1901, Uppal et al 1935 as *Lepiota beckleri* (Berk.) Sacc.
Chlorophyllum molybdites (G. Mey.) Massee	Pun	Sathe & Rahalkar 1976, Sathe & Deshpande 1980b, Sathe & Deshpande 1982
	Kol	Patil & Thite 1978
	Amr	Hedawoo 2010
Chlorophyllum rachodes (Vittad.) Vellinga	Kol	Thite et al. 1976 as *Lepiota rachodes* (Vittad.) Quél.
	Rad	Patil & Thite 1977 as *Lepiota rachodes* (Vittad.) Quél.
	Amr	Hedawoo 2010 as *Macrolepiota rhacodes* (Vittad.) Singer
Chlorophyllum subrhacodes (Murrill) Vellinga	Pun	Sathe & Deshpande 1982 as *Lepiota subrhacodes* Murrill
Coprinus comatus (O.F. Müll.) Pers.	Mum	Berkeley 1851, Uppal et al. 1935
	Nag	Trivedi 1972
	Pun	Sathe & Rahalkar 1976, Sathe & Deshpande 1982
	Amr	Hedawoo 2010
Coprinus fimetarius Fr.	Pun	Sathe & Deshpande 1982
Lepiota alluviina (Peck) Morgan	Pun	Sathe & Deshpande 1982
Lepiota amanitiformis Murrill	Pun	Sathe & Deshpande 1982
Lepiota clypeolaria (Bull.) P. Kumm.	Pun	Sathe & Rahalkar 1976
Lepiota cristata (Bolton) P. Kumm.	Pun	Sathe & Deshpande 1982
	Kol	Thite & Patil 1982-83
Lepiota felina (Pers.) P. Karst.	Pun	Sathe & Rahalkar 1976

Taxa	Distribution	References
Lepiota naucinoides (Peck) Sacc. & Trotter	Pun	Sathe & Rahalkar 1975, Sathe & Deshpande 1982
Lepiota rugulosa Peck	Pun	Sathe & Rahalkar 1975
Leucoagaricus americanus (Peck) Vellinga	Pun	Sathe & Rahalkar 1976, Sathe & Deshpande 1982 as *Lepiota americana* (Peck) Sacc.
Leucoagaricus goossensiae (Beeli) Heinem.	Kol	Patil & Thite 1977 as *Lepiota goossensiae* Beeli
Leucoagaricus leucothites (Vittad.) Wasser	Nag	Trivedi 1972 as *Lepiota naucina* (Fr.) P. Kumm.
Leucoagaricus rubrotinctus (Peck) Singer‖	Nag	Trivedi 1972 as *Lepiota rubrotincta* Peck
	Pun	MCI 963
Leucocoprinus badhamii (Berk. & Broome) Locq.	Tha	Uppal et al. 1935 as *Lepiota badhamii* (Berk. & Broome) Quél.
	Mum	Blatter 1911 as *Leucoagaricus badhamii* (Berk. & Broome) Singer
Leucocoprinus cepistipes (Sowerby) Pat.	Mum	Uppal et al. 1935 as *Lepiota sordescens* (Berk. & M.A. Curtis) Sacc.
	Pun	Massee 1901, Uppal et al. 1935, Sathe & Rahalkar 1975, 1976 as *Lepiota caepastipes*; Sathe & Deshpande 1980b, Sathe & Deshpande 1982 as *Leucocoprinus cepaestipes* (Sowerby) Pat.
	Amr	Hedawoo 2010 as *Leucocoprinus cepaestipes*
Macrolepiota dolichaula (Berk. & Broome) Pegler & R.W. Rayner	Pun	Massee 1898, Woodrow 1903, Uppal et al. 1935 as *Lepiota altissima* Massee
Macrolepiota excoriata (Schaeff.) Wasser	Pun	Massee 1901
	Kol	Uppal et al. 1935, Thite & Patil 1982-83 as *Lepiota excoriata* (Schaeff.) P. Kumm.
Macrolepiota procera (Scop.) Singer‖	Pun	Sathe & Deshpande 1982
	Bhi	MCI 991
	Lon	MCI 952
	Amr	Hedawoo 2010
Singerina indica Sathe & S.D. Deshp.	Mah	Sathe & Deshpande 1980b
Amanitaceae R. Heim ex Pouzar		
Amanita albofloccosa Sathe & S.D. Deshp.	Pun	Sathe & Deshpande 1980b
Amanita konkanensis P.G. Sathe & S.M. Kulk.	Pun	Kulkarni 1992
Amanita vaginata (Bull.) Lam.	Nag	Trivedi 1972
Amanita nauseosa (Wakef.) D.A. Reid	Pun	Sathe & Deshpande 1982
Amanita verna (Bull.) Lam.	Nag	Trivedi 1972
Limacella illinita (Fr.) Maire	Pun	Sathe & Rahalkar 1976, Sathe & Deshpande 1982 as *Lepiota illinita* (Fr.) Quél.
Auriscalpiaceae Maas Geest.		
Lentinellus cochleatus (Pers.) P. Karst	Nag	Trivedi 1972 as *Lentinus cochleatus* (Pers.) Fr.
Bolbitiaceae Singer		
Bolbitius grandiusculus Cooke & Massee	Pun	Massee 1901, Uppal et al. 1935
Conocybe pubescens (Gillet) Kühner‖	Mah	Sathe & Deshpande 1980b
	Mah	AMH 9244
Conocybe tenera (Schaeff.) Fayod	Pun	Sathe & Rahalkar 1975, Sathe & Deshpande 1982
	Mah	Narendra & Rao 1976 as *Galera tenera* (Schaeff.) P. Kumm.
Conocybe rickeniana P.D. Orton	Pun	Sathe & Rahalkar 1975, Sathe & Deshpande 1982 as *Galerina teneroides* [*Galera teneroides* (Peck) Sacc.]
Cantharellaceae J. Schröt.		
Cantharellus violicolor Corner	Sat	Chavan & Barge 1977
Cortinariaceae R. Heim ex Pouzar		

Taxa	Distribution	References
Cortinarius graminicola Sathe & S.D. Deshp.	Pur	Sathe & Deshpande 1980b as *Cortinarius graminicolus* Sathe & S.D. Deshp.
Cortinarius fluorescens E. Horak	Pur	Sathe & Deshpande 1982
Entolomataceae Kotl. & Pouzar		
Entoloma brassicolens (D.A. Reid) Noordel.	Mah	Sathe & Deshpande 1982 as *Nolanea brassicolens* D.A. Reid
Entoloma byssisedum (Pers.) Donk	Pun	Sathe & Rahalkar 1975, Sathe & Deshpande 1982 as *Claudopus byssisedus* (Pers.) Gillet
Entoloma ochrospora Sathe & S.M. Kulk.	Saw	Sathe & Kulkarni 1979
Entoloma strictius (Peck) Sacc.	Thu	Sathe & Rahalkar 1975; Sathe & Deshpande 1982 as *Rhodophyllus strictior* (Peck) Singer (as *R. strictius*)
	Bas	Sathe & Rahalkar 1976 as *Rhodophyllus strictior* (Peck) Singer (as *R. strictus*)
Hydnangiaceae Gäum. & C.W. Dodge		
Laccaria amethystina Cooke	Pun	Sathe & Deshpande 1982
	Amr	Hedawoo 2010
Hygrophoraceae Lotsy		
Chrysomphalina chrysophylla (Fr.) Clémençon	Kol	Thite et al. 1976 as *Omphalina chrysophylla* (Fr.) Murill
	Rad	Patil & Thite 1977 as *Omphalina chrysophylla* (Fr.) Murill
Hygrocybe boriviliensis B.D. Sharma, S.D. Deshp. & S.G. Pradhan	Bor	Sharma et al. 1986
Hygrocybe ceracea (Sowerby) P. Kumm.	Pun	Sathe & Sasangan 1977, Sathe & Deshpande 1982
Hygrocybe pratensis (Fr.) Murrill	Nag	Trivedi 1972 as *Hygrophorus pratensis* (Fr.) Fr.
Hygrophoropsidaceae Kühner		
Hygrophoropsis aurantiaca (Wulfen) Maire	Amr	Hedawoo 2010
Inocybaceae Jülich		
Crepidotus mollis (Schaeff.) Staude‖	Mah	Sathe & Deshpande 1980b
	Bhi	MCI 912
	Mah	AMH 9243
Crepidotus variabilis (Pers.) P. Kumm.	Amb	Patil & Thite 1978 as *Claudopus variabilis* (Pers.) Fr.
	Rad	Patil & Thite 1977
Inocybe cookei Bres.	Pun	Sathe & Deshpande 1982
Inocybe dulcamara (Pers.) P. Kumm.	Pun	Sathe & Deshpande 1982 as *Inocybe delecta* P. Karst.
Inocybe griseolilacina J.E. Lange	Pun	Sathe & Rahalkar 1976, Sathe & Deshpande 1982
Inocybe infelix Peck	Pun	Sathe & Deshpande 1982
Inocybe rimosa (Bull.) P. Kumm.	Pun	Sathe & Sasangan 1977, Sathe & Deshpande 1982 as *Inocybe fastigiata* (Schaeff.) Quél.
Lyophyllaceae Jülich		
Calocybe gambosa (Fr.) Donk	Nag	Trivedi 1972 as *Tricholoma gambosum* (Fr.) P. Kumm.
Calocybe indica Purkay. & A. Chandra	Amr	Hedawoo 2010
Termitomyces clypeatus R. Heim	Kan	Patil et al. 1979
Termitomyces eurrhizus (Berk.) R. Heim‖	Mal	Patil et al. 1979 as *Termitomyces cartilaginous* (Berk.) R. Heim.
	Pun	Sathe & Deshpande 1980b as *Termitomyces poonensis* Sathe & S.D. Deshp.
	Pun	MCI 977
Termitomyces heimii Natarajan	Pun	Patil et al. 1979 as *Termitomyces albuminosus* (Berk.) R. Heim
	Amr	Hedawoo 2010
Termitomyces mammiformis R. Heim	Kol	Thite et al. 1976
	Rad	Patil & Thite 1977
	Pun	Patil et al. 1979
	Amr	Hedawoo 2010

Taxa	Distribution	References
Termitomyces microcarpus (Berk. & Broome) R. Heim‖	Pun	Patil et al. 1979
	Pun	MCI 976
Termitomyces robustus (Beeli) R. Heim	Kol	Patil & Thite 1978
	Pun	Patil et al. 1979
Marasmiaceae Roze ex Kühner		
Anthracophyllum nigritum (Lév.) Kalchbr. ‖	Kha	Bhide et al. 1987
	Mah	AMH 9240, 9268
	Mul	MCI 933
Anthracophyllum lateritium (Berk. & M.A. Curtis) Singer	Kha	Theissen 1911, Uppal et al 1935 as *Xerotus lateritius* Berk. & M.A. Curtis
Atheniella aurantiidisca (Murrill) Redhead, Moncalvo, Vilgalys, Desjardin & B.A. Perry	Kol	Thite & Patil 1982-83 as *Mycena aurantiidisca* (Murrill) Murrill
Gymnopus androsaceus (L.) J.L. Mata & R.H. Petersen	Mah	Sathe & Deshpande 1982 as *Marasmius androsaceus* (L.) Fr.
Gymnopus fusipes (Bull.) Gray	Rad	Thite et al. 1976, Patil & Thite 1977 as *Collybia fusipes* (Bull.) Quél.
Marasmius echinosphaerus Singer	Bhi	Sathe & Deshpande 1982
Marasmius goossensiae Beeli	Rad	Patil & Thite 1977
	Kol	Patil & Thite 1978
Marasmius gordipes Sacc. & Paol.	Pun	Sathe & Deshpande 1982
Marasmius graminum (Lib.) Berk.	Rad	Patil & Thite 1977
	Kol	Patil & Thite 1978
Marasmius haematocephalus (Mont.) Fr. ‖	Rad	Patil & Thite 1977
	Pun	MCI 945
Marasmius oreades (Bolton) Fr.	Pun	Sathe & Rahalkar 1975 as *Scorteus oreades* (Fr.) anon.
	Bor	Sathe & Deshpande 1982 as *Scorteus oreades* (Fr.) anon.
Marasmius rhizophilus (V. Brig.) Fr.	Amb	Patil 1978, Patil & Thite 1978
Marasmius rotula (Scop.) Fr.	Pun	Sathe & Sasangan 1977
	Bor	Sathe & Deshpande 1982
	Amr	Hedawoo 2010
Marasmius siccus (Schwein.) Fr.	Nag	Trivedi 1972
	Pun	Sathe & Rahalkar 1975, 1976
	Mah	Sathe & Deshpande 1982
Marasmius spaniophyllus Berk.	Kha	Theissen 1911, Uppal et al. 1935
Marasmius thwaitesii Berk. & Broome	Pun	Sathe & Deshpande 1982
Marasmius tubulatus Petch	Pun	Sathe & Deshpande 1982
Marasmius umbrinus Pegler	Rad	Patil & Thite 1977
	Kol	Patil & Thite 1978
Megacollybia platyphylla (Pers.) Kotl. & Pouzar	Kol	Patil & Thite 1978 as *Collybia platyphylla* (Pers.) P. Kumm.
Trogia grisea (Berk.) Pat.	Kha	Uppal et al. 1935 as *Xerotus griseus* Berk.
Mycenaceae Overeem		
Mycena avenacea (Fr.) Quél.	Nag	Trivedi 1972
Mycena galericulata (Scop.) Gray	Kol	Thite & Patil 1982-83
Mycena galopus (Pers.) P. Kumm.	Kol	Thite & Patil 1982-83 as *Mycena leucogala* (Cooke) Sacc.
Mycena juncicola (Fr.) Gillet	Mum	Sathe & Deshpande 1982
Mycena madronicola A.H. Sm.	Kha	Sathe & Deshpande 1982
Mycena mucor (Batsch) Quél.	Mah	Sathe & Deshpande 1982
Mycena stylobates (Pers.) P. Kumm.	Mah	Sathe & Deshpande 1982
Mycena subcaerulea (Peck) Sacc.	Pun	Sathe & Rahalkar 1975, Sathe & Deshpande 1982
Panellus belangeri (Mont.) Singer	Nag	Graham 1915 as *Trogia belangeri* (Mont.) Fr.
Panellus ringens (Fr.) Romagn.	Pun	Sathe & Rahalkar 1975, Sathe & Deshpande 1982 as *Scytinotus ringens* (Fr.) P. Karst.
Physalacriaceae Corner		

Taxa	Distribution	References
Armillaria tabescens (Scop.) Emel	Pun	Sathe & Rahalkar 1975, Sathe & Deshpande 1982 as *Clitocybe monadelpha* (Morgan) Sacc.
Hymenopellis radicata (Relhan) R.H. Petersen‖	Kar	Sathe & Rahalkar 1976, Sathe & Deshpande 1982 as *Oudemansiella radicata* (Relhan) Singer; Sathe & Rahalkar 1976 as *Collybia radicata* (Relhan) Quél.
	Thu	Sathe & Rahalkar 1976 as *Oudemansiella radicata* (Relhan) Singer
	Lon	MCI 961
	Bhi	MCI 963
Oudemansiella indica Sathe & S.D. Deshp.	Kan	Sathe & Deshpande 1980b
Oudemansiella mucida (Schrad.) Höhn.	Nag	Trivedi 1972 as *Armillaria mucida* (Schrad.) P. Kumm.
Rhizomarasmius undatus (Berk.) R.H. Petersen	Pun	Sathe & Rahalkar 1976, Sathe & Deshpande 1982 as *Marasmius undatus* (Berk.) Fr.
Pleurotaceae Kühner		
Pleurotus columbinus Quél.	Pun	Sathe & Deshpande 1980b
Pleurotus cornucopiae (Paulet) Rolland	Sat	Chavan & Barge 1977 as *Pleurotus sapidus* Sacc.
Pleurotus dryinus (Pers.) P. Kumm.	Sat	Chavan & Barge 1977
	Amr	Hedawoo 2010
Pleurotus flabellatus Sacc.‖	Pun	Sathe & Deshpande 1980b, Sathe & Deshpande 1982
	Mul	MCI 897
Pleurotus membranaceus Massee	Pan	Massee 1901, Woodrow 1903, Uppal et al. 1935, Thite & Kulkarni 1976
	Pun	Uppal et al. 1935
Pleurotus ostreatus (Jacq.) P. Kumm.	Pan	Sathe & Rahalkar 1975
	Kar	Vaidya et al. 1991
	Amr	Hedawoo 2010
Hohenbuehelia petaloides (Bull.) Schulzer	Amr	Hedawoo 2010 as *Pleurotus petaloides* (Bull.) Quél.
Hohenbuehelia spathulata (Pers.) Singer	Sat	Chavan & Barge 1977 as *Pleurotus spathulatus* (Pers.) Peck
Pluteaceae Kotl. & Pouzar		
Pluteus cervinus (Schaeff.) P. Kumm.	Pun	Sathe & Deshpande 1982; Sathe & Deshpande 1980b as *Pluteus atricapillus* (Batsch) Fayod
Pluteus nanus (Pers.) P. Kumm.	Nag	Trivedi 1972
Volvopluteus earlei (Murrill) Vizzini, Contu & Justo	Amr	Hedawoo 2010 as *Volveriella media* (Schumach.) Singer
Volvopluteus gloiocephalus (DC.) Vizzini, Contu & Justo	Kol	Patil & Thite 1978 as *Volvariella speciosa* (Fr.) Singer
Polyporaceae Fr. Ex Corda		
Lentinus alpacus Senthil. & S.K. Singh#	Pun	Senthilarasu & Singh 2012
Lentinus connatus Berk.	Mum	Pegler 1983; Lévillé 1846 as *Lentinus revelatus* Berk.; Lévillé 1846, Uppal et al. 1935 as *Lentinus javanicus* Lév
Lentinus polychrous Lév.	Nag	Pegler 1983
Lentinus squarrosulus Mont.	Pun	Pegler 1983 (specimen deposited at Kew in 1977 by Sasangan, AMH 3655)
	Kha	Theissen 1911 as *Lentinus* aff. *subnudus* Berk.; Uppal et al. 1935 as *Lentinus subnudus* Berk.
Psathyrellaceae Vilgalys, Moncalvo & Redhead		
Coprinellus micaceus (Bull.) Vilgalys, Hopple & Jacq. Johnson	Nag	Trivedi 1972 as *Coprinus micaceus* (Bull.) Fr.
	Pun	Sathe & Rahalkar 1975, Sathe & Deshpande 1982 as *Coprinus micaceus* (Bull.) Fr.
	Kol	Thite et al. 1976 as *Coprinus micaceus* (Bull.) Fr.
	Rad	Patil & Thite 1977

Taxa	Distribution	References
Coprinellus disseminates (Pers.) J.E. Lange	Pun	Sathe & Rahalkar 1975, Sathe & Deshpande 1982 as *Pseudocoprinus disseminatus* (Pers.) Kühner
Coprinellus ephemerus (Bull.) Redhead, Vilgalys & Moncalvo	Mah	Sathe & Rahalkar 1975, Sathe & Deshpande 1980b as *Ephemerocybe ephemerus* (Fr.) Fayod
	Pun	Sathe & Deshpande 1982 as *Ephemerocybe ephemerus* (Fr.) Fayod
Coprinopsis nivea (Pers.) Redhead, Vilgalys & Moncalvo	Pun	Narendra & Rao 1976 as *Coprinus niveus* (Pers.) Fr.
Coprinopsis radiata (Bolton) Redhead, Vilgalys & Moncalvo	Pun	Narendra & Rao 1976 as *Coprinus radiatus* (Bolton) Gray
Cystoagaricus trisulphuratus (Berk.) Singer‖	Pun	Sathe & Deshpande 1982
	Mul	MCI 832
Ephemerocybe poonensis Sathe & S.D. Deshp.	Pun	Sathe & Deshpande 1980b
Lacrymaria lacrymabunda (Bull.) Pat.	Nag	Trivedi 1972 as *Hypholoma velutinum* (Pers.) P. Kumm.
Parasola setulosa (Berk. & Broome) Redhead, Vilgalys & Hopple	Kol	Thite & Patil 1982-83 as *Coprinus setulosus* Berk. & Brooome
Psathyrella candolleana (Fr.) Maire‖	Pun	Sathe & Rahalkar 1976 as *Hypholoma appendiculatum* (Bull.) Quél.
	Pun	MCI 941
Psathyrella nana (Massee) Manjula	Pun	Manjula 1983; Massee 1901, Uppal et al. 1935 as *Psathyra nana* Massee
Psathyrella poonensis Sathe & S.D. Deshp.	Pun	Sathe & Deshpande 1980b
Russulaceae Lotsy		
Lactarius deliciosus (L.) Gray	Kol	Patil & Thite 1978
Russula claroflava Grove	Amr	Hedawoo 2010
Schizophyllaceae Quél		
Schizophyllum commune Fr. ‖	Mum	Theissen 1911, Uppal et al. 1935 as *Schizophyllum alneum* (L.) J. Schröt.
	Pan	Thite & Kulkarni 1976; Thite & Kulkarni 1976 as *Schizophyllum alneum* (L.) J. Schröt.
	Kha	Uppal et al. 1935
	Pun	Sathe & Deshpande 1982
	Mul	MCI 915
	Amr	Hedawoo 2010
Strophariaceae Singer & A. H. Sm.		
Agrocybe broadwayi (Murrill) Dennis	Kol	Thite et al. 1976
	Rad	Patil & Thite 1977
Agrocybe pediades (Fr.) Fayod	Pun	Sathe & Rahalkar 1975, Sathe & Deshpande 1982 as *Naucoria semiorbicularis* (Bull.) Quél.
Gymnopilus karnalensis S.M. Kulk.	Kar	Kulkarni 1990
Hebeloma albidulum Peck	Pun	Sathe & Rahalkar 1975
Hebeloma fastibile (Pers.) P. Kumm.	Mum	Sathe & Deshpande 1982
Hebeloma vatricosum (Fr.) Murrill	Pun	Sathe & Deshpande 1982 as *Inocybe vatricosa* (Fr.) P. Karst.
Hemipholiota populnea (Pers.) Bon	Sat	Chavan & Barge 1977 as *Pholiota destruens* (Brond.) Gillet
Pachylepyrium fulvidula (Singer) Singer	Pun	Sathe & Rahalkar 1975 as *Pachylepyrium fulvidulum*; Sathe & Deshpande 1982 as *Pachylepyrium fulvida*
Pholiota indica Massee	Pun	Massee 1901, Uppal et al. 1935, Sathe & Deshpande 1982
Pholiota mahabaleshwarensis Sathe & S.D. Deshp.	Mah	Sathe & Deshpande 1980a, Sathe & Deshpande 1980b
Pholiota squarrosoadiposa J. E. Lange	Sat	Chavan & Barge 1977
Psilocybe merdaria (Fr.) Ricken	Pun	Massee 1901, Uppal et al. 1935 as *Stropharia merdaria* (Fr.) Quél.
Psilocybe semilanceata (Fr.) P. Kumm.	Pun	Sathe & Sasangan 1977, Sathe & Deshpande 1982

Taxa	Distribution	References
Stropharia rubrobrunnea Senthil. & S.K. Singh^	Sin	Senthilarasu & Singh 2013
Velomycena phaltanensis Sathe & S.D. Deshp.	Pha	Sathe & Deshpande 1980b
Tricholomataceae R. Heim ex Pouzar		
Cantharellula umbonata (J.F. Gmel.) Singer	Pun	Sathe & Rahalkar 1975, Sathe & Deshpande 1982
Clitocybe nebularis (Batsch) P. Kumm.	Pun	Sathe & Deshpande 1982
Clitocybe sinopica (Fr.) P. Kumm.	Nag	Trivedi 1972
Lepista kamatii Sathe & Sasangan	Pun	Sathe & Sasangan 1978, Sathe & Deshpande 1982 as *Lepista kamati*
Lepista nuda (Bull.) Cooke	Pun	Sathe & Rahalkar 1975 as *Tricholoma nudum* (Bull.) P. Kumm.
	Mah	Sathe & Deshpande 1982 as *Tricholoma nudum* (Bull.) P. Kumm.
Lepista nudoidea Sathe & S.D. Deshp.	Pai	Sathe & Deshpande 1980b
Lepista subaequalis (Britzelm.) Singer	Pun	Sathe & Rahalkar 1975, Sathe & Deshpande 1982
Omphalina buccinalis (Batsch) Murrill	Pun	Sathe & Rahalkar 1975, Sathe & Deshpande 1982 as *Omphalina scyphoides* (Fr.) Quél,
Tricholoma album (Schaeff.) P. Kumm.	Amr	Hedawoo 2010
Tricholoma caligatum (Viv.) Ricken	Pun	Sathe & Rahalkar 1975, Sathe & Deshpande 1982 as *Armillaria caligata* (Viv.) Gillet
Tricholoma equestre (L.) P. Kumm.	Sat	Chavan & Barge 1977
Incerte sedis		
Panaeolus cyanescens (Berk. & Broome) Sacc.	Sin	Sathe & Deshpande 1980b as *Copelandia cyanescens* (Berk. & Broome) Singer
Panaeolus papilionaceus (Bull.) Quél.	Pun	Sathe & Deshpande 1982, Sathe & Rahalkar 1975; Sathe & Rahalkar 1975, Sathe & Deshpande 1982 as *Panaeolus campanulatus* (L.) Quél.
Volvariella diplasia (Berk. & Broome) Singer	Pun	Sathe & Rahalkar 1976, Sathe & Deshpande 1982
Volvariella volvacea (Bull.) Singer	Pun	Sathe & Rahalkar 1976, Sathe & Deshpande 1982
Volvariella sathei Senthil. Sharma, S.K. Singh¶	Pun	Senthilarasu et al. 2012
Volvariella woodrowiana (Massee) Manjula	Mum	Massee 1899 as *Volvaria woodrowiana* Massee
	Pun	Uppal et al. 1935 as *Volvaria woodrowiana* Massee
Species excluded		
Agaricus bhimashankarense Sathe & Sasangan*	Bhi	Sathe & Deshpande 1982
Agaricus campestris var. *mahabaleshwarensis* Sathe & S.D. Deshp.*	Mah	Sathe & Deshpande 1982
Agaricus campestris var. *poonensis* Sathe & Sasangan*	Pun	Sathe & Deshpande 1982
Agaricus chinchwadense Sathe & Sassangan*	Pun	Sathe & Deshpande 1982
Agaricus concoloratus Sathe & Sassangan*	Pun	Sathe & Deshpande 1982
Agaricus endoxanthoides Sathe & Sassangan*	Kha	Sathe & Deshpande 1982
Agaricus khandalense Sathe & Sassangan*	Kha	Sathe & Deshpande 1982
Agaricus microsporus Sathe & Sasangan*		
Agaricus pallidostipes Sathe & Sasangan*	Pun	Sathe & Deshpande 1982

Taxa	Distribution	References
Agaricus pathakii Sathe & Sasangan*	Pun	Sathe & Deshpande 1982
Agaricus subglobosporus Sathe & Sasangan*	Pun	Sathe & Deshpande 1982
Agaricus sylvaticus var. *minor* Sathe & Sasangan*	Pun	Sathe & Deshpande 1982
Agaricus xanthodermus var. *poonensis* Sathe & Sasangan*	Pun	Sathe & Deshpande 1982
Agarocybe poonensis Sathe & Sasangan*	Pun	Sathe & Deshpande 1982
Calocybe khandalensis Sathe & Sasangan*	Kha	Sathe & Deshpande 1982
Clitocybe mahabaleshwarensis Sathe & S.D. Deshp. *	Mah	Sathe & Deshpande 1982
Copelandia cyanescens var. *mahabaleshwarensis* Sathe & S.D. Deshp.*	Mah	Sathe & Deshpande 1982
Flammula mahabaleshwarensis Sathe & S.D. Deshp. *	Mah	Sathe & Deshpande 1982
Galerina poonensis Sathe & Sasangan*	Pun	Sathe & Deshpande 1982
Hypholoma appendiculatum var. *poonensis* Sathe & Rahalkar*	Pun	Sathe & Deshpande 1982
Inocybe indica Sathe & Sasangan*	Pun	Sathe & Deshpande 1982–Nom. illegit. Art. 53.1 a homonym of *Inocybe indica* Sarwal
Inocybe poonensis Sathe & Sasangan*	Pun	Sathe & Deshpande 1982
Lepiota bosii Sathe & Rahalkar*	Pun	Sathe & Rahalkar 1976, Sathe & Deshpande 1982
Lepiota sanguinea Sathe & Deshpande▼	Pha	Sathe & Deshpande 1980b–Nom. illegit. Art. 53.1 a homonym of *Lepiota sanguinea* Beeli (current name *Leucoagaricus sanguineus* (Beeli) Heinem.
Leucocoprinus kamatii Sathe & Sasangan*	Pun	Sathe & Deshpande 1982
Leucopaxillus kamatii Sathe & Rahalkar*	Pun	Sathe & Deshpande 1982
Pholiota squarrosoides var. *mahabaleshwarensis* Sathe & S.D. Deshp.	Mah	Sathe & Deshpande 1982
Pleurotus poonensis Sathe & Sasangan*	Pun	Sathe & Deshpande 1982
Podabrella poonensis Sathe & Sasangan*	Pun	Sathe & Deshpande 1982
Pluteus tropica Sathe & Rahalkar*	Pun	Sathe & Deshpande 1982
Ripartites munjali Sathe & Rahalkar*	Pun	Sathe & Deshpande 1982
Stropharia singeri Sathe & Rahalkar*	Pun	Sathe & Deshpande 1982
Volvariella deodikarii Sathe & Rahalkar*	Pun	Sathe & Deshpande 1982

[#]–as *Lentinus alpakus* in index fungorum; ^ species not found in index fungorum; [¶]–as *Volvariella sathei* Senthil. & S.K. Singh in index fungorum; [‖]–the collections also made in the present study; *–the new species having no description and not validly published (nom. inval./nom. nudum); ▼–homonym (nom. illegit.).

The most represented genus is *Agaricus* (18 spp.) followed by *Marasmius* (13 spp.), *Mycena* (8 spp.), *Lepiota* (7 spp.), *Pleurotus*, *Termitomyces* (6 spp. each) and *Amanita*, *Inocybe* (5 spp. each). Most of the genera are represented by one or two species.

The Kerala state has been well explored for its agaric diversity and 616 species of gilled mushrooms belonging to 112 genera have been reported (Farook et al. 2013). A total of 138 new species have been described from Kerala State, whereas, only 21 new species and two new genera (*Singerina* and *Chlorolepiota*) have been reported from Maharashtra though the State has dense forest areas. The present study indicates that less number of species have been reported from

Fig. 4 – a, *Leucocoprinus fragilissimus*, basidiomes under natural conditions in ARI campus. b, *Leucocoprinus birnbaumii* basidiomes under natural conditions in Pune University campus. c, *Parasola plicatilis*, basidiomes under natural conditions in ARI campus. d, e *Pleurotus djmor*. d, surface view. e, gill view. f, *Pleurotus cystidiosus*, basidiomes under natural conditions in ARI campus. g, *Trogia infundibuliformis*, basdiomes under natural conditions in Mahabaleshwar.

Maharashtra that reflects insufficient study. The most of the species listed were published between the period of Massee 1901 and 1992. Since then apparently, there was no report on the taxonomy and diversity of gilled fungi occurring in Maharashtra. Many parts of the state have not been surveyed and even dense forests in Western Ghats and Vidarbha region have not been adequately explored. A total of 26 new species and 7 new varieties published that are lacking descriptions and illustrations (Sathe & Deshpande 1982) and a properly described, homonym *Lepiota sanguinea* (Sathe & Deshpande 1980b) are excluded. However, the specimens have been well preserved at AMH and all the species will be phylogenetically analysed in future.

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