

Taxonomic studies on wood inhabiting polypores from Chennai

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ABSTRACT

A total of eleven polypore species, *Corioloopsis aspera* (Jungh.) Teng, *C. Caperata* (Berk.) Murrill, *C. Polyzona* (Pers.) Ryvardeen, *Daedalea quercina* (L.) Pers., *Earliella scabrosa* (Pers.) Gilb. & Ryvardeen, *Flavodon flavus* (Klotzsch) Ryvardeen, *Hexagonia hirta* (P. Beauv.) Fr., *H. tenuis* (Hook.) Fr., *Laetiporus sulphureus* (Bull.) Murrill, *Polyporus varius* (Pers.) Fr. and *Truncospora tephropora* (Mont.) Zmitr. belonging to three families under order *Polyporales* are described and illustrated for the first time from Chennai (Tamil Nadu).

KEYWORDS: *Basidiomycota*, polypores, wood-decay, taxonomy.

INTRODUCTION

Polypores are one of the most dynamic and diverse group of fungi, which are well known for their wood decaying property that ultimately, contributes towards the maintenance of forest ecosystem by recycling the minerals (Christensen *et al.*, 2005). Majority of the polypores have been grouped under order *Polyporales* which are characterized by resupinate, effused, effused-reflexed, to pileate basidiocarps that can be stipitate or sessile (Binder *et al.*, 2005). The hymenial surface may be poroid, lamellate, daedaloid or hydroid. Anatomically, the hyphal system may be monomitic, dimitic or trimitic (Gilbertson and Ryvardeen, 1986). Gäumann (1926) proposed the order *Polyporales* with ten families, based on their morphological characters. Later, with the development of molecular techniques, Binder *et al.* (2013) and Justo *et al.* (2017) recognized 41 families under the order *Polyporales*. At present, MycoBank (<http://www.mycobank.org>) record shows 77 families with over 1800 described species making it one of the largest order in *Agaricomycotina* (Kirk *et al.*, 2008).

Chennai, located at the eastern coast of India and northeastern to southeastern Tamil Nadu has an average elevation of 6.7 m and covers an area of about 1189 km². The climate of Chennai is typically hot and humid with three distinct meteorological seasons of summer (Feb-May), monsoon (Jun-Sep) and winter (Oct-Jan). However, taxonomy of macrofungi is poorly documented in Chennai. Initially, Sundaramani and Madurajanin (1925) studied the polypores of Tamil Nadu followed by contributions of Natarajan and Kolandavelu (1998), Selvam *et al.*, (2012), Malarvizhi (2014) and Priyamvada *et al.*, (2017). The present paper is in continuation to the earlier publication by Kezo *et al.*, (2019). This is a preliminary attempt to document the diversity of polypores in Chennai. Twenty one specimens belonging to 11 species of polypore fungi collected from different locations of Chennai during 2015 to 2018 have been illustrated and described with phenetic and micro-taxonomic characters for the first time from the study area.

MATERIALS AND METHODS

Collection and macro-microscopical characterization:

Several field trips were carried out to collect polypores in three areas of Chennai, namely Guindy, Adyar and Tambaram during monsoon season. Locality and host of the basidiomata were recorded and photographed in their natural habitats.

Morphological characters of the basidiomata such as shape, size, color, etc. were recorded. The colour reference is as per Kornerup and Wanscher (1981). The fresh basidiomata were dried at 45 - 55 °C in an electric drier for 24 hours and were preserved in sealed polythene bags with naphthalene balls. Thin sections were cut from basidiomata and studied using CLX2 Labomed microscope. Sections were mounted in cotton blue (CB), Melzer's reagent and 5% potassium hydroxide (KOH). Microscopic descriptions are based on the hyphal construction, pigmentation, presence/absence of cystidia, shape and size of basidia and basidiospores, etc. (Sharma, 2012; Núñez and Ryvardeen, 2001).

RESULTS AND DISCUSSION

In all 11 species belonging to 8 genera and 3 families, namely *Fomitopsidaceae* (*Daedalea quercina*, *L. sulphureus*), *Meruliaceae* (*Flavodon flavus*) and *Polyporaceae* (*Corioloopsis aspera*, *C. caperata*, *C. polyzona*, *Earliella scabrosa*, *Hexagonia hirta*, *H. tenuis*, *Truncospora tephropora*, and *Polyporus varius*) of the order *Polyporales* are illustrated and described on the basis of specimens collected from different localities of Chennai, Tamil Nadu.

TAXONOMIC DESCRIPTIONS

1. *Corioloopsis aspera* (Jungh.) Teng, *Zhong Guo De Zhen Jun* [Fungi of China]: 759 (1963). **Fig.1**

Basidiocarp annual, effused-reflexed to pileate, sessile, solitary, dimidiate; corky when fresh, leathery on drying; pileus up to 80 × 40 × 9 mm; abhymenial surface velutinate to hirsute, rarely glabrous, concentrically zonate with alternating zones of dark brown (6F5) to light brown (6D5) and dark brown (8F3), not changing on drying; hymenial surface poroid, brown (6E7), not changing on drying; pores round, 3-4 per mm; Context homogenous, zonate, light brown (6D5), up to 5 mm in thickness, tissue turning dark brown in KOH; pore tubes brown (6E7), up to 4 mm in thickness; margins acute, rusty brown (6E8), up to 2 mm in thickness. Hyphal system trimitic. Generative hyphae thin-walled, hyaline, clamped, branched, up to 4 µm wide. Skeletal hyphae thick-walled, aseptate, up to 5 µm wide, rarely encrusted. Binding hyphae thick-walled, aseptate, up to 3 µm wide, highly branched. Basidia clavate, 4 sterigmate, 14-22 × 3-5 µm. Basidiospores cylindrical, (8.2-) 8.5-10.8 (-11.4) × (3-) 3.2-4 (-4.5) µm, Q = 2.4, thin-walled, hyaline, CN, IK.

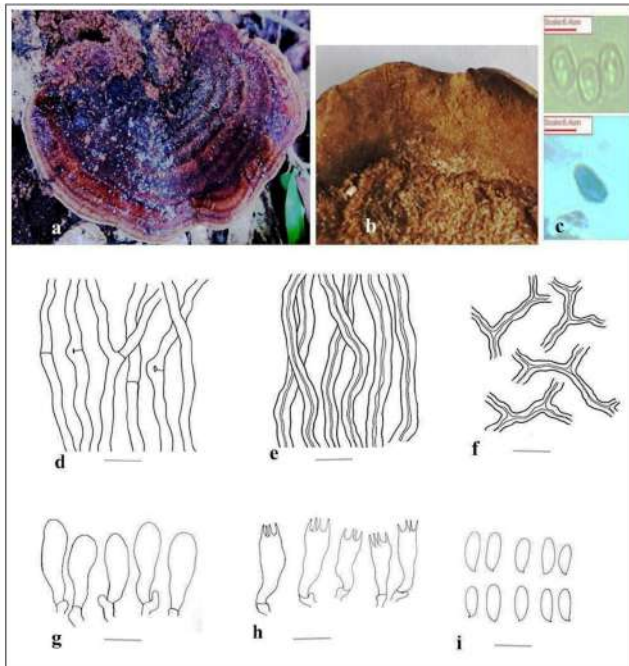


Fig.1. *Corioloopsis aspera*: a. Sporocarp (abhymental surface), b. Hymenial surface, c. Basidiospores in water and cotton blue, d. Generative hyphae, e. Skeletal hyphae, f. Binding hyphae, g. Basidioles, h. Basidia, i. Basidiospores. Scale bar d-i = 10 µm

Specimen examined: India, Tamil Nadu, Chennai, Guindy, in association with dead wood, (13°00'03"N, 80°14'26"E), MLCASB023, 31.10.2015, G. Sughantha.

Comments: The macroscopic and microscopic characters of the present specimen are consistent with the earlier report (Sharma, 2012) except for the colour of the context and the size of basidiospores. In India, it has been reported from Assam (Bose, 1937; Bakshi, 1971), West Bengal (Banerjee, 1947; Bakshi, 1971; Sharma, 2000 and 2012), Andaman Islands (Bakshi, 1971), Gujarat (Arya *et al.*, 2008) and Andhra Pradesh (Nagadesi *et al.*, 2014).

2. *Corioloopsis caperata* (Berk.) Murrill, *North American Flora* 9(2): 77 (1908). **Fig.2**

Basidiocarp annual, pileate, sessile, flexible when fresh, hard and woody on drying; pileus up to 70 × 45 × 5 mm; abhymental surface narrowly zonate with alternating colours of yellowish brown (5E5) and dark brown (7F7), tomentose, not changing on drying; hymenial surface poroid, yellowish dark blond (5D4) when fresh, turning yellowish brown (5E5) on drying; pores round to angular to irregular, 3-5 per mm; context duplex in young basidiocarps, becomes more or less homogenous on maturity, up to 3 mm, yellowish brown (5E5), tissue turning dark brown in KOH; pore tubes inseparable, yellowish dark blond (5D4), up to 1 mm in depth; margins acute, greyish brown (8F3), up to 2 mm in thickness. Hyphal system trimitic. Generative hyphae thin-walled, hyaline, branched, clamped, up to 3.5 µm wide. Skeletal hyphae thick-walled, unbranched, aseptate, up to 6.8 µm wide. Binding hyphae thick-walled, irregularly branched, aseptate, up to 3.8 µm wide. Basidia clavate, usually 4

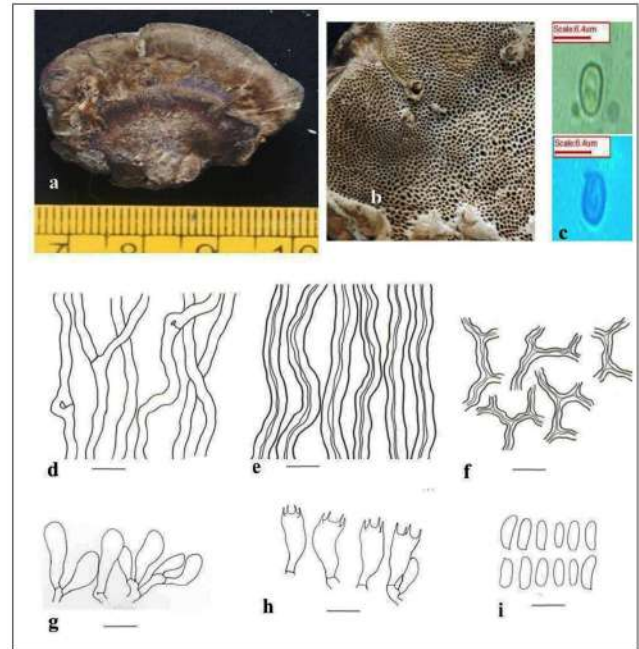


Fig.2. *Corioloopsis caperata*: a. Sporocarp (abhymental surface), b. Hymenial surface, c. Basidiospores in water and cotton blue, d. Generative hyphae, e. Skeletal hyphae, f. Binding hyphae, g. Basidioles, h. Basidia, i. Basidiospores. Scale bar d-i = 10 µm

sterigmate, 13 - 21 × 3.8 - 5.5 µm. Basidiospores cylindrical, (7-) 7.5 - 9.5 (-10.5) × (2-) 2.5 - 3.2 (-3.5) µm, Q = 2.5, hyaline, thin-walled CN, IKI.

Specimen examined: India, Tamil Nadu, Chennai, Guindy, in association with dead wood (13°00'34"N, 80°14'14"E), MLCASB264, 09.11.2015, G. Sughantha.

Comments: *Corioloopsis caperata* is unique in having pileate basidiocarps with tomentose abhymental surface and duplex context. From India it has been reported from Assam (Bose, 1937; Bakshi, 1971), Andaman Islands (Bakshi, 1971), Madhya Pradesh (Bakshi, 1971), Tamil Nadu (Bakshi, 1971), West Bengal (Bakshi, 1971; Sharma and Ghosh, 1989), Kerala (Leelavathy and Ganesh, 2000), Arunachal Pradesh (Sharma, 2012), Himachal Pradesh (Kaur, 2013), Uttarakhand (Sharma, 2012) and Punjab (Kaur, 2017).

3. *Corioloopsis polyzona* (Pers.) Ryvarden, *Norwegian Journal of Botany* 19: 230 (1972). **Fig.3**

Basidiocarp annual, pileate, sessile, dimidiate, broadly and firmly attached, corky when fresh, leathery on drying; pileus up to 120 × 50 × 20 mm; abhymental surface concentrically zonate, pale yellow (3A3) when fresh, becoming yellowish brown (6E7) on drying; hymenial surface poroid, pale yellow (3A3), not changing on drying; pores round to angular, 2-3 per mm; context duplex, lower part fibrous, upper part compact, pale yellow to yellow (3A3), up to 10 mm in thickness; pore tubes light yellow (4A3), up to 3 mm in depth; margins acute, light yellow (4A3), up to 2 mm in thickness. Hyphal system trimitic. Generative hyphae thin-walled, branched, clamped, up to 3 µm in width. Skeletal hyphae dominating in context, thick-walled, light yellowish, aseptate, up to 6 µm in width.

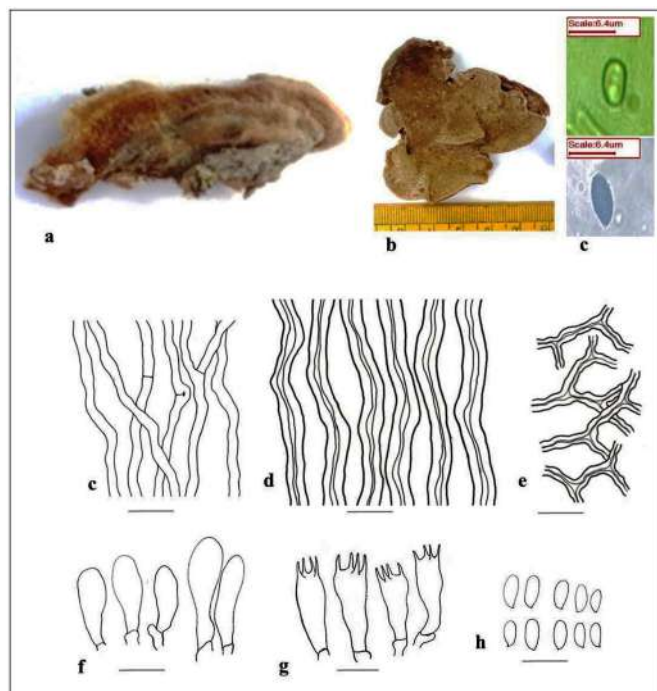


Fig.3. *Coriolopsis polyzona*: a. Sporocarp (abhymental surface), b. Hymenial surface, c. Basidiospores in water and cotton blue, d. Generative hyphae, e. Skeletal hyphae, f. Binding hyphae, g. Basidioles, h. Basidia, i. Basidiospores. Scale bar d-i = 10 μ m.

Binding hyphae thick-walled, hyaline, aseptate, irregularly branched, up to 3 μ m in width. Basidia clavate, 4 sterigmate, 17 - 26 \times 5 - 7 μ m. Basidiospores oblong elongate, (5-) 5.2-7.5 (-8) \times (2.5-) 3-3.4 (-3.8) μ m, Q = 1.7, thin-walled, hyaline, CN⁻, IK⁻.

Specimen examined: India, Tamil Nadu, Chennai, Tambaram, in association with dead wood, (12°55'11"N 80°07'13"E), MLCASB360, 13.10.2015, Tenzing Sangmo; Guindy, in association with dead wood, (13°00'36"N 80°14'17"E), MLCASB017, 31.10.2015, Sugantha G.

Comments: *Coriolopsis polyzona* is characterized by dimidiate basidiocarps, duplex context and oblong-elongate basidiospores. Earlier reports of this fungus from India include; West Bengal (Banerjee, 1947; Bakshi 1971), Kerala (Leelavathy and Ganesh, 2000), Andhra Pradesh and Himachal Pradesh (Sharma, 2012).

4. *Daedalea quercina* (L.) Pers., *Synopsis methodica fungorum*: 500 (1801). **Fig. 4**

Basidiocarp perennial, pileate, sessile, solitary, firmly attached, semi-circular, flat to slightly convex, corky when fresh, hard on drying; pileus up to 150 \times 80 \times 25 mm, thickening towards the attachment; abhymental surface broadly zonate, orange white (5A2) when fresh, greyish yellow (6B3) on drying, glabrous to somewhat velutinate; hymenial surface poroid, yellowish grey (4B2), not changing on drying; pores daedaleoid, lamellate to irregular, lamellae up to 3 mm thick and 4 cm long; context homogenous, light yellow (4A4), up to 10 mm in thickness; pore tubes light yellow (4A4), up to 2 cm in depth; margins acute, brownish

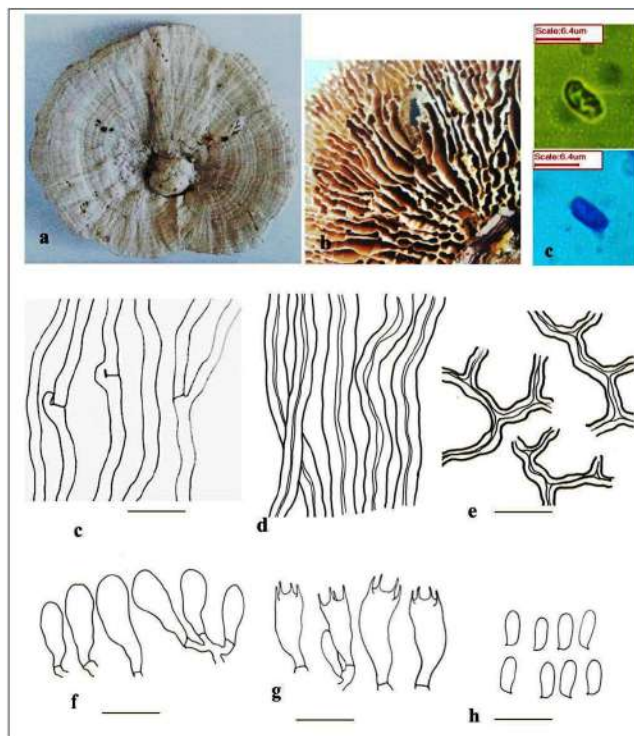


Fig.4. *Daedalea quercina*: a. Sporocarp (abhymental surface), b. Hymenial surface, c. Basidiospores in water and cotton blue, d. Generative hyphae, e. Skeletal hyphae, f. Binding hyphae, g. Basidioles, h. Basidia, i. Basidiospores. Scale bar d-i = 10 μ m.

orange (5C5), up to 2 mm thick. Hyphal system trimitic. Generative hyphae thin-walled, hyaline, branched, clamped, up to 4 μ m in width. Skeletal hyphae dominating in context, thick-walled, aseptate, up to 6 μ m in width. Binding hyphae thick-walled, yellowish brown, with short branches, aseptate, up to 4 μ m in width. Basidia clavate, 4-sterigmate, 14.9 - 18.4 \times 3.9 - 4.6 μ m. Basidiospores cylindrical, (5-) 5.5 - 6.8 (-7) \times (2.4-) 2.6 - 3.1 (-3.5) μ m, Q = 2.1, thin-walled, smooth, CN⁻, IK⁻.

Specimen examined: India, Tamil Nadu, Chennai, Guindy, in association with dead wood 13°00'06"N 80°14'25"E, MLCASB346, 13.10.2017, Lakleiphi Tallanao; in association with dead wood, 13°00'35"N 80°14'15"E, MLCASB332, MLCASB333, 31.10.2015, A. Arockia Mahimai Jayaseelan.

Comments: *Daedalea quercina* has comparatively larger basidiocarps with somewhat paler and velutinate pilear surface, irregular daedaleoid hymenophore and homogenous, brown context. The previous Indian reports are from Maharashtra (Ranadive *et al.*, 2011), Himachal Pradesh, Uttarakhand (Sharma, 2012) and Gujarat (Nagadesi *et al.*, 2014).

5. *Eariella scabrosa* (Pers.) Gilb. & Ryvardeen, *Mycotaxon* 22 (2): 364 (1985). **Fig. 5**

Basidiocarp annual, resupinate to effused-reflexed to pileate, broadly attached, tough and coriaceous when fresh, not changing much on drying; pileus up to 150 \times 110 \times 30 mm; abhymental surface glabrous, narrowly zonate, with

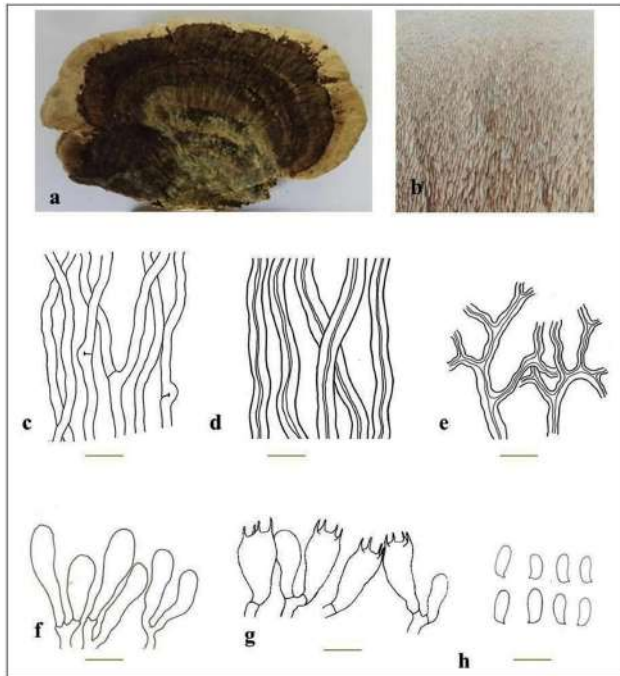


Fig. 5 *Earliella scabrosa*: a. Sporocarp (abhymental surface), b. Hymenial surface, c. Generative hyphae, d. Skeletal hyphae, e. Binding hyphae, f. Basidioles, g. Basidia, h. Basidiospores. Scale bar c-h = 10 µm.

alternating bands of brown (7C4), pale brown (6A3), brown white (6A2) and greyish brown (5B4), with distinct reddish cuticle that is often slightly wrinkled on drying; hymenial surface poroid, pale white (5A3) when fresh, changing to deep brown (6A2) to light brown (6D2) on drying; pores angular to rarely somewhat hydroid especially on sloping parts of the pileus, 3-4 per mm, individual pore elongated up to 5 mm in length; context homogenous, creamish white (5A2), up to 4 mm in thickness, with distinct dark lines under the red cuticle, tissue darkening in KOH; pore tubes concolorous with the context, up to 6 mm in depth; margins acute, light brownish (6D2), up to 1 mm in thickness. Hyphal system trimitic. Generative hyphae thin-walled, branched, clamped, up to 3 µm in width. Skeletal hyphae dominating, thick-walled, hyaline, aseptate, up to 5.5 µm in width. Binding hyphae thick-walled, much branched, aseptate, up to 4 µm in width. Basidia clavate, tetrasterigmate, 13.9 - 24.5 × 4.2 - 6.6 µm. Basidiospores cylindrical, (7.1-) 7.9 - 9.5 (-10) × (3-) 3.2-3.5(-4) µm, Q = 2.4, thin-walled, smooth, hyaline, CN⁻, IK⁻.

Specimen examined: India, Tamil Nadu, Chennai, Guindy, in association with dead wood, (13°00'04"N, 80°14'25"E), MLCASB222, 31.10.2015, G. Sugantha; in association with dead wood, (13°00'05"N, 80°14'25"E), MLCASB343, 13.10.2017, Lakleiphi Tallanao; in association with dead wood, (13°00'03"N, 80°14'26"E), MLCASB355, 21.11.2017, A. Arockia Mahimai Jayaseelan; Adyar, in association with dead wood, (13°00'37"N 80°15'48"E), MLCASB304, 31.10.2015, Kezhocuyi Kezo.

Comments: The present specimens of *Earliella scabrosa* are consistent with the earlier reports except for the minor

variations in the dimensions of basidiocarp and basidiospores. In India, it has been reported from West Bengal (Bakshi, 1971; Sharma and Ghosh, 1989; Roy and De, 1996), Uttarakhand (Dhanda, 1977; Roy and De, 1996; Sharma, 2000 and 2012), Assam (Roy and De, 1996), Kerala (Roy and De, 1996; Leelavathy and Ganesh, 2000), Natarajan and Kolandavelu (1998), Himachal Pradesh (Sharma, 2000 and 2012; Kaur, 2013; Kaur *et al.*, 2017) and Punjab (Kaur, 2017). Natarajan and Kolandavelu (1998) reported this species as *Trametes scabrosa* from Thirunelveli.

6. *Flavodon flavus* (Klotzsch) Ryvar den, *Norwegian Journal of Botany* **20** (1): 3 (1973). **Fig. 6**

Basidiocarp annual, resupinate to pileate, firmly attached, dimidiate; pileus up to 70 × 50 × 10 mm; abhymental surface tomentose, concentrically zonate with alternating zones of brown (6E8) and yellow (2A6), with age may become finely hispid; hymenial surface hydroid with irregular teeth which are up to 2 mm thick, poroid towards the margin and younger basidiomata, round to angular up to 3 per mm, 5 mm deep, yellow (2A6) when fresh, olive yellow (2C7) on drying; context distinctly duplex, lower part dense, upper part loose, yellowish brown to olive brown (4D6), turning to reddish brown in KOH, up to 2 mm in thickness; margins yellow (2A6), up to 2 mm thick. Hyphal system dimitic. Generative hyphae thin- to slightly thick-walled, hyaline, simple septate, moderately branched, up to 4 µm in width. Skeletal hyphae thick-walled, hyaline, rarely branched and encrusted, up to 7 µm in width, dominating in the context, sometime apical encrusted skeletal hyphae project into the hymenium.

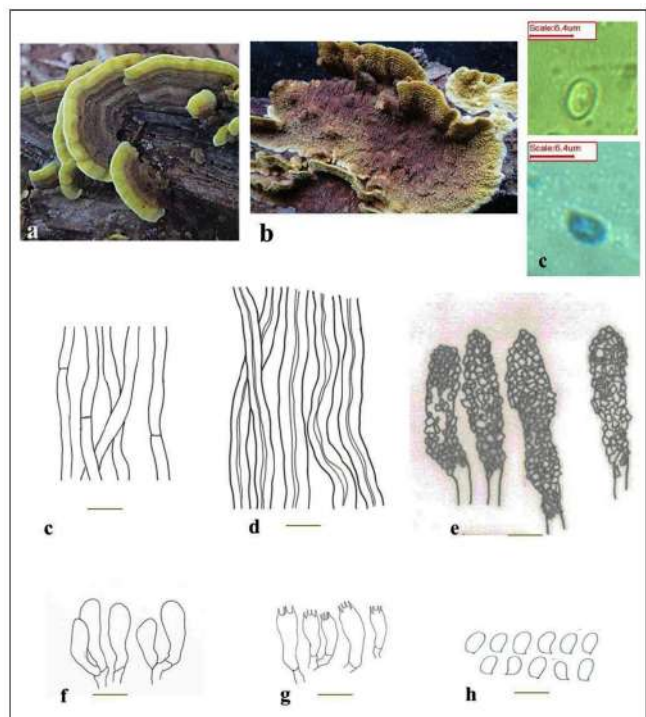


Fig. 6 *Flavodon flavus*: a. Sporocarp (abhymental surface), b. Hymenial surface, c. Basidiospores in water and cotton blue, d. Generative hyphae, e. Skeletal hyphae, f. Binding hyphae, g. Basidioles, h. Basidia, i. Basidiospores. Scale bar d-i = 10 µm.

Cystidia thick-walled, abundant, apically encrusted, $25 - 45 \times 5 - 7 \mu\text{m}$. Basidia clavate, 4-sterigmate, $14.8 - 18 \times 4.7 - 5.6 \mu\text{m}$. Basidiospores ellipsoid, $(5-) 5.5 - 6.5 (-7) \times (3-) 3.5 - 4 (-4.5) \mu\text{m}$, $Q = 1.5$, hyaline, thin-walled, smooth,; CN, IK.

Specimen examined: India, Tamil Nadu, Chennai, Guindy, in association with dead wood, (13°00'35"N, 80°14'25"E), MLCASB006, 10.09.2015, Kezhocuyi Kezo; in association with dead wood, (13°00'03"E, 80°14'26"N), MLCASB230, 31.10.2017, Kezhocuyi Kezo.

Comments: The morpho-taxonomic studies of the present specimens are in conformity with the earlier reports except for the larger cystidial size and minor variations in basidiospore size. The earlier Indian account of *F. flavus* is from West Bengal (Banerjee, 1947; Roy and De, 1996), Chandigarh (Dhanda, 1977), Uttarakhand (Dhanda, 1977; Sharma, 2000), Bihar (Roy and De, 1996), Madhya Pradesh (Roy and De, 1996), Uttar Pradesh (Roy and De, 1996), Tamil Nadu (Natarajan and Kulandavelu, 1998), Kerala (Leelavathy and Ganesh, 2000), Maharashtra (Ranadive *et al.*, 2011) and Himachal Pradesh (Sharma, 2012).

7. *Hexagonia hirta* (P. Beauv.) Fr., *Epicrisis Systematis Mycologici*: 496 (1838). **Fig.7**

Basidiomata annual, pileate, sessile, solitary to imbricate, dimidiate to flabelliform, applanate, corky when fresh, leathery on drying; pileus up to $80 \times 50 \times 8 \text{ mm}$ thick; abhymenial surface greyish brown (6E3) when fresh, turning to dark brown (7F4) on drying, densely covered with dark hairs up to 6 mm long, hairs disappearing or completely falling off with age leaving concentrically zonate surface;

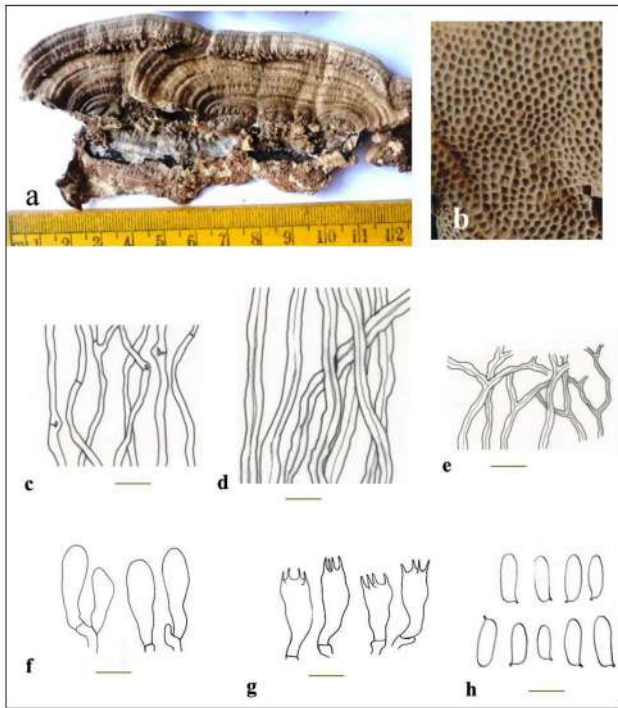


Fig.7 *Hexagonia hirta*: a. Sporocarp (abhymenial surface), b. Hymenial surface, c. Generative hyphae, d. Skeletal hyphae, e. Binding hyphae, f. Basidioles, g. Basidia, h. Basidiospores. Scale bar c-h = 10 μm .

hymenial surface poroid, brownish grey (7C2); pores angular to hexagonal, often radially elongated, 1-2 per mm; context homogenous, light brown (6D4), up to 2 mm in thickness, tissue turning dark brown in KOH; pore tubes light brown (6D4), up to 3 mm in depth; margins acute, thin, greyish brown (6E3), up to 1 mm thick. Hyphal system trimitic. Generative hyphae thin-walled, hyaline, branched, clamped, up to 2.5 μm in width. Skeletal hyphae abundant, thick-walled, yellow to light brown, unbranched, aseptate, up to 5 μm in width. Binding hyphae thick-walled, hyaline, much branched, aseptate, up to 2.5 μm in width. Basidia clavate, 4-sterigmate, $15 - 25 \times 5 - 9 \mu\text{m}$. Basidiospore cylindrical, $(10.5-) 11.2 - 15 (-15.8) \times (4-) 4.6 - 5 (-5.7) \mu\text{m}$, $Q = 2.6$, hyaline, smooth, thin walled, CN, IK.

Specimen examined: India, Tamil Nadu, Chennai, Guindy, in association with dead wood, 13°00'05"N 80°14'26"E, MLCASB348, 13.10.2017, Lakleiphi Tallanao.

Comments: The annual pileate, dimidiate to flabelliform applanate basidiocarp, densely strigose abhymenial surface with long, dark hairs and large hexagonal pores are the distinct characters of *Hexagonia hirta*. It has been report from Himalaya (Bakshi, 1971), Arunachal Pradesh (Sharma, 2000 and 2012), Tamil Nadu (Kandasamy *et al.*, 2016) and Himachal Pradesh (Kaur, 2013; Kaur *et al.*, 2017).

8. *Hexagonia tenuis* (Hook.) Fr., *Epicrisis Systematis Mycologici*: 498 (1838). **Fig.8**

Basidiocarp annual, pileate, sessile, broadly attached, solitary, rarely in clusters, flabelliform to semicircular, flat when fresh, often bent outward on drying, flexible and leathery both when fresh and on drying; pileus $40 \times 30 \times 3$



Fig.8 *Hexagonia tenuis*: a. Sporocarp (abhymenial surface), b. Hymenial surface, c. Generative hyphae, d. Skeletal hyphae, e. Binding hyphae, f. Basidioles, g. Basidia, h. Basidiospores. Scale bar c-h = 10 μm .

mm; abhymenial surface glabrous, concentrically zonate, with alternating colours of light brown (5D5), yellowish brown (5E6), brown (5F8) and dark brown (6F6); hymenial surface poroid, milky white (5A1), often with greyish to ashy-bluish tint that turns greyish brown (5D3) on drying; pores angular to hexagonal, 1 - 2 per mm; context homogeneous, brown (5F8), up to 1 mm in thickness, tissue dark brown in KOH; pore tubes greyish brown (5D3), up to 2 mm in depth; margins acute, slightly depressed, wavy, papery-thin, entire, sometimes lobed, up to 1 mm thick. Hyphal system trimitic. Generative hyphae, thin-walled, hyaline, branched, clamped, up to 3 μm in width. Skeletal hyphae thick-walled, unbranched, yellow to pale brown, aseptate, up to 6 μm in width. Binding hyphae hyaline thick-walled, coralloid to little branched aseptate, up to 4 μm in width. Basidia somewhat collapsed, 4 - sterigmate, 17 - 28 \times 5 - 9 μm . Basidiospores cylindrical, (8-) 9 - 13 (-14) \times (2-) 3 - 5 (-5.5) μm , Q = 1.52, hyaline, thin-walled, CN, IK.

Specimen examined: India, Tamil Nadu, Chennai, Tambarum, in association with dead wood, (12°55'12"N, 80°07'15"E), MLCASB352, 13.10.2015, Tenzing Sangmo; Guindy, in association with dead wood, (13°00'35"E, 80°14'16"N), MLCASB018, 12.09.2016, Kezhocuyi Kezo; in association with dead wood, (13°00'03"E, 80°14'26"N), MLCASB009, 31.10.2017, Kezhocuyi Kezo.

Comments: *Hexagonia tenuis* is easily identified by their dimidiate to flabelliform to semicircular basidiocarps with zonate pilear surface and hexagonal pores. In India, it has been reported from Kerala (Leelavathy and Ganesh, 2000; Mohanan, 2011), Gujarat (Arya *et al.*, 2008), Maharashtra (Rathod, 2011 as *Scenidium tenue*), Himachal Pradesh (Sharma, 2012; Kaur, 2013), Uttarakhand (Sharma, 2012) and West Bengal (De, 2018). It is also listed in fungal data base of Tamil Nadu but without any description and reference.

9. *Laetiporus sulphureus* (Bull.) Murrill, *Mycologia* 12(1): 11 (1920). **Fig. 9**

Basidiocarp annual, pileate, sessile, solitary to imbricate, dimidiate to flabelliform, fleshy and succulent when fresh, becoming lighter on drying; pileus up to 50 \times 40 \times 8 mm, thickening towards the attachment; abhymenial surface faintly concentrically zonate with alternating colours of light brown (6D5), light orange (5A4) to grey orange (5B5); hymenial surface poroid, pale orange (5A3), not changing much on drying; pores angular, 3-4 per mm; context homogenous, white (5A1), up to 2 mm in thickness; pore tubes pale orange (5A3), up to 4 mm in depth; margins acute, brownish yellow (5C8), not more than 1 mm thick. Hyphal system dimitic. Generative hyphae thin-walled, hyaline, branched, simple septate, up to 5 μm in width. Binding hyphae thick-walled, hyaline, irregularly branched, aseptate, up to 7 μm in width. Basidia clavate, 4-sterigmate, 14 - 20 \times 5 - 7 μm . Basidiospores ellipsoid, (5-) 5.2 - 7.5 (-8) \times (3.5-) 4 - 5 (-5.3) μm , Q = 1.52, hyaline, smooth, thin walled, CN, IK.

Specimen examined: India, Tamil Nadu, Chennai, Guindy, on *Pongamia pinnata* (13°00'35"E, 80°14'16"N), MLCASB354, 12.09.2016, Kezhocuyi Kezo.

Comments: *Laetiporus sulphureus* is a common polypore

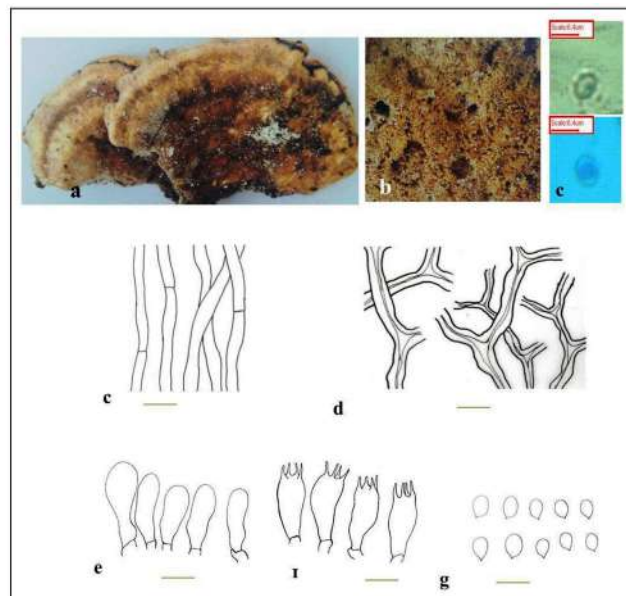


Fig. 9 *Laetiporus sulphureus*: a. Sporocarp (abhymenial surface), b. Hymenial surface, c. Basidiospores in water and cotton blue, d. Generative hyphae, e. Skeletal hyphae, f. Binding hyphae, g. Basidioles, h. Basidia, i. Basidiospores. Scale bar d-i = 10 μm .

which usually occurs in imbricate cluster. The bright yellow to orange basidiocarp with sappy or succulent consistency are the key identifying characters in the field. In India, it has been reported from Uttarakhand (Sharma, 2012), Gujarat (Korat *et al.*, 2013; Rajput *et al.* 2015; Vasava *et al.*, 2018), West Bengal (Tarafder *et al.*, 2017), Tamil Nadu (Sivanandhan *et al.*, 2018) and Madhya Pradesh (Verma *et al.*, 2019).

10. *Polyporus varius* (Pers.) Fr., *Systema Mycologicum* 1: 352 (1821). **Fig. 10**

Basidiocarp annual, pileate, solitary, centrally to laterally stipitate, infundibuliform, depressed towards the stipe; pileus upto 60 \times 80 \times 4 mm; abhymenial surface smooth, azonate, orange white (6A2) to brownish grey (6C2); hymenial surface poroid, pale orange (5A3) when fresh, turning to greyish orange (5B4) on drying; pores round to angular, 6-9 per mm; context homogenous, white (6A1), up to 2 mm in thickness; pore tubes white (4A1), up to 1 mm in depth; margins acute, yellowish brown (6D8), 1 - 2 mm thick. Stipe lateral, with pale orange (6A3) apex and black base (6F2), upto 15 \times 10 mm. Hyphal system dimitic. Generative hyphae thin-walled, hyaline, branched, clamped, up to 4 μm in width. Binding hyphae thick-walled, much branched, aseptate, up to 5 μm in width. Basidia clavate, 4-sterigmate, 14.4 - 24 \times 4.8 - 7.2 μm . Basidiospores cylindrical, (8-) 8.5-9 (-10) \times (2.5-) 3-4 (-4.5) μm , Q = 2.2, hyaline, smooth, thin-walled, CN, IK.

Specimen examined: India, Tamil Nadu, Chennai, Guindy, in association with dead wood, (13°00'05"N 80°14'26"E), MLCASB342, 13.10.2017, Lakleiphi Tallanao.

Comments: *Polyporus varius* is unique in having infundibuliform, stipitate basidiocarps with depression towards the stipe and smooth pilear surface. The present specimen differs from the earlier reports (Sharma, 2012) in

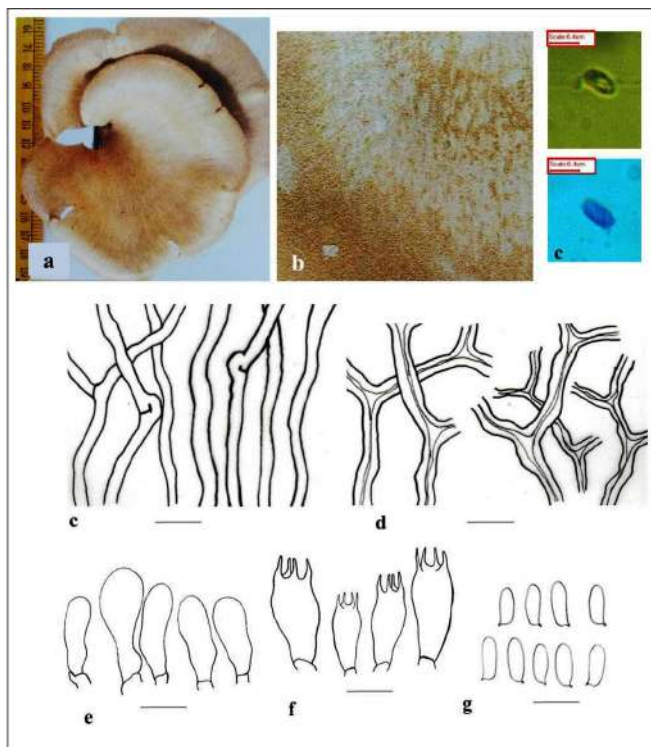


Fig. 10 *Polyporus varius*: a. Sporocarp (abhymental surface), b. Hymenial surface, c. Basidiospores in water and cotton blue, d. Generative hyphae, e. Skeletal hyphae, f. Binding hyphae, g. Basidioles, h. Basidia, i. Basidiospores. Scale bar d-i = 10 µm.

lacking cytidioles. In India, it has been reported from Kerala (Mohanan, 2011; Adarsh *et al.*, 2018), Himachal Pradesh and Meghalaya (Sharma, 2012) and Gujarat (Vasava *et al.*, 2018).

11. *Truncospora tephropora* (Mont.) Zmitr., *Folia Cryptogamica Petropolitana* 6: 77, 2018. **Fig. 11**

Basidiomata perennial, resupinate, effused, firmly attached, woody hard when fresh, brittle on drying, up to 170 × 90 × 10 mm; hymenial surface poroid, pale orange (5A3) when fresh, turning to greyish orange (5B3) on drying, often brownish orange (6C6) towards the margins; pores irregular, round to angular, 4-6 per mm; context homogenous, greyish brown (6D3), up to 2 mm in thickness, tissue darkening in KOH; pore tubes stratified, brownish orange (6C5), each layer up to 4 mm in depth; margins brownish orange (6C6), less than 1 mm thick. Hyphal system trimitic. Generative hyphae thin-walled, hyaline, branched, clamped, up to 3 µm in width, weakly dextrinoid. Skeletal hyphae dominating in context and tubes, thick-walled, pale brown, becoming olivaceous brown in KOH, unbranched, aseptate, up to 5 µm in width. Binding hyphae thin- to thick-walled, hyaline, much branched, aseptate, up to 3.8 µm in width. Basidia clavate, 4-sterigmate, 14 - 22.5 × 4.5 - 6.3 µm. Basidiospores broadly ellipsoid, (4-) 4.5-5.8 (-6) × (3-) 3.2-4 (-4.5) µm, Q = 1.4, hyaline, thin-walled, truncate and CN⁺, IK⁻.

Specimen examined: India, Tamil Nadu, Chennai, Guindy, in association with dead wood, (13°00'33"E, 80°14'16"N), MLCASB026, 12.09.2016, Kezhocuyi Kezo.

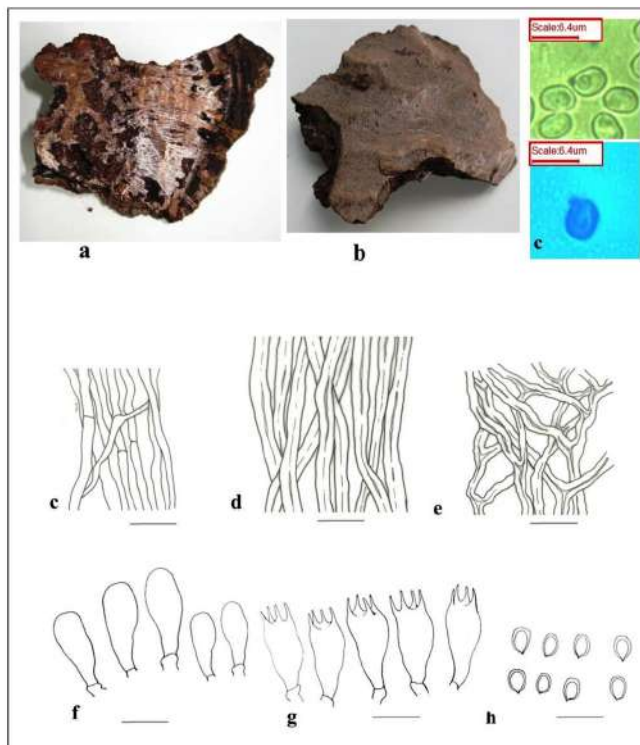


Fig. 11 *Truncospora tephropora*: a. Sporocarp (abhymental surface), b. Hymenial surface, c. Basidiospores in water and cotton blue, d. Generative hyphae, e. Skeletal hyphae, f. Binding hyphae, g. Basidioles, h. Basidia, i. Basidiospores. Scale bar d-i = 10 µm.

Comments: It is characterized by resupinate basidiomata, trimitic hyphal system and hyaline, thin-walled, broadly ellipsoid, truncate basidiospores. In India, Natarajan and Kolandavelu (1998) reported it as *L. tephroporus* from Thirunelveli district of Tamil Nadu. Leelavathy and Ganesh (2000) and Kaur (2013) reported this species as *Loweporus tephroporus* from Kerala and Himachal Pradesh respectively.

CONCLUSION

In this paper eleven polypore species, namely *Corioloopsis aspera*, *C. caperata*, *C. polyzona*, *Daedalea quercina*, *Earliella scabrosa*, *Flavodon flavus*, *Hexagonia hirta*, *H. tenuis*, *Laetiporus sulphureus*, *Polyporus varius* and *Truncospora tephropora* are described for the first time from Chennai.

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