



A Checklist of Coprophilous Agarics of India

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Abstract

This checklist consists of 135 species belonging in 27 genera and 10 families of the Order Agaricales, Class Agaricomycetes, and Phylum Basidiomycota. The families, genera and species have been arranged alphabetically. The status and taxonomic placement of each taxon included in the list has been updated as per the information available on the Index Fungorum/Mycobank. At the family level, Psathyrellaceae has the highest number of coprophilous species (46) reported from India, followed by Agaricaceae and Bolbitiaceae (29 spp. each) and Strophariaceae (20 spp.). The ten most represented coprophilous genera are *Conocybe* (23 spp.), *Panaeolus* (19 spp.), *Coprinopsis* (14 spp.), *Psilocybe* (13 spp.), *Agaricus* (9 spp.), *Lepiota* and *Psathyrella* (6 spp. each), *Coprinellus* and *Coprinus* (5 spp. each) and *Bolbitius* (4 spp.). The geographical distribution of the species covers 13 States (Assam, Bihar, Gujarat, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Maharashtra, Orissa, Punjab, Tamil Nadu, Uttar Pradesh and West Bengal) and 2 Union Territories (Chandigarh, New Delhi) of India. The relevant information is based on the survey of dung localities in Punjab state during the period 2007-2011 and original information contained in 97 research papers. The checklist is an attempt to provide updated information regarding the diversity of coprophilous agarics in India.

Key words – Agaricales – Agaricomycetes – Basidiomycota – biodiversity – dung – Punjab

Introduction

India is located in the southern part of Asia and borders the Arabian Sea, the Indian Ocean, and the Bay of Bengal. It occupies most of the South Asian continent and consists of twenty-nine states and seven union territories covering an area of 3,287,590 square kilometers. The country is situated north of the equator between 8°4' and 37°6' north latitude and 68°7' and 97°25' east longitude. It experiences a variety of climatic conditions due to its great size and varying altitude. The climate ranges from tropical in the south to temperate and alpine in the Himalayan north, where elevated regions receive sustained winter snowfall. The inland of the peninsula ranges from subtropical to temperate. The coasts of the peninsula are humid and tropical. Its four seasons are determined by monsoons, a pattern of winds sweeping across southern Asia. There is a dry, cool season (winter) from December through March; a hot season (spring) in April and May; the rainy season (summer) from June through September; and a less-rainy season (autumn) in October and November. Temperatures for the entire nation reach an average high of 38° to 40°C (100° to 104°F) and dip to an average low of 10°C (50°F). Rainfall for the entire India averages 105 centimeters (41 inches). Around 23.68% of India is covered by forests. Various domesticated and wild herbivores are found on the grazing lands of the country. Of the total

livestock, about 90% are cattle and buffaloes and the rest sheep, goats, elephants, nilgais, camels, and rabbits (Balfour 1976, Wolpert 1999, <http://www.123india.com> accessed on March 31, 2015).

The very high biological diversity of India is primarily due to the highly diversified ecological niches. It is obvious from the above description that India must be harbouring diverse mycoflora. The marked variation in climate plays a determinate role in growth and development of a wide variety of mushrooms including coprophilous mycoflora. In view of this, an attempt has been made to compile the diversity of coprophilous agarics of India.

Materials & Methods

This checklist contains information gathered partly from a study conducted on coprophilous mushrooms from the state of Punjab during the years 2007-2011 and partly from published sources up to 31st March, 2015.

The study area in Punjab constitutes 1.57% of the total area of the country. The amount of rainfall ranges between 250 mm to 1000 mm in the state. About 70-80% of the total rainfall is concentrated during July, August and September and the rest occurs during the winter months. Punjab is primarily an agrarian state having diverse flora and fauna. It has seven to eight months of mean monthly temperature of more than 20°C. The state has been explored systematically to ascertain the diversity, seasonal availability, distribution and ecology of coprophilous mushrooms. In this work, 172 collections belonging to 95 species spread over 20 genera of 7 agaric families are cited as a result of the study.

Besides the study, relevant information about Indian coprophilous mushrooms is searched from all forms of published documentation and literature.

The checklist is done by compiling all the available data. The names of some species as reported in the cited publications have been replaced by currently accepted name according to the MycoBank (www.mycobank.org)/Species Fungorum (www.speciesfungorum.org) websites and this has been indicated in such cases and listed in Table 1. The checklist is organized alphabetically by family, genus and species. The distribution of species is cited according to the state where it was collected.

Checklist of Taxa

I. Family: *Agaricaceae* Chevall. in *Flore Générale des Environs de Paris* p. 121, 1826.

Type genus: *Agaricus* L.: Fr.

(i) Genus: *Agaricus* L.: Fr. in *Species Plantarum* 1: 1171, 1753.

Type species: *Agaricus campestris* L.

1. *Agaricus brunnescens* Peck in *Bull. Torrey Bot. Club* 27: 16, 1900.

West Bengal: (Pal & Mukherjee 1977).

Himachal Pradesh: Kasauli (Sehgal 1978).

Jammu & Kashmir: (Agha 1978, Kaul 1978).

Maharashtra: Poona (Sathe & Deshpande 1980).

Punjab: growing scattered on manure heaps along roadsides (Srivastava 1978, Kannaiyan & Ramasamy 1980, Saini & Atri 1995).

2. *Agaricus campestris* L. in *Species Plantarum* 1: 1173, 1753.

Jammu & Kashmir: Pang Range (Hennings 1900), Pehlgam (Watling & Gregory 1980).

West Bengal: Calcutta (Bose & Bose 1940, Banerjee 1947).

Bihar: (Vasudeva 1960).

Maharashtra: Nagpur (Trivedi 1972).

Uttar Pradesh: Allahabad (Singh & Mehrotra 1974).

Punjab: Sangrur (231m), Qila Rehmatgarh, growing in caespitose groups on mixed cattle dung, Amandeep Kaur, PUN 4772, June 22, 2008; Ferozepur (182 m), Sodhinagar, growing scattered on buffalo dung, Amandeep Kaur, PUN 4773, August 16, 2011.

3. *Agaricus cupreobrunneus* (Schäffer & Steer: Møller) Pilát in *Acta Mus. Nat. Pragae* 7 (1):14, 1951. Maharashtra: (Patil et al. 1995).

Punjab: Sangrur (231m), Fatehgarh Channa, growing scattered in a fairy ring on mixed cattle dung alongwith earthworm excreta, Amandeep Kaur, PUN 4213, July 25, 2010 (Amandeep et al. 2015b).

4. *Agaricus flavistipus* Atri, M. Kaur and A. Kaur in *Kavaka* 42: 22, 2014.

Punjab: Faridkot (196 m), Swaag, growing solitary on buffalo dung, Amandeep Kaur, PUN 4774, August 19, 2011(Kaur et al. 2014b).

5. *Agaricus halophilus* Peck in *Bull. New York State Mus.* 94: 86, 1905.

Punjab: Mohali (316 m), Dau Majra, growing scattered on mixed cattle dung heap, Amandeep Kaur, PUN 4211, July 10, 2010; Sangrur (231 m), Daulatpur Channa, growing in groups on buffalo dung, Amandeep Kaur, PUN 4212, July 25, 2010 (Amandeep et al. 2015b).

6. *Agaricus placomyces* Peck in *Ann. Report on the New York St. Mus. of Nat. Hist.* 29: 40, 1878.

South-Western India: (Sathe & Rahalkar 1978).

Himachal Pradesh: Solan (Sharma et al. 1978).

Punjab: (Saini et al. 1991); Patiala (251m), Chhat Bir, growing solitary on deer dung, Amandeep Kaur, PUN 4775, September 19, 2011.

7. *Agaricus pratensis* Schaeff. in *Fung. Bavar. Palat. Nasc.* 4: 42, 1774.

Assam: Guwahati (Bhattacharya & Baruah 1953).

Punjab: Patiala (251 m), it growing on soil along the roadside (Saini et al. 1991); Sangrur (231m), Jamalpura, growing in groups on mixed cattle dung, Amandeep Kaur, PUN 4210, June 22, 2008.

8. *Agaricus stellatus-cuticus* Atri, M. Kaur and A. Kaur in *Kavaka* 42: 20, 2014.

Punjab: Sangrur (231m), Qila Rehmatgarh, growing solitary on sheep dung among plant debris, Amandeep Kaur, PUN 4776, September 19, 2011 (Kaur et al. 2014b).

9. *Agaricus xanthodermus* Genevier in *Bull. Soc. Bot. France* 23: 31, 1876.

Punjab: Sangrur (231 m), Sandaur, growing scattered on mixed cattle dung, Amandeep Kaur, PUN 4777, September 28, 2008; AahanKhaeri, growing scattered on mixed cattle dung, Amandeep Kaur, PUN 4778, June 27, 2011.

(ii) Genus: ***Chlorophyllum*** Masee in *Bull. Misc. Inf. Roy. Bot. Gard. Kew* 189: 136, 1898.

Type species: *Chlorophyllum esculentum* Masee

10. *Chlorophyllum humei* (Murrill) Vellinga in *Mycotaxon* 83: 416, 2002.

Punjab: Patiala (251 m), Shekhpura, growing gregariously on mixed cattle dung, Babita Kumari, PUN 4112, May 23, 2008; Punjabi University, growing scattered on mixed cattle dung, Babita Kumari, PUN 4110, May 27, 2008; Behal, growing in groups on mixed cattle dung, Amandeep Kaur, PUN 4065, June 16, 2008; Sangrur (231 m), Lasoi, growing in groups on manured ground, Amandeep Kaur, PUN 4207, June 17, 2008; Barnala (228 m), Sherpur, growing solitary on buffalo dung, Amandeep Kaur, PUN 4066, June 26, 2008; Chhat Bir (251 m), growing solitary on buffalo dung, Amandeep Kaur, PUN 4067, June 30, 2008; Patiala (251 m), Punjabi University, growing scattered on cattle dung, Babita Kumari, PUN 4113, July 16, 2008; Punjabi University, growing gregariously on cattle dung, Babita Kumari, PUN 4115, August 12, 2008; Ludhiana (254 m), Seora, growing in groups on manured soil near mixed cattle dung heap, Amandeep Kaur, PUN 4068, July 25, 2009; Bathinda (251 m), Jassi Pau

Wali, growing in groups on mixed cattle dung, Amandeep Kaur, PUN 4069, August 02, 2009; Patiala (251 m), Bahadurgarh, growing scattered on cattle dung, Babita Kumari, PUN 4097, August 18, 2009; Rajpura, growing in groups on cattle dung, Babita Kumari, PUN 4103, August 19, 2009.
North West India: Atri *et al.* (2014) as *Lepiota humei*.

11. *Chlorophyllum molybdites* (G. Mey.) Masseur in *Bull. Misc. Inf. Roy. Bot. Gard. Kew* 189: 136, 1898.

Uttar Pradesh: Allahabad (Singh & Mehrotra 1974); Lucknow (Ghosh *et al.* 1976).

Maharashtra: (Sathe & Deshpande 1980).

Tamil Nadu: Madras, Deer Park (Manjula 1980, Natarajan & Manjula 1981).

Kerala: growing scattered or in fairy rings in fields, around the basins of plants where manuring is done (Bhavani Devi 1995).

Punjab: Sangrur (231 m): Qila Rehmatgarh, growing scattered in a group on camel dung, Amandeep Kaur, PUN 4779, September 27, 2010; Hoshiarpur (295 m), Jattpur, growing gregariously on buffalo dung, Amandeep Kaur, PUN 4780, July 05, 2011; Ropar (394 m), Bairampur, growing scattered on mixed cattle dung heap, Narinderjit Kaur, PUN 4682, August 22, 2011.

12. *Chlorophyllum rhacodes* (Vittad.) Vellinga in *Mycotaxon* 83: 416, 2002.

The species was earlier reported from India by Butler & Bisby (1931) Sharma *et al.* (1978) and Pushpa & Purushothama (2012) as *Macrolepiota rhacodes*. The mushroom has been transferred to *Chlorophyllum rhacodes* by Vellinga (2002). According to MycoBank/ Species Fungorum, *Macrolepiota rhacodes* is a synonym of *Chlorophyllum rhacodes* which is a valid species. Thus *Macrolepiota rhacodes* stands deleted from the Indian record.

Uttar Pradesh: Kalsia Hills (Butler & Bisby 1931) as *Macrolepiota rhacodes*.

Himachal Pradesh: Solan (Sharma *et al.* 1978) as *Macrolepiota rhacodes*.

Punjab: Moga, Chak Fatehpur, growing in a fairy ring on buffalo dung, Amandeep Kaur, PUN 4781, June 28, 2011.

Karnataka: (Pushpa & Purushothama 2012) as *Macrolepiota rhacodes*.

(iii) Genus: *Coprinus* Pers. in *Tent. Disp. Meth. Fung.* p. 62, 1797.

Type species: *Coprinus comatus* (Müll.: Fr.) Gray

The molecular studies by Readhead *et al.* (2001) have resulted in splitting erstwhile *Coprinus* genus belonging to family *Coprinaceae* into four genera, namely *Coprinus sensu stricto*, *Coprinopsis* P. Karst, *Coprinellus* P. Karst. and *Parasola* Redhead, Vilgalys & Hopple. The coprinoid genera *Coprinopsis*, *Coprinellus* and *Parasola* have been shifted to the family *Psathyrellaceae* while genus *Coprinus sensu stricto* has been shifted to family *Agaricaceae* because of phylogenetic proximity. As per MycoBank record, the family name *Coprinaceae* has been placed as synonym of family *Agaricaceae*. Hence, *Coprinaceae* stands deleted from Indian record.

13. *Coprinus comatus* var. *caprimammillatus* Bogart in *Mycotaxon* 4(1): 274, 1976.

Punjab: Sangrur (231 m), Qila Rehmatgarh, solitary to densely grouped on mixed cattle dung in a pasture, Amandeep Kaur, PUN 4061, June 03, 2008; Bathinda (211 m), Naruaana, growing in groups on mixed cattle dung, Amandeep Kaur, PUN 4782, August 01, 2009 (Amandeep *et al.* 2015b).

14. *Coprinus comatus* var. *comatus* (Müll.: Fr.) Gray in *Nat. Arrang. Brit. Pl.* 1: 632, 1821.

West Bengal: Darjeeling (Berkeley 1851); Calcutta (Banerjee 1947).

Gujarat: Baroda (Moses 1948).

Maharashtra: Bombay (Berkeley 1851); Nagpur (Trivedi 1972).

Uttar Pradesh: Lucknow (Ghosh *et al.* 1974); Allahabad (Singh & Mehrotra 1974).

Jammu & Kashmir: Dachigan Reserve (Watling & Gregory 1980); Kashmir Valley (Kaul & Kachroo 1974).

Punjab: Patiala (251m), Chhatbir, growing on horse dung (Kaushal & Grewal 1992, Saini & Atri 1995); Moga (217 m), Ajitwal, growing scattered on mixed cattle dung, Amandeep Kaur, PUN 4783, August 13, 2010.

15. *Coprinus filiformis* Berk. & Br. in *Ann. Mag. Nat. Hist.* 7: 379, 1861.

Punjab: growing on dung of nilgai (Rea 1922, Ginai 1936, Saini & Atri 1995).

16. *Coprinus papillatus* (Batsch) Fr. in *Elenchus Fungorum Continuatio Prima* p. 81, 1838.

Punjab: growing on sambhar dung (Rea 1922, Mahju 1933, Saini & Atri 1995); Chhatbir, growing on panther dung (Kaushal & Grewal 1992, Saini & Atri 1995).

17. *Coprinus sterquilinus* (Fr.) Fr. in *Epicrisis Systematis Mycologici* p. 242, 1838.

Jammu & Kashmir: Srinagar, Sanat Nagar (Watling & Gregory 1980).

Punjab: Ludhiana (254 m), Lohatbaddi, growing solitary on horse dung, Amandeep Kaur, PUN 4785, June 10, 2008; Faridkot (196 m), Bajakhana, growing solitary on manured soil, Harwinder Kaur, PUN 4771, September 10, 2009; Sangrur (231 m), Sikanderpura, growing scattered on mixed cattle dung, Amandeep Kaur, PUN 4786, June 29, 2011.

(iv) Genus: *Crucispora* E. Horak in *New Zealand Journal of Botany* 9: 489, 1971.

Type species: *Crucispora naucorioides* E.Horak

18. *Crucispora rhombisperma* (Hongo) E. Horak in *Sydowia* 33: 57, 1980.

Kerala: Wayanad, Ponkuzhy, growing scattered on elephant dung, K. A. Thomas T338, October 17, 1999, K. A. Thomas T338b, October 18, 1999, K. A. Thomas T338c, October 31, 1999, K. A. Thomas T338d (Manimohan et al. 2007, Noordeloos et al. 2007) as *Panaeolina rhombisperma*.

(v) Genus: *Lepiota* (Pers. ex Fr.) S.F. Gray in *Nat. Arrang. Brit. Plants*, 1: 601, 1821.

Type species: *Lepiota colubrina* (Pers. ex Fr.) S.F. Gray

19. *Lepiota epicharis* var. *occidentalis* Dennis in *Kew Bull.* 15: 111, 1962.

Tamil Nadu: Madras, Guindy, Raj Bhavan (Manjula 1980, 1983).

Punjab: Hoshiarpur (295 m), Shehbazpur Tanda, growing in a group on mixed buffalo dung and wheat straw heap, Munruchi Kaur and Amandeep Kaur, PUN 4787, September 03, 2011 (Amandeep et al. 2015b).

20. *Lepiota leprica* (Berk. & Br.) Sacc. in *Syll. Fung.* 4: 56, 1887.

North-East Hills: growing solitary or in groups in open fields and pastures on cow dung or organic matter rich soil (Verma et al. 1995).

21. *Lepiota subincarnata* J.E. Lange in *Flora Agaricina Danica* 5: 5, 1940.

Kerala: (Kumar & Manimohan 2009).

Punjab: Sangrur (231 m), Qila Rehmatgarh, growing solitary on camel dung, Amandeep Kaur, PUN 4788, September 19, 2011(Amandeep et al. 2015b).

22. *Lepiota thiersii* Sundberg in *Mycotaxon* 34 (1): 242, 1989.

Punjab: (Atri et al. 2000); Mohali (316 m), Bhajauli, growing in groups on buffalo dung heap, Amandeep Kaur, PUN 4070, August 21, 2009.

23. *Lepiota thrombophora* (Berk. & Br.) Sacc. in *Syll. Fung.* 5: 53, 1887.

Tamil Nadu: Madras, IIT campus (Manjula 1980, 1983).

Punjab: Ropar (394 m): Mugal Majri, growing in groups on mixed cattle dung, Amandeep Kaur, PUN 4071, August 21, 2009 (Amandeep et al. 2015b).

24. *Lepiota xanthophylla* P.D. Orton in *Trans. Brit. Mycol. Soc.* 43(2): 289, 1960.

Punjab: Faridkot (196 m), Deena Kangar, growing scattered on buffalo dung, Amandeep Kaur, PUN 4789, August 19, 2011 (Amandeep et al. 2015b).

(vi) Genus: *Leucoagaricus* (Locquin) Sing. in *Sydowia* 2: 35, 1968.

Type species: *Leucoagaricus macrorhizus* (Locquin) Sing.

25. *Leucoagaricus leucothites* (Vittad.) Wasser, *Ukr. bot. Zh.* 34(3): 308, 1977.

Trivedi (1972), Singh & Mehrotra (1974), Manjula (1980, 1983), Bhavani Devi (1995) recorded the species from India as *Leucoagaricus naucinus*. According to Index Fungorum and Kew Mycology (2013), the current name of *Leucoagaricus naucinus* is *Leucoagaricus leucothites*.

Maharashtra: Nagpur (Trivedi 1972) as *Leucoagaricus naucinus*.

Uttar Pradesh: Allahabad (Singh & Mehrotra 1974) as *Leucoagaricus naucinus*.

Tamil Nadu: Madras, Guindy, Deer Park, growing on elephant dung (Manjula 1980, 1983) as *Leucoagaricus naucinus*.

Kerala: growing scattered on the ground in pastures and fields (Bhavani Devi 1995) as *Leucoagaricus naucinus*.

Punjab: Hoshiarpur (295 m), Jejon Duaba, growing gregariously forming a fairy ring on mixed cattle dung heap, Amandeep Kaur, PUN 4790, July 05, 2011.

26. *Leucoagaricus meleagris* (Gray) Singer in *Lilloa* 22: 422, 1951.

Uttar Pradesh: Saharanpur (Hennings 1901) as *Lepiota meleagris*.

Orissa: growing solitary or in caespitose clusters on cow dung (Dhancholia & Sinha 1990) as *Lepiota meleagris*.

(vii) Genus: *Leucocoprinus* Pat. in *Journal de Botanique (Morot)* 2:16, 1888.

Type species: *Leucocoprinus cepistipes* (Sowerby) Patouillard

27. *Leucocoprinus cepistipes* (Sowerby) Pat. in *Journal de Botanique (Morot)* 3: 336, 1889.

Maharashtra: Poona (Masse 1901) as *Lepiota cepistipes*; (Sathe & Deshpande 1980).

West Bengal: Calcutta (Bose 1920, Banerjee 1947) as *Lepiota cepistipes*.

Maharashtra: Bombay, on dung (Patel & Kamat 1935) as *Lepiota sordescens*.

Tamil Nadu: Madras (Manjula 1980).

Orissa: growing on cow dung (Dhancholia & Sinha 1990).

Kerala: growing in caespitose on the manured ground on humus rich soil (Bhavani Devi 1995).

Punjab: Ropar (394 m), Bhupnagar, growing scattered on mixed cattle dung heap, Amandeep Kaur, PUN 4208, July 10, 2010; Jalandhar (233 m), Kala Bakkra, growing in groups on buffalo dung, Amandeep Kaur, PUN 4209, July 30, 2010; Hoshiarpur (295 m): Mehlanwaali, growing in groups on mixed cattle dung, Amandeep Kaur, PUN 4791, July 05, 2011; Hoshiarpur (295 m), Jattpur, growing scattered on mixed cattle dung under *Acacia nilotica*, Narinderjit Kaur, PUN 4690, August 16, 2011; Hoshiarpur (295 m), Chaggran, growing scattered on mixed cattle dung, Narinderjit Kaur, PUN 4691, August 16, 2011.

Karnataka: Bangalore (Pushpa & Purushothama 2011).

28. *Leucocoprinus cretaceus* (Bull.) Locq. in *Bull. mens. Soc. linn. Soc. Bot. Lyon* 14: 93, 1945.

Punjab: Chandigarh (321m), growing on manure heaps and heavily manured beds (Rawla et al. 1982, Saini & Atri 1995) as *Leucocoprinus cretatus*.

29. *Leucocoprinus straminellus* (Bagl.) Narducci & Caroti in *Mem. Soc. Tosc. Sci. Nat.* 102: 49, 1995. Punjab: Patiala (251 m), Harpalpur, growing in groups on buffalo dung heap, Amandeep Kaur, PUN 4792, July 19, 2011(Amandeep et al. 2015b).

II. Family: *Amanitaceae* R. Heim: Pouzar in *Ceská Mykol.* 37(3): 173, 1983.
Type genus: *Amanita* Pers.

(viii) Genus: *Amanita* Pers. in *Neues Mag. Bot.* 1: 145, 1794.
Type species: *Amanita muscaria* (L.) Lam.

30. *Amanita solitaria* (Bull.) Mérat in *Nouvelle Flore des Environs de Paris* 1: 121, 1836.
Kerala: growing solitary or in groups on compost or on cow dung heaps (Bhavani Devi 1995).

III. Family: *Bolbitiaceae* Sing. in *Pap. Michigan Acad. Sci.* 32:147, 1948.
Type genus: *Bolbitius* Fr.

(ix) Genus: *Bolbitius* Fr. in *Epicrisis* p. 253, 1838.
Type species: *Bolbitius vitellinus* (Pers.) Fr.

31. *Bolbitius coprophilous* (Peck) Hongo in *Mem. Fac. Lib. Arts Educ., Shiga University, Nat. Sci.* 9: 82, 1959.

Kerala: Thrissur, Guruvayur, growing on elephant dung, A. Thomas T312, June 11, 1999, A. Thomas T312b, June 17, 1999; Kasaragod, Adhoor, A. Thomas T312c, September 16, 2000 (Thomas et al. 2001, Manimohan et al. 2007).

Punjab: growing in open areas among grasses (Atri et al. 1992); Sangrur (231 m), Bamaal, growing gregariously on buffalo dung flakes near village pond, Amandeep Kaur, PUN 4793, July 22, 2009; Haidernagar, growing scattered on buffalo dung, Amandeep Kaur, PUN 4794, June 29, 2011 (Amandeep et al. 2013b).

32. *Bolbitius demangei* (Quél.) Sacc. & Sacc. in *Sylloge Fungorum* 17: 74, 1905.

Punjab: Sangrur (231 m): Binzoki, growing in groups on buffalo dung and rotting Jute fabric, Amandeep Kaur, PUN 4795, June 29, 2011; Faridkot (196 m): Chandwaja, growing in a group on mixture of cattle dung and straw, Amandeep Kaur, PUN 4796, August 19, 2011(Amandeep et al. 2013b).

33. *Bolbitius marginatipes* Zeller in *Mycologia* 25 (5): 378, 1933.

Punjab: Sangrur (231 m): Haidernagar, growing scattered on buffalo dung, Amandeep Kaur, PUN 4798, June 29, 2011(Amandeep et al. 2013b).

34. *Bolbitius titubans* (Bull.) Fr. in *Epicrisis Systematis Mycologici* p. 254, 1838.

Kerala: growing scattered in coprophilous habitats Bhavani Devi (1995) as *Bolbitius vitellinus*.

Punjab: growing on horse dung (Rea 1922, Mahju 1933, Saini & Atri 1995) as *Bolbitius vitellinus*; Sangrur (251 m), Ratolan, growing solitary on buffalo dung, Amandeep Kaur, PUN 3896, September 29, 2008 (Atri et al. 2009); Sangrur (231 m), Alipur, growing solitary on buffalo dung heap, Amandeep Kaur, PUN 4214, June 08, 2008 (Amandeep et al. 2013b) as *Bolbitius vitellinus*.

(x) Genus *Conocybe* Fayod in *Ann. Sci. Nat. Bot.* 9: 357, 1889.
Type species: *Conocybe tenera* (Schaeff.) Fayod

35. *Conocybe ambigua* Watling, in *Notes R. bot. Gdn Edinb.* 38(2): 331, 1980.

Tamil Nadu: Madras, Maduravoyal, Madras University Botany Field Research Laboratory, growing in groups on cow dung, Herb. Mubl No. 2594, November 07, 1978 (Natarajan & Raman 1983, 1984).

- 36. *Conocybe antipus*** (Lasch) Fayod in *Annls Sci. Nat., Bot.*, sér. 79: 357, 1889.
Kerala: growing solitary or in caespitose clusters on manure and compost heaps (Bhavani Devi 1995) as *Galera antipus*.
- 37. *Conocybe apala*** (Fr.) Arnolds in *Persoonia* 18(2): 225, 2003.
Punjab: Tarn Taran, Baath (169 m), growing solitary on buffalo dung, Amandeep Kaur, PUN 4219, July 31, 2010; Tarn Taran, Naushehra Pannua (169 m), growing in groups on buffalo dung, Amandeep Kaur, PUN 4220, August 02, 2010; Ferozepur, Makhu (182 m), growing in groups on buffalo dung, Amandeep Kaur, PUN 4230, August 02, 2010; Moga (217 m), Chak Kania Wala, growing scattered on mixed cattle dung, Amandeep Kaur, PUN 4344, June 28, 2011; Hoshiarpur (295 m), Shehbaazpur Tanda, growing scattered on mixed buffalo dung and wheat straw, Amandeep Kaur, PUN 4343, September 03, 2011(Atri et al. 2012); Chhat Bir (251 m), growing scattered in a group on elephant dung mixed with rotten wheat straw and leaf litter, Amandeep Kaur, PUN 4799, September 19, 2011(Amandeep et al. 2015a) as *Conocybe albipes*.
- 38. *Conocybe brachypodii*** (Velen.) Hauskn. & Svrček in *Czech Mycol.* 51: 43, 1999.
Punjab: Patiala (251m), Mehmoodpur Jattan, growing in groups on mixed cattle dung heap, Amandeep Kaur, PUN 3899, June 14, 2008 (Atri et al. 2009).
- 39. *Conocybe brunneoaurantiaca*** K. A. Thomas, Hauskn. and Manim. in *Öst. Z. Pilzk.* 10: 90, 2001.
Kerala: Malappuram, Nilambur, growing on elephant dung, Nisha NVS122, August 24, 2002 (Manimohan et al. 2007).
- 40. *Conocybe crispa*** (Longyear) Singer in *Lilloa* 22: 485, 1951.
Punjab: Sangrur (231m), Upoki, growing in caespitose cluster on partially decomposed buffalo dung flake, Amandeep Kaur, PUN 3897, August 20, 2008 (Atri et al. 2009).
- 41. *Conocybe fuscimarginata*** (Murrill) Singer in *Beih. Nova Hedwigia* 29: 210, 1969.
Punjab: Patiala (251 m): Balbehra, growing in groups on cow dung, Amandeep Kaur, PUN 4350, June 25, 2008; Barnala (228 m): Farwahi, growing in groups on mixed cattle dung, Amandeep Kaur, PUN 4349, June 26, 2008(Amandeep et al. 2015a).
- 42. *Conocybe juniana*** (Velen.) Hauskn. & Svrček, in *Öst. Z. Pilzk.* 8: 46, 1999.
Jammu & Kashmir: Tangmarg (Watling & Gregory 1980) as *Conocybe magnicapitata*.
Punjab: Ferozepur (182 m), Sodhinagar, growing solitary on buffalo dung, Amandeep Kaur, PUN 4801, August 16, 2011(Amandeep et al. 2015a) as *Conocybe magnicapitata*.
- 43. *Conocybe lenticulospora*** Watling in *Notes Roy. Bot. Gard. Edinburgh* 38(2): 351, 1980.
Punjab: Ludhiana (254 m), Lohatbaddi, growing in groups on mixed cattle dung, Amandeep Kaur, PUN 4347, July 14, 2008(Amandeep et al. 2015a).
- 44. *Conocybe leucopus*** (Kühner) Kühner & Watling in *Notes from the Royal Botanic Garden Edinburgh* 40 (3): 539, 1983.
Punjab: Ferozepur (182 m), Mudki, growing scattered in a group on cow dung on ants' hill, Amandeep Kaur, PUN 4800, August 16, 2011(Amandeep et al. 2015a).
- 45. *Conocybe microrrhiza* var. *coprophila*** Amandeep Kaur, Atri and Munruchi Kaur in *Mycosphere* 6(1): 29, 2015.
Punjab; Faridkot (196 m): Chandwaja, growing solitary on cow dung, Amandeep Kaur, PUN 4802, August 19, 2011(Amandeep et al. 2015a).
- 46. *Conocybe moseri*** Watling in *Notes Roy. Bot. Gard., Edinburgh* 38(2): 342, 1980.

Punjab: Moga (217 m), Ajitwal, growing scattered on mixed cattle dung, Amandeep Kaur, PUN 4352, August 13, 2010; Ludhiana (254 m): Lohatbaddi, growing in groups on mixed cattle dung, Amandeep Kaur, PUN 3898, July 14, 2008 (Amandeep et al. 2015a).

47. *Conocybe pseudopubescens* K. A. Thomas, Hauskn. & Manimohan in *Öst. Z. Pilzk.* 10: 92, 2001.
Kerala: Wayanad, Muthanga, growing on elephant dung, A. Thomas T84, June 25, 1997; A. Thomas T84b, May 25, 1999 (Thomas et al. 2001, Manimohan et al. 2007).

48. *Conocybe pubescens* (Gillet) Kühner in *Encyclop. Mycol.* 7: 85, 1935.

Maharashtra: (Sathe & Deshpande 1980).

Kerala: (Mohan 2011).

Karnataka: Makutta Reserve forest, Virajpet, Kodagu, growing on elephant dung, N.C. Karun, MUBSNCKKRSMF # 040, July 28, 2012 (Karun & Sridhar 2015).

49. *Conocybe rickenii* (Schaeff.) Kühner in *Encycl. Mycol.* 7: 115, 1935.

Chandigarh (231 m), growing on horse dung (Sarwal & Rawla 1983, Saini & Atri 1995).

Punjab: Sangrur (231 m), Jaatimajra, growing solitary on buffalo dung, Amandeep Kaur, PUN 4351, September 13, 2009 (Amandeep et al. 2015a).

50. *Conocybe semiglobata* Kühner & Watling in *Notes R. bot. Gdn Edinb.* 38(2): 337, 1980.

Tamil Nadu: Nilgiris, Ootacamud, growing solitary on cow dung, Herb. Mubl No. 2591, November 06, 1979 (Natarajan & Raaman 1983, 1984).

51. *Conocybe subpubescens* P. D. Orton in *Trans. of British Mycol. Soc.*, 43: 195, 1960.

Punjab; Hoshiarpur (295 m): Jalota Dasuya, growing scattered in a group on mixed horse dung and cattle dung heap mixed with leaf litter, Amandeep Kaur, PUN 4348, July 14, 2010 (Amandeep et al. 2015a).

52. *Conocybe subxerophytica* var. *brunnea* Hauskn. in *Österr. Z. Pilzk.* 11: 74, 2002.

Punjab: Barnala (228 m), Sherpur, growing in groups on horse dung, Amandeep Kaur, PUN 4217, July 13, 2008 (Atri et al. 2012).

53. *Conocybe subxerophytica* var. *subxerophytica* Singer & Hauskn. in *Pl. Syst. Evol.* 213: 98, 1992.

Punjab: Patiala (251m), Samana, growing scattered on buffalo dung, Amandeep Kaur, PUN 4216, June 25, 2008 (Atri et al. 2012).

54. *Conocybe uralensis* Hauskn., Knudsen & Mukhin in *Folia Cryptog. Estonica, Fasc.* 45: 33, 2009.

Punjab; Ropar (394 m): Kuraali, growing in groups on buffalo dung heap, Amandeep Kaur, PUN 4218, August 21, 2009 (Atri et al. 2012).

55. *Conocybe velutipes* (Velen.) Hauskn. & Svrček in *Czech Mycology* 51(1): 68, 1999.

Punjab; Moga (217 m): Ajitwal, growing scattered on cow dung, Amandeep Kaur, PUN 4803, August 13, 2010 (Amandeep et al. 2015a).

56. *Conocybe volvata* K. A. Thomas, Hauskn. and Manim. in *Öster. Z. Pilzk.* 10: 101, 2001.

Kerala: Thrissur, Guruvayur, growing on elephant dung, A. Thomas T302b, June 11, 1999, A. Thomas T302c, June 17, 1999, A. Thomas T302d, July 14, 1999, A. Thomas T302e, August 21, 2000 (Thomas et al. 2001, Manimohan et al. 2007).

57. *Conocybe zeylanica* (Petch) Boedijn in *Sydowia* 5(3-6): 223, 1951.

Kerala: growing on a heap of dried cow dung (Thomas et al. 2001).

(xi) Genus: *Pholiotina* Fayod in *Annales des Sciences Naturelles Botanique* 9: 359, 1889.

Type species: *Pholiotina blattaria* (Fr.) Fayod

58. *Pholiotina indica* K. A. Thomas, Hauskn. and Manim. in *Öst. Z. Pilzk.* 10: 109, 2001.

Kerala: Wayanad, Muthanga, growing on elephant dung, A. Thomas T96, July 04, 1997, A. Thomas T96c, August 18, 1997, A. Thomas T179, October 01, 1997, A. Thomas T179b, June 30, 1998, A. Thomas T179f, June 09, 1999, Ponkuzhy, A. Thomas T179c, October 13, 1998, A. Thomas T179d, October 27, 1998, A. Thomas T179e, November 19, 1998; Idukki, Munar, A. Thomas T179h, October 11, 1999, A. Thomas T179i, October 12, 1999 (Thomas et al. 2001, Manimohan et al. 2007); (Mohan 2011).

59. *Pholiotina plumbeitincta* (G.F. Atk.) Hauskn., Krisai & Voglmayr in *Öst. Z. Pilzk.* 13: 212, 2004.

Tamil Nadu: Madras, Maduravoyal, Madras University Botany Field Research Laboratory, growing in groups on cow dung, Herb. MuBl No. 2598, November 07, 1978 (Natarajan & Raaman 1983, 1984) as *Conocybe plumbeitincta*.

IV. Family: *Entolomataceae* Kotlába & Pouzar in *Ceská Mykol.* 26(4): 218, 1972.

Type genus: *Entoloma* Fr.: Kummer

(xii) Genus: *Entoloma* Fr.: Kummer in *Der Führer in die Pilzkunde* 23, 97, 1871.

Type species: *Entoloma sinuatum* (Bull. ex Pers.) P. Kumm.

60. *Entoloma anamikum* Manim., A. V. Joseph & Leelav. in *Mycol. Res.* 99 (9): 1091, 1995.

Kerala: Thrissur, Guruvayur, growing on elephant dung, Nisha NVS 136, October 28, 2002, Nisha NVS 136c, July 02, 2003; Malappuram, Nilambur, Nisha NVS 136b, June 28, 2003 (Thomas et al. 2001, Manimohan et al. 2007).

(xiii) Genus: *Rhodocybe* Maire in *Bulletin de la Société Mycologique de France* 40 (3): 298, 1926.

Type species: *Rhodocybe caelata* (Fr.) Maire

61. *Rhodocybe popinalis* var. *macrosporus* Amandeep Kaur, NS Atri & Munruchi Kaur in *JNBR* 2(3): 261, 2013.

Punjab: Hoshiarpur (295 m), Asalpur, growing in caespitose groups on mixed cattle and horse dung heap, Amandeep Kaur, PUN 4804, July 14, 2010 (Kaur et al. 2013a).

V. Family: *Lyophyllaceae* Jülich in *Biblioth. Mycol.* 85: 378, 1981.

Type genus: *Lyophyllum* P. Karst.

(xiv) Genus: *Termitomyces* R. Heim in *Arch. Mus. Nat. Hist. Ser.* 6 18:147, 1942.

Type species: *Termitomyces striatus* (Beeli) Heim

62. *Termitomyces radicans* Natarajan in *Curr. Sci.* 46: 679, 1977.

Jammu & Kashmir: Jammu (Natarajan 1977).

Kerala: (Pegler & Vanhaecke 1994).

Punjab: Patiala (251 m), growing on sandy or humicolous soil (Atri et al. 2005); Sangrur (231 m), Dohla, growing gregariously on cattle manured soil along road side, Amandeep Kaur, PUN 4805, August 19, 2010; Ferozepur (182 m), Badaduraka, growing gregariously in caespitose groups on mixed cattle dung among grasses, Amandeep Kaur, PUN 4806, August 16, 2011.

VI. Family: *Mycenaceae* Overeem in *Icon. Fung. Malay.*: 14, 1926.

Type genus: *Mycena* (Pers.) Roussel

(xv) Genus: *Mycena* (Pers.) Roussel in *Fl. Calvados*, Edn 2: 64 ('46'), 1806.

Type species: *Mycena galericulata* (Scop.) Gray

63. *Mycena glatfelteri* (Peck) Murrill in *N. Amer. Fl.* (New York) **10**(3): 190, 1917.

Punjab: Patiala (251 m), Bhedpura, growing scattered in a group on buffalo dung and leaf litter, Amandeep Kaur, PUN 4797, July 16, 2011 (Amandeep et al. 2013b as *Bolbitius glatfelteri*).

VII. Family: *Pluteaceae* Kotl. & Pouzar in *Ceská Mykologie* 26(4): 218, 1972.

Type genus: *Pluteus* Fr.

(xvi) Genus: *Volvariella* Speg. in *Fungi Argentini Novi Vel Critici* p. 119, 1898.

Type species: *Volvariella argentina* Speg.

64. *Volvariella hypopithys* (Fr.) Shaffer in *Mycologia* 49(4): 572, 1957.

Kerala: (Pradeep et al. 1998)

Punjab: (Saini et al. 1983); Sangrur (231 m), Langrian, growing scattered on buffalo dung, Amandeep Kaur, PUN 4215, June 21, 2008.

65. *Volvariella pusilla* (Pers.) Singer in *Lilloa* 22: 401, 1951.

Tamil Nadu: Madras (Natarajan 1978).

Uttar Pradesh: Lucknow (Ghosh et al. 1967).

Kerala: (Pradeep et al. 1998).

Punjab: (Saini et al. 2008-2009); Sangrur (231 m), Jamalpura, growing in caespitose cluters on mixed cattle and camel dung heap, Amandeep Kaur, PUN 4807, June 22, 2008.

West Bengal: (Dutta et al. 2011).

66. *Volvariella volvacea* (Bull.) Singer in *Lilloa* 22: 401, 1951.

Kerala: Malappuram, Ramapuram, growing on elephant dung, Nisha NVS 137, November 11, 2002, Nisha NVS 137b, November 13, 2002; Thrissur, Guruvayur, growing on elephant dung, Nisha NVS 137c, April 11, 2003, Nisha NVS 137d, July 02, 2003 (Manimohan et al. 2007).

(xvii) Genus: *Volvopluteus* Vizzini, Contu & Justo in *Fungal Biol.* 115(1): 15, 2011.

Type species: *Volvopluteus gloiocephalus* (DC.: Fr.) Vizzini, Contu & Justo

The genus *Volvopluteus* was established by Justo et al. (2010a) on the basis of molecular systematic studies. Myco Bank documents 04 species namely, *V. asiaticus*, *V. earlei*, *V. gloiocephalus* and *V. michiganensis*, belonging to this genus. From coprophilous habitats of India, 02 species namely *Volvopluteus earlei* and *Volvopluteus gloiocephalus* have been recorded.

67. *Volvopluteus earlei* (Murrill) Vizzini, Contu and Justo in *Fungal Biol.* 115(1):15, 2011.

This species was earlier described under the genus *Volvariella* as *V. earlei* from India by Atri et al. (1996). Based on the molecular systematic studies by Justo et al. (2010a,b), *Volvariella earlei* stands transferred to the genus *Volvopluteus* and now is a synonym of *Volvopluteus earlei*. In view of the above, *Volvariella earlei* stands replaced by *Volvopluteus earlei* in the record.

Punjab: Patiala, growing scattered among grasses (Atri et al. 1996) as *Volvariella earlei*; Patiala (251 m), Lahore Majra, growing scattered in groups on buffalo dung, Amandeep Kaur, PUN 4808, June 23, 2008; Patiala (251 m): Bhavanigarh Road, growing scattered in groups on buffalo dung, Amandeep Kaur, PUN 4809, June 23, 2008.

68. *Volvopluteus gloiocephalus* (DC.: Fr.) Vizzini, Contu & Justo in *Fungal Biol.* 115(1): 15, 2011.

This species was earlier described under the genus *Volvariella* as *V. speciosa* from India by Ghosh et al. (1967), Pathak et al. (1978), Saini & Atri (1993), and Bhavani Devi (1995). On the basis of

DNA evidences, Justo et al. (2010a,b) reclassified *V. speciosa* as *Volvopluteus gloiocephalus*. The latest MycoBank record refers *Volvariella speciosa* and *Volvariella gloiocephala* as synonyms of *Volvopluteus gloiocephalus*. Thus *Volvariella speciosa* stands replaced by *Volvopluteus gloiocephalus* in the record.

Uttar Pradesh: Lucknow (Ghosh et al. 1967, Pathak et al. 1978) as *Volvariella speciosa*.

Kerala: growing solitary or gregariously on rich manured ground (Bhavani Devi 1995); (Pradeep et al. 1998) as *Volvariella speciosa*.

Punjab: Patiala, growing on sandy soil (Saini & Atri, 1993 as *Volvariella speciosa*); Sangrur (231 m), Bhavanigarh, growing in groups on mixed cattle dung, Amandeep Kaur, PUN 4810, June 23, 2008; Hoshiarpur (295 m), Siprian, growing scattered on mixed horse and cattle dung, Amandeep Kaur, PUN 4811, July 14, 2010; Sangrur (231 m), Madevi, growing in a caespitose group on buffalo dung, Amandeep Kaur, PUN 4812, June 27, 2011.

West Bengal: growing solitary on cow dung mixed with decaying paddy straw or on compost heaps (Dutta et al. 2011) as *Volvariella gloiocephala*.

VIII. Family: *Psathyrellaceae* Vilgalys, Moncalvo & Redhead in *Taxon* 50(1): 226, 2001.

Type genus: *Psathyrella* Fr.: Quéf.

Readhead et al. (2001) performed a phylogenetic analysis of the genus *Coprinus* traditionally described in the family *Coprinaceae* and reclassified the coprinoid taxa traditionally grouped under *Coprinus* into four genera, namely *Coprinus* Pers. *sensu stricto*, *Coprinopsis* P. Karst, *Coprinellus* P. Karst and *Parasola* Redhead, Vilgalys & Hopple into two different families. Now the genus *Coprinus sensu stricto* belongs to family *Agaricaceae* and the genera *Coprinopsis*, *Coprinellus* and *Parasola* to the family *Psathyrellaceae* Vilgalys, Moncalvo & Redhead.

From Indian coprophilous habitats, mushrooms belonging to the different coprinoid genera namely *Coprinellus*, *Coprinopsis* and *Parasola* of family *Psathyrellaceae* were recorded from time to time and described under the genus *Coprinus*. This list provides updated information regarding their valid names as per MycoBank records.

(xviii) Genus: *Coprinellus* P. Karst. in *Bidrag Kännedom of Finlands Natur Folk* 32: 542, XXVIII, 1879.

Type species: *Coprinellus deliquescens* (Bull.) P. Karst.

As a result of the molecular studies by Hopple & Vilgalys (1999) and Readhead et al. (2001), the coprinoid members with cellular pileus cuticle and comparatively more persistent and less wooly pileal veil remnants, have been transferred to the genus *Coprinellus*. Species recorded from coprophilous habitats of India and earlier described under the genus *Coprinus* exist as legitimate species under *Coprinellus* as per the latest information on MycoBank.

69. *Coprinellus ephemerus* (Bull.) Redhead, Vilgalys & Moncalvo in *Taxon* 50(1): 233, 2001.

Punjab: growing on rabbit dung (Rea 1922, Mahju 1933, Saini & Atri 1995) as *Coprinus ephemerus*; Hoshiarpur (295 m), Mehlanwaali, growing in groups on mixed cattle dung, Amandeep Kaur, PUN 4813, July 5, 2011.

70. *Coprinellus fimbriatus* (Berk. & Br.) Redhead, Vilgalys & Moncalvo in *Taxon* 50(1): 233, 2001.

West Bengal: Howrah and Hooghly districts, on dung (Bose 1920, Manjula 1983) as *Coprinus fimbriatus*.

71. *Coprinellus micaceus* (Bull.: Fr.) Vilgalys, Hopple & Jacq. Johnson in *Taxon* 50: 234, 2001.

West Bengal: Calcutta (Banerjee 1947) as *Coprinus micaceus*.

Maharashtra: Nagpur (Trivedi 1972, Patil et al. 1995) as *Coprinus micaceus*.

Kerala: (Bhavani Devi 1995) as *Coprinus micaceus*.

Himachal Pradesh: Solan (Thapa et al. 1977, Lakhnpal 1993) as *Coprinus micaceus*.

Jammu and Kashmir: Sonamarg (Kaul & Kachroo 1974, Watling & Gregory 1980, Abraham 1991) as *Coprinus micaceus*.

Assam: (Gogoi et al. 2000)

Punjab: Patiala (251 m), Bhunerheri, growing in groups on mixed dung, Amandeep Kaur, PUN 4814, June 16, 2008; Hoshiarpur (295 m), Tanda, growing in groups on humicolous, manured soil, Narinderjit Kaur, PUN 4684, July 23, 2011.

72. *Coprinellus micaceus* var. *macrosporus* Atri & Kaur in *Plant Diversity in India* p. 436, 2004.

Atri & Kaur (2004) described *Coprinus micaceus* var. *macrosporus* from India. The species *Coprinus micaceus* has been transferred to *Coprinellus micaceus* by Readhead et al. (2001) in view of which *Coprinus micaceus* var. *macrosporus* described earlier now becomes *Coprinellus micaceus* var. *macrosporus*.

Punjab: Sirhind (250 m), growing in clusters on cattle dung manured soil under *Psidium guajava* tree, Amanjeet Kaur, PUN 2960, January 12, 1999 (Atri & Kaur 2004 as *Coprinus micaceus* var. *macrosporus*).

73. *Coprinellus truncorum* (Scopoli) Redhead, Vilgalys & Moncalvo in *Taxon* 50(1): 235, 2001.

Jammu & Kashmir: Srinagar, Sanat Nagar (Watling & Gregory 1980, Abraham 1991 as *Coprinus truncorum*).

Punjab: Ludhiana (254 m), Kamaalpura, growing in groups on mixed cattle dung, Amandeep Kaur, PUN 4815, January 30, 2010.

(xix) Genus: *Coprinopsis* P. Karst. in *Acta Societatis pro fauna et flora Fennica* 2(1): 27, 1881.

Type species: *Coprinopsis friesii* (Quél.) P. Karst.

As a result of the molecular studies by Hopple & Vilgalys (1999) and Readhead *et al.* (2001), the coprinoid members which possess hyphal pileus cuticle and abundant powdery to floccose veil covering the whole pileus, have been transferred to the genus *Coprinopsis*. As per MycoBank record following species now exist as legitimate species of genus *Coprinopsis* instead of *Coprinus*.

74. *Coprinopsis cinerea* (Schaeff.) Redhead, Vilgalys & Moncalvo in *Taxon* 50(1): 227, 2001.

Punjab: (Ginai 1936, Manjula 1983) as *Coprinus cinereus*; Sangrur (231 m): Sikanderpura, growing in groups on mixed cattle dung, Amandeep Kaur, PUN 4816, June 02, 2008; Patiala (251 m): Kalyan, growing in groups on horse dung, Amandeep Kaur, PUN 4817, January 31, 2010 (Amandeep et al. 2014).

75. *Coprinopsis cordispora* (T.Gibbs) Watling and M.J. Richardson in *Edinburgh J. Bot.* 67(3): 406, 2010.

Punjab: Hoshiarpur (295m): Satiana, growing in groups on mixed cattle and horse dung heap, Amandeep Kaur, PUN 4784, July 14, 2010 (Amandeep et al. 2015b).

76. *Coprinopsis cothurnata* var. *equsterca* Atri, A. Kaur & M. Kaur in *Mycosphere* 5(1): 18, 2014.

Punjab: Barnala (228 m), Salempur, growing in a caespitose group on horse dung, Amandeep Kaur, PUN 4064, February 08, 2009 (Amandeep et al. 2014).

77. *Coprinopsis foetidella* (P. D. Orton) Atri, A. Kaur & M. Kaur in *Mycosphere* 5(1): 17, 2014.

Punjab: Moga (217 m), Jallalabad, growing in group on buffalo dung, Amandeep Kaur, PUN 4818, June 28, 2011(Amandeep et al. 2014).

78. *Coprinopsis lagopides* var. *lagopides* (P. Karst.) Redhead, Vilgalys & Moncalvo in *Taxon* 50(1): 229, 2001.

Jammu & Kashmir: Pehlgam (Watling & Gregory 1980, Abraham 1991) as *Coprinus lagopides*.

Punjab: Sangrur (231 m), Naushehra, scattered on mixed cattle dung and straw heap, Amandeep Kaur, PUN 4060, July 9, 2007 (Amandeep et al. 2014).

79. *Coprinopsis lagopus* (Fr.) Redhead, Vilgalys & Moncalvo in *Taxon* 50(1): 229, 2001.

New Delhi: (Krishnamurthy & Verma 1974, Manjula 1983) as *Coprinus lagopus*.

Tamil Nadu: Madras, Maduravoyal, Madras University Campus, growing in groups on paddy straw, Herb. Mubl No. 2556, 2557 October 6, 21 1981 (Natarajan & Raaman 1983, 1984) as *Coprinus lagopus*.

Kerala: (Bhavani Devi 1995) as *Coprinus lagopus*.

Punjab: (Garcha & Kalra 1977, Atri & Kaur 2004) as *Coprinus lagopus*; Sangrur (231 m), Amargarh, growing in groups on mixed cattle dung, Amandeep Kaur, PUN 4819, June 21, 2008 (Amandeep et al. 2014).

80. *Coprinopsis macrocephala* (Berk.) Redhead, Vilgalys & Moncalvo in *Taxon* 50(1): 229, 2001.

Tamil Nadu: Madras, Maduravoyal, Madras University Campus, growing in groups on ground, Herb. Mubl No. 2554, March 09, 1979 (Natarajan & Raman 1983, 1984 as *Coprinus macrocephalus*).

Punjab: Jalandhar (233 m), Rahimpur, growing scattered on mixed cattle dung and straw residue heap, Amandeep Kaur, PUN 4820, July 30, 2010 (Amandeep et al. 2014).

81. *Coprinopsis nivea* (Pers.) Redhead, Vilgalys & Moncalvo in *Taxon* 50(1): 229, 2001.

West Bengal (Mahju 1933) as *Coprinus niveus*.

West Bengal: Calcutta (Banerjee 1947) as *Coprinus niveus*.

Maharashtra (Patil et al. 1995) as *Coprinus niveus*.

Kerala: Kottayam, growing solitary or in groups on cow dung during monsoon (Bhavani Devi 1995) as *Coprinus niveus*.

Punjab: growing on unspecified animal dung (Mahju 1933, Saini & Atri 1995) as *Coprinus niveus*; Sangrur (231 m), Amargarh, growing in groups on buffalo dung, Amandeep Kaur, PUN 4821, June 21, 2008; Sangrur (231 m), Mahorana, growing in caespitose groups on buffalo dung, Amandeep Kaur, PUN 4822, June 21, 2008; Sangrur (231 m), Takhar, growing gregariously on buffalo dung, Amandeep Kaur, PUN 4823, June 26, 2008; Ludhiana (254 m), Nasrali, growing in groups on horse dung, Amandeep Kaur, PUN 4824, July 23, 2009; Sangrur (231 m), Chittanwala, growing in groups on buffalo dung flakes, Amandeep Kaur, PUN 4825, July 25, 2010 (Amandeep et al. 2014).

82. *Coprinopsis patouillardii* (Quél.) G. Moreno in *Guía de los hongos de la Península Ibérica*: 813, 2010.

According to Index Fungorum, the current valid name of *Coprinus patouillardii* is *Coprinopsis patouillardii*.

Punjab: Bir Bhadson (250 m), growing on cattle dung under *Albizia lebbek* tree, Amanjeet Kaur, PUN 2954, September 09, 1999 (Atri & Kaur 2004) as *Coprinus patouillardii*.

Karnataka: Heggala-Thora, Virajpet, Kodagu, growing on elephant dung, N.C. Karun, MUBSNCKKRSMF#041, July 29, 2012 (Karun & Sridhar 2015) as *Coprinus patouillardii*.

83. *Coprinopsis pseudonivea* (Bender & Uljé) Redhead, Vilgalys & Moncalvo in *Taxon* 50(1): 230, 2001.

Punjab: Sangrur (231 m), Langrian, growing in groups on cow dung, Amandeep Kaur, PUN 4062, June 21, 2008; Sangrur (231 m): Khurd, growing in groups on mixed cattle dung, Amandeep Kaur, PUN 4826, July 05, 2008; Tarn Taran (169 m): Kang, Khadoor Sahib, growing in a group of two on cow dung, Amandeep Kaur, PUN 4063, December 12, 2009 (Amandeep et al. 2014).

84. *Coprinopsis radiata* (Bolton: Fr.) Redhead, Vilgalys & Moncalvo in *Taxon* 50(1): 230, 2001.

According to MycoBank record, *Coprinus fimetarius* and *Coprinus radiatus* are synonyms of *Coprinopsis radiata*. Hence the names *Coprinus fimetarius* and *Coprinus radiatus* stand deleted and

replaced by the name *Coprinopsis radiata*.

Jammu & Kashmir: (Abraham 1991) as *Coprinus radiatus*.

Maharashtra: (Patil et al. 1995) as *Coprinus fimetarius* and *Coprinus radiatus*.

Kerala: growing solitary or in groups on dung heaps (Bhavani Devi 1995) as *Coprinus fimetarius*.

Punjab: growing on horse dung (Rea 1922, Mahju 1933) as *Coprinus radiatus*; Near Bhadson (250 m), Babulpur, growing on cattle dung, Amanjeet Kaur, PUN 2955, September 08, 1998 (Atri & Kaur 2004) as *Coprinus fimetarius*; Patiala (251 m), Bhedpura, growing in a caespitose group on mixed cattle dung heap, Amandeep Kaur, PUN 4827, July 16, 2011 (Amandeep et al. 2014).

85. *Coprinopsis radiata* var. *macrocarpa* Atri, A. Kaur & M. Kaur in *Mycosphere* 5(1): 15, 2014.

Punjab: Sangrur (231 m), Bhasaur, growing in groups on buffalo dung, Amandeep Kaur, PUN 4828, September 15, 2007; Sangrur (231 m), Langrian, growing in groups on mixed cattle dung, Amandeep Kaur, PUN 4829, June 21, 2008; Patiala (251 m), Chhat Bir, growing in groups on mixed cattle dung heap, Amandeep Kaur, PUN 4830, June 30, 2008; Sangrur (231 m), Sandaur, growing scattered on mixed cattle dung, Amandeep Kaur, PUN 4831, September 29, 2008 (Amandeep et al. 2014).

86. *Coprinopsis scobicola* (P.D. Orton) Redhead, Vilgalys & Moncalvo in *Taxon* 50(1): 231, 2001.

Punjab: Sangrur (231 m), Meemsa, growing solitary on sheep dung, Amandeep Kaur, PUN 4832, July 25, 2010 (Amandeep et al. 2014).

87. *Coprinopsis vermiculifer* (Joss.: Dennis) Redhead, Vilgalys & Moncalvo in *Taxon* 50(1): 232, 2001.

Punjab: Hoshiarpur (295 m), Garhshankar, growing in a group on buffalo dung, Amandeep Kaur, PUN 4833, July 5, 2011 (Amandeep et al. 2014).

(xx) Genus: *Panaeolus* (Fr.) Quél. in *Mémoires de la Société d'Émulation de Montbéliard* 5: 151, 1872.

Type Species: *Panaeolus papilionaceus* (Bull.) Quél. (1872)

88. *Panaeolus acuminatus* Quél. in *Hyménomycètes*, Fasc. Suppl. (Alençon): 621, 1874.

Kerala: Silent Valley, TBGRI Campus, growing scattered on elephant dung (Vrinda et al. 1999).

Punjab: Bathinda (211 m), Lehra Mohabbat, growing gregariously in cattle pasture, Amandeep Kaur, PUN 4030, August 02, 2009 (Kaur et al. 2014c).

89. *Panaeolus africanus* Oláh in *Rev. Mycol. Mem. Ser.* 10: 125, 1969.

Tamil Nadu: Madras, Guindy, Children's Park, growing in groups on elephant dung, Herb. MUBL No. 2574, December 12, 1978 (Natarajan & Raaman 1983, 1984).

90. *Panaeolus africanus* var. *diversistipus* Amandeep Kaur, NS Atri & Munruchi Kaur in *Mycosphere* 4(3): 620, 2013.

Punjab: Hoshiarpur (295 m), Jejon Duaba, growing solitary on mixed cattle dung heap, Amandeep Kaur, PUN 4342, July 5, 2011 (Amandeep et al. 2013a).

91. *Panaeolus alcis* M.M. Moser in *Mycologia* 76 (3): 551, 1984.

Punjab: Moga (217 m), Chak Fatehpur, growing scattered or in caespitose groups on buffalo dung, Amandeep Kaur, PUN 4359, June 28, 2011 (Kaur et al. 2014c).

92. *Panaeolus annulatus* Natarajan & Raman in *Bibliotheca Mycologica* 89: 52, 1983.

Tamil Nadu: Madras, Guindy, Children's Park, growing on elephant dung, Herb. MUBL No. 2579, December 08, 1980 (Natarajan & Raaman 1983, 1984).

93. *Panaeolus antillarum* (Fr.) Dennis in *Kew Bulletin* 15 (1):124, 1961.

Tamil Nadu: Madras, Guindy, Children's Park, growing in groups on elephant dung, August 23, 1978,

December 12, 1978. Herb. MUBL No. 2575, 2576 (Natarajan and Raaman, 1983, 1984).
Kerala: Malappuram, Ramapuram, growing on elephant dung, August 16, 2002, Nisha NVS109; August 18, 2002, Nisha NVS109b; Thrissur, Guruvayur, October 28, 2002, Nisha NVS109c; March 09, 2003, Nisha NVS109d; April 11, 2003, Nisha NVS109e (Manimohan et al. 2007); (Mohanan 2011).
Punjab: Sangrur (231 m), Ratolan, growing solitary on mixed cattle dung, Amandeep Kaur, PUN 4225, September 28, 2008 (Kaur et al. 2014c).

94. *Panaeolus ater* (J.E. Lange) Kühner & Romagn. ex Bon in *Documents Mycologiques* 16 (61): 46, 1985.

Kerala: Kottayam, Ranni, growing solitary or scattered on the droppings of herbivorous animals (Bhavani Devi 1995).

Punjab: Fatehgarh Sahib (228 m), Nogwaan, growing scattered on cattle dung, Amandeep Kaur, PUN 4032, August 21, 2009; Hoshiarpur (295 m), Chak Sadhu, growing in groups on buffalo dung, Narinderjit Kaur, PUN 4704, July 22, 2011 (Kaur et al. 2014c).

95. *Panaeolus cyanescens* (Berk. & Br.) Sacc. in *Sylloge Fungorum* 5: 1123, 1887.

Bose (1920) described the species for the first time from India as *Panaeolus cyanescens*. Later Ghosh et al. (1967) described it as *Copelandia cyanescens*. Manjula (1983) put the name *Panaeolus cyanescens* in the excluded list and described *Copelandia cyanescens* as the valid name. Natarajan & Raaman (1983, 1984) and Manimohan et al. (2007) described it under the name *Copelandia cyanescens*. But MycoBank record shows that *Panaeolus cyanescens* is the legitimate name for the species and *Copelandia cyanescens* is an obligate synonym of this name. Hence, the name *Copelandia cyanescens* stands replaced in the Indian record by *Panaeolus cyanescens*.

West Bengal: on dung heaps (Bose 1920).

Uttar Pradesh: Lucknow (Ghosh et al. 1967) as *Copelandia cyanescens*.

Tamil Nadu: Madras, Guindy, growing in groups on elephant dung, Herb. MUBL No. 2570, November 02, 1978 (Natarajan & Raman 1983, 1984) as *Copelandia cyanescens*.

Jammu and Kashmir: Abraham (1991); Lakhanpal (1993).

Kerala: Malappuram, Angadipuram, growing on elephant dung, Nisha NVS107, August 12, 2002; Thrissur, Guruvayur, Nisha NVS128, September 09, 2002 (Manimohan et al. 2007) as *Copelandia cyanescens*.

Punjab: Fatehgarh Sahib (228 m), Sirhind, along G.T. Road, growing in groups on mixed dung and humicolous soil under *Eucalyptus citridora* tree, Amanjeet Kaur, PUN 2708, September 16, 1995; Fatehgarh Sahib (228 m), Sirhind, growing in caespitose groups on cattle manure in the field of *Allium sativum* crop, Amanjeet Kaur, PUN 2712, November 17, 1995; Fatehgarh Sahib (228 m), Sirhind, growing in groups on cattle dung, Amanjeet Kaur, PUN 2707, November 17, 1995; Fatehgarh Sahib (228 m), Sirhind, growing in groups on cattle manured soil, Amanjeet Kaur, PUN 2711, November 27, 1995; Patiala (250 m), Bir Bhunerheri, growing scattered on cattle manured soil near *Parthenium* grass, Amanjeet Kaur, PUN 2710, March 07, 1998; Fatehgarh Sahib (228 m), Bassi, growing scattered on mixed dung, Amanjeet Kaur, PUN 2713, September 14, 1998; Fatehgarh Sahib (228 m), Sirhind, growing in groups on cattle dung manured soil in *Allium sativum* field, Amanjeet Kaur, PUN 2709, November 28, 1998; Sangrur (251 m), Malak Majra, growing gregariously on buffalo dung, Amandeep Kaur, PUN 4355, June 23, 2008; Patiala (251 m), Dakala, Dashmesh Nagar, growing gregariously on cow dung, Amandeep Kaur, PUN 4077, June 25, 2008; Patiala (251 m), Chhat Bir, growing in caespitose clusters on buffalo dung, Amandeep Kaur, PUN 4028, June 30, 2008; Patiala (251 m), Chhat Bir, growing gregariously on buffalo dung, Amandeep Kaur, PUN 4078, June 30, 2008; Hoshiarpur (295 m), Simbli, growing scattered on mixed cattle dung, Harwinder Kaur, PUN 4361, July 19, 2008; Ludhiana (254 m), growing in groups on cattle dung, Baljit Kaur, PUN 3922, September 03, 2008; Ludhiana (254 m), Nasrali, growing scattered in groups on mixed cattle dung, Amandeep Kaur, PUN 4079, July 23, 2009; Mohali (31 6m), Bhajauli, growing scattered on cow dung heap, Amandeep Kaur, PUN 4031, August 21, 2009; Ropar (394 m), Kuraali, growing solitary on mixed cattle dung,

Amandeep Kaur, PUN 4033, August 21, 2009; Sangrur (251 m): Jaatimajra, growing gregariously on horse dung, Amandeep Kaur, PUN 4080, September 03, 2009; Patiala (251 m), Chhat Bir, growing in groups on elephant dung, Amandeep Kaur, PUN 4353, July 10, 2010; Patiala (251 m), Chhat Bir, growing scattered on elephant dung, Amandeep Kaur, PUN 4354, July 10, 2010; Ropar (394 m), near Haveli, growing in groups on buffalo dung, Arpana Lamba, PUN 4296, July 16, 2010; Ropar (394 m), growing in groups on buffalo dung, Arpana Lamba, PUN 4297, July 25, 2010 (Kaur et al. 2014c).

96. *Panaeolus cyanoannulatus* Atri, M. Kaur & A. Kaur in *JNBR* 3(2): 126, 2014.

Punjab: Hoshiarpur (295 m), Jeewanpur Jattan, found growing in a group on a mixed cow and horse dung heap in a pasture, Amandeep Kaur, PUN 4223, July 18, 2008 (Kaur et al. 2014a).

97. *Panaeolus fimicola* (Pers.) Gillet in *Hyménomycètes* (Alençon): 621, 1878.

Karnataka: Makutta Reserve forest, Virajpet, Kodagu, growing on elephant dung, N.C. Karun, MUBSNCKKRSMF # 042, August 20, 2012 (Karun & Sridhar 2015).

98. *Panaeolus lepus-stercus* Atri, M. Kaur & A. Kaur in *JNBR* 3(2): 129, 2014.

Punjab: Pathankot (309 m), Sheep and Rabbit Breeding Farm Dalla Dhar, growing scattered on rabbit pellets, Amandeep Kaur, PUN 4340, September 01, 2011 (Kaur et al. 2014a).

99. *Panaeolus papilionaceus* (Bull.) Qué. In *Mém. Soc. Émul. Montbéliard*, Sér. 2,5: 152 [122 repr.], 1872.

Tamil Nadu: Kodaikanal, Konalaru, Pine Regeneration Area, growing solitary on ground, August 13, 1978. Herb. MUBL No. 2578 (Natarajan & Raaman 1983, 1984) as *Panaeolus sphinctrinus*.

Punjab: Hoshiarpur (295 m), Mahilpur, growing gregariously on horse dung in a pasture, Munruchi Kaur and Amandeep Kaur, PUN 4224, July 18, 2008; Bathinda (211 m), Lehra Mohabbat, growing gregariously in caespitose groups on cow dung, Amandeep Kaur and Harwinder Kaur, PUN 4029, August 02, 2009 (Kaur et al. 2014c) as *Panaeolus sphinctrinus*; Sangrur (231 m), Dugni, growing in groups on buffalo dung among grasses along roadside, Amandeep Kaur, PUN 4360, June 27, 2011 (Kaur et al. 2014c) as *Panaeolus papilionaceus* var. *parvisporus*.

100. *Panaeolus rickenii* Hora in *Trans. Brit. Mycol. Soc.* 43: 454, 1960.

Kerala: Thrissur, Guruvayur, growing on elephant dung, Nisha NVS129, September 09, 2002; Malappuram, Ramapuram, growing on elephant dung, Nisha NVS133; November 11, 2002, (Manimohan et al. 2007).

101. *Panaeolus semiovatus* (Sowerby) S. Lundell & Nannf. in *Fungi Exsiccati Suecici Fasc.* 11-12 (537), 1938.

Bhavani Devi (1995) reported this species as *Anellaria semiovata*. MycoBank record refers this name as a synonym of *Panaeolus semiovatus*. Now, *Anellaria semiovata* stands deleted from Indian list and replaced by *Panaeolus semiovatus* which is the legitimate name.

Kerala: Konni, Pathanamthitta, growing solitary or scattered on elephant dung (Bhavani Devi 1995 as *Anellaria semiovata*).

102. *Panaeolus solidipes* (Peck) Sacc. in *Sylloge Fungorum* 5: 1123, 1887.

Kerala: Trivandrum, Vellayani, Agricultural College Campus, growing solitary or scattered on manured ground (Bhavani Devi 1995).

Punjab: Sangrur (231 m), Upoki, growing solitary on horse dung, Amandeep Kaur, PUN 4034, September 4, 2009 (Kaur et al. 2014c).

103. *Panaeolus speciosus* var. *pilocystidiosus* Amandeep Kaur, NS Atri & Munruchi Kaur in *Mycosphere* 4(3): 622, 2013.

Punjab: Barnala (228m), Rarh, growing scattered on cattle dung, Amandeep Kaur, PUN 4081, June 26, 2008 (Amandeep et al. 2013a).

104. *Panaeolus subbalteatus* (Berk. & Br.) Sacc. in *Sylloge Fungorum* 5: 1124, 1887.

Tamil Nadu: Madras, Guindy, Deer Park, growing in groups on elephant dung, November 02, 1979, Herb. MUBL No. 2577 (Natarajan & Raaman 1983, 1984).

Jammu & Kashmir: Lakhanpal (1986); Abraham (1991).

Punjab: Barnala (228 m), Wazeedake, growing in groups on buffalo dung among grasses, Amandeep Kaur, PUN 4228, July 31, 2009; Bathinda (211m), Nandgarh, growing scattered on buffalo dung, Amandeep Kaur, PUN 4227, August 01, 2009; Ropar (394 m), Padijala, growing in groups on a mixed cattle dung heap, Amandeep Kaur, PUN 4229, August 21, 2009; Ropar (394 m): Kiratpur Sahib, growing in groups on mixed cattle dung, Harwinder Kaur, PUN 4770, July 13, 2012 (Kaur et al. 2014c).

105. *Panaeolus tropicalis* Oláh in *Rev. Mycol.* 4: 289, 1969.

Punjab: Patiala (251 m), Nainakut, growing in groups on mixed cattle dung, Amandeep Kaur, PUN 4076, June 16, 2008; Patiala (251 m), Bhunerheri, growing in groups on mixed cattle dung, Amandeep Kaur, PUN 4346, June 16, 2008; Hoshiarpur (295 m), Kot Fatuhi, growing solitary on mixed cattle dung among grassy litter, Narinderjit Kaur, PUN 4341, August 18, 2011 (Kaur et al. 2014c).

106. *Panaeolus venezolanus* Guzmán in *Mycotaxon* 7 (2): 221, 1978.

Punjab: Faridkot (196 m), Panjgraeen, growing in a group on cattle dung and wheat straw mixture heap, Amandeep Kaur, PUN 4834, August 19, 2011 (Kaur et al. 2014c).

(xxi) Genus: ***Parasola*** Redhead, Vilgalys & Hopple in *Taxon* 50(1): 235, 2001.

Type species: *Parasola plicatilis* (Curtis) Redhead, Vilgalys & Hopple

The genus *Parasola* was established by Readhead et al. (2001). Erstwhile *Coprinus* species having smooth pileus and stipe surfaces, non-deliquestent lamellae and hymeniform pileus cuticle have been placed under the newly established genus *Parasola* Redhead, Vilgalys & Hopple.

107. *Parasola conopilus* (Fr.) Örstadius & E. Larss. In *Mycol. Res.* 112(10): 1180, 2008.

Kerala: growing scattered on elephant dung (Vrinda et al. 1999) as *Psathyrella conopilus*.

Punjab: Sangrur (231 m), Bhudan, growing solitary on buffalo dung and vegetable waste heap, Amandeep Kaur, PUN 4073, January 20, 2008.

108. *Parasola plicatilis* (Curtis) Redhead, Vilgalys & Hopple in *Taxon* 50(1):235, 2001.

Watling and Gregory (1980) recorded *Coprinus plicatilis* which has now been reclassified as *Parasola plicatilis* which is a valid name. Hence the name *Coprinus plicatilis* stands deleted from the Indian record.

Tamil Nadu: Madras, Guindy, Children's park, growing in groups on ground, Herb. Mubl No. 2559, September 24, 1979 (Natarajan & Raaman 1983, 1984).

Kerala: growing solitary in grassland and gardens (Bhavani Devi 1995).

Jammu & Kashmir: Dachigan Reserve (Watling & Gregory 1980) as *Coprinus plicatilis*; Abraham (1991).

Punjab: Atri & Kaur (2004); Kapurthala (224 m), growing scattered on manured soil, Jyoti Mann and Amandeep Kaur, PUN 4059, May 15, 2007.

(xxii) Genus: ***Psathyrella*** Fr.: Quél. in *Mém. Soc. Émul. Montbéliard* 5: 152, 1872.

Type species: *Psathyrella gracilis* (Fr.) Quél.

109. *Psathyrella castaneifolia* (Murrill) A.H. Sm., *Mem. N. Y. bot. Gdn* 24: 33, 1972.

Punjab: Sangrur (231 m), Sikanderpura, growing in groups on mixed cattle dung, Amandeep Kaur,

PUN 4358, June 29, 2011; Patiala (251 m), Ghanaur, growing solitary on buffalo dung, Amandeep Kaur, PUN 4357, July 19, 2011(Kaur et al. 2014c) as *Panaeolus castaneifolius*.

110. *Psathyrella fimicola* NS Atri, Munruchi Kaur and Amandeep Kaur in JNBR 2(3): 276, 2013. Punjab: Patiala (251m), Harigarh, growing in group on horse dung, Amandeep Kaur, PUN 4317, June 18, 2011(Kaur et al. 2013b).

111. *Psathyrella flocculosa* (Earle) A.H. Smith in *Mem. N. Y. Bot. Gdn.* 24: 181, 1972. Punjab: Sangrur (231 m), Naushehra, growing gregariously on mixed cattle dung heap, Amandeep Kaur, PUN 4074, July 07, 2007.

112. *Psathyrella kauffmanii* var. *kauffmanii* Smith in *Mem. N. Y. Bot. Gdn.* 24: 69, 1972. Punjab: Moga (217 m), Loahgarh, growing in caespitose clusters on buffalo dung heap under *Azadirachta indica* tree, Amandeep Kaur, PUN 4318, July 28, 2009.

113. *Psathyrella sphaerocystis* Orton in *Notes Roy. Bot. Gard. Edinburgh* 26: 57. 1964. Punjab: Sangrur (231 m), Balamgarh, growing in caespitose cluster on mixed cattle dung heap, Amandeep Kaur, PUN 4075, July 30, 2009.

114. *Psathyrella vanhermanii* Smith in *Mem. N. Y. Bot. Gdn.* 24: 79, 1972. Punjab: Mohali (316 m), Parol, growing in groups on buffalo dung, Amandeep Kaur, PUN 4316, July 14, 2007; Ludhiana (254 m): Issru, growing in groups on buffalo dung, Amandeep Kaur, PUN 4315, June 17, 2008.

IX. Family: *Strophariaceae* Singer & Smith in *Mycologia* 38: 503, 1946.
Type genus: *Stropharia* (Fr.) Quél.

(xxiii) Genus: *Agrocybe* Fayod in *Annales des Sciences Naturelles Series VII*, 9: 358, 1889.
Type species: *Agrocybe praecox* (Pers.: Fr.) Fayod

115. *Agrocybe guruvayoorensis* K. A. Thomas & Manim. in *Mycotaxon* 86: 330, 2003. Kerala: Thrissur, Guruvayur, growing on elephant dung, A. Thomas T316, July 14, 1999, A. Thomas T316b, July 16, 1999, A. Thomas T316c, July 21, 1999, A. Thomas T316d, October 18, 1999 (Thomas & Manimohan 2003, Manimohan et al. 2007).

116. *Agrocybe microspora* Singer in *Sydowia* 30(1-6): 205, 1977. Punjab: Patiala (251 m): Bahadurgarh, growing in groups on manured soil in a cattle pasture, Munruchi Kaur and Yadwinder Singh, PUN 4835, May 28, 2008 (Kaur et al. 2014d).

117. *Agrocybe pediades* (Fr.) Fayod in *Annales des Sciences Naturelles*, Series 7,9: 358, 1889. Kerala: (Mohanan 2011)
Uttar Pradesh: Saharanpur (Hennings 1901).
Chandigarh (321 m): growing on dung (Rawla et al. 1982, Saini & Atri 1995) as *Agrocybe semiorbicularis*.
Punjab; Sangrur (231m): Kelon, growing in groups on mixed cattle dung, Amandeep Kaur, PUN 4226, August 14, 2008 (Kaur et al. 2014d).

(xxiv) Genus: *Protostropharia* Redhead, Moncalvo & Vilgalys in *Index Fungorum* 15:2, 2013.
Type species: *Protostropharia semiglobata* (Batsch) Redhead, Moncalvo & Vilgalys

118. *Protostropharia. semiglobata* (Batsch) Redhead, Moncalvo & Vilgalys in *Index Fungorum* 15: 2, 2013.

Assam: Khasi Hills (Berkeley 1852) as *Agaricus semiglobata*.

Punjab: growing on camel dung (Rea 1922, Ginai 1936, Saini & Atri 1995) as *Stropharia semiglobata*.

Jammu and Kashmir: Gulmarg (Watling & Gregory 1980) as *Stropharia semiglobata*.

Tamil Nadu: Nilgiris, Ootacamud, Naduvattam, growing in groups on dung, Herb. Mubl No. 2604, September 08, 1978 (Natarajan & Raaman 1983, 1984) as *Stropharia semiglobata*.

Kerala: growing solitary or gregarious on dung, or manured soil (Bhavani Devi 1995); (Mohanan 2011 as *Stropharia semiglobata*).

119. *Protostropharia semiglobata* var. *punjabensis* Amandeep Kaur, NS Atri and Munruchi Kaur in *Kavaka* 41: 11, 2013.

Punjab: Pathankot (309 m), Berkula, growing solitary on cow dung in an open pasture, Munruchi Kaur and Amandeep Kaur, PUN 4840, September 02, 2011 (Kaur et al. 2013c).

(xxv) Genus: *Psilocybe* (Fr.) P. Kumm. in *Der Führer in die Pilzkunde* 1: 21, 71, 1871.

Type species: *Psilocybe montana* (Pers.) P. Kumm.

120. *Psilocybe argentina* (Speg.) Singer in *Nova Hedwigia Beih.* 29: 241, 1969.

Tamil Nadu: Nilgiris, Ootacamud, Santinella, growing in groups on cow dung, Herb. MUBL No. 2627, November 06, 1979 (Natarajan & Raman 1983, 1984).

Kerala: Idukki, Munnar, Thomas T150b, August 28, 1997 (Thomas & Manimohan 2002); (Mohanan 2011).

121. *Psilocybe aztecorum* R. Heim in *Revue Mycol., Paris* 22: 78, 1978.

Punjab: Patiala (251 m), Wazeedpur, growing solitary on buffalo dung, Amandeep Kaur, PUN 4837, July 16, 2011; Pathankot (309 m): Shahpur Kandi, growing in group on buffalo dung, Munruchi Kaur and Amandeep Kaur, PUN 4838, September 01, 2011.

122. *Psilocybe bonetii* Guzmán in *Anais da Escola nac. Cienc. biol., Méx.* 17(1-4): 9, 1970.

Tamil Nadu: Nilgiris, Ootacamud, Santinella, growing in groups on cow dung, Herb. MUBL No. 2621, November 06, 1979 (Natarajan & Raaman 1983, 1984) as *Psilocybe aztecorum* var. *bonetii*.

Punjab: Hoshiarpur, Badowan (295 m), growing scattered on a buffalo dung flake, Munruchi Kaur and Amandeep Kaur, PUN 4836, July 18, 2008.

123. *Psilocybe coprophila* (Bull.) P. Kumm. in *Der Führer in die Pilzkunde*: 71, 1871.

Jammu & Kashmir: Watling & Gregory (1980).

Tamil Nadu: Kodaikanal, Konalaru, growing solitary and in groups on dung, Herb. MUBL No. 2626, August 13, 1978 (Natarajan & Raaman 1983, 1984).

Kerala: growing gregariously or scattered on elephant dung (Bhavani Devi, 1995); Idukki, Munnar, growing on elephant dung A. Thomas T149, August 28, 1997 (Thomas & Manimohan 2002, Manimohan et al. 2007).

Karnataka: Shola Forest of Heggala-Thora, Virajpet, Kodagu, growing on elephant dung, N.C. Karun, MUBSNCKKRSMF # 044, July 29, 2012 (Karun & Sridhar, 2015).

124. *Psilocybe cubensis* (Earle) Singer in *Sydowia* 2: 37, 1948.

Tamil Nadu: Madras, Guindy, Deer Park, growing solitary on elephant dung manure, Herb. MUBL No. 2613, November 02, 1978 (Natarajan & Raaman 1983, 1984).

Kerala: Idukki, Munnar, growing on soil with heavy traffic of cattle, Thomas T156, August 29, 1997, Thomas T156b, August 30, 1997, Thomas T156c, August 30, 1997 (Thomas & Manimohan 2002).

125. *Psilocybe fimetaria* (P.D. Orton) Watling in *Lloydia* 30 (2): 150, 1967.

Karnataka: Shola Forest, Heggala-Thora, Virajpet, Kodagu, growing on elephant dung, N.C. Karun, MUBSNCKKRSMF # 045, September 07, 2012 (Karun & Sridhar 2015).

126. *Psilocybe gigaspora* Natarajan & Raaman in *Bibliotheca Mycologica* 89: 100, 1983.
Tamil Nadu: Nilgiris, Ootacamud, Santinella, growing in groups on cow dung, Herb. MUBL No. 2611, November 06, 1979 (Natarajan & Raaman 1983, 1984).

127. *Psilocybe inquilina* (Fr.) Bres. in *Iconographia Mycologica* 18: 863, 1931.
Kerala: (Mohan 2011).

128. *Psilocybe merdaria* (Fr.) Ricken in *Die Blätterpilze*: 251, 1912.
Maharashtra: Bombay, Poona, on dung (Masse 1901) as *Stropharia merdaria*.

129. *Psilocybe pegleriana* Guzmán in *Doc. Mycol.* 29 (116): 43, 2000.
Kerala: Thrissur, Guruvayur, growing on elephant dung, A. Thomas T311, June 11, 1999, A. Thomas T311b, June 17, 1999, A. Thomas T311c, July 14, 1999; Palakkad, Nelliampathy, A. Thomas T311d, August 30, 1999; Kasaragod, Adhoor, A. Thomas T311e, September 16, 2000 (Manimohan et al. 2007); (Mohan 2011).

130. *Psilocybe semilanceata* (Fr.) P. Kumm. in *Der Führer in die Pilzkunde* p. 71, 1871.
Maharashtra: Patil et al. (1995).
Punjab: Patiala (251 m), Bhunerheri, growing in groups on mixed cattle dung heap in a pasture, Amandeep Kaur, PUN 4839, June 16, 2008.

131. *Psilocybe subaeruginascens* Höhn in Sitzungsber. Kaiserl. Akad. Wiss., Math-Naturwiss. Kl., AbL I, 123 (1): 78, 1914.
Kerala: Calicut, Vellarimala, growing on elephant dung, K. A. Thomas T170, September 19, 1999; K. A. Thomas T170b, September 20, 1997, K. A. Thomas T170c, November 08, 1999 (Thomas & Manimohan 2002, Manimohan et al. 2007).

132. *Psilocybe subcubensis* Guzmán in *Mycotaxon* 7: 248, 1978.
Kerala: Wayanad, Muthanga, growing on elephant dung, K. A. Thomas T76, June 17, 1997; K. A. Thomas T76b, June 25, 1997; K. A. Thomas T76c, July 04, 1997; K. A. Thomas T76d, August 19, 1997; K. A. Thomas T76e, October 01, 1997; K. A. Thomas T76f, October 26, 1997; K. A. Thomas T76g, May 25, 1999; K. A. Thomas T76h, July 21, 1999; Malappuram, Nilambur, Nisha NVS 142, June 28, 2003 (Thomas & Manimohan 2002, Manimohan et al. 2007); (Mohan 2011).

(xxvi) Genus: *Stropharia* (Fr.) Quél. in *Mém. Soc. Émul. Montbéliard* 5: 141, 1872.
Type species: *Stropharia aeruginosa* (Curtis) Quél.

133. *Stropharia bicolor* Pegler in *Kew. Bull. Addit. Ser.* 6: 463, 1977.
Kerala: Idukki, Munnar, growing on elephant dung, A. Thomas T152, August 29, 1997; Palakkad, Nelliampathy, A. Thomas T152 b, August 29, 1999, A. Thomas T152 c, August 30, 1999 (Manimohan et al. 2007).

134. *Stropharia rugosoannulata* Farl.: Murrill in *Mycologia* 14: 139, 1922.
Kerala: Wayanad, Muthanga, growing on elephant dung, A. Thomas T75, June 17, 1997, A. Thomas T75b, June 25, 1997, A. Thomas T75c, July 04, 1997, A. Thomas T75e, July 21, 1999, A. Thomas T75f, July 25, 1999; Palakkad, Nelliampathy, A. Thomas T75d, August 15, 1997 (Manimohan et al. 2007).

X. Family: *Tricholomataceae* R. Heim: Pouzar in *Ceská Mykol.* 37(3): 174, 1983.

Type genus: *Tricholoma* (Fr.) Staude

(xxvii) Genus: *Macrocybe* Pegler & Lodge in *Mycologia* 90: 496, 1998.

Type species: *Macrocybe titans* (H.E. Bigelow & Kimbr.) Pegler, Lodge & Nakasone

135. *Macrocybe gigantea* (Masse) Pegler & Lodge in *Mycologia* 90: 497, 1998.

Kerala: Thrissur, Guruvayur, growing on elephant dung, P. Manimohan M750, May 27, 1999, P. Manimohan M750a, June 17, 1999 (Manimohan et al. 2007).

Table 1 List showing excluded and replaced names of coprophilous mushrooms in India

Excluded names	Current names
<i>Coprinaceae</i>	<i>Agaricaceae</i>
<i>Agrocybe semiorbicularis</i>	<i>Agrocybe pediades</i>
<i>Anellaria semiovata</i>	<i>Panaeolus semiovatus</i>
<i>Bolbitius glatfelteri</i>	<i>Mycena glatfelteri</i>
<i>Bolbitius vitellinus</i>	<i>Bolbitius titubans</i>
<i>Conocybe albipes</i>	<i>Conocybe apala</i>
<i>Conocybe magnicapitata</i>	<i>Conocybe juniana</i>
<i>Conocybe plumbeitincta</i>	<i>Pholiotina plumbeitincta</i>
<i>Copelandia cyanescens</i>	<i>Panaeolus cyanescens</i>
<i>Coprinus cinerea</i>	<i>Coprinopsis cinerea</i>
<i>Coprinus cordisporus</i>	<i>Coprinopsis cordispora</i>
<i>Coprinus ephemerus</i>	<i>Coprinellus ephemerus</i>
<i>Coprinus fimbriatus</i>	<i>Coprinellus fimbriatus</i>
<i>Coprinus fimetarius</i>	<i>Coprinopsis radiata</i>
<i>Coprinus lagopides</i>	<i>Coprinopsis lagopides</i>
<i>Coprinus lagopus</i>	<i>Coprinopsis lagopus</i>
<i>Coprinus macrocephalus</i>	<i>Coprinopsis macrocephala</i>
<i>Coprinus micaceus</i>	<i>Coprinellus micaceus</i>
<i>Coprinus niveus</i>	<i>Coprinopsis nivea</i>
<i>Coprinus patouillardii</i>	<i>Coprinopsis patouillardii</i>
<i>Coprinus plicatilis</i>	<i>Parasola plicatilis</i>
<i>Coprinus radiatus</i>	<i>Coprinopsis radiata</i>
<i>Coprinus truncorum</i>	<i>Coprinellus truncorum</i>
<i>Galera antipus</i>	<i>Conocybe antipus</i>
<i>Lepiota cepistipes</i>	<i>Leucocoprinus cepistipes</i>
<i>Lepiota humei</i>	<i>Chlorophyllum humei</i>
<i>Lepiota meleagris</i>	<i>Leucoagaricus meleagris</i>
<i>Lepiota sordescens</i>	<i>Leucocoprinus cepistipes</i>
<i>Leucoagaricus naucinus</i>	<i>Leucoagaricus leucothites</i>
<i>Leucocoprinus cretatus</i>	<i>Leucocoprinus cretaceus</i>
<i>Macrolepiota rhacodes</i>	<i>Chlorophyllum rhacodes</i>
<i>Panaeolina rhombisperma</i>	<i>Crucispora rhombisperma</i>
<i>Panaeolus castaneifolius</i>	<i>Psathyrella castaneifolia</i>
<i>Panaeolus papilionaceus</i> var. <i>parvisporus</i>	<i>Panaeolus papilionaceus</i>
<i>Panaeolus sphinctrinus</i>	<i>Panaeolus papilionaceus</i>
<i>Psathyrella conopilus</i>	<i>Parasola conopilus</i>
<i>Psilocybe aztecorum</i> var. <i>aztecorum</i>	<i>Psilocybe aztecorum</i>
<i>Psilocybe aztecorum</i> var. <i>bonetii</i>	<i>Psilocybe bonetii</i>
<i>Stropharia merdaria</i>	<i>Psilocybe merdaria</i>
<i>Stropharia semiglobata</i>	<i>Protostropharia semiglobata</i>
<i>Volvariella earlei</i>	<i>Volvopluteus earlei</i>
<i>Volvariella gloiocephala</i>	<i>Volvopluteus gloiocephalus</i>
<i>Volvariella speciosa</i>	<i>Volvopluteus gloiocephalus</i>

Discussion

India exhibits marked variations in climate, vegetation and livestock population. The extent of available information about coprophilous mushrooms from India in general is meager and there is much scope for exploratory work on these mushrooms. In the present work, systematic exploration on coprophilous mushrooms was undertaken in Punjab state with a focus on taxonomy, diversity and

ecological aspects of coprophilous mushrooms. In this checklist all the coprophilous agarics recorded previously from different parts of India to date, including those in the investigation of Punjab state, have been listed. The work done has vast scope for further extension as 135 taxa have been documented from 13 states and 2 union territories. The knowledge generated by the work is of immense utility as it is key to revealing the diversity and ecology of coprophilous agarics. However, the list covers only a part of the actual diversity of these mushrooms in India as most of the relevant original information is literature-based and many of the papers bear only limited information on habit and habitat. Moreover, studies on the coprophilous agarics have been inadequate in the country and therefore there still maybe many undescribed coprophilous mushrooms which may have been missed due to their fragility and tendency to disappear quickly in addition to the many unsurveyed states. The work demonstrates that dung is a significant substrate which serves as a favorable niche for the growth of a variety of mushrooms. Coprophilous mushrooms must be conserved as they play a significant role in the sustenance of ecological balance on the earth.

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