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A revised list of the agaricoid and boletoid basidiomycetes from India and Nepal

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Abstract. Most of the knowledge of Agaricales of the Indian subcontinent was based upon Berkeley's descriptions of the collections made by Sir J D Hooker, mostly in Sikkim and the Khasi Hills. These specimens were deposited in the Herbarium of the Royal Botanic Gardens, Kew. Recent years have witnessed a fundamental change in agaric taxonomy, with a major emphasis being placed on microstructure. It has therefore become necessary to re-evaluate the early species of Berkeley and to ascertain their microstructure. The present study is an attempt towards this end. In addition, the nomenclature of all published records of the Indian agaricoid and boletoid basidiomycetes has been revised and a modern check-list, together with keys to the species, is presented.

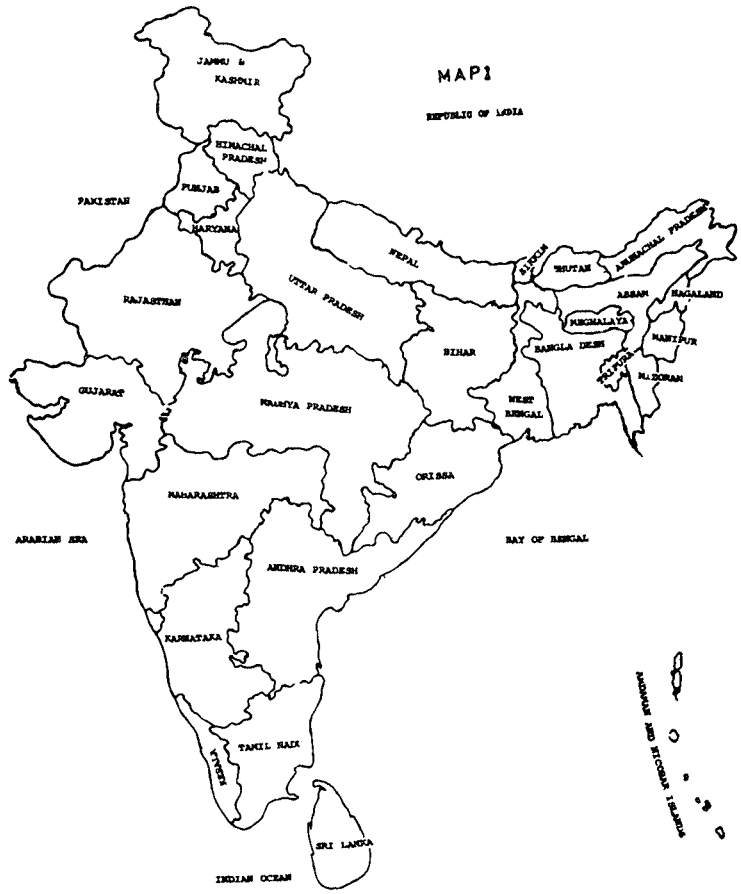
Keywords. Taxonomic revision of type material; 28 Com. Nov.; 22 syn. nov.; Agaricales; Boletales.

1. Introduction

The first attempt to provide a complete list of fungi reported from India was published by Butler and Bisby (1931). This was revised by Vasudeva (1960) who extended the list to include all species reported from India up to the end of 1952. Although Vasudeva's list (1960) remains the standard work, several additional lists have appeared (Mundkur 1938; Ramakrishnan and Subramanian 1952; Subramanian and Ramakrishnan 1958; Subramanian and Tyagi 1964; Tandon and Chandra 1964; Tilak and Rao 1968; Mukerji and Juneja 1974; Bilgrami *et al* 1979). In all cases the classification adopted followed the early arrangement provided by Saccardo (1882-1931).

In recent years, there has been an increasing interest in the Agaricales of India and, in addition, the advance of agaric taxonomy has rendered the Saccardoan classification largely obsolete. There is an urgent need for an updated list with a revised classification: the present paper attempts to fulfil this need. It includes all reliable records from the Republic of India (Map 1) and the Kingdom of Nepal, but does not include the Peoples Republic of Bangladesh, the Islamic Republic of Pakistan or the Republic of Sri Lanka. Further, it does not include records of species for which no descriptive data have been provided. *e.g.* Sathe and Rahalkar (1975, 1978) and Sathe and Sasangan (1977).

The Indian subcontinent comprises a vast landmass covering 3,268,090 sq km lying between latitudes 8-37°N and longitudes 68-97°E. It is isolated from the rest of Asia by the mountain ranges of the Himalayas in the North. Geographically, four main regions may be defined: (a) the *Himalayas*, representing the highest mountain system in the world, extends across northern India from west to east. Much of the early collecting of Indian agarics was undertaken in the foothills of the Himalayas, especially in Darjeeling, Khasia Hills and Simla. Relatively low temperatures are recorded in these hill stations, which have an annual mean temperature of 12-14°C.



The mycoflora is therefore decidedly temperate in its composition, and many species familiar to the north temperate regions of Europe and North America are to be found there. (b) *Indo-Gangetic Plain*, covers 643,700 sq km formed by the river basins of the Indus, Ganges and Brahmaputra. This area is largely tropical with a mean annual temperature of 26°C. Much of the region experiences a high rainfall, especially in Meghalaya where, in Cherrapunji, a maximum annual rainfall of 10800 mm has been recorded. In Assam a tropical rain-forest vegetation exists, elements of which are shown to have affinities with the forests of Kerala in the far South. The Indo-Gangetic Plain is an area of high population and extensive cultivation and so little collecting of fleshy fungi has been undertaken, apart from Assam and the Calcutta region of West Bengal. (c) The *Indian Desert*, is a region to the north-west of India, covering Rajasthan, having minimum rainfall and few fleshy fungi. (d) *Deccan Plateau*, (or Peninsula plateau), is the oldest landmass in India. In the north it is bordered by the Vindhya Mountains, with an altitudinal range of 450-1220 m, and is separated from the Arabian Sea coast and the Bay of Bengal coast by the Western Ghats and Eastern Ghats respectively. The Ghats have an altitudinal range of around 500-650 m. The Western and Eastern Ghats meet at the Nilgiri Hills in Tamil Nadu State, where fairly extensive collecting of Agaricales has been undertaken. In the areas of higher elevation, a sub-temperate mycoflora is to be found, whilst in Kerala the fungus flora shows much closer affinities to that of Sri

Lanka. The plains of Southern India experience periods of high temperature and humidity.

The climate of India is governed by the tropical monsoon, establishing three seasons, a period of cool conditions from November to February, a hot season from March to June, and a rainy season from June to October. Best collecting of the fleshy agarics is achieved during the early days of the early monsoon period.

The following account is divided into two parts. Part I is a taxonomic revision of a number of species, especially those described by Berkeley and Massee. New information obtained from a study of the type material is presented. Part II is a list of the genera and species arranged taxonomically according to the classification of Singer (1975) for the Agaricales, Pegler and Young (1979) for the Russulales and Pegler and Young (1981) for the Boletales.

Twenty-eight new combinations are proposed and 22 taxa have been reduced to synonymy. Five hundred and thirty-eight species are recognised, arranged in 115 genera and 20 families.

Part I. A revision of the Indian type material deposited in the herbarium, Royal Botanical Gardens, Kew

This is a taxonomic revision of type material mostly described by Berkeley and Massee, and now deposited in the Herbarium of the Royal Botanical Gardens, Kew. Many of these collections are accompanied by water-colour illustrations provided by the original collector. In the case of species described by Berkeley, the collections and paintings were provided by Sir J D Hooker. The species are arranged alphabetically according to their epithet. Wherever possible additional information on the microcharacters is given and line drawings are provided for both the overall habit and microstructures. The structures of the hymenium, pileipellis and the spores were examined by mounting in ten per cent potassium hydroxide solution and/or Melzer's reagent, and drawings were made with the aid of a camera lucida attachment.

Agaricus adelphus Berk. in *Hooker J. Bot.* **2** 47 (1850); *Armillaria adelpha* (Berk.) Sacc., Syll Fung. **5** 84 (1887)

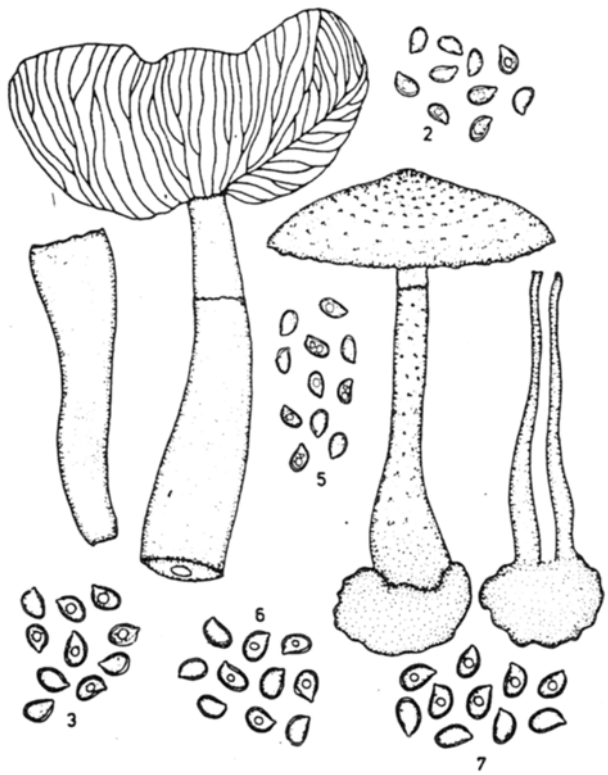
Type: Darjeeling, on dead wood, alt. 2286 m (7500 ft). May 1848, Hooker fil. 47 cum icon.

The accompanying water-colour illustration shows two basidiomes with depressed to infundibuliform pilei, 2-3 cm diameter, pale pinkish buff with small vinaceous brown, floccose squamules. The slender stipe is reddish brown, and glabrous, and the decurrent lamellae are pale pinkish brown. The spores, 8-9.5 × 5-6.3 µm, are ovoid to broadly ellipsoid, hyaline, smooth and thin-walled. The pileal squamules comprise elongate, inflated elements, 35-55 × 9-12 µm, with a slightly thickened wall and brownish contents, with catenulate arrangement. The characters are typical of an annulate species of *Armillaria* (Fr. ex Fr.) Staude closely approaching *A. omnituens* (Berk.) Sacc., also described from Darjeeling (figures 8, 9).

Agaricus alliciens Berk. in *Intell. Obs.* **12** 18 (1867); *Lepiota alliciens* (Berk.) Sacc. *Syll Fung.* **9** 7 (1891)

Type: Masulipatam, on the roof of a house, E S Berkeley.

This species is described as having slender, sulphur yellow basidiocarps with



Figures 1-7. **1-2.** *Agaricus exaltatus* (Hooker fil. 31, holotype). **1.** habit sketch, × 0.5; **2.** spores. **3.** *A. fulviceps* (holotype), spores. **4-5.** *A. latipes* (Hooker fil. 24, holotype). **4.** habit sketch and section of stipe, × 0.5; **5.** spores. **6.** *A. squalidus* (holotype), spores. **7.** *A. woodrowii* (holotype), spores. All × 1000 unless otherwise stated.

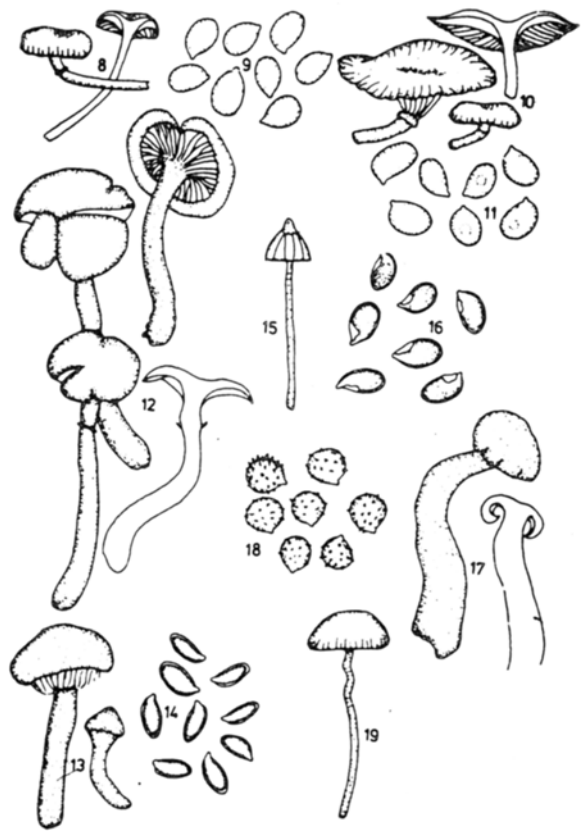
greenish lamellae. The spores, measuring 8-10 × 6-7 µm, are broadly ellipsoid and apically truncated by a broad germpore, and the endosporium is metachromatic with cresyl blue. The characters are typical of *Leucocoprinus birnbaumii* (Corda) Singer and the species is reduced in synonymy. Cooke (1888a: 105) had overlooked the original description by Berkeley (1867) and provided a second description for this species, using Berkeley's herbarium name.

Lepiota altissima Massee in *Bull. Misc. Inf. Kew* **1898** 114 (1898)

Type: Bombay, Poona, growing in open pastures, 31 August, 1895, Woodrow 22.

A black-and-white photograph of the type collection shows a large, fleshy basidiocarp with an umbonate pileus with minute, concolorous squamules, and an elongate stipe. The spores are large, 9-11.5 × 6-7.8 µm, ovoid to broadly ellipsoid, hyaline, dextrinoid, with a metachromatic endosporium in cresyl blue, and a small but conspicuous germ-pore. On the lamella-edge are found, clavate cheilocystidia, 26-38 × 10-15 µm, hyaline, thin-walled. All these characters indicate this species to be a later synonym of *Macrolepiota dolichaula* (Berk. and Br.) Pegler and Rayner.

Agaricus anax Berk. in *Hooker J. Bot.* **4** 98 (1852); *Lepiota anax* (Berk.) Sacc., *Syll. Fung.* **5** 28 (1887)



Figures 8-19. **8-9.** *Armillaria adelpha* (Hooker fil. 47, holotype). **8.** habit sketch and section, × 0.5; **9.** spores. **10-11.** *A. omnituens* (Hooker fil. 46, holotype). **10.** habit sketch and section, × 0.5; **11.** spores. **12.** *A. vara.* (Hooker fil. 2, holotype), habit sketch and section, × 0.5. **13-14.** *'Agaricus' macrophalus* (Hooker fil. 79, holotype). **13.** habit sketch, × 0.5; **14.** spores. **15-16.** *'Agaricus' macrothelus.* (Hooker fil. 19, holotype). **15.** habit sketch, × 1; **16.** spores. **17-18.** *'Agaricus' podagrosus.* (Hooker fil. 134, holotype). **17.** habit sketch and section, × 0.5; **18.** spores. **19.** *Collybia blandula.* (Hooker fil. 8, holotype), habit sketch, × 1. All × 1000 unless otherwise stated.

Type: Nunklow, on clay banks, 10 July, 1850, Hooker fil. 23 cum icon. The material is in a poor condition and only the spores can be revived. The spores are large, 10-13.5 × 6.7-8.7 µm, broadly ellipsoid with a conspicuous germ-pore, dextrinoid and a metachromatic endosporium. The accompanying water-colour illustration shows a large basidiocarp with an umbonate, pinkish cinnamon pileus bearing minute squamules. The stipe is up to 30 cm long with a bulbous base. All these characters are reminiscent of *Macrolepiota dolichaula* but owing to the poor material this cannot be confirmed at present.

Agaricus antitypus Berk. in *Hooker J. Bot.* **2** 77 (1850); *Collybia antitypa* (Berk.) Sacc., *Syll. Fung.* **5** 230 (1887)

Type: Darjeeling, on mossy trunks, alt. 2590 m (8500 ft), April, Hooker fil. 6 cum icon.

The spores, 16-18 × 18-20 µm, are globose, smooth, hyaline, inamyloid, with a large refractive oil-guttule. The spores are characteristic of *Oudemansiella canarii* (Jungh.) Höhn. and *A. antitypus* is reduced in synonymy.

Agaricus aratus Berk. in *Hooker J. Bot.* **2** 79 (1850); *Mycena arata* (Berk.) Sacc., *Syll. Fung.* **5** 269 (1887)
Type: Sinchul, on roots of trees amongst moss, alt. 2590-2743 m (8500-9000 ft), May, Hooker fil. 37 cum icon.

The spores, 8.2-11 × 5.7-7.7 µm, are ellipsoid, smooth, hyaline, thin-walled and amyloid. This is a good species of *Mycena* (Pers. ex Fr.) S F Gray section *Mycena* (figures 78, 79).

Boletus areolatus Berk. in *Hooker J. Bot.* **4** 138 (1852)
Type: Kala-Panee, Khassya, open pastures, alt. 1676 m (5500 ft), 27 June 1850, Hooker fil. 6 cum icon.

Owing to the pink colouration of the hymenophore, the slender stipe, and the small, pale pinkish spores, measuring 6.5-12 × 3-4 µm, which are subfusoid, smooth, hyaline, thin-walled, the species is better referred to the genus *Tylopilus* Karst. and the combination **Tylopilus areolatus** (Berk.) Manjula, comb. nov., is proposed here (figures 150,151).

Agaricus atrichus Berk. in *Hooker J. Bot.* **2** 108 (1850); *Hypholoma atrichum* (Berk.) Sacc., *Syll. Fung.* **5** 1035 (1887)
Type: Darjeeling, on dead timber and soil impregnated with charcoal, alt. 2133-2438 m (7000-8000 ft), May, Hooker fil. 35 cum icon.

The spores, 7.5-8 × 10-11 µm, are broadly ovoid and apically truncated by a conspicuous germ-pore, dark fuscous brown, thick-walled with verrucose ornamentation. The spores are characteristic of *Lacrymaria velutina* (Pers. ex Fr.) Konard and Maubl. and *A. atrichus* is reduced in synonymy.

Agaricus aureo-fulvus Berk. in *Hooker J. Bot.* **2** 107 (1850); *Stropharia aureo-fulva* (Berk.) Sacc., *Syll. Fung.* **5** 1015 (1887)
Type: Jillapahar, on dead wood, alt. 2133-2438 m (7000-8000 ft), October, Hooker fil. 127 cum icon.

The spores, 10.5-12.5 × 5.5-7.5 µm, are ellipsoid, deep yellowish brown, with a thick complex wall and a small germ-pore which truncates the apex, the suprahilar depression is absent. Basidia, 15-20 × 6-8.5 µm, are short clavate with four sterigmata. Lamella-edge sterile. Cheilocystidia 23-28 × 2.5-5.5 µm, are cylindric to fusoid, hyaline, thin-walled. Pleurocystidia absent. The presence of large spores and the annulate basidiocarps shows it belongs to the section *Stercophila* (Romagnesi) Singer of *Stropharia* (Fr.) Quél closely to *S. semiglobata* (Batsch ex Fr.) but has a distinctive umbonate pileus. Although Berkeley described this species as growing on wood, the overall habit would suggest this to be unlikely (figures 140-143).

Stropharia aurivella Massee in *Bull. Misc. Inf. Kew* **1912** 255 (1912)
Type: India, Calcutta, Maiden, among grass, 11 October 1911, E M Burkill 33.

The spores, 3.5-4.5 × 5-6 µm, are ovoid to ellipsoid with a smooth brown colour wall, and no germ-pore. The pileus is reddish orange, and squamules are present on both the pileus and stipe. The species is typical of *Agaricus trisulphuratus* Berk. and *S. aurivella* is reduced in synonymy.

Agaricus bicrenatus Hooker f. apud Berk. in *Hooker J. Bot.* **2** 79 (1850); *Mycena bicrenata* (Hooker f.) Sacc., *Syll. Fung.* **5** 278 (1887)

Figures 20-32. **20.** *Collybia broomeiana* (Hooker fil. 62, holotype), habit sketch, × 0.5. **21-22.** *C. himalaica* (Hooker fil. 53, holotype). **21.** habit sketch and section, × 0.5; **22.** spores. **23-24.** *C. iridescens* (Hooker fil. 41, holotype). **23.** habit sketch and section, × 0.5; **24.** spores. **25-26.** *C. macra* (Hooker fil. 5, holotype). **25.** habit sketch and section, × 0.5; **26.** spores. **27.** *C. papaveracea* (Hooker fil. 86, holotype), habit sketch, × 0.5. **28-29.** *C. rhodella* (Hooker fil. 120, holotype). **28.** habit sketch and section, × 0.5; **29.** spores. **30-32.** *C. rufata* (Hooker fil. 44, holotype). **30.** habit sketch and section, × 0.5; **31.** pleurocystidia; **32.** spores. All × 1000 unless otherwise stated.

Type: Jillapahar, on rotten wood, June, Hooker fil. 58 cum icon.

Even though the microstructures could not be observed, the accompanying water-colour illustration shows the pinkish basidiocarps with interveined lamellae. The stipe base is dark brown and it is clearly a species of *Mycena*. It belongs to the section *Purae* Konrad and Maubl. and is close to *M. pura* (Pers. ex Fr.) Kummer but differs in size and the absence of lilac pigments (figure 80).

Agaricus blandulus Berk. in *Hooker J. Bot.* **4** 100 (1852); *Collybia blandula* (Berk.) Sacc., *Syll. Fung.* **5** 219 (1887)

Type: Sikkim, in pine woods, alt. 3352 m (11000 ft), Hooker fil. 8 cum icon.

The type material is sterile and no microcharacters can be traced (figure 19).

Agaricus broomeianus Berk. in *Hooker J. Bot.* **2** 77 (1850); *Mycena broomeiana* (Berk.) Sacc., *Syll. Fung.* **5** 281 (1887)

Type: Darjeeling, on dead wood, June, Hooker fil. 62 cum icon.

The type material is in very poor condition and no microstructures can be recovered. From the accompanying illustration, this large agaric with a sulcate-striate pileus and a robust, elongate stipe is clearly a species of *Collybia* (Fr.) Staude section *Striipedes* (Fr.) Quél. and the combination **Collybia broomeiana** (Berk.) Manjula, comb. nov., is here proposed (figure 20).

Galera burkillii Massee in *Bull. Misc. Inf. Kew.* **1910** 2 (1910)

Type: India, Darjeeling, Sureil, on the ground, I H Burkill, 1 June, 1909

The pileus is coral red, membranous, 1-1.5 cm diameter, campanulate, glabrous, with striate margin. The spores, 7-8.5 × 3.5-4 µm, are hyaline, smooth, thin-walled, ellipsoid with a tapering base. The epicutis consists of hymeniform broom-cells of the *Siccus*-type; individual elements, 12-20 × 15-20 µm, globose, with brown, thick-walled setules, 1-2 µm long, covering the apex. By virtue of all these characters this is a species of *Marasmius* Fr. section *Sicci* Singer and **Marasmius burkillii** (Massee) Manjula, comb. nov., is proposed here (figures 73, 74).

Agaricus caespititius Berk. in *Hooker J. Bot.* **2** 110 (1850); *Psilocybe caespiticia* (Berk.) Sacc., *Syll. Fung.* **5** 1053 (1887)·

Type: Darjeeling, on clay banks, alt. 2286 m (7500 ft), June, Hooker fil. 69 cum icon.

The spores, 5.3-6.5 × 3.2-4.3 µm, are dark reddish brown, characteristically mitriform with a conspicuous germ-pore which truncates the apex. The spores are typical of section *Psilocybe* (figures 130, 131).

Agaricus calvescens Berk. in *Hooker J. Bot.* **3** 20 (1851); *Psathyra calvescens* (Berk.) Sacc., *Syll. Fung.* **5** 1064 (1887)

Type: Darjeeling, on mossy earth, in tufts, alt. 2286 m (7500 ft), September, Hooker fil. 117 cum icon.

The type collection is accompanied by a water-colour illustration by the collector J D Hooker, of basidiocarps with conical pilei which are white or show a yellowish tinge when young. The spores are reddish brown, translucent, ellipsoid, measuring 9-10.5 × 5-6 µm, and apically truncated by a conspicuous germ-pore. The type collection, although is in poor condition, has black lamellae that are clearly deliquescent when fresh, and therefore the species is more correctly assigned to *Coprinus* Pers. ex. S F Gray. The combination, **Coprinus calvescens** (Berk.) Manjula, comb. nov., is herewith proposed (figures 38, 39).

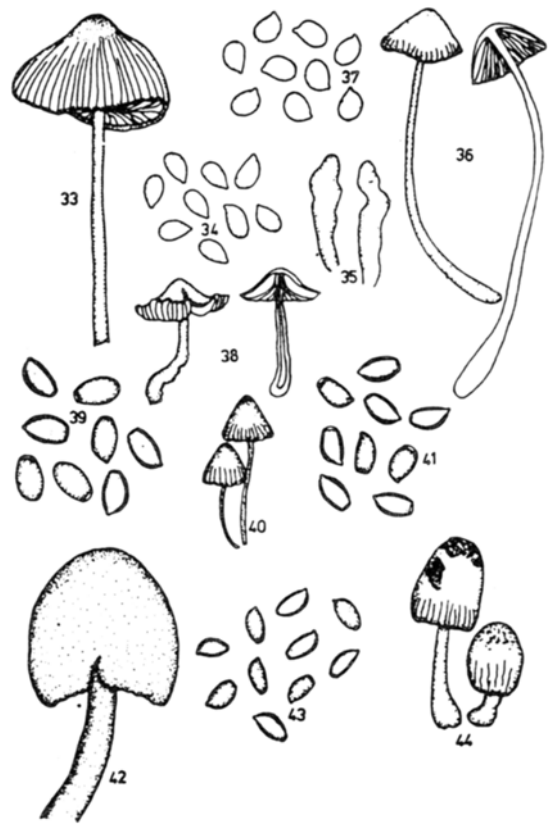
Agaricus camptopus Berk. in *Hooker J. Bot.* **2** 77 (1850); *Collybia camptopus* (Berk.) Sacc., *Syll. Fung.* **5** 231 (1887 as '*camptopoda*')

Type: Darjeeling, on wood, alt. 2286 m (7500 ft), September, Hooker fil. 113 cum icon.

The spores, 16-20 × 18-22 µm, are globose to subglobose, smooth, hyaline, inamyloid, with a large refractive oil-guttule. The spores are characteristic of *Oudemansiella canarii* and *A. camptopus* is reduced in synonymy.

Xerotus cantharelloides Berk. in *Hooker J. Bot.* **3** 47 (1851)

Type: Jillapahar, on dead wood, June.



Figures 33-44. **33-35.** *Collybia triplicata* (Hooker fil. 88, holotype). **33.** habit sketch, × 0.5; **34.** spores. **35.** cheilocystidia. **36-37.** *C. ustipes* (Hooker fil. 129, holotype). **36.** habit sketch, × 0.5; **37.** spores. **38-39.** *Coprinus calvescens* (Hooker fil. 117, holotype). **38.** habit sketch and section, × 0.5; **39.** spores. **40-41.** *C. flavo-griseus* (Hooker fil. 114, holotype). **40.** habit sketch, × 0.5; **41.** spores. **42-43.** *C. hookeri* (Hooker fil. 101, holotype). **42.** habit sketch, × 0.5; **43.** spores. **44.** *C. vellereus* (Hooker fil. 115, holotype), habit sketch, × 0.5. All × 1000 unless otherwise stated.

The type collection has a few isolated spores, measuring 6-8 × 4-4.5 µm, which are ovoid-ellipsoid, hyaline, inamyloid, smooth, thin-walled, sometimes with brown contents. This species should be regarded as a later synonym for *Anthracophyllum nigritum* (Lév.) Kalchbr.

Volvaria castanea Massee in *Bull. Misc. Inf. Kew* **1912** 254 (1912); *Volvariella castanea* (Massee) Rath in *J. Indian Bot. Soc.* **41** 525 (1962)
Type: India, Calcutta, Secretary's walk, under the north side of the wall, E M Burkill 36.

The spores, 5-6.5 × 3.5-4 µm, are ellipsoid, smooth, hyaline, thin-walled. The presence of both a volva and pink lamellae shows it is a good species of *Volvariella* Speg (figure 152).

Agaricus castanophyllus Berk. in *Hooker J. Bot.* **2** 109 (1850); *Hypholoma castanophyllum* (Berk.) Sacc., *Syll. Fung.* **5** 1035 (1887)

Type: Jillapahar, on the ground, September, Hooker fil. 124 cum icon.

An examination of the type material reveals spores, 9-10 × 7-8 µm, which are broadly ovoid and abruptly truncated by a conspicuous germ-pore, dark fuscous brown, thick-walled, with verrucose ornamentation. The spores are typical of *Lacrymaria velutina* and *A. castanophyllus* is reduced in synonymy.

Agaricus catervarius Lév. in *Ann. Sci. Nat. Bot.* **5** 111 (1846); *Hebeloma catervarium* (Lév.) Sacc., *Syll. Fung.* 5 804 (1887)

Type: Nilgiri Hills, on tree trunks, Perrothet.

The spores are yellowish brown, elongate ellipsoid, measuring 7.5-9 × 4.5-5 µm, with a smooth, thickened wall and a small, inconspicuous apical germ-pore. The pileipellis consists of an epicutis of interwoven, repent hyphae. This is not a species of *Hebeloma* (Fr.) Kummer as proposed by Léveillé, but the spores are typical of *Pholiota* (Fr.) Kummer section *Subsiccae* (Lange) Singer and the pileal colour is reminiscent of *P. astragalina* (Fr.) Singer. The new combination, **Pholiota catervaria** (Lév.) Manjula, comb. nov., is proposed here (figure 115).

Agaricus chrysimyces Berk. in *Hooker J. Bot.* **2** 87 (1850); *Flammula chrysomyces* (Berk.) Sacc., *Syll. Fung.* 5 825 (1887)

Type: Darjeeling, on dead wood, alt. 2133-2438 m (7000-8000 ft), August, Hooker fil. 109 cum icon.

The pileus is golden yellow with a floccose surface, and the stipe is provided with a faint ring zone which is soon evanescent. The spores, measuring 7-8.5 × 4.7-6 µm, are ovoid to broadly ellipsoid, yellowish brown and ornamented with coarse verrucae. On the lamella-edge are crowded, subcapitate cheilocystidia, 20-25 × 4-7 µm, and the hyphae of the velar squamules are 5-11 µm diameter with transverse bands of encrusting pigment. This is a distinctive species of *Gymnopilus* Karst. section *Gymnopilus* and a new combination is herewith proposed: **Gymnopilus chrysimyces** (Berk.) Manjula, comb. nov. (figures 51-54).

Agaricus chrysoprasius Berk. in *Hooker J. Bot.* **2** 84 (1850); *Pluteus chrysoprasius* (Berk.) Sacc., *Syll. Fung.* 5 678 (1887)

Type: On burnt fir-roots, base of Tonglo, alt. 609 m (2000 ft), Hooker fil. 142 cum icon.

Only the water-colour illustration is available which shows the light green pileus with cream coloured lamellae. No material can be traced in the Kew Herbarium (figure 132).

Russula cinnabarina Hook. f. apud Berk. in *Hooker J. Bot.* **3** 42 (1851)

Type: Darjeeling, on clay banks, alt. 2286 m (7500 ft), June, Hooker fil. 65 cum icon.

The spores, 7-8.3 × 5.3-6.7 µm, are hyaline, subglobose to globose, with amyloid verrucae which are sometimes connected. The accompanying water-colour illustration shows the beautiful basidiocarps with a vermilion coloured pileus. These characters show it belongs to the section *Rubrinae* Melzer and Zvára (figures 137, 138).

Agaricus colligatus Berk. in *Hooker J. Bot.* **4** 101 (1852); *Mycena colligata* (Berk.) Sacc., *Syll. Fung.* **5** 271 (1887)

Type: Sikkim, in pine woods, alt. 3352 m (11000 ft), 1849, Hooker fil. 7 cum icon.

Figures 45-58. **45.** *Clitocybe pumila* (holotype), spores. **46-48.** *Cortinarius flammeus* (Hooker fil. 20, holotype). **46.** habit sketch, × 0.5; **47.** spores. **48.** basidia. **49-50.** *C. vinosus* (Hooker fil. 30, holotype). **49.** habit sketch and section, × 0.5; **50.** spores. **51-54.** *Gymnopilus chrysimyces* (Hooker fil. 109, holotype). **51.** habit sketch and section, × 0.5; **52.** cheilocystidia; **53.** spores. **54.** pileus surface hypha. **55-56.** *G. micromegas* (Hooker fil. 15, holotype). **55.** habit sketch, × 0.5; **56.** spores. **57-58.** *Hygrocybe fulva.* (Hooker fil. 23, holotype). **57.** habit sketch, × 1; **58.** spores. All × 1000 unless otherwise stated.

The spores are strongly amyloid, 5.5-7 × 2.7-3.5 µm, ellipsoid, smooth, thin-walled, hyaline. The water-colour illustration shows a caespitose habit and the basidiocarps have a pale pinkish grey pileus with strongly interveined lamellae. It belongs to the section *Mycena* (figures 81, 82).

Agaricus condensus Berk. in *Hooker J. Bot.* **2** 109 (1850); *Hypholoma condensum* (Berk.) Sacc., *Syll. Fung.* **5** 1042 (1887)
Type: Darjeeling, on the ground, May, Hooker fil. 54 cum icon.

The pileal surface is greyish purple brown, retaining white velar remnants at the margin. The spores 6.7-9 × 3.7-5 µm, are ellipsoid, thick-walled, with a germ-pore which truncates the apex. By virtue of these characters it belongs to the genus *Psathyrella* (Fr.) Quél. and the transfer is here proposed: **Psathyrella condensa** (Berk.) Manjula, comb. nov. (figures 122, 123).

Cantharellus congregatus Mont. in *Ann. Sci. Nat. Bot. sér.* 1, **18** 21 (1842)
Type: Ootacamund, on dead trunk and wood.

The authentic material deposited in Herb. Kew is typical of *Resupinatus applicatus*

(Batsch ex Fr.) S F Gray with abundant, hyaline, subglobose spores which are measuring 4.5-5.5 × 4-5 µm. *C. congregatus* might therefore be considered of later synonym of that species.

Marasmius consocius Berk. in *Hooker J. Bot.* **3** 44 (1851)
Type: Darjeeling, on dead twigs, alt. 2438 m (8000 ft).

The epicuticular structure is typical of *Xerulina asprata* (Berk.) Pegler but the material is sterile and the basidiocarps were described as white.

Agaricus cremoriceps Berk. in *Hooker J. Bot.* **2** 47 (1850); *Tricholoma cremoriceps* (Berk.) Sacc., *Syll. Fung.* **5** 113 (1887)
Type: Darjeeling, on trunks of trees, alt. 2286 m (7500 ft), September, Hooker fil. 123 cum icon.

The spores, 16-18 × 19-20 µm, are subglobose to globose, smooth, hyaline, inamyloid, with a large refractive oil-guttule. The spores are characteristic of *Oudemansiella canarii* and *A. cremoriceps* is reduced in synonymy.

Agaricus cuspidatus Berk. in *Hooker J. Bot.* **4** 105 (1852); *Pluteus cuspidatus* (Berk.) Sacc., *Syll. Fung.* **5** 677 (1887)
Type: Khassya mountains, on the ground, Hooker fil. 27 cum icon.

A distinctive species with uniformly fuligineus brown pileus and stipe. No micro-characters were recoverable (figure 133).

Volvaria delicatula Massee in *Bull. Misc. Inf. Kew* 1912 254 (1912)
Type: Calcutta, Secretary's walk, under a wall, 18 October 1911, E M Burkill 43.

The small spores, 5-6 × 3.2-4 µm, are ellipsoid, smooth, with a slightly thickened stramineous wall. Other microstructures cannot be revived. The small volvate basidiocarp shows it is a species of *Volvariella* and the combination is here proposed: **Volvariella delicatula** (Massee) Manjula, comb. nov. (figure 153).

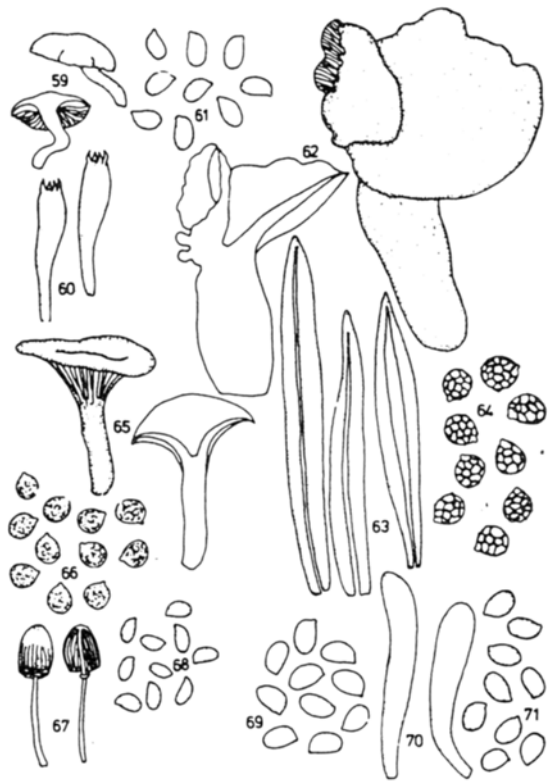
Agaricus deliciolum Berk. in *Hooker J. Bot.* **2** 44 (1850):*Lepiota deliciola* (Berk.) Sacc., *Syll Fung.* **5** 44 (1887) as ('*deliciolum*').
Type: Darjeeling, in the hollow of dead trees, alt. 2438 m (8000 ft), May, Hooker fil. 40 cum icon.

The spores, 5.2-6.3 × 2.3-3.5 µm, are hyaline, dextrinoid, ellipsoid, smooth, thin-walled, germ-pore absent, without any metachromatic endosporium. The spore characters confirm this to be a species of *Lepiota* Pers. ex S F Gray (figures 67, 68).

Boletus delphinus Hooker fil. ex Berk. in *Hooker J. Bot.* **3** 77 (1851)
Type: Darjeeling, on earthy, open places, alt. 2286 m (7500 ft), June, Hooker fil. 76 cum icon.

This small bolete, with a deeply cyanescent context, is typical of the genus *Xerocomus* Quél. The species is characterised by a reddish brown, tometose pileus; a cylindric, concolorous stipe; and a lemon yellow hymenophore, with large angular pores. The spores are broadly fusoid, 10-13 × 4.5-5.5 µm, appearing yellowish olivaceous under the microscope. The combination **Xerocomus delphinus** (Berk.) Manjula, comb. nov., is herewith proposed (figures 157,158).

Agaricus dentosus Berk. in *Hooker J. Bot.* **4** 102 (1852); *Mycena dentosa* (Berk.) Sacc., *Syll. Fung.* **5** 282 (1887)



Figures 59-71. **59-61.** *Hygrocybe pomona* (Hooker fil. 10, holotype). **59.** habit sketch and section, × 0.5; **60.** basidia; **61.** spores. **62-64.** *Lactarius princeps* (Hooker fil. 16, holotype). **62.** habit sketch and section, × 0.5; **63.** macrocystidia; **64.** spores. **65-66.** *L. stramineus* (Hooker fil. 34, holotype). **65.** habit sketch and section, × 0.5; **66.** spores. **67-68.** *Lepiota deliciola* (Hooker fil. 40, holotype). **67.** habit sketch and section, × 0.5; **68.** spores. **69.** *L. mimica* (holotype), spores. **70-71.** *L. sericea* (holotype). **70.** cheilocystidia; **71.** spores. All × 1000 unless otherwise stated.

Type: Sikkim, in pine woods, alt. 3352 m (11000 ft), Hooker fil. 29 cum icon.

The spores are large, 8.5-12 × 6.3-8.3 µm, amyloid, broadly ellipsoid, smooth, hyaline, thin-walled. It is clearly a species of *Mycena* belonging to the section *Filipedes* Fr. (figures 83,84).

Agaricus descendens Berk. in *Hooker J. Bot.* **4** 130 (1852); *Naucoria descendens* (Berk.) Sacc., *Syll. Fung.* **5** 849 (1887)

Type: Sikkim, in pine woods, amongst moss, alt. 3352 m (11000 ft), Hooker fil. 14 cum icon.

The small agaric has brown, smooth, ovo-ellipsoid spores, 6-7 × 4.5-5.3 µm, with a thickened wall but no germ-pore. There is a sterile lamella-edge lined with crowded cheilocystidia, 26-36 × 7-10 µm, clavate, hyaline, thin-walled. The pileipellis is a repent, non-agglutinated epicutis with scattered dermatocystidia, 30-40 × 9-15 µm, clavate to subcylindric, hyaline, thin-walled. In view of the spore structure, the presence of cheilocystidia and pileocystidia and the hygrophanous nature of the pileal surface, it is proposed to transfer this species to *Simocybe* Karst. as **Simocybe descendens** (Berk.) Manjula, comb. nov. (figures 144-147).

Agaricus discolor Berk. in *Hooker J. Bot* **3** 39 (1851); *Psathyrella discolor* (Berk.) Sacc., *Syll. Fung* **5** 1132 (1887)

Type: Darjeeling, on the ground and on dead timber, alt. 2286 m (7500 ft), October, Hooker fil. 137 cum icon.

This is a typical species of *Psathyrella* section *Psathyrella* by virtue of the large spores, 10.5-12.5 × 5.7-7.5 µm, which are dark brown, broadly ellipsoid, thick-walled, and have a germ-pore truncating the apex. The habit is similar to that of *P. gracilis* (Fr.) Quel., but the pileus is bright yellow when young although this gradually fades in older basidiocarps (figures 124,125).

Agaricus discordis Berk. *Hooker J. Bot.* **4** 101 (1852); *Mycena discors* (Berk.) Sacc., *Syll. Fung.* **5** 264 (1887)

Figures 72-89. **72.** *Macrolepiota mallea* (holotype), spores. **73-74.** *Marasmius burkillii* (holotype). **73.** pileus surface elements. **74.** spores. **75-77.** *M. hookeri* (Hooker fil. 5, holotype). **75.** habit sketch, × 0.5; **76.** pileus surface elements. **77.** spores. **78-79.** *Mycena arata* (Hooker fil. 37, holotype). **78.** habit sketch and section, × 0.5. **79.** spores. **80.** *M. bicrenata* (Hooker fil. 58, holotype), habit sketch and section, × 0.5. **81-82.** *M. colligata* (Hooker fil. 7, holotype). **81.** habit sketch, × 0.5; **82.** spores. **83-84.** *M. dentosa* (Hooker fil. 29, holotype). **83.** habit sketch and section, × 0.5. **84.** spores. **85-86.** *M. discors* (Hooker fil. 4, holotype). **85.** habit sketch and section, × 0.5. **86.** spores. **87.** *M. flavo-miniata* (Hooker fil. 26, holotype), habit sketch, × 0.5. **88-89.** *'Mycena' incommiscibilis* (Hooker fil. 11, holotype). **88.** habit sketch and section, × 0.5. **89.** metuloids. All × 1000 unless otherwise stated.

Type: Sikkim, in pine woods, on wood, alt. 3352 m (11000 ft), 16 June, 1849, Hooker fil. 4 cum icon.

The spores are amyloid, 6-7 × 4.5-5.7 µm, hyaline, ellipsoid, smooth, thin-walled. The convexo-depressed pileus shows some resemblance to the genus *Clitocybe* (Fr.) Staude but the presence of amyloid spores places it in the genus *Mycena*, probably best placed in section *Purae* (figures 85, 86).

Agaricus exaltatus Berk. in *Hooker J. Bot.* **2** 106 (1850)
Type: Darjeeling, on clay and earthy banks, alt. 2133 m (7000 ft), May, Hooker fil. 31 cum icon.

The pileal surface consists of radially arranged, repent, agglutinated hyphae, 4-12 µm diameter, with fuscous brown contents. The spores 4.5-6 × 3-3.5 µm, are brown, thick-walled, ellipsoid, smooth, without a germ-pore. This species of *Agaricus* L. ex Fr. belongs to the section *Agaricus* (figures 1,2).

Agaricus examinans Berk. in *Hooker J. Bot.* **2** 86 (1850); *Pholiota examinans* (Berk.) Sacc., *Syll. Fung.* **5** 742 (1887)
Type: Darjeeling, on dead wood, Hooker fil. 21 cum icon.

The water-colour illustration of the type material shows a pileus with a transparently striate margin. The stipe has an ephemeral annulus. The brown spores, measuring 5-7 × 3.5-4.5 µm, are mitriform in face-view, ellipsoid in side-view, and apically truncated by a germ-pore. The pileus and spores are characteristic of *Kuehneromyces* Singer and Smith and this is judged to be a later synonym of *K. mutabilis* (Schnaeff. ex. Fr.) Singer and Smith.

Cortinarius flammeus Berk. in *Hooker J. Bot.* **4** 133 (1852)
Type: Sikkim, in pine woods, alt. 3352 m (11000 ft), Hooker fil. 20 cum icon.

The spores, 6.7-8.3 × 4.2-5 (7.4 × 4.7) µm, are ellipsoid, finely rugulose to subsmooth. It belongs to the subgenus *Dermocybe* Fr., the characteristic feature of the species is the blood red pileus and stipe (figures 46-48).

Agaricus flavo-griseus Berk. in *Hooker J. Bot.* **2** 110 (1850); *Psathyra flavo-grisea* (Berk.) Sacc., *Syll. Fung.* **5** 1063 (1887)
Type: Darjeeling, on dead wood, in tufts, alt. 2133-2438 m (7000-8000 ft), September, Hooker fil. 114 cum icon.

The spores, 7-9.3 × 4.5-5.5 µm, are ellipsoid, apically truncated by the germ-pore, smooth, thick-walled and dark reddish brown. The pileus is delicate, soft, brittle, conico-campanulate, and grey. The delicate pileus with characteristic spores shows it to be a species of the genus *Coprinus* and the combination is proposed here: **Coprinus flavo-griseus** (Berk.) Manjula, comb. nov. (figures 40,41).

Agaricus flavo-miniatus Berk. in *Hooker J. Bot.* **4** 103 (1852); *Mycena flavo-miniatus* (Berk.) Sacc., *Syll. Fung* **5** 289 (1887)
Type: Sikkim, in pine woods, on sticks, alt. 3352 m (11000 ft), 1849, Hooker fil. 26 cum icon.

No microstructures can be recovered, but the water-colour illustration on which the description was based, shows small delicate basidiocarps with exceptionally

long, sinuous stipe and a pileus pigmented vermillion red with yellowish tints. This is a good species of *Mycena* section *Aciculae* (Kühn.) Singer (figure 87).

Lepiota flavophylla Massee, in *Bull. Misc. Inf. Kew* **1912** 253 (1912)
Type: Calcutta, Secretary's walk, under a wall, October 1911, E M Burkill.

The spores, 5-6.5 × 3-4 µm, are small, ellipsoid, hyaline, smooth, thin-walled, dextrinoid, without any germ-pore. The endosporium is not metachromatic with cresyl blue. The pileal surface comprises loose fasciles of chains of cylindric elements measuring 14-34 × 4-7 µm. The white pileus with reddish brown squamules and the epicutis structure are characteristic of *Lepiota lepidophora* (Berk. and Fr.) Sacc., a species described from Sri Lanka and *L. flavophylla* is reduced in synonymy.

Figures 90-111. **90-91.** *Mycena manipularis* (Hooker fil. 49, holotype). **90.** habit sketch, × 0.5. **91.** spores. **92-93.** *M. myriadea* (Hooker fil. 130, holotype). **92.** habit sketch and section, × 0.5. **93.** spores. **94-95.** *M. nubigena* (Hooker fil. 78, holotype). **94.** habit sketch and section, × 0.5. **95.** spores. **96.** *M. prasia* (Hooker fil. 140, holotype), habit sketch, × 0.5. **97-98.** *M. puberula* (Hooker fil. 19, holotype). **97.** habit sketch and section, × 0.5. **98.** spores. **99-100.** *M. rubiaetincta* (Hooker fil. 84, holotype). **99.** habit sketch and section, × 0.5. **100.** spores. **101-102.** *M. rufopicta* (Hooker fil. 48, holotype). **101.** habit sketch, × 0.5. **102.** spores. **103-104.** *M. russulina* (Hooker fil. 43, holotype). **103.** habit sketch and section, × 0.5. **104.** spores. **105-106.** *M. xanthophylla* (Hooker fil. 42, holotype). **105.** habit sketch and section, × 0.5. **106.** spores. **107-108.** *Omphalina fuliginosa* (holotype). **107.** habit sketch, × 2.5. **108.** spores. 109. *O. oedipus* (holotype), spores. **110-111.** *O. radiatilis* (Hooker fil. 24, holotype). **110.** habit sketch and section, × 0.5. **111.** spores. All × 1000 unless otherwise stated.

Omphalia fuliginosa Massee in *Bull. Misc. Inf. Kew* **1907** 122 (1907)
Type: Bengal, Calcutta, growing on a wall, Burkill No. 1 cum icon.

The spores, 6.5-8 × 4.5-6.5 µm, are subglobose to globose, hyaline, smooth, thin-walled. This species is characterised by the dull green basidiocarps with decurrent lamellae and the combination. **Omphalina fuliginosa** (Massee) Manjula, comb. nov., is proposed here (figures 107,108).

Agaricus fulviceps Berk. in *Hooker J. Bot* **6** 130 (1854)
Type: Sikkim, on the ground, Hooker.

The spores, 5.5-7 × 4-5 µm, are ellipsoid, fuscous brown, smooth, thick-walled, with a single oil-guttule. It belongs to the section *Sanguinolentae* of the genus *Agaricus* (figure 3).

Hygrophorus fulvus Berk. in *Hooker J. Bot.* **4** 134 (1852)
Type: Sikkim, in pine woods, alt. 3352 m (11000 ft), Hooker fil. 23 cum icon.

The spores, 7.2-9.5 × 5-6.5 µm, are ellipsoid, hyaline, smooth, thin-walled, inamyloid. The accompanying water-colour illustration shows bright tawny coloured pileus. The stipe is tawny with a yellow base and the lamellae are bright yellow. It belongs to the genus *Hygrocybe* (Fr.) Kummer and the combination **Hygrocybe fulva** (Berk.) Manjula, comb. nov., is proposed here (figures 57,58).

Tricholoma giganteum Massee in *Bull. Misc. Inf. Kew* **1912** 254 (1912)
Type: India, Shamnagar, near Calcutta, October, 1911, E M Burkill 44.

The spores, 5.7-7.5 × 4-5.3 µm, are hyaline, smooth, thin-walled, ellipsoid, inamyloid. The basidia are 25-30 × 5-7 µm, subcylindric to clavate, 4-spored. The pileipellis consists of undifferentiated interwoven hyphae. Clamp-connexions are present. The large white basidiocarp, the small hyaline spores, and the clamp-connexions show it belongs to the section *Leucorigida* Singer of the genus *Tricholoma* (Fr. ex Fr.) Staude (figures 148,149).

Russula grossa Berk. in *Hooker J. Bot.* **3** 42 (1851)
Type: Darjeeling.

The spors, 5-6 × 4.5-5.3 µm, are small, subglobose, hyaline, with amyloid, minute verruculae. The type material is not accompanied with a water-colour illustration. The characteristic spores show it to be a good species of *Russula* Pers. ex S F Gray but at present, owing to lack of many characters, it cannot be accommodated into any section (figure 139).

Agaricus hemisoodes Berk. in *Hooker J. Bot.* **2** 108 (1850); *Hypholoma hemisoodes* (Berk.) Sacc., *Syll. Fung.* **5** 1035 (1887)

Type: Darjeeling, on earth banks, alt. 2316 m (7600 ft), October, Hooker fil. 136 cum icon.

The spores, 9-10 × 7-8 µm, are broadly ovoid and abruptly truncated by a conspicuous germ-pore, dark fuscous brown, thick-walled with verrucose ornamentation. They are characteristic of *Lacrymaria velutina* and *A. hemisoodes* is reduced in synonymy.

Lentinus hepaticus Berk. in *Hooker J. Bot.* **3** 45 (1851)
Type: Darjeeling, on trunks of trees, alt. 2286 m (7500 ft), June, Hooker fil. 53 cum icon.

Berkeley described this species as a *Lentinus* Fr., but the monomitic hyphal system, presence of small ellipsoid spores, measuring 5.7-6.7 × 3.3-3.5 µm, an undifferentiated cutis, viscid pileus, and adnexed to adnate, crowded lamellae would preclude this possibility. By virtue of the adnexo-adnate lamellae, and the absence of any cystidia, it is proposed herewith to transfer this species to *Collybia* as **Collybia himalaica** Manjula, nom. nov., non *Collybia hepatica* (Berk.) Pegler (1965) (figures 21,22).

Hygrophorus hobsonii Berk. in *Grevillea* **11** 39 (1882)
Type: Communicated by General Hobson, who gathered the specimen in Central India.

The specimen is immature and sterile and no conclusion on its true identity is possible.

Coprinus hookeri Berk. in *Hooker J. Bot.* **3** 40 (1851)
Type: Jillapahar, in grassy places, alt. 2286 m (7500 ft), July, Hooker fil. 101 cum icon.

The spores, 7-9 × 3.7-4.5 (7.5 × 4) µm, are ellipsoid, smooth, translucent, fuscous brown, with a prominent germ-pore which truncates the apex. The accompanying water-colour illustration shows ovoid, blackish brown basidiocarps. It is a good species of *Coprinus* (figures 42,43).

Marasmius hookeri Berk. in *Hooker J. Bot.* **4** 136 (1852)
Type: Khassya mountains, in copse-wood, on moss, alt. 1524 m (5000 ft), 26 June, 1850, Hooker fil. 5 cum icon.

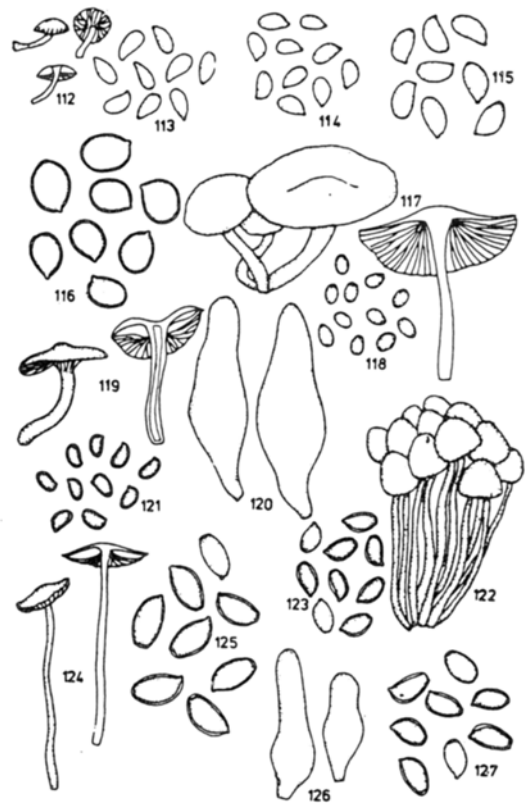
The spores, 18-25 × 3.5-4.5 µm, are elongate, lanceolate, to narrowly clavate, smooth, hyaline, thin-walled and inamyloid. The pileal surface is made up of hymeniform, smooth, clavate elements, measuring 16-23 × 12-14 µm. The epicuticular elements show it belongs to the section *Globulares* Kühn. of the genus *Marasmius* (figures 75-77).

Agaricus incommiscibilis Berk. in *Hooker J. Bot.* **4** 102 (1852): *Mycena incommiscibilis* (Berk.) Sacc., *Syll. Fung* **5** 281 (1887)
Type: Sikkim, in pine woods, alt. 3352 m (11000 ft), 1849, Hooker fil. 11 cum icon.

An unusual species with mycenoid habit, an agglutinated epicutis and an inamyloid hymenial trama. Both the sides and edge of the lamellae are covered with large, projecting, subhyaline, metuloidal cystidia, 60-70 × 7.5-12 µm, with a wall 1-2 µm thick. No spores can be covered. By virtue of the unusual cystidia the species could possibly be placed in *Pseudohiatula* Singer, but fertile material is required before any transfer is made (figures 88,89).

Pholiota indica Massee in *Bull. Misc. Inf. Kew* **1901** 151 (1901)
Type: Bombay Presidency, on the ground, Poona, October 1898, Woodrow 58.

The spores, 8.5-11.3 × 7-9 µm, are broadly ellipsoid, thickwalled, and brown coloured. The accompanying black-and-white photograph shows a fleshy basidiocarp with floccose squamules on the pileal surface. It resembles *P. destruens* (Brond.)



Figures 112-127. **112-113.** *Omphalina ranunculina* (Hooker fil. 35, holotype). **112.** habit sketch and section, × 0.5. **113.** spores. **114.** *O. rogersi* (holotype). **115.** *Pholiota catervaria* (holotype), spores. **116.** *P. indica* (holotype), spores. **117-118.** *'Pholiota' microspora* (Hooker fil. 45, holotype). **117.** habit sketch and section, × 0.5. **118.** spores. **119-121.** *P. phlegmatica* (Hooker fil. 21, holotype). **119.** habit sketch and section, × 0.5. **120.** cheilocystidia. **121.** spores. **122-123.** *Psathyrella condensa* (Hooker fil. 54, holotype). **122.** habit sketch, × 0.5. **123.** spores. **124-125.** *P. discolor* (Hooker fil. 137, holotype). **124.** habit sketch and section, × 0.5. **125.** spores. **126-127.** *P. nanna* (holotype). **126.** cheilocystidia. **127.** spores. All × 1000 unless otherwise stated.

Gillet, but the spores are larger than for that species. It is a good species of *Pholiota* (Fr.) Kummer belonging to the section *Hemipholoita* Singer (figure 116).

Marasmius iridescens Berk. in *Hooker. J. Bot.* **3** 43 (1851)
Type: Sinchul, on mossy banks, alt. 2438 m (8000 ft), May, Hooker fil. 41 cum icon.

The spores, measuring 3.5-4.5 × 2.3-3 µm, are hyaline, subellipsoid, thin-walled and inamyloid. By virtue of an undifferentiated cutis, it is proposed herewith to transfer the species to the genus *Collybia* section *Iocephalae* Singer, as **Collybia iridescens** (Berk.) Manjula, comb. nov. (figures 23,24).

Agaricus latipes Berk. in *Hooker J. Bot.* **4** 131 (1852)
Type: Nunklow. Khassya, on the ground, alt. 1219 m (4000 ft), 11 July, 1850, Hooker fil. 24 cum icon.

The spores, 4.7-5.7 × 2.8-4 µm, are thick-walled, ellipsoid, smooth, brown and

contain an oil-guttule. The accompanying water-colour illustration shows a yellowish context. This species belongs to the section *Arvenses* Konr. & Maubl. of the genus *Agaricus* (figures 4,5).

Collybia lutea Massee in *Bull. Misc. Inf. Kew* **1907** 122 (1907)
Type: Bengal, Ballygunge, Calcutta, on a wall, Burkill, 3 cum icon.

The examination of the type material shows the presence of yellowish brown spores, ovoid to ellipsoid, measuring 5 × 3 µm. The pileipellis with numerous detersile globose sphaerocytes are typical of *Flammulaster fulvoalbus* (Berk and Br.) Pegler and *C. lutea* is reduced in synonmy. The type collection is accompanied by a water-colour illustration of small yellowish basidiocarps with adnexed lamellae.

Agaricus macer Berk. in *Hooker J. Bot.* **4** 100 (1852); *Collybia macra* (Berk.) Sacc., *Syll. Fung.* **5** 236 (1887)
Type: Sikkim, in pine woods, on the ground, alt. 3352 m (11000 ft), 1849, Hooker fil. 5 cum icon.

The spores, 6.7-8.5 × 3.5-5 µm, are hyaline, smooth, thin-walled, inamyloid, and ellipsoid. It belongs to the section *Levipedes* (Fr.) Quél of the genus *Collybia*. It is allied to *C. dryophila* (Bull. ex Fr.) Kummer but differs from it in having an exceptionally elongate stipe (figures 25,26).

Agaricus macrophalus Berk. in *Hooker J. Bot* **2** 107 (1850); *Flammula macrophala* (Berk.) Sacc., *Syll. Fung.* **5** 817 (1887)
Type: Darjeeling, on trunks of trees, alt. 2133-2438 m (7000-8000 ft), June, Hooker fil. 79 cum icon.

The specimens of the type collection have clearly decayed prior to their drying and no microcharacters, apart from the spores are recoverable. The dark fuscous brown spores, 8-10 × 3.5-5 µm, are short fusoid with a suprahilar depression, smooth, with a thickened wall but devoid of a germ-pore. The original description of the accompanying illustration suggests a species of *Hypholoma* (Fr.) Kummer, but the spores are not typical, and no transfer is proposed at the present time (figures 13,14).

Agaricus macrothelus Berk. in *Hooker J. Bot.* **4** 103 (1852); *Mycena macrothela* (Berk.) Sacc., *Syll. Fung.* **5** 294 (1887)
Type: Amongst moss, Myrong woods, Khassya, July 1850, Hooker fil. 19 cum icon.

The type collection is very fragmentary but has brown, ellipsoid spores measuring, 8-10 × 4.5-5.5 µm, which are smooth or finely rugose bearing a prominent suprahilar plage. This is clearly a species of *Galerina* Earle but due to poor material a transfer cannot be made (figures 15,16).

Chlorolepiota mahabaleshwarensis Sathe and Deshpande in *Curr. Sci.* **48** 694 figure 1 (1979)
Type: Maharashtra, Poona, Mahabaleshwar, on ground, 17 June 1978, Sathe and Deshpande (Ajrekar Mycological Herbarium, Poona 4023).

This fleshy agaric has prime rose yellow lamellae. The spore print colour is also primrose yellow and the spores are large, 11.4-15.7 × 5.7-9.3 µm, broadly ellipsoid with a small germ-pore, thickwalled, with the endosporium metachromatic in cresyl blue. Clamp-connexions are present. The species shows all the characters of *Macrolepiota* Singer. Massee (1901) identified a specimen also collected from Poona but named it as *L. beckleri* (Berk.) Sacc. The microcharacters of this (Woodrow 65)

deposited in the Kew Herbarium, are in accord with the above species. By virtue of the metachromatic spore reaction, the presence of clamp-connexions and the pale yellowish spore-deposit, the combination **Macrolepiota mahabaleshwarensis** (Sathe and Deshpande) Manjula, comb. nov., is herewith proposed.

Agaricus malleus Berk. in *Intell. Obser.* **12** 20 (1867); *Lepiota malleus* (Berk.) Sacc., *Syll. Fung.* **9** 3 (1891)
Type: Wellington, Neilgherries, E S Berkeley, June, 1864.

The type collection, from the Nilgiri Hills, comprises two basidiocarps, of which one is immature, together with a water-colour illustration by E S Berkeley. The painting resembles a slender form of *Macrolepiota rhacodes* (Vitt.) Singer by virtue of the reddening stipe context, the swollen stipe base and the brown squamules on a white pileal surface. However the spores differ from those of *M. rhacodes*, being large, 10-12 × 7-8.5 µm, are broadly ellipsoid with a small, conspicuous germ-pore, hyaline, dextrinoid, and metachromatic in cresyl blue. The species does not match any known species of *Macrolepiota* and therefore the combination is proposed here as **Macrolepiota mallea** (Berk.) Manjula, comb. nov. Cooke (1888a, 105) overlooked the earlier description by Berkeley (1867) and provided a second description for the species using Berkeley's Herbarium name. Cooke erroneously cited Masulipatam as the type locality and this was repeated by Saccardo (1891) (figure 72).

Agaricus manipularis Berk. in *Hooker J. Bot.* **2** 81 (1850); *Mycena manipularis* (Berk.) Sacc., *Syll. Fung.* **5** 272 (1887)
Type: Sinchul, on trunks and stumps, alt. 2590 m (8500 ft), May, Hooker fil. 49 cum icon.

The accompanying water-colour illustration shows the densely caespitose habit and the species is characterised by the yellow lamellae. The spores, 6-7.5 × 4-5 µm, are amyloid, smooth, hyaline, thin-walled and ellipsoid (figures 90,91).

Agaricus micromegas Berk. in *Hooker J. Bot.* **4** 107 (1852); *Naucoria micromegala* (Berk.) Sacc., *Syll. Fung.* **5** 833 (1887)
Type: On dead wood, Myrong, Khassya, 6 July, 1850, Hooker fil. 15 cum icon.

Although the type collection is in a poor condition it is accompanied by an excellent water-colour illustration showing four small basidiocarps growing on wood. The spores, 6-8.3 × 4.2-5.5 µm, are ovoid to ellipsoid with a fine but distinct verruculose ornamentation. The material clearly represents a species of *Gymnopilus* Karst. and the combination **Gymnopilus micromegas** (Berk.) Manjula comb. nov., is herewith proposed (figures 55,56).

Lepiota microspora Massee in *Bull. Misc. Inf. Kew* **1906** 92 (1906)
Type: Andaman Islands, Narcondom, on the ground, Rogers.

The spores, 6.5-7.8 × 2-3 µm, have a slight abaxial protraction, and are hyaline, thin-walled, and dextrinoid. The pileal surface consists of interwoven hyphae, 3-5 µm diameter, which are brown with clamp-connexions. The small, umbonate pileus, and the characteristic spores show it to be *Lepiota leontoderes* (Berk. and Br.) Sacc., of the section *Stenosporae* (J. Lange) Kühn. *L. microspora* is therefore a later synonym of this species.

Agaricus microsporus Berk. in *Hooker. J. Bot.* **2**.86 (1850); *Pholiota microspora* (Berk.) Sacc., *Syll. Fung.* **5** 742 (1887)

Type: Darjeeling, on dead wood, Hooker fil. 45 cum icon.

The type material is in a poor condition and only the spores can be studied. The spores, 4.5-6 × 3-3.5 µm, are ellipsoid with a minute inconspicuous germ-pore and smooth. This species is possibly better placed in *Hypholoma* but further collections are necessary to reach a definite conclusion (figures 117,118).

Lepiota mimica Massee in *Bull. Misc. Inf. Kew* **1912** 253 (1912)
Type: India, Calcutta, Maiden, on decaying mown grass, October 1911, E M Burkill 31.

The spores, 7-8.3 × 4-5.5 µm, are ellipsoid, hyaline, smooth,thin-walled, dextrinoid, with neither a germ-pore nor a metachromatic endosporium. The spore characters show it is a typical species of *Lepiota* (figure 69).

Agaricus montosus Berk. in *Hooker J. Bot.* **6** 129 (1854); *Lepiota montosa* (Berk.) Sacc., *Syll. Fung.*.5 41 (1887)
Type: Sikkim, on the ground, Hooker.

The accompanying illustration shows the pileus and stipe bearing prominent conical verrucose squamules. The analysis of the pileipellis shows the presence of sphaerocytes. The spores, 6.5-7.5 × 2-3 µm, are oblong, ellipsoid, hyaline, dextrinoid, thin-walled and smooth. The characteristic basidiocarp with verrucose squamules and the spores show it belongs to *Lepiota acutesquamosa* (Weinm.) Kummer and *A. montosus* is reduced in synonymy.

Agaricus myriadeus Berk. in *Hooker J. Bot.* **2** 78 (1850); *Mycena myriadea* (Berk.) Sacc., *Syll. Fung.* 5.271 (1887)
Type: Darjeeling, trunks of dead trees, etc. alt. 2438 m (8000 ft), October, Hooker fil. 130 cum icon.

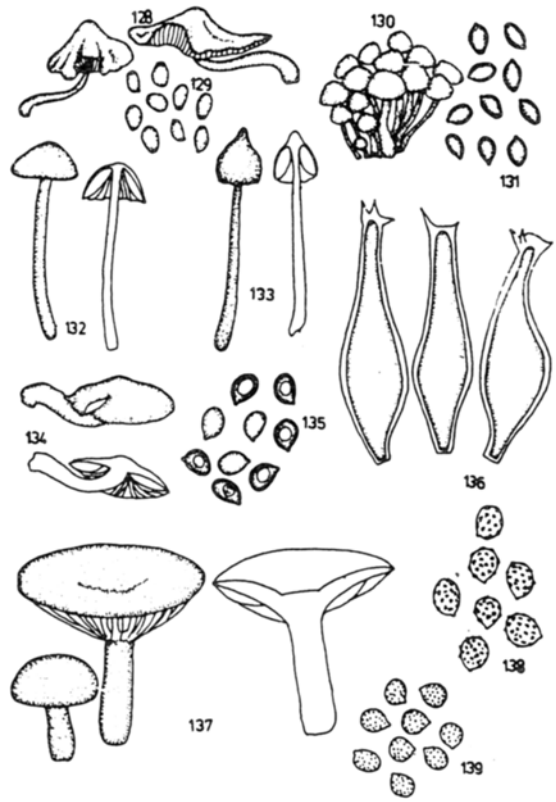
The spores, 4.5-5.5 × 2.7-3.5 µm, are amyloid, smooth,thin-walled, hyaline. The small, amyloid spores confirm Berkeley's remark that this species closely approaches *Mycena tintinnabulum* (Fr.) Quél (figures 92, 93).

Psathyra nana Massee in *Bull. Misc. Inf. Kew* **1901** 152 (1901)
Type: Bombay Presidency, on the ground, Poona, Woodrow 56.

The spores, 7.5-10 × 5-6 µm, are reddish brown, ellipsoid with a broad germ-pore. The lamella-edge is sterile with crowded cheilocystidia present, hyaline,thin-walled, 26-36 × 9-10 µm and obclavate. Basidia tetrasporic, sphaeropedunculate, 15 × 8 µm. This is a species of *Psathyrella.* The presence of hyaline cheilocystidia and spores less than 11 µm shows it belongs to the section *Obtusatae* (Fr.) Singer and the combination **Psathyrella nana** (Massee) Manjula, comb. nov., is proposed here (figures 126,127).

Agaricus napipes Hooker f. apud Berk. in *Hooker J. Bot.* **2**.48 (1850); *Collybia napipes* (Berk.) Sacc., *Syll. Fung.* **5** 201 (1887)
Type: Darjeeling, on the ground, alt. 2286 m (7500 ft), July, Hooker fil. 102 cum icon.

The accompanying water-colour illustration shows a stipe with a pseudorrhiza. The spores measure, 14.5-18 × 10.5-13 µm, are ellipsoid, smooth, sometimes thick-walled, and with oil-guttules. The presence of a pseudorrhiza and the spores are the characteristic of *Oudemansiella radiacata* (Rehl. ex Fr.) Singer and *A. napipes* is reduced to synonymy here.



Figures 128-139. **128-129.** *Psathyrella nassa* (Hooker fil. 75, holotype). **128.** habit sketch and section, × 0.5. **129.** spores. **130-131.** *Psilocybe caespititicia* (Hooker fil. 69, holotype). **130.** habit sketch, × 0.5. **131.** spores. **132.** *Pluteus chrysoprasius* (Hooker fil. 142, holotype), habit sketch and section, × 0.5. **133.** *P. cuspidatus* (Hooker fil. 27, holotype), habit sketch and section, × 0.5. **134-136.** *P. palumbinus* (Hooker fil. 72, holotype). **134.** habit sketch and section × 0.5. **135.** spores. **136.** pleurocystidia. **137-138.** *Russula cinnabarina* (Hooker fil. 65, holotype). **137.** habit sketch and section, × 0.5; **138.** spores. **139.** *R. grossa* (holotype), spores. All × 1000 unless otherwise stated.

Agaricus nassa Berk. in *Hooker J. Bot.* **2** 110 (1850); *Psathyra nassa* (Berk.) Sacc., *Syll. Fung.* **5** 1061 (1887)

Type: Darjeeling, on dead wood, alt. 2133 m (7000 ft), Hooker fil. 75 cum icon.

The type material of this species, with a olivaceous brown pileus and purplish brown lamellae, is found on examination to possess an epithelial pileipellis and pale reddish brown ellipsoid spores, measuring, 4.5-6 × 2.7-3.5 (5.2 × 3) µm, which are truncated by a broad germ-pore. This is a true species of *Psathyrella* probably belonging in section *Psathyra* (Fr.) Singer and the combination is therefore proposed: **Psathyrella nassa** (Berk.) Manjula, comb. nov. (figures 128,129).

Agaricus nubigenus Berk. in *Hooker. J. Bot.* **2** 78 (1850); *Mycena nubigena* (Berk.) Sacc., *Syll. Fung.* **5** 269 (1887)

Type: Darjeeling, on old timber, alt. 2286 m (7500 ft), June, Hooker fil. 78 cum icon.

The spores, 8-9.5 × 6-7 µm, are broadly ellipsoid, amyloid, smooth, hyaline, thin-walled. It is a robust species of the section *Mycena*, differing from *M. galericulata* (Scop. ex Fr.) S F Gray by the smaller spores and shorter stipe (figures 94,95).

Omphalia oedipus Massee in *Bull. Misc. Inf. Kew* **1907** 122 (1907)
Type: Bengal, Calcutta, on the ground at the base of a wall in one of the streets, Burkill, 4 cum icon.

The small spores, 4.3-5.7 × 2.3-3.5 µm, are hyaline, ellipsoid, smooth and thin-walled. The combination, **Omphalina oedipus** (Massee) Manjula, comb. nov., is proposed here (figure 109).

Agaricus omnituens Berk.in *Hooker J.Bot.* **2** 46 (1850);*Armillaria omnituens* (Berk.) Sacc., *Syll. Fung.* **5** 84 (1887)
Type: Darjeeling, on dead wood, alt. 2590 m (8500 ft), May, Hooker fil. 46 cum icon.

The spores, 7.5-10 × 5.5-6,5 µm, are hyaline, smooth, thin-walled and ellipsoid. This species of *Armillaria* is distinguished by the grey, depressed pileus and orange-pink lamellae (figures 10,11).

Agaricus palumbinus Berk. in *Hooker J. Bot.* **2** 84 (1850); *Pluteus palumbinus* (Berk.) Sacc., *Syll. Fung.* **5** 677 (1887).
Type: Darjeeling, on trunks of living trees, alt. 2286 m (7500 ft), Hooker fil. 72 cum icon.

The spores, 5-7 × 4.5-5.3 µm, are short ellipsoid, smooth, with a slightly thickened wall and oil-guttules are present. The pileus cystidia are metuloidal, 50-55 × 13-66 µm, ventricose with thickened, hyaline wall, the apex is modified with two to three hook-like prongs. The characteristics shown by cystidia clearly indicates that it is a species of *Pluteus* Fr. which belongs to the section *Pluteus* (figures 134,136).

Agaricus papaveraceus Berk. in *Hooker J. Bot.* **2** 50 (1850); *Collybia papaveracea* (Berk.) Sacc., *Syll. Fung.* **5** 225 (1887)
Type: Darjeeling, on dead sticks amongst moss, alt. 2286 m (7500 ft), June, Hooker fil. 86 cum icon.

The material is mould infected and sterile, but on the basis of the accompanying water-colour illustration it is clearly a species of *Collybia* belonging to the section *Striipedes* (figure 27).

Agaricus phlegmaticus Berk. in *Hooker J. Bot.* **4** 106 (1852); *Flammula phlegmatica* (Berk.) Sacc., *Syll. Fung.* **5** 815 (1887)
Type: Sikkim, in pine woods, alt. 3352 m (11000 ft), Hooker fil. 21 cum icon.

The spores, 5.5-6.5 × 3-4 µm, are ellipsoid, brown, thick-walled, smooth. The cheilocystidia are hyaline, thin-walled, 45-50 × 14-16 µm, ventricose. It is a good species of *Pholiota* and the combination is proposed here is **Pholiota phlegmatica** (Berk.) Manjula, comb. nov. (figures 119-121).

Agaricus podagrosus Berk. in *Hooker J. Bot.* **2** 50 (1850); *Collybia podagrosa* (Berk.) Sacc., *Syll. Fung.* **5** 211 (1887)
Type: Sinchul, on clay banks, alt. 2438 m (8000 ft), October, Hooker fil. 134 cum icon.

The presence of globose, spinose spores which are measuring 6.5-8.7 × 6-7.5 µm, with spines 1-2 µm long, shows this to be a species of *Laccaria* (Berk. and Br.) The accompanying illustration of the type collection resembles *L. laccata* (Scop. ex Fr.) Cooke although the spores have longer spines than is typical for that species. Further it was not possible to resurrect any basidia in the type material, and therefore any synonymy or generic transfer at this stage is not suggested (figures 17,18).

Hygrophorus pomona Berk. in *Hooker J. Bot.* **4** 134 (1852)
Type: Moflong, Khassya, on clay banks, 1 July, 1850, Hooker fil. 10 cum Icon.

The spores, 6-8 × 3.5-4.5 µm, are ellipsoid, hyaline, smooth, thin-walled and inamyloid. The basidia, 24-33 × 5-6 µm, clavate, 4-spored. The water-colour illustration of the type material shows yellow basidiocarps with reddish tints. The bright coloured basidiocarps are typical of *Hygrocybe* and the combination **Hygrocybe pomona** (Berk.) Manjula, comb. nov., is proposed here (figures 59-61).

Agaricus prasius Berk. in *Hooker J. Bot.* **2** 81 (1850); *Mycena prasia* (Berk.) Sacc., *Syll. Fung.* **5** 264 (1887)
Type: Tonglo, on the ground, alt. 3048 m (10000 ft), Hooker fil. 140 cum icon.

Although Hooker's original illustration is available in Herb. K no specimens can be traced (figure 96).

Lactarius princeps Berk. in *Hooker J. Bot.* **4** 135 (1852)
Type: Kullung, Khassya, in woods, alt. 1828 m (6000 ft), 9 July, Hooker fil. 16 cum icon.

The spores, 6.7-9 × 6-7.5 µm, are globose to subglobose, hyaline, thinwalled, with an ornamentation comprising a complete amyloid reticulum connecting verrucae. The lamella-surface bears numerous macrocystidia which are elongate to fusoid with acute apex, are thick-walled and have narrow lumen. The accompanying water-colour illustration shows bright red pilei. The white latex and the characteristic spores show it is a good species of *Lactarius* Pers. ex S F Gray (figures 62-64).

Agaricus puberulus Berk. in *Hooker J. Bot.* **4** 102 (1852); *Mycena puberula* (Berk.) Sacc., *Syll. Fung.* **5** 284 (1887)
Type: Sikkim, in pine woods, alt. 3352 m (11000 ft), 1849, Hooker fil. 19 cum icon.

The spores are amyloid, broadly ellipsoid, 7-8.5 × 4.3-5.7 µm, smooth, hyaline, thin-walled. The other microcharacters are not revived. It belongs to the section *Mycena* and allied to *M. filopes* (Bull. ex Fr.) Kummer but differs in having small spores and shorter stipe (figures 97,98).

Clitocybe pumila Massee in *Bull. Misc. Inf. Kew* **1912** 254 (1912)
Type: Calcutta, Secretary's walk, about ants nests under a wall, E M Burkill 10.

The spores, 5.3-6.5 × 3-3.7 µm, are inamyloid, hyaline, smooth, thin-walled and ellipsoid. The small white, infundibuliform basidiocarps with small, inamyloid spores are typical of *Clitocybe* but further collections may reveal this to be better placed in *Omphalina* Quél (figure 45).

Lepiota punicea Massee in *Bull. Misc. Inf. Kew* **1912** 253 (1912)
Type: India, Calcutta, Secretary's walk, 6 October, 1911, E M Burkill 23.

The type material is a small, immature basidiocarp with a rooting base. The spores are small, ovoid to ellipsoid, 5-6 × 3-4 µm, thick-walled and smooth. The pileal surface is composed of loosely arranged, branching septate hyphae, 3-5 µm diameter. The characteristic spores, epicutis and the cottony crimson red veil shows it is *Agaricus trisulphuratus* and *L. punicea* is reduced in synonymy.

Agaricus radiatilis Berk. in *Hooker J. Bot.* **4** 104 (1852); *Omphalia radiatilis* (Berk.) Sacc., *Syll. Fung.* **5** 323 (1887)

Type: Sikkim, in pine woods, alt. 3352 m (11000 ft), Hooker fil. 24 cum icon.

The spores, 6.7-8 × 3-4.3 (7.2 × 3.4) µm, are hyaline, smooth thin-walled,elongate ellipsoid with a tapering base. The accompanying water-colour illustration shows a straw yellow basidiocarp. It belongs to the genus *Omphalina* and the combination proposed here is **Omphalina radiatilis** (Berk.) Manjula, comb. nov. (figures 110,111).

Agaricus ranunculinus Berk. in *Hooker J. Bot.* **4** 104 (1852); *Omphalia ranunculina* (Berk.) Sacc., *Syll. Fung.* **5** 325 (1887)

Type: Lachen, on turf, etc. alt. 4267-4876 m (14000-16000 ft), 19 July, 1849, Hooker fil. 35 cum icon.

The spores, 6.7-7.7 × 2.5-3.7 (7.2 × 3.5) µm, are hyaline, thin-walled, smooth, inamyloid and elongate ellipsoid. The water-colour illustration of the type material shows a few bright yellow coloured basidiocarps. It is a good species of *Omphalina* and the combination proposed here is **Omphalina ranunculina** (Berk.) Manjula, comb. nov. (figures 112,113).

Agaricus raphanipes Berk. in *Hooker J. Bot.* **2** 48 (1850); *Collybia raphanipes* (Berk.) Sacc., *Syll. Fung.* **5** 202 (1887)

Type: Jillapahar, on the ground, alt. 2133 m (7000 ft), June, Hooker fil. 96 cum icon.

The spores, 15-19 × 11-13 µm, are ellipsoid, smooth, thick-walled, with an oil-guttule. The basidia are large, 50-70 × 12-14 µm, bisporic, with sterigmata up to 10 µm. The pileipellis consists of clavate epithelial elements measuring 25-35 × 15-20 µm. These are characteristic features of *Oudemanseilla radicata* and *A. raphanipes* is here reduced in synonymy.

Agaricus rhodellus Berk. in *Hooker J. Bot.* **2** 76 (1850); *Collybia rhodella* (Berk.) Sacc., *Syll. Fung.* **5** 236 (1887)

Type: Darjeeling, on wood; alt. 2286 m (7500 ft), Hooker fil. 120 cum icon.

The spores, 5-6.5 × 2.7-3.5 (5.7 × 3) µm, are ellipsoid, smooth, hyaline,thin-walled and inamyloid. It is clearly a species of *Collybia* and belongs to the section *Iocephalae*, owing to the pinkish pileus, tinged with yellow (figures 28,29).

Omphalia rogersi Massee in *Bull. Misc. Inf. Kew* **1906** 92 (1906)

Type: Andaman Islands, Narcondan, on the ground, 1906, Rogers.

The spores, 5.5-7 × 3.2-3.7 µm, are ellipsoid, hyaline, smooth, inamyloid and thin walled. The small basidiocarps with decurrent gills is typical of *Omphalina* and the combination **Omphalina rogersi** (Massee) Manjula, comb. nov., is proposed here (figure 114).

Agaricus rubiaetinctus Berk. in *Hooker J. Bot.* **2** 79 (1850); *Mycena rubiaetincta* (Berk.) Sacc., *Syll. Fung.* **5** 291 (1887)

Type: Darjeeling, on trunks of trees, alt. 2286 m (7500 ft), June, Hooker fil. 84 cum icon.

The spores, 7.5-10 × 5-6.3 µm, are broadly ellipsoid, smooth, hyaline, thin-walled, and amyloid. It belongs to the section *Mycena*. The reddish brown pileus, and lack of an iodoform odour, distinguish this from *M. metata* (Fr. ex Fr.) Kummer (figures 99,100).

Agaricus rufatus Berk. in *Hooker J. Bot.* **2** 80 (1850); *Mycena rufata* (Berk.) Sacc., *Syll. Fung.* **5** 272 (1887)

Type: Darjeeling, on trunks of trees, alt. 2438 m (8000 ft), May, Hooker fil. 44 cum icon.

The pileipellis consists of strongly agglutinated, hyaline hyphae. The spores are small, 4.7-6.5 × 3-4 µm, ellipsoid, inamyloid, smooth and hyaline. Pleurocystidia are present, hyaline, thin-walled, 18-28 × 8-11 µm and clavate. The lamella-edge is sterile with cheilocystidia similar to the pleurocystidia. By virtue of these characters it belongs to *Collybia* section *Cystidiatae* Singer and the combination proposed here is: **Collybia rufata** (Berk.) Manjula, comb. nov. (figures 30-32).

Agaricus rufopictus Berk. in *Hooker J. Bot.* **2** 82 (1850); *Mycena rufopicta* (Berk.) Sacc., *Syll. Fung.* **5** 294 (1887)
Type: Darjeeling, on dead wood, alt. 2438 m (8000 ft), Hooker fil. 48 cum icon.

The spores, 6.7-9.4 × 4-5 (7.5 × 4.4) µm, are ellipsoid, hyaline, smooth, thin-walled and amyloid. This species of *Mycena* has a characteristic viscid pileus (figures 101,102).

Agaricus russulinus Berk. in *Hooker J. Bot.* **2** 80 (1850); *Mycena russulina* (Berk.) Sacc., *Syll. Fung.* **5** 272 (1887)
Type: Darjeeling, on trunks of trees, alt. 2621 m (8600 ft), May, Hooker fil. 43 cum icon.

The spores, 6.5-8.5 × 5-5.7 µm, are broadly ellipsoid, amyloid, hyaline, thin-walled and smooth. This is a good species of *Mycena*, distinguished by the red pileus and yellowish lamellae (figures 103,104).

Lepiota sericea Massee in *Bull. Misc. Inf. Kew* **1912** 254 (1912), non *Lepiota sericea* (Cool) Huijsman (1943).
Type: India, Calcutta, Indian Museum compound, in plant pot and amongst grass, E M Burkill.

The spores, 6-7.5 × 4.5-5.3 µm, are ellipsoid, smooth, hyaline, dextrinoid, lacking both a germ-pore and a metachromatic endosporium. Cheilocystidia are present, clavate, hyaline and thin-walled, 37-45 × 7-8 µm. The characteristic spores show it belongs to the genus *Lepiota* (figures 70.71).

Agaricus stillaticius Berk. in *Hooker J. Bot.* **2** 49 (1850); *Collybia stillaticia* (Berk.) Sacc., *Syll. Fung.* **5** 231 (1887)
Type: Jillapahar, on trunks of dead and living trees, alt. 2438 m (8000 ft), May, Hooker fil. 38 cum icon.

The spores, 19-21 × 20-22 µm, are subglubose, large, smooth, hyaline and inamyloid, containing a large refractive oil-guttule. The spores are characteristic of *Oudemansiella canarii* and therefore *A. stillaticius* is reduced in synonymy under that species.

Lactarius stramineus Berk. in *Hooker J. Bot.* **6** 131 (1854)
Type: Pomrang, Khasia Mountains, on the ground, alt. 1524 m (5000 ft), 18 September, 1850, Hooker fil. 34 cum icon.

The spores are small, typically of the *Lactarius*, measuring, 5.7-7 × 4.7-5.5 (6.2 × 5.2) µm, with a strongly amyloid ornamentation of fine isolated verrucae with occasional connectives (figures 65,66).

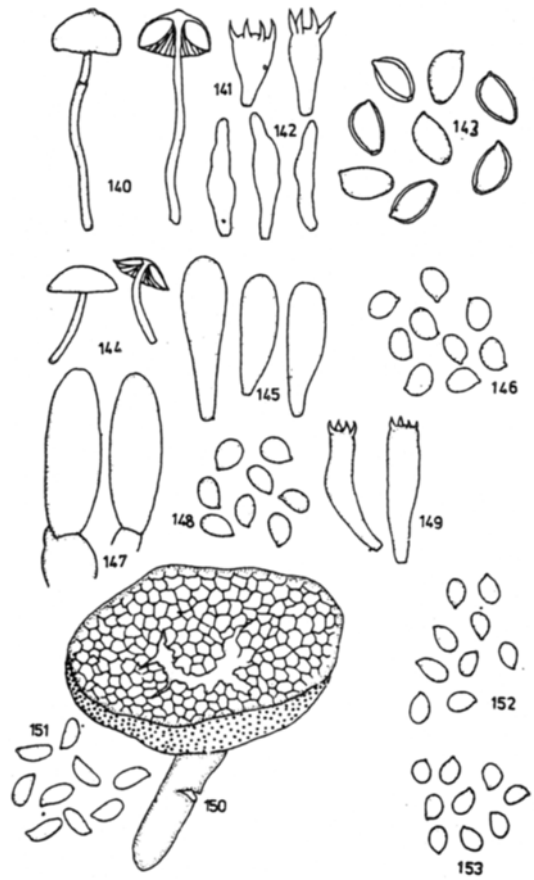
Agaricus squalidus Massee in *Bull. Misc. Inf. Kew* **1912** 255 (1912)
Type: Calcutta, Secretary's walk, 13 October 1911, E M Burkill.

The spores, 5.5-6.5 × 3.7-4.7 µm, are ellipsoid, thick-walled, brown, smooth and lack a germ-pore. The species belongs to the section *Sanguinolentae* of the genus *Agaricus* (figure 6).

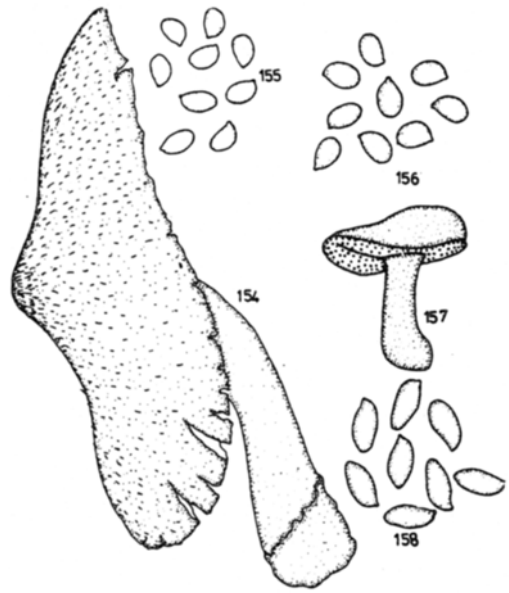
Agaricus thwaitesii Hooker f. apud Berk. in *Hooker J. Bot.* **2** 85 (1850); *Volvaria thwaitesii* (Hooker f.) Sacc., *Syll. Fung.* 5 656 (1887); *Volvariella thwaitesii* (Hooker f.) Rath in *J. Indian Bot. Soc.* **41** 529 (1962)

Type: Darjeeling, on dead wood, alt. 2133 m (7000 ft), June, Hooker fil. 85 cum icon.

The spores, 6.3-8 × 4-5 µm, are ellipsoid, smooth, slightly thick-walled. The accompanying water-colour illustration shows a large fleshy basidiocarp with a volva at the base of the stipe. It comes close to *V. bombycina* (Schaeff. ex Fr.) Singer but the presence of smaller spores and the shape of the volva distinguish it separately from others (figures 154,155).



Figures 140-153. **140-143.** *Stropharia aureo-fulva* (Hooker fil. 127, holotype). **140.** habit sketch and section, × 0.5. **141.** basidia. **142.** cheilocystidia. **143.** spores. **144-147.** *Simocybe descendens* (Hooker fil. 14, holotype). **144.** habit sketch and section, × 0.5. **145.** cheilocystidia; 146, spores. **147.** pileocystidia. **148-149.** *Tricholoma giganteum* (holotype). **148.** spores. **149.** basidia. **150-151.** *Tylopilus areolatus* (Hooker fil. 6, holotype). **150.** habit sketch, × 0.5. **151.** spores. **152.** *Volvariella castanea* (holotype), spores. **153.** *V. delicatula* (holotype), spores. All × 1000 unless otherwise stated.



Figures 154-158. **154.** *Volvariella thwaitesii* (Hooker fil. 85, holotype). **154.** habit sketch, × 0.5. **155.** spores. **156.** *V. woodrowiana* (holotype), spores. **157-158.** *Xerocomus delphinus* (Hooker fil. 76, holotype). **157.** habit sketch, × 0.5. **158.** spores. All × 1000 unless otherwise stated.

Agaricus triplicatus Hooker f. apud Berk. in *Hooker J. Bot.* **2** 50 (1850); *Collybia triplicata* (Hooker f.) Sacc., *Syll. Fung.* **5** 221 (1887)
Type: Hooker fil. 88 cum icon. No particular locality is indicated in Dr. Hooker's notes.

The pileipellis consists of repent, interwoven hyphae, 4-9 µm diameter. Clamp-connexions are present. The spores, 6.3-8.3 × 3.2-4.7 µm, are ellipsoid, hyaline, smooth, thin-walled and inamyloid. The lamella-edge is sterile with cheilocystidia, 25-35 × 3-6 µm, nodulose, hyaline, and thin-walled. No hairs are present on the stipe. It is a well defined species of *Collybia* which belongs to the section *Striipedes.* This species invites comparison with *C. broomeiana* which differs in having much more crowded lamellae and a reddish brown rather than yellowish brown pileus (figures 33-35).

Agaricus undabundus Berk. in *Hooker J. Bot.* **2** 49 (1850); *Collybia undabunda* (Berk.) Sacc., *Syll. Fung.* **5** 201 (1887)
Type: Darjeeling, on old timber in woods, alt. 2286 m (7500 ft), June, Hooker fil. 77 cum icon.

The spores, 14-16 × 10-12 µm, are ellipsoid, smooth, thick-walled and contain an oil-guttule. The long stipe has a pseudorrhiza, typical of *Oudemansiella radicata*, and therefore *A. undabundus* is reduced in synonymy.

Agaricus ustipes Berk. in *Hooker J. Bot.* **2** 76 (1850); *Collybia ustipes* (Berk.) Sacc., *Syll. Fung.* **5** 234 (1887)
Type: Darjeeling, on the ground, alt. 2438 m (8000 ft) October, Hooker fil. 129 cum icon.

The pileipellis is composed of undifferentiated hyphae. The spores, 6.7-8 × 4.5-6 µm,

are hyaline, thin-walled, smooth, inamyloid, and ellipsoid. No other microcharacters can be observed, but it is a species of *Collybia* and section *Levipedes* (figures 36,37).

Agaricus varus Berk. in *Hooker J. Bot.* **2** 45 (1850); *Armillaria vara* (Berk.) Sacc., *Syll. Fung.* **5** 83 (1887)
Type: Sinchul, on rottontimber, alt. 2621 m (8600 ft), April. Hookerfil. 2 cum icon.

The water-colour illustration shows the annulate basidiocarps closely allied to *A. mellea* but differs from that in having a glabrous pileus (figure 12).

Coprinus vellereus Berk. in *Hooker J. Bot.* **3** 40 (1851)
Type: Darjeeling, on dead wood and earth, as on the mossy edges of Mr. Hodgson's verandah, August, Hooker fil. 115 cum icon.

No material can be traced in the Kew Herbarium, there is a water-colour illustration which shows ovoid, yellowish red basidiocarps with white squamules on the pileal surface (figure 44).

Cortinarius vinosus Berk. in *Hooker J. Bot.* **4** 132 (1852) non Cooke (1883); *C. vinosulus* Sacc., *Syll. Fung.* **9** 121 (1891)
Type: Sikkim, in pine woods, alt. 3352 m (11000 ft), Hooker fil. 30 cum icon.

The spores 13.5-16 × 7.2-8.5 (15×8) µm, are strongly ornamented, ellipsoid and brown coloured. This species of the subgenus *Myxacium* (Fr.) Loud. has exceptionally large spores and so can be readily identified (figures 49,50).

Agaricus woodrowii Massee in *Bull. Misc. Inf. Kew* **1901** 151 (1901)
Type: Bombay Presidency, on the ground, Poona, Woodrow 61.

The spores, 6-7.5 × 3.7-5 (6.7 × 4.3) µm, are ellipsoid, smooth, brown and without a germ-pore. This is a species of section *Sanguinolenate* of the genus *Agaricus* (figure 7).

Volvaria woodrowiana Massee in *Bull. Misc. Inf. Kew* **1899** 166 (1899)
Type: Bombay, Poona, on the ground, June, 1895, G M Woodrow 13.

The spores, 7.3-9 × 4.5-5.5 µm, are ellipsoid, smooth with a slightly thickened stramineous wall. It closely approaches *Volvariella volvacea* (Bull. ex Fr.) Singer. It is a good species of *Volvariella* and the combination **Volvariella woodrowiana** (Massee) Manjula, comb. nov., is proposed here (figure 156).

Agaricus xanthophyllus Berk. in *Hooker J. Bot.* 2 80 (1850); *Mycena xanthophylla* (Berk.) Sacc., *Syll. Fung.* **5** 272 (1887)
Type: Darjeeling, on roots of trees, alt. 2438 m (8000 ft), May, Hooker fil. 42 cum icon.

The spores, 7-8.3 × 4.3-5.5 µm, are amyloid, smooth, hyaline, thin-walled and ellipsoid. This beautifully coloured species has pinkish grey pilei with pure yellow lamellae and is distinctive within the genus *Mycena* (figures 105,106).

Part II. A revised list of Indian agaricoid and boletoid basidiomycetes

Genera are arranged alphabetically within their tribes and the species within their genera. Keys to the species are provided for each genus. Excluded species are added at the end of each genus. Individual records are cited according to the political state boundaries currently recognised.

Order 1. *Cantharellales* Gäumann

1. *Cantharellaceae* J. Schroet. in *Krypt.—Fl. Schles.* 3 413 (1888)

1. *Cantharellus* Fr., *Syst. Mycol.* **1** 316 (1821)

Key to the Indian species of Cantharellus

1. Pileus greyish yellow to brownish ochre, fibrillose, 1.5-6 cm diameter, infundibuliform; stipe 4-8 cm × 4-8 mm, light yellow; spores 8-12.5 × 7-10 µm . . . . . 2. *C. infundibuliformis*

1. Pileus pale ochraceous yellow to deep orange, not infundibuliform.

2. Pileus small, 1-2.5 cm diameter, often umbilicate; stipe 2-5 cm × 2-4 mm, hymenophore ridges crowded, not anastomosing; spores 6.5-7.5 × 4-5 µm . . . . . 3. *C. minor*

2. Pileus larger, 3-15 cm diameter, plano-convex to depressed; stipe 3-8 × 1-3 cm; hymenphore ridges strongly anastomosing; spores 8-12 × 5-7 *u*m . . . . . 1. *C. cibarius*

1. *C. cibarius* Fr. Syst. Mycol. **1** 318 (1821)
Uttar Pradesh, Mussoorie (Hennings, 1901 328; Bakshi 1974 16); Himachal Pradesh, Solan (Sohi *et al* 1964 320), Jammu and Tangmarg, near Gulmarg (Watling and Gregory, 1980 504; Abraham *et al* 1980 37).

2. *C. infundibuliformis* Fr., *Epicrisis* 366 (1838)
Assam, Khasi Hills, Myrong (Berkeley 1852a 135); Uttar Pradesh, Allahabad (Singh and Mehrotra 1974 514).

3. *C. minor* Peck in *Rep. N.Y. State Mus.* **23** 122 (1872).
Himachal Pradesh, Solan (Sohi *et al* 1964 320)

Cantharellus sp.
West Bengal, Darjeeling, Jillapahar, type locality, K (Berkeley, 1851a 47 as *Xerotus cantharelloides* (Berk.).

Excluded species

Cantharellus congregatus Mont. see *Resupinatus applicatus.*
Cantharellus haplorutis Mont. see *Trogia montagnei.*

Order 2. *Aphyllophorales* Rea.

2. *Polyporaceae* Corda, *Icon. Fung.* **3** 49 (1839).
Lentineae Fayod in *Ann. Sci. Nat. Bot. sér.* 7 9 335 (1889)

2. *Phyllotopsis* (Gilbert and Donk apud Pilát) Singer in *Rev. Mycol.* **1** 76 (1936)

P. nidulans (Pers. ex. Fr.) Singer in *Rev. Mycol.* **1** 76 (1936)
Orissa (Sinha and Padhi, 1978a 298 as *Pleurotus*)

3. *Pleurotus* (Fr.) Kummer, *Führ. Pilzk.* 24 (1871) (See Pegler, 1976)

Key to the Indian species of Pleurotus

1. Spores 6-9 µm, long:
   2. Pileus white when fresh:
      3. Pileus membranous, with context 0.5-1 mm thick, lamellae crowded; stipe absent ..... 8. *P. ningüidus*
      3. Pileus fleshy; stipe present, lateral or excentric, rarely absent:
         4. Lamellae densely crowded; cheilocystidia fusoid or ventricose ..... 7. *P. membranaceus*
         4. Lamellae moderately crowded; cheilocystidia clavate sometimes mucronate ..... 5. *P. flabellatus*
   2. Pileus with ochraceous, livid brown or pinkish tints:
      5. Pileus pinkish; stipe absent ..... 4. *P. eöus*
      5. Pileus with brown shades:
         6. Basidiocarp sessile; pileus 5-9 cm diameter; lamellae densely crowded: spores 3.5-4.5 µm, wide
            7. Pileus livid brown, paler at the margin; spores cylindric ..... 1. *P. anserinus*
            7. Pileus bright ochraceous; spores ellipsoid to oblong-ellipsoid ..... 10. *P. placentodes*
         6. Basidiocarp with an excentric to subcentral stipe; pileus 1.5-4 cm diameter; tawny brown; lamellae moderately crowded; spores 2.5-3.5 µm wide ..... 11. *P. platypus*

1. Spores more than 10 µm long:
   8. Pileus whitish:
      9. Pileus deeply rimose, with thick strobiliform squamules, soon becoming hard and brittle; spores 10-14 × 4.5-5 µm ..... 6. *P. fossulatus*
      9. Pileus not rimose:
         10. Stipe well developed, slightly excentric to subcentral; lamellae decurrent, anastomosing at stipe apex; spores 7.5-11 × 3.5-5 µm ..... 2. *P. cornucopiae*
         10. Stipe shorter and sublateral ..... 12. *P. pulmonarius*
   8. Pileus greyish:
      11. Pileus with purplish tints; stipe without annulus; spores 10-13 × 4.5-5 µm ..... 9. *P. ostreatus*

11. Pileus without purplish tints; stipe with annulus; spores 9-14 × 3-5 µm . . . . . 3. *P. dryinus*

1. *P. anserinus* (Berk.) Sacc., *Syll. Fung.* **5** 362 (1887)
West Bengal, Darjeeling, type locality, K (Berkeley 1850 83 as *Agaricus*).

2. *P. cornucopiae* (Paulet ex Pers.) Rolland, *Alt. Champ.* 45 (1910)
Madhya Pradesh (Graham 1915 15 as *P. sapidus* Kalchbr.).

3. *P. dryinus* (Pers ex Fr.) Kummer, *Führ. Pilzk.* 104 (1871)
Jammu & Kashmir, Kashmir near Avantipur (Berkeley, 1854 129), unconfirmed (see Pegler 1976)

4. *P. eöus* (Berk.) Sacc., *Syll. Fung.* **5** 361 (1887)
Sikkim, type locality, K (Berkeley 1850 83 as *Agaricus*); Mysore, (Singh and Rajarathinam 1977 617)

5. *P. flabellatus* (Berk. & Br.) Sacc., *Fung.* **5** 369 (1887)
West Bengal (Bose 1920a 349), Calcutta (Banerjee 1947 44); Karnataka, Mysore, Sept. 1966; Coorg Dt., Nov. 1974; Shimoga Dt., Agumbe, Nov. 1974 (Pegler 1976 507); Jammu and Kashmir, Katia forest (Watling and Gregory 1980 534); Tamil Nadu, Tirunelveli Dt., 1979 (Natarajan and Raman 1981 166)

6. *P. fossulatus* (Cooke) Sacc., *Syll. Fung.* **9** 49 (1891)
Punjab (Massee 1899 165 as *P. cretaceus* Massee); Jammu and Kashmir, Draso, Soji La pass (Watling and Gregory 1980 532)

7. *P. membranaceus* Massee in *Bull. Misc. Inf. Kew* **1901** 151 (1901)
Maharashtra, Poona, type locality, Woodrow, 80, K; Jammu and Kashmir, Jammu (Watling and Gregory 1980 535)

8. *P. ninguidus* (Berk.) Sacc., *Syll. Fung.* **5** 361 (1887)
Sikkim. type locality, May 1848, Hooker fil. 12, K (Berkeley 1850 84 as *Agaricus*)

9. *P. ostreatus* (Jacq. ex Fr.) Kummer, *Führ. Pilzk.* 105 (1871)
Assam, Khasi Hills, type locality, Herb. Hooker, K (Berkeley 1854 129 as *Agaricus salignus* Pers. ex Fr.; Pegler 1976 507); Jammu and Kashmir Sonamarg (Murrill 1924 133); (Kaul and Kachroo 1974)

10. *P. placentodes* (Berk.) Sacc., *Syll. Fung.* **5** 359 (1887)
Sikkim, type locality, 1848, Hooker fil. K (Berkeley 1852b 104 as *Agaricus*)

11. *P. platypus* (Cooke and Massee) Sacc., *Syll. Fung.* **9** 47 (1891)
Nepal, type locality, K (Cooke 1888b 121 as *Agaricus*); Jammu and Kashmir, Jammu-Tawi, (Watling and Gregory 1980 535); Natarajan (1978 68) studied the material and identified it correctly as the above species which was collected and wrongly identified by Jandaik and Kapoor (1975 1) as *Pleurotus sajor-caju*

12. *P. pulmonarius* (Fr.) Quél. in *Mem. Soc. Emul. Montbeliard* sér. 2 **5** 113 (1872)
West Bengal, Sebanipur (Nibha Chakraborty and Purkayastha 1976 51)

Excluded species

Pleurotus apalosclerus (Berk.) Sacc. see *Armillaria mellea* (Pegler 1976 508)

Pleurotus cretaceus Massee	see *Pleurotus fossulatus* (Pegler 1976 507)
Pleurotus fimbriatus (Bolt. ex Fr. Gillet)	see *Pleurocybella lignatilis*
Pleurotus nidulans Pers. ex Fr.	see *Phyllotopsis nidulans*
Pleurotus petaloides (Bull. ex Fr.) Quél	see *Hohenbuehelia petaloides*
Pleurotus salignus Pers. ex Fr.	see *Pleurotus ostreatus*
Pleurotus sapidus Kalchbr	see *Pleurotus cornucopieae*
Pleurotus subpalmatus Fr.	see *Rhotodus palmatus*
Pleurotus verrucarius (Berk.) Sacc.	see *Lentinus badius*

4. *Lentinus* Fr. *Syst. Orb.* 77 (1825)

Key to the Indian species of Lentinus

1. Hyphal system dimitic:
   2. Hyphal system with branched, ligative hyphae . . . . . Sect. 1. *Lentinus*
      3. Pileus glabrous, white:
         4. Stipe absent, up to 2 cm long; pileus infundibuliform, 2 cm diameter . . . . . 8. *L. molliceps*
         4. Stipe elongate; basidiocarp caespitose:
            5. Basidiocarp slender, pileus 2-5 cm diameter, depressed; stipe often bifurcated at the base; spores 6.5-8.5 × 3.7-4.5 µm . . . 3. *L. cladopus*
            5. Basidiocarp more robust, densely tufted; pileus 6-10 cm diameter, infundibuliform; spores 7-8.5 × 2-3 µm . . . . . 4. *L. coadunatus*
      3. Pileus not glabrous but squamose:
         6. Pileus squamose to squarrose:
            7. Pileus up to 13 cm diameter, reddish grey with dark brown, verrucose squamules; stipe yellowish; spores 5.2-7 × 2-3 µm . . . . . 2. *L. badius*
            7. Pileus white to pale cream coloured:
               8. Pileus with appressed, dark brown, fibrillose squamules; stipe floccose; veil absent . . . . . 13. *L. squarrosulus*
               8. Pileus with appressed, dark brown, fibrillose squamules; stipe with grey-brown squamules; cortinoid veil present . . . . . 16. *L. tigrinus*
         6. Pileus pilose, strongly hispid, brown, often with purplish tints when young . . . . . 6. *L. crinitus*
2. Hyphal system with unbranched, skeletal hyphae:
   9. Spores cylindric; hymenial metuloids absent . . . . . Sect. 2. *Squamosi*
      10. Pileus glabrous:
         11. Basidiocarps forming imbricate clusters:
            12. Stipe central; pileus depressed, 2-4 cm diameter, membranous . . . . . 9. *L. pergameneus*

12. Stipe lateral or excentric:

13. Pileus 2-7 cm diameter, white, glabrous, flabelliform with lobed margin; stipe absent or very reduced 15. *L. subdulcis*

13. Pileus up to 14 cm diameter, pale ochraceous with radial grey striae; floccose veil present when young . . . 5. *L. connatus*

11. Basidiocarp solitary:

14. Stipe central, velutinate; pileus 5-8 cm diameter, subinfundibuliform . . . . . '*Panus monticola*'

14. Stipe absent or very reduced; pileal margin often incised; lamellae very crowded . . . . . 11. *L. prolifer*

10. Pileus tomentose to velutinate, fulvous to ferruginous:

15. Basidiocarp large and fleshy; pileus 10-20 cm diameter, lamellae very crowded, interveined at the stipe apex; stipe obconical, tomentose . . . . . 7. *L. decaisneanus*

15. Pileus up to 10 cm diameter:

16. Stipe very short, 2-3 cm long, pale, villose . . 1. *L. alopecinus*

16. Stipe elongate, slender, up to 9 cm long, velutinate, arising from a pseudosclerotium . . . . . 17. *L. velutinus*

9. Spores ovo-ellipsoid, hymenial metuloids present . . . . . Sect. 3. *Lentinopanus*

Stipe lateral or excentric, reduced; pileus 3-6 cm diameter; pale yellowish ochre, strigose; spores 4.8-6 × 2.7-3.7 um . . . . . 14. *L. strigosus*

1. Hyphal system trimitic, with both ligative and skeletal hyphae . Sect. 4. *Rigidi*

17. Pileus 5-20 cm diameter, pale brown, tomentose; lamellae dark brown to purplish . . . . . 10. *L. polychrous*

17. Pileus 3-10 cm diameter, cream-coloured, glabrous; lamellae cream-coloured, very crowded; annulus typically present . . . . . 12. *L. sajor-caju*

1. *L. alopecinus* Fr. ex Fr., *Epicrisis* 392 (1838)
"India Orientalis"

2. *L. badius* (Berk.) Berk. in *Lond. J. Bot.* **6** 491 bis (1847)
West Bengal, Darjeeling, type locality, Hooker fil. 20, holotype, K (Berkeley 1850 82) as *Agaricus verrucarius* (Berk.); Sikkim, Changacheiling, Nov. 1848, Hooker fil., holotype, K (Berkeley 1854 132 as *Lentinus inquinans* Berk.).

3. *L. cladopus* Lév. in *Ann. Sci. Nat., Bot. sér* 3 **2** 174 (1844)
Tamil Nadu, Madras (Natarajan 1978 66)

4. *L. coadunatus* Hooker fil. apud Berk. in *Hooker J. Bot.* **3** 45 (1851)
West Bengal, Darjeeling, type locality, holotype, K (Pegler 1975 13)

5. *L. connatus* Berk. in *Hooker J. Bot.* **1** 145 (1842), non *Panus connatus* Berk. (1852)
Andaman Islands (Cooke 1881 98 as *L. revelatus* Berk.); Uttar Pradesh, Dehra-Dun (Massee 1906 92 as *Panus ochraceus* Massee); West Bengal, Calcutta, Howrah (Bose 1920a 347; Banerjee 1947 43 as *L. revelatus*); Maharashtra, Bombay (Léveillé 1846 118 as *L. javanicus* Lév)

6. *L. crinitus* (Fr. ex Fr.) Fr., *Syst. Orb. Veg.* 77 (1825)
"India" Specimen in Herb. Kew reported by Lloyd (1913 9 as *L. villosus* Klotzsch) but none found; Tamil Nadu, Tirunelveli Dt., Mundanthurai (Natarajan and Raman 1981 164)

7. *L. decaisneanus* Lév in *Ann. Sci. Nat. Bot. sér.* 3 **5** 120 (1846)
West Bengal (Lloyd 1921), Calcutta (Banerjee 1947 43)

8. *L. molliceps* Fr., *Nov. Symb. Mycol.* 38 (1851)
Nicobar Islands, type locality

9. *L. pergameneus* Lév. in *Ann. Sci. Nat. Bot. sér.* 3 **5** 117 (1846)
India (?), type locality

10. *L. polychrous* Lév. in *Ann. Sci. Nat. Bot. sér.* 3 **2** 175 (1844)
Bihar, Soane River, Hooker fil., type locality, K (Berkeley 1854 132 as *Lentinus praerigidus* Berk.); West Bengal, Calcutta (Banerjee 1947 43 as *L. praerigidus*)

11. *L. prolifer* (Pat. and Har.) Pegler in *Kew Bull. Add. Ser.* **6** 40 (1977)
Tamil Nadu, Madras (Natarajan and Raman 1981 163)

12. *L. sajor-caju* (Fr.) Fr., *Epicrisis* 393 (1838)
Andaman Islands (Cooke 1881 98 as *L. exilis* Klotzsch); West Bengal (Bose 1920a 348; Lloyd 1921 1069 as *L. candidus* Graff.); Kerala, Tenmalai (Natarajan 1978 67)

13. *L. squarrosulus* Mont. in *Ann. Sci. Nat., Bot. sér.* 2 **18** 21 (1842)
Tamil Nadu, Nilgiris Dt., Perrothet, type locality; Madras (Natarajan and Manjula 1978 451); Maharashtra, Khandala, Bombay (Theissen 1911 157 as *L.* aff. *subnudus* Berk.); West Bengal, Calcutta (Bose 1920a 348 as *L. subnudus*; Banerjee 1947 43 as *L. curreyanus* Sacc.)

14. *L. strigosus* (Schwein) Fr., *Syst. Orb. Veg.* 77 (1825), non *Panus strigosus* Berk. and Curt (1859)
Jammu & Kashmir, Sonamarg (Murrill 1924 133; Watling and Gregory 1980 531); Sonamarg (Berkeley 1876 137 as *L. lecomtei* Fr.); Sikkim, Tonglo (Berkeley 1851a 44 as *L. lecomtei*); Nepal (Berkeley 1854 132 as *L. lecomtei*)

15. *L. subdulcis* Berk. in *Hooker J. Bot.* **3** 46 (1851)
West Bengal, Darjeeling, type locality, Hooker fil. 25 K.

16. *L. tigrinus* (Bull. ex Fr.) Fr., *Syst. Orb. Veg.* 78 (1825)
'India' (Lloyd 1913 13); Jammu and Kashmir, Sarband (Watling and Gregory 1980 532), Sanat Nagar, Srinagar (Abraham *et al* 1981 40).

17. *L. velutinus* Fr. in *Linnaea* **5** 510 (1830) non *Panus velutinus* (Fr.) Fr. (1838)
West Bengal, Darjeeling (Berkeley 1851a 44 as *L. hookerianus* Berk.; Currey 1876 120); Calcutta (Banerjee 1947 43 as *L. blepharodes* Berk.; Lloyd 1913 10 as *L. blepharodes* Berk.); Madhya Pradesh, Bilaspur (Hennings 1900 152 as *L. melanophyllus* Lév.); Nepal (Berkeley 1854 131 as *L. nepalensis* Berk.).

Panus monticola Berk. in *Hooker J. Bot.* **3** 46 (1851)
Sikkim, type locality, Tonglo, holotype, K.

The type collection represents a species of *Lentinus*, having a dimitic hyphal system with skeletal hyphae. As the material is sterile the transfer to *Lentinus* is not proposed at the present time.

Excluded species

Lentinus blepharodes Berk.	see *Lentinus velutinus*
Lentinus candidus Graff.	see *Lentinus sajor-caju*
Lentinus curreyanus Sacc.	see *Lentinus squarrosulus*
Lentinus exilis Klotzsch	see *Lentinus sajor-caju*

Lentinus glabratus Mont. West Bengal North Rajmahal Hills (Currey 1876 120)

Specimen (Kurz 1779) in Herb. Kew does not represent *L. glabratus* but more probably *L. squarrosulus*

Lentinus hepaticus Berk.	see *Collybia himalaica*
Lentinus hookerianus Berk.	see *Lentinus velutinus*
Lentinus inquinans Berk.	see *Lentinus badius*
Lentinus javanicus Lév.	see *Lentinus connatus*
Lentinus lecomtei Fr.	see *Lentinus strigosus*
Lentinus melanophyllus Lév.	see *Lentinus velutinus*
Lentinus nepalensis Berk.	see *Lentinus velutinus*
Lentinus nicobarensis Berk.	probably *Lentinus sajor-caju*
Lentinus praerigidus Berk.	see *Lentinus polychrous*
Lentinus revelatus Berk.	see *Lentinus connatus*
Lentinus subnudus Berk.	see *Lentinus squarrosulus*

Lentinus torulosus (Pers. ex Fr.) Lloyd Berkeley (1851a 47) reported this species from Darjeeling (as *Panus conchatus* Fr.). A re-examination of this material in Herb. Kew reveals it to be *Pleurotus placentodes* (Berk.) Sacc.

Lentinus villosus Klotzsch	see *Lentinus crinitus*
Panus ochraceus Massee	see *Lentinus connatus*

3. *Schizophyllaceae* Quél., *Fl. Mycol. Fr.* 365 (1888)

5. *Schizophyllum* Fr. ex Fr., *Syst. Mycol.* **1** 330 (1821)

Key to the Indian species of Schizophyllum

1. Pileal margin sparsely lobed; lamellae greyish ..... 1. *S. commune*

1. Pileal margin strongly lobed; lamellae white to wood-coloured . 2. *S. flabellare*

1. *S. commune* Fr., *Epicrisis* 403 (1838)
West Bengal, Darjeeling (Berkeley 1851a 41), Calcutta (Bose 1919 109; Banerjee 1947 44); Bihar, Paras North (Berkeley 1854 133); Pusa (Padmanabhan and Refay 1942 151); Andaman Islands (Currey 1876 121); Uttar Pradesh, Saharanpur (Hennings 1901 328) and *S. alneum* (L. Schroet.); Maharashtra, Bombay (Theissen 1911 157 as *S. alneum*); Jammu and Kashmir, Srinagar, Sanatnagar (Watling and Gregory 1980 547).

2. *S. flabellare* Fr., *Afzel. Fung. Guin.* 25 (1837)
Tamil Nadu, Nilgiri Hills (Montagne 1842 21).

Excluded species

Schizophyllum alneum (L.) Schroet see *Schizophyllum commune*

Order 3. *Agaricales* Clements

4. *Hygrophoraceae* Rose in *Bull. Soc. Bot. Fr.* **23** 110 (1876)

6. *Camarophyllus* (Fr.) Kummer, *Führ. Pilzk.* 26 (1871).

C. pratensis (Pers. ex Fr.) Kummer, *Führ. Pilzk.* 26 (1871)
Maharashtra, Nagpur (Trivedi, 1972 as *Hygrocybe*)

7. *Hygrophorus* Fr., *Gen. Hymen.* 8 (1836)

Key to the Indian species of Hygrophorus

1. Pileus white or golden yellow:
   2. Pileus white, conical, 2.5 cm diameter, with conspicuous appendiculate velar remnants ..... 2. *H. hobsonii*

   2. Pileus white with golden yellow floccose granules, convex to subumbonate, 3-8 cm diameter ..... 1. *H. chrysodon*

1. Pileus grey with brownish disk, convex to papillate; stipe white ..... 3. *H. pustulatus*

1. *H. chrysodon* (Batsch ex Fr.) Fr., *Epicrisis* 320 (1838)

Jammu and Kashmir, Tangmarg near Gulmarg (Watling and Gregory 1980 529)

2. *H. hobsonii* Berk. in *Grevillea* **11** 39 (1882)

Central India, holotype, K.

3. *H. pustulatus* (Pers. ex Fr.) Fr., *Epicrisis* 325 (1838)

Jammu and Kashmir, Gulmarg (Watling and Gregory 1980 (530)

Excluded species

Hygrophorus fulvus Berk.	see *Hygrocybe fulva*
Hygrophorus miniatus Fr.	see *Hygrocybe miniata*
Hygrophorus pomona Berk.	see *Hygrocybe pomona*

8. *Hygrocybe* (Fr.) Kummer, *Führ. Pilzk.* 26 (1871)

Key to the Indian species of Hygrocybe

1. Pileus surface a cutis or an ixocutis:
   2. Neither pileus nor stipe viscid; pileus deep red fading to orange or pale yellow; spores 6-8 × 4-5 µm ..... 5. *H. miniata*
   2. Either pileus or stipe or both viscid to glutinous:
      3. Stipe dry; pileus 4-6 cm diameter, whitish with a grey disk; spores 7-9 × 4.5-5.5 µm ..... 3. *H. fornicata*
      3. Both pileus and stipe viscid or glutinous:
         4. Pileus bluish green fading to yellow; stipe green then yellow ..... 7. *H. psittacina*
         4. Pileus reddish yellow or yellow never green:
            5. Lamellae decurrent; pileus 2-4 cm diameter, spores 8 × 3.5-4.5 µm ..... 6. *H. pomona*
            5. Lamellae adnate to adnexed:
               6. Pileus small, up to 3 cm diameter:
                  7. Pileus 1 cm diameter, spores 7-9.5 × 5-6.5 µm ..... 4. *H. fulva*
                  7. Pileus up to 3 cm diameter, spores 5.5-6.6 × 2.2-3.3 µm ..... 1. *H. ceracea*
               6. Pileus large, up to 7 cm diameter, greyish yellow; fleshy; stipe up to 6 cm long; spores 8.8-11.0 × 5.5-6.6 µm ..... 2. *H. chlorophana*

1. Pileus surface an ixotrichodermium; pileus 2-3 cm diameter, reddish yellow; spores 6.6-8.8 × 4.4-5.5 µm ..... 2. *'H. westii*

1. *H. ceracea* (Fr.) Kummer, *Führ. Pilzk.* 112 (1871)

Tamil Nadu, Ootacamund, Nilgiris (Manjula 1980 30)

2. *H. chlorophana* (Fr.) Wunsche, *Pilze* 112 (1877)

Tamil Nadu, Madras, Tambaram, Madras Christian College campus (Manjula 1980 31)

3. *H. fornicata* (Fr.) Singer in *Lilloa* **22** 152 (1951)

Tamil Nadu, Nilgiri Hills (Natarajan and Raman 1980 225)

4. *H. fulva* (Berk.) Manjula

Sikkim, type locality, K (Berkeley 1852a 134 as *Hygrophorus*)

5. *H. miniata* (Fr.) Kummer, *Führ. Pilzk.* 112 (1871)

Sikkim, Lachen (Berkeley 1852a 133 as *Hygrophorus*); Himachal Pradesh, Solan (Sharma and Manjula 1977 20); Tamil Nadu, Kodaikanal, Tiger Shola (Manjula 1980 28)

6. *H. pomona* (Berk.) Manjula

Assam, Khasi Hills, type locality, K (Berkeley 1852a 134 as *Hygrophorus*)

7. *H. psittacina* (Schaeff. ex Fr.) Kummer, *Führ. Pilzk.* 112 (1871)

Jammu and Kashmir, Gulmarg (Watling and Gregory 1980 530)

8. '*Hygrophorus westii*' Murrill in *Lloydia* **5** 139 (1942)

Tamil Nadu, Nilgiris, Ootacamund (Manjula 1980 32). It is a true species of *Hygrocybe* and a formal transfer will be made at a later date.

Excluded species

Hygrocybe pratensis Pers. ex Fr. see *Camarophyllus pratensis*

9. *Hygrotrama* Singer in *Sydowia* **12** 221 (1958)

Hygrotrama pedicellata Natarajan and Manjula in *Mycologia* **74** 130 (1982)

Tamil Nadu, Madras, Tambaram, Madras Christian College campus, type locality.

5. *Tricholomataceae* Roze in *Bull. Soc. Bot. Fr.* **23** 51 (1876)

Lyophylleae Kühner in *Bull. Mens. Soc. Linn. Lyon* **9** 204 (1938)

10. *Calocybe* Kühn. ex Donk in *Beih. Nova Hedwig.* **5** 42 (1962)

Key to the Indian species of Calocybe

1. Gregarious; pileus 7-13 cm diameter, cream or alutaceous white; spores 4-7 × 2-4 µm ..... 1. *C. gambosa*

1. Solitary; pileus 10-14 cm diameter, white; spores 5.9-6.8 × 4.2-5.1 µm ..... 2. *C. indica*

1. *C. gambosa* (Fr.) Singer in *Lilloa* **22** 168 (1951)

Orissa, Bhubaneswar, Kapilash (Sinha and Padhi 1978b 461 as *Tricholoma georgii* (L. ex Fr.) Quél.)

2. *C. indica* Purkayastha and Chandra in *Trans. Br. mycol. Soc.* **62** 415 (1974)

West Bengal, Calcutta, type locality (Type: Univ. Calcutta)

11. *Lyophyllum* Karst. in *Acta Pl. Faun. Fenn.* **2** 3 (1881)

Key to the Indian species of Lyophyllum

1. Basidiocarp small; neither white nor cream coloured:

2. Basidiocarp olive brown, spores smooth, 6.6-8.8 × 4.4-5.5 µm ..... 3. *L. subnigricans*

2. Basidiocarp greyish brown, on burnt ground; spores verrucose, 7-8 × 5-5.5 µm ..... 1. *L. ambustum*

1. Basidiocarp larger, white or cream coloured:

3. Pileus pure white; stipe with tapering base; spores verrucose, 7-10 × 4-6 µm ..... 2. *L. leucocephalum*

3. Pileus cream coloured; caespitose on wood; spores 5-7.5 × 4.5-5.7 µm ..... 4. *L. ulmarium*

1. *L. ambustum* (Fr.) Singer in *Lilloa* **22** 166 (1951)

West Bengal, Calcutta (Bose 1919 112; Banerjee 1947 42 as *Collybia*)

2. *L. leucocephalum* (Fr.) Singer in *Ann. mycol.* **41** 100 (1943)

Orissa, Detjharan, Badarana Forest (Sinha and Padhi 1978b 458 as *Tricholoma*)

3. *L. subnigricans* (Peck) Bigelow in *Lloydia* **28** 178 (1965)

Tamil Nadu, Kodaikanal (Manjula 1980 39)

4. *L. ulmarium* (Bull. ex Fr.) Kühn. in *Bull. Soc. Linn. Lyon* **7** 211 (1938)

Uttar Pradesh, Allahabad University (Singh and Mehrotra 1974 512)

Clitocybeae Fayod in *Ann. Sci. Nat., Bot. sér.* 7 **9** 344 (1889)

12. *Armillaria* (Fr. ex Fr.) Staude, *Schwämme Mitteldentschl.* 130 (1857)

(see Aindrila Chandra and Watling 1982)

Key to the Indian species of Armillaria

1. Basidiocarp small, slender; pileus grey, depressed; lamellae orange pink:

2. Pileus 2-3 cm diameter, with incurved margin; stipe elongate ..... 1. *A. adelpha*

2. Pileus 3-6 cm diameter, expanding; stipe short ..... 4. *A. omnituens*

1. Basidiocarps larger, more robust; pileus yellowish brown

3. Annulus absent; pileus surface squamose ..... 5. *A. tabescens*

3. Annulus present:

4. Annulus large, erect, persistent:

5. Pileus squamose to squarrose ..... 2. *A. mellea*

5. Pileus glabrous ..... 6. *A. vara*

4. Annulus cortinoid; pileus blackish at disk ..... 3. *A. obscura*

1. *A. adelpha* (Berk.) Sacc., *Syll. Fung.***5** 84 (1887)

West Bengal, Darjeeling, type locality, K (Berkeley 1850 47 as *Agaricus*)

2. *A. mellea* (Vahl. ex Fr.) Kummer, *Führ. Pilzk.* 134 (1871)

West Bengal, Darjeeling (Berkeley 1850 45 as *Agaricus dichupellus* Berk.; *Agaricus duplicatus* Berk. 1850 44 as *Agaricus horrens* Berk. 46 1850: *Agaricus multicolorus* Berk. 1850 52 as *Agaricus apalosclerus* Berk.); Uttar Pradesh, Deban (Hole 1927 437) Bhowali, Mundali (Bagchee *et al* 1954 18); North East India (Tunstall 1940); Tamil Nadu, Nilgiri Hills (Venkataram 1959 as *Armillaria fuscipes* Petch.); Gujarat, Baroda (Moses 1948)

3. *A. obscura* (Pers. ex Secr.) Romagn. in *Bull. Soc. Mycol. Fr.* **86** 262 (1970)

Jammu & Kashmir, Pahlgam (Watling and Gregory 1980 550)

4. *A. omnituens* (Berk.) Sacc., *Syll. Fung.* **5** 84 (1887)

West Bengal, Darjeeling, type locality, K (Berkeley 1850 46 as *Agaricus*)

5. *A. tabescens* (Scop. ex Fr.) Emel., *Gen. Arm.* 50 (1921)

India (Prasad 1950 19 as *Clitocybe*)

6. *A. vara* (Berk.) Sacc., *Syll. Fung.* **5** 83 (1887)

Sikkim, Sinchul, type locality, K (Berkeley 1850 45 as *Agaricus*)

Excluded species

Armillaria dichupella (Berk.) Sacc.	see *Armillaria mellea* (Pegler 1976 508)
Armillaria duplicata (Berk.) Sacc.	see *Armillaria mellea* (Pegler 1976 508)
Armillaria fuscipes Petch	see *Armillaria mellea*
Armillaria horrens (Berk.) Sacc.	see *Armillaria mellea* (Pegler 1976 508)
Armillaria multicolor (Berk.) Sacc.	see *Armillaria mellea* (Pegler 1976 508)

13. *Cantharocybe* Bigelow and Smith in *Mycologia* **65** 486 (1973)

C. gruberi (Smith) Bigelow and Smith in *Mycologia* **65** 486 (1973)

Tamil Nadu, Madras, Deer Park, Guindy (Manjula 1980 47)

14. *Clitocybe* (Fr.) Staude, *Schwämme Mitteldeutschl.* 122 (1857)

Key to the Indian species of Clitocybe

1. Stipe excentric, 2.5-3.5 cm long, strigose at the base; pileus 2.5-5 cm diameter; spores 4-5 × 2.5-3 µm ..... 2. *C. excentrica*

1. Stipe not excentric:

2. Pileus white; spores minute:

3. Pileus 2-4 cm diameter, planoconvex; stipe 3 cm long; spores 4 × 3-3.5 µm ..... 1. *C. dealbata*

3. Pileus 1-2 cm diameter, convex, depressed; stipe 1 cm long; spores 4 × 3 µm ..... 4. *C. pumila*

2. Pileus grey, hygrophanous, 3-5 cm diameter; stipe 6 cm long; spores 5.5-6.5 × 3-3.5 µm ..... 3. *C. hydrogramma*

1. *C. dealbata* (Sow. ex Fr.) Kummer, *Führ. Pilzk.* 121 (1871)

Uttar Pradesh, Allahabad, Naini (Singh and Mehrotra 1974 513)

2. *C. excentrica* Peck in *Bull. Torrey Bot. Cl.* **25** 321 (1898)

Assam, Borbhetta (Roy 1965 328)

3. *C. hydrogramma* (Bull. ex Fr.) Kummer, *Führ. Pilzk.* 122 (1871)

Madhya Pradesh (Graham 1915 as *Omphalia*)

4. *C. pumila* Massee in *Bull. Misc. Inf. Kew* **1912** 254 (1912)

West Bengal, Calcutta, type locality K.

Excluded species

Clitocybe incongrua (Berk.) Sacc. see *Leptonia incongrua*
Clitocybe laccata (Scop.) Sacc. see *Laccaria laccata*
Clitocybe tabescens (Scop.) Bres. see *Armillaria tabescens*

15. *Laccaria* Berk. and Br. in *Ann. Mag. Nat. Hist. sér.* 5, **12** 370 (1883)

Key to the Indian species of Laccaria

1. Basidia tetrasporic; temperate 1. *L. laccata*
1. Basidia bisporic; tropical 2. *L. ohiensis*

1. *L. laccata* (Scop. ex Fr.) Cooke in *Grevillea*. **12** 70 (1884)

Uttar Pradesh, Mussoorie, Arnigadh (Hennings 1901 335 as *Clitocybe*); Tamil Nadu, Kodaikanal (Natarajan 1977 38); Sikkim (Berkeley 1852b 99 as *Agaricus*)

2. *L. ohiensis* (Mont.) Singer in *Mycologia* **38** 688 (1946)

Tamil Nadu, Nilgiri Hills (Natarajan 1977 37)

Laccaria sp.
Sikkim, Sinchul, type locality, K (Berkeley 1850 50 as *Agaricus podagrosus* Berk.)

16. *Lactocollybia* Singer in *Schweiz. Zeit. fur Pilzk.* **17** 71 (1939)

L. angiospermarum Singer in *Sydowia* **2** 32 (1948)

Uttar Pradesh, Varanasi (Tewari and Singh 1973 21)

17. *Lepista* (Fr.) W.G. Smith in *J. Bot., Lond.* **8** 248 (1870)

Key to the Indian species of Lepista

1. Pileus 2-7 cm diameter, plano-convex to depressed, greyish lilac to brownish violet; spores 6-7 × 3-4 µm ..... 3. *L. sordida*

1. Pileus lacking violaceous tints:

2. Basidiocarp small, 2-2.5 cm diameter, reddish brown; stipe reddish brown; spores 7-9 × 5-6 µm ..... 2. *L. kamathi*

2. Basidiocarp large; pileus 3-12 cm diameter, brown; stipe white; spores 5.7-7.5 × 3.5-5 µm . . . . . 1. *L. glabella*

1. *L. glabella* (Speg.) Singer in *Lilloa* **23** 159 (1950)

Uttar Pradesh, Varanasi (Tewari and Singh 1973 22)

2. *L. kamathi* Sathe and Sasangan in *Curr. Sci.* **47** 739 (1978)

Maharashtra, type locality

3. *L. sordida* (Fr.) Singer in *Lilloa* **22** 193 (1951)

Tamil Nadu, Madras (Natarajan and Raman 1980 226)

18. *Macrocystidia* Heim ex Joss. in *Bull. Soc. Mycol. Fr.* **49** 376 (1934)

M. cucumis (Pers. ex Fr.) Heim in *Bull. Soc. Mycol. Fr.* **49** 376 (1934)

West Bengal, Calcutta (Bose 1919 112 as *Collybia mimica* (W G Smith) Sacc.).

19. *Omphalina* Quél., *Enchirid.* 42 (1886)

Key to the Indian species of Omphalina

1. Pileus white or yellow:

2. Pileus white, 1-2 cm diameter:

3. Stipe white with swollen base; spores 4.3-5.7 × 2.3-3.5 µm . . 4. *O. oedipus*

3. Stipe brown; spores 5-6 × 4 µm . . . . . 1. *'Omphalia calycinoides'*

2. Pileus yellow:

4. Stipe elongate, up to 6 cm long; pileus depressed; spores 6.7-8 × 3-4.3 µm . . . . . 5. *O. radiatilis*

4. Stipe short, up to 2 cm long; pileus convex; spores 6.7-7.7 × 2.5-3.7 µm . . . . . 6. *O. ranunculina*

1. Pileus not yellow, but sometimes ochraceous:

5. Pileus with grey shades:

6. Pileus greenish grey to fuscous, 1-1.5 cm diameter, spores 6.5-8 × 4.5-6.5 µm, subglobose . . . . . 3. *O. fuliginosa*

6. Pileus grey brown, 0.5-1 cm diameter; spores 6-9 × 3-5 µm . . 8. *O. rustica*

5. Pileus without grey shades:

7. Pileus 1-2 cm diameter, white to olive brown; stipe 1-2 cm long; spores 8-10 × 4-6 µm . . . . . 2. *O. ericetorum*

7. Pileus 1.5 cm diameter, ochraceous; stipe 4-5 cm long; spores 5.5-7 × 3.2-3.7 µm, ellipsoid . . . . . 7. *O. rogersi*

1. *'Omphalia calycinoides'* P. Henn. in *Hedwigia* **40** 334 (1901)

Uttar Pradesh, Saharanpur, type locality

2. *Omphalina ericetorum* (Fr. ex Fr.) M. Lange in *Medd. Grönl.* **147** 25 (1955)

Sikkim (Berkeley 1952b 104 as *Agaricus umbelliferus* Linn.)

3. *O. fuliginosa* (Massee) Manjula

West Bengal, Calcutta, type locality, K (Massee 1907 122 as *Omphalia*)

4. *O. oedipus* (Massee) Manjula

West Bengal, Calcutta, (type locality, K. (Massee 1907 122 as *Omphalia*)

5. *O. radiatilis* (Berk.) Manjula

Sikkim, type locality, K (Berkeley 1852b 104 as *Agaricus*)

6. *O. ranunculina* (Berk.) Manjula

Sikkim, Lachen, type locality K (Berkeley 1852b 104 as *Agaricus*)

7. *O. rogersi* (Massee) Manjula

Andaman Islands, Narcondan, type locality, K (Massee 1906 92 as *Omphalia*)

8. *O. rustica* (Fr.) Quél., *Enchirid.* 13 (1886)

Uttar Pradesh, Saharanpur (Hennings 1900 153 as *Omphalia*)

Excluded species

Omphalia campanella (Batsch) Fr.	see *Xeromphalina campanella*
Omphalia fuliginosa Massee	see *Omphalina fuliginosa*
Omphalia hydrogramma (Bull.) Fr.	see *Clitocybe hydrogramma*
Omphalia oedipus Massee	see *Omphalina oedipus*
Omphalia radiatilis Berk.	see *Omphalina radiatilis*
Omphalia ranunculina Berk.	see *Omphalina ranunculina*
Omphalina rogersi Massee	see *Omphalina rogersi*
Omphalia rustica Fr.	see *Omphalina rustica*
Omphalia umbellifera (L.) Fr.	see *Omphalina ericetorum*

20. *Omphalotus* Fayod in *Ann. Sci. Nat., Bot. sér.*6 **9** 338 (1889)

O. olearius (DC ex Fr.) Singer in *Pap. Mich. Acad. Sci.* **32** 133 (1946)

Tamil Nadu, Madras, Tambaram, Madras Christian College campus (Manjula 1980 45)

21. *Tricholoma* (Fr. ex Fr.) Staude, *Schwämme Mittledeutschl.* 125 (1857)

Key to the Indian species of Tricholoma

1. Pileus white to cream coloured, basidiocarp very large; pileus 30-35 cm diameter, stipe 15-18 cm long; spores 7 × 5 µm ..... 1. *T. giganteum*

1. Pileus not white.

2. Pileus grey, squamose; stipe 3-8 cm long; spores 6-7 × 3-5 µm .....
..... 3. *T. terreum*

2. Pileus sulphur yellow; stipe 5-10 cm long; spores 8-14 × 5-6 µm; with odour of coal gas . . . . . 2. *T. sulphureum*

1. *T. giganteum* Massee in *Bull. Misc. Inf. Kew* **1912** 254 (1912)

West Bengal, near Calcutta, Shamnagar, type locality, K; Tamil Nadu Madras, Chepauk, P.G. Women's Hostel, Maduravoyal (Manjula 1980 92 as *T. lobayense* Heim). See also Nagasawa and Hongo 1981 181

2. *T. sulphureum* (Bull. ex Fr.) Kummer, *Führ. Pilzk.* 133 (1871)

Uttar Pradesh, Allahabad University Campus (Singh and Mehrotra 1974 514)

3. *T. terreum* (Bull. ex Fr.) Kummer, *Führ. Pilzk.* 134 (1871)

Jammu and Kashmir, Tangmarg (Watling and Gregory 1980 558)

Excluded species

Tricholoma cremoriceps (Berk.) Sacc.	see *Oudemansiella canarii*
Tricholoma leucocephalum (Fr.) Lange	see *Lyophyllum leucocephalum*
Tricholoma georgii (L. ex Fr.) Quél	see *Calocybe gambosa*
Tricholoma lobayense Heim	see *Tricholoma giganteum*
Tricholoma melaleucum (Pers, ex Fr.) Pat.	see *Melanoleuca melaleuca*
Tricholoma subpulverulentum (Pers.) Fr.	see *Malanoleuca subpulverulenta*

22. *Tricholomopsis* Singer in *Schweiz. Zeit. für. Pilzk.* **17** 56 (1939)

T. platyphylla (Pers ex Fr.) Singer in *Schweiz. Zeit. fur. Pilzk.* **17** 56 (1939)

Uttar Pradesh, Allahabad (Singh and Mehrotra 1974 515 as *Collybia*)

Leucopaxilleae Singer in *Sydowia* **2** 29 (1948)

23. *Leucopaxillus* Boursier in *Bull. Soc. Mycol. Fr.* **41** 393 (1925)

Key to the Indian species of Leucopaxillus

1. Spores smooth, weakly amyloid, 5.3-8 × 3-5.7 µm; pileus 10-45 cm diameter, cream buff . . . . . 3. *L. giganteus*

1. Spores verrucose, strongly amyloid:

2. Cheilocystidia scattered or absent:

3. Pileus white to cream coloured, tinted yellow; spores 5.5-8 × 4.5-5 µm; coniferous wood . . . . . 1. *L. albissimus* var. *piceinus*

3. Pileus with pinkish tints, sometimes white; spores 3.5-5.5 × 3.5-4.7 µm . . . . . 4. *L. laterarius*

2. Cheilocystidia numerous; pileus pale reddish brown at the disk, buff at the margin; spores 5-7 × 4-5 µm . . . . . 2. *L. amarus* f. *roseibrunneus*

1. *L. albissimus* (Peck) Singer var. *piceinus* (Peck) Singer and Smith in *Pap. Mich. Acad. Sci., Arts Lett.* **28** 104 (1943)

Jammu and Kashmir, Gulmarg (Watling and Gregory 1980 552)

2. *L. amarus* (A. and S. ex Fr.) Kühn. f. *roseibrunneus* (Murr.) Singh and Smith in *Pap. Mich. Acad. Sci., Arts and Lett.* **28** 127 (1943)

Jammu and Kashmir, Gulmarg (Watling and Gregory 1980 553)

3. *L. giganteus* (Sow. ex Fr.) Singer in *Schweiz. Zeit. für Pilzk.* **17** 57 (1939)

Jammu and Kashmir, Tangmang (Watling and Gregory 1980 553); Uttar Pradesh. Allahabad (Singh and Mehrotra 1974 513)

4. *L. laterarius* (Peck) Singer and Smith in *Pap. Mich. Acad. Sci. Arts* and *Lett.* **28** 117 (1943)

Jammu and Kashmir, Gulmarg (Watling and Gregory 1980 553)

24. *Melanoleuca* Pat., *Cat. Rais. Pl. Cell. Tunisia* 22 (1897)

Key to the Indian species of Melanoleuca

1. Pileus 4-10 cm diameter, dark brown, glabrous; stipe 5-8 cm, white with brownish fibrils; spores 7-9 × 4-5 µm ..... 1. *M. melaleuca*

1. Pileus 5-7 cm diameter, grey pruinose; stipe 5-6 cm, bulbous, concolorous the pileus; spores 6-7 × 4-5 µm ..... 2. *M. subpulverulenta*

1. *M. melaleuca* (Pers. ex Fr.) Murr. in *Mycologia* **3** 167 (1911)

Jammu and Kashmir Sonamarg (Murrill 1924 133), (Watling and Gregory, 1980 554)

2. *M. subpulverulenta* (Pers. ex Fr.) Singer in *Ann. Mycol.* **41** 57 (1943)

Jammu and Kashmir, Sassar (Berkeley 1854 129 as *Agaricus)*

Collybieae (Fr.) Stuade, *Schwämme Mitteldeutsch.* 122 (1857)

25. *Anthracophyllum* Cesati in *Atti. Accad. Sci. Fis. Mat. Napoli* **8** 3 (1879)

Key to the Indian species of Anthracophyllum

1. Spores 6-8 × 4-4.5 µm — 1. *A. nigritum*
1. *Spores* 9-12.5 × 5.5-8 µm — 2. *A. lateritium*

1. *A. nigritum* (Lév.) Kalchbr. in *Grevillea* **9** 137 (1881)

Tamil Nadu, Nilgiri Hills, Ootacamund (Montagne 1842 22 as *Xerotus berteri* Mont. in error; Montagne 1856 151 as *X. perrottetii* Mont.); Assam, Khasia Hills (Berkeley 1854 133 as *Xerotus lobatus* Berk.); Tamil Nadu, Kodaikanal, Tiger Shola (Manjula 1980 50)

2. *A. lateritium* (Berk. and Curt.) Singer in *Lilloa* **22** 206 (1951)

Maharashtra, Bombay, Khandala (Theissen 1911 157 as *Xerotus*)

Xerotus Fr., *Elenchus Fung.* 48 (1828)

Excluded species

X. cantharelloides Berk. in *Hooker J. Bot.* **3** 47 (1851)

The type material represents a species of *Cantharellus* Fr.

X. griseus Berk. in *London J. Bot.* **6** 497 (1847)

Reported from Bombay by Vasudeva (1960 176) but no material can be traced. This species was transferred to *Trogia* by Patouillard (1900), but this position cannot be confirmed by examination of the poor, immature type material from Sri Lanka.

Xerotus lateritius Berk. and Curt. — see *Anthracophyllum lateritium*

Xerotus lobatus Berk. — see *Anthracophyllum nigritum*

Xerotus perrottetii Mont. — see *Anthracophyllum nigritum*

26. *Campanella* P. Henn. in *England Bot. Jahrb.* **22** 95 (1895)

Key to the Indian species of Campanella

1. Growing on wood; spores 3-4 µm diameter . . . . . 1. *C. cucullata*
1. Growing on monocotyledonous hosts; spores 7.5-9 × 4-5 µm . . 2. *C. junghuhnii*

1. *C. cucullata* (Jungh.) Lloyd. *Mycol. Writ.* **5** 815 (1915)

Punjab, Jaggatpur, Gurdaspur (Ahmad 1945 244 as *Arrhenia*)

2. *C. junghuhnii* (Mont.) Singer in *Lloydia* **8** 192 (1945)

Tamil Nadu, Kodaikanal, Tiger Shola (Manjula 1980 66, Natarajan and Manjula 1982 62)

27. *Collybia* (Fr.) Staude, *Schwämme Mitteldeutschl.* 119 (1857)

Key to the Indian species of Collybia

1. Stipe thick, usually striate, sometimes swollen . . . . . Sect. *Striipedes*
   2. Stipe short, up to 4 cm, sometimes excentric . . . . . 8. *C. himalaica*
   2. Stipe long, more than 4 cm, central:
      3. Pileus sulcate:
         4. Pileus reddish brown, lamellae crowded . . . . . 3. *C. broomeiana*
         4. Pileus yellowish brown, lamellae not crowded . . . . . 19. *C. triplicata*
      3. Pileus not sulcate:
         5. Basidiocarp white, spotted reddish brown . . . . . 12. *C. maculata*
         5. Basidiocarp not pale, uniformly reddish grey . . . . . 13. *C. papaveracea*
1. Stipe slender not striate:
   6. Stipe pruinose, tomentose or strigose . . . . . Sect. *Vestipedes*
      7. Basidiocarp caespitose; stipe elongate, more than 5 cm long:

8. Pileus sulcate-striate, 2-5 cm diameter, umbonate, campanulate, yellowish grey to pinkish cinnamon, stipe finely pruinose . . . . . 1. *C. allegretii*

8. Pileus not sulcate:

9. Pileus pale greyish brown, stipe densely hirsute . . . . . 4. *C. confluens*

9. Pileus reddish-brown, stipe strongly strigose at the base . . . . . 14. *C. peronata*

7. Basidiocarps not caespitose, stipe pruinose:

10. Stipe bulbous at the base:

11. Pileus pale brown to yellowish brown; stipe greyish brown . . . . . 10. *C. johnstonii*

11. Pileus and stipe white with pinkish tinge . . . . . 2. *C. blandula*

10. Stipe not bulbous towards the base:

12. Pileus up to 3 cm diameter, reddish brown . . . . . 18. *C. sericipes*

12. Pileus up to 5 cm diameter, light brown to greyish orange . . . . . 15. *C. polygramma*

6. Stipe glabrous:

13. Vesiculose cheilocystidia and pleurocystidia present . . . . . Sect. *Cystidiatae*

Pileus and stipe yellowish brown; lamellae staining reddish brown . . . . . 17. *C. rufata*

13. Pleurocystidia absent; cheilocystidia not well differentiated:

14. Pileus uniformly coloured, not zoned . . . . . Sect. *Levipedes*

15. Pileus brownish purple . . . . . 7. *C. fuscopurpurea*

15. Pileus not purple:

16. Basidiocarp caespitose, lignicolous, pileus reddish brown drying paler . . . . . 6. *C. erythropus*

16. Basidiocarp not caespitose:

17. Pileus reddish brown; stipe elongate:

18. Pileus not striate, visid; stipe concolorous . . . . . 11. *C. macra*

18. Pileus striate at the margin, dry; stipe darker . . . . 20. *C. ustipes*

17. Pileus pale yellow brown; stipe yellow . . . . . 5. *C. dryophila*

14. Pileus zonate, with pink and yellowish zone . . . . . Sect. *Iocephalae*

19. Pileus yellow at the apex, pinkish grey elsewhere; stipe yellowish above, pinkish grey below; lamellae narrow, crowded; terrestial . . . . . 9. *C. iridescens*

19. Pileus pink with yellowish margin, radially ridged; stipe brown; lamellae broad and distant; lignicolous ..... 16. *C. rhodella*

1. *C. allergretii* (Seynes) Pegler in *Kew Bull.* **23** 243 (1969)

Tamil Nadu, Madras, Tambaram, Madras Christian College Campus, (Manjula 1980 55; Natarajan and Manjula 1982 57)

2. *C. blandula* (Berk.) Sacc., *Syll. Fung.* **5** 219 (1887)

Sikkim, type locality, K (Berkeley 1852b 100 as *Agaricus*)

3. *C. broomeiana* (Berk.) Manjula

West Bengal, Darjeeling, type locality, K (Berkeley 1850: 77 as *Agaricus*).

4. *C. confluens* (Pers. ex Fr.) Kummer, *Führ. Pilzk.* 117 (1871)

West Bengal, Bankura (Ray and Samajpati 1979 67); Tamil Nadu, Kodaikanal, (Manjula 1980 56, Natarajan and Manjula 1982 60)

5. *C. dryophila* (Bull. ex Fr.) Kummer, *Führ. Pilzk.* 115 (1871)

Uttar Pradesh, Allahabad (Singh and Mehrotra 1974 514); Jammu and Kashmir, Verinag (Watling and Gregory 1980 551); Sikkim, Lachen (Berkeley 1852 100 as variety *caespitis*)

6. *C. erythropus* (Pers. ex Fr.) Kummer, *Führ. Pilzk.* 115 (1871)

West Bengal, Darjeeling (Berkeley 1851a 44 as *Marasmius erythropus* Fr.)

7. *C. fuscopurpurea* (Pers. ex Fr.) Kummer, *Führ. Pilzk.* 116 (1871)

Jammu and Kashmir, Verinag (Watling and Gregory 1980 551)

8. *C. himalaica* Manjula

West Bengal, Darjeeling, type locality, K (Berkeley 1851a 45 as *Lentinus hepaticus* Berk.)

9. *C. iridescens* (Berk.) Manjula

Sikkim, Sinchul, type locality, K (Berkeley 1851a 43 as *Marasmius*)

10. *C. johnstonii* (Murrill) Dennis in *Trans. Br. Mycol. Soc.* **34** 437 (1951)

Tamil Nadu, Kodaikanal, Carton Hotel campus (Manjula 1980 58; Natarajan and Manjula 1982 60)

11. *C. macra* (Berk.) Sacc., *Syll. Fung.* **5** 236 (1887)

Sikkim, type locality, K (Berkeley 1852b 100 as *Agaricus*)

12. *C. maculata* (Alb. and Schw. ex Fr.) Kummer, *Führ. Pilzk.* 117 (1871)

Sikkim, Lachen (Berkeley 1852b 99 as *Agaricus*)

13. *C. papaveracea* (Berk.) Sacc., *Syll. Fung.* **5** 225 (1887)

West Bengal, Darjeeling, type locality, K (Berkeley 1850 50 as *Agaricus*)

14. *C. peronata* (Bolt. ex Fr.) Kummer, *Führ. Pilzk.* 116 (1871)

Uttar Pradesh, Mussoorie (Hennings 1901 328 as *Marasmius urens* Fr.)

15. *C. polygramma* (Mont.) Dennis in *Trans. Br. Mycol. Soc.* **34** 447 (1951)

Tamil Nadu, Madras, Adyar, Indian Institute of Technology campus, (Manjula 1980 60; Natarajan and Manjula 1982 60)

16. *C. rhodella* (Berk.) Sacc., *Syll. Fung.* **5** 236 (1887)

West Bengal, Darjeeling, type locality, K (Berkeley 1850 76 as *Agaricus*)

17. *C. rufata* (Berk.) Manjula

West Bengal, Darjeeling, type locality, K. (Berkeley 1850 80 as *Agaricus*)

18. *C. sericipes* (Berk. and Curt.) Dennis in *Trans. Br. Mycol. Soc.* **34** 453 (1951)

Tamil Nadu, Madras University campus (Manjula 1980 59, Natarajan and Manjula 1982 57)

19. *C. triplicata* (Hooker f.) Sacc., *Syll. Fung.* **5** 221 (1887)

Sikkim, type locality, K (Berkeley 1850 50 as *Agaricus*)

20. *C. ustipes* (Berk.) Sacc., *Syll. Fung.* **5** 234 (1887)

West Bengal, Darjeeling, type locality, K (Berkeley 1850 76 as *Agaricus*)

Excluded species

Collybia albuminosa (Berk.) Petch	see *Macrolepiota albuminosa*
Collybia ambusta (Fr.) Quél	see *Lyophyllum ambustum*
Collybia antitypa (Berk.) Sacc.	see *Oudemansiella canarii*
Collybia camptopus (Berk.) Sacc.	see *Oudemansiella canarii*
Collybia dealbata (Berk. and Curt.) Dennis	see *Marasmiellus dealbata*
Collybia longipes (Bull.) Berk.	see *Oudemansiella longipes*
Collybia lutea Massee	see *Flammulaster fulvoalbus*
Collybia macroaura (Scop.) Schroet.	see *Oudemansiella radicata*
Collybia mimica (W G Smith apud Stevenson) Sacc.	see *Macrocystidia cucumis*
Collybia napipes (Hooker f.) Sacc.	see *Oudemansiella radicata*
Collybia platyphylla Fr.	see *Tricholomopsis platyphylla*
Collybia podagrosa (Berk.) Sacc.	see *Laccaria* sp.
Collybia radicata (Relh). Berk. var. *superbiens* (Berk.) Sacc.	see *Oudemansiella radicata*
Collybia raphanipes (Berk.) Sacc.	see *Oudemansiella radicata*
Collybia rupicola Massee	see *Panellus rupicola*
Collybia stillaticia (Berk.) Sacc.	see *Oudemansiella canarii*
Collybia stipitaria (Fr.) Gillet	see *Crinipellis stipitaria*
Collybia undabunda (Berk.) Sacc.	see *Oudemansiella radicata*
Collybia velutipes (Curt.) Fr.	see *Flammulina velutipes*

28. *Marasmiellus* Murrill, *N. Am. Fl.* **9** 243 (1915)

Key to the Indian species of Marasmiellus

1. Spores tetrahedral with four radiating triangular process, pileus white bruising blue or greenish ..... 5. *M. subcinereus*

1. Spores never stellate:

2. Graminicolous or terrestrial:

3. Pileus white:

4. Pileus white, conico-campanulate to convex; spores 8.8-11 × 3.3-4.4 µm ..... 1. *M. dealbata*

4. Pileus white, grey to pink, convex to umbilicate; spores 9-11.3 × 3.5-5.5 µm ..... 3. *M. languidus*

3. Pileus not white, yellowish brown, convexo-depressed to infundibuliform, 1-2 cm diameter, lamellae pale yellow-brown, decurrent; stipe 2-4 cm × 1-1.5 mm, cinnamon brown; spores unknown ..... 6. *'Marasmius subomphalodes'*

2. Lignicolous or on stem bases of sugarcane or banana:

5. On banana or sugarcane stem bases; pileus whitish, 1.2-2.5 cm diameter; stipe 1.5 cm long, white with ochraceous base, often excentric; spores 6-11.7 × 3.3-6.5 µm ..... 2. *M. inoderma*

5. Growing on twigs, gregarius; pileus 5-10 cm diameter; convex becoming plane, white, pink at the centre; spores 8-11 × 2-4 µm; 4. *M. ramealis*

1. *M. dealbata* (Berk. and Curt.) Singer in *Sydowia* **15** 58 (1961)

Tamil Nadu, Alagar Hills, Madurai Dt. (Manjula 1980 54, Natarajan and Manjula 1982 59 as *Collybia dealbata* (Berk. and Curt.) Dennis)

2. *M. inoderma* (Berk.) Singer in *Sydowia* **9** 385 (1955)

Kerala (Nagaraj 1965 618)

3. *M. languidus* (Lasch.) Singer in *Lilloa* **22** 300.(1951)

Uttar Pradesh, Saharanpur, (Hennings 1900 152 as *Marasmius*); Tamil Nadu (Parambaramani *et al* 1975 358 as *Marasmius candidus* (Bolt.) Fr.)

4. *M. ramealis* (Bull. ex Fr.) Singer in *Pap. Mich. Acad. Sci. Arts and Lett.* **32** 130 (1946)

Uttar Pradesh, Saharanpur, (Hennings 1901 328 as *Marasmius*)

5. *M. subcinereus* (Berk. Br.) Pegler in *Kew. Bull. Addit Ser.* **6** 117 (1977)

Tamil Nadu, Madras, Indian Institute of Technology campus, Tambaram, Madras Christian College campus; Madurai Dt. Alagar Hills; Tirunelveli Dt., Kodimudi (Manjula 1980 62; Natarajan and Manjula 1982 61)

6. '*Marasmius subomphalodes*' P. Henn. in *Hedwigia* **40** 329 (1901)

Uttar Pradesh, Saharanpur, type locality

29. *Micromphale* Nees ex S F Gray, *Nat. Arr. Brit. Pl.* **1** 621 (1821)

M. foetidum (Sow. ex Fr.) Singer in *Lloydia* **8** 182 (1945)

Uttar Pradesh, Allahabad, High Court lawns (Singh and Mehrotra 1974 516)

30. *Mniopetalum* Donk and Singer ex Donk in *Persoonia* **2** 332 (1962)

M. distinctum Horak in *Sydowia* **33** 100 (1980)

Sikkim, type locality

31. *Pleurocybella* Singer in *Mycologia* **39** 81 (1947)

P. lignatilis (Pers. ex Fr.) Singer in *Lilloa* **22** 203 (1951)

Madhya Pradesh (Graham 1915 as *Pleurotus fimbriatus* (Bull. ex Fr.) Gillet)

32. *Trogia* Fr., *Gen. Hymen.* 10 (1836)

T. montagnei Fr., *Epicrisis* 402 (1838)

Tamil Nadu, Trichinopoli, type locality (Montagne 1834 149 as *Cantharellus haplorutis* Mont.

Excluded species

Trogia belangeri (Mont.) Fr. see Corner (1966 225), possibly a *Panus* sp.
Trogia koenigii (Mont.) Fr. see Corner (1966 255), possibly a *Marasmius* sp.

Resupinateae Singer in *Sydowia* **2** 30 (1948)

33. *Agaricochaete* Eichelbaum, *Verhandl. Naturw. Ver. Hambug.* 3 **14** 58 (1906)

A. indica Natarajan and Raman in *Mycologia* **72** 630 (1980)

Tamil Nadu, Kodaikanal, Tiger Shola, type locality

34. *Hohenbuehelia* Schulzer in *Verh. Zool. Bot. Ges. Wien* **16** 45 (1866)

Key to the Indian species of Hohenbuehelia

1. Pileus small, up to 2.5 cm diameter; applanate, densely villose; stipe absent . . . . . 1. *H. atrocaerulea*

1. Pileus up to 5 cm diameter, spathulate, with short lateral stipe 2. *H. petaloides*

1. *H. atrocaerulea* (Fr. ex Fr.) Singer in *Lilloa* **22** 255 (1951)

Tamil Nadu, Madras, Chepauk, Near State Guest House (Manjula 1980 70; Natarajan and Manjula 1982 63)

2. *H. petaloides* (Bull. ex Fr.) Schulzer in *Verh. Zool. Bot. Ges. Wien.* **16** 45 (1886)

Nepal (Berkeley 1854 129 as *Agaricus*); Uttar Pradesh, Lucknow (Ghosh *et al* 1967 241); Tamil Nadu, Madras, Guindy (Natarajan and Raman 1981 166), Madurai Dt.,

Alagar Hills (Manjula 1980 72); Orissa (Sinha and Padhi 1978a 299 as *Pleurotus*)

35. *Resupinatus* Nees ex S F Gray, *Nat. arr. Brit. Pl.* **1** 617 (1821)

R. applicatus (Batsch. ex Fr.) S F Gray, *Nat. Arr. Brit. Pl.* **1** 617 (1821)

Jammu and Kashmir, Gulmarg (Watling and Gregory 1980 557); Tamil Nadu, Nilgiri Hills, authentic material, K as *Canthearellus congregatus* Mont. (Montagne 1842 21)

Panelleae Singer ex Singer, *Agar. Mod. Taxon. ed.* **3** 337 (1975)

36. *Panellus* Karst., *Hattsv. Bidr. Finl. Nat. Folk* **32** 14 (1879)

Key to the Indian species of Panellus

1. Pileus up to 4 cm diameter, lacking olivaceous tints:
   2. Pileus 1-3 cm diameter, flabelliform, golden yellow; stipe 5-10 cm long; spores 3.5-5 × 0.8-1.2 µm ..... 1. *P. aureofactus*
   2. Pileus 2-4 cm diameter, campanulate, greyish brown, squamose; spores 5-6.3 × 2-2.7 µm; caespitose ..... 2. *P. rupicola*
1. Pileus 4-15 cm diameter, olivaceous brown, finely tomentose; spores 4-5.5 × 1-2 µm ..... 3. *P. serotinus*

1. *P. aureofactus* Horak in *Sydowia* **33** 102 (1980)

Sikkim, Upper Rangit, type locality

2. *P. rupicola* (Massee) Singer in *Lloydia* **5** 129 (1942)

Himalayas, (Massee 1898 114 as *Collybia*), type locality, K. Uttar Pradesh, Chakrata and Punjab (Bagchee 1954)

3. *P. serotinus* (Fr.) Kuhn. *Fl. Anal. Champ. sup.* 67 (1953)

Sikkim, Upper Rangit (Horak 1980 109)

Marasmiaeae Fayod in *Ann. Sci. Nat. Bot. sér.* 7 **9** 340 (1889)

37. *Amyloflagellula* Singer in *Darwiniana* **14** 14 (1966)

A. pulchra (Berk. and Br.) Singer in *Darwiniana* **14** 14 (1966)

Assam (Tunstall 1925 38 as *Marasmius pulcher* (Berk. and Br.) Petch)

38. *Crinipellis* Pat. in *J. Bot.* **3** 336 (1889)

Key to the Indian species of Crinipellis

1. Pileus 25 mm diameter, without a prominent umbo and central dark zone; spores ellipsoid ..... 2. *C. subtomentosa*

1. Pileus 15 mm diameter, with a prominent central umbo and central dark zone; spores subglobose ..... 1. *C. stipitaria*

1. *C. stipitaria* (Fr.) Pat. in *J. Bot.* **3** 336 (1889)

Uttar Pradesh, Saharanpur (Hennings 1900 153; 1901 335 as *Collybia*); Himachal Pradesh, Simla (Theissen 1911 158 as *Collybia*); Tamil Nadu, Madras, Maduravoyal (Manjula 1980 122)

2. *C. subtomentosa* (Peck) Singer in *Lilloa* **8** 463 (1942)

Tamil Nadu, Madras, Chepauk, Post-Graduate Women's Hostel campus, (Manjula 1980 120)

39. *Marasmius* Fr., *Fl. Scanica* 339 (1835)

Key to the Indian species of Marasmius

1. Pileipellis not hymeniform but with irregular diverticulate elements or setulae:
   2. Stipe central, insititious, often with dark rhizomorphs . . . . . Sect. *Androsacei*
      3. Pileus 5-10 mm diameter, slightly depressed, red brown; spores 7-9 × 3-4 µm . . . . . 1. *M. androsaceus*
      3. Pileus 2-7 mm diameter, convex to campanulate finally depressed, ash grey to cinnamon; spores 5.8-7 × 2.5-3.7 µm . . . . . 20. *M. hakgalensis*
   2. Stipe excentric, lateral, rarely absent, arising from a small white mycelial patch appressed to the substratum . . . . . Sect. *Fusicystides*
      4. Pileus 2-4 cm diameter, campanulate, sulcate, white; purple grey to greyish brown; spores 7-12 × 5-6 µm . . . . . 6 *M. campanella*
      4. Pileus 2-3 cm diameter, flabelliform, whitish; lamellae venose, anastomose; spores 6-8 × 4-5 µm . . . . . 31. *M. pangerangensis*

Pileipellis hymeniform or epithelial:

5. Lamellae collariate; stipe central, insititious; epicutis with 'broom cells' of the *Siccus*-type or *Rotalis*-type . . . . . Sect. *Marasmius*
   6. Broom cells of *Rotalis*-type; rhizomorphs sometimes present:
      7. Pileus white when fresh, turning dirty brownish at maturity:
         8. Lamellae 12-15; stipe black, growing on twigs:
            9. Stipe elongate, up to 8 cm long; spores 6-8 × 3-3.8 µm . . . . . 34. *M. rotalis*
            9. Stipe short, 2-4 cm long; spores 7-10 × 3-5 µm . . . . . 35. *M. rotula*
         8. Lamellae 8-10; stipe brown, growing on dead leaves 2. *M. apatelius*
      7. Pileus white to light brown when fresh, turning brownish orange at maturity with black central papillae; lamellae 10-15; spores 7.2-8.4 × 2.4-3.6 µm . . . . . 25. *M. leucorotalis*
   6. *Siccus*-type broom cells present:

10. Both *Siccus*-type and *Rotalis*-type broom cells present pileus 2 mm diameter, white, conical with fuligenous papilla in the umbilicus; spores, 6.7-8.5 × 3.5-4.5 µm ..... 11. *M. cupressiformis*

10. Broom cells of the *Siccus*-type present:

11. Abundant black rhizomorphs present, pileus orange, 1-3 mm diameter, attached to the branches of living trees ..... 10. *M. crinis-equi*

11. Black rhizomorphs absent:

12. Pileus white with a black papilla; stipe black 9. *M. conicopapillatus*

12. Pileus not white:

13. Graminicolous, pileus reddish brown; spores 8-12 × 4-6 µm, ellipsoid ..... 16. *M. graminum*

13. Pileus brownish orange; spores 11-14 × 2.5-4 µm, fusoid-clavate ..... 18. *M. guyanensis*

5. Lamellae not collariate:

14. Stipe central, insititious; epicutis hymeniodermic, with broom cells of *Siccus-type* ..... Sect. *Leveilliani*

15. Pileus dark reddish brown, 1-3 cm diameter, stipe elongate up to 8 cm long, blackish brown; spores 7.2-9.5 × 3.3-4.4 µm ellipsoid ..... 26. *M. leveillianus*

15. Pileus vivid red, 1 cm diameter, stipe short, 2 cm long, light orange; spores 5.6-7 × 4.2-5.6 µm, globose to subglobose; pleurocystidia present ..... 29. *M. nilgiriensis*

14. Stipe insititious; basal mycelium well developed; epicutis hymeniodermic:

16. Stipe central:

17. Epicuticular elements smooth; context dextrinoid .... Sect. *Globulares*

18. Pileus small, 10-15 mm diameter, greyish orange, stipe short, 15-20 mm; spores 6.6-9.9 × 4.4-5.5 µm, ellipsoid .21. *M. heliomyces*

18. Pileus large, stipe long:

19. Pileus 2-5 cm diameter, campanulate, expanding, rust brown, then paler; stipe 2-7 cm long, spores 7-10 × 4-6 µm, often form fairy rings ..... 30. *M. oreades*

19. Pileus up to 6 cm diameter, yellowish green with yellow at the centre, sulcate, stipe elongate, 15-18 cm long; spores elongate 18-25 × 3.5-4.5 µm ..... 22. *M. hookeri*

17. Epicuticular elements forming broom cells; context dextrinoid ..... Sect. *Sicci*

20. Setae in the pileus epicutis and hymenophore none; stipe glabrous rarely pruinate:

21. Cystidia on the sides of the lamellae absent or not clearly differentiated:

22. Pileus white:

23. Lamellae 15, distant, not crowded, rhizomorphs present; spores 6-9 × 2.5-4 µm . . . . . 32. *M. proletarius*

23. Lamellae crowded, close, rhizomorphs absent:

24. Pileus 15 mm, hygrophanous; spores 7.7-8.8 × 4.4-5.5 µm . . . . . 26. *M. microhaedinus*

24. Pileus 30 mm, not hygrophanous; spores 5.5-6.6 × 2.2-3.3 µm . . . . . 40. *M. subarborescens*

22. Pileus not white:

25. Pileus brownish:

26. Pileus olive brown to olive grey; spores 5-8 × 3.3-4.4 µm . . . . . 12. *M. digilioi*

26. Pileus yellowish brown to pale brown; spores 7-10 × 2.5-4 µm . . . . . 4. *M. beniensis*

25 Pileus orange, or reddish:

27. Broom cells present on the stipe; pileus 15-42 mm diameter, spores 9.6-12 × 2.4-3.6 µm . . . . . 24. *M. leoninus*

27. Broom cells not present on the stipe:

28. Growing on plant roots:

29. Pileus applanate, glabrous fading to yellow . . . . . 33. *M. rhizophilus*

29. Pileus convex, velutinate . . . . . 23. *M. korthalsii*

28. On soil:

30. Pileus 20-35 mm diameter, orange-rusty; spores 8.4-10.8 × 4.8-6 µm; stipe brown . . . . . 15. *M. floriceps*

30. Pileus 15 mm diameter, pink to coral red, stipe white; spores 7-8.5 × 3.5-4 µm . . . . . 5. *M. burkillii*

21. Cystidia on the sides of the lamellae present:

31. Lamellae subdistant to distant:

32. Spores 11-33 × 2.2-4.4 µm, lanceolate to subclavate, pileus deep brown . . . . . 27. *M. megistosporus*

32. Spores not more than 20.5 µm long:

33. Pileus pinkish red to reddish brown:

34. Spores 18-20.5 × 3.6-4.8 µm, pileus purplish red to vinaceous; stipe reddish brown . . . . . 19. *M. haematocephalus*

34. Spores 16-21 × 2.8-4.2 µm, pileus reddish brown; stipe dark brown . . . . . 37. *M. siccus*

33. Pileus not red coloured:

35. Pileus orange; spores 13.2-16.5 × 3.3-4.4 µm; lamellae 8-10 . . . . . 3. *M. bambusinus*

35. Pileus greyish orange; spores 12-18 × 3.6-5 µm . . . . . 14. *M. ferrugineus*

31. Lamellae crowded, close or subclose:

36. Spores up to 15.5 µm long, on leaf litter:

37. Caespitose; spores 8-13 µm long . . . . . 8. *M. confertus*

37. Solitary; spores 7-10 µm long . . . . . 39. *M. spegazzinii*

36. Spores longer up to 20.5 µm long, on the bark of living plant . . . . . 17. *M. grandisetulosus*

20. Setae in pileus epicutis and or hymenophore present; stipe pruinate, pubescent or hirsute:

38. Setae absent on both pileus and stipe surface, stipe covered by hyaline hairs; pileus greyish orange . . . . . 36. *M. rubroflavus*

38. Setae present on both pileus epicutis and stipe surface:

39. Setoid cystidia present on the sides of lamellae . . . . . 7. *M. cohaerens*

39. Setoid cystidia absent on the sides of the lamellae:

40. Pileus and stipe umbrinus; setae absent on the stipe but thick walled caulocystidia present; lignicolous; spores 11.5-15 × 3.3-4.8 µm . . . . . 41. *M. umbrinus*

40. Pileus reddish orange and stipe light brown; setae present on the stipe and pileus; folicolous; spores 7.7-9.9 × 2.2-3.3 µm . . . . . 13. *M. echinatulus*

16. Stipe excentric, lateral or rudimentary, epicutis with broom cells . . . . . Sect. *Neosessiles*

Pileus 5-7 mm diameter, white becoming dirty brown; spores 10.5-12.3 × 5.3-6 µm . . . . . 38. *M. spaniophyllus*

1. *M. androsaceus* (L. ex Fr.) Fr., *Epicrisis* 385 (1838)

Uttar Pradesh, Saharanpur (Hennings 1901 329)

2. *M. apatelius* Singer in *Bull. Jard. Bot. Etat Brux.* **34** 332 (1964)

Tamil Nadu, Madurai, Alagar Hills (Manjula 1980 80; Natarajan and Manjula 1982 80)

3. *M. bambusinus* (Fr.) Fr., *Epicrisis* 385 (1838)

Tamil Nadu, Kodaikanal, Bryant Park (Manjula 1980 108; Natarajan and Manjula 1982 22)

4. *M. beniensis* Singer in *Sydowia* **18** 334 (1964)

Tamil Nadu, Courtallum; Madras, Chepauk, Presidency College hostel campus (Manjula 1980 97; Natarajan and Manjula 1982 18)

5. *M. burkillii* (Massee) Manjula

West Bengal, Darjeeling, Suriel, type locality, K (Massee 1910 2)

6. *M. campanella* Holtern., *Mykol. Unters aus den Tropen* 1898 105 (1898)

West Bengal, Calcutta (Bose and Chatterjee 1950 56)

7. *M. cohaerens* (Alb. and Schw. ex Fr.) Cooke and Quél., *Clav. Syn. Hymen. Eur.* 135 (1878)

Jammu and Kashmir, Gulmarg (Watling and Gregory 1980 554)

8. *M. confertus* Berk. and Br. in *J. Linn. Soc., Bot.* **14** 34 (1875)

Tamil Nadu, Madras, Guindy, Deer Park (Manjula 1980 110; Natarajan and Manjula 1982 22)

9. *M. conicopapillatus* P. Henn in *Engl. Bot. Jahrb.* **22** 100 (1895)

Tamil Nadu, Madurai Dt., Alagar Hills (Manjula 1980 84; Natarajan and Manjula 1982 16)

10. *M. crinis-equi* Müller ex Kalchbr. in *Grevillea* **8** 153 (1880)

India (Tunstall 1925 38 1928)

11. *M. cupressiformis* Berk. in *Hooker J. Bot.* **8** 140 (1856)

India (Bagchee 1953 21)

12. *M. digilioi* Singer in Singer and Digilio in *Lilloa* **25** 201 (1952)

Tamil Nadu, Madras, Indian Institute of Technology Campus, (Manjula 1980 97; Natarajan and Manjula 1982 18)

13. *M. echinatulus* Singer in *Sydowia* **12** 98 (1958)

Tamil Nadu, Madras, Chepauk, Post-Graduate Women's Hostel campus, Indian Institute of Technology campus, Madras University campus, Deer Park, Maduravoyal, Tambaram, Madras Christian College campus, Raj Bhavan; Tirunelveli Dt., Courtallam (Manjula 1980 116; Natarajan and Manjula 1982 25)

14. *M. ferrugineus* (Berk.) Berk. and Curtis in *J. Linn. Soc., Bot.* **10** 297 (1869)

Tamil Nadu, Madras, Post-Graduate Women's Hostel campus (Manjula 1980 108; Natarajan and Manjula 1982 23)

15. *M. floriceps* Berk. and Curt. in *J. Linn. Soc., Bot.* **10** 298 (1869)

Tamil Nadu, Madras, Madras University campus (Manjula 1980 100; Natarajan and Manjula 1982 18)

16. *M. graminum* (Lib.) Berk. and Br. apud Berk., *Outl. Brit. Fung.* 222 (1860)

Uttar Pradesh, Saharanpur (Hennings 1900 152; 1901 329 as *M. curreyi* Berk. and Br.)

17. *M. grandisetulosus* Singer in *Bull. Jard. Bot. Etat. Brux.* **34** 379 (1964)

Kerala, Munnar, Kannan Devan Tea Estate (Manjula 1980 113; Natarajan and Manjula 1982 23)

18. *M. guyanensis* Mont. in *Ann. Sci. Nat., Bot. sér.* 6 **1** 114 (1854)

Tamil Nadu, Madras, Indian Institute of Technology campus (Manjula 1980 85; Natarajan and Manjula 1982 16)

19. *M. haematocephalus* (Mont.) Fr., *Epicrisis* 376 (1838)

Tamil Nadu, Madras, Deer Park (Manjula 1980 105; Natarajan and Manjula 1982)

20. *M. hakgalensis* Petch in *Trans. Br. Mycol. Soc.* **31** 35 (1947)

Tamil Nadu, Madras, Deer Park (Manjula 1980 87; Natarajan and Manjula, 1982 13)

21. *M. heliomyces* Murrill in *Bull. Torrey Bot. Club* **67** 149 (1940)

Tamil Nadu, Madras, Indian Institute of Technology campus (Manjula 1980 85; Natarajan and Manjula 1982 27)

22. *M. hookeri* Berk. in *Hooker J. Bot.* **4** 136 (1852)

Assam, Khasi Hills, type locality, K

23. *M. korthalsii* Fr., *Noc. Symb. Mycol.* 30 (1855)

Nicobar Islands type locality

24. *M. leoninus* Berk. in *Hooker J. Bot.* **8** 135 (1856)

Tamil Nadu, Madras, Indian Institute of Technology campus, Raj Bhavan campus (Manjula 1980 98; Natarajan and Manjula 1982 19)

25. *M. leucorotalis* Singer in *Sydowia* **18** 337 (1964)

Tamil Nadu, Madras, Theosophical Society campus (Manjula 1980 89; Natarajan and Manjula 1982 15)

26. *M. leveillianus* (Berk.) Pat in *Bull. Soc. Mycol. Fr.* **33** 55 (1917)

Tamil Nadu, Madras, Theosophical Society campus (Manjula 1980 89; Natarajan and Manjula 1982 14)

27. *M. megistosporus* Singer in *Sydowia* **18** 338 (1964)

Tamil Nadu, Tirunelveli Dt., Courtallum (Manjula 1980 103; Natarajan and Manjula 1982 24)

28. *M. microhaedinus* Singer in *Sydowia* **18** 338 (1964)

Tamil Nadu, Madras, Madras University campus (Manjula 1980 94; Natarajan and Manjula 1982 20)

29. *M. nilgiriensis* Natarajan and Raman in *Kavaka* **8** 71 (1980)

Tamil Nadu, Nilgiris, Ootacamund, type locality (type in Herb. Madras Univ. Bot. Lab.)

30. *M. oreades* (Bolt. ex Fr.) Fr., *Epicrisis* 375 (1838)

Uttar Pradesh, Allahabad, (Singh and Mehrotra 1974 515); Gujarat, Baroda (Moses 1948)

31. *M. pangerangensis* P. Henn. *Monsunia* **1** 150 (1899)

West Bengal, Calcutta (Bose 1949 123)

32. *M. proletarius* Berk. and Curt. in *J. Linn. Soc. Bot.* **10** 296 (1868)

Andaman Islands, Narcondon (Butler and Bisby 1931 110)

33. *M. rhizophilus* (Brig.) Fr., *Mongr. Hymen. Suec.* **2** 331 (1851)

Maharashtra, Amboli (Patil 1978 32)

34. *M. rotalis* Berk. & Br. in *J. Linn. Soc., Bot.* **14** 40 (1875)

Tamil Nadu, Madras, Indian Institute of Technology campus (Manjula 1980 78; Natarajan and Manjula 1982 14)

35. *M. rotula* (Scop.) Fr., *Epicrisis* 305 (1838)

Sikkim (Berkeley 1852a 136)

36. *M. rubroflavus* (Theissen) Singer in *Lilloa* **22** 326 (1951)

Tamil Nadu, Madurai, Alagar Hills (Manjula 1980 115; Natarajan and Manjula 1982 25)

37. *M. siccus* (Schw.) Fr., *Epicrisis* 382 (1838)

Uttar Pradesh, Lucknow (Ghosh *et al* 1974)

38. *M. spaniophyllus* Berk. in *London J. Bot.* **2** 631 (1843)

Maharashtra, Bombay (Theissen 1911 157)

39. *M. spegazzinii* Sacc. and Sydow, *Syll. Fung.* **14** 117 (1899)

Kerala, Munnar, Kannan Devan Tea Estate (Manjula 1980 113; Natarajan and Manjula 1982 24)

40. *M. subarborescens* Singer in *Bull. Jard. Bot. Etat Brux.* **34** 364 (1964)

Tamil Nadu, Madras, Madras University campus (Manjula 1980 95; Natarajan and

Manjula 1982 20)

41. *M. umbrinus* Pegler in *Kew Bull.* **21** 530 (1968)

West Bengal, Bankura (Ray and Samajpati 1979 67)

Excluded species

Marasmius candidus (Bolt.) Fr. see *Marasmiellus languidus*

Marasmius caperatus Berk. This is a *Marasmiellus* sp. but the material is sterile and no microcharacters were recovered. The epicutis is not epithelial.

Marasmius consocius Berk. The epicuticular structure is typical of *Xerulina asprata* (Berk.) Pegler but the material is sterile and the basidiocarps are described as white.

Marasmius curreyi Berk. & Br. see *Marasmius graminum*

Marasmius erythropus Fr. see *Collybia erythropus*

Marasmius haematodes Berk. It is also a *Marasmiellus* sp. but no microcharacters were recovered. The epicutis is not epithelial.

Marasmius iridescens Berk. see *Collybia iridescens*

Marasmius languiaus (Lasch.) Fr. see *Marasmiellus languidus*

Marasmius pulcher (Berk. and Br.) Petch see *Amyloflagellula pulchra*

Marasmius ramealis Bull. ex Fr. see *Marasmiellus ramealis*

Marasmius subomphalodes P. Henn. see *Marasmiellus*

Marasmius urens Fr. see *Collybia peronata*

40. *Mycenella* (Lange) Singer in *Notulae Systematicae Sect. Crypt. Inst. Bot. Acad. Sc. U.S.S.R.* fasc. **10-12** 9 (1938)
M. bryophila (Vocrl.) Singer in *Notulae Systematicae Sect. Crypt. Inst. Bot. Acad. Sc. U.S.S.R.* fasc. **10-12** 9 (1938)

Tamil Nadu, Nilgiri Hills (Natarajan and Raman 1980 230)

41. *Oudemansiella* Speg. in *An. Sci. Cient. Argent.* **12** 24 (1881)

Key to the Indian species of Oudemansiella

1. Stipe short; usually growing on living trees; annulus normally present; pileus white to sepia, glutinous, with velar squamules; spores globose, 15-24 × 10-22 µm . . . . . 1. *O. canarii*

1. Stipe elongate, radicant, growing on buried wood; annulus absent:

2. Pileus and stipe fuligenous, dry, densely velutinate; spores ellipsoid to subglobose, 8-9 × 6-6.5 µm . . . . . 2. *O. longipes*

2. Pileus greyish brown, viscid; stipe glabrous; spores ellipsoid, 13-20 × 9-13 µm . . . . . 3. *O. radicata*

1. *O. canarii* (Jungh.) Höhn. in *Akad. Wiss. Wien. Math-Naturw. Kl.* **118** 276 (1909)

West Bengal, Darjeeling (Berkeley 1850 77 as *Agaricus camptopus* Berk. 1850 47 as *A. cremoriceps Berk.* 1850 49 as *A. stillaticius* Berk. 1850 77 as *A. antitypus* Berk.); India (Sinha *et al* 1979 72)

2. *O. longipes* (Bull.) Moser apud Gams, *Kl. Kryptogamen-Fl. Ed.* **2** 121 (1967)

Assam, Khasi Hills (Berkeley 1854 129 as *Agaricus*)

3. *O. radicata* (Rehl. ex Fr.) Singer in *Ann. Mycol. Berl.* **34** 333 (1936)

West Bengal, Darjeeling (Berkeley 1850 48 as *Agaricus raphanipes* Berk. 1850 49 as *A. undabundus* 1850 48 as *A. napipes* Hook. f); Uttar Pradesh, Saharanpur (Hennings 1901 335 as *Collybia macroura* (Scop.) Schrot.); Tamil Nadu, Nilgiri Hills, Ootacamund (Natarajan and Raman 1981 168); Assam, Mawphlang (Ghosh *et al* 1967 241) and West Bengal, Kurseong

42. *Physalacria* Peck in *Bull. Torrey Bot. Cl.* **1** 2 (1882)

P. indica Chandrasekar and Natarajan in *Mycologia* **71** 876 (1979)

Karnataka, Coorg Dt., Mercara, type locality

Myceneae Fayod in *Ann. Sci. Nat., Bot. sér.* 7 **9** 310 (1889)

43. *Filoboletus* Henn. in *Monsunia* **1** 146 (1900)
F. gracilis (Klotach ex Fr.) Singer in Lloydia **8** 26 (1945)

Tamil Nadu, Tirunelveli Dt., (Natarajan and Raman 1981 175)

44. *Hemimycena* Singer in *Rev. Mycol.* **3** 194 (1938)

Key to the Indian species of Hemimycena

1. Pileus deep orange, 10-15 mm diameter; spores ellipsoid to cylindric, 4.4-6.6 × 2.2-3.3 µm . . . . . 1. *H. aurantiaca*

1. Pileus not orange coloured:

2. Basidiocarps caespitose; white with yellowish disk, 1.5-2.5 cm diameter; spores 8-10 × 4 µm . . . . . 2. *H. cucullata*

2. Lignicolour; pileus up to 4 cm diameter, white, spores short cylindric, 5.5-6.6 × 2.2-3.3 mµ . . . . . 3. *H. indica*

1. *H. aurantiaca* Natarajan and Manjula in *Mycologia* **74** 132 (1982)

Tamil Nadu, Nilgiris, Ootacamund, type locality

2. *H. cucullata* (Pers. ex Fr.) Singer in *Persoonia* **2** 20 (1961)

Uttar Pradesh, Saharanpur (Hennings 1901 334 as *Mycena gypsea* (Fr.) Quél.)

3. *H. indica* Natarajan and Manjula in *Can. J. Bot.* **59** 556 (1981)

Tamil Nadu, Tirunelveli Dt., Senkaltheri, Annamalai Nagar Estate, Kalakkadu sanctuary, type locality

45. *Mycena* (Pers ex Fr.) S F Gray, *Nat. Arr. Br. Pl.* **1** 619 (1821)

Key to the Indian species of Mycena

1. Pileus pale pinkish to pale grey; pine wood species:
   2. Lamellae interveined:
      3. Caespitose; lamellae strongly interveined to subporoid; stipe pale ..... 5. *M. colligata*
      3. Solitary; lamellae slightly interveined:
         4. Pileus pinkish white; stipe base dark brown ..... 4. *M. bicrenata*
         4. Pileus and stipe greyish brown ..... 1. *M. aetites*
   2. Lamellae not interveined:
      5. Pileus soon depressed to umbilicate; lignicolous ..... 8. *M. discors*
      5. Pileus convex to umbonate; terrestrial ..... 18. *M. pura*
1. Pileus neither pale pinkish nor pale grey:
   6. Stipe yellow; pine wood species:
      7. Basidiocarp small, pileus less than 1 cm diameter, deep red with yellow apex; stipe filiform ..... 10. *M. flavominiata*
      7. Basidiocarp larger, pileus 1-2 cm diameter, yellowish or greenish:
         8. Stipe viscid ..... 9. *M. epipterygia*
         8. Stipe dry ..... 16. *M. prasia*
   6. Stipe not yellow:
      9. Basidiocarp robust, stipe 2-3 mm thick; pileus and stipe greyish brown; lignicolous:
         10. Stipe base ridged, strigose ..... 11. *M. galericulata*
         10. Stipe base smooth, glabrous ..... 14. *M. nubigena*
      9. Basidiocarp slender, fragile; stipe 1-2 mm diameter:
         11. Lamellae yellow; spores 6-8 × 4-5.7 µm; lignicolous:
            12. Pileus red; stipe umbrinous ..... 21. *M. russulina*
            12. Pileus greyish white with yellowish tints towards the margin:
               13. Basidiocarp small; pileus up to 1 cm diameter densely caespitose ..... 12. *M. manipularis*
               13. Pileus 1-3 cm diameter; solitary ..... 22. *M. xanthophylla*

11. Lamellae not yellow:

14. Pileus with red or red-brown tints:

15. Pileus white with reddish brown disk and striae; basidiocarp caespitose:

16. Stipe short; spores 5-7 × 4-6 µm . . . . . 6. *M. conocephala*

16. Stipe long; spores 8-11 × 5.7-7.7 µm . . . . . 3. *M. arata*

15. Pileus uniformly red to reddish brown; lamellae reddish:

17. Pileus conico-campanulate; spores 7.5-10 × 5-6.3 µm . . . . . 19. *M. rubiaetincta*

17. Pileus convex to depressed; spores 6.5-9.5 × 4-5 µm . . . . . 20. *M. rufo-picta*

14. Pileus lacking red tints:

18. Pileus greyish green; stipe white; spores 8.5-12 × 6.3-8.3 µm . . . . . 7. *M. dentosa*

18. Pileus greyish brown, lacking any green tints:

19. Spores 4.5-5.5 × 2.7-3.5 µm; stipe grey . . . . . 13. *M. myriadea*

19. Spores 7-9 × 3.5-5.5 µm:

20. Lamellae greyish; pileus greyish brown . . . . . 2. *M. atrocyanea*

20. Lamellae not greyish:

21. Lamellae pale pink; stipe brown at the base . . . . 17. *M. puberula*

21. Lamellae staining red; stipe grey . . . . . 15. *M. plicosa*

1. *M. aetites* (Fr.) Quél. in *Mem. Soc. Emul. Montbelian sér.* 2 **5** 242 (1872)

Jammu and Kashmir, Gulmarg (Watling and Gregory 1980 556)

2. *M. atrocyanea* (Fr.) Gillet, *Hymen.* 271 (1874)

Jammu and Kashmir, Gulmarg (Watling and Gregory 1980 556)

3. *M. arata* (Berk.) Sacc., *Syll. Fung.* **5** 269 (1887)

Sikkim, type locality, K (Berkeley 1850 79 as *Agaricus*)

4. *M. bicrenata* (Hook. f.) Sacc., *Syll. Fung.* **5** 278 (1887)

West Bengal, Darjeeling, Jillapahar, type locality, K (Berkeley 1850 79 as *Agaricus*)

5. *M. colligata* (Berk.) Sacc., *Syll. Fung.* **5** 271 (1887)

Sikkim, type locality, K (Berkeley 1852b 101 as *Agaricus*)

6. *M. conocephala* P. Henn. in *Hedwigia* **40** 334 (1901)

Uttar Pradesh, Saharanpur, type locality

7. *M. dentosa* (Berk.) Sacc., *Syll. Fung.* **5** 282 (1887)

Sikkim, type locality, K (Berkeley 1852b 102 as *Agaricus*)

8. *M. discors* (Berk.) Sacc., *Syll. Fung.* **5** 264 (1887)

Sikkim, type locality, K (Berkeley 1852b 101 as *Agaricus*)

9. *M. epipterygia* (Scop. ex Fr.) S F Gray, *Nat. Arr. Brit. Pl.* **1** 619 (1821)

Sikkim (Berkeley, 1852b 103 as *Agaricus*)

10. *M. flavominiata* (Berk.) Sacc., *Syll. Fung.* **5** 289 (1887)

Sikkim, type locality, K (Berkeley 1852b 103 as *Agaricus*), Sikkim upper Rangit (Horak 1980 107)

11. *M. galericulata* (Scop. ex Fr.) S F Gray, *Nat. Arr. Brit. Pl.* **1** 619 (1821)

Sikkim (Berkeley 1852b 101 as *Agaricus*); Jammu and Kashmir, Sonamarg (Watling and Gregory 1980 557)

12. *M. manipularis* (Berk.) Sacc., *Syll. Fung.* **5** 272 (1887), non Metrod (1949)

Sikkim, Sinchul, type locality, K (Berkeley 1850 81 as *Agaricus*)

13. *M. myriadea* (Berk.) Sacc., *Syll. Fung.* **5** 271 (1887)

Sikkim, Sinchul, type locality, K (Berkeley 1850 78 as *Agaricus*)

14. *M. nubigena* (Berk.) Sacc., *Syll. Fung.* **5** 269 (1887)

West Bengal, Darjeeling, type locality, K (Berkeley 1850 78 as *Agaricus*)

15. *M. plicosa* (Fr.) Gillet, Hymen. 270 (1874)

Uttar Pradesh, Saharanpur (Hennings 1901 334)

16. *M. prasia* (Berk.) Sacc., *Syll. Fung.* **5** 264 (1887)

Sikkim, type locality, K (Berkeley 1850 81 as *Agaricus*)

17. *M. puberula* (Berk.) Sacc., *Syll. Fung.* **5** 284 (1887)

Sikkim, type locality, K (Berkeley 1852b 102 as *Agaricus*)

18. *M. pura* (Pers ex Fr.) Kummer, *Führ. Pilzk.* 110 (1871)

Sikkim (Berkeley 1852b 101 as *Agaricus purus* Pers.)

19. *M. rubiaetincta* (Berk.) Sacc., *Syll. Fung.* **5** 291 (1887)

West Bengal, Darjeeling, type locality, K (Berkeley 1850 79 as *Agaricus*)

20. *M. rufo-picta* (Berk.) Sacc., *Syll. Fung.* **5** 276 (1887)

West Bengal, Darjeeling, type locality, K (Berkeley 1850 81 as *Agaricus*)

21. *M. russulina* (Berk.) Sacc., *Syll. Fung.* **5** 272 (1887)

West Bengal, Darjeeling, type locality, K (Berkeley 1850 80 as *Agaricus*)

22. *M. xanthophylla* (Berk.) Sacc., *Syll. Fung.* **5** 272 (1887)

West Bengal, Darjeeling, type locality, K (Berkeley 1850 80 as *Agaricus*)

Excluded species

Mycena broomeiana (Berk.) Sacc.	see *Collybia broomeiana*
Mycena gypsea (Fr.) Quél.	see *Hemimycena cucullata*
Mycena incommiscibilis (Berk.) Sacc.	see *Pseudohiatula* sp.
Mycena macrothela (Berk.) Sacc.	see *Galerina* sp.
Mycena rufata (Berk.) Sacc.	see *Collybia rufata*

46. *Xeromphalina* Kühn and Maire in *Bull. Soc. Mycol. Fr.* **50** 18 (1934)

Key to the Indian species of Xeromphalina

1. Spores 6.5-7.5 × 2.8-3.5 µm; pileus 0.6-1.3 cm diameter, campanulate-convex, ochraceous ..... 2. *X. campanella*

1. Spores smaller, up to 6.5 µm long:

   2. Spores 4-6 × 2.8-3.5 µm; pileus 1-2.5 cm diameter, hygrophanous, fuscous brown at the centre, yellow elsewhere; stipe 2-6 cm long ..... 1. *X. amara*

   2. Spores 5-6.5 × 3 µm; pileus 3-7 mm diameter, reddish brown; dry; stipe 1.5-2.5 cm long, short ..... 3. *X. disseminata*

1. *X. amara* Horak and Peter apud Horak in *Schweiz. Zeit. Pilzk.* **42** 103 (1964)

Jammu and Kashmir, Gulmarg (Watling and Gregory 1980 558)

2. *X. campanella* (Batsch ex Fr.) Maire apud Kühn. and Maire in *Bull. Soc. Mycol. Fr.* **50** 18 (1934)

Jammu and Kashmir, Sonamarg (Murrill 1924 133 as *Omphalia*; Watling and Gregory, 1980 560)

3. *X. disseminata* Horak in *Sydowia* **33** 104 (1980)

Sikkim, Upper Rangit, Dzongri, type locality

Pseudohiatuleae Singer, *Agar. Mod. Taxon.* ed. **3** 412 (1975)

47. *Flammulina* Karst. in *Medd. Soc. Fauna Fl. Fenn.* **18** 62 (1891)
F. velutipes (Curt. ex Fr.) Karst. ex Singer in *Lilloa* **22** 351 (1951)

West Bengal, Darjeeling (Berkeley 1850 76 as *Agaricus*); Calcutta (Banerjee 1947 42); Sikkim (Berkeley 1852b 100 as *Agaricus*); Uttar Pradesh, Allahabad University (Singh and Mehrotra 1974 515 as *Collybia*); Jammu and Kashmir, Pahlgam (Watling and Gregory 1980 552); Punjab, Kulu (Ghosh *et al* 1967 240)

48. *Pseudohiatula* (Singer) Singer *Notulae Crypt. Sect. Crypt. Ac. Sc. U.S.S.R.* **10-12** 8 (1938)

Pseudohiatula sp.

Sikkim, type locality, K (Berkeley 1852b 102 as *Agaricus incommiscibilis* Berk.)

49. *Xerulina* Singer in *Sydowia* **15** 59 (1962)
X. asprata (Singer) Pegler in *Kew. Bull.* **27** 196 (1972)

Tamil Nadu, Kodaikanal, Berijam lake (Manjula 1980 127)

Rhodoteae Imai in *J. Imp. Univ. Hokk.* **1** 237 (1938)

50. *Rhodotus* R. Maire in *Bull. Soc. Mycol. Fr.* **40** 308 (1924)
R. palmatus (Bull. ex Fr.) Maire in *Bull. Soc. Mycol. Fr.* **40** 308 (1924)

Uttar Pradesh, Saharanpur (Hennings 1901 334 as *Pleurotus subpalmatus* Fr.)

6. *Amanitaceae* Roze in *Bull. Soc. Bot. Fr.* **23** 51 (1876)

51. *Amanita* Pers. ex Hooker, *Fl. Scot.* **2** 19 (1821)

Key to the Indian species of Amanita

1. Spores amyloid; pileal margin not sulcate-striate . . . . . Subgenus: *Lepidella*

2. Volva saccate, pileal margin not appendiculate . . . . . Sect. *Phalloideae*

Pileus white to cream coloured, glabrous; spores subglobose, 8-12 × 7-9 µm; stipe white, smooth . . . . . 9. *A. verna*

2. Volva floccose-pulverulent:

3. Pileal margin appendiculate; annulus floccose to fugacious . . . . . Sect. *Lepidella*

4. Stipe pale purplish grey, with floccose velar scales; volva forming irregular greyish brown patches at the base of the stipe; spores 8-12 × 6.5-9.7 µm . . . . . 2. *A. eriophora*

4. Stipe whitish, without purplish tints; volva fugacious without leaving any remnants at the base; spores 8-11.5 × 7-9 µm . . . . . 1. *A. berkeleyi*

3. Pileal margin not appendiculate; annulus membranous . . . . . Sect. *Validae*

Pileus pale greyish umber, 5-10 cm diameter, with crowded conical, verrucae near the disk; spores subglobose, 7-8 × 6.5-7.5 µm . . . . . 3. *A. fritillaria*

1. Spores inamyloid; pileal margin sulcate-striate . . . . . Subgenus: *Amanita*

5. Volva friable; stipe with a bulbous base . . . . . Sect. *Amanita*

6. Pileus scarlet to pale orange with large white velar squamules; annulus large, pendent . . . . . 6. *A. muscaria*

6. Pileus brown to olivaceous brown; annulus fragile . . . . . 7. *A. pantherina*

5. Volva saccate; stipe without bulbous base:

7. Pileus pale grey to greyish brown; spores globose:

8. Pileus white to grey; volva persistent . . . . . 8. *A. vaginata*

8. Pileus yellowish to greyish brown; volva soon breaking up into loose squamules . . . . . 5. *A. inaurata*

7. Pileus reddish orange to yellow; lamellae yellowish; spores 8-11 × 7-9 µm, ellipsoid ..... 4. *A. hemibapha*

1. *A. berkeleyi* (Hook. f.) Bas in *Persoonia* **5** 476 (1969)

West Bengal, Darjeeling, type locality, K (Berkeley 1850 43 as *Agaricus*); Jillapahar (Berkeley 1850 42 as *Agaricus regalis* Berk.)

2. *A. eriophora* (Berk.) Gillet. apud Bres., *Icon. Mycol.* **27** 230 (1941)

West Bengal, Darjeeling, type locality, K (Berkeley 1850 43 as *Agaricus*)

3. *A. fritillaria* (Berk.) Sacc., *Syll. Fung.* **9** 2 (1891)

Assam, Khasia Hills, type locality, K (Berkeley 1852b 97 as *Agaricus*); Uttar Pradesh, Dehra Dun (Bakshi 1974 10)

4. *A. hemibapha* (Berk. and Br.) Sacc., *Syll. Fung.* **5** 13 (1887)

Assam, Khasi Hills (Berkeley 1852b 97 misidentified as *Agaricus caesareus* Scop.); Uttar Pradesh, Dehra Dun (Bakshi 1974 10)

5. *A. inaurata* Secr., *Mycogr. Suisse* **1** 36 (1833)

Uttar Pradesh, Allahabad (Singh and Mehrotra 1974 517)

6. *A. muscaria* (L. ex Fr.) W. J. Hooker, *Fl. Scot.* 19 (1821)

Tamil Nadu, Kodaikanal, Guntur (Natarajan 1977 35); Jammu and Kashmir, Sonamarg (Watling and Gregory 1980 499)

7. *A. pantherina* (DC ex Fr.) Secr., *Mycogr. Suisse* **1** 20 (1833)

Jammu and Kashmir, Gulmarg (Watling and Gregory 1980 500)

8. *A. vaginata* (Bull. ex Fr.) Vitt., *Tenam. Mycol. Amanitarum Illustr.* (1828)

Assam, Khasia Hills (Berkeley 1852b 97 as *Agaricus*); Himachal Pradesh, Solan (Sohi *et al* 1964 320); Jammu and Kashmir, Sarband near Harwan (Watling and Gregory 1980 500); Maharashtra, Nagpur (Trivedi 1972); Uttar Pradesh, Lucknow (Ghosh *et al* 1974), Allahabad (Singh and Mehrotra 1974 516); West Bengal, Bankura (Ray and Samajpati 1979 68)

9. *A. verna* (Bull. ex Fr.) Vitt., *Descr. Fung. Mang. Pl.* **44** (1835)

Uttar Pradesh, Dehra Dun (Bakshi 1974 11)

Excluded species

Amanita caesarea sensu Berkeley (1852) non Fr. (1821)	see *Amanita hemibapha*
Amanitopsis berkeleyi (Hook. f.) Sacc.	see *Amanita berkeleyi*
Amanitopsis eriophora (Berk.) Sacc.	see *Amanita eriophora*
Amanitopsis fritillaria (Berk.) Sacc.	see *Amanita fritillaria*
Amanitopsis regalis (Berk.) Sacc.	see *Amanita berkeleyi*
Amanitopsis vaginata (Bull.) Roze	see *Amanita vaginata*

52. *Termitomyces* Heim in *Arch. Mus. Nat. Hist. Nat. sér.* 6 **18** 148 (1942)

Key to the Indian species of Termitomyces

1. Basidiocarp small, mycenoid, epigeal or subepigeal; pileus up to 3.5 cm diameter, veil absent ..... Subgenus: *Praetermitomyces*

2. Pileus brown, 1-1.5 cm diameter ..... 1. *T. badius*

2. Pileus white to cream coloured:

3. Pseudorrhiza present; cystidia absent ..... 9. *T. radicatus*

3. Pseudorrhiza absent:

4. Cystidia present and numerous ..... 7. *T. microcarpus*

4. Cystidia absent ..... 5. *T. indicus*

1. Basidiocarp large, pluteoid, hypogeal; pileal diameter generally exceeding 3.5 cm diameter, usually with a long pseudorrhiza ... Subgenus: *Termitomyces*

5. Annulus absent or fugacious:

6. Veil appendiculate; pileus surface brown with brownish striations and pustular velar squamules ..... 6. *T. mammiformis*

6. Veil fugacious:

7. Perforatorium strongly spiniform; blackish brown, pileal surface dark brown ..... 2. *T. clypeatus*

7. Perforatorium not spiniform:

8. Perforatorium obtusely conical, pileal surface chestnut brown ..... 8. *T. rabuorii*

8. Perforatorium submammilate; pileus dark brown, scrobiculate ..... 10. *T. robustus*

5. Annulus present:

9. Pileus up to 10 cm diameter, white with greyish centre; annulus thick, woolly ..... 4. *T. heimii*

9. Pileus 10-25 cm diameter, greyish brown to fuligineus, viscid; annulus present, at times inconstant ..... 3. *T. eurrhizus*

1. *T. badius* Otieno in *Sydowia* **22** 162 (1969)

Tamil Nadu, Madras University campus (Natarajan 1975 64)

Agaricus burkillae Massee in *Bull. Misc. Inf. Kew* **1912** 255 (1912)
Annularia burkillae (Massee) Sacc., *Syll. Fung.* **23** 181 (1925)

West Bengal, Calcutta, type locality, K. The microstructures indicate this to be a pecies of *Termitomyces* Heim, but the poorly preserved type material and the lack f an accompanying illustration preclude a transfer at this time.

2. *T: clypeatus* Heim in *Bull. Jard. Bot. Brux.* **21** 207 (1951)

Tamil Nadu, Madras University campus (Natarajan 1975 65); Himachal Pradesh, Solan (Sharma *et al* 1977 14); Maharashtra, Kanaeshwar (Patil *et al* 1979 353)

3. *T. eurrhizus* (Berk.) Heim. in *Arch. Mus. Nat. Hist. sér.* 6 **18** 140 (1942)

West Bengal, Midnapur (Purkayastha and Chandra 1975 168), Maharashtra, Poona (Patil, Nair and Kapadnis 1979 353 as *T. cartilagineus*)

Entoloma goliath (Hook. f.) Sacc., *Syll. Fung.* **5** 680 (1887)

West Bengal, Darjeeling, type locality (Berkeley 1850 85 as *Agaricus goliath*). It is unfortunate that no material can be traced in the Kew Herbarium of this large fungus, but there does exist the original water-color sketches by J D Hooker. The gigantic proportions of the basidiocarps, the prominent and persistent umbo, and the almost free, pinkish brown lamellae strongly suggest this to be a species of *Termitomyces*, possibly *T. eurrhizus* (Berk.) Heim. The sketches, however figure a stipe with a rounded base lacking any indication of a pseudorrhiza

4. *T. heimii* Natarajan in *Mycologia* **71** 853 (1979)

Tamil Nadu, Madras University campus, type locality; Maharashtra, Poona (Patil *et al* 1979 353 as *T. albuminosa*)

5. *T. indicus* Natarajan in *Kavaka* **3** 63 (1975)

Tamil Nadu, Madras, Chepauk, Post-Graduate Women's Hostel campus, type locality

6. *T. mammiformis* Heim in *Arch. Mus. Nat. Hist. Nat. sér.* 7 **18** 147 (1942)

Maharashtra, Poona University campus (Patil *et al* 1979 349)

7. *T. microcarpus* (Berk. and Br.) Heim in *Mem. Acad. Sci. Inst. Fr.* **64** 72 (1941)

Tamil Nadu, Madras University campus (Natarajan 1975 66); Tirunelveli Dt. Mundanthurai sanctuary (Natarajan and Raman 1981 173 as forma *elongatus* Heim); Maharashtra, Poona (Patil *et al* 1979 353)

8. *T. rabuorii* Otieno in *Proc. E. Afr. Acad.* **21** 115 (1966)

Tamil Nadu, Madras (Natarajan 1977 36)

9. *T. radicatus* Natarajan in *Curr. Sci.* **46** 679 (1977)

Jammu and Kashmir, Jammu, Regional Research Laboratory, type locality

10. *T. robustus* (Beeli) Heim in *Bull. Jard. Bot. Brux.* **21** 210 (1951)

Kerala, Vellayani Agriculture College campus (Bhavani Devi *et al* 1980 53); Maharashtra, Poona (Patil *et al* 1979 349)

Excluded species

Termitomyces albuminosa (Berk.) Heim. see *Termitomyces heimii*

Termitomyces cartilagineus (Berk.) Heim. see *Termitomyces eurrhizus*

7. *Pluteaceae* Kotl. and Pouz. in *Ceska Mykol.* **26** 218 (1972)

53. *Pluteus* Fr., *Gen. Hymen.* 6 (1836)

Key to the Indian species of Pluteus

1. Pileus pale green, glabrous, 3 cm diameter, conico-convex; stipe up to 8 cm long, white; lamellae yellow; on burnt conifer roots . . . . . 2. *P. chrysoprasius*

1. Pileus not green:

2. Stipe blackish brown; pileus conical, concolorous . . . . . 3. *P. cuspidatus*

2. Stipe white or yellow:

3. Stipe yellow, glabrous; pileus orange brown with yellow margin; spores 5.5-7 × 4.5-6 µm, subglobose . . . . . 4. *P. lutescens*

3. Stipe white:

4. Pileus obtusely umbonate, lead grey, glabrous . . . . . 5. *P. palumbinus*

4. Pileus-brown:

5. Stipe smooth, glabrous, pileus pale brown; spores 4.5-6.5 × 3.5-4.5 µm . . . . . 6. *P. subcervinus*

5. Stipe with dark fibrils; pileus greyish brown to umber; spores 6-8 × 4-6 µm . . . . . 1. *P. cervinus*

1. *P. cervinus* (Schaeff. ex Fr.) Kummer, *Führ. Pilzk.* 99 (1871)

Uttar Pradesh, Lucknow (Ghosh *et al* 1974); Jammu and Kashmir, Phalgam Watling and Gregory 1980 536); Gujarat, Baroda (Moses 1948)

2. *P. chrysoprasius* (Berk.) Sacc., *Syll. Fung.* **5** 678 (1887)

Sikkim, Tonglo, type locality, K (Berkeley 1850 84 as *Agaricus*)

3. *P. cuspidatus* (Berk.) Sacc., *Syll. Fung.* **5** 677 (1887)

Assam, Khasi Hills, type locality, K (Berkeley 1852b 105 as *Agaricus*)

4. *P. lutescens* (Fr.) Bres., *Icon. Mycol.* **11** 547 (1929)

Sikkim, Upper Rangit (Horak 1980 109)

5. *P. palumbinus* (Berk.) Sacc., *Syll. Fung.* **5** 677 (1887)

West Bengal, Darjeeling, type locality, K (Berkeley 1850 84 as *Agaricus*)

6. *P. subcervinus* (Berk. and Br.) Sacc., *Syll. Fung.* **5** 66 (1887)

Tamil Nadu, Tirunelveli Dt., Senkaltheri (Natarajan and Raman 1980 233)

54. *Volvariella* Speg. in *Anal. Mus. Nac. B. Aires* **6** 118 (1899)

Key to the Indian species of Volvariella

1. Spores more than 11 µm long:

2. Pileus more than 5 cm diameter:

3. Pileus blackish brown, 12-18 cm diameter, volva fleshy, tomentose ..... 5. *V. indica*

3. Pileus white to pale grey, 7-15 cm diameter; volva membranous ..... 9. *V. speciosa*

2. Pileus 3-5 cm diameter, whitish; volva white ..... 7. *V. media*

1. Spores up to 10 µm long:

4. Lignicolous, on dead wood; pileus pale yellow then whitish:

5. Volva white:

6. Spores 8-10 × 5-6 µm; volva large and fleshy ..... 1. *V. bombycina*

6. Spores 6.3-8 × 4-5 µm; volva small and thin; lamellae with brownish tints ..... 10. *V. thwaitesii*

5. Volva brown ..... 4. *V. diplasia*

4. Growing on other substrata:

7. Basidiocarp small; pileus 0.5-2 (3) cm diameter; pileus white; volva white:

8. Pileus subvelutinate, 0.5-1 cm diameter; spores 4-5 × 4 µm ..... 6. *V. liliputiana*

8. Pileus glabrous to silky fibrillose, 1-3 cm diameter:

9. Spores 5-6 × 3.2-4 µm; pileus at first slightly pinkish ..... 3. *V. delicatula*

9. Spores 5.5-6.5 × 4-5 µm; pileus white finally dirty yellowish ..... 8. *V. parvula*

7. Basidiocarp larger; pileus 4-10 cm diameter; coloured:

10. Pileus reddish brown, rimose:

11. Volva with large, brown, verrucose squamules ... 11. *V. terastia*

11. Volva smooth, not squamose:

12. Pileus bright chestnut brown; spores 5-6.5 × 3.5-4 µm ..... 2. *V. castanea*

12. Pileus dull brown, snuff-brown to date-brown; spores 7-9 (10) × 5-6 µm ..... 12. *V. volvacea*

10. Pileus ash-green to greyish brown; volva white; spores 7.3-9 × 4.5-5.5 µm ..... 13. *V. woodrowiana*

1. *V. bombycina* (Schaeff. ex Fr.) Singer in *Lilloa* **22** 401 (1951)

Uttar Pradesh, Lucknow (Ghosh *et al* 1967 237; Pathak *et al* 1978 298); Allahabad (Singh and Mehrotra 1974 517)

2. *V. castanea* (Massee) Rath in *J. Indian Bot. Soc.* **41** 525 (1962)

Uttar Pradesh, Lucknow (Pathak *et al* 1978 297); West Bengal, Calcutta (Massee 1912 254 as *Volvaria*), type locality, K

3. *V. delicatula* (Massee) Manjula

West Bengal, Calcutta (Massee 1912 254 as *Volvaria*) type locality, K; Uttar Pradesh, Lucknow (Pathak *et al* 1978 300 as *Volvaria*)

4. *V. diplasia* (Berk. and Br.) Singer in *Lilloa* **22** 401 (1951)

West Bengal, Hooghly (Bose 1920a 350 as *Volvaria*); Uttar Pradesh, Lucknow (Pathak *et al* 1978 299; Rath 1962)

5. *V. indica* Pathak, Ghosh and Singh in *Indian Mush. Sci.* **1** 300 (1978)

Uttar Pradesh, Lucknow, type locality

6. *V. liliputiana* (P. Henn.) Rath in *J. Indian Bot. Soc.* **41** 527 (1962)

Uttar Pradesh, Saharanpur, type locality (Hennings 1901 333 as *Volvaria*); Lucknow (Pathak *et al* 1978 297)

7. *V. media* (Schum. ex Fr.) Singer in *Lilloa* **22** 401 (1951)

Uttar Pradesh, Saharanpur (Hennings 1901 334 as *Volvaria*), Lucknow (Pathak *et al* 1978 298)

8. *V. parvula* (Weinm.) Speg. in *Bot. Acad. Cienc. Cordoba* **28** 309 (1926)

Tamil Nadu, Madras (Natarajan 1978 70); Uttar Pradesh, Lucknow (Ghosh *et al* 1967 237 as *V. pusilla* (Pers. ex Fr.) Singer)

9. *V. speciosa* (Fr. ex Fr.) Singer in *Lilloa* **22** 401 (1951)

Uttar Pradesh, Lucknow (Pathak *et al* 1978 298; Ghosh *et al* 1967 237)

10. *V. thwaitesii* (Hook. f.) Rath in *J. Indian Bot. Soc.* **41** 529 (1962)

Uttar Pradesh, Lucknow; West Bengal, Darjeeling, type locality, K (Berkeley 1850 85 as *Volvaria*; Pathak *et al* 1978 298)

11. *V. terastia* (Berk. and Br.) Singer *Mushrooms and Truffles* 114 (1961)

West Bengal (Bose 1920b 137; 1921 643 as *Volvaria*); Uttar Pradesh, Lucknow (Pathak *et al* 1978 299; Rath 1962)

12. *V. volvacea* (Bull. ex Fr.) Singer in *Lilloa* **22** 401 (1951)

Uttar Pradesh, Mussoorie (Hennings 1901 334 as *Volvaria*), Lucknow (Pathak *et al* 1978 299)

13. *V. woodrowiana* (Massee) Manjula

Maharashtra, Poona, type locality, K (Massee 1899 166); Uttar Pradesh, Lucknow (Pathak *et al* 1978 300 as *Volvaria*)

Excluded species

Volvaria castanea Massee — see *Volvariella castanea*

Volvaria delicatula Massee	see *Volvariella delicatula*
Volvaria diplasia Berk. and Br.	see *Volvariella diplasia*
Volvaria liliputiana P. Henn.	see *Volvariella liliputiana*
Volvaria media (Schum) Fr.	see *Volvariella media*
Volvariella pusilla (Pers. ex Fr.) Singer	see *Volvariella parvula*
Volvaria terastia Berk. and Br.	see *Volvariella terastia*
Volvaria thwaitesii Hook. f.	see *Volvariella thwaitesii*
Volvaria volvacea (Bull.) Sacc.	see *Volvariella volvacea*
Volvaria woodrowiana Massee	see *Volvariella woodrowiana*

8. *Agaricaceae* Fr., *Syst. Orb. Veg.* 65 (1825)
Leucocoprineae Singer in *Pap. Mich. Acad. Sci. Arts Lett.* **32** 141 (1948)

55. *Chlorophyllum* Massee in *Bull. Misc. Inf. Kew* **1898** 135 (1898)
C. molybdities (Meyer ex Fr.) Massee in *Bull. Misc. Inf. Kew* **1898** 136 (1898)

Uttar Pradesh, Lucknow (Ghosh *et al* 1976 50), Allahabad (Singh and Mehrotra 1974 517); Tamil Nadu, Madras, Indian Institute of Technology campus, Deer Park, Post-Graduate Women's Hostel campus, Madras University campus (Manjula 1980 134; Natarajan and Manjula 1981 50)

56. *Clarkeinda* O. Kuntze in *Rev. Gen. Pl.* **2** 848 (1891)
C. trachodes (Berk.) Singer in *Lilloa* **22** 413 (1951)

Kerala, Calicut University campus (Leelavathy *et al* 1981 204)

57. *Leucoagaricus* (Locq.) Singer in *Sydowia* **2** 35 (1948)

Key to the Indian species of Leucoagaricus

1. Pileus squamose:
   2. Pileus at first white soon bright reddish brown, finally dark brown, squamose ..... 1. *L. badhamii*
   2. Pileus bearing greyish brown fibrillose squamules on a white background ..... 2. *L. fuligineus*
1. Pileus white, glabrous, not reddening:
   3. Basidiocarp remaining white ..... 4. *L. naucinus*
   3. Basidiocarp bruising yellowish, at least on the stipe ..... 3. *L. holosericeus*

1. *L. badhamii* (Berk. and Br.) Singer in *Lilloa* **22** 416 (1951)

Maharashtra, Bombay (Blatter 1911)

2. *L. fuligineus* Pegler in *Kew Bull. Addit. sér.* **6** 314 (1977)

Tamil Nadu, Nilgiris, Lovedale Railway Station (Manjula 1980 148, Natarajan and Manjula 1981 55)

3. *L. holosericeus* (Fr.) Moser apud Gams, *Kl. Krypt. Fl.* **2** 185 (1953)

Uttar Pradesh, Saharanpur (Hennings 1901 335 as *Lepiota*)

4. *L. naucinus* (Fr.) Singer in *Lilloa* **22** 418 (1951)

Uttar Pradesh, Allahabad University campus (Singh and Mehrotra 1974 519 as *Lepiota*); Tamil Nadu, Madras, Deer Park (Manjula 1980 147; Natarajan and Manjula 1981 54); Maharashtra, Nagpur (Trivedi 1972)

Excluded species

Leucoagaricus excoriatus (Schaeff. ex Fr.) Singer see *Macrolepiota excoriata*

58. *Leucocoprinus* Pat. in *J. Bot. Paris* **2** 16 (1888)

Key to the Indian species of Leucocoprinus

1. Basidiocarp colour does not change by bruising:
   2. Basidiocarp uniformly white, yellow or greenish yellow; pileus covered by granular furfuraceous squamules:
      3. Basidiocarp uniformly white; cheilocystidia mucronate, sometimes constricted ..... 2. *L. cepaestipes*
      3. Pileus white with brownish umbo; spores with obscure germ-pore ..... 5. *L. tropicus*
   2. Basidiocarp not white:
      4. Basidiocarp uniformly bright yellow, with dimorphic cheilocystidia ..... 1. *L. birnbaumii*
      4. Basidiocarp uniformly greenish yellow ..... 3. *L. flavipes*
1. Basidiocarp surface bruising either yellow or red; pileus with brown fibrillose squamules; stipe brownish from the base ..... 4. *L. meleagris*

1. *L. birnbaumii* (Corda) Singer in *Sydowia* **15** 67 (1962)

Uttar Pradesh, Saharanpur (Hennings 1901 335 as *Lepiota cepaestipes* var. *lutea*); Tamil Nadu, Madras (Natarajan 1977 36 as *Leucocoprinus cepaestipes*), Madras Christian College campus, Raj Bhavan campus (Manjula 1980 153, Natarajan and Manjula 1981 55); Andhra Pradesh, Masulipatam (Berkeley 1867 18 as *Agaricus allicens* Berk.)

2. *L. cepaestipes* (Sow. ex Fr.) Pat., *Tab. Analyt. Fung.* Fasc. 7 45 (1889)

Maharashtra, Poona (Massee 1901 151 as *Lepiota* with two varieties); West Bengal, Calcutta (Bose 1920a 350 as *Lepiota* and recognises two varieties white and red. Tamil Nadu, Madras, Deer Park (Manjula 1980 156); Gujarat, Baroda (Moses 1948)

3. *L. flavipes* Pat. and Gillard in *Bull. Soc. Mycol. Fr.* **4** 26 (1888)

Tamil Nadu, Madras, Post-Graduate Women's Hostel (Manjula 1980 154; Natarajan and Manjula 1981 57)

4. *L. meleagris* ([Sow.] S F Gray) Locq. in *Bull. Soc. Linn. Lyon* **14** 93 (1943)

Uttar Pradesh, Saharanpur (Hennings 1901 335 as *Lepiota*)

5. *L. tropicus* Natarajan and Manjula in *Mycologia* **74** 132 (1982)

Tamil Nadu, Madras, Raj Bhavan campus, type locality

59. *Macrolepiota* Singer in *Pap. Mich. Acad. Sci., Arts. Lett.* **32** 141 (1948)

Key to the Indian species of Macrolepiota

1. Spores more than 12 µm long:
   2. Stipe elongate, longer than pileus diameter:
      3. Stipe brown, squamose; pileus with large reflexed squamules ..... 7. *M. procera*
      3. Stipe glabrous:
         4. Pileus with mamillate, umbonate, with furfuraceous squamules ..... 2. *M. dolichaula*
         4. Pileus convex, subumbonate, with squamules ..... 6. *M. mahabaleshwarensis*
   2. Stipe length generally not exceeding pileal diameter:
      5. Pileus minutely furfuraceous ..... 5. *M. mastoidea*
      5. Pileus with reflexed, fibrilled squamules ..... 3. *M. excoriata*

1. Spores 7-12 µm long:
   6. Context reddens on exposure; pileus surface with large dark brown squamules:
      7. Spores abruptly truncated by germ-pore ..... 9. *M. rhacodes*
      7. Spores broadly ellipsoid with inconspicuous germ-pore ..... 4. *M. mallea*
   6. Context white, not reddening on exposure; pileus pale:
      8. Spores truncated by germ-pore; pileus surface with appressed viscid squamules ..... 1. *M. albuminosa*
      8. Spores ellipsoid with inconspicuous germ-pore; pileal surface with reflexed fibrillose squamules ..... 8. *M. puellaris*

1. *M. albuminosa* (Berk.) Pegler in *Kew Bull.* **27** 189 (1972)

West Bengal (Bose 1920a 349, 1921 643 as *Collybia* and *Lepiota*)

2. *M. dolichaula* (Berk. and Br.) Pegler and Rayner in *Kew Bull.* **23** 365 (1965)

Kerala, Deviculam (Manjula 1980 139, Natarajan and Manjula 1981 53); Maharashtra, Poona (Massee 1898 114 as *Lepiota altissima* Massee)

3. *M. excoriata* (Schaeff. ex Fr.) Moser, *Kleine Krypt. Fl.* 244 (1978)

Punjab (Cooke 1880 13); Uttar Pradesh, Saharanpur (Hennings 1901 336); Maha-

rashtra, Poona (Massee 1901 151); West Bengal, Darjeeling (Berkeley 1850 43 as *Agaricus*)

4. *M. mallea* (Berk.) Manjula

Tamil Nadu, Nilgiri Hills, Wellington, type locality, K (Berkeley 1867 20)·

5. *M. mastoidea* (Fr.) Singer in *Lilloa* **22** 417 (1951)

Uttar Pradesh, Lucknow (Ghosh and Pathak 1965 361); West Bengal, Calcutta (Bose 1920b 136, 1921 643; Banerjee 1947 43 as *Lepiota*)

6. *M. mahabaleshwarensis* (Sathe and Deshpande) Manjula

Maharashtra, Poona (Sathe and Deshpande 1979 694); Poona (Massee 1901 151 as *Lepiota beckleri* (Berk.) Sacc.)

7. *M. procera* (Scop. ex Fr.) Singer in *Pap. Mich. Acad. Sci. Arts Lett.* **32** 141 (1948)

Uttar Pradesh, Saharanpur (Hennings 1901 336 as *Lepiota*), Lucknow (Sohi *et al* 1964 320), Allahabad, Naini (Singh and Mehrotra 1974 518); Jammu and Kashmir, Pahlgam (Watling and Gregory 1980 531); Himachal Pradesh, Solan (Sohi *et al* 1964 320)

8. *M. puellaris* (Fr.) Moser apud Gams in *Kleine. Krypto Mittleeuropa* **2** 114 (1953)

Uttar Pradesh, Kalsia Hills (Hennings 1900 153)

9. *M. rhacodes* (Vitt.) Singer in *Lilloa* **22** 417 (1951)

Tamil Nadu, Madras, Post-Graduate Women's Hostel campus, Indian Institute of Technology campus, Madras University campus, Deer Park, Raj Bhavan campus (Manjula 1980 142; Natarajan and Manjula 1981 51)

60. *Volvolepiota* Singer in *Bot. Soc. Arg. Bot.* **8** 12 (1959)
V. brunnea (Rick) Singer in *Bot. Soc. Arg. Bot.* **8** 12 (1959)

Uttar Pradesh, Allahabad (Singh and Mehrotra 1974 518)

Agariceae Pat., *Hymén. Eur.* 74 (1887)

61. *Agaricus* L. ex Fr., *Syst. Mycol.* **1** 5 (1821)

Key to the Indian species of Agaricus

1. Pileus glabrous or innately squamose, lacking a woolly, universal veil . . . . . Subgenus *Agaricus*

2. Context reddening on exposure:

3. Annulus poorly developed, thin, fragile, cheilocystidia clavate, globose or absent . . . . . Sect. *Agaricus*

4. Pileus 5-10 cm diameter, surface white; stipe not fusoid:

5. Pileus globose to broadly campanulate, spores ovoid . . . . . 3. *A. campestris*

5. Pileus planoconvex, spores globose . . . . . 2. *A. basiannulosus*

4. Pileus up to 15 cm diameter, surface deep brownish vinaceous; stipe fusoid . . . . . 6. *A. exaltatus*

3. Annulus well developed, persistent, often with squamules on underside . . . . . Sec. *Sanguinolentae*

6. Pileus 1-4 cm diameter:

7. Spores 4-5 µm broad:

8. Pileus areolately squamose, white becoming brown . . . . . 18. *A. woodrowii*

8. Pileus floccose-squamose, pale brown . . . . . *1. A. fulviceps*

7. Spores 3-4 *m*m broad; pileus white with brown squamules . . . . . 8. *A. comosus*

6. Pileus 3-8 cm diameter:

9. Spores 3-3.5 µm broad:

10. Pileus radially rimose . . . . . 13. *A. rimosus*

10. Pileus fibrillose squamose:

11. Context faintly red on exposure; cystidia clavate globose . . . . . 17. *A. variegans*

11. Context dark crimson on exposure; cystidia clavate . . . . . 14. *A. silvaticus*

9. Spores 3.7-4.7 µm broad; pileus and stipe pale brown 15. *A. squalidis*

2. Basidiocarp surface yellowing on bruising; context not reddening:

12. Basidiocarp fleshy, pileus 4-8 cm or more; annulus well developed; spores medium to long . . . . . Sect. *Majales*

13. Context deep yellow on exposure, at least at stipe base:

14. Stipe with a swollen base; pileal surface with dark sepia squamules . . . . . 19. *A. xanthosarcus*

14. Stipe cylindric:

15. Pileus with sooty brown squamules . . . . . 11. *A. placomyces*

15. Pileus with pale grey fuscus squamules . . . . . 9. *A. iodolens*

13. Context not deeply yellow:

16. Pileus white, glabrous; stipe cylindric . . . . . 1. *A. arvensis*

16. Pileus ochraceous, squamose:

17. Stipe with abruptly swollen base . . . . . 10. *A. latipes*

17. Stipe cylindric, floccose ..... 8. *A. heterocystis*

12. Basidiocarp slender; pileus 2-5 cm diameter, pileus radially fibrillose, vinaceous ..... 12. *A. purpurellus*

1. Pileus and stipe base covered by a woolly universal veil, often brightly coloured ..... Subgenus *Lanagaricus*

18. Pileus reddish orange ..... 16. *A. trisulphuratus*

18. Pileus yellowish orange ..... 5. *A. crocopeplus*

(For section characters refer Wasser, Garibova and Mokeeva V.L., 1976)

1. *A. arvensis* Schaeff. ex Fr., *Epicrisis* 213 (1838)

Uttar Pradesh, Allahabad (Singh and Mehrotra 1974 519); West Bengal, Calcutta (Banerjee 1947 42); Maharashtra, Nagpur (Trivedi 1972); Gujarat, Baroda (Moses 1948)

2. *A. basiannulosus* Paracer and Chahal in *Mycopath. Mycol. appl.* **18** 269 (1962)

Punjab, Ludhiana, type locality

3. *A. campestris* L. ex Fr., *Syst. Mycol.* **1** 281 (1821)

Jammu and Kashmir, Pang Range (Hennings 1900 153); Pahlgam (Watling and Gregory 1980 499); Uttar Pradesh, Allahabad (Singh and Mehrotra 1974 519); West Bengal, Calcutta (Banerjee 1947 42); Maharashtra, Nagpur (Trivedi 1972)

4. *A. comosus* (P. Henn.) Sacc. and D. Sacc., *Syll. Fung.* **17** 84 (1905)

Uttar Pradesh, Saharanpur (Hennings 1901 331 as *Psalliota*)

5. *A. crocopeplus* Berk. and Br. in *J. Linn. Soc., Bot.* **11** 546 (1871)

Uttar Pradesh, Kalsia (Hennings 1900 153)

6. *A. exaltatus* Berk. in *Hooker J. Bot.* **2** 106 (1850)

West Bengal, Darjeeling, type locality, K

7. *A. fulviceps* Berk. in *Hooker J. Bot.* **6** 130 (1854)

Sikkim, type locality, K

8. *A. heterocystis* Heinem. and Gooss. in *Bull. Jard. Bot. Etat Brux.* **26** 49 (1956)

Punjab, Manali (Heinemann 1968 18)

9. *A. iodolens* Heinem and Gooss. apud Heinem.in *Bull. Jard. Bot. Etat. Brux.* **26** 55 (1956)

Himachal Pradesh, Narkanda (Heinemann 1968 18)

10. *A. latipes* Berk. in *Hooker J. Bot.* **4** 131 (1852)

Assam, United Khasi-Jantia Hills, type locality, K

11. *A. placomyces* Peck in *Ann. Rep. N.Y. State Mus.* **29** 40 (1878)

Punjab, Manali (Heinemann 1968 20 as *A. melagris* J. Schaeff.)

12. *A. purpurellus* (Mull.) Mull. in *Friesia* **4** 204 (1952)

Punjab, Kulu valley (Heinemann 1968 17)

13. *A. rimosus* (P. Henn.) Sacc. and D. Sacc., *Syll. Fung.* **17** 83 (1905)

Uttar Pradesh, Saharanpur (Hennings 1901 331 as *Psalliota*)

14. *A. silvaticus* Schaeff. ex. Secr., *Mycol. Suisse* **1** 98 (1833)

West Bengal, Darjeeling (Berkeley 1850 106)

15. *A. squalidus* Massee in *Bull. Misc. Inf. Kew* **1912** 255 (1912)

West Bengal, Calcutta, type locality, K (Banerjee 1947 42)

16. *A. trisulphuratus* Berk. in *Ann. Mag. Nat. Hist. sér.* 5 **15** 386 (1885)

West Bengal, Calcutta (Massee 1907 123 as *Psalliota burkillii* Massee). (Massee 1912 253 as *Lepiota punicea* Massee, 1912 255 as *Stropharia aurivella* Massee); Uttar Pradesh, Dehra Dun (Bakshi 1974 8); Tamil Nadu, Madras, Post-Graduate Women's Hostel campus, Indian Institute of Technology campus, Deer Park, Raj Bhavan campus (Manjula 1980 165; Natarajan and Manjula 1981 57)

17. *A. variegans* (Mull.) Mull. in *Friesia* **4** 203 (1952)

Punjab, Manali (Heinemann 1968 15)

18. *A. woodrowii* Massee in *Bull. Misc. Inf. Kew* **1901** 151 (1901)

Maharashtra, Poona, type locality, K (Woodrow 1903 363)

19. *A. xanthosarcus* Heinem. and Gooss. apud Heinem. in *Bull. Jard. Bot. Etat Brux.* **26** 58 (1956)

Punjab, Manali (Heinemann 1968 19)

Excluded species

Agaricus burkillii (Mossee) Sacc. and Trott. see *Agaricus trisulphuratus*

Agaricus cretaceus Fr. is variously interpreted either as *Leucoagaricus naucinus* or as *Leucocoprinus cepaestipes*

Agaricus elvensis Berk. and Br. Type of *Agaricus elvensis* Berk. and Br. is a species of *Lepiota* (Dennis *et al* 1960 184)

Agaricus meleagris Schaeff see *Agaricus placomyces*

Agaricus pratensis Schaeff. It is a doubtful species and variously interpreted by different authors (see Dennis *et al* 1960 208)

62. *Micropsalliota* Höhnel in *Akad. Wiss. Wien. Math. Naturw. Klasse* **123** 31 (1914)
M. cystidiosa Natarajan and Manjula in *Mycologia* **74** 135 (1982)

Tamil Nadu, Madras, Indian Institute of Technology campus, type locality

63. *Melanophyllum* Vel., *Ceske Houby* **3** 569 (1912)
M. echinatum (Roth ex Fr.) Singer in *Lilloa* **22** 436 (1951)

Uttar Pradesh, Saharanpur (Hennings 1901 332 as *Inocybe echinata* Roth ex Fr.)

Lepioteae Fayod in *Ann. Sci. Nat., Bot. sér.* 7 **9** 349 (1889)

64. *Lepiota* Pers. ex S F Gray, *Nat. Arr. Br. Pl.* **1** 601 (1821)

Key to the Indian species of Lepiota

1. Pileus surface not formed by filamentous hyphae: :
2. Epicutis of the pileus a palisadic layer or trichodermium:
3. Epicutis of the pileus trichodermial; spores fusoid or spurred.
4. Spores spurred ..... Sect. *Stenosporae*
5. Basidiocarps large; pileus 4-9 cm diameter, brown ..... 13. *L. leontoderes*
5. Basidiocarps small; pileus not more than 2.5 cm diameter:
6. Pileus greyish yellow with light brown squamules, terminal elements of the trichodermium of the pileus up to 100 µm long ..... 5. *L. citrophylla*
6. Pileus reddish orange with brown fibrillose squamules, terminal elements of the trichodermium of the pileus up to 200 µm long ..... 2. *L. alopochroa*
4. Spores elongate, fusoid more than 10 µm long with a well developed suprahilar depression ..... Sect. *Lepiota*
7. Basidiocarps large; pileus up to 8 cm diameter, subumbonate, brownish at the centre, minutely squamose ..... 6. *L. clypeolaria*
7. Basidiocarps small, pileus up to 4 cm diameter:
8. Pileus with light ochraceous buff, concentric squamules present; terminal elements of the trichodermium narrowly clavate ..... 17. *L. metulaespora*
8. Pileus with crowded dark brown squamules, terminal elements of the trichodermium is dimorphic ..... 30. *L. thrombophora*
3. Epicutis of the pileus trichodermial; spores neither fusoid nor spurred ..... Sect. *Ovisporae*
9. Pileus glabrous, silky fibrillose, white ..... 11. *L. erminea*
9. Pileus squamose, up to 3 cm diameter:
10. Basidiocarp slender; pileus up to 3 cm diameter:
11. Pileus 2 cm diameter, covered by greyish brown squamules, lamellae white ..... 22. *L. phaeosticta*

11. Pileus 3 cm diameter, covered by reddish brown squamules; lamellae yellowish white . . . . . 14. *L. lepidophora*

10. Basidiocarp larger; pileus more than 3 cm diameter:

12. Pileus up to 6 cm diameter, colour not changing on bruising; trichodermial elements septate . . . . . 23. *L. phlyctaenodes*

12. Pileus up to 12 cm diameter, colour changing on bruising; trichodermial elements septate . . . . . 12. *L. holospilota*

2. Epicutis of the pileus hymeniform layer or loose fasicles consisting of sphaerocysts:

13. Epicutis of the pileus hymeniform; pileus surface entire at the disk, later disrupted into squamules . . . . . Sect. *Cristatae*

14. Basidiocarp small, pileus up to 3 cm diameter:

15. Pileus white with or without coloured squamules:

16. Pileus white with brownish orange squamules . . . . . 19. *L. micropholis*

16. Pileus white, glabrous . . . . . 20. *L. micropholis* var. *laceta*

15. Pileus not white:

17. Pileus greyish yellow with minute concolorous squamules, lamellae yellow . . . . . 4. *L. ceramogenes*

17. Pileus yellow with brown squamules; lamellae white . . . . . 3. *L. apalochroa*

14. Basidiocarp larger; pileus more than 3 cm diameter:

18. Pileus and stipe covered by concolorous scales:

19. Pileus planoconvex with brown squamules; lamellae white . . . . . 9. *L. epicharis* var. *occidentalis*

19. Pileus convex with umbo, with reddish brown squamules; lamellae light orange . . . . . 10. *L. epicharis* var. *indica*

18. Stipe glabrous; pileus applanate, white with minute reddish brown squamules towards the centre . . . . . 7. *L. cristata*

13. Epicutis of the pileus consisting of sphaerocysts; pileus surface with verrucose squamules the apices of the spines consisting of sphaerocyst . . . . . Sect. *Echinatae*

20. Pileus white, 2 cm diameter, convex with pinkish scales . . . . . 25. *L. sistrata*

20. Pileus not white:

21. Pileus brown; lamellae white; spores 1.6-2.2 × 3.3-4.4 µm . . . . . 18. *L. microspila*

21. Pileus pale red:

22. Spores 5-7 µm long . . . . . 1. *L. acutesquamosa*

22. Spores 2.2-4.4 µm long . . . . . 29. *L. subrufa*

1. Pileus surface formed by filamentous hyphae or pileus surface structure unknown:

23. Pileus surface formed by filamentous hyphae . . . . . Sect. *Sericellae*

24. Pileus glabrous:

25. Basidiocarp slender, pileus ovate, snow white; stipe 5 cm long . . . . . 8. *L. deliciola*

25. Basidiocarp fleshy, pileus convex with obtuse umbo light brown . . . . . 28. *L. subamantiformis*

24. Pileus with fibrillose squamules:

26. Pileus white with black squamules . . . . . 26. *L. sordescens*

26. Pileus white with brown squamules:

27. Pileus strong umbonate . . . . . 21. *L. mimica*

27. Pileus without umbo:

28. Stipe elongate up to 7 cm . . . . . 29. *L. subclypeolaria*

28. Stipe short . . . . . 24. *L. sericea*

23. Pileus surface structure unknown:

29. Spores subglobose, 6-8 µm; pileus umbonate, white to cream coloured . . . . . 15. *L. longicauda*

29. Spores ellipsoid, 5-6 µm; pileus campanulate rimose . . . 16. *L. mammosa*

1. *L. acutesquamosa* (Weinm.) Kummer, *Führ. Pilzk.* 136 (1871)

Sikkim (Berkeley 1854 129 as *Agaricus montosus* Berk.)

2. *L. alopochroa* (Berk. and Br.) Sacc., *Syll. Fung.* **5** 63 (1887)

Tamil Nadu, Madras, Tambaram, Madras Christian College campus, (Manjula 1980 174)

3. *L. apalochroa* (Berk. and Br.) Sacc., *Syll. Fung.* **5** 55 (1887)

Tamil Nadu, Madras, Nungambakkam, Kamdar Nagar (Manjula 1980 187)

4. *L. ceramogenes* (Berk. and Br.) Sacc., *Syll. Fung.* **5** 51 (1887)

Tamil Nadu, Madras, Post-Graduate Women's Hostel campus (Manjula 1980 185)

5. *L. citrophylla* (Berk. and Br.) Sacc., *Syll. Fung.* **5** 51 (1887)

Tamil Nadu, Madras, Indian Institute of Technology campus (Manjula 1980 173)

6. *L. clypeolaria* (Bull. ex Fr.) Kummer, *Führ. Pilzk.* 137 (1871)

Uttar Pradesh, Saharanpur (Hennings 1901 335)

7. *L. cristata* (Fr.) Kummer, *Führ. Pilzk.* 137 (1871)

Uttar Pradesh, Saharanpur (Hennings 1901 335); Jammu and Kashmir (Watling and Gregory 1980 530)

8. *L. deliciola* (Berk.) Sacc., *Syll. Fung.* **5** 44 (1887)

West Bengal, Darjeeling, type locality, K (Berkeley 1850 44 as *Agaricus*)

9. *L. epicharis* (Berk. and Br.) Sacc. var. *occidentalis* Dennis in *Kew Bull.* **15** 111 1961)

Tamil Nadu, Madras, Guindy, Raj Bhavan (Manjula 1980 188)

10. *L. epicharis* (Berk. and Br.) Sacc., var. *indica* Natarajan and Manjula in *Mycologia* **74** 136 (1982)

Tamil Nadu, Madras, Post-Graduate Women's Hostel campus, Raj Bhavan (Manjula 1980 189)

11. *L. erminea* (Fr.) Gillet, *Hymén.* **59** (1874)

West Bengal, Calcutta (Bose 1919 112)

12. *L. holospilota* (Berk. and Br.) Sacc. *Syll. Fung.* **5** 53 (1887)

Tamil Nadu, Madras University campus, Adyar, Indian Institute of Technology campus, Mylapore (Manjula 1980 181)

13. *L. leontoderes* (Berk. and Br.) Sacc., *Syll. Fung.* **5** 66 (1887)

Andaman Islands (Massee 1906 92 as *L. microspora* Massee)

14. *L. lepidophora* (Berk. and Br.) Sacc., *Syll. Fung.* **5** 54 (1887)

West Bengal, Calcutta (Massee 1912 253 as *L. flavophylla* Massee); Tamil Nadu, Indian Institute of Technology campus (Manjula 1980 179)

15. *L. longicauda* P. Henn. in *Hedwigia* **39** 153 (1900)

Uttar Pradesh, Kalsia, Saharanpur, type locality

16. *L. mammosa* P. Henn. in *Hedwigia* **40** 335 (1901)

Uttar Pradesh, Saharanpur, type locality

17. *L. metulaespora* (Berk. and Br.) Sacc., *Syll. Fung.* **5** 38 (1887)

Tamil Nadu, Madras, Raj Bhavan campus (Manjula 1980 175)

18. *L. microspila* (Berk.) Sacc., *Syll. Fung.* **9** 10 (1891)

Tamil Nadu, Indian Institute of Technology campus (Manjula 1980 191)

19. *L. micropholis* (Berk. and Br.) Sacc., *Syll. Fung.* **5** 61 (1887)

Tamil Nadu, Madras, Indian Institute of Technology campus (Manjula 1980 184)

20. *L. micropholis* (Berk. and Br.) Sacc. var. *lactea* (Murrill) Dennis in *Kew Bull.* 7 468 (1952)

Tamil Nadu, Madras, Deer Park (Manjula 1980 184)

21. *L. mimica* Massee in *Bull. Misc. Inf. Kew* **1912** 253 (1912)

West Bengal, Calcutta, type locality, K

22. *L. phaeosticta* Morgan in *J. Mycol.* **12** 248 (1906)

Tamil Nadu, Madras, Deer Park (Manjula 1980 179)

23. *L. phlyctaenodes* (Berk. and Br.) Sacc., *Syll. Fung.* **5** 52 (1887)

Tamil Nadu, Tirunelveli Dt., Senkaltheri, Kalakadu Sanctuary (Manjula 1980 180)

24. *L. sericea* Massee in *Bull. Misc. Inf. Kew* **1912** 254 (1912) non (Cool) Huijsman (1943)

West Bengal, Calcutta, type locality, K

25. *L. sistrata* (Fr.) Quél. in *Mem. Soc. Emul. Montbeliard, sér.* 2 **5** 231 (1872)

Uttar Pradesh, Saharanpur (Hennings 1901 335 as *L. sistrata* and *L. seminuda*)

26. *L. sordescens* (Berk. and Curt.) Sacc., *Syll. Fung.* **5** 66 (1887)

Maharashtra, Bombay (Uppal *et al* 1935 21)

27. *L. subclypeolaria* (Berk. and Curt.) Sacc., *Syll. Fung.* **5** 67 (1887)

Tamil Nadu, Madras, Post-Graduate Women's Hostel campus (Manjula 1980 194)

28. *L. subamantiformis* Dennis in *Kew Bull.* **21** 499 (1968)

Tamil Nadu, Madras, Indian Institute of Technology campus (Manjula 1980 194)

29. *L. subrufa* Natarajan and Manjula in *Mycologia* **74** 136 (1982)

Tamil Nadu, Madras, Indian Institute of Technology campus, type locality

30. *L. thrombophora* (Berk. and Br.) Sacc., *Syll. Fung.* **5** 53 (1887)

Tamil Nadu, Madras, Indian Institute of Technology campus (Manjula 1980 176)

Excluded species

Lepiota albuminosa (Berk.)	see *Macrolepiota albuminosa*
Lepiota alliciens (Berk.) Sacc.	see *Leucocoprinus birnbaumii*
Lepiota altissima Massee	see *Macrolepiota dolichaula*
Lepiota anax Berk.	see *Macrolepiota* sp.
Lepiota badhamii Berk. and Br.	see *Leucoagaricus badhamii*
Lepiota beckleri (Berk.) Sacc.	see *Macrolepiota mahabaleshwarensis*
Lepiota cepaestipes (Sow. ex Fr.) Kummer.	see *Leucocoprinus cepaestipes*
Lepiota cepaestipes (Sow. ex Fr.) Kummer var. *lutea* With.	see *Leucocoprinus birnbaumii*

Lepiota flavophylla Massee — see *Lepiota lepidophora*

Lepiota hispida (Lasch.) Fr. According to Dennis, Orton and Horak (1960), it is a doubtful species.

Lepiota holosericeus (Fr.) Sacc. — see *Leucoagaricus holosericea*

Lepiota implana (Berk.) Sacc. Type specimen badly mould infected, possibly an *Amanita* sp.

Lepiota malleus (Berk.) Sacc. — see *Macrolepiota mallea*

Lepiota mastoidea (Fr.) Kummer — see *Macrolepiota mastoidea*

Lepiota meleagris ([Sow.] S F Gray Quél. — see *Leucocoprinus meleagris*

Lepiota microspora Massee — see *Lepiota leontoderes*

Lepiota montosa (Berk.) Sacc. — see *Lepiota acutesquamosa*

Lepiota punicea Massee — see *Agaricus trisulphuratus*

Lepiota seminuda (Lasch.) Quél. — see *Lepiota sistrata*

Cystodermateae Singer, *Agar. Mod. Taxon.* ed. **3** 477 (1975)

65. *Cystoderma* Fayod in *Ann. Sci. Nat. Bot. sér.* 7 **9** 351 (1889)
C. amianthinum (Fr.) Fayod, *Hist. Nat. Agar.* 351 (1889)

West Bengal, Darjeeling, Tiger Hills (Horak 1980 108)

9. *Coprinaceae* Roze in *Bull. Soc. Bot. Fr.* **23** 3 (1876)

66. *Copelandia* Bres. in *Hedwigia* **53** 51 (1913)
C. cyanescens (Berk. and Br.) Singer in *Lilloa* **22** 473 (1951)

West Bengal (Bose 1920a 352 as *Panaeolus*); Uttar Pradesh, Lucknow (Vaish *et al* 1967 241)

67. *Coprinus* (Pers. ex Fr.) S F Gray *Nat. Arr. Brit. Pl.* **1** 632 (1821)

Key to the Indian species of Coprinus

1. Veil present, either filamentous, or with spaerocysts; dermatocystidia absent:
   2. Veil filamentous, with cylindrical elements . . . . . Sect. *Coprinus*
      3. Veil not forming separable scales:
         4. Pileal surface of reflexed scales; a ring or ring zone present at stipe base; terrestrial or coprophilous:
            5. Terrestrial; large, pileus 6-15 cm tall, white, pinkish or brown with recurved scales; stipe 10-25 cm long; spores 10-14 × 6-8 µm . . . . . 4. *C. comatus*
            5. Coprophilous:
               6. Pileus 4-6 cm diameter, white then vinaceous grey, white, floccose; stipe 8-15 cm tall, white buff; spores 17-22 × 10-13 µm . . . . . 23. *C. sterquilinus*

6. Pileus 5-10 mm diameter, grey, scaly, stipe 2-3 cm tall, white, scaly, radicant; spores 8-11 × 4.5-6.3 µm . . . . . 16. *C. papillatus*

4. Pileus surface smooth; veil forming either minute pileal squamules or a ring zone on stipe base:

7. Basidiocarp large, fleshy, caespitose; stipe elongate, 14-20 cm long:

8. Pileus grey, with scales at the centre; spores 8-11 × 5-6 µm . . . . . 1. *C. atramentarius*

8. Pileus brown to purple brown, smooth; spores 7-9 × 3.7-4.5 µm . . . . . 11. *C. hookeri*

7. Basidiocarp slender; stipe short, less than 10 cm long; pileus with yellowish tints:

9. Pileus ovoid, not expanding, bright reddish yellow, with white velar squamules . . . . . 25. *C. vellereus*

9. Pileus conical, soon expanding, greyish yellow, with fibrillose veil . . . . . 2. *C. calvescens*

3. Veil forming distinct layer of separable white or grey squamules:

10. Corprophilous:

11. Pileus very small, 2-6 mm diameter; spores 11-14 × 6-7 µm . . . . . 20. *C. radiatus*

11. Pileus larger, 1-5 cm diameter; spores 9-12 × 6-7 µm 3. *C. cinereus*

10. Not coprophilous; pileus covered with white hair:

12. Terrestrial:

13. On burnt ground; spores lentiform, 7-9 × 6-7.5 × 5-6 µm . . . . . 12. *C. lagopides*

13. On soil, spores ellipsoid, 11-13.5 × 6-7 µm . . . . . 13. *C. lagopus*

12. Lignicolous, spores ellipsoid, 9-11 × 6-6.5 µm . 18. *C. quadrifidus*

2. Veil at least in part, of globose elements . . . . . Sect. *Micaceous*

14. Pileus white or yellow:

15. Coprophilous; pileus white, tomentose, 2 cm or more diameter, ovo-campanulate:

16. Spores 9-11 × 8-9 µm . . . . . 9. *C. fimbriatus*

16. Spores 15-19 × 11-13 µm . . . . . 15. *C. niveus*

15. Lignicolous; never coprophilous:

17. Pileus white; umber at the disk; spores 8.5-11 × 5-6.5 µm . . . . . 19. *C. radians*

17. Pileus yellowish grey; spores 7-9 × 4.5-5.5 µm ..... 10. *C. flavo-griseus*

14. Pileus greyish brown or grey:

18. Coprophilous; pileus 5-15 mm diameter, pale grey with fulvous centre; stipe 4-7 cm long ..... 6. *C. ephemeroides*

18. Not coprophilous:

19. Lignicolous, often caespitose, from buried roots:

20. Spores mitriform, 7.5-10 × 4-5.5 µm ..... 14. *C. micaceus*

20. Spores ovoid. 6-9 × 4-5 × 5-6 µm ..... 24. *C. truncorum*

19. Growing on other substrata; terrestrial:

21. Pileus 4-15 mm diameter, grey; spores 8-10 × 4.7-5.5 µm ..... 8. *C. filiformis*

21. Pileus 8-12 mm diameter; spores 8.3-9.5 × 4.5-5.5 µm ..... 21. *C. roris*

1. Veil absent; pileus with hair-like dermatocystidia:

22. Lignicolous:

23. Caespitose, small; pileus 0.5-1.5 cm diameter, pale yellow to grey; spores 9-11 × 5-7 µm ..... 5. *C. disseminatus*

23. Pileus 1-4 cm diameter; cream-buff to darker fulvus; spores 11-15 × 7-9 µm, amygdaliform in side view, ellipsoid in face view ..... 22. *C. silvaticus*

22. Coprophilous or terrestrial:

24. Coprophilous; pileus 0.5-2 cm diameter, whitish grey, ovoid to conico-convex ..... 7. *C. ephemerus*

24. Growing on lawns; pileus 2-3 cm diameter, applanate, brownish grey with a brown central disk ..... 17. *C. plicatilis*

1. *C. atramentarius* (Bull. ex Fr.) Fr., *Epicrisis* 243 (1838)

Uttar Pradesh, Allahabad (Saksena and Mehrotra 1952); Himachal Pradesh, Solan (Munjal *et al* 1974 204), Solan (Thapa *et al* 1977 27); Jammu and Kashmir, Gulmarg (Watling and Gregory 1980 505), Kashmir (Kaul *et al* 1978; Kaul and Kachroo 1974), Chundinah, Shadipora (Abraham *et al* 1981 35)

2. *C. calvescens* (Berk.) Manjula

West Bengal, Darjeeling, type locality, K (Berkeley 1851b 20 as *Agaricus*)

3. *C. cinereus* (Schaeff. ex Fr.) S F Gray, *Nat. Arr. Brit. Pl.* **1** 634 (1821)
Punjab (Ginai 1936 277)

4. *C. comatus* (Mull. ex Fr.) S F Gray, *Nat. Arr. Brit. Pl.* **1** 633 (1821)

West Bengal, Darjeeling (Berkeley 1851a 39), Calcutta (Banerjee 1947 42), Gujarat, Baroda (Moses 1948); Bombay (Berkeley 1851a 39), Maharashtra, Nagpur (Trivedi 1972); Uttar Pradesh, Lucknow (Ghosh *et al* 1974), Allahabad (Singh and Mehrotra 1974 520); Jammu and Kashmir near Harwan, Dachigam Reserve (Watling and Gregory 1980 506, Kaul and Kachroo 1974).

5. *C. disseminatus* (Pers. ex Fr.) S F Gray, *Nat. Arr. Brit. Pl.* **1** 634 (1821)

India (Lange and Smith 1953 777); West Bengal, Calcutta (Baneriee 1947 44 as *Psathyrella*); Uttar Pradesh, Lucknow (Ghosh *et al* 1967 241); Jammu and Kashmir, Harwan, Dachigam Reserve (Watling and Gregory 1980 506)

6. *C. ephemeroides* (Bull. ex Fr.) Fr., *Epicrisis* 250 (1838)

Punjab (Ginai 1936 278 as *C. hendersonii Berk.*)

7. *C. ephemerus* (Bull. ex Fr.) Fr., *Epicrisis* 252 (1838)

Punjab (Mahju 1933 161)

8. *C. filiformis* Berk. and Br. in *Ann. Mag. Nat. Hist. sér.* 3 **7** 379 (1861)

Punjab (Ginai 1936 279)

9. *C. fimbriatus* Berk. and Br. in *J. Linn. Soc. Bot.* **11** 561 (1871)

West Bengal, Howrah and Hooghly Districts (Bose 1920a 352)

10. *C. flavo-griseus* (Berk.) Manjula

West Bengal, Darjeeling, type locality, K (Berkeley 1850 110)

11. *C. hookeri* Berk. in *Hooker J. Bot.* **3** 40 (1851)

West Bengal, Jillapahar, type locality, K

12. *C. lagopides* Karst., *Symb. Mycol.* **9** 48 (1882)

Jammu and Kashmir, Pahlgam (Watling and Gregory 1980 506)

13. *C. lagopus* (Fr.) Fr., *Epicrisis* 250 (1838)

New Delhi (Krishnamurthy and Verma 1974 226)

14. *C. micaceus* (Bull. ex Fr.) Fr., *Epicrisis* 247 (1838)

West Bengal, Calcutta (Banerjee 1947 42); Jammu and Kashmir, Sonamarg, (Watling and Gregory 1980 507); Himachal Pradesh, Solan (Thapa *et al* 1977 27); Maharashtra, Nagpur (Trivedi 1972)

15. *C. niveus* (Pers. ex Fr.) Fr., *Epicrisis* 246 (1838)

West Bengal and Punjab (Mahju 1933 160)

16. *C. papillatus* (Batsch.) Fr., sensu Rea, *Br. Basid.* 507 (1922)

Punjab (Mahju 1933 161)

17 *C nlicatilis* (Curt. ex Fr.) Fr., *Epicrisis* 252 (1838)

Jammu and Kashmir, Harwan, Dachigam Reserve (Watling and Gregory 1980 507)

18. *C. quadrifidus* Peck in *Rep. N. Y. State Mus.* **50** 106 (1897)

Himachal Pradesh, Solan (Thapa *et al* 1977 27)

19 *C. radians* (Desm.) Fr., *Epicrisis* 248 (1838)

Jammu and Kashmir, Gulmarg (Watling and Gregory 1980 507)

20. *C. radiatus* (Bolt. ex Fr.) S F Gray, *Nat. Arr. Brit. Pl.* **1** 635 (1821)

Punjab (Mahju 1933 160)

21. *C. roris* Quél. in *Mem. Soc. Emul. Montbéliard sér.* 2 **5** 322 (1872)

Jammu and Kashmir, Near Batakut (Watling and Gregory 1980 508)

22. *C. silvaticus* Peck in *New York St. Mus.* 7 (1870)

Jammu and Kashmir, Sonamarg (Watling and Gregory 1980 508)

23. *C. sterquilinus* (Fr.) Fr., *Epicrisis* 242 (1938)

Jammu and Kashmir, Samat Nagar (Watling and Gregory 1980 508); Himachal Pradesh, Solan (Thapa *et al* 1977 27)

24. *C. truncorum* (Schaeff.) Fr., *Epicrisis* 248 (1838)

Jammu and Kashmir, Sanat Nagar, Srinagar (Watling and Gregory 1980 509)

25. *C. vellereus* Berk. in *Hooker J. Bot.* **3** 40 (1851)

West Bengal, Darjeeling, type locality, K

Excluded species

Coprinus acuminatus (Romagn.) P D Orton—No proper field data, refer Watling and Gregory 1980 505

Coprinus cortinatus Lange.—No proper field data, refer Watling and Gregory 1980 505

Coprinus hendersonii Berk.	see *Coprinus ephemeroides*
Coprinus gibbsii Massee and Crossl.	According to Dennis *et al* 1960
Coprinus nycthemerus Fr., *Coprinus spraguei* Berk. and Curt. *Coprinus stellaris* Quél.	202, 216, they are doubtful species

68. *Lacrymaria* Pat., *Hymén. Eur.* 122 (1887)

L. velutina (Pers. ex Fr.) Konrad and Maubl., *Icon. sel. Fung.* 90 (1925)

West Bengal, Darjeeling (Berkeley 1850 108 as *A. atrichus* Berk. and *A. hemisoodes* Berk.; 1850 109 as *A. castanophyllus* Berk.); Maharashtra, Nagpur (Trivedi 1972)

Lacrymaria sp.

Jammu and Kashmir, Pahlgam (Watling and Gregory 1980 510)

69. *Panaeolus* (Bull. ex Fr.) Quél. in *Mem. Soc. Emul. Montbéliard sér.* 2 **5** 151 (1872)

Key to the Indian species of Panaeolus

1. Annulus present; pileus 2-6 cm diameter, white to pale brown; stipe white or yellowish; spores 16-22 × 9-15 µm ..... 4. *P. semiovatus*

1. Annulus absent; spores less than 15 µm:

2. Pileus 2-3 cm diameter; pleurocystidia absent:

3. Pileus reddish brown; spores 12-14 × 8-9 µm ..... 1. *P. campanulatus*

3. Pileus often entirely white; spores 10.8-15 × 8-10.5 µm ..... 3. *P. retirugis*

2. Pleurocystidia present; pileus 1.5-1.8 cm diameter, greyish sepia; spores 13-14.5 × 6-10 µm ..... 2. *P. indicus*

1. *P. campanulatus* (Bull. ex Fr.) Quél. in *Mem. Soc. Emul. Montbéliard sér.* 2 **5** 151 (1872)

Uttar Pradesh, Saharanpur (Hennings 1901 329; 1900 152 as *Chalymmota campanulata* (Linn.) Karst.; West Bengal (Bose 1920a 352)

2. *P. indicus* Sathe and Daniel in *Curr. Sci.* **48** 905 (1979)

Kerala, Kottayam, type locality

3. *P. retirugis* (Fr.) Gillet, *Hymén.* 621 (1874)

Himachal Pradesh, Solan (Thapa *et al* 1977 27)

4. *P. semiovatus* (Sow. ex Fr.) Lundell and Nannf., *Fungi exsico. Suec.* **1-12** (1938)

Jammu and Kashmir, Gulmarg (Watling and Gregory 1980 509)

Excluded species

P. cyanescens (Berk. and Br.) Sacc. see *Copelandia cyanescens*

70. *Psathyrella* (Fr.) Quél. in *Mem. Soc. Emul. Montbéliard sér.* 2 **5** 122 (1872)

Key to the Indian species of Psathyrella

1. Spores subglobose to ovoid, 7-11 × 5.5-8.5 µm, with germ-pore indistinct; pileus 1.5-2.5 cm diameter, pale yellow with violaceous brown squamules at apex ..... 12. *P. terrestris*

1. Spores ovoid to ellipsoid with a prominent germ pore:

2. Spores more than 10 µm long:

3. Pileus small, less than 2 cm diameter, brown, hygrophanous; spores 13-15 × 7-8.5 µm ..... 11.—*P. prona*

3. Pileus more than 2 cm diameter:

4. Basidiocarp caespitose; pileus yellow becoming greyish purple from margin; spores 10.5-12.5 × 5.7-7.5 µm ..... 4. *P. discolor*

4. Basidiocarp solitary; pileus greyish with a cinnamon buff disk; spores 11-14 × 6-7.5 µm ..... 5. *P. gracilis*

2. Spores up to 10 µm long:

5. Basidiocarp caespitose:

6. Terrestial; pileus dry, pale greyish purple brown; spores 6.7-9 × 3.7-5 µm ..... 3. *P. condensa*

6. Lignicolous; pileus hygrophanous, dark bistre:

7. Spores 4.5-6 × 3-3.7 µm; no odour ..... 6. *P. hydrophila*

7. Spores 6-8.5 µm; odour of bitter almonds ..... 2. *P. chondroderma*

5. Basidiocarp not caespitose:

8. Pileus white, or pale yellowish:

9. Pileus white, small, 1-2 cm diameter; spores 7.5-10 × 5-6 µm ..... 8. *P. nana*

9. Pileus cream coloured to yellowish, large, 2-6 cm diameter; spores 6-7.5 × 3.5-4.5 µm ..... 7. *P. hypsipoda*

8. Pileus brown:

10. Pileus large, more than 3 cm diameter:

11. Pileus conical, dry, olive brown, 4-6.5 cm diameter ... 9. *P. nassa*

11. Pileus campanulate to applanate, hygrophanous, brown ..... 1. *P. candolleana*

10. Pileus small, less than 3 cm diameter, hygrophanous, cinnamon brown; spores 7-9 × 4-4.5 µm ..... 10. *P. obtusata*

1. *P. candolleana* (Fr.) Maire in *Mém. Soc. Sci. Nat. Maroc.* **45** 113 (1938)

Jammu and Kashmir, near Harwan Dachigam Reserve (Watling and Gregory 1980 509)

2. *P. chondroderma* (Berk. and Br.) A H Smith in *Contr. Univ. Mich. Herb.* **5** 43 (1941)

Orissa, Bhubaneshwar (Sinha and Padhi 1978c 234 as *Psilocybe*)

3. *P. condensa* (Berk.) Manjula

West Bengal, Darjeeling, type locality, K (Berkeley 1850 109 as *Agaricus*)

4. *P. discolor* (Berk.) Sacc. *Syll. Fung.* **5** 1132 (1887)

West Bengal, Darjeeling, type locality, K (Berkeley 1851a 39 as *Agaricus*)

5. *P. gracilis* (Fr.) Quél. in *Mem. Soc. Emul. Montbéliard sér.* 2 **5** 152 (1872)

Uttar Pradesh, Saharanpur (Hennings 1900 152); Jammu and Kashmir, Kashmir, Kurscor, Nutravelly (Berkeley 1854 131 as *Agaricus*)

6. *P. hydrophila* (Bull. ex Merat) Maire in *Mém. Soc. Sci. Nat. Maroc.* **45** 113 (1937)

Uttar Pradesh, Saharanpur (Hennings 1901 330 as *Hypholoma appendiculatum* (Bull.) Sacc.)

7. *P. hypsipoda* (Fr.) Konr. and Maubl. in *Encycl. Myc.* **14** 128 (1947)

Uttar Pradesh, Varanasi (Tewari and Singh 1973 24)

8. *P. nana* (Massee) Manjula

Maharashtra, Poona, type locality, K (Massee 1901 152 as *Psathyra*)

9. *P. nassa* (Berk.) Manjula

West Bengal, Darjeeling, type locality, K (Berkeley 1850 110 as *Agaricus*)

10. *P. obtusata* (Fr.) A H Smith in *Contr. Univ. Mich. Herb.* **5** 55 (1941)

Uttar Pradesh, Saharanpur (Hennings 1901 329)

11. *P. prona* (Fr.) Gillet, *Les Hymén.* 618 (1874)

Uttar Pradesh, Saharanpur (Hennings 1900 152, 1901 329)

12. *P. terrestris* Natarajan in *Mycologia* **70** 1259 (1978)

Tamil Nadu, Madras, type locality

Excluded species

Psathyra calvescens (Berk.) Sacc. — see *Coprinus calvescens*

Psathyrella disseminata (Pers. ex Fr.) Quél. — see *Coprinus disseminatus*

Psathyra flavo-grisea (Berk.) Sacc. — see *Coprinus flavo-grisea*

Psathyrella cfr. *hydrophora* (Bull.) Sacc. — According to Dennis, Orton and Hora 1960 192, it is a doubtful species.

Psathyra obtusata Fr. — see *Psathyrella obtusata*

10. *Bolbitiaceae* Singer in *Pap. Mich. Acad. Sci., Arts. Lett.* **32** 147 (1948)

71. *Agrocybe* Fayod in *Ann. Sci. Nat. Bot. sér.* 7 **9** 358 (1889)

Key to the Indian species of Agrocybe

2. Terrestrial, solitary:

3. Pileus up to 9 cm diameter, fleshy, yellowish brown to ivory, convex to plane; spores 10-14 × 6-8 µm ..... 5. *A. molesta*

1. Annulus well developed and persistent:

2. Lignicolous, caespitose; pileus 4-12 cm diameter, clay brown to light tan; spores 8-10 × 5-6 µm ..... 2. *A. cylindracea*

2. Terrestrial, solitary: .

3. Pileus up to 9 cm diameter, fleshy, yellowish brown to ivory, convex to plane; spores 10-14 × 6-8 µm ..... 5. *A. molesta*

3. Pileus 2-6 cm diameter, convex, ochre yellow to pale brown; spores 8-11 × 5-7 µm ..... 7. *A. praecox*

1. Annulus absent; spores more than 10 µm long:

4. Pleurocystidia present; pileus 7-30 mm diameter, smooth, light buff; spores 10-14.5 × 7.5-9.5 µm ..... 4. *A. manihotis*

4. Pleurocystidia absent:

5. Pileus up to 6 cm diameter:

6. Pileus umbonate, yellowish brown, wrinkled ..... 3. *A. holophlebia*

6. Pileus convex, cream coloured, smooth ..... 6. *A. pediades*

5. Pileus 1-3 cm diameter, convex, smooth; amongst grass:

7. Pileus yellowish to pale tan; spores 10-14 × 7-9 µm; cheilocystidia small; temperate ..... 8. *A. semiorbicularis*

7. Pileus white to cream coloured, perhaps with olive tint; spores 13-16 × 7-8 µm; cheilocystidia large; tropical ..... 1. *A. broadwayi*

1. *A. broadwayi* (Murr.) Dennis in *Bull. Soc. Mycol. Fr.* **69** 179 (1953)

Assam, Borbheta (Roy 1976 31

2. *A. cylindracea* (DC ex Fr.) Maire in *Mem. Soc. Sci. Nat. Maroc.* **45** 106 (1938)

Jammu and Kashmir, road side between Narbal and Magam (Watling and Gregory 1980 501)

3. *A. holophlebia* (Berk.) Horak in *Persoonia* **11** 35 (1980)

Andhra Pradesh, Masulipatam, type locality, K (Berkeley 1891 104 as *Agaricus*)

4. *A. manihotis* Pegler in *Kew Bull.* **21** 508 (1968)

Tamil Nadu, Madras (Natarajan 1978 65)

5. *A. molesta* (Lasch.) Singer in *Sydowia* **30** 197 (1978)

Jammu and Kashmir, Sanat Nagar, Srinagar (Watling and Gregory 1980 501 as *Agrocybe dura* (Bolt. ex Fr.) Singer)

6. *A. pediades* (Pers, ex Fr.) Fayod in *Ann. Sci. Nat. Bot. sér.* 7 **9** 359 (1889)

Uttar Pradesh, Saharanpur (Hennings 1901 332)

7. *A. praecox* (Pers. ex Fr.) Fayod in *Ann. Sci. Nat. Bot. sér.* 7 **9** 358 (1889)

Uttar Pradesh, Saharanpur (Hennings 1901 333 as *Pholiota candicans* (Schaeff.) Schroet.)

8. *A. semiorbicularis* (Bull. ex St. Amans) Fayod in *Ann. Sci. Nat. Bot. sér.* 7 **9** 358 (1889)

India is included in the distribution listed by Saccardo 1887 884 as *Naucoria*

Excluded species

Agrocybe dura (Bolt. ex Fr.) Singer see *Agrocybe molesta*

Naucoria scrupea (Berk.) Sacc., *Syll. Fung.* **5** 851 (1887)

Agaricus scrupeus Berk. in *Hooker J. Bot.* **2** 87 (1850)

The microstructure of the type material (Darjeeling Hooker fil. 56) would suggest a member of Bolbitiaceae but the genus remains uncertain.

72. *Bolbitius* Fr., Epicrisis: 253 (1838).

Key to the Indian species of Bolbitius

1. Pileus up to 4 cm diameter, convex, brownish yellow; spores 12-13 × 8-9 µm ..... 1. *B. flavellus*

1. Pileus up to 1-6 cm diameter, conico-campanulate, golden yellow; spores 10.5-14 × 6-8.5 µm ..... 2. *B. vitellinus*

1. *B. flavellus* (Murr.) Singh and Tewari in *Indian Phytopath.* **29** 68 (1976)

Uttar Pradesh, Varanasi

2. *B. vitellinus* (Pers.) Fr., *Epicrisis* 254 (1838)

Punjab (Mahju, 1933 161); Maharashtra, Poona (Massee 1901 151 as *Bolbitius grandiusculus* Cooke and Massee)

Excluded species

Bolbitius tener Berk. see *Conocybe lactea*

Bolbitius grandiusculus Cooke and Massee see *Bolbitius vitellinus*

73. *Conocybe* Fayod in *Ann. Sci. Nat. Bot. sér.* 7 **9** 357 (1889)

Key to the Indian species of Conocybe

1. Basidiocarp large; pileus 3-5 cm diameter; stipe white, more than 20 cm long ..... 6. *C. zeylanica*

1. Basidiocarp smaller; pileus up to 3.5 cm diameter; stipe 1-3 mm thick:

2. Stipe white; spores ellipsoid to hexagonal, 12.5-14 × 8-10 µm; pileus 15-20 mm diameter, non-hygrophanous, white to cream coloured ..... 2. *C. lactea*

2. Stipe yellowish or brown; spores never hexagonal:

3. Spores large, 10-15 × 5-8 µm; pileus 1-3.5 cm diameter, ochraceous brown hygrophanous ..... 5. *C. tenera*

3. Spores smaller, less than 15 µm:

4. Stipe short, up to 4 cm long, filiform; pileus 1-2 cm diameter, fragile, spores 7-9 × 4.5-5.3 µm ..... 4. *C. sienophylla*

4. Stipe elongate, up to 7 cm long; spores more than 10 µm long:

5. Pileus 5-14 mm diameter, conico-convex ochraceous; spores 9-12 × 5-6 µm ..... 3. *C. magnicapitata*

5. Pileus 20 mm diameter, brownish yellow; spores 11-13 × 6.2-7.7 µm ..... 1. *C. khasiensis*

1. *C. khasiensis* (Berk.) Watling and Gregory in *Bibl. Mycol.* **82** 178 (1981)

West Bengal, Khasi Hills, type locality, K (Berkeley 1854 130 as *Agaricus*)

2. *C. lactea* (J. Lange) Metrod in *Bull. Mycol. Soc. Fr.* **56** 46 (1940)

Uttar Pradesh, Saharanpur (Hennings 1901 331 as *Galera lateritia* Fr.); Punjab (Ginai 1936 279 as *Bolbitius tener* Berk.)

3. *C. magnicapitata* P D Orton in *Trans. Br. Mycol. Soc.* **43** 193 (1960)

Jammu and Kashmir, Tangmarg (Watling and Gregory 1980 502)

4. *C. sienophylla* (Berk. and Br.) Singer in *Sydowia* **9** 402 (1955)

Uttar Pradesh, Varanasi (Tewari and Singh 1973 23)

5. *C. tenera* (Schaeff. ex Fr.) Kühn. in *Encyclop. Mycol.* 7 68 (1938)

West Bengal, Darjeeling (Berkeley 1850 88 as *Agaricus*)

6. *C. zeylanica* (Petch) Boedijn in *Sydowia* **5** 223 (1951)

West Bengal, Hooghly (Bose 1920a 354 as *Galera*)

74. *Pholiotina* Fayod in *Ann. Sci. Nat. Bot. sér.* 7 **9** 359 (1889)
P. filaris (Fr.) Fayod, *Prodr. Hist. Nat. Agar.* 359 (1889)

Sikkim, Upper Rangit (Horak 1980 109)

11. *Strophariaceae* Singer and Smith in *Mycologia* **38** 503 (1946)

75. *Hypholoma* (Fr.) Kummer, *Führ Pilzk.* 21 (1871)

Key to the Indian species of Hypholoma

1. Lamellae not yellow, bluish grey to dark brown; pileus 1-8 cm diameter, ochre yellow; stipe slender, pale yellow, tinged with brown; spores 7-9 × 4-5 µm ..... 1. *H. capnoides*

1. Lamellae yellow:

2. Pileus and stipe brick red; spores 6-7 × 3-4 µm ..... 4. *H. sublateritium*

2. Pileus and stipe sulphur yellow:

3. Spores 8-10 × 3.5-5 µm, amygdaliform, germ-pore indistinct; lamellae broad, distant ..... 3. *Flammula macrophala*

3. Spores 6-7 × 3-5 µm, ovo-ellipsoid with distinct germ-pore; lamellae narrow, crowded ..... 2. *H. fasiculare*

1. *H. capnoides* (Fr. ex Fr.) Kummer, *Führ. Pilzk.* 72 (1871)

Jammu and Kashmir, Gulmarg (Watling and Gregory 1980 548)

2. *H. fasiculare* (Huds. ex Fr.) Kummer, *Führ. Pilzk.* 72 (1871)

West Bengal, Darjeeling (Berkeley 1850 107 as *Agaricus*); Himachal Pradesh, Simla (Berkeley 1854 130 as *Agaricus*); Jammu and Kashmir, Pahlgam (Watling and Gregory 1980 549)

3. *Flammula macrophala* (Berk.) Sacc., *Syll. Fung.* **5** 817 (1887)

West Bengal, Darjeeling, type locality, K (Berkeley 1850 107 as *Agaricus*). See Part I (p. 100)

4. *H. sublateritium* (Fr.) Quél. in *Mem. Soc. Emul. Montbéliard ser.* 2 **5** 143 (1872)

West Bengal, Darjeeling (Berkeley 1850 107 as *Agaricus*)

Excluded species

Hypholoma appendiculatum (Bull. ex St. Amans) Quél.	see *Psathyrella hydrophila*
Hypholoma atrichum (Berk.) Sacc.	see *Lacrymaria velutina*
Hypholoma castanophyllum (Berk.) Sacc.	see *Lacrymaria velutina*
Hypholoma condensum (Berk.) Sacc.	see *Psathyrella condensa*
Hypholoma hemisoodes (Berk.) Sacc.	see *Lacrymaria velutina*
Hypholoma velutinum (Pers. ex Fr.) Sacc.	see *Lacrymaria velutina*

76. *Kuehneromyces* Singer and Smith in *Mycologia* **38** 504 (1946)
K. mutabilis (Schaeff. ex Fr.) Singer and Smith in *Mycologia* **38** 504 (1946)

Jammu and Kashmir, Sonamarg (Watling and Gregory 1980 517 as *Galerina mutabilis* (Schaeff. ex Fr.) P D Orton; West Bengal, Darjeeling (Berkeley 1850 86 as *Agaricus examinans* Berk.)

77. *Pholiota* (Fr.) Kummer, *Führ. Pilzk.* 22 (1871)

Key to the Indian species of Pholiota

1. Stipe with a membranous annulus or a fibrillose annular zone; large pleurocystidia never present:
   2. Basidiocarp reddish brown, dark brown or bright yellow:
      3. Pileus glabrous, brown:
         4. Pileus 3-16 cm diameter; stipe up to 3 cm thick, sparsely squamose; spores 10-13 × 6-8 µm. . . . . 6. *P. gollani*
         4. Pileus 3-7 cm diameter; viscid; stipe 0.5-1 cm thick, viscid; spores 4.5-6 × 3-3.5 µm. . . . . 11. *P. microspora*
      3. Pileus squamose to squarrose:
         5. Basidiocarp small, pileus up to 1 cm diameter, pale yellowish brown, with verrucose squamules; spores 3.5-4 × 3 µm 7. *P. granuloso-verrucosa*
         5. Basidiocarp much large, fleshy, caespitose:
            6. Pileus and stipe squarrose, yellow to golden; spores 4-4.5 × 2-3 µm . . . . . 5. *P. flammans*

6. Pileal squamules reddish brown:

7. Pileus and stipe dry, squarrose; spores 6-9 × 4-5 µm ..... 13. *P. squarrosa*

7. Pileus viscid, with appressed gelatinous squamules:

8. Stipe dry, with small, fibrillose squamules; spores 7-9 × 5-6 µm ..... 2. *P. aurivella*

8. Stipe covered with gelatinous squamules; spores 5-7 × 3-4 µm ..... 1. *P. adiposa*

2. Basidiocarp whitish to pale brown, lacking reddish brown or yellow tints:

9. Pileus 6-20 cm diameter, with large, fibrillose, white squamules on a pale brown ground; spores 7.5-9 × 5.5-6.5 µm ..... 4. *P. destruens*

9. Pileus 3-8 cm diameter, with appressed brown squamules on a white ground; spores 8.5-13 × 7-9 µm ..... 9. *P. indica*

1. Stipe with annular zone evanescent or absent:

10. Large pleurocystidia present; pileus 2-7 cm diameter, brown, viscid:

11. Spores 6-8 × 4-5 µm, ellipsoid; on burnt stumps and fire sites ..... 8. *P. highlandensis*

11. Spores 5.5-6 × 3-4 µm, phaseoliform; in pine woods 12. *P. phlegmatica*

10. Large pleurocystidia absent:

12. Pileus brick-red, 3-6 cm diameter, caespitose on tree trunks ..... 3. *P. catervaria*

12. Pileus pale yellow to olive grey when mature, 2-4 cm diameter, solitary ..... 10. *P. mahabaleshwarensis*

1. *P. adiposa* (Fr.) Kummer, *Führ. Pilzk.* 83 (1871)

Uttar Pradesh, Allahabad (Singh and Mehrotra 1974 522)

2. *P. aurivella* (Batsch. ex Fr.) Kummer, *Führ. Pilzk.* 83 (1871)

West Bengal, Darjeeling (Berkeley 1850 87 as *Agaricus*)

3. *P. catervaria* (Lév.) Manjula

Tamil Nadu, Nilgiri Hills (Lévillé 1846 111 as *Agaricus*) type locality, K

4. *P. destruens* (Brond.) Gillet, *Champ. Fr.* 442 (1876)

Jammu and Kashmir, Narbal and Magam (Watling and Gregory 1980 525)

5. *P. flammans* (Fr.) Kummer, *Führ. Pilzk.* 22 (1871)

Uttar Pradesh, Varanasi (Tewari and Singh 1973 24)

6. *P. gollani* P. Henn. in *Hedwigia* **40** 333 (1901)

Uttar Pradesh, Saharanpur, type locality

7. *P. granuloso-verrucosa* P. Henn in *Hedwigia* **40** 333 (1901)

Uttar Pradesh. Saharanpur, type locality

8. *P. highlandensis* (Peck) Smith and Hesler, *North Am. species Pholiota* 287 (1968)

Jammu and Kashmir, Sonamarg (Watling and Gregory 1980 525)

9. *P. indica* Massee in *Bull. Misc. Inf. Kew* **1901** 151 (1901)

Maharashtra, Poona, type locality, K

10. *P. mahabaleshwarensis* Sathe and Deshpande in *Curr. Sci.* **49** 517 (1980)

Maharashtra, Mahabaleshwar, type locality

11. *P. microspora* (Berk.) Sacc., *Syll. Fung.* **5** 742 (1887)

West Bengal, Darjeeling, type locality, K (Berkeley 1850 86 as *Agaricus*)

12. *P. phlegmatica* (Berk.) Manjula

Sikkim, type locality, K (Berkeley 1852b 106 as *Agaricus*)

13. *P. squarrosa* (Muller ex Fr.) Kummer, *Führ. Pilzk.* 84 (1871)

Jammu and Kashmir, Sonamarg (Murrill 1924 133; Watling and Gregory 1980 526)

Excluded species

Pholiota candicans (Schaeff.) Schroet. see *Agrocybe praecox*

Pholiota examinans (Berk.) Sacc. see *Kuehneromyces mutabilis*

Pholiota flavida (Schaeff. ex Fr.) Singer in *Lilloa* **22** 516 (1951)

Sikkim (Berkeley 1852b 106 as *Agaricus*)
An examination of the microstructure of this specimen indicates it should be better referred to *P. phlegmatica* (Berk.) Manjula

Pholiota praecox (Pers. ex Fr.) Kummer see *Agrocybe praecox*

78. *Psilocybe* (Fr.) Kummer, *Führ. Pilzk.* 71 (1871)

Key to the Indian species of Psilocybe

1. Pileus greyish brown, squamose; spores 4 × 3-3.5 µm . . . . . 5. *P. tristis*

1. Pileus not grey, glabrous:

2. Coprophilous:

3. Spores 12-15 × 8-10 µm, hexagonal; stipe lacking an annulus . . . . . 2. *P. coprophila*

3. Spores 10-13 × 6-8 µm, ellipsoid; stipe with ephemeral annulus and white squamules . . . . . 3. *P. merdaria*

2. On soil; spores ellipsoid; pileus reddish brown:

4. Caespitose; pileus viscid; spores 5.3-6.5 × 3.2-4.3 µm . . . . 1. *P. caespiticia*

4. Solitary; pileus hygrophanous, not viscid; spores 6-8 × 4-5 µm . . . . . 4. *P. montana*

1. *P. caespiticia* (Berk.) Sacc., *Syll. Fung.* **5** 1053 (1887)

West Bengal, Darjeeling, type locality, K (Berkeley 1850 110 as *Agaricus*)

2. *P. coprophila* (Bull. ex Fr.) Kummer, *Führ. Pilzk.* 71 (1871)

Jammu and Kashmir, Dachigam Reserve forest (Watling and Gregory 1980 549)

3. *P. merdaria* (Fr.) Ricken, *Blätterpilze* 251 (1912)

Maharashtra, Poona (Massee 1901 151); Uttar Pradesh, Saharanpur (Hennings 1901 330)

4. *P. montana* (Pers. ex Fr.) Kummer, *Führ. Pilzk.* 71 (1871)

Uttar Pradesh, Saharanpur (Hennings 1901 330 as *Deconica atrorufa* Schaeff.)

5. *P. tristis* P. Henn. in *Hedwigia* **40** 330 (1901)

Uttar Pradesh, Saharanpur, type locality

Excluded species

Psilocybe atrobrunnea (Lasch) Gillet, *Hymén.* 584 (1874)

Orissa, Bhubaneshwar (Sinha and Padhi 1978c 233). A confused name

79. *Stropharia* (Fr.) Quél. in *Mem. Soc. Emul. Montbéliard sér.* 2 **5** 110 (1872)

Key to the Indian species of Stropharia

1. Coprophilus; tall and slender with an annulus; pileus straw yellow, viscid; spores enormous, 16-24 × 8-11 µm . . . . 6. *S. semiglobata*

1. Not coprophilous:

2. Lignicolous; pileus 2.5-3.5 cm diameter, campanulate, golden yellow, with small squamules at the margin; spores 10.5-12.5 × 5.5-7.7 µm . . . . 1. *S. aureofulva*

2. Terrestrial:

3. Pileus glabrous:

4. Pileus 3-3.5 cm diameter, pale brown, membranous; stipe 6-7 cm × 4 mm; spores 5-6.5 × 4 µm . . . . 4. *S. psathyroides*

4. Pileus 2-5 mm, dark violaceous, pruinose; stipe 10 × 0.5 mm; dark greenish brown; spores 4-5 × 3.5 µm . . . . 5. *S. pygmaea*

3. Pileus squamose:

5. Pileus small, up to 1 cm diameter, golden yellow with lemon yellow

squarrose squamules; stipe squarrose, 2 cm × 1 mm . . . . . 2. *S. gollani*

5. Pileus fleshy, 4-5 cm diameter, reddish brown with detersile squamules; stipe 4-6 cm × 3-4 mm . . . . . 3. *S. mephistopheles*

1. *S. aureofulva* (Berk.) Sacc., *Syll. Fung.* **5** 1015 (1887)

West Bengal, Darjeeling, type locality, K (Berkeley 1850 107 as *Agaricus*)

2. *S. gollani* P. Henn. in *Hedwigia* **39** 152 (1900)

Uttar Pradesh, Saharanpur, type locality

3. *S. mephistopheles* (Cooke) Sacc., *Syll. Fung.* **9** 139 (1891)

Maharashtra, Belgaum, Bombay, type locality (Cooke 1890 as *Agaricus*). No material or illustration at Kew.

4. *S. psathyroides* P. Henn. in *Hedwigia* **40** 330 (1901)

Uttar Pradesh, Saharanpur, type locality

5. *S. pygmaea* P. Henn. in *Hedwigia* **39** 152 (1900)

Uttar Pradesh, Saharanpur, type locality

6. *S. semiglobata* (Batsch. ex Fr.) Quél. in *Mem. Soc. Emul. Montbéliard sér.* 2 **5** 143 (1872)

Assam, Khasi Hills (Berkeley 1852a 131 as *Agaricus*); Punjab (Ginai 1936 277); Jammu and Kashmir, Gulmarg (Watling and Gregory 1980 549)

Excluded species

Stropharia aurivella Massee	see *Agaricus trisulphuratus*
Stropharia crocopepla Berk. and Br.	see *Agaricus crocopeplus*
Stropharia merdaria Karst	see *Psilocybe merdaria*

Flammula (Fr.) Kummer, *Führ. Pilzk.* 80 (1871)

Excluded species

Flammula chrysomyces (Berk.) Sacc.	see *Gymnopilus chrysimyces*
Flammula dilepis Berk. and Br.	see *Gymnopilus dilepis*
Flammula flavida (Schaeff.) Fr.	see *Pholiota flavida*
Flammula macrophala (Berk.) Sacc.	see *Hypholoma*
Flammula phlegmatica (Berk.) Sacc.	see *Pholiota phlegmatica*
Flammula sapinea (Fr.) Sacc.	see *Gymnopilus sapineus*

12. *Cortinariaceae* Roze in *Bull. Soc. Bot. Fr.* **23** 113 (1876)
Inocybeae Fayod in *Ann. Sci. Nat. Bot. sér.* 8 **9** 361 (1889)

80. *Hebeloma* (Fr.) Kummer, *Führ. Pilzk.* 22 (1871)

Key to the Indian species of Hebeloma

1. Pileus large, up to 20 cm diameter, fleshy, ochraceous; stipe concolourous . . . . . 1. *H. thomasianum*

1. Pileus up to 10 cm diameter:

   2. Distinct cortina present, atleast when young; pileus argillaceous brown; stipe glabrous; spores 7.5-9 × 4.5-6.5 µm .....3. *H. versipelle*

   2. Cortina absent; pileus reddish brown to dark tawny brown; stipe floccose-furfuraceous; spores 9.5-11 × 5-5.5 µm .....2. *H. truncatum*

1. *H. thomasianum* (Cooke) Sacc., *Syll. Fung.* **9** 102 (1891)

Maharashtra, Bombay, Belgaum, type locality (Cooke 1890 7 as *Agaricus*), no specimen found at Kew, only the water-colour painting is present

2. *H. truncatum* (Schaeff. ex Fr.) Kummer, *Führ. Pilzk.* 80 (1871)

Jammu and Kashmir, Pahlgam (Watling and Gregory 1980 518)

3. *H. versipelle* (Fr.) Gillet, *Hymén.* 524 (1874)

Jammu and Kashmir, Pahlgam (Watling and Gregory 1980 519)

Excluded species

Hebeloma catervarium Lév. see *Pholiota catervaria*

81. *Hebelomina* Maire in *Bull. Soc. Hist. Nat. Afr. Nord.* **26** 12 (1935)
H. maderaspatana Natarajan and Raman in *Kavaka* **8** 74 (1980)

Tamil Nadu, Madras, Guindy, Indian Institute of Technology campus, type locality

82. *Inocybe* (Fr.) Fr., *Mongr. Hymen. Suec.* **2** 346 (1863)

Key to the Indian species of Inocybe

1. Pileus and stipe squamose, pileus yellowish brown; stipe whitish, with fibrillose base; spores 9-11.5 × 5.5-7 µm, amygdaliform .....4. *I. friesii*

1. Pileus and stipe not squamose:

   2. Pileus white or lilac; spores 8-10 × 4-15 µm, ellipsoid:

      3. Pileus and stipe white .....5. *I. geophylla*

      3. Pileus and stipe lilac .....6. *I. geophylla* var. *lilacina*

   2. Pileus not white or lilac:

      4. Pileus brown, without any yellow tints:
         5. Pileus fibrillose, pale brown with pale margin; stipe whitish, powdery; spores 7-11 × 4-6 µm, ellipsoid .....2. *I. eutheles*

         5. Pileus chestnut brown with darker fibrils; stipe white becoming brown; spores 8-12 × 4-8 µm, phaseoliform .....8. *I. maculata*

      4. Pileus yellowish brown:
         6. Pileus without appendiculate veil and cystidia:

            7. Pileus strongly rimose with broad fibrils in the margin; spores 10-14 ×

5.5-7.5 µm ..... 3. *I. fastigata*

7. Pileus indistinctly rimose; spores 9-10 × 4.2-5 µm; *Picea* forests ..... 7. *I. hygrophorus*

6. Pileus with white appendiculate velar rements and the cystidia clavata to fusiform, 38-56 × 12-20 µm ..... 1. *I. appendiculata*

1. *I. appendiculata* Kühn. in *Bull. Soc. Nat. Oyonnax* **9** suppl. 4 (1955)

Jammu and Kashmir, Tangmarg (Watling and Gregory 1980 523)

2. *I. eutheles* (Berk. and Br.) Quél. in *Bull. Soc. Amir. Sci. Nat. Romen. sér.* 2 **15** 162 (1880)

Jammu and Kashmir, Gulmarg (Watling and Gregory 1980 519)

3. *I. fastigata* (Schaeff. ex Fr.) Quél. in *Mem. Soc. Emul. Montbéliard sér.* 2 **5** 180 (1872)

Jammu and Kashmir, Pahlgam (Watling and Gregory 1980 520)

4. *I. friesii* Heim in *Encycl. Mycol.* **1** 330 (1931)

Jammu and Kashmir, Tangmarg (Watling and Gregory 1980 520)

5. *I. geophylla* (Sow. ex. Fr.) Kummer, *Führ. Pilzk.* 78 (1871)

Jammu and Kashmir, Tangmarg (Watling and Gregory 1980 521)

6. *I. geophylla* (Sow. ex Fr.) Kummer var. *lilacina* Gillet, *Hymén.* 520 (1874)

Jammu & Kashmir, Harwan Reservoir (Watling and Gregory 1980 521)

7. *I. hygrophorus* Kühn. in *Bull. Soc. Mycol. Fr.* **71** 169 (1955)

Jammu and Kashmir, Harwan Reservoir (Watling and Gregory 1980 522)

8. *I. maculata* Boud. in *Bull. Soc. Bot. Fr.* **32** 282 (1885)

Jammu and Kashmir, Harwan (Watling and Gregory 1980 521)

Excluded species

Inocybe echinata (Roth) Cooke — see *Melanophyllum echinatum*

Inocybe holophelebia (Berk.) Sacc. — see *Agrocybe holophelebia*

83. *Naucoria* (Fr.) Kummer, *Führ. Pilzk.* 76 (1871)
N. fusispora P. Henn. in *Hedwigia* **40** 332 (1901)

Uttar Pradesh, Saharanpur, type locality

Excluded species

Naucoria cerodes (Fr.) Sacc. According to Dennis *et al* (1960 179) a doubtful species.

Naucoria conspersa (Pers. ex Fr.) Kummer — see *Tubaria conspersa*

Naucoria descendens (Berk.) Sacc. — see *Simocybe descendens*

Naucoria khasiensis (Berk.) Sacc. see *Conocybe khasiensis*

Naucoria micromegala (Berk.) Sacc. see *Gymnopilus* sp.

Naucoria pediades (Pers. ex Fr.) Sacc. see *Agrocybe pediades*

Naucoria scrupea (Berk.) Sacc. see *Bolbitiaceae*

Naucoria semiorbicularis (Bull. ex. St.Amanes) Sacc. see *Agrocybe semiorbicularis*

Phaeomarasmieae Singer, *Agaric. Mod. Taxon.* **2** 590 (1962)

84. *Flammulaster* Earle in *Bull. New York Bot. Gard.* **5** 435 (1909)
F. fulvoalbus (Berk. and Br.) Pegler in *Kew Bull. Addt. sér.* **6** 493 (1977)

West Bengal, Calcutta (Massee 1907 122 as *Collybia lutea* Massee Banerjee 1947 43)

85. *Phaeomarasmius* Scherffel. in *Hedwigia* **36** 289 (1897)
P. erinaceus (Fr.) Kühner apud Singer in *Trudy. Bot. Inst. V. L. Komarova Akad. nauk. S.S.S.R.* sér. 2 **6** 483 (1950)

West Bengal, Bankura Dt. (Ray and Samajpati 1979 66)

Cortinarieae Fayod in *Ann. Sci. Nat. Bot. sér.* 7 **9** 371 (1889)

86. *Cortinarius* S F Gray, *Nat. arr. Brit. Pl.* **1** 627 (1821)

Key to the Indian species of Cortinarius

Pileus and/or stipe viscid

2. Pileus viscid; stipe dry ..... Subgenus *Phlegmacium*

3. Stipe short, less than 3 cm long, with a bulbous base; pileus 4-5 cm diameter, white becoming ochraceous; tawny; spores 10-11.5 × 7.5-9 µm ..... 7. *C. kashmiriensis*

3. Stipe elongate, 4-12 cm long:

4. Pileus ochraceous brown; lamellae pale becoming cinnamon; spores 12-13 × 6.5-7 µm, amygdaliform to sublimoniform ..... 6. *C. gringlingii*

4. Pileus reddish brown to ochraceous brown, lamellae yellow when young; spores 9-11 × 5-6 µm, sublimoniform ..... 9. *C. subfulgens*

2. Both pileus and stipe viscid ..... Subgenus *Myxacium*

Basidiocarp vinosus; stipe lacking a bulbous base, floccose; spores 13.5-16 × 7.2-8.5 µm ..... 10. *C. vinosus*

1. Pileus and stipe dry:

5. Basidiocarps dark violet, large, cheilocystidia and pleurocystidia present ..... Subgenus *Cortinarius*

6. Basidiocarp dark violaceous, pileus velvety, squamose; spores 11-15 × 7-9 µm, amygdaliform ..... 11. *C. violaceous*

6. Pileus and lamellae with violaceous tints, pileus 10 cm diameter, ochraceous brown; spores 10-12 × 6-7 µm, ovoid to amygdaliform . . . . . 2. *C.* cfr. *cyanopus*

5. Basidiocarp not dark violet; pleurocystidia absent:

7. Pileus not hygrophanous:

8. Pileus innately squamose, fibrillose or silky, context rather thick; stipe stout ±clavate bulbous . . . . . Subgenus *Inoloma*

Stipe 3.5-12 cm long. white discolouring pallid or pale yellowish; pileus off-white to pale ochraceous; spores 12-13 × 7.5-8.5 µm. 1. *C. argutus*

8. Pileus innately silky becoming smooth, context thin; stipe slender, equal or tapering above . . . . . Subgenus *Dermocybe*

Pileus up to 4 cm diameter, floccose, deep blood red; stipe concolorous; lamellae orange with green tints; caespitose . . . . . 5. *C. flammeus*

7. Pileus hygrophanous:

9. Stipe with cortina ±fugacious, more rarely leaving traces near base without veil in addition . . . . . Subgenus *Hydrocybe*

Pileus 1-3 cm diameter, yellowish brown, squamose with yellow veil, umbonate; spores 8-9 × 4.5-5.5 µm, ovate . . . . . 8. *C. saniosus*

9. Stipe peronate or annulate from the remains of the veil in addition to the cortina . . . . . Subgenus *Telamonia*

10. Pileus 1-4 cm diameter, umbonate, bay brown; stipe paler; spores 8-9 × 5-6 µm, ellipsoid . . . . . 4. *C. decipiens*

10. Pileus 1-7 cm diameter, fawn with violet tints on the disk; squamulose; spores 7-9.5 × 6-7 µm, ellipsoid . . . . . 3. *C. deceptivus*

1. *C. argutus* Fr., *Epicrisis* 278 (1838)

Jammu and Kashmir, Pahlgam (Watling and Gregory 1980 511)

2. *C.* aff. *cyanopus* (Secr.) Fr., *Epicrisis* 258 (1838)

Jammu and Kashmir, Pahlgam (Watling and Gregory 1980 512)

3. *C. deceptivus* Kauffm. in *Bull. Torrey Bot. Cl.* **32** 324 (1905)

Delhi (Chona *et al* 1958)

4. *C. decipiens* (Pers.) Fr. *Epicrisis* 312 (1838)

Jammu and Kashmir, Harwan Reservoir (Watling and Gregory 1980 514)

5. *C. flammeus* Berk. in *Hook. J. Bot.* **4** 133 (1852)

Sikkim, type locality, K

6. *C. gringlingii* Moser in *Kew Bull.* **14** 66 (1960)

Uttar Pradesh, Mussoorie, type locality

7. *C. kashmiriensis* Watling in *Notes Roy. Bot. Gard. Edinb.* **38** 357 (1980)

Jammu and Kashmir, Gulmarg, type locality

8. *C. saniosus* Fr. *Epicrisis* 313 (1838)

Sikkim (Berkeley 1852a 133)

9. *C. subfulgens* P D Orton in *Trans. Br. Mycol. Soc.* **43** 212 (1960)

Jammu and Kashmir, Sonamarg (Watling and Gregory 1980 514)

10. *C. vinosus* Berk. in *Hook. J. Bot.* **4** 132 (1852)

Sikkim, type locality, K (Saccardo 1891 121 as *C. vinosulus* Sacc.)

11. *C. violaceus* (L. ex Fr.) Fr. *Epicrisis* 279 (1838)

Assam, Khasi Hills, Myrong (Berkeley 1852a 133)

Excluded species

Cortinarius emodensis Berk.	see *Rozites emodensis*
Cortinarius vinosulus Sacc.	see *Cortinarius vinosus*

87. *Galerina* Earle in *Bull. New York Bot. Gard.* **5** 423 (1909)

Key to the Indian species of Galerina

1. Spores smooth, lacking a distinct suprahilar plage:

   2. Spores 10-13.5 × 7-8 µm, smooth, apically truncated by a broad germ-pore; pileus pale yellow to grey orange . . . . . 3. *G. truncata*

   2. Spores not truncated by a germ-pore, 7-7.7 × 4-4.5 µm; cystidia tibiform . . . . . 2. *G.* cfr. *stylifera*

1. Spores ornamented, lacking a germ-pore:

   3. Pileus conico-campanulate, 8-13 mm diameter, sulcate-striate, vinaceous cinnamon to ochraceous brown; spores 11.5-13 × 6-7.5 µm . . . . . 5. *G. vinolenta*

   3. Pileus without any vinaceous tints; caulocystidia absent:

      4. Lignicolous, tufted; stipe with a persistent annulus; spores 8-11 × 5-7 µm, loose perisporium:

         5. On conifer stumps; pileus dark brown . . . . . 4. *G. unicolor*

         5. On frandose wood; pileus yellowish brown . . . . . 1. *G. helvoliceps*

      4. Growing amongst moss, solitary; pileus 0.5-1.5 cm diameter, conico-convex; spores 8-12 × 5-7 µm, lacking a loose perisporium . . . 6. *G. vittaeformis*

1. *C. helvoliceps* (Berk. and Curt.) Singer in *Lilloa* **22** 572 (1951)

Jammu and Kashmir, Pahlgam (Watling and Gregory 1980 516)

2. *G.* cfr. *stylifera* (Atk.) Smith and Singer in *Sydowia* **2** 449 (1957)

Jammu and Kashmir, Pahlgam (Watling and Gregory 1980 517)

3. *G. truncata* Natarajan in *Mycologia* **59** 186 (1977)

Tamil Nadu, Madras, type locality

4. *G. unicolor* (Vahl. ex Sommerf.) Singer in *Trudy Bot. Inst. Akad. Nauk S.S.S.R.* **6** 468 (1950)

Jammu and Kashmir, Pahlgam (Watling and Gregory 1980 517)

5. *G. vinolenta* (Berk.) Smith and Singer, *Mongr. Galerina* 320 (1964)

Sikkim, type locality, K (Berkeley 1852a 131 as *Agaricus*)

6. *G. vittaeformis* (Fr.) Singer in *Trudy Bot. Inst. Akad. Nauk. S.S.S.R.* **6** 472 (1950)

Jammu and Kashmir, Sonamarg (Watling and Gregory 1980 518)

Excluded species

Galerina mutabilis (Schaeff. ex Fr.) P D Orton see *Kuehneromyces mutabilis*

88. *Gymnopilus* Karst. in *Bidr. Kann. Finl. Nat. Folk* **32** 21 400 (1879)

Key to the Indian species of Gymnopilus

1. Stipe with persistent annulus or annular zone:

2. Annulus membranaceous, pendant; pileus 4.5-6 cm diameter, depressed to infundibuliform; spores 6-7.5 × 3.7-4.7 µm; caespitose.....2. *G. chrysites*

2. Stipe with a fibrillose, cortinoid zone; pileus 2-7 cm diameter, convex to applanate; spores 7-9 × 3.5-5.5 µm.....4. *G. hybridus*

1. Stipe without persistent annulus:

3. Pileus not squamose:

4. Pileus small, 2 cm diameter, dull tawny, ochre with incurved margin .....5. *G. micromegas*

4. Pileus larger, 3-6 cm diameter, chrome yellow to rusty brown, margin not incurved.....6. *G. penetrans*

3. Pileus squamose:

5. Pileus small up to 3 cm diameter:

6. Spores large, 7-15.5 × 4.2-6.5 µm, subamygdaliform; stipe burnt sienna; pileus golden yellow with darker fibrillose squamules...8. *G. tropicus*

6. Spores small, 7-8 × 1.5 µm, ellipsoid; stipe white; pileus sulphur yellow with small punctate dark brown squamules at the disk....3. *G. dilepis*

5. Pileus larger, 3-10 cm diameter:

7. Pileus 2-8 cm diameter, convex, bright golden yellow, with floccose

squamules; spores 7.5-8.5 × 4.7-6 µm. . . . . 1. *G. chrysimyces*

7. Pileus 3-10 cm diameter, yellowish brown, surface cracking with age; spores 7.5-8.5 × 4-5 µm . . . . . 7. *G. sapineus*

1. *G. chrysimyces* (Berk.) Manjula

West Bengal, Darjeeling, type locality, K (Berkeley 1850 87 as *Agaricus*)

2. *G. chrysites* (Berk.) Singer in *Sydowia* **15** 76 (1962)

West Bengal, Darjeeling, type locality, K (Berkeley 1851a 41 as *Paxillus*)

3. *G. dilepis* (Berk. and Br.) Singer in *Lilloa* **22** 560 (1951)

West Bengal, Calcutta (Bose 1920a 351; Banerjee 1947 43 as *Flammula*)

4. *G. hybridus* (Fr. ex Fr.) Singer in *Lilloa* **22** 561 (1951)

Jammu and Kashmir, Pahlgam (Watling and Gregory 1980 518)

5. *G. micromegas* (Berk.) Manjula

Assam, Khasi Hills, Myrong, type locality, K (Berkeley 1852b 107 as *Agaricus*)

6. *G. penetrans* (Fr. ex Fr.) Murr. in *Mycologia* **4** 254 (1912)

Jammu and Kashmir, Gulmarg (Watling and Gregory 1980 518)

7. *G. sapineus* (Fr.) Maire in *Treb. Mus. Cienc. Nat. Barcelona* **15** 96 (1937)

Himachal Pradesh, Simla (Berkeley 1854 130 as *Flammula*); Uttar Pradesh, Saharanpur (Hennings 1901 333 as Flammula); Punjab, Migra forest (Massee 1901 151)

8. *G. tropicus* Natarajan in *Mycologia* **59** 185 (1977)

Tamil Nadu, Madras, type locality

89. *Phaeocollybia* Heim in *Encyclop. Mycol.* **1** 70 (1931)

Key to the Indian species of Phaeocollybia

1. Lamellae at first lilac becoming rust brown; pileus 2.5-6 cm diameter, ochraceous to tawny brown, drying paler, glutinous; spores 5-6 × 3-3.5 µm, ovoid . . . . . 2. *P. rancida*

1. Lamellae without any lilac tints:

2. Pileus 1.5-5 cm diameter, orange brown-reddish orange; stipe 9.5 cm long, pale brownish with purple to red brown base; spores 9.5-10 × 5.5 µm, sublimoniform . . . . . 3. *P. spoliata*

2. Pileus 1-2.5 cm diameter, dirty brown with yellow tinge; stipe 14 cm long, white becoming red brown; spores 9-10 × 5-6.5 µm, limoniform . . . . . 1. *P. coniuncta*

1. *P. coniuncta* Horak in Sydowia **33** 106 (1980)

Sikkim, upper Rangit, type locality

2. *P. rancida* Horak in *Acta. Bot. Indica* **2** 72 (1974)

Himachal Pradesh, Narkanda, type locality

3. *P. spoliata* Horak in *Acta Bot. Indica* **2** 70 (1974)

Himachal Pradesh, Narkanda, type locality

90. *Rozites* Karst. in *Bidr. Finl. Nat. Folk* **32** 20 (1879)

Key to the Indian species of Rozites

1. Lamellae violaceous when young; pileus golden brown with white floccose veil, margin striate; stipe white, with hanging annulus . . . . . 2. *R. emodensis*

1. Lamellae not violaceous; veil and annulus ochre to whitish; pileus with whitish or violaceous veil . . . . . 1. *R. caperata*

1. *R. caperata* (Pers. ex Fr.) Karst., *Hattsv.* **1** 295 (1879)

Uttar Pradesh, Allahabad (Singh and Mehrotra 1974 521)

2. *R. emodensis* (Berk.) Moser in *Schw. Zeit f. Pilzk.* **31** 169 (1953)

Sikkim, Lachen, type locality, K (Berkeley 1852a 132 as *Cortinarius*)

13. *Crepidocateae* (Imai) Singer in *Lilloa* **22** 584 (1951)

91. *Crepidotus* (Fr.) Kummer, *Führ. Pilzk.* **21** (1871)

Key to the Indian species of Crepidotus

1. Spores echinate, globose:

2. Pileus 1-4 cm diameter, white, becoming brownish, pleurocystidia absent . . . . . 2. *C. applanatus*

2. Pileus 1.5-6 cm diameter, white, pleurocystidia and cheilocystidia present . . . . . 3. *C. cystidiosus*

1. Spores smooth, ellipsoid, clamp-connexions absent; contex or epicutis gelatinised:

3. Pileus cream coloured with brown squamules . . . . . 1. *C. alveolus*

3. Pileus not squamose, whitish or pale brown:

4. Pileus small up to 2 cm diameter, cheilocystidia septate . . . . . 5. *C. uber* var. *phragmocystidiosus*

4. Pileus larger up to 3.4 cm diameter. cheilocystidia not septate, mucronate, pileocystidia present . . . . . 4. *C. eucalypticola*

1. *C. alveolus* (Lasch.) Kummer, *Führ. Pilzk.* **74** (1871)

Uttar Pradesh, Saharanpur (Hennings 1901 331). Doubtfully distinct from *Crepidotus mollis* (Dennis *et al* 1960 171)

2. *C. applanatus* (Pers. ex Fr.) Kummer, *Führ. Pilzk.* 74 (1871)

Uttar Pradesh, Mussoorie (Hennings 1901 331)

3. *C. cystidiosus* Hesler and Smith, *North. Am. Spec. Crepidotus* 43 (1965)

Tamil Nadu, Tirunelveli Dist., Senkaltheri (Natarajan and Raman 1981 170)

4. *C. eucalypticola* Singer in *Nova Hedwigia* **29** 73 (1978)

Tamil Nadu, Nilgiri Hills (Natarajan and Raman 1981 172)

5. *C. uber* (Berk. and Cooke) Sacc. var. *phragmocystidiosus* Natarajan and Raman

Tamil Nadu, Tirunelveli Dt., type locality

92. *Simocybe* Karst. in *Bids. Finl. Natur. Folk* **32** 22 (1879)
S. descendens (Berk.) Manjula

Sikkim (Berkeley 1852a 130 as *Agaricus*), type locality, K

93. *Tubaria* (W G Smith) Gillet, *Hymén.* 537 (1874)

Key to the Indian species of Tubaria

1. Spores smooth:

2. Pileus with aculeate squamules, subochraceous, convex with striate margin ..... 1. *T. asprata*

2. Pileus smooth with indistinct appressed squamules:

3. Pileus white, glabrous, 5-12 mm diameter; spores subglobose-ellipsoid, 5-6 × 4 µm ..... 5. *T. saharanpurensis*

3. Pileus brown:

4. Pileus strongly hygrophanous; spores ellipsoid, 6-9 × 4.5-5.7 µm ..... 4. *T. furfuracea*

4. Pileus not or scarcely hygrophanous; spores amygdaliform ..... 3. *T. conspersa*

1. Spores asperulate; lamellae yellow; pileus 0.8-1.3 cm diameter, pale alutaceous ..... 2. *T. autochthona*

1. *T. asprata* P. Henn. in *Hedwigia* **40** 331 (1901)

Uttar Pradesh, Saharanpur, type locality

2. *T. autochthona* (Berk. and Br.) Sacc., *Syll. Fung.* **5** 874 (1887)

Jammu and Kashmir, Harwan, Dachigam Reserve Forest (Watling and Gregory 1980 527)

3. *T. conspersa* (Pers. ex Fr.) Fayod in *Ann. Sci. Nat. Bot. sér.* 7 **9** 355 (1889)

Jammu and Kashmir (Watling and Gregory 1980 528); Uttar Pradesh, Saharanpur (Hennings 1901 332 as *Naucoria*)

4. *T. furfuracea* (Pers. ex Fr.) Gillet, *Champ.* 537 (1976)

Uttar Pradesh, Saharanpur (Hennings 190 331)

5. *T. saharanpurensis* P. Henn. in *Hedwigia* **40** 332 (1901)

Uttar Pradesh, Saharanpur, type locality

14. *Entolomataceae* Kotl. and Pouz. in *Ceska Mykol.* **26** 218 (1972)

94. *Alboleptonia* Largent and Benedict in *Mycologia* **62** 439 (1970)
A. stylophora (Berk. and Br.) Pegler in *Kew. Bull.* **32** 199 (1977)

Kerala, Calicut University campus (Leelavathy and Little Flower 1981 32)

95. *Clitopilus* (Fr.) Kummer, *Führ. Pilzk.* 23 (1871)

Key to the Indian species of Clitopilus

1. Pileus 3-8 cm diameter, depressed, white, stipe excentric 2-5 cm long . . . . . 2. *C. prunulus*

1. Basidiocarp small, stipe short or absent, pileus greyish white . . . . . 1. *C. passeckerianus*

1. *C. passeckerianus* (Pilat) Singer in *Lilloa* **22** 607 (1951)

Himachal Pradesh, Solan (Thapa *et al* 1977 27)

2. *C. prunulus* (Scop. ex Fr.) Kummer, *Führ. Pilzk.* 97 (1871)

Jammu and Kashmir, Pahlgam (Watling and Gregory 1980 551)

96. *Claudopus* Gillet, *Hymén.* 426 (1876)
C. byssisedus (Fr.) Gillet, *Hymén.* 427 (1876)

Tamil Nadu, Madras, Tambaram, Christian College campus (Natarajan and Raman 1980 233)

97. *Entoloma* (Fr.) Kummer, *Führ. Pilzk.* 23 (1871)

Key to the Indian species of Entoloma

1. Pileus brown, glabrous, conical strongly umbonate . . . . . 1. *E. euthelium*

1. Pileus pale yellow, plano-convex becoming infundibuliform . 2. *E. ochrospora*

1. *E. euthelium* (Berk.) Sacc., *Syll. Fung.* **5** 694 (1887)

Sikkim, type locality, K (Berkeley 1852b 105 as *Agaricus*). See also Pegler 1977 196)

2. *E. ochrospora* Sathe and Kulkarni in *Curr. Sci.* **48** 1042 (1979)

Maharashtra, Sawantwadi, type locality

Excluded species

Entoloma cystopus (Berk.) Sacc. see *Nolanea cystopus*
Entoloma goliath (Hook. fil) Sacc. see *Termitomyces*

Eccilia (Fr.) Kummer, *Führ. Pilzk.* 23 (1871)

Excluded species

Eccilia blandfordii P. Henn. see *Leptonia griseo-rubella*

Eccilia griseo-rubella (Lasch) Sacc. see *Leptonia griseo-rubella*

98. *Leptonia* (Fr.) Kummer, *Führ. Pilzk.* 24 (1871)

Key to the Indian species of Leptonia

1. Stipe elongate, 12-14 cm long; pileus 2.5-3 cm diameter, violaceous; lamellae white, spores 8.5-10.5 × 5.5-7 µm. . . . . .2. *L. incongrua*

1. Stipe short, 3-4 cm long; pileus 4 cm diameter, brown; lamellae white; spores 9-12 × 6-9 µm. . . . . .1. *L. griseo-rubella*

1. *L. griseo-rubella* (Lasch) P D Orton in *Trans. Brit. Mycol. Soc.* **43** 177 (1960)

Uttar Pradesh (Hennings 1900 153 as *Eccilia blandfordii* P. Henn 1901 333 as *Eccilia griseo-rubella* (Lasch) Kummer). See also Pegler 1977 216

2. *L. incongrua* (Berk.) Pegler in *Kew Bull.* **32** 209 (1977)

West Bengal, Darjeeling, Jillapahar, type locality, K (Berkeley 1850 48 as *Agaricus*)

Excluded species

Leptonia lazulina (Fr.) Quél. see Pegler 1977 217

99. *Pouzaromyces* Pilát in *Acta Mus. Nat. Prag.* **9B** 60 (1953)

Key to the Indian species of Pouzaromyces

1. Pileus pearl grey with fuscous brown hairs; spores 14 × 8.5 µm. . . .1. *P. lasius*

1. Pileus ochraceous tawny; spores 10.5 × 6.5 µm. . . . . .2. *P. myodermus*

1. *P. lasius* (Berk. and Br.) Pegler in *Kew. Bull.* **32** 199 (1977)

Kerala, Calicut University campus (Leelavathy and Little Flower 1981 31)

2. *P. myodermus* (Berk. and Br.) Pegler in *Kew. Bull.* **32** 198 (1977)

Kerala, Calicut University campus (Leelavathy and Little Flower 1981 33)

100. *Nolanea* (Fr.) Kummer, *Führ. Pilzk.* 24 (1871)

Key to the Indian species of Nolanea

1. Basidiocarp minute; pileus 3-5 mm diameter, vinaceous to ochraceous red; spores isodiametric, 7.5 × 6 µm. . . . . .4. *N. nana*

1. Basidiocarp larger; pileus 10 mm or more in diameter:

   2. Spores isodiametric, polygonal, angular:

      3. Spores 7.5-11.5 × 6.3-9 µm; pileus silky, striate, subglobose to conico-convex with mamillate umbo, dark blistre brown . . . . . .3. *N. mammifera*

      3. Spores 7.5-9 × 6.5-7.5 µm; pileus 1.5-4 cm, conico-convex, sometimes

umbonate, silky, margin translucent striate, sometimes umbonate, brown ..... 5. *N. sericea*

2. Spores heterodiametric:

4. Stipe cylindric, cream coloured, spores nodulose . . . 2. *N. maderaspatana*

4. Stipe with in inflated, bulbous base, brown, spores angular ..... 1. *N. cystopus*

1. *N. cystopus* (Berk.) Pegler in *Kew. Bull.* **32** 202 (1977)

West Bengal, Darjeeling, type locality, K (Berkeley 1850 85 as *Agaricus*)

2. *N. maderaspatana* Pegler in *Kew. Bull.* **32** 202 (1977)

Tamil Nadu, Madurai Dt., Palani Hills, Kodaikanal, type locality, K

3. *N. mammifera* (Romagn.) Pegler in *Kew. Bull. Addn. sér.* **6** 535 (1977)

Tamil Nadu, Kodaikanal (Natarajan and Raman 1980 234)

4. *N. nana* Massee in *Bull. Misc. Inf. Kew.* **1907** 123 (1907)

West Bengal, Calcutta, type locality, K

5. *N. sericea* (Bull. ex. Mérat) Orton in *Trans. Br. Mycol. Soc.* **43** 179 (1960)

Tamil Nadu, Madurai Dt., Palani Hills, Kodaikanal (Pegler 1977 205)

101. *Rhodocybe* R. Maire in *Bull. Soc. Mycol. Fr.* **40** 298 (1925)
R. villosa Horak in *Sydowia* **33** 105 (1980)

Sikkim, Upper Rangit, type locality

4. Order *Boletales* Gilbert, *Les Boletes* 82 (1931)

15. *Paxillaceae* Maire ex Gilbert, *Les Boletes* 84 (1931)

102. *Hygrophoropsis* (Schroet.) R. Maire in Martin sans, *Empois Champ.* 99 (1929)
H. aurantiaca (van Wulfen) Fr. Maire in Martin sans, *Empois Champ.* 99 (1929)

India (Bose and Bose 1940)

Paxillus Fr., *Fl. Scan.* 339 (1835)

Excluded species

Paxillus chrysites Berk. Probably the same as *Phylloporus sulphureus*

Paxillus pinguis Hooker fil. see *Phylloporus pinguis*

Paxillus sulphureus Berk. see *Phylloporus sulphureus*

16. *Gyrodontaceae* (Singer) Heinem. in *Bull. Jard. Bot. Etat Brux.* **21** 228 (1951)

103. *Phaeogyroporus* Singer in *Mycologia* **4** 36 360 (1944)
P. fragicolor (Berk.) Horak in *Sydowia* **33** 98 (1980)

Assam, Khasi Hills, type locality, K (Berkeley 1852a 137 as *Boletus*)

17. *Xerocomaceae* (Singer) Pegler and Young in *Trans. Br. Mycol. Soc.* **76** 112 (1981)

104. *Boletellus* Murr. in *Mycologia* **1** 10 (1909)

Key to the Indian species of Boletellus

1. Pileus chestnut brown; spores 18-23 × 9-10.5 µm. . . . . 4. *B. verrucarius*

1. Pileus with purplish, reddish or pinkish tints:

2. Spores 13-17.5 × 9-10 µm. . . . . 3. *B. squamatus*

2. Spores longer, 15-22 × 6-8 µm:

3. Context yellow, discolouring blue; spore ridges conspicuous. . . . . 1. *B. emodensis*

3. Context not bluing; spore ridges fiant. . . . . 2. *B. obscurecoccineus*

1. *B. emodensis* (Berk.) Singer in *Ann. Mycol. Berl.* **40** 18 (1942)

West Bengal, Darjeeling, type locality, K (Berkeley 1851a 48 as *Boletus*). See also Horak (1980 96)

2. *B. obscurecoccineus* (Höhnel) Singer in *Farlowia* **2** 127 (1945)

West Bengal, Bankura (Ray and Samajpati 1979 66)

3. *B. squamatus* (Berk.) Singer in *Sydowia* **9** 424 (1955)

Assam, Myrong Hills, type locality, K (Berkeley 1852a 137 as *Boletus*). See also Horak (1980 96)

4. *B. verrucarius* (Berk.) Singer in *Sydowia* **9** 425 (1955)

Sikkim, type locality, K (Berkeley 1854 135 as *Boletus*)

105. *Phylloporus* Quél. *Fl. Mycol. Fr.* 409 (1888)

Key to the Indian species of Phylloporus

1. Pileus depressed, infundibuliform, reddish brown; lamellae veined at the base; spores 8.5-11 × 3-4 µm, pale melleous coloured. . . . . 1. *P. pinguis*

1. Pileus plano-convex, sulphur yellow to orange; lamellae very broad distant; spores 9-12.5 × 3.5-4.5 µm, olive brown. . . . . 2. *P. sulphureus*

1. *P. pinguis* (Hook. f.) Singer ex Corner in *Nova Hedwigia* **20** 813 (1970)

West Bengal, Darjeeling, type locality, K (Berkeley 1851a 42 as *Paxillus*)

2. *P. sulphureus* (Berk.) Singer in *Lilloa* **22** 665 (1951)

West Bengal, Darjeeling, type locality, K (Berkeley 1851a 41 as *Paxillus*)

106. *Xerocomus* Quél., *Fl. Mycol. Fr.* 417 (1888)

Key to the Indian species of Xerocomus

1. Pileus up to 2 cm diameter, pale yellow; spores small, 5-6.5 × 3.2-3.5 µm ..... 3. *X. indicus*

1. Pileus not yellow, 2-5 cm diameter; spores more than 8 µm; context cyanescent on exposure:

2. Pileus liver brown; stipe concolorous but with red to yellow apex; spores 10-13 × 4.5-5.5 µm ..... 2. *X. delphinus*

2. Pileus purplish red; stipe brown; spores 9-11 × 3.5-4.5 µm .... 1. *X. bakshii*

1. *X. bakshii* Singer and Singh in *Mycopathol. Mycol. Appl.* **43** 31 (1971)

Uttar Pradesh, Dehra Dun, type locality

2. *X. delphinus* (Hook. f. ex Berk.) Manjula

West Bengal, Darjeeling, type locality, K (Berkeley 1851c 77 as *Boletus*)

3. *X. indicus* Singer in *Pap. Mich. Acad. Sci. Arts Lett.* **32** 104 (1946)

India, type locality

18. *Boletaceae* Chev., *Fl. Env. Paris* 248 (1828)

107. *Boletus* Dill. ex Fr., *Syst. Mycol.* **1** 385 (1821)

Key to the Indian species of Boletus

1. Pileus large, 10-15 cm diameter, ochraceous buff to tawny brown, with minute squamules; stipe 15 cm with swollen base, with coarsely reticulate ornamentation; spores 14-17 × 4-5 µm, with suprahilar depression ..... 1. *B. gigas*

1. Pileus smaller, less than 10 cm diameter:

2. Pileus up to 7 cm diameter, deep purple brown; stipe dark brown, clavate; pores purple brown; context white turning to purple brown; spores 10-12.5 × 4-5 µm ..... 3. *B. scrobiculatus*

2. Pileus not purple; context discolouring blue; basidiocarp small; pileus up to 2.5 cm diameter, white; stipe 3 cm long, subclavate, white; spores 9-11 × 4.5-5 µm, broadly fusoid ..... 2. *B. pusillus*

1. *B. gigas* Berk. in *Hooker J. Bot.* **4** 138 (1852)

Sikkim, type locality, K. See also Horak (1980 97)

2. *B. pusillus* Berk. in *Hooker J. Bot.* **6** 135 (1854)

Assam, Khasi Hills, Moflong, type locality, K. See also Horak (1980 97)

3. *B. scrobiculatus* Berk. in *Hooker J. Bot.* **4** 139 (1852)

Assam, Khasi Hills, Moflong, type locality, K. See also Horak (1980 96)

Excluded species

Boletus areolatus Berk.	see *Tylopilus areolatus*
Boletus delphinus Berk.	see *Xerocomus delphinus*

Boletus emodensis Berk.	see *Boletellus emodensis*
Boletus flavipes Berk.	see *Pulveroboletus flavipes*
Boletus fragicolor Berk.	see *Phaeogyroporus fragicolor*
Boletus furfuraceus Berk.	see *Suillus furfuraceus*
Boletus squamatus Berk.	see *Boletellus squamatus*
Boletus ustalis Berk.	see *Leccinum ustale*
Boletus verrucarius Berk.	see *Boletellus verrucarius*

108. *Leccinum* S F Gray, *Nat. Arr. Br. Pl.* **1** 646 (1821)
L. ustale (Berk.) Horak in *Sydowia* **33** 97 (1980)

West Bengal, Darjeeling, type locality, K (Berkeley 1851 48 as *Boletus*)

109. *Pulveroboletus* Murr. in *Mycologia* **1** 9 (1909)

Key to the Indian species of Pulveroboletus

1. Pileus up to 5 cm diameter; fuscous yellow; stipe bright yellow, pruinose ..... 1. *P. flavipes*

1. Pileus 3-7 cm diameter, orange rufous; stipe concolorous ..... 2. *P. shoreae*

1. *P. flavipes* (Berk.) Horak in *Sydowia* **33** 98 (1980)

Assam, Khasi Hills, type locality, K (Berkeley 1854 135 as *Boletus*)

2. *P. shoreae* Singer and Singh in *Mycopath. Mycol. Appl.* **43** 28 (1971)

Uttar Pradesh, Dehra Dun, type locality

19. *Strobilomycetaceae* Gilb., *Les Bolets* 105 (1931)

110. *Porphyrellus* Gilb., *Les Bolets* 99 (1931)
P. malaccensis (Pat and Baker) Singer in *Farlowia* **2** 132 (1945)

West Bengal, Bankura Dt. (Ray and Samajpati 1979 66)

111. *Strobilomyces* Berk. in *Hooker J. Bot.* **3** 78 (1851)

Key to the Indian species of Strobilomyces

1. Pileus white, grey or black:

2. Stipe elongate 8-14 cm long; spores 8.5-12 × 8-10 µm, subglobose to broadly ovoid, with a completely reticulate ornamentation ..... 1. *S. floccopus*

2. Stipe short, up to 6 cm long:

3. Spores 8.5-12 × 7.5-9.5 µm with a reticulate ornamentation with wings and large mesh ..... 3. *S. nigricans*

3. Spores 7-10 × 5-8 µm, with a low rugose-verrucose ornamentation ..... 5. *S. velutipes*

1. Pileus dark brown:

4. Pileus 4-8 cm diameter, amethyst brown, with large pyramidal squamules

on both the pileus and stem; spores 11-14 × 9-12 µm, globose with a complete reticulate ornamentation of low ridges ..... 2. *S. montosus*

4. Pileus 15-18 cm diameter, umber brown, with small, soft pyramidal squamules; spores 9.5-14.5 × 8.5-11.5 µm, globose with an ornamentation of large verrucae and ridges forming an incomplete reticulum 4. *S. polygramis*

1. *S. floccopus* (Vahl. ex Fr.) Karst in *Bidr. Finl. Nat. Folk.* **37** 16 (1882)

Jammu and Kashmir, Sonamarg (Murrill 1924 133 as *Strobilomyces strobilaceus* Scop. ex Fr.)

2. *S. montosus* Berk. in *Hooker J. Bot.* **3** 78 (1851)

West Bengal, Darjeeling, Jillapahar, type locality, K. See also Horak (1980 94)

3. *S. nigricans* Berk. in *Hooker J. Bot.* **4** 139 (1852)

Assam, Khasi Hills, type locality, K

4. *S. polygramis* Hook. f. apud Berk. in *Hooker J. Bot.* **3** 78 (1851)

West Bengal, Darjeeling, Jillapahar. See also Horak (1980 94)

5. *S. velutipes* Cooke and Massee in *Grevillea* **18** 5 (1889)

Tamil Nadu, Coimbatore (Lloyd 1924 1331 as *S. indica* Lloyd, type locality)

Excluded species

Strobilomyces indica Lloyd	see *Strobilomyces velutipes*
Strobilomyces kalimpongensis Bose	This is a poroid species of Aphyllophorales
Strobilomyces strobilaceus Scop. ex Fr.	see *Strobilomyces floccopus*

112. *Suillus* Mich. ex S F Gray *Nat. Arr. Br. Pl.* **1** 646 (1821)

Key to the Indian species of Suillus

1. Stipe with large, membranous, glutinous annulus; pileus bay brown; spores 7-10 × 3-3.5 µm ..... 2. *S. luteus*

1. Annulus absent:

2. Pileus with yellow tints; spores 8-11 × 3-4 µm; under pines:

3. Pileus umbonate, olivaceous yellow to sulphur yellow, viscid 4. *S. sibiricus*

3. Pileus cream coloured or white with sulphur yellow or brown tints; context slowly discolouring pink with ammonia ..... 3. *S. plorans*

2. Pileus lacking yellow tints, reddish grey, floccose; tubes tinged with red; spores 6.5-8.5 × 2.5-3.3 µm ..... 1. *S. furfuraceus*

1. *S. furfuraceus* (Berk.) Horak in *Sydowia* **33** 96 (1980)

Assam, Khasi Hills, type locality, K (Berkeley 1852a 137 as *Boletus*)

2. *S. luteus* (L. ex Fr.) S F Gray, *Nat. Arrang. Br. Pl.* **1** 646 (1821)

Himachal Pradesh, Simla (Sharma and Munjal 1977 20 as *Boletus*)

3. *S. plorans* (Roll.) O Kuntze, *Rev. Gen. Pl.* **3** 536 (1898)

Jammu and Kashmir, Pahlgam (Watling and Gregory 1980 502)

4. *S. sibiricus* (Singer) Singer in *Farlowia* **2** 260 (1945)

Jammu and Kashmir, Pahlgam (Watling and Gregory 1980 502)

113. *Tylopilus* Karst. in *Rev. Mycol.* **3** 16 (1881)
T. areolatus (Berk.) Manjula

Assam, Kala Pani, Khasi Hills, type locality, K (Berkeley 1852a 138 as *Boletus*; Horak 1980 100 pl. 3E as *Boletus*)

5. Order *Russulales* emend. Pegler and Young in *Trans. Br. Mycol. Soc.* **72** 358 (1979)

20. *Russulaceae* Roze in *Bull. Soc. Bot. Fr.* **23** 110 (1876)

114. *Lactarius* Pers. ex S F Gray, *Nat. Arr. Br. Pl.* **1** 623 (1821)

Key to the Indian species of Lactarius

1. Latex orange:
   2. Latex discolouring green on exposure; pileus 6-20 cm diameter, orange red with concentric zones, convex to depressed, margin inrolled ..... 3. *L. deliciosus*
   2. Latex discolouring purple or vinaceous red:
      3. Pileus 10-15 cm diameter, convex to depressed, reddish orange, margin incurved; spores 8-10 × 7-9 µm: ..... 4. *L. deterrimus*
      3. Pileus 3-10 cm diameter, dark vinaceous red; spores 8-11 × 6.5-8 µm, latex deep vinaceous ..... 9. *L. subfurfuraceus*
1. Latex not orange:
   4. Latex white, discolouring on exposure:
      5. Latex discolouring to yellow:
         6. Pileus glabrous, viscid, straw yellow; stipe with yellow spots; spores 8-9 × 6-7 µm ..... 6. *L. scrobiculatus*
         6. Pileus radially strigose with woolly margin, pale pink then brown, zonate; spores 7-10 × 6-7 µm ..... 1. *L. cilicioides*
      5. Latex discolouring to lilac; pileus pale grey, viscid ..... 11. *L.* aff. *uvidus*
   4. Latex white, unchanging:
      7. Pileus pale, white to pale straw coloured:
         8. Basidiocarp large and fleshy; pileus 10-30 cm diameter:

9. Pileus white to cream coloured; lamellae white; spores 8-10 × 7-9 µm ..... 10. *L. vellereus*

9. Pileus white with pink or vinaceous tints; lamellae pink; spores 6-7.5 × 4.5-5 µm ..... 2. *L. controversus*

8. Basidiocarp smaller; pileus 5-6 cm diameter, white to cream coloured; lamellae not forked; spores 5.7-7 × 4.7-5.5 µm ..... 7. *L. stramineus*

7. Pileus deeply pigmented, pinkish cinnamon to blood red:

10. Pileus pinkish cinnamon up to 8 cm diameter; lamellae pinkish; spores 10-11 × 7-9 µm, with fine low reticulate ornamentation ..... 8. *L. subdulcis*

10. Pileus deep blood red, over 10 cm diameter; lamellae yellowish brown; spores 6.7-9 × 6.7-5 µm with coarsely reticulate ornamentation ..... 5. *L. princeps*

1. *L. cilicioides* (Fr.) Fr., *Epicrisis* 334 (1838)

Delhi (Chona *et al* 1958)

2. *L. controversus* (Fr.) Fr., *Epicrisis* 335 (1838)

Jammu and Kashmir, Sarband near Harwan (Watling and Gregory 1980 536). Dachigam (Abraham *et al* 1981 37)

3. *L. deliciosus* (L. ex Fr.) S F Gray, *Nat. Arr. Br. Pl.* **1** 624 (1821)

Sikkim, Lachen (Berkeley 1852a 134)

4. *L. deterrimus* Gröger in *Westfal. Pilzbriefe* **7** 10 (1968)

Jammu and Kashmir, Tangmarg (Watling and Gregory 1980 536); Gulmarg (Abraham *et al* 1980 33)

5. *L. princeps* Berk. in *Hook. J. Bot.* **4** 135 (1852)

Assam, Kullong, Khassia, type locality, K

6. *L. scrobiculatus* (Scop. ex Fr.) Fr. *Epicrisis* 334 (1838)

Jammu and Kashmir, Tangmarg (Watling and Gregory 1980 537), Gulmarg (Abraham *et al* 1980 35)

7. *L. stramineus* Berk. in *Hook. J. Bot.* **6** 131 (1854)

Assam, Khasi Hills, Pomrang, type locality, K

8. *L. subdulcis* (Pers. ex Fr.) S F Gray, *Nat. Arr. Br. Pl.* **1** 625 (1821)

India (Berkeley 1852a 135)

9. *L. subpurpureus* Peck in *Ann. Rep. New York St. Mus.* **29** 43 (1878)

Jammu and Kashmir, Gulmarg (Watling and Gregory 1980 537)

10. *L. vellereus* (Fr.) Fr. *Epicrisis* 340 (1838)

Sikkim (Berkeley 1852a 134)

11. *L.* aff. *uvidus* (Fr. ex Fr.) Fr. *Epicrisis* 338 (1838)

Jammu and Kashmir, Sarband near Harwan (Watling and Gregory 1980 538). Dachigam (Abraham *et al* 1981 37)

115. *Russula* Pers. ex. S F Gray, *Nat. Arr. Br. Pl.* **1** 618 (1821)

Key to the Indian species of Russula

1. Context hard and compact, not brittle; lamellulae present:

2. Context discolouring reddish then bleaching; pileus greyish brown, paler at margin; lamellae very crowded ..... 4. *R. densifolia*

2. Context not changing colour; pileus white to cream coloured; lamellae thick and widely spaced ..... 3. *R. delica*

1. Context brittle; lamellulae absent or very few:

3. Spore print pure white to cream coloured, never yellow:

4. Pileus red, orange, purple or vinaceous:

5. Stipe flushed with pink, red or vermillion tints:

6. Growing with coniferous trees:

7. Pileus purplish red, often with white areas, margin smooth; lamellae cream coloured; stipe pink ..... 13. *R. sanguinea*

7. Pileus deep vermillion, with yellow areas, margin striate; lamellae snow white; stipe vermillion or yellow ..... 2. *R. cinnabarina*

6. Growing with deciduous trees; pileus pale red or pink; lamellae cream coloured:

8. Pileus uniformly carmine red; taste mild; spores reticulate ..... 10. *R. lepida*

8. Pileus red, with discoloured patches; taste acrid; spores verrucose ..... 11. *R. rubicunda*

5. Stipe pure white or perhaps tending to yellow; pileus scarlet or blood red; with coniferous trees ..... 5. *R. emetica*

4. Pileus not red, orange or purple:

9. Pileus yellowish green or alutaceous brown; lamellae forking, very thin, cream coloured; stipe white; short, 4-6 cm; spores 5-7 × 4-6 µm ..... 9. *R. heterophylla*

9. Pileus ochre to tawny; lamellae thick; stipe long, 10-13 cm; spores 8-10 × 7-9 µm; smell rancid ..... 7. *R. foetens*

3. Spore print yellow:

19. Basidiocarp large, often robust:

11. Stipe white:

12. Taste acrid; pileus purplish, sometimes with green; lamellae saffron yellow ..... 6. *R. firmula*

12. Taste mild; pileus vinaceous, often straw yellow at centre; lamellae pale yellow ..... 1. *R. alutacea*

11. Stipe yellowish; pileus greyish red, spotted, viscid; lamellae ochraceous ..... 8. *R. grossa*

10. Basidiocarp small, slender with fragile stipe; pileus versicolourous, vinaceous, cinnamon, olivaceous or yellowish buff, margin tuberculate, lamellae saffron yellow ..... 11. *R. nauseosa*

1. *R. alutacea* Fr. *Epicrisis* 362 (1938)

Jammu and Kashmir (Berkeley 1876 137)

2. *R. cinnabarina* Hook. fil. apud Berk. in *Hook. J. Bot.* **3** 42 (1851)

West Bengal, Darjeeling, type locality, K

3. *R. delica* Fr. *Epicrisis* 355 (1838)

Uttar Pradesh, Dehra Dun (Bakshi 1974 24); Jammu and Kashmir; Tangmarg (Watling and Gregory 1980 538 as *R. brevipes* Peck), Gulmarg (Abraham 1980 29)

4. *R. densifolia* (Secr.) Gillet, *Champ. Fr.* 231 (1874)

Jammu and Kashmir, Gulmarg (Watling and Gregory 1980 540). Sonamarg (Abraham *et al* 1981 41)

5. *R. emetica* Fr., *Epicrisis* 357 (1838)

West Bengal, Darjeeling (Berkeley 1851a 43; 1852a 135)

6. *R. firmula* J. Schaeff. in *Ann. Mycol. Berlin* **38** 111 (1940)

Jammu and Kashmir, Pahlgam (Watling and Gregory 1980 541)

7. *R. foetens* Fr., *Epicrisis* 359 (1838)

Himachal Pradesh, Simla, Summer Hill (Saini and Atri 1981 460)

8. *R. grossa* Berk. in *Hook J. Bot.* **3** 42 (1851)

West Bengal, Darjeeling, type locality, K

9. *R. heterophylla* Fr. *Epicrisis* 352 (1838)

Sikkim, Sinchul (Berkeley 1851a 42 as *R. furcata* Fr.)

10. *R. lepida* Fr. *Epicrisis* 355 (1838)

West Bengal, Darjeeling (Berkeley 1851a 43)

11. *R. nauseosa* (Pers. ex Secr.) Fr. *Epicrisis* 363 (1838)

Jammu and Kashmir, Pahlgam (Watling and Gregory 1980 543)

12. *R. rubicunda* Quél. in *C.R. Ass. frac. Av. Sci.* (Besancon) **24** 619 (1896)

Jammu and Kashmir, Tangmarg-Gulmarg, 1 Oct. 1977, Kachroo (Watling and Gregory 1980 544)

13. *R. sanguinea* (Bull. ex St. Amans) Fr. *Epicrisis* 351 (1838)

Sikkim, Lachen (Berkeley 1852a 135 as *R. rosacea* Fr.)

Excluded species

Russula brevipes Peck	see *Russula delica*
Russula furcata Fr.	see *Russula heterophylla*
Russula rosacea Fr.	see *Russula sanguinea*
Russula aff. *fragrantissima* Romagn.	May be a new species (Watling and Gregory 1980 541)

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Index to genera and species