PENNY'S BASIC DETAILS FOR SOME COMMON MUSHROOM GENERA (formulated July 2022)

GENUS (common name) SPORE COLOUR	GILL / PORE COLOUR and ATTACHMENT	KEY MACRO CHARACTERS	SUBSTRATE and GENERAL HABITAT	KEY MICRO CHARACTERS	CHEMICALS and STAINS	BOOKS and KEYS (*other than* Fungi of T.E., Funga Nordica and Kibby Mushrooms & Toadstools	NUMBER of UK SPECIES (approx)
AGARICUS (Mushroom)	Pale pink / almost white, later dark greyish to black. Free.	Stem with (sometimes ephemeral) ring. Caps white, smooth / brown scaly. Flesh staining red / yellow or not. Smell.	Soil in woodland / soil in grassland. Saprotrophic.	Spores very dark , smooth / ellipsoid / ovoid, without / with germ pore. Sometimes with cheilocystidia.	Congo Red for cheilocystidia; water or ammonia for spores.	Kibby *The genus Agaricus in Britain;* FAN vol 5; B&K vol 4.	About 40
AMANITA (Amanita)	White to pale cream. Free	Stem base with (some form of) volva. Stem with / without ring. Cap with / without veil remnants. Smell.	Soil in woodland. Mycorrrhizal with trees: noting host tree often critical.	Spores hyaline / amyloid, globose to ellipsoid, size. Cystidia absent.	Congo Red for spore shape & size; Melzers for amyloidity (best tested on a print).	Kibby *The genus Amanita in Gt Britain;* B&K vol 4; Galli *Le Amanite.*	About 30
The BOLETES including all the many allied genera	Pores not gills: yellow, orange, red, white, beige, bruising blue / black or not. Occ. subdecurrent.	Pore colour. Flesh / pores changing colour when exposed to air / bruised. Cap colour and texture. Stem texture and markings, (occ. with a ring in Suillus).	Soil in woodland. Mycorrrhizal with trees: noting host tree often critical. (A few sp. with Helianthemum.)	Spores smooth, narrow ellipsoid, in one species truncate. Cap cuticle in Leccinum is critical. Cystidia not used.	Ammonia for spores; Congo Red for Leccinum cap cuticle.	Kibby *British Boletes with keys to species*; FAN vol 7; B&K vol 4; Galli *I Boleti.*	About 80, split into a growing number of different genera
CLITOCYBE (Funnel) including allied genera	White to cream / greyish. Often ± decurrent but not always.	Caps varied, often whitish, cream, greyish, ± smooth, hygrophanous or not. Stems with no ring. Smells important: mealy / sweet / aniseed / etc.	Litter in woodland / soil in grassland. Saprotrophic.	Of less significance than in many genera: no cystidia present. Spores hyaline, size and shape. Occ. cap cuticle cells are significant.	Congo Red for all microscopic examination.	FAN vol 3; B&K vol 3.	About 30
CONOCYBE (Conecap) including Pholiotina	Pale rust. Adnate to free. *NB easily confused with very similar Galerina.*	Mycenoid but with ± rust brown cap & gills. Cap margin fluted or not. Stem (with ring in Pholiotina) pruinose, sometimes with bulb.	A large range of substrates incl. dung, soil, wood, litter, grassland. Saprotrophic.	Spores smooth, pale brown, ± ellipsoid / amygdaliform. Cystidia (Conocybe), skittle-shaped, (Pholiotina) other. No pleuros. Stem cells important.	Congo Red for all microscopic examination.	B&K vol 4	Conocybe about 60; Pholiotina about 10.
COPRINUS (Inkcap) including Coprinellus / -opsis, Parasola & Tullosesus.	White at first but quickly turning black. Free.	Gills deliquescing (not in Parasola). Veil (tiny white flecks) on cap or not. Setules on stem / cap or not. Fruitbody size. Smell.	A large range of substrates incl. dung, soil, wood, herbaceous stems. Saprotrophic.	Spore size & shape. Cheilocystidia shape, pleurocystidia present or not. Cap / Stem setules present or not.	Water or ammonia for spores; Congo Red for cystidia	FAN vol 6; B&K vol 4.	About 100, split into 4 different genera

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CORTINARIUS (Webcap)	Young gills vital: purple / violet / yellow / greenish / beige /etc, later rust brown. ± adnate.	Upper stem / Cap with rusty cortina remnants. Stem base shape. Cap / Stem texture, sticky or not. Smell. Flesh colour change + KOH.	Soil in woodland. Mycorrrhizal with trees: noting host tree icritical. (A few sp. with Helianthemum.)	Spores dextrinoid, ± verrucose, size & shape. Cystidia either not significant or absent.	Ammonia or Melzers reagent for spores.	B&K vol 5; Kibby The genus Cortinarius in Britain.	Over 600. 4 main Sections: Phlegmaceum, Myxaceum, Cortinarius, Telamonia.
ENTOLOMA (Pinkgill)	Young gills pale beige (occ. blue / with blue edge), later pinkish brown as in Pluteus (diagnostic). Variable.	Caps mostly ± dull brown, occ. white or deep blue, smooth / scaly. Stems mostly smooth, no ring. Smell. Gill colour is the best diagnostic character.	A large range of substrates: many species in grassland, also soil in woodland litter / occ. on wood. Saprotrophic.	Spores unique: iso- / heterodiametric, hyaline; spore size & shape. Cheilocystidia present or not. Clamps present or not. Cap cuticle sometimes pigmented.	Congo Red for all micro examination except for cap pigmentation: water.	B&K vol 4; Fungi Europeae vol 5; FAN vol 1.	About 160
GYMNOPUS (Toughshank)	Variable: from ± white to cream / pinkish / brownish. Distant or crowded. Adnate.	Fruit body generally flexuose, esp. the stem which can have hairy basal mycelium, no ring. Strong unpleasant smell in a few species.	Mainly in woodland litter (conifer / decid.), clustered or not; occ. on wood. Saprotrophic.	Spores hyaline, shape variable. Cheilocystidia varied: flexuose / clavate / coralloid / occ. with brushcells. No pleuros.	Congo Red for all micro examination (though many sp. recognisable without a scope).	B&K vol 3 (as Micromphale / Collybia; FAN vol 3 (as Collybia).	About 15 (includes some previously in Micromphale & Collybia.
HEBELOMA (Poisonpie)	Dull beige to clay-brown. Sometimes with droplets on gill edge. ± Adnate.	Caps mostly smooth but ± viscid. Upper stem pruinose or not, no ring (one exception). Smell diagnostic: often raphanoid (radish), occ. sweet / of marzipan.	Soil in woodland. Mycorrrhizal with trees; noting host tree critical. (A few sp. with Helianthemum.)	Spores ± dextrinoid & verrucose; spore size & shape, note loosening perispore or not. Cheilocystidia shape important.	Melzers reagent essential for spores; Congo Red for cheilocystidia.	Fungi of N. Europe vol 3; Fungi Europeae vol 14 .	About 40
HYGROCYBE (Waxcap) including Gliophorus, Cuphophyllus & others	Often coloured as cap though spores are white. Variable: adnate to decurrent.	Caps & stems often brightly coloured (red / yellow / green / etc), viscid or not. Smell diagnostic in some species.	Soil in unimproved grassland, occ. soil in woodland. Fruiting mainly late autumn. Saprotrophic.	Spores hyaline; spore size and shape. Cystidia absent. Length of gill trama often diagnostic.	Congo Red for all microscopic examination.	Fungi of N. Europe vol 1 – Boertmann; FAN vol 2.	About 60

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INOCYBE (Fibrecap) including Inosperma, Pseudosperma, Mallocybe.	Young gills pale beige to off-white, occ. violaceous, later snuff brown. ± Adnate.	Caps dry, often radially splitting, smooth / scaly, mainly brown, occ. yellow / white / lilac. Stems with bulb or not, cortina or not. Smell diagnostic: mainly spermatic, occ. fruity / marzipan /fishy / other.	Soil in woodland. Mycorrrhizal with trees: noting host tree critical. (A few sp. with Helianthemum.)	Spores smooth / nodulose; spore size & shape. Cystidia metuloid or not; pleurocystidia present or not; caulocystidia present or not: all of critical importance.	Ammonia for all microscopic examination.	Outen & Cullington *Keys to British species of Inocybe*; Stangl *The genus Inocybe in Bavaria*; Kuyper *A revision of the genus Inocybe in Europe*.	About 150
LACCARIA (Deceiver)	Pink / amethyst. Gills rather thick and widely spaced. Adnate to sub-decurrent.	Caps smooth to scurfy, strongly hygrophanous – drying out to almost white. N.B. gill colour remains unchanged when dry.	Soil in woodland litter, one sp. in heathland. Mycorrhizal with trees and shrubs.	Spores (sub)globose and distinctly spiny; spore size & shape critical. Cystidia not used for identification.	Congo Red for spores.	FAN vol 3; (NB Funga Nordica key gives spores for L. laccata as ellipsoid rather than round)	About 10
LACTARIUS (Milkcap) including Lactifluus	Generally beige to brown. NB Colour change of latex in damaged gills is diagnostic. Adnate to sub-decurrent.	Colour, zoning and texture of cap. Colour of latex as it dries. Smell. Sometimes colour change of flesh / taste diagnostic.	Soil in woodland. Mycorrrhizal with trees: noting host tree critical. (A few sp. with Helianthemum.)	Spores ornamented and amyloid; spore shape & size. Cystidia not significant. Occ. cap cuticle is required.	Melzers reagent essential for spores. Congo Red for cap cuticle. (Latex makes gill examination tricky!)	Fungi of N. Europe vol 2; FAN vol 7.	About 70
LEPIOTA (Dapplerling) including Macrolepiota, Cystolepiota & related genera	White to cream, gills usually somewhat crowded. Free.	Cap dry, often scaly, often ± pale with darker centre. Gills crowded. Stem mostly with ring (can be fugacious). Smell. Flesh sometimes reddening.	Soil in woodland litter, occ. in grass / dunes. Saprotrophic.	Spores dextrinoid (metachromatic in Macro-lep.); spore shape varied: vital for following keys. Cheilocystidia shape. Cap veil / scales important.	Melzers reagent for spores (& Cresyl Blue for Macrolep.). Congo Red for cap details and cheilocystidia.	FAN vol 5; Fungi Europeae vol 4.	About 40 in Lepiota (a few moved to Echinoderma); 6 in Macrolepiota
LEPISTA (Blewit)	White / cream / pale ochre. Gills often crowded. Adnate to strongly decurrent.	Caps fleshy, smooth, sometimes with zoning. Stems without a ring. Smell can be diagnostic.	Soil in grassland / conifer & decid. litter / compost / sometimes in fairy rings. Saprotrophic.	Spores cyanophilous and finely to distinctly ornamented; spore shape & size. No cystidia.	Cotton blue for spore ornamentation.	FAN vol 3.	About 10

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MARASMIUS / ELLUS (Parachute)	± whitish, crowded or not. Sometimes reduced / veinlike. Free to adnate, occ. with collarium.	Stem often thin / hairlike, no ring, often with pale apex but much darker below (unlike similar Mycena). When dry fruitbody revivable in water. Occ. smell diagnostic.	On stems / leaves / petioles of many plants / woodland litter. Also soil in grassland / woodland. Saprotrophic.	Spores smooth, hyaline; spore shape & size. Cystidia shape & size. Cap cuticle cells.	Congo red for all microscopic examination.	FAN vol 3; B&K vol 3.	Marasmius: about 40 ; Marasmiellus: about 10
MELANOLEUCA (Cavalier)	White to cream, occ. salmon, ± crowded. Adnate.	Cap smooth, often with raised centre / rounded umbo, dry to moist, can be v. large. Stem smooth, no ring.	Soil in woodland litter / grassland / dunes. Saprotrophic.	Spores amyloid and finely ornamented. Cystidia harpoon-shaped, can be hard to find – critical in identification.	Melzers for spores (best tested on a print); Congo Red for cheilo / pleurocystidia.	FAN vol 4; B&K vol 3	About 40
MYCENA (Bonnet)	Most species white, sometimes greyish / pinkish; some species with coloured gill edge. Adnate to (sub) decurrent.	Cap often ± conical, smooth, can be fluted / translucent. Stem usually pale, no ring. Some species with coloured latex when damaged. Smell.	A large range of subtrates / habitats: soil / litter / wood (living / fallen) / herbaceous stems / grassland. Saprotrophic.	Spores smooth, ellipsoid / ovoid, amyloid / hyaline. Cystidia critical*: shapes very varied*, pleuros absent / present. Basidia 4- / 2-spored. Cap & stem cells can be needed.	Congo red for all microscopic examination. Melzers reagent for spores.	Fungi of N. Europe vol 5; Robich *Mycena d'Europa* vol 1 & 2; Cullington Brief Descriptions	About 80
PHOLIOTA (Scalycap)	Yellowish becoming rusty brown. ± crowded. Adnate.	Caps yellow / ochre brown, often sticky and scaly. Stems with ring / ring zone.	On living wood / roots / chips, often in large tight clusters. Saprotrophic.	Spores smooth, ± ovoid / ellipsoid with germ pore. Cystidia shape & size, chrysocystidia present or not.	Ammonia for all microscopic examination. Patent blue useful for chrysocystidia.	FAN vol 4; Holek *Libri Botanici vol 20*; B&K vol 4.	About 25
PLUTEUS (Shield)	Young gills white, later turning pinkish brown as in Entoloma. Crowded and free (diagnostic).	Caps mainly smooth, occ. scaly, mainly brown, occ. yellow / white / orange! Gills occ. with dark edge.	On fallen wood / woodchips; mainly deciduous, occ. conifer. Saprotrophic.	Spores hyaline. Cystidia shape & cap cuticle characters vital in keys. Clamps in cuticle can be important.	Congo Red for all microscopic examination; occ. water for cuticle pigment.	FAN vol 2.	About 25

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PSATHYRELLA (Brittlestem) including Homophron	Young gills ± white, later turning dark grey-brown. Gill edge pink / red or not. Adnexed / adnate.	Fruit body quite fragile. Cap hygrophanous, sometimes fading pinkish, with scales/ veil or not. Stem white and brittle, note if rooting in soil or not – diagnostic.	On fallen wood / soil (occ. dung / burnt ground). Single /clustered / in colonies. Saprotrophic.	Spores smooth, ± ellipsoid. Cystidia critical: presence of pleurocystidia or not (sometimes v. scarce – diligence needed), occ. metuloid.	Ammonia or Congo Red for all microscopic examination.	B&K vol 4.	About 70
RUSSULA (Brittlegill)	Diagnostic: white/ cream / orange-ochre; crowded / distant; flexible / brittle. Adnate to sub decurrent.	Cap colour & texture; cuticle peeling or not. Stem white with patches of colour or not. FE crystal / Guaiac / KOH tests on stem useful. Smell. Sporeprint often essential.	Soil in woodland. Mycorrrhizal with trees: noting host tree critical.	Spores warty to spiny, amyloid. Gill cystidia not used for microscopic study. Cap cuticle dermatocystidia and hyphae critical.	For spores: Melzers reagent. For cap cuticle: Cresyl Blue, Carbol Fuchsin & Hydrochloric Acid, occ. Congo Red.	Kibby *The genus Russula in Gt Britain;* Galli *Le Russule;*	About 160
TRICHOLOMA (Knight)	White / cream / yellowish; staining with blackish dots or not. ± emarginate.	Cap colour varied - many greyish, smooth / scaly, sticky / dry. Stem with ring in one sp. Smell.	Soil in woodland. Mycorrrhizal with trees: noting host tree critical. (A few sp. with Helianthemum.)	Spores smooth, hyaline, ellipsoid to subglobose; spore size. Cystidia if present not used for microscopic study.	Congo Red for spores.	Fungi of N. Europe vol 4; FAN vol 4; B&K vol 3; Galli *I Tricholomi.*	About 50

For supplies of chemicals, stains, slides etc try Microscience Ltd http://www.micro-science.co.uk/ (minimum order £16)
Recommended razor blades: Derby Professional single edge blades for barbers (box of 100 - online)

For further information on the use of chemicals / stains, go to www.britmycolsoc.org.uk/mycology/microscopy/reagents

Useful keys etc online (provisional list)
MycoKey Petersen & Laessoe: google MycoKey
Inocybe Keys - Outen & Cullington: go to www.bucksfungusgroup.org.uk/password.html then Private Keys: username bfg; password pennyandderek
Mycena Brief Descriptions – Cullington: go to www.bucksfungusgroup.org.uk/password.html then Private Keys: username bfg; password pennyandderek
Scutellinia, Geoglossum, Piloblus Keys: google Mid Yorkshire Fungus Group
Mycena Key, Corticioids of Hampshire Key: google: Hampshire Fungus Group
Peziza Key – Paul Cannon: https://fungi.myspecies.info/content/peziza-key
Pluteus, Waxcaps, non-poroid resupinates : google mycology keys.org