Tricholomatoids

The tricholomatoid agarics are rather fleshy with ± solid stems, ± notched gills and whitish or, rarely, brownish rose spore deposits. The genera *Tricholoma* and *Catathelasma* form ectomycorrhiza, while species of *Dissoderma* and *Squamanita* are parasites on other agarics. The remaining genera are decomposers (saprotrophs), although *Armillaria* may kill trees and bushes before decaying the wood (necrotrophs).

Tricholomatoids have rather few reliable characters for separating the genera. Besides the spore morphology and the presence of veils and cystidia, identification very much depends upon experience and gut feeling. It is, for example, relatively straightforward for an experienced field mycologist to recognize the elegant melanoleucas as such, but it is very difficult to put into words the macroscopical differences between, e.g., a *Melanoleuca* and a *Lyophyllum*.

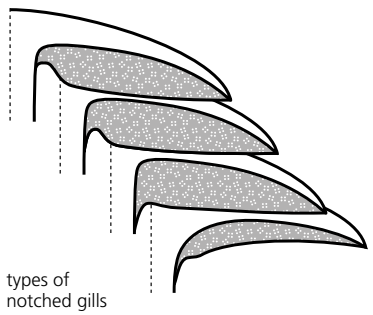
Other similar fungi:

– the large, brown hygrocyboids in the genus *Neohygrocybe* have thick, waxy gills (page 90).

– collybioids are typically more fragile with hollow stems, and normally with narrowly attached gills (page 156).

– species of *Entoloma* have pinkish, angular spores (page 242).

– *hebelomas* and *cortinarioids* may have the same stature, but have brown spore deposits (pages 474 & 482).



types of notched gills

Micro-drawings: spores first, thereafter cystidia. cy. = cystidium.

Calocybe key F

Tricholomella B1

Gerhardtia F67

Dermoloma key E

Melanoleuca key C

Lepista key D

Pseudoporpoloma F84

Pseudotricholoma F56

Pogonoloma F79

Floccularia & ***Cercopemyces*** B8

Leucocortinarius B13

Lyophyllum F52

Catathelasma page 74

Tricholoma keys B (with a ring) and F

Hypsizygus A5

Megacollybia & ***Clitocybula*** A1

Tricholomopsis A7

Armillaria & ***Desarmillaria*** A12, E79

Rhodotus A4

Lentinula A11

Leucopholiota A13

Dissoderma & ***Squamanita*** B2

tricholomatoids have rather large to large, fleshy fruitbodies with ± notched gills and whitish, rarely brownish rose spore deposits

other similar fungi

DECOMPOSERS; ON SOIL

DECOMPOSERS; ON WOOD OR BRACKEN

PARASITES ON AGARICS

ECTOMYCORRHIZAL

cap ± pale vinaceous brown; on rich soil

threadlike to membranous partial veil evanescent

cap cuticle non-fibrous; smell ± mealy

cap ± smooth; mostly high up on hardwood

cap radially cracking; mostly with thick hyphal cords; on hardwood

cap scaly; gills yellow; on conifer wood

with veil; cap centre ± dark, scaly; mostly on wood

cap veined; on deciduous wood

with threadlike veil; cultivated; on deciduous wood

scaly; on wood

mostly scaly; with thick lower stem; on fungi

cap cuticle non-fibrous; smell mealy

elegant and mostly umbonate; with caulo-cystidia

stem ± fluffy; smell sweetish

cap conical, fibrillose; ± hygrocyboid

cap margin coarsly hairy; smell soaplike

cap ± scaly from remnants of veil

cap smooth, soft-fleshy, grey-brown

large; with veil and basal bulb

gills ± decurrent; with membranous double veil

gills notched; with or without veil; on soil

spores whitish

spores coloured

gills thick and waxy

gills normal

spores angular, ± brownish rose

spores verrucose, brown

hygrocyboids page 90

collybioids page 156

entolomatoids page 242

hebelomas & ***cortinarioids*** pages 474 & 482

Key to groups of tricholomatoid fungi

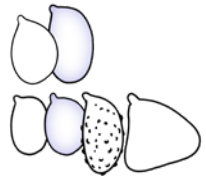
1. On wood or from rhizomes of bracken (*Pteridium aquilinum*) . . . . . **key A**
In different habitats or substrates 2

2. With a ring or a ring-zone . . . . . **key B**
Without a ring or a ring-zone 3

3. Stem straight, cylindrical to club-shaped and usually downy from cystidia; cap rather regular and umbonate; usually with 2-celled or encrusted cheilo- and pleurocystidia; spores warty, amyloid . [*Melanoleuca*] . . **key C**
Stem usually bent-flexed, bulbous or tapering, not downy from cystidia; cap often ± wavy; cystidia absent or 1-celled without crystals; spores warty and inamyloid *and/or* smooth with variable iodine reactions 4

4. Spore deposit brownish rose (❋); smell sweetish-aromatic; spores warty . . . . . [*Lepista*] . . **key D**
Spore deposit white to cream (❋); smell mostly different (e.g. mealy) or absent; spores smooth or rarely ornamented 5

5. Cap 6–30 (-50) mm wide, whitish, ± mouse grey to ± clay buff ( ); cap surface glabrous, usually ± pruinose and irregularly cracking, as a palisade of erect club-shaped cells (check in the cap centre); smell mealy . . . . . [*Dermoloma*] . . **key E**
Cap different; cap surface radiating to scaly or pruinose but never as a palisade of erect club-shaped cells; smell variable including mealy . **key F**

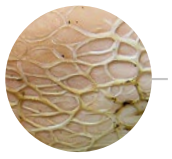


Key A – tricholomatoids on wood or bracken (*Pteridium aquilinum*)

1. Stem base with millimetre-thick, tough hyphal cords connecting ± buried pieces of wood in the litter; mature caps distinctly radially fibrous. Cap 30–150 mm wide; stem 8–15 mm thick; cheilocystidia club-shaped; spores 7–10 × 6–8.5 µm, smooth, inamyloid; common . . . . . ***Megacollybia platyphylla***
Without millimetre-thick hyphal cords; typically on larger wood or roots; caps smooth, scaly or with veil remnants 2

2. Cap smooth, radially fibrous or veined 3
Cap scaly or with veil remnants 6

3. Cap radially fibrous, sometimes slightly cracking from the margin. Cap 10–40 mm wide, greyish; stem 3–7 mm thick; spores 4–6 (–8) × 4–5 µm; on coniferous wood; rare (S), mainly at higher elevations . . . . . ***Clitocybula lacerata***
Cap smooth or veined, but without radial structure 4



4. Cap with a coarse net of veins, salmon to coral ( ); spores warty. Cap 35–150 mm wide; stem 4–15 mm thick; spore deposit ± rose; cheilocystidia bottle-shaped; spores 5.5–7 × 5–7 µm, inamyloid; on large trunks of deciduous trees, mostly *Ulmus*; scattered to rare (N) . . . . . ***Rhodotus palmatus***
Cap without veins, but may be marbled or spotted; cap whitish, cream to pale pinkish buff ( ); spores smooth 5

5. Cap with drop-like spots; on various deciduous trees. Cap 60–120 mm wide; stem 4–15 mm thick; spores 4–6 × 4–5 µm, inamyloid; rare to scattered (NE) . . . . . ***Hypsizygus tessulatus***
Cap without drop-like spots; mostly on *Ulmus*. Cap 60–300 mm wide; stem 20–35 mm thick; spores (5–) 5.5–6 (–7) × 5–5.5 (–6) µm, inamyloid; rare . . . . . ***Hypsizygus ulmarius***

6. Gills ± yellow ( ); spores inamyloid . . . . . [*Tricholomopsis*] . . 7
Gills white to pinkish buff ( ); spores inamyloid or amyloid . . 11

7. Cap with yellowish or dark grey ( ) scales 8
Cap with purple to wine red ( ) scales which may partly disappear in weathered specimens 9

8. Cap with yellowish ( ) scales. Cap 30–90 mm wide; stem 4–12 mm thick; cheilocystidia ± club-shaped; spores 6–9.5 × 4.5–6 µm; on coniferous wood; rare, mainly NE . . . . . ***Tricholomopsis sulphureoides***
Cap with dark grey ( ) scales. Cap 20–100 mm wide; stem 5–18 mm thick; cheilocystidia ± club-shaped; spores 6–8 × 4–5.5 µm; on coniferous wood; common (N) to rare in parts of lowlands . ***Tricholomopsis decora***

9. From rhizomes of bracken (*Pteridium*). Cap 7–28 (–60) mm wide; stem 3–5 (–12) mm thick; cheilocystidia mostly club-shaped; spores (5–) 5.5–7 (–7.5) × 4–5.5 µm, Qav. 1.30–1.35; on the ground amongst bracken; rare (described from Spain) . . . . . ***Tricholomopsis pteridiicola***
From wood 10

10. Stem with purple to wine red ( ) scales (may be washed away); spores 5–7.5 × 4.5–6 µm. Cap (13–) 20–140 mm wide; stem 6–25 mm thick; cheilocystidia spindle- to club-shaped; on coniferous wood, typically with soil contact; common . . . . . ***Tricholomopsis rutilans***
Stem pale yellow ( ) without purple to wine red scales; spores 5–8 × 3–5 µm. Cap 8–40 mm wide; stem 2–6 mm thick; cheilocystidia spindle- to club-shaped; on deciduous and coniferous wood; rare, mostly absent in the lowlands . . . . . ***Tricholomopsis flammula***

11. Gills serrated; cap with white scales or veil remnants. Cap 30–100 mm wide; stem 5–15 mm thick; gills crowded and white; spores 5–6.5 × 2.5–3 µm, inamyloid; on deciduous wood; apparently escaped from cultivation in parts of the area covered . . . . . ***Lentinula edodes***
Gills not serrated; cap with brown scales 12

12. Without a ring or a ring-zone. Cap 35–80 mm wide; stem 4–22 mm thick; cystidia absent; spores 7–9 × 5–6.5 µm, inamyloid; on deciduous wood, mostly *Quercus*; absent in N, scattered SW . . . . ***Desarmillaria tabescens***
With a ring or a ring-zone 13

13. Stem and cap covered with uniform, curved, upright, yellowish brown to brownish orange ( ) scales; spores amyloid, 5.5–6 (–7) × 3.5–4 µm; with cheilocystidia. Cap 35–70 mm wide; stem 5–10 mm thick; cheilocystidia club-shaped; on large trunks of deciduous wood, mostly *Betula*; rare (mainly absent) . . . . . ***Leucopholiota decorosa***
Cap and stem with somewhat fluffy, white to yellow hairlike scales, though with more upright, curved and dark scales in the centre; spores inamyloid, 5–10 × 4.5–6 µm; without cheilocystidia . . . . [*Armillaria*] . . 14

14. Ring woolly, soon irregularly frayed at the margin 15
Ring membranous to woolly, rather persistent and for long with an entire margin 16

15. Expanded cap with scattered scales, almost to margin; stem with yellowish veil remnants. Cap 25–100 mm wide; stem 8–15 mm thick; spores 7–9 × 4.5–5.5 µm; on deciduous wood, rarely coniferous; common . . . . . ***Armillaria lutea***
Expanded cap with scales concentrated in the central part; stem without yellowish veil remnants, but usually fluffy and sometimes with a yellowish base. Cap 20–100 mm wide; stem 5–15 mm thick; spores 7–9 × 5–6 µm; on deciduous and coniferous wood; scattered . . . . ***Armillaria cepistipes***

16. Cap with contrasting, blackish scales on a cream to pale buff background; ring margin and stem with brown, fluffy scales. Cap 20–100 mm wide; stem 5–10 mm thick; spores 8–10 × 5–6 µm; on coniferous wood, rarely deciduous; common . . . . . ***Armillaria ostoyae***
Cap scales paler; ring margin and stem not with brown, fluffy scales . . 17

17. Typically in large and crowded clusters, usually with more than 25 fruitbodies; ring membranous; stem 4–10 mm thick, cylindrical, typically very long and with a tapering base; without clamps. Cap 20–80 mm wide; spores 7–9×5–6 µm; on deciduous wood, mostly on rich soil; common, thinning out towards the N ..... ***Armillaria mellea***
In clusters, but probably never with more than 25 fruitbodies; ring woolly to almost membranous; stem 8–20 mm thick, cylindrical to club-shaped; with clamps. Cap 30–100 mm wide; spores 7–8.5×4.5–5.5 µm; on deciduous and coniferous wood, usually early in the season; common N, thinning out going S ..... ***Armillaria borealis***

Key B – tricholomatoids with a ring or a ring-zone

1. Fruitbodies white (□); spores warty, inamyloid. Cap 10–50 mm wide; stem 3–8 mm thick; cystidia absent; spores (6–) 7–9 (–10.5) × 5–6.5 (–7) µm; in various habitats, on nutrient-enriched spots, e.g. where animals urinate; scattered ..... ***Tricholomella constricta***
Fruitbodies coloured; spores smooth, amyloid, dextrinoid or inamyloid 2

2. Stem above the ring-zone greyish (■■■), below the ring-zone usually ± cinnamon-buff, curry yellow to yellowish brown (■■■■), (the lower, usually thickened part in part consists of a fungal host – another agaric) ..... [*Dissoderma*] ... 3
Without this combination of colours 7

3. Fruitbodies arising from a common, yellowish, basal, fleshy bulb; with very strong, sweetish-nauseating smell 4
Fruitbodies not arising from a common bulb; smell absent or fruity ... 5

4. Tubers (up to 30 mm wide) formed on the ground in connection with the fruitbodies of *Hebeloma mesophaeum*; without cheilocystidia; spores inamyloid. Cap 5–20 mm wide; stem 3–8 mm thick; spores 6.5–9.5 × 4–6 µm; mostly on rather dry, disturbed sites, on roadside verges, etc., together with the host; rare ..... ***Dissoderma odoratum***
Tubers formed on wood in connection with *Kuehneromyces*; with cheilocystidia; spores amyloid. Cap 10–20 mm wide; stem 1.5–3 mm thick; spores (5–) 5.5–7 (–8) × 4–5 µm; rare (Norway, Switzerland) ..... ***Dissoderma fimbriatum***

5. Stem only slightly curry yellow (▽ □) at the base; cap with distinct protruding scales. Cap 10–25 mm wide; stem 3–8 mm thick; spores 7–10 × 4.5–6 µm, distinctly dextrinoid; clamydospores globose; probably a parasite on *Cystoderma*; rare ..... ***Dissoderma pearsonii***
Lower half of the stem cinnamon-buff, curry yellow to yellowish brown (▽ ■■■); cap smooth or weakly adpressed scaly 6

6. Middle stem distinctly granular as in *Cystoderma amianthinum*; spores ellipsoid, 8–10 × 4.5–6 µm, not or weakly dextrinoid; clamydospores irregularly shaped. Cap 9–32 mm wide; stem 2.5–3.5 mm thick (above the thickened, parasitized part); smell fruity, almost like oranges; growing with the host *Cystoderma amianthinum*; rare ..... ***Dissoderma paradoxum***
Stem almost glabrous; spores globose, 5–6 µm, amyloid; without clamydospores. Cap 5–20 mm wide, stem 1.5–2 mm thick; smell insignificant; typically growing together with the host, probably always *Galerina pumila*; rare ..... ***Dissoderma galerinicola***

7. Cap and stem with small, upright, ± pyramidal, cream to yellow (▽ ▽ ■■■) scales on paler background; in warm, dry grassland 8
Cap and stem glabrous or with adpressed, brownish or greyish (▽ ▽ ■■■■) scales 9

8. With striking yellow colours (■) when young; spores 6–9×4.5–5 µm, smooth. Cap 50–100 mm wide; stem 10–20 mm thick; cystidia absent; rare (reaching dry, warm sites in Norway and SE Sweden in N) ..... ***Floccularia luteovirens***
Whitish to cream, with pale yellow scales (■■); spores 4.5–6 × 3–3.5 µm, with scattered warts (×1.000!). Cap 30–70 mm wide; stem 10–30 mm thick; cystidia absent; rare, reaching Öland in Sweden, mainly E ..... ***Cercopemyces rickenii***

9. Cap greyish to greyish brown (▽ ■■) 10
Cap yellowish brown, orange-brown to cinnamon (▽ ■■■) ... 11

10. With a veil and a fleeting ring-zone ... see *Tricholoma argyraceum*, F45
With well-defined, membranous ring. Cap 20–50 (–70) mm wide; stem 5–10 mm thick; with or without ± club-shaped cheilocystidia; spores 4–6×2–4 µm; smell mealy; with *Salix*, usually on calcareous, ± waterlogged soil; common to scattered (N) ..... ***Tricholoma cingulatum***

11. Gills decurrent; spores amyloid, 11–14×5–6.5 µm ..... see *Catathelasma imperialis*, p. 74
Gills ± notched; spores inamyloid, smaller 12

12. With wide, marginated bulb at stem base 13
Stem club-shaped or tapering towards the base 14

13. Bulb with an erect collar of scales, similar to cap scales; probably a parasite on *Amanita solitaria* and *A. strobiliformis*. Cap 50–100 mm wide; bulb up to 100 × 65 mm; cheilocystidia ± bottle-shaped; spores 5–7 × 4–5.5 µm; in thermophilous, ± calcareous habitats with presence of *A. solitaria* or *A. strobiliformis*; rare (mainly SE) ..... ***Squamanita schreieri***
Bulb without such a collar; biology not fully understood. Cap 30–100 mm wide; stem 7–15 mm thick; spore deposit cream or slightly brownish rose; without cystidia; spores 7–9 × 4–5 µm; on rich soil with conifers; scattered to rare (NW lowlands) ... ***Leucocortinarius bulbiger***

14. Ring thin and fleeting 15
Ring prominent and protruding, membranous or fluffy 16

15. Cap 50–150 mm wide; ring normally obvious though fleeting; spores 4–6.5 × 3–5.5 µm. Stem 5–25 mm thick; smell and taste mealy; with *Pinus* in forests and parks; scattered to rare, mainly found S–SW ..... ***Tricholoma batschii***
Cap 100–250 mm wide; ring very fleeting; spores 7–9.5×5–6.5 µm. Stem 30–60 mm thick; smell insignificant; with *Pinus*; scattered (N), rare S–W ..... ***Tricholoma colossus***

16. Cap smooth to slightly scaly, mostly at the margin, ± uniformly brownish orange to curry yellow (▽ ■■), usually streaky; smell mealy. Cap 50–150 mm wide; stem 8–30 mm thick; spores 4–6×3–4.5 µm; with *Pinus* on sandy soil; common but rare going S ..... ***Tricholoma focale***
Cap distinctly brownish scaly (▽ ■■■■); smell distinctly sweetish-aromatic 17

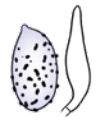
17. Cap coarsely and irregularly scaly from large, orange-brown (▽ ■■) scales on paler background; spores 6–9.5 × 4.5–7.5 µm. Cap 60–200 (–300) mm wide; stem 15–40 mm thick; with *Pinus*, rarely *Picea*, mostly on sandy soil; scattered (N) to rare or absent going S ..... ***Tricholoma matsutake***
Cap with smaller and more regular, paler, pinkish buff to clay-pink (▽ ■■) scales; spores 4.5–8 × 4–6 µm. Cap 50–100 (–120) mm wide; stem with prominent, scaly belts, 10–20 mm thick; with *Pinus* on ± calcareous soil; scattered (N), ± absent going S ... ***Tricholoma dulciolens***

Key C – tricholomatoids with straight, usually downy stems and amyloid, warty spores (*Melanoleuca*[1])

1. Stem dark-dotted–scaly on a white background; smell sourish, perfumed fruity. Cap 30–100 mm wide, whitish; stem 4–18 mm thick; cystidia of the stinging-hair-type with crystals at the top; spores 7–10.5 × 4–6 µm, Q 1.6–2.0; on wood chips, compost, debris, etc.., often in disturbed sites in woody habiats; scattered (has become more common) ***Melanoleuca verrucipes***
   Stem not dark-dotted on a white background; smell different 2

2. Gills ± ochre-rose ( ). Cap 60–140 mm wide; stem 6–11 mm thick; spores 7–9.5 × 4–6 µm; cystidia spindle-shaped; on ± disturbed soil in forests and parkland, usually in clearings or along roadsides, also in grassland, mostly spring and autumn; common ***Melanoleuca cognata***
   Gills white, cream, pinkish buff to ash grey ( ) 3

3. All parts cream to pale buff ( ). Cap 55–115 mm wide, ± greasy; stem 60–130 × 6–11 mm; with 50–100 full-length gills; spores 7–10 × (4–) 4.5–6 µm, Q 1.45–2.1, Qav. 1.75; cystidia 1-celled, ± flask- to spindle-shaped, usually with crystals at the top; on soil in grassland and open deciduous forests; rare to common, especially at higher elevations ***Melanoleuca strictipes***[2]
   Either cap, gills or stem darker greyish or brownish ( ) 4



4. Cheilocystidia spindle-shaped to bottle-shaped, either 1-celled or with one septum (they are typically easy to find), sometimes distinctly encrusted at the tops 5
   Cheilocystidia absent or with a sharply defined, narrow upper part and a wider lower part, separated from each other by a septum – stinging-hair-type (they may be hard to find), usually with goo on the tips 10

5. Flesh in stem base whitish ( ) 6
   Flesh in stem base grey to brown ( ) 7

6. Cap brownish rose, brown to pale mouse grey ( ). Cap 40–80 mm wide; with ca. 60 full-length gills; stem 55–80 × 6–8 mm; spores 7.5–9.5 × 5–6.5 µm; cystidia spindle- to bottle-shaped; usually on sandy soil with coniferous trees (?); rare ***Melanoleuca melaleuca***
   Cap dark greyish brown ( ) with a pale margin. Cap ± greasy, 37–43 mm wide; stem 7–9 mm thick; spores 8–9 (–9.5) × 5–5.5 (–6) µm; cystidia 50–82 × 11–17 µm, spindle- to bottle-shaped with tapering, crystal-covered tops; on ± disturbed soil; status uncertain, mainly S ***Melanoleuca granadensis***[3]

7. Gills ash grey ( ), at least at maturity. Cap 20–80 mm wide, ± pale mouse grey ( ); stem 4–10 (–15) mm thick; spores 7–11 × 4.5–6.5 µm, Q ca. 1.6; in sand in white dunes; common along exposed coasts with dune formation ***Melanoleuca ammophila***
   Gills whitish, cream to pinkish buff ( ) 8

8. Cystidia usually with crystals on top; cap usually rather uniformly pale buff, clay-buff to greyish brown ( ) with slightly darker centre. Cap 30–160 mm wide; stem 40–170 × 4–12 (–18) mm, slightly paler than the cap; spores 7–9.5 × 4.5–6 µm, Q 1.4–1.8; found in disturbed open habitats close to the coast; apparently common ***Melanoleuca bataillei***
   Cystidia without crystals on top; cap sometimes darker 9[4]

1. DNA analyses have totally disrupted our understanding of *Melanoleuca*, and this key deviates strongly from most earlier keys.

2. *Melanoleuca pallidicutis* is similar, but sometimes has a dryer cap cuticle and should occur in wet habitats with *Salix* and *Betula*.

3. *Melanoleuca albomarginata* is almost or entirely morphologically identical.

4. *Melanoleuca friesii* and *Melanoleuca polioleuca* are almost or completely impossible to separate without molecular data.

9. Stem 4–12 mm thick. Cap 25–80 mm wide, clay-buff to dark greyish brown ( ); stem 50–90 × 4–12 mm, usually strikingly dark; with 60–65 rather pale, full-length gills; spores 7.5–10 × 4.5–5.5 µm, Q ca. 1.7; on dry grasslands and dunes; apparently common ***Melanoleuca friesii***
   Stem 3–7 mm thick. Cap 20–65 mm, clay-buff to dark greyish brown ( ); stem 30–75 × 3–7 mm, longer than the cap width; with 55–60 full-length gills; spores 7.5–10 × 4.5–5 µm, Q ca. 1.7; on disturbed soil in roadside verges, parks, gardens, open forest, etc.; probably common ***Melanoleuca polioleuca***

10. Flesh in stem base whitish 11
    Flesh in stem base dark grey-brown or greyish 13

11. Stem 3–7 mm thick. Cap 20–70 mm wide, surface may seem felty, greyish brown to almost white; stem 20–60 × 3–7 mm; smell insignificant (strong and sweetish in var. *iris*); spores 8–11 × 5.5–6.5 µm, av. 9.3 × 5.9 µm, Q 1.4–1.8; on ± disturbed soil in forests, gardens and grasslands; probably common ***Melanoleuca exscissa***
    Stem 7–25 mm thick 12

12. Cap pinkish buff to ± greyish brown ( ). Cap 50–170 mm wide, fleshy; stem usually longitudinally striate, 17–110 × 5–17 mm; spores 7–10 × 4.5–6 µm, av. 9.4 × 5.5 µm, Q 1.55–1.8; in deciduous forests and scrub; common ***Melanoleuca grammopodia***
    Cap very dark brown ( ). Cap 40–100 mm wide; stem 50–60 × 7–11 mm; spores 8–9.5 × 5–6 µm, Q 1.4–1.9; on meadows and unimproved grasslands; probably common ***Melanoleuca rasilis***

13. Cap 10–40 (–60) mm wide; stem 1.5–5 (–7) mm thick 14
    Cap wider; stem usually thicker 15

14. Cheilocystidia absent. Cap 18–60 mm wide, dark pale vinaceous brown to pale mouse grey ( ); stem 22–105 × 2–5.5 mm; spores 7–9.5 × 5–7 µm, Q ca. 1.4; scattered (?) ***Melanoleuca microcephala***
    Cheilocystidia present. Cap 9–39 mm wide, ± pale vinaceous brown to dark greyish brown ( ); stem 17–60 × 1.5–7 mm; flesh dark; spores 6.5–10 × 4.5–6 µm, Q ca. 1.4; on sandy soil in plantations and in dunes; status uncertain ***Melanoleuca fontenlae***

15. Without stinging-hair-shaped caulocystidia. Cap 50–120 mm wide, ash grey, cream-grey, pinkish buff, cinnamon to pale vinaceous brown ( ); stem 50–70 × 8–12 mm, usually concolorous with the cap; spores 7–10.5 × 4–6 µm, Q 1.4–1.7; on grasslands, along roadside verges and along coasts; status uncertain, probably not rare ***Melanoleuca diverticulata***
    With stinging-hair-shaped caulocystidia; cap pinkish buff, greyish brown to almost black ( ) 16

16. Cap ± pinkish buff ( ), sometimes darker in the centre. Cap 25–65 mm wide; stem at most slightly downy at the top, longitudinally striate, 25–55 × 3–7 mm; spores 7.5–10 × 4.5–6 µm, Q 1.4–1.7; in grasslands, also close to the coast; status uncertain ***Melanoleuca stepposa***
    Cap darker greyish brown ( ) 17

17. With 55–70 full-length gills; stem up to 6 mm thick. Cap 30–65 (–100) mm wide, greyish brown ( ); stem very dark, downy and usually twisted, 20–55 × 5–6 mm; spores 7–10 × 5–6 µm, Q 1.4–1.6; on roadsides, in coastal forests/plantations and on grasslands; probably scattered ***Melanoleuca tristis***[5]
    With 70–80 full-length gills; stem 5–10 mm thick. Cap up to 70 mm wide, pale clay-buff to greyish brown ( ); stem 22–65 × 5–10 mm; gills greyish to pale greyish brown; smell sweetish; spores 7–10 × 5–6.5 µm, Q 1.4–1.7; on ± disturbed land, mostly close to the coast and in parks; status uncertain, probably not rare ***Melanoleuca humilis***

5. *Melanoleuca malenconii* is almost or completely morphologically identical.

Key D – tricholomatoid fungi without ring, with brownish rose, finely ornamented spores and sweetish, aromatic smells (*Lepista*)

1. Cap margin with protruding hairs . . . . see *Pogonoloma spinulosum*, F79
   Cap margin without protruding hairs 2

2. Fruitbody whitish to very pale lilac ( ). Fruitbody large and fleshy; cap 50–150 mm wide; stem 10–20 mm thick; spores 6–8.5 × 3.5–5 µm, warty; in forests and on disturbed land; rare (S) . . ***Lepista glaucocana***
   Fruitbody more coloured 3

3. Fruitbody with distinct ± violet ( ) colours 4
   Fruitbody without violet colours 7

4. Gills whitish, cream to pale buff ( ). Cap without violet colours, 50–200 mm wide; stem with lilac fibres downwards, 10–30 (–40) mm thick; spores 6–9 × 4–6 µm, finely warty; on rich soil, in forests, gardens, parks, etc., typically fairly open, often salt-affected habitats, late in the season, often in fairy rings; common . . . . ***Lepista saeva***
   Gills with ± violet colours ( ) 5

5. Stem typically thicker than 10 mm; cap not or only slightly hygrophanous; smell strongly sweetish perfumed. Cap ± violet or brown, 40–150 mm wide, stem 10–30 mm thick; spores 6–8.5 × 4–5 µm, finely warty; on rich soils or compost in forests, gardens, parks, grassland, etc., often in fairy rings; common . . . . ***Lepista nuda***
   Stem typically thinner than 10 mm; cap distinctly hygrophanous, smell weak, sweetish or slightly like bitter almonds 6

6. Cap mostly greyish brown; mainly in disturbed habitats, e.g. enriched soil around old cow manure and the like. Cap 40–80 mm wide; stem 5–10 (–15) mm thick; spores 6–7.5 × 3.5–4.5 µm; common . . . . ***Lepista sordida***
   Cap distinctly violet to lavender, at least when young and near the margin; in forests, grassland and disturbed habitats on nutrient-rich soils. Cap 15–50 (–70) mm wide; stem 5–10 mm thick; spores 6–8.5 × 4–5 µm, finely warty; common . . . . ***Lepista nuda* var. *lilacea***

7. Cap ± clay-pink ( ) 8
   Cap greyish to greyish brown ( ) 9

8. Smell weak, sometimes slightly mealy; spore deposit ± cream; spores very finely warty, 4.5–6.5 × 2.5–3.5 µm . . . . see *Gerhardtia borealis*, F67
   Smell perfumed; spore deposit brownish rose; spores pustulate, 4.5–7 × 3–4.5 µm . . . . see *Rhodocybe gemina*, p. 248

9. Cap without hygrophanous, drop-shaped spots; smell strong, sweetish. Cap 50–120 mm wide; stem 10–25 mm thick; spores 6.5–9 × 4–5 µm, finely warty; on roadsides, in forests, gardens, etc.; common . . . . ***Lepista irina***
   Cap usually with hygrophanous, ± drop-shaped spots; smell weak, acidic or slightly mealy 10

10. Flesh soft and spongy in cap and stem base; gills always decurrent; spores smooth . . . . see *Ampulloclitocybe clavipes*, p. 78
    Flesh not soft and spongy; gills notched, at maturity slightly decurrent; spores warty. Cap 30–100 mm wide; stem 5–15 mm thick; smell insignificant or slightly perfumed; spores 5–6.5 × 3.5–5 µm; mostly in unimproved grasslands, often in fairy rings; scattered . . . . ***Lepista panaeolus***

Key E – mycenoid to small tricholomatoid fungi with a cap cuticle as a palisade of swollen cells; with mealy smells; mostly in grassland.

1. Flesh ± apricot to blackish when bruised. Cap 25–50 mm wide; gills rather thick and somewhat distant; stem 4–12 mm thick; spores 6–9 × 4–5 µm, amyloid; in unimproved grasslands; rare, apparently absent in northernmost parts . . . . ***Dermoloma magicum***
   Flesh not staining when bruised 2

2. Spores inamyloid or, rarely, weakly amyloid or dextrinoid . . . . [*Dermoloma cuneifolium* s.l.] 3
   Spores distinctly amyloid 11

3. Spore Q 1.65–2.1. Cap 10–30 mm wide, pale mouse grey, greyish brown to pale vinaceous brown; stem 3.5–8 mm thick; spores 5–6 × 2.5–3.4 µm; in forests and unimproved grasslands; rare, but widespread . . . . ***Dermoloma bellerianum***
   Spore Q lower than 1.55 4

4. Stem narrower than 4 mm; on average with less than 30 full-length gills 5
   Some stems wider than 4 mm; mostly with more full-length gills 7

5. Margin translucently striate as wet. Cap 8–22 mm wide, mouse grey; stem 1–4 mm thick, very pale clay buff to whitish; spores 4.5–5.5 × 3.3–3.8 µm, Q 1.3–1.55; in forests and unimproved grasslands; uncommon, but widespread . . . . ***Dermoloma simile***
   Margin not obviously striate 6

6. Cheilocystidia 15–22 µm long; stem base white to very pale mouse grey ( ). Cap 10–25 mm wide, mouse grey; stem 2.5–4 mm thick, very pale clay buff to whitish; spores 5–5.5 × 3.5–4 µm, Q 1.29–1.42; in forests and grasslands; rare (France, Slovakia and UK) . . . . ***Dermoloma fuscobrunneum***
   Cheilocystidia 21–32 µm long; stem base often with ± mouse grey ( ) fibres or scales. Cap 10–40 mm wide, mouse grey; stem 1–5 mm thick, whitish; spores 5–5.5 × 3.5–4.5 mm, Q 1.31–1.49; in unimproved grasslands; rare (SE) . . . . ***Dermoloma carpathicum***

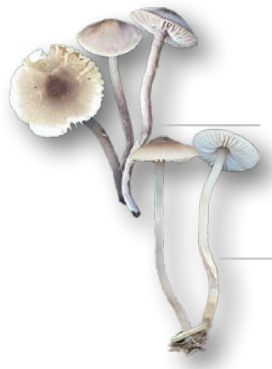
7. Spores on average more than 6 × 4.2 µm. Cap 20–30 mm wide, mouse grey; stem 2–5 mm thick, whitish; spores 5.5–7 × 4.5 µm, Q 1.34–1.5; in forests and calcareous grasslands; rare, but widespread . . . . ***Dermoloma huartii***
   Spores smaller 8

8. With 23–38 full-length gills. Cap 10–40 mm wide, mouse grey, at most weakly striate; stem 2–6 mm thick, whitish; spores 4.5–5.5 × 3.5–4 µm, Q 1.24–1.4; in unimproved grasslands and in scrub; scattered . . . . ***Dermoloma cuneifolium***
   With 32–53 full-length gills 9

9. Spore Q 1.41–1.64. Cap 23–37 mm wide, mouse grey, striate or not; stem 3.5–7.5 mm thick, whitish, darker towards the finely scaly base; spores 5–6 × 3.5–4 µm; in unimproved grasslands; rare (Denmark, the Netherlands, Slovakia and UK) . . . . ***Dermoloma fusipes***
   Spore Q 1.27–1.46 10

10. Cheilocystidia ± club-shaped; cap hygrophanous. Cap 25–50 mm wide, mouse grey, rarely striate; stem 4–10 mm thick, whitish; gills thick; spores 5–6 × 3.5–4.2 µm, Q 1.27–1.46; in unimproved grasslands; scattered ***Dermoloma intermedium***

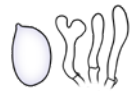
Cheilocystidia usually somewhat contorted, sometimes almost branched; cap not hygrophanous. Cap 20–45 mm wide, mouse grey to pale vinaceous brown, not striate, surface often ± wrinkled; stem 4.5–12 mm thick, whitish, darker towards the finely scaly base; spores 5–6 × 4–4.5 µm, Q 1.28–1.45; in unimproved grasslands; scattered ***Dermoloma atrocinereum***



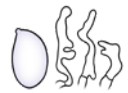
11. Stem thinner than 2 mm ... 12
Stem at least in some specimens thicker than 2 mm ... 17

12. Gills (in side view) pale ... 13
Gills (in side view) darker grey or brown ... 14

13. Cheilocystidia ± club-shaped, rarely bifurcate. Cap 9–20 mm wide, clay buff with a darker, mouse grey centre, at most weakly striate; stem 1–1.5 mm thick, pale mouse grey, darkest below; spores 5.5–6.2×3.2–3.6 µm, Q 1.6–1.8; in calcareous grasslands; rare (Germany and Sweden) ***Dermoloma angustisporum***



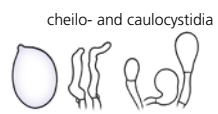
Cheilocystidia mostly irregularly curled or fingered. Cap 4–20 mm wide, margin pale mouse grey, centre darker, striate; stem 0.5–2 mm thick, pale mouse grey, darker below; spores 5–6 × 3.2–3.7 µm, Q 1.45–1.73 (4-spored basidia), 5.7–7.5 × 3.5–4.4 µm, Q 1.47–1.94 (2-spored basidia); caulocystidia 18–64 × 4.5–8 µm; in unimproved, calcareous grasslands; rare, but widespread ***Dermoloma rostratum***



14. Spores 6.3–7 µm long, on average longer than 6.4 µm ... see *Dermoloma curvicystidiatum*, cpl. 19
Spores 4.8–6.6 µm long, on average shorter than 6.4 µm ... 15

15. Caulocystidia 12–26 µm long, broadly clavate. Cap 4–8 mm wide, mouse grey to clay buff, striate; stem 1–1.5 mm thick, pale mouse grey, darker below; spores 5.3–6.2 × 3.5–4.5 µm, Q 1.35–1.56; in calcareous forests and grasslands; rare (Finland, France, Germany and Slovakia) ***Dermoloma vestigium***

cheilo- and caulocystidia



Caulocystidia 18–50 µm long, often somewhat curled ... 16

16. Spores wider than 4 µm; cheilocystidia ± club-shaped. Cap 7–14 mm wide, mouse grey, striate; stem 1–2 mm thick, mouse grey, darker below; spores 5.4–6.4×4.2–4.8 µm, Q 1.2–1.42; caulocystidia 21–48×3.5–6.5 µm; in calcareous grasslands; rare, but widespread ***Dermoloma obscurum***

Spores narrower than 4 µm; cheilocystidia mostly irregularly curled or fingered. Cap 6–8 mm wide, margin pale mouse grey, centre darker; stem 0.7–1.3 mm thick, pale mouse grey, darker below; spores 4.8–5.5 ×3.5–4 µm, Q 1.3–1.45; caulocystidia 23–40×8.5–14 µm; in unimproved grasslands; rare ***Dermoloma parvisporum***

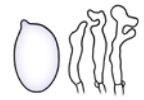
17. Fruitbodies very pale, fleshy; stem 5–10 mm thick; gills distant (16–30 full length gills) and often interveined; hyphae of the cap cuticle near the margin remarkably curled and fingered. Cap 25–45 mm wide, not striate; spores 5–6.5 × 4–4.6 µm, Q 1.27–1.41; cheilocystidia not known; in calcareous grasslands; rare (France) ***Dermoloma hygrophorus***

Fruitbodies ± mouse grey to clay pink, at least the cap, mostly slender; stem 1–6 mm thick; gills often different ... 18

18. Cheilocystidia with ± fingered, gnarled or branched tops ... 19
Cheilocystidia with ± rounded, rarely bifurcate tops ... 22

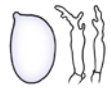
19. Gills (in side view) clay buff to greyish brown ... Cap 10–22 mm wide, ± clay buff, striate; stem 1–3 mm thick, ± clay brown; spores 6.3–7 × 4–4.5 µm, Q 1.45–1.64; in calcareous, unimproved forests and grasslands; rare (Croatia, Finland, Germany and Norway) ***Dermoloma curvicystidiatum***

cheilocystidia



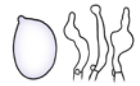
Gills (in side view) paler or more grey ... 20

20. Stem in young specimens pruinose in full length; cheilocystidia mostly strongly branched. Cap 9–20 mm wide, ± clay buff, striate; stem 1–3 mm thick, ± clay buff; spores 6–7 × 3.9–4.5 µm, Q 1.45–1.72; in unimproved, calcareous grasslands; rare, but widespread ***Dermoloma pruinosipes***



Stem not pruinose in full length; cheilocystidia without or with a few branchings ... 21

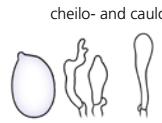
21. Gills (in side view) pale pinkish buff to pale clay buff ... see *Dermoloma griseobasale*, cpl. 23
Gills (in side view) ± mouse grey ... Cap 10–35 mm wide, mouse grey to clay buff, striate; stem 2–6 mm thick, pale clay buff; spores 5.5–6.5 × 3.7–4.3 µm, Q 1.4–1.61; in unimproved, calcareous grasslands; rare (France, Germany, Slovakia and UK) ***Dermoloma confusum***



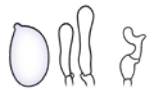
22. Fruitbodies rather slender, stem 1–3.5 (–4) mm thick, rather dark ..., especially towards the base ... [*Dermoloma phaeopodium* s.l.] ... 23
Fruitbodies more robust; stem 2–6 mm thick, rather pale ... 24

23. Gills (in side view) pale pinkish buff to pale clay buff ...; caulocystidia rather regularly clavate. Cap 7–20 mm wide, ± clay buff, striate or not; stem 1–3.5 mm thick; spores 5.3–7 × 3.7–4.5 µm, Q 1.37–1.61; in calcareous grasslands; scattered ***Dermoloma griseobasale***

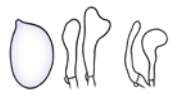
cheilo- and caulocystidia



Gills (in side view) ± mouse grey ...; caulocystidia often remarkably irregularly curved or twisted. Cap 8–25 mm wide, ± clay buff to mouse grey, striate or not; stem 1–4 mm thick; spores ellipsoid, 5.5–6.5×3.5–4.2 µm, Q 1.5–1.7; in calcareous grasslands; rare, but widespread ***Dermoloma phaeopodium***

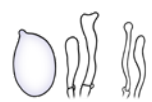


24. Caulocystidia mostly rather broadly clavate, 5–9 (–15) µm wide. Cap 10–21 mm wide, ± clay buff, not striate; stem 3–6 mm thick, base with brown fibres or scales; spores 5.8–6.8×3.9–4.5 µm, Q 1.41–1.6; in calcareous grasslands; rare, mainly SE-SW ***Dermoloma compactum***



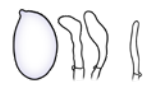
Caulocystidia cylindrical to narrowly clavate, mostly narrower than 7 µm ... 25

25. Spores 3.5–4 µm wide; stem base with brown fibres or scales. Cap 10–30 mm wide, clay buff to mouse grey, striate or not; stem 2–5.5 mm thick; spores 5.2–7 × 3.5–4 µm, Q 1.44–1.8; caulocystidia 3.5–5.5 (–7.5) µm wide; in calcareous forests and grasslands; rare (France, Germany and UK) ***Dermoloma applanatum***

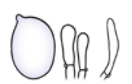


Spores wider than 4 µm; stem base only slightly darker ... 26

26. With 24–31 full-length gills; spore Q 1.4–1.65; cheilocystidia 4.5–7.5 (–10) µm wide. Cap 15–21 mm wide, ± clay buff, at most weakly striate; stem 2–5 mm thick; spores 6–7.5 × 4.3–5 µm, Q 1.4–1.65; in calcareous grasslands; rare (France, Germany, Slovakia and UK) ***Dermoloma josserandii***



With 30–37 full-length gills; spore Q 1.3–1.47; cheilocystidia 6.5–11.5 (–13) µm wide. Cap 15–35 mm wide, ± clay buff, at most weakly striate; stem 2.5–5.5 mm thick; spores 5.8–6.6 × 4–4.8 µm, Q 1.3–1.47; in calcareous forests and grasslands; rare (France and Germany) ***Dermoloma pseudojosserandii***



Key F – tricholomatoid fungi without ring, on soil and with whitish spore deposits

All *Tricholoma* species are ectomycorrhizal – usually with specific hosts.

1. Smell like unperfumed soap or rotten flesh; cap cuticle without an obvious radial structure, but sometimes cracking in coarse scales . 2
Smell different (e.g. absent, fruity or mealy); cap cuticle with or without radial structure 5

2. Stem at maturity with obvious fine scales; cap initially olivaceous buff to mouse grey ( ). Cap up to 90 mm wide; stem up to 20 mm thick; spores (4–) 4.5–6 (–6.5) × 3–4 (–4.5) µm; with deciduous and coniferous trees on better soils; scattered . . . . ***Tricholoma atrovirens***

Stem longitudinally fibrous but probably never scaly; cap initially with paler or more greenish yellow ( ) colours 3

3. Not reddening; cap with distinct greenish yellow ( ) colours. Cap 35–90 mm wide; stem 8–15 mm thick; spores 4.5–7 × 3–4.5 µm; with coniferous trees; rare . . . . ***Tricholoma rapipes***

Fruitbody ± reddening, e.g. on the gills or at stem base; young cap olivaceous buff, greyish brown, silvery grey to pale mouse grey ( ), with or without greenish shades, later sometimes cinnamon to reddish brown ( ) 4

4. With smell of rotten flesh; with deciduous trees on warm, clayey or calcareous soil. Cap 25–80 mm wide, initially silvery grey to pale mouse grey with or without greenish shades, later, not least at centre, cinnamon to reddish brown; stem 7–15 mm thick; spores 5–7.5 × 3.5–5.5 µm; rare or overlooked . . . . ***Tricholoma boudieri***

With soaplike smell; with deciduous and coniferous trees on mor soil. Cap 30–110 mm wide, with olivaceous buff to greyish brown colours, to pale vinaceous brown at maturity; stem 7–25 mm thick; spores 4–7 × 3–4.5 µm; common . . . . ***Tricholoma saponaceum***


5. Cap with distinct yellow, olive or greenish colours, sometimes more brownish when mature ( ) 6
Cap with other colours ( ) 22

6. Smell strong, gas- or camphor-like; gills distant. Fruitbody yellow in all parts, but cap sometimes reddish brown; spores 8–12 × 4.5–7 µm; with deciduous and coniferous trees; common . ***Tricholoma sulphureum* s.l.**[6]

Smell mealy, like celery or absent; gills normal to crowded 7

7. Gills initially uniformly coloured, ± yellow ( ) 8
Gills white ( ), sometimes yellow-spotted at maturity or towards the margin 13


8. Fruitbodies rather small, cap up to 50 mm wide; spores 3.5–4.5 × 2–3 µm 9
Fruitbodies larger; spores larger 10

6. *Tricholoma sulphureum* is variable, both morphologically and genetically, and constitutes without doubt a complex with several species.

9. Cap yellow to orange-yellow ( ), ingrown, radial fibres; cap cuticle with long cells; gills not dark grey when drying. Cap 20–50 (–60) mm wide; stem 4–8 (–15) mm thick; spores 2.5–3.5 (–4) × 2–2.5 (–3) µm; with conifers on calcareous soil; rare . . . . ***Calocybe chrysenteron***

Cap yellow to yellowish brown ( ), without radial fibres; cap cuticle with many globose cells; gills stain, ± dark grey when drying. Cap 15–50 mm wide; stem 4–8 mm thick; spores 3.5–4 (–4.5) × 2–2.5 (–3) µm; with conifers on calcareous soils; rare . . . . ***Calocybe cerina***[7]


10. Flesh with a bitter to hot taste; cap conical. Cap 30–70 (–100) mm wide; stem 7–20 mm thick; spores 6–8.5 × 4–6 µm; in older coniferous forests, very rarely in *Fagus* forests on mor soils; common to scattered (N) to rare going S . . . . ***Tricholoma aestuans***

Flesh with a mild, mealy taste; cap conical or convex 11

11. With *Populus tremula*, usually on relatively rich soil. Cap 50–110 mm wide; stem 10–20 (–25) mm thick; spores 5–8.5 × 3.5–6 µm; scattered to rare . . . . ***Tricholoma frondosa***

With *Pinus* on sandy soils 12

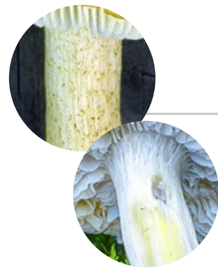
12. Fruitbody with pale lemon yellow colours ( ), but cap sometimes brownish ( ) in the centre. Cap 50–100 mm wide; stem 8–15 mm thick; spores 5.5–7 (–8) × 4–5.5 µm; with *Pinus*; scattered, mainly NE . . . . ***Tricholoma ulvinenii***

Fruitbody with greenish yellow to yellow ( ) colours, but cap usually reddish to brownish ( ). Cap 40–100 (–130) mm wide; stem 6–25 mm thick; spores 6–9.5 × 3.5–6 µm; with *Pinus*; common to scattered going W . . . . ***Tricholoma equestre***


13. Smell strong, like Maggicubes or celery; cap surface not sticky, felty and cracking . . . . see *Tricholoma apium*, cpl. 93
Smell mealy, fruit- or soaplike, often faint; cap surface radially fibrous to scaly, usually sticky 14

14. With conifers, often on sandy soils 15
With deciduous trees on clayey or calcareous soils 18

15. Cap centre dark greyish brown, brownish olive to blackish ( ), towards margin paler olivaceous buff, olive to yellowish ( ); with *Picea* on slightly better soils 16
Cap to margin with paler olivaceous buff to yellowish ( ) colours; with *Pinus* on sandy soils 17



16. Stem with dense, greyish brown to brownish olive small scales. Cap 30–80 (–100) mm wide; stem 6–18 mm thick; spores 6–9 × 4.5–7.5 µm; with *Picea* on calcareous soil; scattered (N) to ± absent S–W . . . ***Tricholoma fucatum***

Stem with whitish to greenish yellow longitudinal fibres. Cap 40–80 mm wide; stem 10–15 (–20) mm thick; spores 5.5–9 × 4.5–7.5 µm; with *Picea* on slightly better soils; scattered to rare going S in the lowlands . . . . ***Tricholoma viridilutescens***


17. Stem with mustard yellow scales; cap finely scaly, mustard yellow to curry yellow ( ). Cap 50–100 mm wide; stem 15–25 mm thick; smell and taste mealy; spores 5–8 × 3.5–6 µm; rare, mainly Scandinavia . . . . ***Tricholoma joachimii***

Stem without mustard yellow scales; cap radially fibrous, in places with distinct olive shades ( ). Cap 50–120 (–170) mm wide; stem 8–30 mm thick; smell and taste mealy; spores 4.5–6 × 3.5–5 µm; scattered (N) to rare in S lowlands . . . . ***Tricholoma arvernense***


7. There is some confusion over the number of yellow *Calocybe* species and their nomenclature. *Calocybe cerina*, *C. fallax* and *C. naucoria* have all been in use for the species, which should have globose cells in the cap cuticle; *C. fallax* and *C. naucoria* were described from North America, while *C. cerina* is described from Europe.

18. Gills distinctly yellow close to the cap margin; cheilocystidia broadly club-shaped, 12–18 µm wide. Cap 50–90 mm wide; stem 8–25 mm thick; spores 5.5–7 × 4.5–5.5 µm; in warm places; rare (SE) ***Tricholoma eosinobasis***

Gills without yellow colours towards the margin; cheilocystidia more narrow 19

19. Cap with a well-marked pointed umbo 20

Cap convex to expanded, without or with a less pointed umbo 21

20. Stem typically deeply rooting; cap narrowly to broadly conical, strongly radially fibrous, whitish to greenish yellow. Cap 35–90 (–115) mm wide; stem 8–20 (–25) mm thick; spores 5–8.5 × 4–6.5 µm; on clayey or calcareous soils; rare ***Tricholoma umbonatum* type 2**

Stem not distinctly rooting; cap bell-shaped to expanded with umbo, radially fibrous, pale yellow, pale mouse grey to olivaceous buff. Cap 60–90 mm wide; stem 10–20 mm thick; spores 6–8 × 5–6 µm; with deciduous trees on clayey or calcareous soils; rare ***Tricholoma umbonatum* type 1**

21. Cap up to 50 mm wide, olivaceous buff, straw yellow to mustard yellow, with ± distinct drop-shaped spots at cap margin. Cap 30–80 mm wide; stem 8–15 mm thick; spores 5.5–7 × 4.5–5 µm; with *Quercus* on clayey soil; rare ***Tricholoma rufenum***

Cap up to 110 mm wide, greenish yellow to olivaceous buff, with darker, more olive centre; without drop-shaped spots at cap margin. Cap 30–110 mm wide; stem 8–25 mm thick; spores 5–8 × 4–6.5 µm; on warm, calcareous or clayey soils; scattered ***Tricholoma sejunctum***

22. Cap surface glabrous or with silky fibres; cap white, cream, pale mouse grey to pale pinkish buff, sometimes yellowing when touched 23

Cap surface distinctly felty to scaly *and/or* darker 34

23. Smell and taste distinctly mealy 24

Smell different (absent or spicy, celery-, radish-, honey- or flowerlike), taste different or at most weakly mealy 25

24. Cap not radially fibrous, matt, whitish to pale pinkish buff or greyish brown; typically appearing April–June, rarely in late autumn. Cap 30–120 mm wide; stem 10–35 mm thick; spores 5–7 × 2–4 µm; in forests and on ± disturbed land, mostly on calcareous soils, in fairy rings; common, thinning out going N ***Calocybe gambosa***

Cap radially silky-fibrous, usually shiny, pure white, but usually with bluish spots; only appearing in autumn. Cap 40–100 (–120) mm wide; stem 10–30 mm thick; spores 4.5–7 × 3–5 µm; in deciduous forest, usually on rather poor soils; common to scattered ***Tricholoma columbetta***

25. Gills browning or greying 26

Gills unchanging or reddening 27

26. Smell cocoa-like, sometimes weak; spores 3–5 × 1.5–3 µm see *Tephrocybella griseonigrescens*, p. 173

Smell radish-like; spores 5–10 × 3–6 µm see *Tricholoma lascivum*, cpl. 32

27. Fruitbodies in distinct clusters; cap and gills violet with $FeSO_4$ see *Leucocybe connata*, p. 72

Fruitbodies normally not in distinct clusters, but sometimes many together; cap and gills not violet with $FeSO_4$ 28

28. Cap margin for long deeply inrolled; smell weak see *Tricholoma acerbum*, cpl. 91

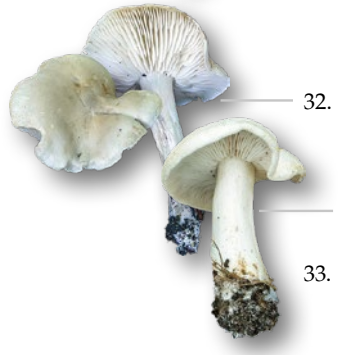
Cap margin not or only weakly inrolled; smell strong 29

29. Smell like unperfumed soap; flesh reddening at least in stem bases see *Tricholoma saponaceum* and others, cpl. 2

Smell gas-, radish-, honey-, or flowerlike, flesh unchanging or yellowing 30

30. Cap significantly yellowing when touched; in deciduous forests on calcareous soil. Cap 50–100 (–120) mm wide; stem 8–20 (–25) mm thick; spores 4.5–8 × 3.5–6 µm; rare, increasing towards SW ***Tricholoma sulphurescens***

Cap not significantly yellowing, but often somewhat greyish or yellowish discoloured at maturity 31



31. Gills distant; smell unpleasantly gaseous; with *Picea* on calcareous soil. Cap 15–60 (–80) mm wide; stem 3–13 (–18) mm thick; spores 8–13 × 5.5–8 µm; common (N), thinning out towards S ***Tricholoma inamoenum***

Gills crowded or distant, smell radish- or flowerlike; with deciduous trees 32

32. Cap with an obvious greyish yellow tinge; spore Q on average more than 1.6; with *Fagus* on humus-rich soils. Cap 30–75 mm wide; stem 6–15 mm thick; spores 5–10 × 3–6 µm; common to scattered ***Tricholoma lascivum***

Cap white to yellowish, without greyish tinge; spore Q on average less than 1.6; with *Quercus* or *Betula* 33

33. Smell aromatic sweetish, usually with an obvious honey component; cap margin probably never ribbed; with *Quercus*. Cap 20–80 (120) mm wide; stem 5–15 mm thick; spores 4.5–7.5 × 3.5–5 µm; common ***Tricholoma album***

Smell complex radish-like with sweetish components, but not honey-like; cap margin usually ribbed; with *Betula*. Cap 40–140 mm wide; stem 10–25 mm thick; spores 4.5–8 × 3–5.5 µm; common ***Tricholoma stiparophyllum***

34. Cap neutral ash grey, vinaceous grey or almost black 35

Cap more brown or more colourful 52

35. Cap sticky; stem usually with distinct yellow shades. Cap 50–110 mm wide; stem 10–30 mm thick; spores 4.5–8 × 3–5.5 µm; with *Pinus* on sandy soil, less commonly with deciduous trees (*Fagus*, *Tilia*) on clayey soil; common to scattered ***Tricholoma portentosum***

Cap not sticky; stem without yellow colours 36

36. Cap smooth or very finely radially fibrous (lens!), sometimes cracking into scales at centre; taste mild 37

Cap distinctly radially fibrous, felty or finely scaly; taste mild or bitter to hot 38

37. Stem with dark scales *and/or* fruitbody in places reddening see cpl. 2

Stem without dark scales; flesh never reddening. Cap 40–130 mm wide; stem 7–25 mm thick; smell mealy or radish-like; spores 5–8 × 3.5–5 µm; with *Pinus* on sandy soil; scattered (N) to rare or absent going S–SW ***Tricholoma sudum***

38. Cap ± shiny; distinctly radially fibrous, often with scaly areas; flesh after some time with bitter or hot taste 39

Cap not shiny; radially scaly or felty; flesh with mild, usually mealy taste, sometimes astringent after some time 41

39. Cap semiglobose to flattened, with or without a broad umbo; stem with distinct dark grey, scaly belts. Cap 40–110 mm wide; stem 10–25 mm thick; spores 6–9 × 4.5–7.5 µm; with *Quercus* on warm calcareous soil; rare, mainly S, but also SE Sweden ***Tricholoma bresadolanum***
Cap conical to bell-shaped with a pointed umbo; stem glabrous or slightly scaly 40

40. With *Fagus* on ± mor soils; cap usually with distinctly scaly areas. Cap 30–100 mm wide; stem 10–18 mm thick; gill edge typically dark-spotted; spores (6–) 6.5–7.5 (–8) × 5–6.5 µm; common to rare in parts of the lowlands S of Denmark ***Tricholoma sciodes***
With *Picea*, *Betula* or *Pinus* on nitrogen-poor soil; cap silvery, radially fibrous, normally without scaly areas. Cap 30–75 (–100) mm wide; stem 8–15 mm thick; spores 6.5–7.5 (–8) × 5–6 µm; common (N), but thinning in lowlands towards S and reappearing at higher altitudes ***Tricholoma virgatum***

41. Gills white to cream (), sometimes with greenish or bluish reflex; with clamps 42
Gills white to greyish (), sometimes yellow-spotted at maturity, but without greenish or bluish reflex; without clamps 43

42. Cap with concentrically arranged, dark scales, forming a marked contrast to a whitish, silky-fibrous background; with *Fagus* and *Abies* on calcareous soils. Cap 50–100 (–150) mm wide; stem 15–30 (–45) mm thick; spores 7–10.5 × 5–7.5 µm; rare (E–SE–S) ***Tricholoma pardinum***
Cap radially fibrous, often cracking in irregular scales, but without large contrast between scales and background; with *Fagus* and *Quercus* on warm, calcareous soils. Cap 40–90 (–140) mm wide; stem 15–25 (–30) mm thick; spores 6.5–10 × 5–7 µm; rare, absent in western lowlands ***Tricholoma filamentosum***

43. Smell of uncut fruitbodies mealy; gills and flesh usually yellow-spotted at maturity or after bruising; spores on average shorter than 6 µm 44
Smell of uncut fruitbodies sweetish, peppery or absent; gills and flesh unchanging, reddening or bluish-green-spotted; spores usually longer 46

44. Cap convex to expanded with distinct scales, usually with a low and wide umbo; spore Q on average less than 1.6. Cap 25–75 (–120) mm wide; stem 5–18 mm thick; spores 4–7 × 2.5–4.5 µm; with deciduous trees in forests, parks and gardens; common ***Tricholoma scalpturatum***
Cap conical to bell-shaped, radially fibrous or scaly, usually with a pointed umbo; spore Q on average more than 1.6 45

45. Veil weakly developed, only visible on very young specimens; spores on average 2.9–3.6 µm wide. Cap 20–60 mm wide; stem 5–10 (–15) mm thick; spores 4–7 × 2–4 µm; with deciduous trees, especially *Betula*, often in cemeteries or parks; common ***Tricholoma inocybeoides***
Veil well-developed, normally visible as a weak ring-zone on the stem on mature specimens; spores on average 2.6–3.2 µm wide. Cap 25–70 mm wide; stem 5–15 (–20) mm thick; spores 3.5–7 × 2–4 µm; with deciduous trees, especially *Betula*, in forests and parks; common ***Tricholoma argyraceum***

46. Cap felty to weakly scaly, rather uniformly white, ash grey or almost black; smell weak; flesh not reddening or spotted bluish green 47
Cap with prominent dark scales, creating contrast to an underlying pale background; smell of uncut fruitbodies flowerlike, sweetish spicy or peppery; flesh usually red or spotted bluish green, especially at stem base 49

47. Stem whitish to pale ash grey, without dark scales; spores regularly ellipsoid, Q on average less than 1.7. Cap 20–80 mm wide; stem 5–15 (–20) mm thick; spores 4–9 × 3–6 µm; taste mild, sometimes astringent after some time; gill edge sometimes blackening; with *Pinus* on sandy or mineral rich soil, typically along roads or in parks, less commonly with deciduous trees (*Fagus*, *Carpinus*, *Tilia*) on clayey soil; common ***Tricholoma terreum***
Stem with distinct dark, fine scales or fibres, mostly at the top; spores variable, but a considerable part ± cylindrical, Q on average more than 1.7 48

48. Cap margin with an obvious woolly, whitish zone. Cap 20–50 mm wide; stem 5–10 mm thick; spores 5.5–10 × 3.5–5.5 µm; with coniferous trees, sometimes also deciduous trees; rare or overlooked ***Tricholoma triste***
Cap margin without an obvious woolly zone. Cap 10–40 mm wide; stem 4–8 mm thick; spores 6–11 × 3–5.5 µm; with coniferous trees, sometimes also deciduous trees; rare or overlooked ***Tricholoma bonii***

49. Cap margin, mostly in young specimens, with a prominent woolly zone; flesh only weakly and slowly reddening in the stem base 50
Cap margin, also in young specimens, glabrous, slightly scaly or felty; flesh usually with prominent bluish green or red spots in the stem base 51

50. Smell sourish to flowerlike; flesh not reddening; spores amyloid see *Pogonoloma spinulosum*, cpl. 79
Smell peppery; flesh slowly reddening in stem base; spores inamyloid. Cap 40–100 (–120) mm wide; stem 10–25 (–30) mm thick; spores 5–10.5 × 3–6.5 µm; with *Fagus* and *Quercus* on clayey or calcareous soil; scattered to rare ***Tricholoma squarrulosum***

51. Stem white, sometimes with well-defined, blackish, dot-like scales; mycelium greenish yellow; flesh in the stem base soon with bluish green or reddish spots. Cap 30–100 mm wide; stem 10–25 mm thick; spores 4–6.5 × 3–5 µm; with *Fagus* on clayey or calcareous soils; rare (N) to scattered going S ***Tricholoma orirubens***
Stem greyish, finely scaly-girdled; mycelium white; especially the stem base, strongly reddening. Cap 40–90 (–120) mm wide; stem 8–20 (–25) mm thick; spores 4.5–7.5 × 3–6 µm; with *Fagus* and *Quercus* on thermophilous, clay soils; rare – S Scandinavia and further S ***Tricholoma basirubens***

52. Gills, stem or flesh change colour to reddish, orange or bluish, and later usually blackish, when bruised (→→) 53
Fruitbody unchanging when bruised 65

53. Staining reddish to orange, and then sometimes black, when bruised (→ →) 54
Staining directly bluish to black when bruised (→→) 57

54. Gills yellow (); spores 3.5–5 × 2.5–3.5 µm. Cap 50–120 mm wide, mouse grey to greyish violet; stem 10–25 mm thick; all parts reddening and then blackening; smell mealy; spores smooth, inamyloid; cheilocystidia up to 80 µm long, sometimes with septa; on calcareous soil in deciduous and coniferous forest; rare (S) ***Calocybe favrei***
Gills whitish, brownish to greyish (); spores larger 55

55. Spores inamyloid; in coniferous forests on calcareous soils. Cap 20–70 mm wide; stem 4–8 mm thick; all parts ± orange, later greyish when bruised; spores 7.5–9 × 4–5.5 µm, smooth; rare ***Lyophyllum aemiliae***
Spores amyloid; in grasslands 56

56. Both stem and cap ± pale vinaceous brown (); stem 12–20 mm thick; spores 3–4 µm wide. Cap 40–100 mm wide; gills rather thick; spores 6–8×3–4 µm; in unimproved grasslands; rare ***Pseudotricholoma metapodium***
Stem paler than the cap; stem 4–12 mm thick; spores 4–5 µm wide see *Dermoloma magicum*, E1

57. Spores warty (smooth in KOH). All surfaces stain blue to black; cap 20–80 mm wide; stem 5–15 mm thick; spores 5.5–8.5×3–4 µm; in coniferous forests, less commonly in deciduous forests; scattered ***Calocybe gangraenosa***
Spores smooth 58

58. Spores triangular in outline. Gills blackening when bruised; cap 35–80 mm wide; stem 5–15 mm thick; spores 8–9.5×4.5–7.5 µm; on soil in deciduous forests, rarely coniferous forests; rare to absent in parts of W–SW lowlands ***Lyophyllum transforme***
Spores globose, ellipsoid, spindle-shaped, cylindrical, rhombic or almond-shaped 59

59. Spores ± globose 60
Spores ellipsoid, spindle-shaped, cylindrical, rhombic or almond-shaped 61

60. Cap greyish to greyish cream, darker ash grey to greyish brown () at maturity or when bruised; stem 10–20 mm thick; in deciduous forests on calcareous soil. Surfaces stain blue initially or blacken directly; cap 30–80 mm wide; spores 5–7×4.5–6 µm; rare ***Lyophyllum eustygium***
Cap clay-buff to greyish brown (); stem 6–10 mm thick; in parks and scrub. Surfaces stain blue and then blacken; cap 30–60 mm wide; spores 4–7×4–6.5 µm; rare ***Lyophyllum paelochroum***

61. Spores on average shorter than 6 µm; with or without cheilocystidia 62
Spores longer than 6 µm; without cheilocystidia 63

62. With bottle-shaped cheilocystidia; spores 2–3 µm wide. Fruitbody stains black in all parts; cap 15–55 mm wide; stem 5–8 mm thick; spores 3.5–6×2–3 µm; in coniferous forests on calcareous soils; rare ***Lyophyllum konradianum***
Without cheilocystidia; spores 3.5–4 mm wide. Cap 10–40 mm wide; stem 2.5–8 mm thick; spores 4.5–6.5×3.5–4 µm; smell and taste mealy; in grasslands; rare (mostly absent) ***Lyophyllum pulvis-horrei***

63. Spores ellipsoid. Fruitbody stains black instantaneously in all parts; cap 20–45 mm wide; stem 3–8 mm thick; spores 7–9.5×4.5–6 µm; with deciduous trees; rare ***Lyophyllum brunneo-ochrascens***
Spores rhombic, almond- or spindle-shaped 64

64. Spores 8.5–11.5×5–6.5 µm, rhombic when viewed from the front, almond-shaped from the side. Fruitbody stains blue or blackens directly; cap 30–90 mm wide; stem 5–20 mm thick; on calcareous soils in deciduous forests, sometimes also coniferous forests; scattered to rare and absent going SW ***Lyophyllum deliberatum***
Spores 6–8×4–5 µm, almond- to spindle-shaped. Fruitbody blackens; cap 30–70 mm wide; stem 5–15 mm thick; in coniferous forests; scattered ***Lyophyllum semitale***

65. Cap with ± lilac, rose to clay-pink () colours 66
Cap with different colours () 69

66. Cap ± clay-pink () 67
Cap ± lilac to rose () 68

67. Smell weak, sometimes slightly mealy; spore deposit ± cream; spores finely warty to almost smooth, 4.5–6.5×2.5–3.5 µm. Cap 30–80 mm wide; stem 9–14 mm thick; in mull-rich deciduous forests etc.; rare , probably overlooked ***Gerhardtia borealis***
Smell perfumed; spore deposit brownish rose; spores pustulate, 4.5–7×3–4.5 µm see *Rhodocybe gemina*, p. 248

68. Cap ± rose (). Cap 12–50 mm wide; stem 2–5 mm thick, solitary or occasionally in clusters; smell insignificant; spores 3–7 (–8)×2–3 µm; in lawns and unimproved grassland; common ***Calocybe carnea***
Cap ± lilac (). Cap 30–80 mm wide; stem 3–10 mm thick; spores 5–5.5×2.5–3 µm; mostly in deciduous forests on calcareous soil; rare ***Calocybe ionides***

69. Cap vivid orange (); stem cracking in orange, scaly girdles. Cap 70–120 mm wide; stem 10–20 (–40) mm thick; spores 4.5–7×3–4.5 µm; with deciduous and coniferous trees on calcareous soil; scattered (N) to rare ***Tricholoma aurantium***
Cap with other colours (); stem without orange girdles 70

70. Cap sticky to slimy 71
Cap not sticky but sometimes greasy 79

71. Cap 100–250 mm wide; stem 30–100 mm thick; spores 7–9.5 × 5–6.5 µm see *Tricholoma colossus*, B15
Cap 30–150 mm wide; stem rarely thicker than 30 mm; spores up to 7.5 µm long 72

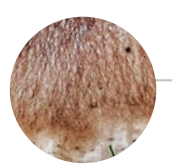
72. Stem flesh yellow (). Cap 30–120 (–150) mm wide; stem 4–20 mm thick; smell mealy; spores 5–7.5×3.5–6 µm; with *Betula* and *Picea*, mostly on peaty soils; common ***Tricholoma fulvum***
Stem flesh whitish to pale brownish 73

73. Stem reddish brown scaly with a well-defined, white zone at the top (check young specimens). Cap 40–80 (–100) mm wide; stem 10–20 mm thick; taste mealy and bitter; spores 5–8.5×4–6.5 µm; with *Quercus* or *Fagus* on clayey or calcareous soil; scattered ***Tricholoma ustaloides***
Stem white or brownish, and at most finely scaly, without an aberrant white zone at the top 74

74. With *Populus*, including *Populus tremula*. Cap 50–150 (–200) mm wide; stem 12–30 (–40) mm thick; spores 3.5–6.5×2.5–4.5 µm; smell strongly mealy; in forests and parks and on roadsides; common to scattered (UK) ***Tricholoma populinum***
With *Fagus*, *Quercus* or coniferous trees 75

75. With *Fagus* or *Quercus* 76
With coniferous trees 77

76. With *Fagus*; spores on average wider than 5 µm. Cap 30–100 mm wide, yellow-, orange- to reddish brown; stem 10–25 mm thick; smell mealy; spores 5.5–8×4.5–6.5 µm; in forests on mull and mor soils; common ***Tricholoma ustale***
With *Quercus*; spores narrower than 5 µm. Cap 45–80 mm wide, orange brown to reddish brown; stem 8–10 mm thick; smell mealy; spores 5–7×3.5–5 µm; in warm places, often in parks; rare (S) ***Tricholoma quercetorum***



77. Cap usually significantly radially fibrous. Cap 30–90 mm wide; stem 7–20 mm thick; smell mealy; spores 4.5–6.5×3–4.5 µm; with *Pinus* on nutrient-poor or calcareous soils; common (N) to scattered going S ***Tricholoma albobrunneum***
Cap without or with weak radially fibrous structure 78

78. Cap usually with drop-shaped spots; cap margin without ribs. Cap 60–150 mm wide; stem 10–20 mm thick; smell mealy; spores 3.5–6 × 2.5–4 µm; with *Picea*, *Pinus* and *Abies*; common (N), thinning out going S ***Tricholoma pessundatum***
Cap without drop-shaped spots; cap margin usually with ribs. Cap 50–120 (–150) mm wide; stem 10–35 mm thick; smell faint to strongly mealy; spores 3.5–6.5×3–5 µm; with various coniferous trees; common (N) to rare going S ***Tricholoma stans***

79. Cap margin rough-haired; smell perfumed-soaplike. Cap 50–100 (–140) mm wide; stem 8–25 (–35) mm thick; spores 4.5–6.5 × 3–5 µm, amyloid; in deciduous forest on clay soils; rare – from Denmark and southwards ***Pogonoloma spinulosum***
Cap margin glabrous or scaly; smell absent or acidic, mealy, celery- to licorice-like 80

80. Long-stemmed and growing deeply in the vegetation in fens and bogs. Cap 15–60 mm wide; stem 5–20 mm thick; spores 7–9 × 5.6–6.5 µm, inamyloid; rare ***Desarmillaria ectypa***
More short-stemmed and on drier soils 81

81. Smell mealy, of celery or of Maggicubes 82
Smell not striking 114

82. Stem densely greyish brown to brownish olive, finely scaly see *Tricholoma fucatum*, cpl. 16
Stem without such scales 83

83. Cap pointed and conical, surface sometimes cracking 84
Cap depressed, flat to convex, not radially cracking 85

84. In forests; spores inamyloid see *Tricholoma rufenum*, cpl. 21
On unimproved, calcareous grasslands; spores amyloid. Cap 30–80 mm wide; stem 5–13 mm thick; spores 6.5–8.5×4.5–5.5 µm; rare, reappearing at higher elevations (S) ***Pseudoporpoloma pes-caprae***

85. Gills rather thick; in unimproved grasslands, not ectomycorrhizal; spores amyloid see *Pseudotricholoma metapodium*, cpl. 56
Gills with normal thickness; ectomycorrhizal or not; spores inamyloid 86

86. With smell like Maggicubes or celery; cap felty and at maturity, irregularly cracking. Cap pale mustard yellow to brownish yellow; spores 3.5–5 ×3–4 µm; common (NE) to absent going S–SW ***Tricholoma apium***
Smell mostly mealy; cap almost or entirely unstructured, sometimes cracking 87

87. Rather long-stemmed and in distinct clusters, usually with a rooting tendency see *Lyophyllum fumosum* s.l., cpl. 96
Not long-stemmed and not in distinct clusters 88

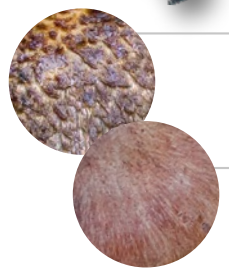
88. Cap somewhat shiny. Cap 20–60 mm wide, brownish, hygrophanous; stem 5–10 (–15) mm thick; smell somewhat mealy; spores 5.5–7 × 3.5–4.5 µm, Q 1.3–1.8; with or without irregular cheilocystidia; in coniferous forest; rare or overlooked ***Lyophyllum turcicum***
Cap not shiny 89

89. Cap greyish brown to dark grey-brown (🍄 ■■■). Cap 25–35 mm wide; stem 3–7 mm thick; smell mealy; spores 5–6×3–4.5 µm; in deciduous forests and conifer forests/plantations on calcareous soils; rare (N) to scattered going S ***Calocybe obscurissima***
Cap clay-buff to yellowish brown (🍄 ■■) see *Calocybe gambosa*, cpl. 24

90. Stem top dotted-scaly; cap pale buff, clay-buff to yellowish brown (🍄 ■■■) 91
Stem top not dotted-scaly; cap sometimes darker 92

91. Mostly with *Quercus*, less commonly other deciduous trees; stem 15–40 mm thick. Cap 70–150 (–200) mm wide; smell insignificant; taste ± bitter to hot; spores 4–6×3–5 µm; in warm sites on calcareous or clay soils in open forests; rare to scattered going SW ***Tricholoma acerbum***
With *Larix*, rarely other coniferous trees; stem 8–15 mm thick. Cap 15–50 (–80) mm wide; smell insignificant; spores 5–7.5 × 4–6 µm; on calcareous soil; scattered ***Tricholoma psammopus***

92. Cap matt-fibrous, usually cracking in radiating scales; not in distinct clusters 93
Cap smooth-greasy, not cracking; usually in tight, sometimes rooting, clusters 94



93. Cap ± orange-brown (🍄 ■); cap centre with coarse threadlike scales. Cap 40–80 mm wide; stem 10–22 mm thick, glabrous to finely scaly; smell insignificant, but mealy when cut; spores 5–7×3.5–5.5 µm; with coniferous trees, mostly *Picea*; common (N) to rare in parts of the lowlands ***Tricholoma vaccinum***
Cap reddish brown to greyish brown (🍄 ■■); cap centre felty or with fine scales. Cap 30–140 mm wide; stem 10–25 mm thick, glabrous to weakly longitudinally fibrous; spores 5–8.5 × 4–5.5 µm; with *Pinus*; common (N) to scattered going S ***Tricholoma imbricatum***

94. Spore Q more than 1.3 95
Spore Q around 1 96

95. Spores 5.5–7×3.5–4.5 µm, Q 1.3–1.8 see *Lyophyllum turcicum*, cpl. 88
Spores 4–6 × 2–3 µm, Q about 2. Cap 25–80 mm wide, irregularly shaped and umbonate, partly hygrophanous; stem 3–6 mm thick; on calcareous mull soil in scrub; rare ***Calocybe hebelomoides***

96. Smell spermatic with sour and mealy components. Cap 10–80 mm wide; stem 5–10 mm thick; spores ± globose, 5–6.5 µm; in deciduous and coniferous forests and in parks; common ***Lyophyllum fumosum* s.l.**
Smell insignificant 97

97. In nutrient-poor, coniferous forest. Cap 40–110 mm wide; stem 5–15 mm thick; spores ± globose, 5–6.5 µm; scattered (N), mainly Scandinavia ***Lyophyllum shimeji***
On better soils in deciduous and coniferous forests, parks, gardens, heathlands, etc. Cap 20–120 mm wide; stem 4–20 mm thick; smell insignificant; spores ± globose, 5–6.5 µm; on soil; common ***Lyophyllum decastes* s.l.**[8]

8. There are more species in this complex, and separation based on smell/taste is dubious.