

Morels and the like

All species belong to the operculate cup fungi, *i.e.* *Ascomycota*, and have an exposed hymenium and asci that open with a lid (an operculum). All have inamyloid asci. They produce the largest fruitbodies (apothecia) within the ascomycotes - species of *Morchella* ▷ and *Gyromitra* ▷▷ can reach more than 20 cm in height. The

hymenophore is often highly folded, resulting in the hymenium having a large surface area.

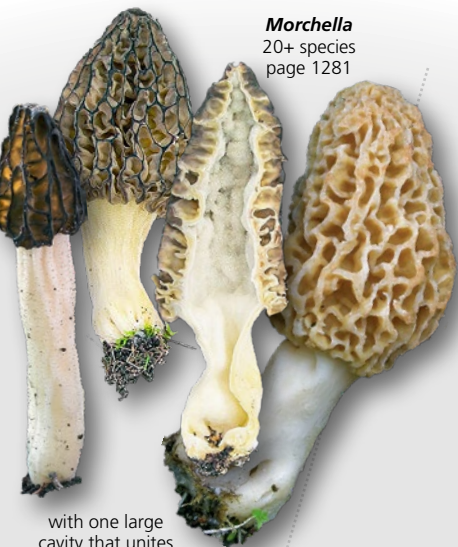
Morchella may form mycorrhizal-like associations with plants, *e.g.* with *Rosaceae*, *Ulmus* or herbs. *Gyromitra* is saprotrophic, while *Helvella* is ectomycorrhizal.

OTHER SIMILAR FUNGI:

- some species in the group 'earthtongues and the like' may look similar to tiny morels. These, however, have inoperculate asci (page 1350).

See also the main wheel, page 1278.

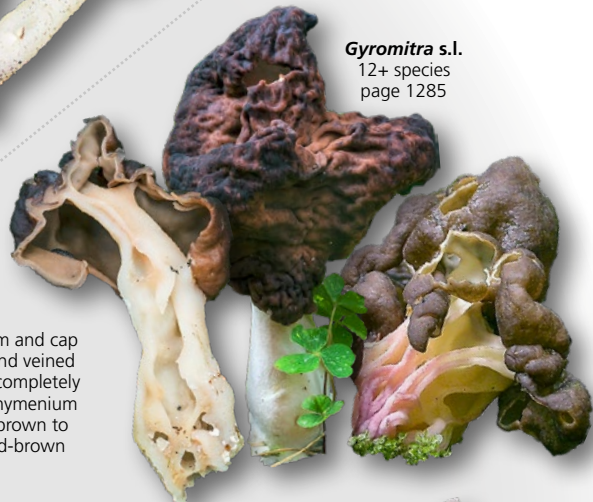
FURTHER READING: 101, 180, 266, 301 328.



Morchella
20+ species
page 1281



Verpa
2 species
page 1284



Gyromitra s.l.
12+ species
page 1285



Helvella s.l.
35+ species
page 1288

Micro-drawings:
spores and asci.

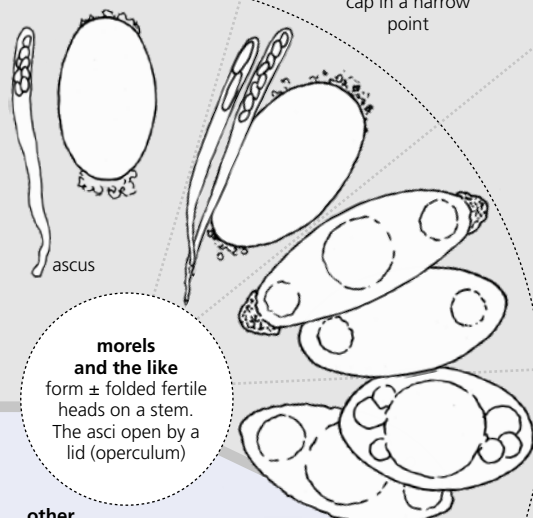
Approximate
species number
applies to
temperate
Europe.

with one large
cavity that unites
stem and fertile
part

cavity only formed
in the stem that
is attached to the
cap in a narrow
point

both stem and cap
folded and veined
and not completely
hollow; hymenium
yellow-brown to
dark red-brown

stem grooved or
plane; hymenium
± veined/folded,
white to dark
grey-brown



**morels
and the like**
form ± folded fertile
heads on a stem.
The asci open by a
lid (operculum)

**other
similar fungi**

small; asci
inoperculate

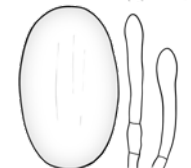
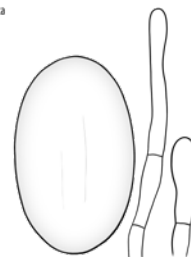
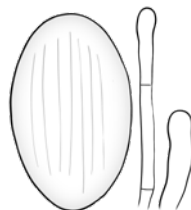
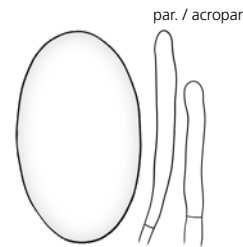
earthtongues and others
page 1350

Key to groups of morel-like fungi

1. Stem and top forming one continuous cavity **key A - *Morchella***
Top not forming a continuous cavity with the stem 2
2. Spores without large, internal drops but often with small drops outside the ends; fruitbodies a stem fused to the central underside of a hanging, bell-shaped cap **key B - *Verpa***
Spores with large, internal drops and without small drops outside the ends (but possible with apical ornaments); fruitbodies sessile og stipitate with a cup-shaped, saddle-shaped or irregularly folded top 3
3. Fruitbodies sessile og stipitate with a cup-shaped to irregularly folded top; spores often with two drops near the ends, rarer with one central drop **key C - *Gyromitra* s.l.**
Fruitbodies sessile og stipitate with a cup-shaped, saddle-shaped or irregularly folded top; spores often with one large, central drop surrounded by two or more smaller drops **key D - *Helvella* s.l.**

Key A – *Morchella*

1. The vertical main ridges of the top are split in two (somewhat like the gill edge of *Schizophyllum*). Fruitbodies up to 150 mm high, slender; hymenium first ± vinaceous grey, then clay pink, clay buff to fawn; ridges orange brown when bruised; spores (21-) 23-25 x (13-) 14-16 µm, Q-av. ≈ 1.6; asci up to 350 µm long; paraphyses with somewhat fusiform tips; acroparaphyses (sterile cells at the ridges) cylindrical to clavate; with deciduous and coniferous trees; southern ***Morchella tridentina* (Mel-2)**
Vertical ridges not split in two 2
2. Pattern at mature fruitbodies dominated by open, 4-6-edged pits or dense, almost labyrinthine folds; ridges becoming ± orange brown to brownish orange (■ ■ ■) when bruised; acroparaphyses (sterile cells at the ridges) at maturity embedded in brownish orange (■ ■ ■) goo 3
3. Pattern at mature fruitbodies dominated by oblong, longitudinal crests and open pits; ridges becoming rather dark grey brown (■ ■ ■); acroparaphyses; ascoparaphyses at maturity imbedded in dark brown (■ ■ ■) goo 7
3. Top at mature fruitbodies with compressed, almost labyrinthine folds (pits); known from dry grassland, especially after fire. Fruitbody up to 120 x 90 mm, but often smaller; spores smooth to finely longitudinally striate in cotton blue, 18-24 (29) x (10-) 11.5-14 (-16.5) µm; Q 1.5-1.8; asci 300-370 µm long; paraphyses with clavate tips; spring to early summer, eastern Europe ***Morchella steppicola* (Mes-1)**
Top with open, 4-6-edged pits; with deciduous shrubs and trees 4
4. Smell weak; hymenium buff to cinnamon buff (☉ ■ ■ ■); pits of ± equal size; top-stem transition without a furrow [*Morchella esculenta* s.l.] 5
Smell strong; hymenium at mature fruitbodies mostly rather dark grey brown (☉ ■ ■ ■ ■ ■), rarely paler; pits of very varying size; top-stem transition often with a small furrow [*Morchella vulgaris* s.l.] 6
5. Spores on average more than 21.5 µm long; with various deciduous trees. Fruitbody to 220 mm high; spores smooth to very finely longitudinally striate in cotton blue, (19-) 21-24 (-26) x (12-) 13-15 (-16) µm, Q-av. ≈ 1.65; asci 250-300 µm long; paraphyses ± cylindrical; with deciduous trees, spring; widespread and rather common ***Morchella esculenta* (Mes-8)**
Spores on average less than 21.5 µ long; mostly with *Populus* and *Fraxinus*. Fruitbody to 220 mm high; spores smooth to very finely longitudinally striate in cotton blue (17-) 18-22 (-24) x 11-13 (-15) µm, Q-av. ≈ 1.55; asci 225-325 mm long; paraphyses tips cylindrical to clavate is known; known from Germany, France and Spain, spring; probably rare and possibly introduced from North America ***Morchella americana* (Mes-4)**



par. / acropar.



6. In deciduous forest. Fruitbodies up to 150 mm high; spores smooth or very finely longitudinally striate in cotton blue, 20-23 x 12-14.5 µm, Q-av. ≈ 1.59; asci 300-350 µm long; paraphyses with clavate tips; with deciduous trees, spring; probably widespread *Morchella vulgaris* (Mes-17 s.l.)
 In sand dunes. Fruitbodies up to 80 (-120) mm high; spores smooth or finely longitudinally striate in cotton blue, 19-21 x 13-14 µm, Q-av. ≈ 1.56; asci 300-410 µm; paraphyses with cylindrical to clavate tips; spring; CY, DK, ES, TR *Morchella dumensis* (Mes-17)



7. Top less than one third of the full height of the fruitbody; the tops lower margin remarkably free (incision to ¼ or ⅓ of the total height of the top); tops of the paraphyses clavate to almost capitate. Fruitbodies up to 200 mm high; hymenium pinkish buff, fawn to dark grey brown; spores smooth, 21-28 x 12-16 µm; asci 70-310 µm long; paraphyses with slightly clavate tips; with deciduous trees, spring; widespread and rather common *Morchella semilibera* (Mel-3)



Top more than one third of the full height of the fruitbody; margin only slightly free; tops of the paraphyses cylindrical to clavate 8

8. On 1-3 years old burned places 9
 Not on recently burned places 11

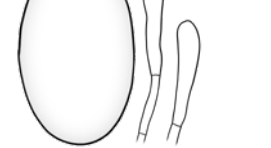
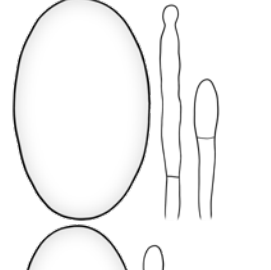
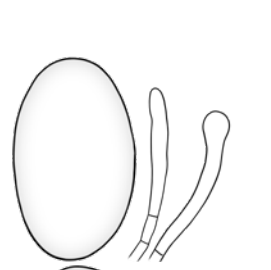
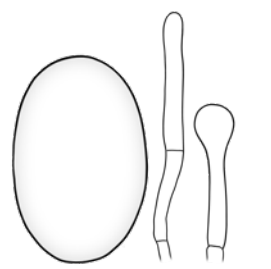
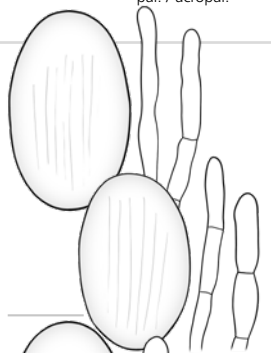
9. Acroparaphyses (sterile cells at the ridges) strongly capitate. Fruitbody 60-110 mm high; hymenium first buff to olivaceous buff, rarely almost glaucous, later dark orange brown; spores smooth, shape variable, but mostly ellipsoid, 18-25 (-27) x 12-17 (-19) µm; asci 175-320 µm long; paraphyses cylindrical or with somewhat clavate tips; spring or rarely late summer, CY, N, S, TR *Morchella exuberans* (Mel-9)
 Acroparaphyses cylindrical, fusiform to subcapitate 10

10. Hymenium of mature fruitbodies rather dark brown (☞ ■■■■■); transverse ribs of the top (mature specimens) remarkably parallel (ladder-like) see *Morchella importuna*, cp. xxx
 Hymenium of mature fruitbodies caly pink, clay buff to cinnamon (☞ ■■■■■); transverse ribs of the top more irregular. Fruitbody up to 110 mm high; spores smooth, 20-23 (-24) x 13-15 µm; asci 240-310 µm long; paraphyses with cylindrical to slightly clavate tips; acroparaphyses (sterile cells at the ridges) clavate; under recently burned *Pinus* spp., spring; widespread in southern Europe *Morchella eximia* (Mel-7)

11. Fruitbody up to 45 x 10 mm large; spores on average about 26 x 16 µm. Top with rather distant ridges, fawn to grey brown, ridges and possibly also hymenium downy; spores smooth to extremely finely striate in cotton blue, (22-) 24-28 (-31) x 15-18 µm; asci 300-340 µm long; paraphyses often moniliform and with small, capitate tips; acroparaphyses (sterile cells at the ridges) ± fusiform; with deciduous trees; southern, rare
 *Morchella pulchella* (Mel-31)
 Fruitbody mostly larger; spores smaller 12



12. On woodchips. Fruitbody up to 200 mm high; hymenium first pale mouse grey, later dark brown; spores smooth, 18-24 x 10-13 (-14) µm; asci 220-300 µm long; paraphyses with cylindrical to clavate tips; acroparaphyses (sterile cells at the ridges) clavate; on woodchips and burned ground, often in towns and gardens, spring; widespread
 *Morchella importuna* (*M. elata* ss. Clowez) (Mel-10)¹
 Not on woodchips 13

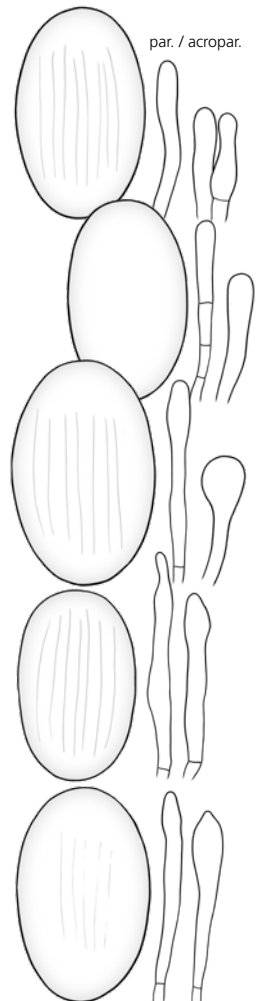


13. Acroparaphyses (sterile cells at the ridges) tips cylindrical to ± clavate 14
 Acroparaphyses tips ± fusiform to capitate 15

14. Hymenium ± downy; spore-Q-av. ≈ 1.55. Fruitbody up to 100 mm high; hymenium fawn to dark orange brown (☞ ■■■■■); spores smooth to finely longitudinally striate in cotton blue, shape quite variable, (18.5-) 20-27 x (10-) 12-17 µm; asci 200-300 µm long; paraphyses with clavate tips; on disturbed soil, often with coniferous trees, late spring; widespread *Morchella norvegiensis* (Mel-19)
 Hymenium smooth (?); spore-Q-av. ≈ 2. Fruitbody up to 90 mm high; hymenium clay pink, fawn to vinaceous grey (☞ ■■■■■); spores smooth or extremely finely wrinkled-striate in cotton blue, (19-) 21-24 (-25) x 10-13 µm, Q-av. ≈ 1.56; asci 280-310 µm; paraphyses with ± clavate tips; on disturbed soil with deciduous and coniferous trees, spring; northern *Morchella eximioides* (Mel-16)

15. Acroparaphyses tips ± capitate. Fruitbody up to 150 mm high; hymenium vinaceous to vinaceous grey (☞ ■■■■■); spores smooth to finely longitudinally striate in cotton blue, (21-) 23-27 (-30) x 13-16 (-17) µm; asci 280-310 µm long; paraphyses with clavate tips; with coniferous and deciduous trees, often in gardens, spring; widespread *Morchella purpurascens* (Mel-20)
 Acroparaphyses tips ± fusiform 16

16. Fruitbody up to 60 mm high; spores 12-14 µm wide. Hymenium fawn to orange brown; spores smooth to finely longitudinally striate in cotton blue, 21-25 x 12-14 µm; asci 280-370 µm long; paraphyses somewhat moniliform; with coniferous trees, spring; probably widespread
 *Morchella conifericola* (Mel-32)
 Fruitbody up to 150 mm high; spores 14-17 mm wide. Hymenium clay pink, fawn to dark grey brown; spores smooth or very finely wrinkled-striate in cotton blue, (21-) 22-26 x (13.5-) 14-17 (-18) µm, Q-av. 1.56; asci 250-450 µm long; with coniferous trees, early spring; probably widespread and rather common
 *Morchella deliciosa* (Mel-26)



1. *Morchella oweri*, described from China, where it is cultivated, is very similar, but probably has less regular transverse ribs. It probably has been introduced to Europe, where it grown on woodchips.

Key B – *Verpa*

1. Hymenium planar (not folded); ascus 8-spored; spores 21-25 x 11-15 µm. Fruitbody up to 130 x 30 mm (but often smaller); hymenium cinnamon to cinnamon-buff; stem whitish; asci to 350 µm long; paraphyses with somewhat clavate tips; on calcareous soil among deciduous shrubs and in grassland, spring; widespread but rare . . . *Verpa conica*
Hymenium folded into wrinkles; asci 2-spored; spores 55-87 x 17-20 µm. Fruitbody up to 150 x 40 mm; hymenium dull orange brown to curry-yellow; stem whitish; asci up to 350 µm long; paraphyses ± cylindrical; on calcareous soil among deciduous shrubs, spring; south-eastern, rare . . . *Verpa bohemica*



Key D - *Gyromitra* s.l.

The key contains only stipitate species. For the cup-shaped species, see page xxx.

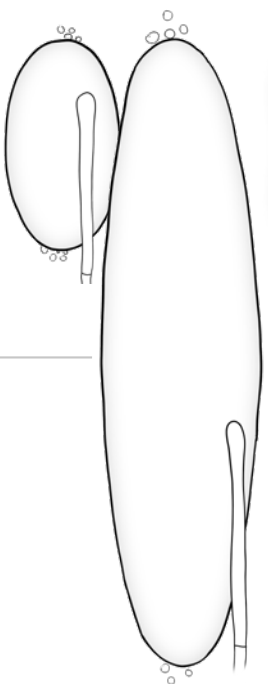
Spores measured from dry material (†), when nothing else is mentioned. Note that it may be difficult to find mature spores – try always to obtain a pore deposit.

Spring species:

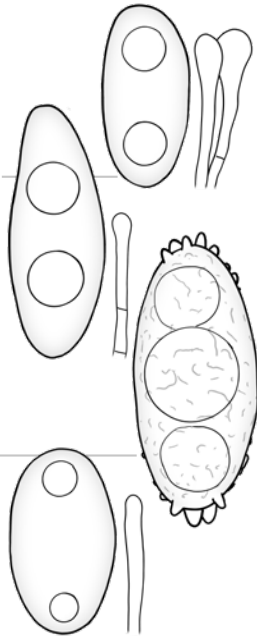
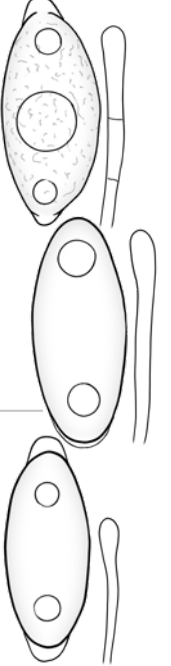
Discina gigas, *Discina grandis*, *Gyromitra esculenta*, *Gyromitra splendida*, *Pseudoverpa anthracobia*.

1. Stem with pinkish (☞ ) shades; spores spherical. Fruitbody up to 180 mm high; hymenium reddish brown to fawn; stem cream above; spores smooth, 8-12 µm; asci 100-320 µm long; paraphyses with clavate tips; on coniferous and deciduous wood, summer; continental, very rare . . . *Pseudorhizina korshinskii*?
Stem white, cream to brownish (☞ ) ; spores ellipsoidal to fusiform . . . 2
2. Top with two to three pointed tips . . . 3
Top with rounded, brainlike folds . . . 5
3. Spores 20-23 µm long. Fruitbody up to 180 x 140 mm; hymenium orange brown, red brown to dark vinaceous brown; stem whitish to brown; spores smooth, 20-23 x 7.5-10 µm; asci 200-260 µm long; paraphyses with clavate to capitate tips; on deciduous wood, autumn; widespread, rather common . . . *Paragyromitra infula*
Spores on average more than 23 µm long . . . 4
4. On soil and debris near *Pinus*; spores 7.5-12 µm wide. Like *Peregryromitra infula*, but hymenium with more vinaceous brown colours; spores smooth, 22-33 (-37) x 7.5-12 µm; asci 210-280 µm long; paraphyses with somewhat clavate tips; summer-autumn; mostly northern, rare . . . *Paragyromitra ambigua*
On wood in deciduous forests; spores 12-14 µm wide. Fruitbody up to 270 x 180 mm; hymenium red brown; stem whitish to cream; spores finely reticulate in cotton blue, 26.5-36.5 x 12-14 µm; spring-early summer; continental, rare . . . *Discina grandis*
5. Stem cylindrical; hymenium hairy; asci 150-270 µm long; on burned ground. Fruitbody 10-40 (-60) x 10-30 mm; hymenium yellowish brown to dark reddish brown; stem finely tomentose, white to cream; spores smooth with two drops (16-) 18-21 (-22) x (9-) 10-11.5 (-12) µm; paraphyses cylindrical to slightly clavate at the tips; spring; very rare . . . *Pseudoverpa anthracobia*
Stem compressed or furrowed; hymenium smooth; asci more than 270 µm long; not on burned ground . . . 6

2. If this and the North American species *Pseudorhizina sphaerospora* are conspecific, the latter name has priority.



6. Spores finely reticulate, with no drops but with apical appendages; typically in association with rotten wood of conifers. Fruitbodies up to 140 x 130 mm; hymenium orange brown to reddish brown; stem relatively thick, white to cream; spores finely reticulate in cotton blue 23-32 x 10-15 µm; asci 290-330 µm; paraphyses clavate at the tips; spring; widespread . . . *Discina gigas*³
Spores smooth, with two drops and without apical appendages; on soil and woodchips near *Pinus* . . . 7
7. Spores ellipsoidal. Fruitbodies typically 2-3-times higher than wide; hymenium orange brown, reddish brown to dark reddish brown; stem white to cream; spores 20-27 x 9.5-12.5 µm; asci 330-350 µm long; paraphyses ± cylindrical; on the ground, associated with *Pinus*, spring; widespread . . . *Gyromitra esculenta*
Spores fusiform with a loosening perispore at the ends. Fruitbodies strikingly slender, up to 120 x 70 mm; hymenium ± brown; stem 50-80 x 15-25 mm, buff to pale brown; spores 23-28 x 11.5-13.5 µm; asci ca. 280 µm long; paraphyses ± cylindrical; on the ground, associated with *Pinus*, spring; northern, rare . . . *Gyromitra splendida*



3. *Discina ticiniana*, known from southern Europe should have more narrow spores (smooth, w24-28 x 8-10 µm), but intermediates are reported. It prefers deciduous forest.

Key D - *Helvella* s.l.

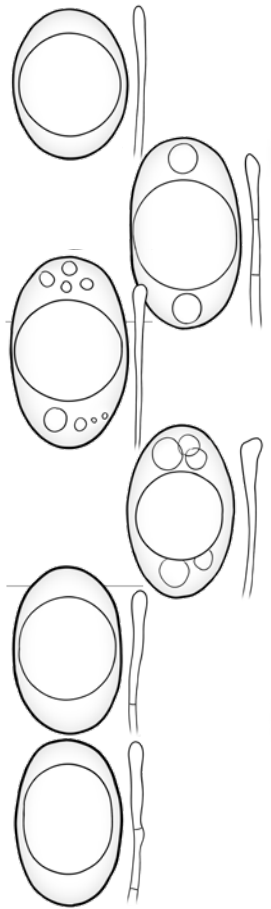
The key contains species with morcheloid and cup-shaped, ± stipitate fruitbodies.

Spores measured from dry material (+), when nothing else is mentioned.

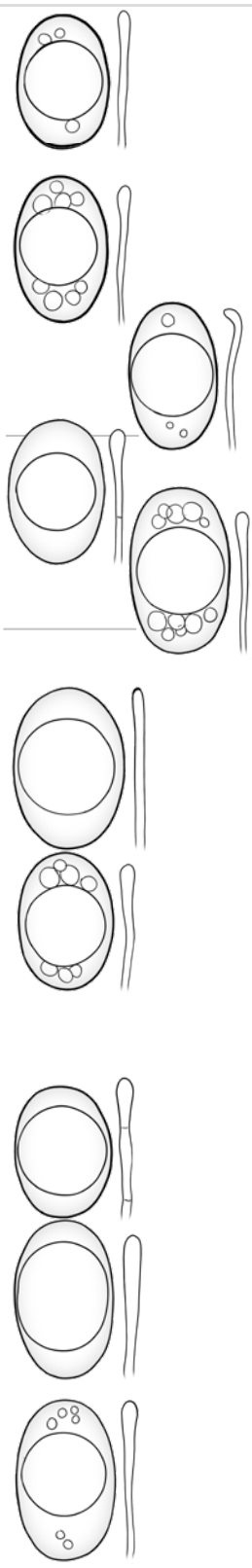
Temperate spring species (at low altitudes):

- Dissingia confusa* – cupulate
- Dissingia leucomelaena* – cupulate
- Helvella acetabulum* – cupulate
- Helvella fusca* – saddle-shaped with ribbet stem
- Helvella monarchella* – saddle-shaped with ribbet stem
- Helvella queletiana* – saddle-shaped with ribbet stem

1. Stem or base veined to intricately ribbed 2
Stem not veined, but often compressed or with a few longitudinal ribs 22
2. Top cup-shaped 3
Top saddle-shaped to irregularly folded 11
3. Fruiting from spring to middle of June (later at high altitudes – *Morchella*-season) 4
Fruiting from summer to autumn 6
4. With broadleaved trees; short stipitate; hymenium yellowish brown to cinnamon (☞☞☞☞☞); asci with croziers. Fruitbody 15-70 mm wide; outside downy, pale yellowish brown to pale cinnamon; stem whitish; spores 15.5-19 x 10.5-11.5 µm *Helvella acetabulum*
With conifers; sessil to short stipitate; hymenium ± greyish brown (☞☞☞☞☞); asci without croziers 5
5. With *Pinus*; with a reduced stem; hymenium dark grey brown (☞☞☞☞☞); spores 10.5-13 µm wide. Fruitbody 15-70 (-100) mm wide; outside downy, pale grey brown, whitish below; spores 19.5-24 x 10.5-13 µm *Dissingia leucomelaena*
With *Picea*; with an obvious stem; hymenium grey brown to fawn (☞☞☞☞☞); spores 12-15 µm wide. Fruitbody 10-40 mm wide; outside downy, pale grey brown, whitish below; spores 19-24 x 12-15 µm *Dissingia confusa*
6. Ribs almost only at the stem 7
Ribs extending far up the underside of the top 9
7. Hymenium dark brown (☞☞☞☞☞); stem white to cream (☞☞☞☞☞). Fruitbody 20-60 (-80) mm wide; outside downy, pale grey to olivaceous buff; stem downy; spores 18-22 x 11.5-13 µm *Helvella solitaria*
Hymenium ± black (☞☞☞☞☞); stem grey to black (☞☞☞☞☞) 8
8. Outside and margin almost smooth; mostly arctic-alpine; probably not associated with *Salix*. Fruitbody 10-30 mm wide, sometimes almost saddle-shaped; outside grey to black; stem dark grey, paler below; spores 17-21 x 10-12.5 µm *Helvella philonotis*
Outside and especially margin with black or pale warts; both alpine and lowland; associated with *Salix* see *Helvella corium*, cp. 24xx
9. Spores 17.5- 21 µm long; asci without croziers. Fruitbody 15-50 mm wide, outside almost smooth, ± dull yellowish brown; stem paler; spores 17.5-21 x 10.5-13 µm *Dissingia oblongispora*
Spores 14-17.5 µm long; asci with croziers [*Helvella costifera* s.l.] 10
10. Hymenium ± brown (☞☞☞☞☞); margin often paler. Fruitbody 20-75 mm wide; outside delicately downy, pale greyish brown with whitish veins; stem downy, whitish below; spores 14.5-17.5 x 9.5-12 µm *Helvella calycina*
Hymenium ± grey to brownish grey (☞☞☞☞☞); margin concolor-



- ous (?). Fruitbody 15-40 mm wide; outside delicately downy, pale grey to olivaceous buff with whitish veins; stem downy, whitish below; spores 14-16.5 x 10.5-13.5 µm *Helvella costifera*
11. Hymenium white to pale brown (☞☞☞☞☞) [*Helvella crispa* s.l.] 12
Hymenium brown, grey to blackish (☞☞☞☞☞) 15
12. Stem and head pinkish buff to olivaceous buff (☞☞☞☞☞). Top 30-70 mm wide, outside and stem finely downy; spores 16-19 x 10-12 µm *Helvella leucophaea*
Stem and/or head paler (☞☞☞☞☞) 13
13. Top with the margin partially fused to the stem. Top 6-20 mm wide, outside almost smooth; hymenium white to greyish cream; spores 15-18 x 10-13 µm *Helvella pallescens*
Margin totally free of the stem 14
14. Outside almost smooth; stipe 15-30 mm long; asci 240-260 µm long. Top 15-30 mm wide; hymenium white to cream; stem white; spores 15.5-17 x 10-12 µm *Helvella lactea*
Outside pubescent; stipe 30-120 (-200) mm long; asci 270-320 µm long. Top 15-60 mm wide; hymenium white to cream; spores 18-21.5 x 11-12.5 µm *Helvella crispa*
15. Top arched, with age possibly somewhat; outside of top strongly veined 16
Top saddle-shaped, then 2-3-4-lobed to brain-like folded; outside veined or not 17
16. Fruiting from spring to early summer (June); spores 17-19 µm long. Top 20-30 mm wide, outside delicately downy; hymenium greyish to brownish; stem pale mouse grey; spores 17-19 x 11-13.5 µm; with deciduous trees (e.g. *Fagus*) *Helvella queletiana*
Fruiting from summer to autumn; spores 15-16 µm long. Top 5-15 mm wide; hymenium dark grey; stem pale grey; spores 15-16 x 9-10 µm *Helvella phlebophora*
17. Hymenium ± brown (☞☞☞☞☞); stem white, cream to pinkish buff (☞☞☞☞☞); fruiting from spring to middle of June; with *Populus*. Top 15-40 mm wide, outside almost smooth to delicately downy; spores 17.5-21 x 11-13 µm *Helvella fusca*
Hymenium grey to black (☞☞☞☞☞); stem ± grey, but paler than the hymenium; from summer to autumn; with various trees [*Helvella lacunosa* s.l.] 18
18. Spores on average up to 16.5 long. Top 10-40 mm wide, outside almost smooth; hymenium pale to dark mouse grey or almost black; stem almost smooth, pale mouse grey; spores 14-17 x 10.5-13 µm *Helvella sulcata*
Spores on average more than 16.5 µm long 19
19. In bogs. Top 10-45 mm wide, margin sometimes partially fused to the stem, outside almost smooth; hymenium dark grey; stem relatively thin compared to the top, paler grey; spores 16.5-19 x 10-12.5 µm; mostly subalpine *Helvella palustris*
Ecology different 20
20. With a dark mouse grey to black (☞☞☞☞☞) hymenium and a conspicuously paler (☞☞☞☞☞) stem; margin at mature specimens often bend away from the stem. Top 30-60 mm wide, often fused to the stem at several points, outside almost smooth; spores 17-19 x 9-11.5 µm; with coniferous and deciduous trees, *Dryas* and arctic herbs; mostly boreal to arctic-alpine *Helvella lacunosa*
Hymenium and stem more uniformly grey to black (☞☞☞☞☞); margin mostly bend towards the stem 21



21. Hymenium and stem ± uniformly grey (☞); paraphyses somewhat bend at the top. Top 20-60 mm wide, outside dark mouse grey, almost smooth; hymenium dark mouse grey; stem almost smooth, ± mouse grey; spores 16.5-19 × 10.5-12 µm *Helvella nigra*
 Hymenium and stem ± black (☞); paraphyses not bend at the top. Top 5-15 mm wide, outside downy, mouse grey; hymenium mouse grey; stem downy, mouse grey; spores 15.5-18.5 × 10-12.5 µm *Helvella atra* ss. Skrede
22. Top cup-shaped to flat 23
 Top ± saddle-shaped to irregularly folded 28
23. Spores 50-60 × 10-15 µm, fusiform; top up to 10 mm wide. Hymenium dark vinaceous brown; outside paler, hairy to felted; spores smooth (in SEM finely warty), living spores multi-guttulate with one large guttule at each end, dead spores with one large guttule; often along river banks *Pindara terrestris*
 Spores smaller, ± elliptical; top mostly wider 24
24. Hymenium black (☞); outside and especially margin with black or pale warts. Top 10-50 mm wide; hymenium ± black; outside and stem drak mouse grey to black, often with some ribs near the base; spores 18-22 × 11-13 µm; both alpine and lowland; associated with *Salix*
*Helvella corium*⁴
 Hymenium grey to brownish (☞); outside and margin without warts 25
25. Spores on average up to 20 µm long µm long; outside downy to moderately hairy 26
 Spores on average more than 20 µm long; outside downy to distinctly hairy 27
26. Hymenium ± olivaceous buff to almost curry-yellow (☞). Top 20-35 mm wide, outside delicately downy; stem downy, brownish; spores 17-21 × 10-11.8 µm; with conifers and deciduous trees, often in roadsides *Helvella pubescens*
 Hymenium greyish brown to mouse grey (☞). Top 10-25 mm wide, outside downy, greyish brown to mouse grey; stem downy, pores 17-21 µm long, ellipsoid, almost smooth. Spores 17-21 × 9-12.5 µm *Helvella fibrosa*
27. Spores up to 20-27 µm long, ± fusiform and often with fine warts (best seen in Cotton Blue); outside very hairy; hymenium ± grey, greyish brown to dark greyish brown (☞). Top 20-30 mm wide; hymenium; stem greyish, paler below; spores 20-27 × 9-12 µm; with deciduous trees, often in roadsides and on rotten wood
Helvella macropus
 Spores up to 22 µm long, ellipsoid, smooth; outside downy; hymenium ± cinnamon (☞). Top 5-20 mm wide, outside downy; stem clay buff to whitish, downy; spores 20.5-22 × 12-14.5 µm *Helvella hypocrateriformis*⁵
28. Fruiting from spring to middle of June (later at high altitudes – *Morchella*-season). Top 10-35 mm wide, margin bend away from the stem, outside almost smooth; hymenium very dark brown; stem whitish; spores 20.5-24 × 12.5-15 µm *Helvella monachella*
 Fruiting from summer to autumn 29
29. Hymenium very dark (☞) 30
 Hymenium whitish, pinkish buff, olivaceous buff to medium grey (☞) 32
30. Outside of the top hairy to warty; margin bend away from the stem; spores 14.5-16.5 × 8.5-9.5 µm. Top 5-25 mm wide, margin bend away from the stem; hymenium dark brown to ± black; stem hairy, whitish, brown to grey, paler below *Helvella pezizoides*
 Outside of the top almost smooth; margin mostly bend towards from the stem; spores larger 31
31. Hymenium dark grey to black (☞); stem hairy; spores on average less than 11 µm wide. Top 10-20 mm wide, outside almost smooth; stem hairy, ± grey; spores 17-19 × 10-11 µm
Helvella fallax (= *Helvella atra* ss. van Voren & Dissing)
 Hymenium dark grey (☞); stem downy; spores on average more than 11 µm wide. Top 5-15 mm wide, outside somewhat downy; stem grey, sometimes with a whitish base; spores 17.5-19 × 10.5-12 µm
Helvella pulla
32. Outside of top hairy to warty. Top 5-20 mm wide, outside downy to hairy; hymenium olivaceous buff, grey to grey brown; stem cream to ± olivaceous buff; spores 19-21.5 × 10.5-12.5 µm *Helvella sublicia*
 Outside almost smooth to finely downy 33
33. The margin of the top fused with the stem in several points 34
 Margin free of the stem 35
34. Underside of top almost smooth; hymenium clay-buff to cinnamon (5-7D4-8). Spores 19-22 × 10.5-12 µm *Helvella elastica*
 Underside of top finely downy; hymenium slightly darker. Spores 19-24 × 11.5-13.5 µm *Helvella panormitana*
35. Hymenium whitish, pinkish buff to olivaceous buff (☞) 36
 Hymenium darker brown to grey (☞)
 [*Helvella bicolor* s.l.] 37
36. Top 6-10 (-15) mm wide, outside warty; spore Q-av. 1.5-1.6. Hymenium white to cream; stem warty, whitish; spores 16-22 × 11-14 µm
Helvella corbierei
 Top 15-30 mm wide, outside almost smooth; spore Q-av. 1.3-1.5. Hymenium whitish, pinkish buff to olivaceous buff; stem almost smooth, whitish; spores 18-21 × 12-18 µm *Helvella levis*
37. Paraphyses wider towards the tips 38
 Paraphyses cylindrical 39
38. Paraphyses widest just below the tips; asci 300-340 µm long; stem 15-35 mm long. Top 12-30 mm wide; hymenium honey-yellow; stem whitish to pinkish buff, almost smooth; spores 19.5-22.5 × 12-13 µm
Helvella danica
 Paraphyses widest at the tips (clubshaped); asci 260-300 µm long; stem often more than 35 mm long. Top 5-15 mm wide, outside almost smooth; hymenium clay buff to dark cinnamon; stem almost smooth, whitish to cream; spores 19-22 × 11-13.5 µm *Helvella bicolor*
39. Spores 18-20 × 11.5-12.5 µm; asci 270-300 mm long. Top 5-15 mm wide, margin free, outside delicately downy; hymenium dull orange brown; stem pinkish buff, downy *Helvella carnosa*
 Spores 19-21.5 × 12-13.5 µm; asci 300-320 µm long Top 5-10 mm wide, outside delicately downy; hymenium ± dull orange brown; stem pinkish buff *Helvella fistulosa*

4. A number of similar species with tops 5-20 mm wide are found in arctic/alpine climate zones. *Helvella alpina* has a longer stipe. *Helvella namfeldtii* has a pale stipe base and a downy, not warty margin. *Helvella alpestris* and *H. macrosperma* are small with short, black stipes.

5. The very similar *Helvella scyphoides*, described from a single Norwegian specimen, is maybe a bit more grey-brown.