

Flammulaster Earle

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Flocculina P.D. Orton

Fr. mycenoid to collybioid. Cap 2-60 mm, conical to convex, later plane, felty to scaly, granulose or mealy, often appendiculate, dry, hygrophanous or not, translucently striate or not, whitish, yellowish, pale ochraceous, buff or ± brown. Gills adnexed, adnate, emarginate or short decurrent, whitish to brownish or rust brown. Stem 7-60 x 0.2-7 mm, cylindrical, dry, fibrillose, finely scaly or granulose in lower part. Veil sometimes forming a fugacious ring zone. Smell and taste indistinct. Sp deposit pale cream or brown.

Sp ellipsoid, phaseoliform, dacryoid, ± rhomboid, fusiform or amygdaloid, smooth, thin- or thick-walled, without or with a small germ pore, hyaline to brown, dextrinoid or without iodine reactions. Cheilocystidia cylindrical, clavate, capitate or lageniform. Pleurocystidia absent. Pileipellis a paraderm or a conioderm. Clamps present.

Saprotrophic on wood, organic litter and soil.

11 species in Nordic countries.

Note: Molecular results show no clear limits towards *Phaeomarasmius* (Petersen et al. in press).

Lit.: Ludwig 2001, Orton 1984, Vellinga 1986, Watling 1967.

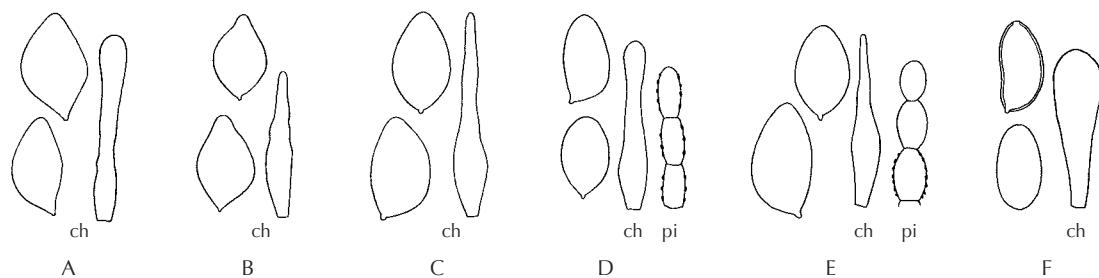


Fig. 779. Spores, cheilocystidia and pileipellis elements: A: *Flammulaster subincarnatus*, B: *F. rhombosporus*, C: *F. carpophilus*, D: *F. ferrugineus*, E: *F. granulosus*, F: *F. muricatus*.

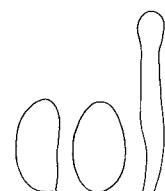


Fig. 781. Spores and cheilocystidia: *Flammulaster limulatus*.

1. Sp deposit pale cream; sp thin-walled	2
- Sp deposit brown; sp slightly to distinctly thick-walled	5
2. On naked, rich soil in forests; sp 5-7 x 2.5-4 µm. Cap 2-5 mm, hemispherical to convex, slightly granulose to hairy under lens, dark orange brown at centre, paler towards margin; gills medium spaced to distant, cream to pale orange brown; stem 8-13 x 0.2-0.5 mm, cylindrical, with short, appressed hairs, cream at top, orange brown in lower part. Sp amygdaloid to ellipsoid or slightly phaseoliform, thin-walled; cheilocystidia 25-35 x 3-10 µm, cylindrical to narrowly lageniform. Summer to autumn; very rare or overlooked in temp.; DK (DD), SE (NE). - ◎.	
<i>F. speireoides</i> (Romagn.) Watling	
- On plant debris; sp > 7 µm long	3

3. Cheilocystidia cylindrical to lageniform or clavate, sometimes capitate, apex on av $> 4 \mu\text{m}$ broad (fig. 779A). Cap 3-10 mm, hemispherical to low convex, minutely granulose, translucently striate, pale cream with pinkish-ochraceous centre; gills distant, concolorous with the cap; stem 8-20 x 0.5-1 mm, cylindrical or slightly broadened at base, concolorous with cap or paler, slightly whitish flocculose in lower part. Sp 7-10 x 4.5-5.5 μm , amygdaloid to fusiform, thin-walled, often collapsed; cheilocystidia 30-45 x 4-8 μm . On many kinds of plant debris, e.g. *Salix* leaves, *Fagus* fruits, cupules and leaves, grass leaves, etc.; summer to autumn; very common in temp.-hemib., occasional in bore., in FI north to PeP; DK (LC), FI (LC), NO (NE, Østf: Hvaler, Rygge), SE (LC). – FAD 124F, F1, Lud 25.11, ◎.

F. subincarnatus (Joss. & Kühner) Watling (*F. carpophilus* (Fr.) Earle var. *subincarnatus* (Joss. & Kühner) Vellinga)

Note: *Tubaria pallidospora* J.E. Lange described from wood chips is similar and possibly identical.

- Cheilocystidia lageniform, apex on av $< 4 \mu\text{m}$ broad 4

4. Sp \pm rhomboid with a pronouncedly papilla-like apex (fig. 779B). Cap 4-12 mm, conical to convex, granulose, whitish to pale ochraceous; gills medium spaced, ochraceous; stem 5-25 x 0.5-2 mm, slightly widened at base, fibrillose to granulose, concolorous with cap. Sp 7-9.5 x 4-5.5 μm , thin-walled; cheilocystidia 35-50 x 3.5-6 μm , lageniform, with a 1-4 μm broad apex. On deciduous twigs and leaves, etc. in damp habitats, less often on leaves of grasses or *Carex*; spring to autumn; occasional in temp.-bore., in FI with a northern distribution, north to Ks; DK (LC), FI (LC), NO (NE), SE (LC). – Lud 25.9.

F. rhombosporus (G.F. Atk.) Watling (*F. carpophilus* (Fr.) Earle var. *rhombosporus* (G.F. Atk.) Vellinga)

- Sp amygdaloid to ovoid, without a pronouncedly papilla-like apex (fig. 779C). Cap 3-20 mm, hemispherical to convex, later plane, granulose, cream to pale ochraceous, sometimes with a dirty pink or brownish tinge; gills medium spaced to distant, pale brown; stem 5-20 x 0.5-2.5 mm, cylindrical with slightly widened base, slightly granulose, cream. Sp 7-10 x 4.5-6 μm , thin-walled; cheilocystidia 30-60 x 5-10 μm , lageniform with a 2-3.5 μm broad apex. On leaves of *Salix*, *Fagus*, *Quercus*, etc., very common on leaves of *Salix repens* in coastal dunes in temp.; summer to late autumn; occasional in temp.-suba.; DK (LC), FI (LC), IS (Au), NO (NE), SE (LC). – B&K 4:405, GBW 4:348, Lud 25.8, R&H 463, Ves 383, ◎.

F. carpophilus (Fr.) Earle (incl. *F. carpophiloides* (Kühner) Watling)

5. On soil, rarely on woody debris; sp without a germ pore 6

- On dead wood, including sawdust; sp with or without a germ pore 8

6. Sp ellipsoid, not narrowed towards apiculus, distinctly thick-walled. Cap 6-9 mm, low convex to plane, with or without a low umbo, dark reddish brown, with a paler, finely scaly covering; gills distant, rust brown; stem 11-20 x 0.5-2 mm, \pm cylindrical, fibrillose, dark reddish brown. Sp 7-9(-10) x (4-)4.5-5(-5.5) μm ; cheilocystidia 30-45 x 5-12 μm , \pm cylindrical to lageniform or subclavate. On soil in deciduous forests, parks and gardens; autumn; very rare in temp.-suba.; NO (NE), SE (NE, Sk).

F. gracilis (Quél.) Watling

- Sp \pm narrowed towards apiculus, slightly thick-walled 7

7. Cap striate in outer part; sp 6-8 x 4-5 μm (fig. 779D); pileipellis with permanent chains of elongate cells. Cap 5-15 mm, low conical to bell-shaped, later convex with or without a broad umbo, finely granulose at centre, rust brown to reddish brown; gills medium spaced to distant, rust brown; stem 7-20 x 0.5-3.5 mm, cylindrical or with a clavate base, pale at top, flocculose and reddish brown below ring zone. Sp ellipsoid to amygdaloid, slightly thick-walled; cheilocystidia 25-35 x 5-8 μm , narrowly clavate, sometimes lageniform. On naked soil in forests, rarely on dead wood; summer to late autumn; occasional in temp.-arc./alp.; DK (LC), FI (DD, EH), FO, NO (NE, STr: Dovre), SE (LC). – C&D 1232, FAD 124E, GBW 4:350, Lud 25.5.

F. ferrugineus (Maire) Watling

- Cap not striate; sp 8-10 x 4.5-5.5 μm (fig. 779E); pileipellis of \pm globose to pyriform elements, released as spherocysts. Cap 5-15 mm, conical to bell-shaped, later convex with a

broad umbo, finely granulose, rust brown to dark ochraceous brown; gills medium spaced to distant, brownish, often with an orange tinge; stem 10-40 x 1-3 mm, \pm cylindrical, finely flocculose to scaly, concolorous with cap with paler top. Sp ellipsoid to amygdaloid, slightly thick-walled; cheilocystidia 25-75 x 5-6 μm , narrowly lageniform. On naked, rich soil in forests and parks, e.g. under *Petasites*; spring to late autumn or even in mild winters; occasional in temp., rare in hemib.-suba., only two records from NO (NE, M&R: Smøla, Nord: Narvik); DK (LC), FO, NO, SE (LC). – B&K 4:407, FAD 124C, Lud 25.1, M&J 3, Phil 230a, .

F. granulosus (J.E. Lange) Watling

8. Sp dextrinoid; cheilocystidia often strongly inflated, up to 16 μm broad in lower part. Cap 6-10 mm, convex to low convex, flocculose-granulose, ochraceous brown, paler in outer part; gills distant, dark purplish brown; stem 9-14 x 0.8-1 mm, cylindrical, pale reddish brown with a cream to ochraceous, fibrillose-flocculose covering. Sp 8.5-10.5 x 5-5.5 μm , ovoid, thick-walled; cheilocystidia 25-45 μm long, with a 4-8 μm broad apex, lageniform to utriform, often non-pedunculate. On deciduous wood; autumn; very rare in middle bore.; NO (NE, Troms: Alta).

F. wieslandri (Fr.) M.M. Moser

- Sp without iodine reactions; cheilocystidia not or only moderately inflated in lower part 9

9. Cap and stem below ring zone with 0.1-1 mm long, slender, conical, crowded warts; cap margin with appendiculate, triangular, 1-2 mm long veil-scales when fresh; pileipellis scales of globose to broadly ellipsoid elements. Cap 5-30 mm, hemispherical to convex, rusty brown; gills medium spaced, at first yellowish, becoming rusty brown; stem 20-50 x 1.5-5 mm, cylindrical or with a clavate base, above the ring zone finely flocculose, yellowish, below ring zone buff to rusty brown. Sp 7-8 x 4-5 μm , ellipsoid to amygdaloid, not or slightly phaseoliform, thick-walled (fig. 779F), with germ pore; cheilocystidia 36-60 x 6-13 μm , clavate with distinctly swollen apex; pileipellis with rather rounded elements. On rotten wood of deciduous trees, especially *Fagus*, also on sawdust; summer to autumn; rare, but locally occasional in temp.-bore., in FI north to InL; DK (EN), FI (DD), NO (NE, Østf: Fredrikstad, Hord: Bergen), SE (NE). – Cet 1436, Lud 25.6, M&J 3, Svp 42:39, .

F. muricatus (Fr.: Fr.) Watling

- Cap and stem below ring zone flocculose, hairy or scaly; cap margin appendiculate or not; pileipellis scales of \pm cylindrical elements 10

10. Sp amygdaloid with an acute apex and a distinct germ pore. Cap 10-35 mm, convex to low convex, with appendiculate margin, fulvous to orange sienna; gills medium spaced to crowded, straw-coloured, becoming fulvous cinnamon; stem 20-55 x 1.5-4 mm, \pm cylindrical, saffron to pale ochre with straw-coloured top. Sp 7.5-8.5(-10) x 4-5 μm , thick-walled; cheilocystidia 25-35 x 8-14 μm , mostly clavate. On deciduous wood; late summer to autumn; very rare in temp.; DK (LC, Sj: Suserup Skov), SE.

F. nova-silvensis P.D. Orton

- Sp with rounded apex and an indistinct germ pore (fig. 781A). Cap 8-40(-60) mm, convex to expanded, sometimes with a small umbo, granulose, slightly hygrophanous, rusty tawny or orange rusty, becoming cinnamon fulvous or ochraceous buff when dry; gills medium spaced to crowded, ochraceous yellow, becoming brown; stem 20-60 x 2-6 mm, \pm cylindrical, rusty tawny with yellowish top. Sp 7-9(-10) x 4-4.5(-5) μm , distinctly phaseoliform in side view, slightly thick-walled; cheilocystidia 20-57 x 6-16(-20) μm , clavate without abruptly swollen apex. On sawdust, logs and stumps; autumn; occasional in hemib.-suba., rare in temp.; DK (EN), FI (LC), FO, NO (LC), SE (LC). – BCat 269, Lud 25.2, R&H 463, Sieniop 228.

F. limulatus (Fr.) Watling var. *limulatus* (*F. limulatoides* P.D. Orton)

var. *lituus* Vellinga differs in sp amygdaloid, not or only slightly phaseoliform in side view, 6.5-8.5(-9) x 4-4.5(-5) μm , with or without an indistinct germ pore; cheilocystidia 28-52 x 5-8 μm , variable, some clavate, but rarely with abruptly swollen apex. On sawdust or wood of deciduous trees or conifers; summer; very rare in temp.; SE.