

Emericellopsis terricola J.F.H. Beyma, Antonie van Leeuwenhoek Ned. Tijdschr. Hyg. 6: 263. 1940.
ANAMORPH: *Acremonium*.

Ascomata 30–125(–300) μm diam, non-ostiolate, wall 6–15 μm thick. Asci 14–16 μm long. Ascospores ellipsoid, pale brown, 4.5–6.5 \times 2.5–4 μm , surrounded by 4–6 longitudinal, subhyaline wings, finely spinulose. Anamorph *Acremonium*, with phialides 30–45 μm long, tapering from 1.5–2.5 μm at the base to 1–1.5 μm at the apex. Conidia narrowly ellipsoid, 5.5–8.5 \times 2–2.5 μm , about the same length as but narrower than the ascospores, hyaline. Description modified from Domsch *et al.* (1980).

HABITAT.— Isolated from forest- and cultivated soils, fresh and estuarine water, sputum, slime fluxes, bean and potato rhizosphere, mycorrhizae, bee provisions, and air.

DISTRIBUTION.— Worldwide.

EX-TYPE CULTURE.— NETHERLANDS. Isolated from soil, F.H. van Beyma, CBS 120.40, not examined.

ILLUSTRATIONS.— Domsch *et al.* (1980, Fig. 113); Gams (1971, Fig. 9 d, e).

HALONECTRIA E.B.G. Jones, Trans. Brit. Mycol. Soc. 48: 287. 1965.

Type: *H. milfordensis* E.B.G. Jones.

Ascomata partly or totally immersed in the substratum, solitary or gregarious, ascomata orange, globose, each with an elongate neck emerging from the substratum, fleshy. Asci clavate, deliquescing at maturity, 8-spored. Ascospores fusiform, non-septate, thin-walled, hyaline, smooth. Anamorph unknown. On intertidal wood.

NOTES.— Jones (1965) described this unispecific genus as being similar to *Nectria* but differentiated by the immersed perithecia with long necks. Kohlmeyer & Kohlmeyer (1968, 1979) provided a description and illustrations of *H. milfordensis* noting its occurrence on intertidal wood from northern regions of both the Atlantic and Pacific Oceans. They considered the genus to be a member of the *Hypocreaceae* similar to *Trailia* stating, however, that '*Halonectria* has many characters in common with members of the family *Halosphaeriaceae* von Arx & E. Müll.', from which it was excluded due to the lack of appendaged ascospores. In a recent classification of filamentous marine ascomycetes, Kohlmeyer (1986) retained *Halonectria* as one of the four marine hypocrealean genera. The immersed ascomata with long necks and the elongate, aseptate ascospores of *H. milfordensis* are unlike most

hypocrealean fungi. However, the wall surface anatomy and negative reaction in KOH indicate that it could be hypocrealean and, at present, is best included in the *Bionectriaceae*.

Halonectria milfordensis E.B.G. Jones, Trans. Brit. Mycol. Soc. 48: 287. 1965.

Ascomata immersed, solitary, scattered, orange, becoming dark orange with age, KOH–, yellow in lactic acid, globose to subglobose, 130–250 μm tall \times 105–180 μm diam, each with an elongate, orange neck 108–252 μm \times 30–54 μm ; in immature ascomata, necks filled with elongate, hyaline, thin-walled cells. Cells of wall surface forming a *textura angularis*, thin-walled. Asci clavate, deliquescing at maturity, 21.5–28.5 \times 4–6.5 μm , 8-spored. Ascospores fusiform, slightly curved, 16.5–29 \times 2–3.5 μm , non-septate, hyaline, smooth-walled. Associated anamorph with pycnidia partly immersed or superficial, solitary or gregarious, reddish brown, obpyriform or cylindrical, coriaceous, 140–170 \times 45–55 μm ; conidia filiform, non-septate, hyaline.

HABITAT.— On intertidal wood.

DISTRIBUTION.— Temperate regions of the Atlantic and Pacific Oceans.

HOLOTYPE.— GREAT BRITAIN. South Wales: Pembrokeshire, Dale Fort Field Centre, on blocks of Scots pine, 19 Apr 1961, E.B.G. Jones (IMI 86722). This specimen consists of thin slices of wood without bark. A few ascomata lying near the surface were examined but the specimen is in poor condition.

ILLUSTRATIONS.— Jones (1965, Fig. 1), Kohlmeyer & Kohlmeyer (1968, Figs. 1–8).

NOTES.— This description is based primarily on the original publication and Kohlmeyer & Kohlmeyer (1979).

HELEOCOCCUM C.A. Jørg., Bot. Tidsskr. 37: 417. 1922.

Type: *H. aurantiacum* C.A. Jørg.

Ascomata superficial, white, pale pink, pale orange, pale brown to greyish or bright yellow. KOH–, globose, surface of loosely interwoven hyphae, wall pseudoparenchymatous, non-ostiolate, disintegrating at maturity. Asci subglobose, globose to broadly clavate or cylindrical, irregularly arranged. Ascospores ovoid to ellipsoid, 1-septate, slightly constricted or not, hyaline to pale yellow, smooth, slightly roughened, irregularly striate, or having irregular wing-like ridges, with or without an irregular gelatinous sheath. Anamorph, where known, *Acremonium*- or *Trichothecium*-like. Isolated from soil or water submerged in seawater.

NOTES.— *Heleococcum* is a cleistothecial fungus that has been placed in the *Eurotiales* as well as the *Hypocreales*. Although characteristics of *Heleococcum* such as the cleistothecial ascomata, lack of a nectrioid centrum, and deliquescent asci are not typical, the fleshy, bright-colored ascomata, one-septate, hyaline ascospores, and *Acremonium*- or *Trichothecium*-like anamorphs suggest that *Heleococcum* does belong in the *Hypocreales*. Tubaki (1967) presented a thorough review of the genus, speculating on the relationship of *Heleococcum* with the *Eurotiales* or *Hypocreales* and suggested that the genus represents a link between these two orders. Using 28S rDNA sequence data, Rehner & Samuels (1995) demonstrated that *Heleococcum japonense* is hypocrealean and grouped with *Roumegueriella rufula*, another cleistothecial member of the *Bionectriaceae*.

Heleococcum aurantiacum C.A. Jørg., Bot. Tidsskr. 37: 417, 1922. — Plate 5, a–b.

Ascomata solitary, scattered, superficial, pale orange, KOH-, globose, 210–275 μm diam, non-ostiolate, ascumatal wall pseudoparenchymatous, breaking down to release the asci. Asci subglobose to globose, 37.5–45 \times 30 μm , irregularly arranged, 8-spored. Ascospores ellipsoid, 23.5–27 \times 9–10.5 μm , 1-septate, hyaline to pale yellow, walls 1.5 μm thick, smooth with irregular gelatinous sheath on outer wall, loosening in KOH.

HABITAT.— On moist soil associated with algae or mushroom compost.

DISTRIBUTION.— England and Denmark.

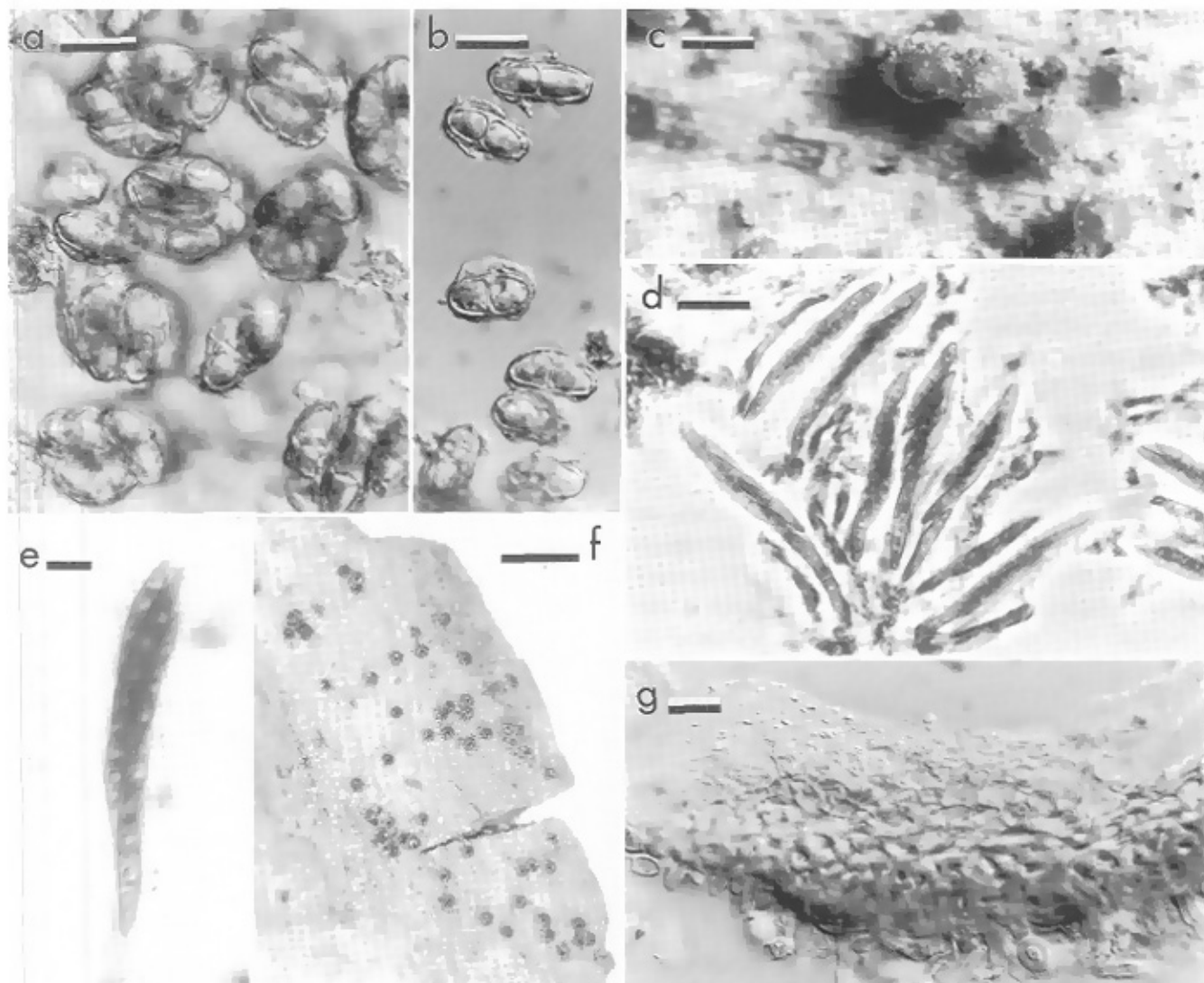


Plate 5. a–b. *Heleococcum aurantiacum*. a. Asci with ascospores. b. Ascospores. c–e. *Ijuhya chilensis*. c. Ascumata. d–e. Asci with striate ascospores. f, g. *Lasionectria mantuana*. f. Ascumata on natural substratum. g. Median section of ascumatal wall. a, b. Holotype – C. c–e. Holotype of *Lepidonectria chilensis* – LPS. f, g. Holotype – PAD. Scale bars: a, b = 20 μm ; c = 250 μm ; d = 25 μm ; e = 10 μm ; f = 1 mm; g = 100 μm .

KEY TO THE SPECIES OF *HELEOCOCCUM*modified from Udagawa *et al.* (1995)

1. Ascospores 22.5–25.5 × 9–10.5 μm, pale yellow, not constricted at the septum, with an irregular gelatinous sheath; anamorph unknown; on moist soil; known from England and Denmark *H. aurantiacum*
1. Ascospores less than 22 μm long, hyaline; anamorph *Acremonium*-like or *Trichothecium*-like; isolated from soil or wood immersed in sea water; known from Indonesia, Japan, or the Philippines 2
2. Ascospores 18–21 × 10–13 μm, smooth or slightly roughened; anamorph *Trichothecium*-like; isolated from wood immersed in sea water; known from Japan *H. japonense* Tubaki
2. Ascospores less than 18 μm long; anamorph *Acremonium*-like; isolated from soil; known from Indonesia or the Philippines 3
3. Ascospores 10–11 × 5–6 μm, slightly verrucose to striate, surrounded by a sheath; known from the Philippines *H. inapertum* Udagawa *et al.*
3. Ascospores 6–8 × 3–3.5 μm, slightly verrucose, with 2–3 longitudinal, wing-like ridges; known from Indonesia *H. alatosporum* Udagawa *et al.*

HOLOTYPE.— DENMARK. Botanical Garden of the University of Copenhagen, in the moor, on moist soil, Autumn 1921, L. Kolderup Rosenvinge (C; NY, slides of holotype). Culture CBS 201.35

ILLUSTRATIONS.— Dennis (1978, Pl. 44J); Jørgensen (1922, Figs. 1–2); Tubaki (1967, Pl. 2E–F).

NOTES.— The holotype specimen and slides of *Heleococcum aurantiacum* were examined, on which the few remaining ascomata were broken, apparently disintegrating, revealing globose asci and loose ascospores in the centrum. The above description is based on this fragmentary type specimen, the original description, and the description and illustrations based on the type specimen by Tubaki (1967).

A second species, *Heleococcum japonense*, was described by Tubaki (1967) that occurs on submerged wood in a marine habitat and produces a *Trichothecium*-like anamorph (culture CBS 397.67). Two additional species of *Heleococcum* both having *Acremonium*-like anamorphs have been described recently by Udagawa *et al.* (1995) who included a key to the four species of *Heleococcum*.

HYDROSPHAERA Dumort., *Comment. bot.* p. 90, 1822.

Type: *H. peziza* (Tode : Fr.) Dumort. (= *Sphaeria peziza* Tode : Fr.).

= *Nectria* subgenus *Hyphonectria* Sacc., *Syll. Fung.* 2: 501, 1883.

= *Hyphonectria* (Sacc.) Petch, *J. Bot.* 75: 220, 1937. — Lectotype, designated by Samuels (1976a): *Nectria peziza* (Tode : Fr.) Fr. (= *Sphaeria peziza* Tode : Fr.), recognized as *Hydropisphaera peziza* (Tode : Fr.) Dumort.

= *Neuronectria* Munk, *Dansk Bot. Ark.* 17 (1): 56, 1957. — Type: *N. peziza* (Tode : Fr.) Munk (= *Sphaeria peziza* Tode : Fr.), recognized as *H. peziza*.

= *Neohenningsia* Koord., *Verh. Kon. Ned. Akad. Wetensch. Afd. Natuurk., Sect. 2*, 13: 164, 1907. — Type: *N. stellatula* Koord. (= *Nectria stellatula* (Koord.) Höhn., a synonym of *H. rufofusca*).

= *Perrotiella* Naumov, *Bull. Soc. Oural. Amis Sci. Nat.* p. 26, 1916. — Type: *P. uralensis* Naumov, a synonym of *H. peziza*.

Ascomata superficial, non-stromatic, pale yellow, orange or umber, KOH –, globose to subglobose or doliform, usually collapsed and deeply cupulate, smooth or with fasciculate hairs. Ascomatal wall generally over 25 μm thick, of two regions: outer region of thin-walled, globose cells. Asci clavate. Ascospores ellipsoid, 1- to multiseptate, hyaline, generally finely to coarsely striate, rarely smooth or spinulose. Anamorph, where known, *Acremonium*-like. On dead herbaceous or woody monocotyledonous or dicotyledonous substrata.

NOTES.— Within the *Nectria*-like fungi of the *Hypocreales*, *Hydropisphaera* is unique in ascomatal wall structure in which the wall is relatively thick, generally over 25 μm, and up to 100 μm thick in *H. pachyderma*, and is composed of large, thin-walled, globose cells often over 15 μm diam. This ascomatal wall structure results in a characteristic deeply cupulate collapse of the ascumata upon drying (Booth, 1959; Rossman, 1983; Samuels, 1976b). The ascospores of *Hydropisphaera* are one- to multiseptate, often finely to coarsely striate although also spinulose or smooth. The anamorphs have been placed in *Acremonium* or, if the conidia are septate, in *Cephalosporiopsis*, always having simple conidiophores and relatively long, tapering, phialidic conidiogenous cells. Species of *Hydropisphaera* often occur as saprobes on decaying monocotyledonous plants and ferns, although there are many exceptions in-