

ARACHNOCREA Z. Moravec, Bull. Trimestriel Soc. Mycol. France 72: 161. 1956.

Type: *A. stipata* (Fuckel) Z. Moravec (= *Hypocrea stipata* Fuckel).

Ascomata immersed in a loose subiculum with only papillae visible, individual ascomata remaining discrete within the subiculum, easily separated from it; ascumatal wall of a single, 20–30 µm thick region; papilla of small, rectangular cells that merge with periphyses, cells at the exterior of the papilla circular in outline. Ascumatal surface of *textura epidermoidea*. Asci cylindrical, with more or less thickened apex, sessile or stalked. Ascospores fusiform, equally 1-septate, disarticulating into two conical, monomorphic part-ascospores, hyaline, smooth to slightly spinulose. Anamorph, where known, *Verticillium*-like. On decaying wood, herbaceous substrata or polypores.

NOTES.— *Arachnocrea* was established as a segregate of *Hypomyces* and *Hypocrea* for species having fusiform ascospores that disarticulate into part-ascospores at maturity. *Arachnocrea* has characteristics of *Hypomyces*, i.e. ascomata immersed in a subiculum and fusiform ascospores, and *Hypocrea*, i.e. disarticulating ascospores. *Arachnocrea* is distinguished from *Hypomyces* by its disarticulating ascospores. Although ascospores in some species of *Hypomyces* disarticulate at the septum, they do so after being discharged from the asci. Further, ascomata of these species of *Hypomyces* are superficial on a parchment-like subiculum that is easily separated from the host, which is always a basidiomycete and often a member of the *Ganodermataceae*. Although *Arachnocrea* is macroscopically similar to *Protocrea* in having ascomata immersed in a loose subiculum, *Protocrea* has inequally septate ascospores that disarticulate into dimorphic part-ascospores. Two species are included in *Arachnocrea*.

Arachnocrea stipata (Fuckel) Z. Moravec, Bull. Trimestriel Soc. Mycol. France 72: 162. 1956. — Plate 4, e (see page 25); Plate 16, a–c.

= *Hypocrea stipata* Fuckel, Jahrb. Nassauischen Vereins Naturk. 25–26: 311. 1871 [as '(Lib.) Fuckel'].

[= *Sphaeria stipata* Lib., Plantae Cryptog. Ardenn. p. 343. 1837, non Schweinitz 1832.]

= *Protocrea stipata* (Fuckel) Petch, J. Bot. 75: 219. 1937.

= *Hypocrea papyracea* Ellis & Holw., J. Mycol. 2: 66. 1886.

= *Hypomyces papyraceus* (Ellis & Holw.) Seaver, Mycologia 2: 80. 1910.

= *Arachnocrea papyracea* (Ellis & Holw.) E. Müll., Beitr. Kryptogamenfl. Schweiz, 11(2): 801. 1962.

= *Hypomyces arachnoideus* Schroeter, in Cohn, Krypt.-Fl. Schlesien 3, Bd. 2: 268. 1908.

Anamorph: *Verticillium*-like.

Ascomata immersed in a loose, cottony subiculum, caespitose, papillae emergent, aggregated ascomata forming in an effused area with sterile white mycelium at the margin; hyphae 5–10 µm wide, constricted at the septa, smooth or warted, branched, anastomosing. Ascomata easily separated from the subiculum, subglobose or globose to pyriform, 190–265 µm high × 145–185 µm diam, white to yellow-orange, KOH–, papillate, with an acute apex about 50 µm high, collapsing vertically. Ascumatal wall 15–20 µm thick, of a single region, cells fusiform to ellipsoid, 15–25 × ca 7 µm, thin-walled. Papilla of small, rectangular cells that merge with the periphyses, at the exterior cells circular, 10–15 µm diam, thin-walled. Asci cylindrical, sometimes with a long stalk, 90–110(–125) × 4–6 µm, apex simple, ascospores uniseriate. Ascospores fusiform with acute ends, 1-septate, disarticulating into two conical, monomorphic, distinctly apiculate part-ascospores, (4.5–)5–6(–7) × (1.5–)2–2.5(–3) µm, hyaline, smooth.

HABITAT.— On old polypores, also reported on decaying wood with no obvious fruiting bodies.

DISTRIBUTION.— Europe, reported from Belgium, Czech Republic, Denmark, Estonia (Pöldmaa, 1999), France, Germany, Poland, Slovakia, Ukraine, and United Kingdom, and North America.

TYPE.— GERMANY. Ad *Fagi* folia corticesque putridos, rarissime, in forest below Mappen. Aut., Fuckel. Fungi Rhenani Exs. 2358 (BPI, in bound copy, lectotype of *Hypocrea stipata*, designated herein); UNITED STATES. Ohio: A.P. Morgan 920 (NY, holotype of *Hypocrea papyracea*).

SPECIMENS EXAMINED.— CANADA. Ontario, Queen's University Biological Station, Lake Opinicon, southwest of Chaffey Locks, on *Fomes* sp., 28 Sep 1958, C.T. Rogerson (NY). FRANCE. vic. Montluçon, Château Begouen, on decorticated, dicotyledonous wood, 12 Oct. 1986, Giles, comm. F. Candossau 4804, det. G.J. Samuels (BPI); GERMANY. Eifel, Gerolstein, on decaying wood, Oct. 1979, J. Daams, det. W. Gams (BPI); UNITED STATES. New York, Tompkins Co., McLean Lloyd Cornell Preserve, on underside of very rotted, decorticated branch, Sep 1995, R.P. Korf & T. Iturriaga (BPI 749248, CUP 63545); Ohio: Warren Co., Fort Ancient State Memorial, on *Phellinus* sp., Oct 1965, W.B. & V.G. Cooke 36373 (NY).

ILLUSTRATIONS.— Ellis & Ellis (1985, Fig. 275); Læssøe (1998); Moravec (1956, Fig. 1, 2); Malençon (1979, Figs. 4A, B, as *A. papyracea*); Seaver (1910a, Pl. 21, Fig. 15, as *Hypomyces papyraceus*).

NOTES.— The specimen at BPI issued as Libert, Pl. Crypt. Ardennes, no. 343 (BPI 631843) is not *A. stipata*.

Arachnocrea scabrada Doi, Bull. Natl. Sci. Mus. Tokyo 15: 653. 1972. — Plate 16, d–f.

Anamorph: None known.

Ascomata immersed in white mycelium with the papilla free, individual ascomata not evident, caespitose,

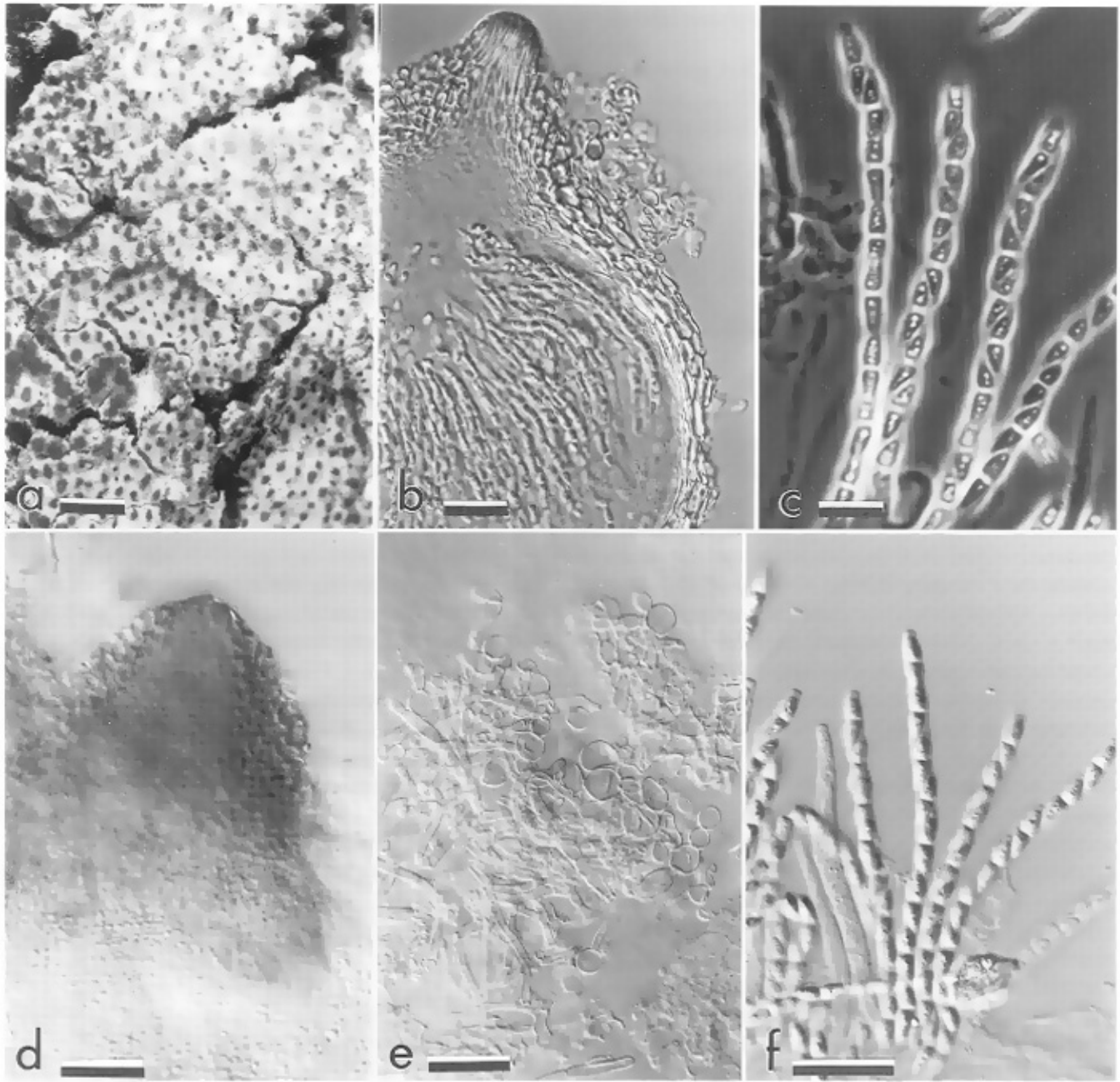


Plate 16. a–c. *Arachnocrea stipata*. a. Surface view of ascomata immersed in stroma. b. Median section of ascoma. c. Asci with disarticulating ascospores in phase contrast. d–f. *Arachnocrea scabrada*. d. Ascomatal apex. e. Cells of effused stroma. f. Asci with disarticulating ascospores. a–c. Lectotype Fuckel 2358 – BPI. d–f. Isotype – NY ex TNS–F–223292. Scale bars: a = 500 μ m; b, f = 25 μ m; c = 10 μ m; d, e = 50 μ m.

aggregated ascomata forming in an effused area, hyphae uniform in width or somewhat constricted at the septa, smooth-walled. Ascomata easily separated from the subiculum, subglobose to obpyriform, (200–)335–380 μ m high \times 200–260 μ m diam, papillate, white, pale yellow in KOH; papilla of small, rectangular cells that merge with periphyses, cells at the exterior circular, 7–20 μ m diam, with 1–2.5 μ m thick walls. Ascomatal wall ca 20 μ m thick, of a single region, cells fusiform to ellipsoid. Asci cylindrical, sessile, (80–)90–105 \times (3.5–)5.5–7.2 μ m, apex thickened and with a pore, ascospores uniseriate. Ascospores

fusiform with ends acute or subacute, one-septate, disarticulating into monomorphic part-ascospores, (5–)5.5–6.5(–7.5) \times (2.5–)3–4(–4.5) μ m, hyaline, slightly spinulose.

HABITAT.— On wood or herbaceous debris.

DISTRIBUTION.— Japan, New Zealand.

TYPE.— JAPAN. Chiba Pref., Kiyosumi Forestry Experimental Station of Tokyo University, [on bark of *Abies* sp.], 25 Jun. 1966, Y. Doi (TNS–D–106, holotype; NY ex TNS–F–223292, isotype).

ADDITIONAL SPECIMEN EXAMINED.— NEW ZEALAND: Auck-

KEY TO THE SPECIES OF *ARACHNOCREA*

1. Part-ascospores mostly 3–4 μm wide, ends acute or subacute, slightly spinulose *A. scabrida*
2. Part-ascospores mostly 2–2.5 μm wide, ends acute, smooth-walled *A. stipata*

land, Waitemata City, Waitakere Ranges, Marguerite Track, on *Rhopalostylis sapida*, 21 Mar. 1977, G. J. Samuels 77-25 (NY ex PDD 35883).

ILLUSTRATIONS.— Doi (1972, Fig. 3).

DIALHYPOCREA Speg., Bol. Acad. Nac. Ci. 23: 475, 1919.

Type: *D. puiggariana* Speg.

Stromata discrete, tuberculate with protruding perithecial apices, pseudoparenchymatous, yellow-orange, KOH–. Ascumata immersed below a narrow layer of pseudoparenchymatous stromal tissue, few to several produced within each stroma, individual ascumata retaining their integrity at least over the upper half; wall KOH–. Apical paraphyses persisting among the nearly mature asci. Asci cylindrical, apex with a ring. Ascospores one-septate, disarticulating early in the development at the septum, hyaline, spinulose. Anamorph unknown. On decaying branches.

NOTES.— This unispecific genus was established for a species having *Nectria*-like ascumata and one-septate ascospores that separate into part-ascospores as in *Hypocrea*. Weese (1927) placed *Dialonectria puiggariana* in *Neoskofitzia* Schulzer, a genus for which no type specimen exists. *Dialhypocrea* was considered a synonym of *Hypocrea* by Clements & Shear (1931) and Müller & von Arx (1962). Based on an examination of the type specimen, *Dialhypocrea* is accepted in the *Hypocreaceae*, distinguished from *Hypocrea* on the basis of stromal anatomy and perithecia that are nearly free from each other over a large part of their length. Just as Müller and von Arx (1962) were dubious about placing the species in *Hypocrea*, we are doubtful in retaining *Dialhypocrea*. At the very least, the species would be unusual in *Hypocrea* and there is no doubt about the close affinity of *D. puiggariana* with *Hypocrea*. Characters of asci and ascospores of *D. puiggariana* are typical of *Hypocrea*, and the substratum, i.e. rotten, decorticated wood, is also a feature that sets *Hypocrea* apart in the *Hypocreaceae*. If the anamorph of *D. puiggariana* were a *Trichoderma*, then this species should be placed in *Hypocrea*. However, until the anamorph is discovered or DNA sequences of *D. puiggariana* are analyzed, *Dialhypocrea* is retained as a genus distinct from *Hypocrea*.

Dialhypocrea puiggariana Speg., Bol. Acad. Nac. Ci. 23: 475, 1919. — Plate 17, a–d.

≡ *Neoskofitzia puiggariana* (Speg.) Weese, Mitt. Bot. Lab. TH Wien 4: 86, 1927.

≡ *Hypocrea puiggariana* (Speg.) E. Müll., in Müller & von Arx, Beitr. Kryptogamenfl. Schweiz 11(2): 645, 1962.

Anamorph: None known.

Stromata densely gregarious, tuberculate, 1 mm diam \times 0.5 mm high, each with 3–20 ascumata. Stromal surface layer ca 30 μm thick, of angular cells 5–15 μm diam with walls to 4 μm thick; cells of the stroma below the ascumata pseudoparenchymatous, tending to *textura epidermoidea* with ca 4 μm thick walls, not sharply distinguished from the surface region; surface region separated from the ascumata by a narrow layer of small, non-pigmented cells. Ascumata globose to subglobose, 260–310 μm high \times 170–200 μm diam, non-papillate, smooth, easily separating from the surrounding stromal tissue at the apex. Asci narrowly cylindrical, 55–87 \times 3.5–6.5 μm , 8-spored, apex with a ring; ascospores uniseriate. Part-ascospores dimorphic: distal part conical to subglobose, (3–)3.5–4.5(–5.5) \times 2.5–3 μm ; proximal part wedge-shaped to oblong, (3.5–)4–5(–6) \times 2–2.5(–3) μm , hyaline, spinulose.

HOLOTYPE.— BRAZIL, São Paulo, in the forest near Apiaty, on fragments of decaying branches, April, 1890, J. Puiggari 186 (LPS).

HYPOCREA Fr., Syst. Orb. Veg. 1: 104, 1825.

Type: *H. rufa* (Pers.: Fr.) Fr. (≡ *Sphaeria rufa* Pers.: Fr.).

≡ *Creopus* Link, Handbuch Erk. Gewächse 3: 349, 1833. — Type: *C. gelatinosus* (Tode: Fr.) Link (≡ *Sphaeria gelatinosa* Tode: Fr.), recognized as *Hypocrea gelatinosa* (Tode: Fr.) Fr.

≡ *Chromocrea* Seaver, Mycologia 2: 63, 1910. — Type: *C. gelatinosa* (Tode: Fr.) Seaver (≡ *Sphaeria gelatinosa* Tode: Fr.), recognized as *Hypocrea gelatinosa* (Tode: Fr.) Fr.

Stromata discrete to effused, pseudoparenchyma or highly compacted hyphae, with ascumatal elevations evident or not, stromatal surface variously wrinkled, creased or tuberculate, margins of stromata free from or adherent to the substratum, nearly hyaline, white, yellow, rufous, dark brown to nearly black; ascumata immersed in the stroma, ascumatal wall and stromal tissues KOH+ or KOH–. Asci cylindrical. Ascospores