



1-4, Conidiophores and conidia. $\times 1500$. 1,2 from DAOM 63869, on the host; 3,4 from DAOM 166980, on Czapek's solution agar.

Paecilomyces farinosus (Holm ex S.F. Gray) Brown & Smith, Trans. Brit. mycol. Soc. 40:50. 1957.
 ≡ *Corynoides farinosa* (Holm) ex S.F. Gray, Nat. Arrang. Brit. Pl., p. 654. 1821.

COLONIES with a moderate growth rate, 2.5-4 cm in diameter after 10 days, appearing powdery or granular with abundant sporulation, or with a loose overgrowth of white mycelium, white at first, later turning cream-colored or bright yellow, occasionally with conspicuous, phototropic, yellow synnemata. Reverse usually in bright yellow shades, occasionally with orange patches. Exudate absent, or produced as small, colorless droplets. Odor lacking. On the host producing a white or cream-colored mycelial felt enveloping the insect from which several, erect synnemata arise. SYNNEMATA 4-22 mm long, simple or sparingly branched, cream-colored or yellowish, more or less clavate, the head and most of the stalk fertile and powdery. MYCELIUM smooth-walled, hyaline, 1.3-2.5 μ m wide. CONIDIOPHORES, in culture, arising primarily from hyphae immersed in the substratum, cylindrical, 60-300 μ m long, 1.7-3.3 μ m wide, also arising as relatively short branches from the aerial mycelium; smooth-walled, hyaline, usually bearing a verticil of 3-7 slightly divergent branches immediately below the uppermost septum, frequently with additional branches in whorls at 1-3 lower levels, branches 5-14 μ m long, occasionally bearing secondary branches, or with phialides borne in whorls directly on the main axis of the conidiophore. Conidiophores and their branches terminating with a group of 1-6 adpressed or slightly

divergent phialides. PHIALIDES hyaline, $5.1-13.2 \times 1.8-3.2\mu\text{m}$, ellipsoidal in the lower part, tapering to a relatively short neck about $0.7\mu\text{m}$ wide. CONIDIA hyaline, smooth-walled, fusiform to ellipsoidal, $2.0-4.2 \times 1.5-2.5\mu\text{m}$ (ave. $2.9 \times 1.8\mu\text{m}$), usually forming short, tangled columns.

SUBSTRATE: Pathogenic on insects and isolated from soil and from rotting wood.

DISTRIBUTION: Quebec, Ontario, Alberta, British Columbia, Northwest Territories.

COLLECTIONS: N.W.T., Baffin Is., Frobisher Bay, cultured from tracks of *Mycobates* sp. (Acari), VII.1976, DAOM 160598 (V. Behan); Que., near Lacolle, isolated from the A-horizon of a maple-hickory forest soil, II.1977, DAOM 166980 (P. Widden LP35); Ont.: Algoma, isolated from rot in *Acer saccharum* Marsh., 5.III.1958, DAOM 61912 (T.H. 4406a); Fallowfield, on Lepidoptera pupa, 17.VI.1959, DAOM 63869 (W.B. Kendrick); Lake Timagami, Gomphidius Bay, on Lepidoptera pupa, 11.X.1936, DAOM 81730 (R.F. Cain 7553); Muskoka District, University of Toronto forest, on Lepidoptera pupa, 15.IX.1967, DAOM 136802 (D. Malloch); Ottawa, culture contaminant, I.1960, DAOM 144411 (M.E. Elliott); Ottawa, Rockcliff, on dead insect, 16.IX.1891, DAOM 38141 (J. Macoun); Alta., Kananaskis, Mt. Allen: isolated from the C-horizon of a brunisol at an alpine grassland site at 1900 m, 4.IX.1971, DAOM 170771 (J. Bissett JB933); isolated from the Ahj- and AC-horizons of a regosol at an alpine meadow site at 2530 m, 9.VII.1969 and 4.IX.1971, DAOM 170772, 170773 (JB771, 956); isolated from the AC-horizon of a regosol at an alpine summit ridge site under *Oxytropis podocarpa* L. at 2840 m, 4.VI.1971, DAOM 170774 (JB791); B.C., Victoria, isolated from canker on *Abies lasiocarpa* (Hook.) Nutt., 20.III.1953, DAOM 37983 (D.E. Wells).

NOTES: The colony description is from cultures on 2% malt-extract and potato-dextrose agars, grown at about 22°C (room temperature) in diffuse daylight.

Paecilomyces farinosus can be distinguished by its cream-colored or yellow colonies and small, fusiform conidia. The morphology of the conidiogenous structure is highly variable in culture. On the host, the conidiophore branches and phialides are more swollen and conidiophore branching is more complex than in pure culture. Numerous synonyms were listed by Samson (Stud. Mycol. 6:32-33. 1974).

In addition to the collections cited above, this species was also reported from sandy soil under a pure stand of *Pinus strobus* L. at St. Williams, Ontario; from podzol under *Pinus resinosa* Ait. at Petawawa, Ontario; from podzol under *Pinus contorta* Dougl. at Kananaskis, Alta. (P. Widden & D. Parkinson, Can. J. Botany 51:2275-2290. 1973), and from peat soil under *Thuja occidentalis* L. near Guelph, Ontario (G.C. Bhatt, Can. J. Botany 48:333-339. 1970).

Cultures from ascospores and endosclerotia of *Cordyceps memorabilis* Ces. have produced an anamorph indistinguishable from *Paecilomyces farinosus* (G. Pacioni & G. Frizzi, Can. J. Botany 56:391-394. 1978). *Spicaria longipes* Petch and *Spicaria pulvinata* Mains, both regarded as synonyms of *P. farinosus* by Samson (loc. cit.), have been associated on the natural substrate with *Torrubiella gonylepticida* (T. Petch, Trans. Brit. mycol. Soc. 21:34-67. 1938) and *T. pulvinata* (E.B. Mains, Mycologia 41:303-310. 1949) respectively. Cultural confirmation of these relationships is required to determine whether several morphologically similar species, or anamorphs of Clavicipitaceae, are included in the present treatment of *P. farinosus*.

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