

## Genera coelomycetarum. VII. *Cryptocline* Petrak

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The genus *Cryptocline* Petrak is redescribed. Fourteen species are accepted, of which 10 are illustrated. *Cryptocline nobile* (Sacc.) Arx and *C. proquinqua* (Bubák and Vleugel) Arx are excluded from the genus while *Rhabdogloeum hypophyllum* D. E. Ellis and Gill is transferred to it.

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L'auteur redécrit le genre *Cryptocline* Petrak. Il accepte 14 espèces dont 10 sont illustrées. *Cryptocline nobile* (Sacc.) Arx et *C. proquinqua* (Bubák et Vleugel) Arx sont exclus du genre alors que *Rhabdogloeum hypophyllum* D. E. Ellis et Gill est transféré au genre *Cryptocline*. [Traduit par le journal]

### Introduction

The generic name *Cryptocline* was established by Petrak (apud Sydow and Petrak 1924) to accommodate two melanconiaceous taxa occurring on leaves of *Abies concolor* in western North America. The two taxa were named *Cryptocline effusa* and *C. abietina*, and the following generic description was given: "Fruchtkörper subepidermal eingeswachsen, zerstreut, mehr oder weniger rundlich im Umriss, aus einer blass gelblichbraun gefärbten oder subhyalinen, kleinzelligen, gelatinös-fleischigen Basalschicht bestehend, bei der Reife die Epidermis deckelartig absprengeend. Konidien länglich, ellipsoidisch oder keulig, hyalin, 1-zellig, gerade, ziemlich gross, akrogen auf sehr dichtstehenden, verlängert stäbchenförmigen, sehr kräftigen, einfachen oder gabelästigen, meist zellig gegliederten Trägern wiederholt entstehend." The type species was not indicated but *C. effusa*, being the first described, is taken as such (von Arx 1957). Petrak considered the genus to be most closely related to *Cryptosporiopsis* Bubák and Kabát, and *Discosporiella* Petrak. He stated that it could be distinguished from the former by the lack of a typical basal stroma and from the latter by the very stout, septate conidiophores and by mode of conidium formation. The conidia in *C. abietina* were said to develop as bladder-like, more or less spherical, blown-out conidiophore apices, separated from the rest of the conidiophore by a distinct constriction.

Two additional species were added to the genus by Petrak. *Gloeosporium taxicola* Allescher was described as having the characteristics of *Cryptocline* and was transferred to it as *C.*

*taxicola* (Allesch.) Petrak (Petrak 1925). A fourth species, *C. andina* Petrak, was also described (Petrak 1950).

The genus remained relatively little known for several decades until von Arx (1957), as a result of extensive revisionary studies on the genus *Gloeosporium* Desm. and Mont., added nine further species to it. von Arx (1963) added one more species and Sutton (1971) added two. Morgan-Jones *et al.* (1972a) provided a brief description of the genus and illustrated the type species.

In the present study, material of all species, with the exception of *C. andina*, has been examined, and they have been found, except for *C. nobile* (Sacc.) Arx and *C. propinqua* (Bubák and Vleugel) Arx, to be congeneric.

Conidium ontogeny in the genus has been analyzed in detail by Morgan-Jones (1964, 1971a, 1971b) and Morgan-Jones *et al.* (1972b). We have concluded that the conidiogenous cells are phialides, although in some species, as a result of percurrent proliferations, successive collarettes resembling annellations can be seen.

An examination of *Rhabdogloeum hypophyllum* D. E. Ellis and Gill, which was described from leaves of *Pseudotsuga taxifolia* collected in New Mexico (Ellis and Gill 1945), has shown it to be misclassified in *Rhabdogloeum* Sydow. It possesses the characteristics of *Cryptocline* and is, accordingly, transferred to that genus in this paper.

### Taxonomic Part

*Cryptocline* Petrak, Ann. Mycol. 22: 402, 1924, emend Morgan-Jones.

Acervuli subcuticular, intraepidermal or sub-

epidermal, scattered or gregarious, with a basal stroma. Stroma made up of hyaline to pale brown, usually guttulate, isodiametric or somewhat elongated cells. Conidiophores phialidic, cylindrical, erect, closely packed, smooth-walled, with one or more terminal collarettes, frequently proliferating percurrently. Conidia subspherical to ellipsoidal, unicellular, hyaline or subhyaline to pale brown, smooth-walled, usually guttulate, obtuse at the apex, truncate at the base, and sometimes with a marginal frill. Microconidia,

when present, short-cylindrical or oval, hyaline, smooth-walled.

TYPE SPECIES: *C. effusa* Petrak.

(1) *Cryptocline abietina* Petrak, Ann. Mycol. 22: 403, 1924.

Fig. 1

Immersed mycelium composed of hyaline to very pale brown, septate, branched, smooth-walled hyphae, 3–4 microns ( $\mu$ ) wide, penetrating deeply into the mesophyll. Acervuli abundant, gregarious, mostly arranged in rows, round

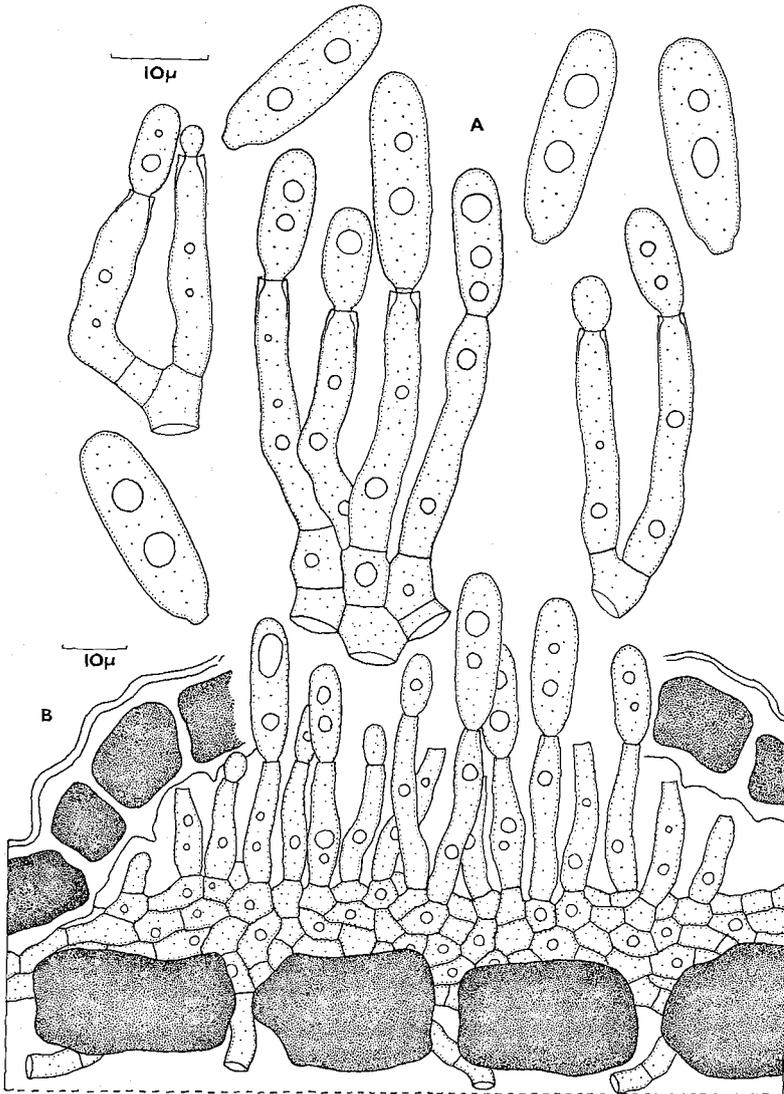


FIG. 1. *Cryptocline abietina*. A, Conidiophores and conidia; B, vertical section of acervulus; from type.

in outline, 200–300  $\mu$  in diameter, at first covered, later exposed by the rupture of the cuticle and epidermis. Stroma pseudoparenchymatous, immersed in the substratum, subepidermal, composed of isodiametric or slightly elongated, hyaline to subhyaline or very pale brown cells, 15–25  $\mu$  thick. Conidiophores phialidic, arising from the upper cells of the stroma, compactly arranged, straight or somewhat flexuous, elongate, cylindrical, hyaline, smooth-walled, guttulate, with a very small terminal collarette, very occasionally proliferating percurrently and possessing, as a result, two terminal collarettes, 20–40  $\times$  2.5–4.5  $\mu$ . Conidia formed in succession from phialides, ellipsoidal or narrowly obovate, unicellular, hyaline, smooth-walled, guttulate, obtuse at the apex and sharply attenuating to a truncate base, 18–25  $\times$  5–7  $\mu$ .

On living leaves of *Abies concolor*; North America.

COLLECTION EXAMINED: Holotype. Wasco Pine Mill, Friend, Wasco Co., Oregon, U.S.A. 21 IX 1921, J. S. Boyce, BPI.

(2) *Cryptocline betularum* (Ell. and Mart.) Arx, Verh. K. Ned. Akad. Wet., Afd. Natuurkd., Sect. II, 51: 63, 1957.

≡ *Gloeosporium betularum* Ell. and Mart., Am. Nat. 16: 1002, 1882.

≡ *Gloeosporidium betularum* (Ell. and Mart.) Petrak, Ann. Mycol. 21: 13, 1923.

Immersed mycelium composed of hyaline to very pale brown, septate, branched, smooth-walled, guttulate hyphae, 3–4  $\mu$  wide. Acervuli abundant, gregarious, occurring on distinct, light buff, leaf spots which have a determinate, darker margin, appearing as dark brown pustules, round in outline, 130–300  $\mu$  in diameter, epiphyllous, at first covered, later exposed by the rupture of the cuticle. Stroma pseudoparenchymatous, immersed in the substratum, subcuticular or partly intraepidermal, composed of isodiametric or somewhat elongated, hyaline to subhyaline or very pale brown cells, 10–15  $\mu$  thick. Conidiophores phialidic, arising from the upper cells of the stroma, compactly arranged, straight or slightly flexuous, cylindrical, hyaline, smooth-walled, proliferating several times percurrently, and possessing, as a result, a number of terminal collarettes, 10–16  $\times$  2–3.5  $\mu$ . Conidia formed in succession from phialides,

broadly ellipsoidal, unicellular, hyaline, smooth-walled, attenuating to a truncate base, 8–12  $\times$  5–7  $\mu$ .

On *Betula* spp.; North America.

COLLECTIONS EXAMINED: (1) Holotype. On *Betula lenta*, Bethlehem, Pa., U.S.A., X 1882, E. A. Rau, NY; (2) on *B. nigra*, Bethlehem, Pa., U.S.A., X 1882, E. A. Rau, NY; (3) on *B. nigra*, Cobden, Ill., U.S.A., 1 X 1882, F. S. Earle, NY; (4) on *B. nigra*, Nuttallburg, W. Va., U.S.A., XI 1894, L. W. Nuttall, Ell. and Everh. Fungi Columbiani 683, FH; (5) on *B. nigra*, Devils Lake, Wisc., U.S.A., 9 VIII 1913, J. J. Davis, E. Bartholomew Fungi Columbiani 4231, FH.

The conidiophores of *C. betularum* were described as annellides by Morgan-Jones (1971a). The further studies on conidium ontogeny in this genus (Morgan-Jones *et al.* 1972b) have convinced me, however, that there is no fundamental difference between conidiogenesis in this species and that in other species not showing percurrent apical proliferations.

(3) *Cryptocline ceanothi* (H. C. Greene) Arx, Verh. K. Ned. Akad. Wet., Afd. Natuurkd., Sect. II, 51: 70, 1957. Fig. 2

≡ *Gloeosporium ceanothi* H. C. Greene, Am. Midl. Nat. 48: 755, 1952.

Immersed mycelium composed of hyaline to very pale brown, septate, branched, smooth-walled, guttulate hyphae, 3–4  $\mu$  wide. Acervuli abundant, gregarious, occasionally confluent, on brown, dark-margined leaf spots, round in outline, 50–130  $\mu$  in diameter, amphigenous, but mostly epiphyllous, at first covered by the cuticle, later exposed by its rupture, appearing as minute white pustules. Stroma pseudoparenchymatous, immersed in the substratum, intra- and subepidermal, composed of isodiametric or somewhat elongated, hyaline to very light brown cells, 15–24  $\mu$  thick. Conidiophores phialidic, arising from the upper cells of the stroma, compactly arranged, straight or somewhat flexuous, cylindrical, hyaline, smooth-walled, slightly attenuated at the apex, with a small terminal collarette, 10–15  $\times$  2.5–4  $\mu$ . Conidia formed in succession from phialides, oblong to ellipsoidal, unicellular, hyaline, smooth-walled, guttulate, 12–16  $\times$  3.5–5  $\mu$ .

On leaves of *Ceanothus americanus*; North America.

COLLECTION EXAMINED: Holotype. University

of Wisconsin Arboretum, Madison, Wisc., U.S.A., 20 VI 1951, H. C. Greene, WIS (isotype DAOM 137734).

(4) *Cryptocline cinerescens* (Bub.) Arx, Verh. K. Ned. Akad. Wet., Afd. Natuurkd., Sect. II, 51: 73, 1957. Fig. 3

= *Gloeosporium cinerescens* Bubák, Ann. Mycol. 2: 339, 1904.

= *Gloeosporidium cinerescens* (Bub.) Petrak, Ann. Mycol. 21: 14, 1923.

= *Gloeosporium bicolor* Davis, Trans. Wisc. Acad. Sci. Arts Lett. 20: 427, 1922.

= *Gloeosporium variabilisporium* Kabát and Bubák, Hedwigia, 52: 360, 1912.

Immersed mycelium composed of hyaline to subhyaline, septate, branched, smooth-walled, guttulate hyphae, 2.5–3.5  $\mu$  wide. Acervuli abundant, scattered or gregarious, on discolored areas of leaf, round in outline, 100–180  $\mu$  in diameter, hypophyllous, at first covered, later exposed by the rupture of the epidermis and cuticle, yellowish in appearance. Stroma pseudoparenchymatous, immersed in the substratum, subepidermal, composed of isodiametric, hyaline to subhyaline cells, 10–15  $\mu$  thick. Conidiophores phialidic, arising from the upper cells of the stroma, compactly arranged, straight or somewhat flexuous, cylindrical, with occasional lateral swellings, hyaline, smooth-walled, slightly attenuated at

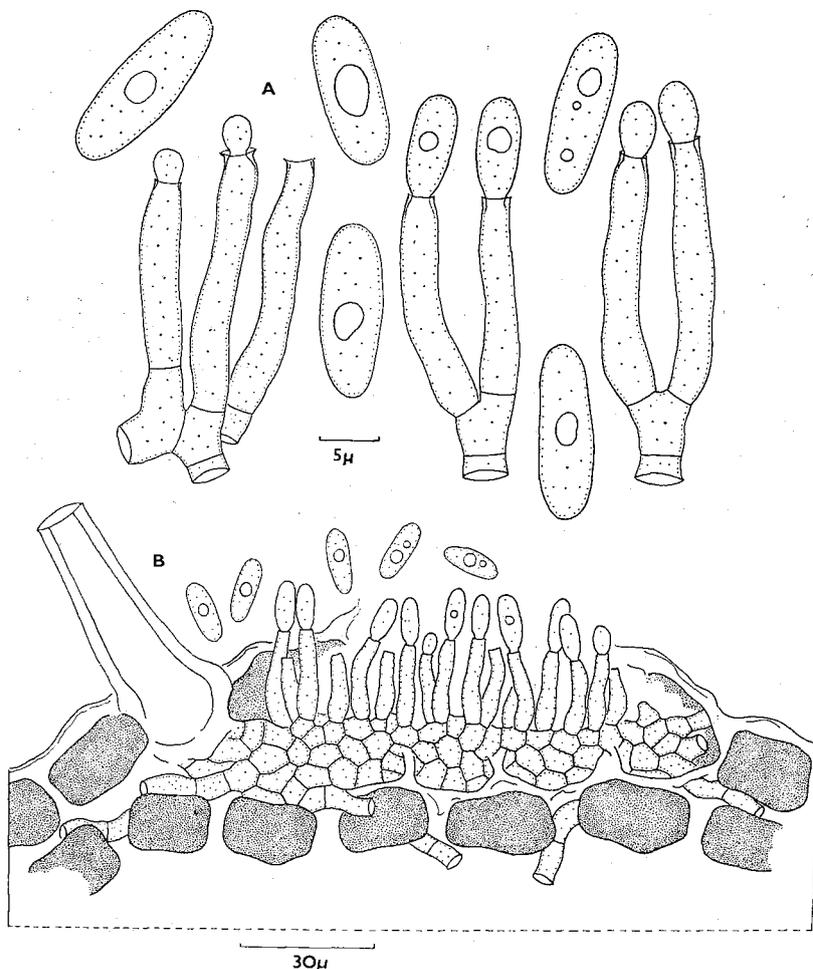


FIG. 2. *Cryptocline ceanothi*. A, Conidiophores and conidia; B, vertical section of acervulus; from type.

the apex,  $10-25 \times 3.5-5 \mu$ . Conidia formed in succession from phialides, ellipsoidal to clavate, unicellular, hyaline, smooth-walled, guttulate, attenuating to a truncate base,  $10-27 \times 4-8 \mu$ .

On leaves of *Quercus* spp.; Europe and North America.

COLLECTIONS EXAMINED: (1) Type. On *Quercus pedunculata*, Pintovka Forest, nr. Tabor, Czechoslovakia, IX 1903, F. Bubák, Kabát et Bubák Fungi imperfecti exsiccati 183, BPI, FH; (2) on *Q. pedunculata*, Dahlewitz and Rangsdorf, nr. Zossen, Brandenburg, Germany, 20 IX 1907, H. Sydow, Sydow Mycotheca Germanica 722, FH;

(3) on *Q. bicolor*, Chippewa Falls, Wisc., U.S.A., 14 IX 1918, J. J. Davis (holotype of *Gloeosporium bicolor*), WIS; (4) on *Q. robur*, Berg Căle, nr. Wsetin, Romania, IX 1923, F. Petrak, Petrak Mycotheca Carpatica 301, FH; (5) on *Q. rubra*, Gross-Skal, Czechoslovakia, 3 X 1911, J. E. Kabát, Kabát et Bubák Fungi imperfecti exsiccati 737, FH; (6) on *Q. rubra*, Mähr-Weisskirchen, Ohrensdorf, Czechoslovakia, 7 X 1914, F. Petrak, Petrak Flora Bohemiae et Moraviae exs. 1224, FH; (7) on *Q. rubra*, Freinenwald, nr. R. Oder, Brandenburg, Germany, 30 IX 1934, H. Sydow, FH.

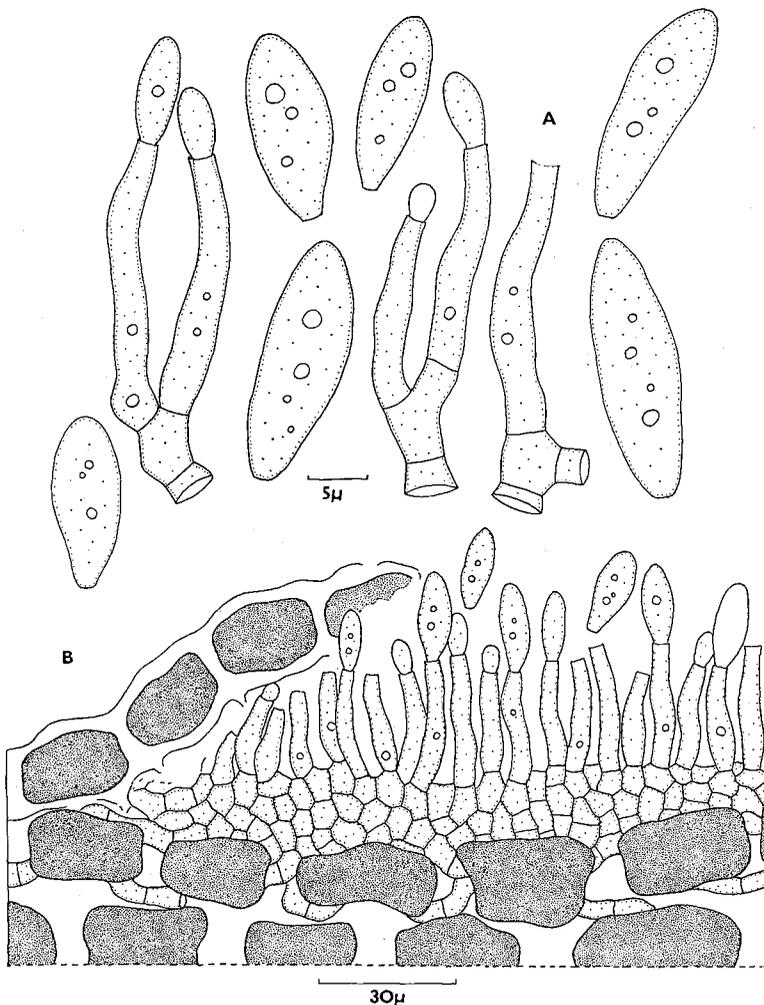


FIG. 3. *Cryptocline cinerescens*. A, Conidiophores and conidia; B, vertical section of acervulus; from type.

(5) *Cryptocline conigena* (Sacc. and Roum.) Arx, Verh. K. Ned. Akad. Wet., Afd. Natuurkd., Sect. II, 51: 76, 1957.

≡ *Gloeosporium conigenum* Sacc. and Roum., Michelia, 2: 633, 1882.

Immersed mycelium composed of hyaline to pale brown, septate, branched, smooth-walled, guttulate hyphae, 2.5–3.5  $\mu$  wide. Acervuli sparse, scattered or gregarious, round or elongate in outline, 200–370  $\mu$  in diameter, at first covered by the cuticle and epidermis, later exposed by rupture of the epidermis, appearing as light

brown pustules. Stroma pseudoparenchymatous, immersed in the substratum, subepidermal, composed of isodiametric or elongated, hyaline to light yellowish brown, guttulate cells, 10–30  $\mu$  thick. Conidiophores phialidic, arising from the upper cells of the stroma, compactly arranged, straight or somewhat flexuous, stout, cylindrical, hyaline, smooth-walled, guttulate, with one or more slightly flaring collarettes, frequently proliferating percurrently, 12–33  $\times$  3–4  $\mu$ . Conidia formed in succession from phialides, short, ellipsoidal, unicellular, obtuse at the apex, truncate

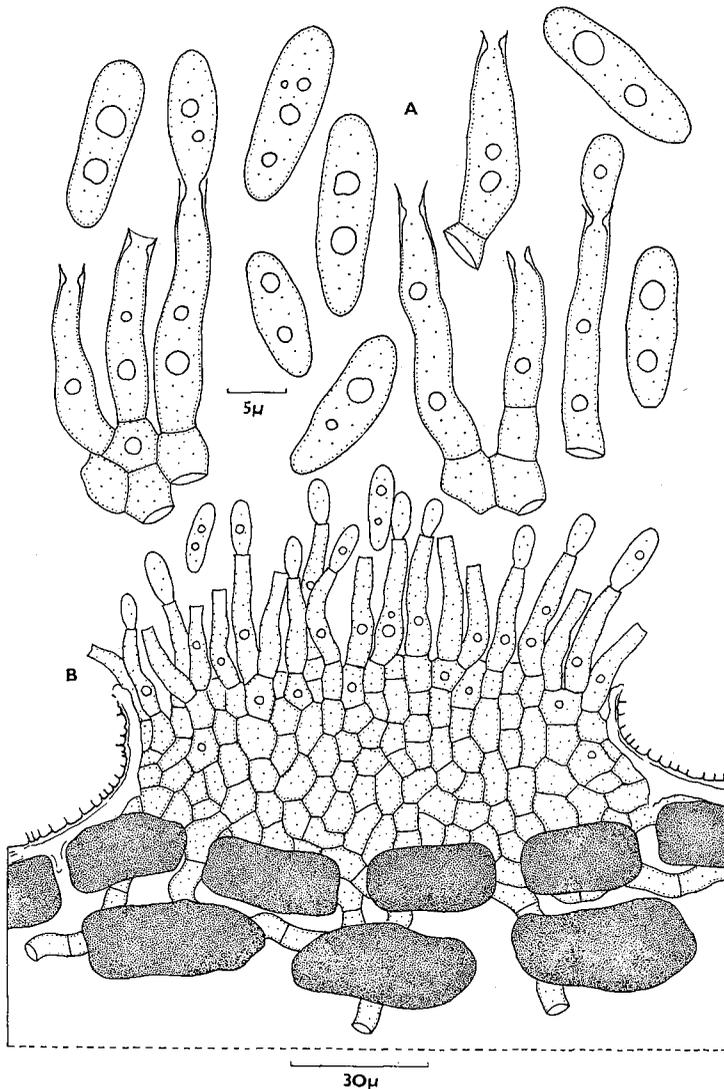


FIG. 4. *Cryptocline cyclaminis*. A, Conidiophores and conidia; B, vertical section of acervulus; from type.

at the base, hyaline, smooth-walled, guttulate,  $4.5-6.5 \times 3.5-5 \mu$ .

On cone scales of *Picea abies*; Europe.

COLLECTIONS EXAMINED: (1) Malmedy, Roume-guère Fungi Gallici 1758, FH; (2) Herb. P. A. Saccardo [no particulars available on packet], PAD.

This species has been illustrated and its conidium ontogeny described by Morgan-Jones (1971b).

(6) *Cryptocline cyclaminis* (Sibilia) Arx, Proc. K. Ned. Akad. Wet., C, 66: 179, 1963. Fig. 4  $\equiv$  *Gloeosporium cyclaminis* Sibilia, Boll. R. Staz. Pat. Veg. 6: 250, 1922.

Immersed mycelium composed of hyaline to very pale brown, septate, branched, smooth-walled hyphae,  $3-4 \mu$  wide. Acervuli abundant, gregarious, occasionally confluent, round or somewhat irregular in outline,  $100-150 \mu$  in diameter, amphigenous, at first covered by the

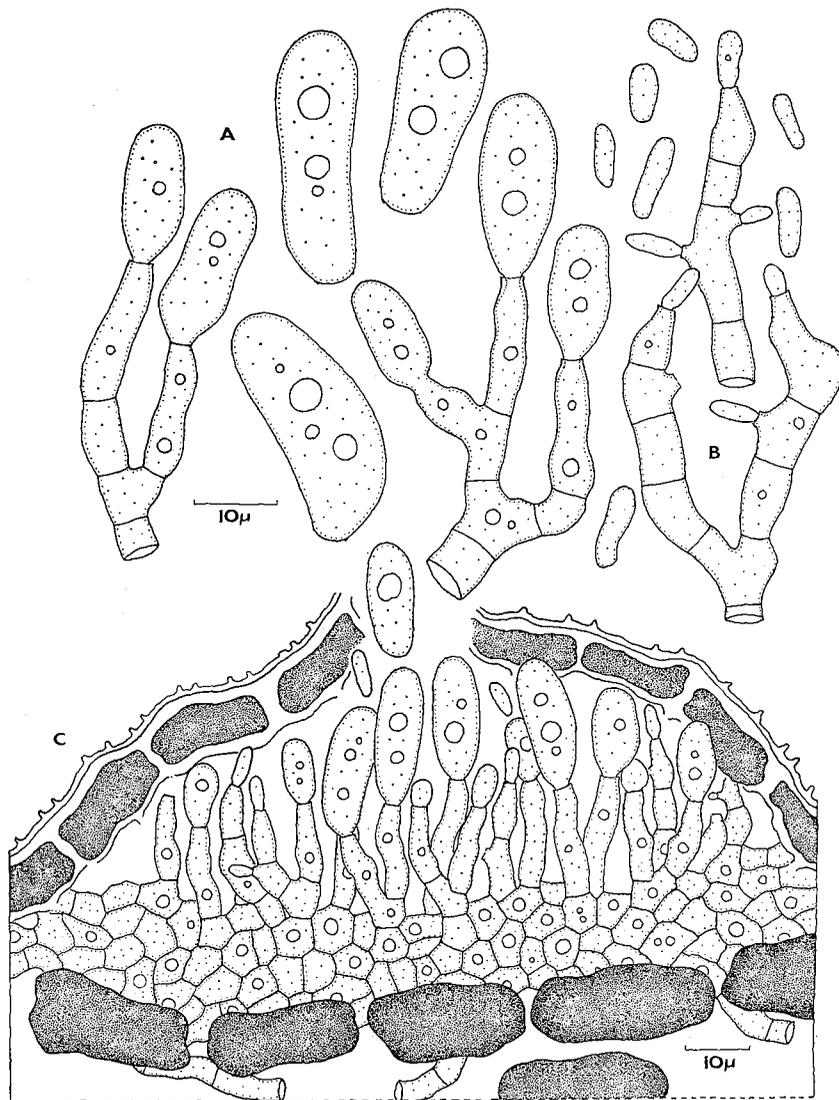


FIG. 5. *Cryptocline dubia*. A, Conidiophores and conidia; B, microconidia and conidiophores; C, vertical section of acervulus; PRC specimen.

cuticle, later exposed by its rupture, appearing as small, white to very pale orange pustules. Stroma pseudoparenchymatous, partly immersed in the substratum, partly emergent, subcuticular, composed of isodiametric or somewhat elongated, hyaline to subhyaline or very pale brown cells, 35–60  $\mu$  thick. Conidiophores phialidic, arising from the upper cells of the stroma, compactly arranged, straight or flexuous, cylindrical, hyaline, smooth-walled, slightly attenuated at the apex, with a small terminal, flaring collarette, 17–28  $\times$  3–5  $\mu$ . Conidia formed in succession from phialides, oblong to ellipsoidal, unicellular, truncate at the base, hyaline, smooth-walled, guttulate, 12–16  $\times$  4–6  $\mu$ .

On leaves and stems of *Cyclamen* sp.; Europe.

COLLECTION EXAMINED: Neotype. From inoculation experiments, Baarn, Netherlands, XI 1958, J. A. von Arx (strain received from G. Goidanich, Bologna, Italy), CBS (syntype DAOM 137735).

No type material of this species seems to exist but there can be little doubt about the identity of the fungus. It is convenient to choose the material studied here, and by Dr. von Arx, as neotype for the name *G. cyclaminis*.

The acervular stroma is better developed in *C. cyclaminis* than is normal in the genus *Cryptocline*. A distinct apical thickening can be observed in phialides when viewed under phase-contrast illumination. The same thickening has been seen in *C. ceanothi* and is similar in appearance to that occurring towards the tip of the conidiophores in *Fusarium* Link ex Fries, and some other phialidic genera.

(7) *Cryptocline dubia* (Bäumler) Arx, Verh. K. Akad. Wet., Afd. Natuurkd., Sect. II, 51: 85, 1957. Fig. 5

= *Gloeosporium dubium* Bäumler, Verh. Zool.-Bot. Ges. Wien, 40: 146, 1890.

= *Gloeosporium naevioides* Roum. and Sacc., Grevillea, 21: 68, 1893.

Immersed mycelium composed of hyaline to pale brown, septate, branched, smooth-walled, guttulate hyphae, 3–4  $\mu$  wide. Acervuli abundant, gregarious, on irregular, brown leaf spots which have a rather indefinite margin, round in outline, 150–280  $\mu$  in diameter, hypophyllous, at first covered by the epidermis, later exposed by its rupture, appearing as light orange pustules.

Stroma pseudoparenchymatous, immersed in the substratum, subepidermal, composed of isodiametric or somewhat elongated, hyaline to very pale brown cells, 12–20  $\mu$  thick. Conidiophores phialidic, arising from the upper cells of the stroma, compactly arranged, of two types. One type straight or slightly flexuous, cylindrical, hyaline, smooth-walled, attenuating towards the apex, with a small terminal collarette, non- or one-septate, sometimes branched, 10–22  $\times$  3.5–4.5  $\mu$ ; the other irregularly cylindrical with lateral swellings, two- to five-septate, with a terminal phialide and one or more lateral phialides originating directly below the septa, 12–25  $\times$  3.5–5  $\mu$ . Conidia formed in succession from phialides, ellipsoidal to narrowly obovate, unicellular, obtuse at the apex, truncate at the base, with a marginal frill, hyaline, smooth-walled, guttulate, 15–28  $\times$  8–12  $\mu$ . Microconidia formed from phialides, hyaline, unicellular, oblong, 5–10  $\times$  2.5–3  $\mu$ .

On leaves of *Populus tremula*; Europe.

COLLECTION EXAMINED: Pelešan, nr. Turnau, Czechoslovakia, IX 1907, J. E. Kabát, PRC.

von Arx (1957) incorrectly described the acervuli in this species as epiphyllous.

(8) *Cryptocline effusa* Petrak, Ann. Mycol. 22: 402, 1924. Fig. 6

Immersed mycelium composed of hyaline to subhyaline, branched, smooth-walled hyphae, 2.5–3  $\mu$  wide. Acervuli abundant, scattered or gregarious in small groups of two or three, in rows along the longitudinal axis of the leaf, rather irregular in outline, hypophyllous, black, 260–350  $\mu$  in diameter, at first covered, later exposed by the rupture of the epidermis and cuticle. Stroma pseudoparenchymatous, immersed in the substratum, subepidermal, composed of isodiametric, subhyaline to very pale yellowish brown cells, 20–38  $\mu$  thick. Conidiophores phialidic, arising from the upper cells of the stroma, compactly arranged, short, stout, cylindrical, hyaline, smooth-walled, with one or two terminal collar-ettes, proliferating percurrently, 10–28  $\times$  4–5  $\mu$ . Conidia formed in succession from phialides, short, ellipsoidal, unicellular, hyaline, guttulate, smooth-walled, obtuse at the apex, truncate at the base with a minute marginal frill, 9–12  $\times$  6.5–7.5  $\mu$ .

On leaves of *Abies concolor*; North America.

COLLECTION EXAMINED: Holotype. Wasco Pine Mill, Friend, Wasco Co., Oregon, U.S.A., 21 IX 1921, J. S. Boyce, BPL.

Petrak (apud Sydow and Petrak 1924) in his original description gives conidiophore length in this species as 15–50  $\mu$ . I have not observed conidiophores of this length in this study. Morgan-Jones *et al.* (1972b) have described conidiogenesis in this species in detail.

- (9) *Cryptocline hypophyllum* (D. E. Ellis and Gill) Morgan-Jones et Nag Raj, comb. nov. Fig. 7

$\equiv$  *Rhabdogloeum hypophyllum* D. E. Ellis and Gill, Mycologia, 37: 330, 1945.

Immersed mycelium composed of hyaline to very pale brown, septate, branched, smooth-walled hyphae, 3–4  $\mu$  wide. Acervuli abundant, scattered, irregular in outline, 250–350  $\mu$  in diameter, at first covered, later exposed by the rupture of the epidermis and cuticle. Stroma pseudoparenchymatous, partly immersed in the substratum, partly emergent, subepidermal, composed of isodiametric to elongated, hyaline cells, 50–90  $\mu$  thick. Conidiophores arising from the upper cells of the stroma, very compactly ar-

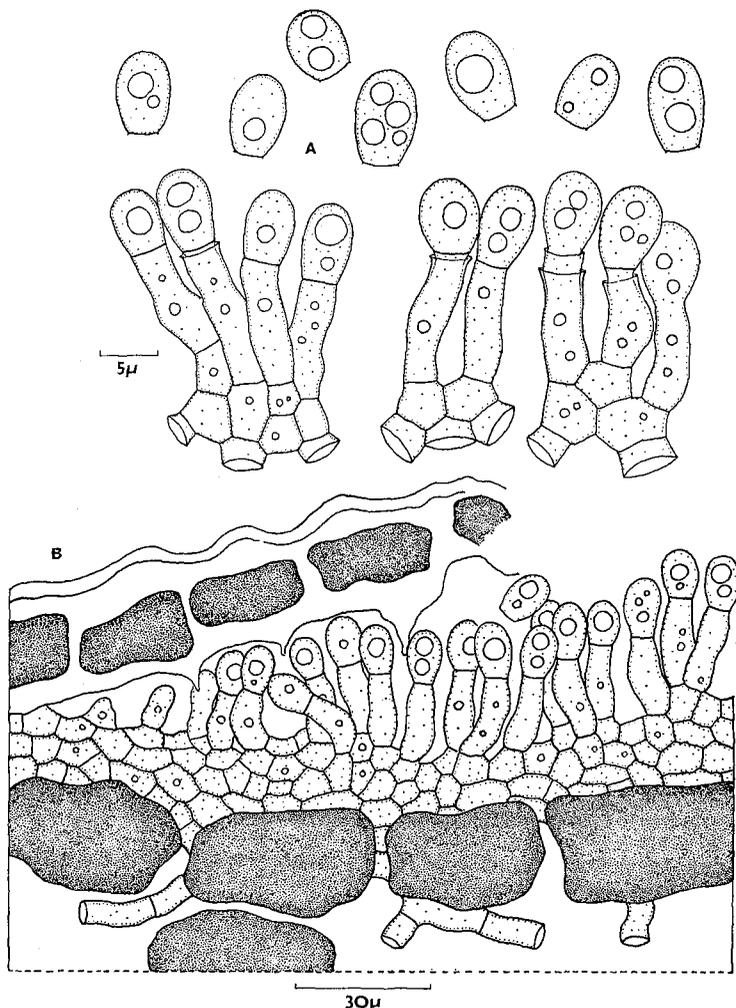


FIG. 6. *Cryptocline effusa*. A, Conidiophores and conidia; B, vertical section of acervulus; from type.

ranged, straight, elongate, cylindrical, hyaline, smooth-walled, slightly attenuated at the apex, with a very small collarete, guttulate,  $15\text{--}24 \times 3\text{--}4 \mu$ . Conidia formed in succession from phialides, oblong, frequently slightly narrower in the middle, unicellular, obtuse at the apex, truncate at the base, hyaline, smooth-walled, guttulate,  $10\text{--}11.5 \times 4\text{--}4.5 \mu$ .

On leaves of *Pseudotsuga taxifolia*; North America.

COLLECTION EXAMINED: Holotype. Cloudcraft

Nursery, Lincoln, N. Mex., U.S.A., 13 V 1942, L. S. Gill and G.G.H., BPI.

This species resembles *C. cyclaminis* in having a very well-developed acervular stroma. The conidia are of a similar shape to those of *C. abietina* and *C. phacidiella* but are much smaller than those of either of these species.

(10) *Cryptocline nigricans* (Cke. and Mass.) Sutton, Commonw. Mycol. Inst. Mycol. Pap. 123: 40, 1971. Fig. 8

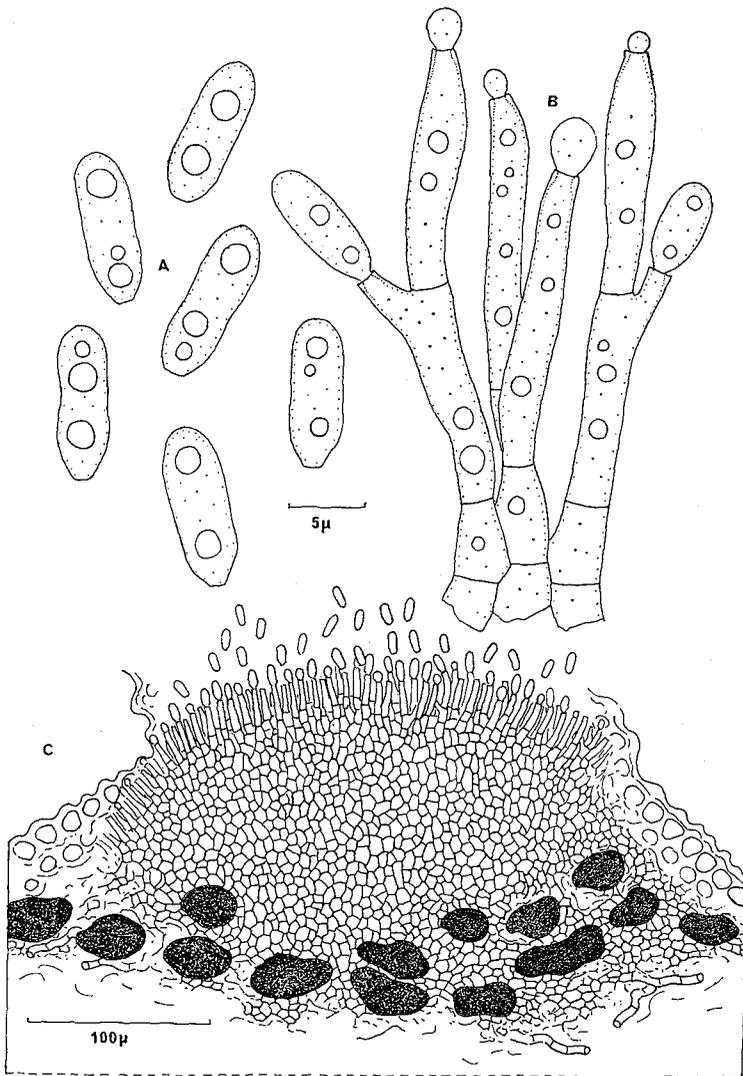


FIG. 7. *Cryptocline hypophyllum*. A, Conidia; B, conidiophores; C, vertical section of acervulus; from type.

≡ *Gloeosporium nigricans* Cooke and Masee, Grevillea, 19: 91, 1890.

≡ *Fairmaniella nigricans* (Cke. and Mass.) Arx, Verh. K. Ned. Akad. Wet., Afd. Natuurkd., Sect. II, 51: 109, 1957.

Immersed mycelium composed of hyaline to pale brown, septate, branched, smooth-walled hyphae, 2.5–4  $\mu$  wide. Acervuli abundant, scattered or gregarious, or sometimes confluent, irregular in outline, black, 140–300  $\mu$  in diameter, at first covered, later erupting by rupture of the cuticle, amphigenous. Stroma pseudoparenchymatous, immersed in the substratum, subcutic-

ular, composed of isodiametric subhyaline to pale yellowish brown cells, 12–15  $\mu$  thick. Conidiophores phialidic, arising from the upper cells of the stroma, compactly arranged, of two types. One type short, stout, cylindrical, hyaline, smooth-walled, with one or more terminal colarettes, frequently proliferating percurrently, 10–16  $\times$  3.5–5  $\mu$ ; the other slender, elongated, hyaline to subhyaline, smooth-walled, 15–25  $\times$  2–3  $\mu$ . Conidia formed in succession from phialides, short, unicellular, ellipsoidal, obtuse at the apex, truncate at the base, with a minute marginal frill, subhyaline to very pale brown, smooth-

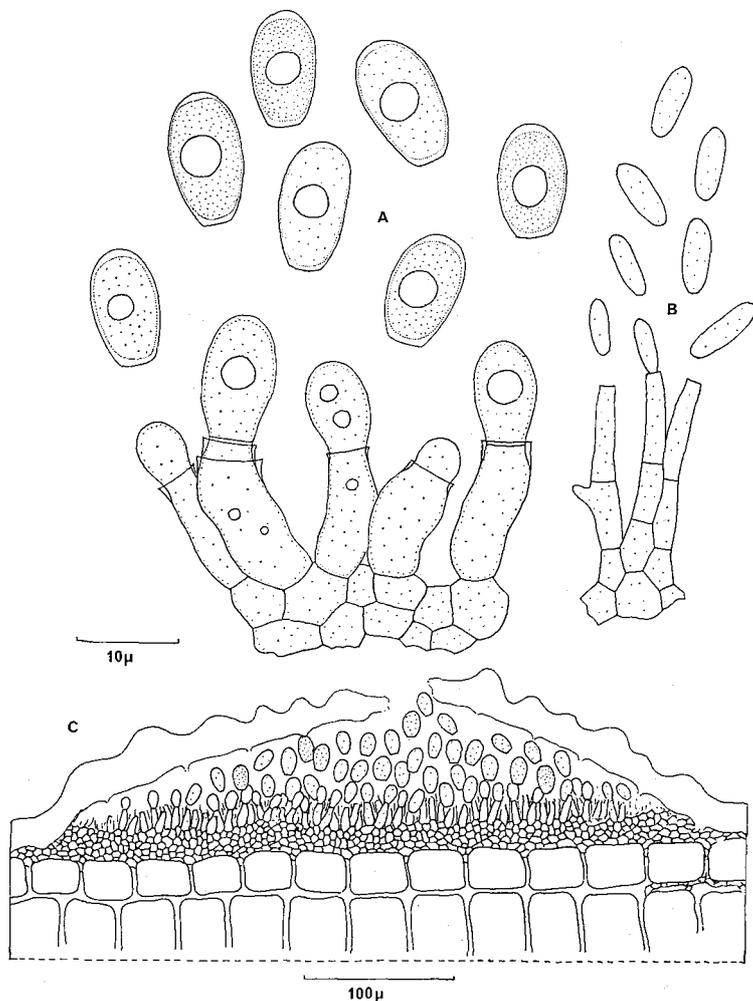


FIG. 8. *Cryptocline nigricans*. A, Conidiophores and conidia; B, microconidia and conidiophores; C, vertical section of acervulus; from type.

walled, guttulate,  $9-11 \times 5 \mu$ . Microconidia formed from phialides, hyaline, unicellular, oblong to elliptical,  $4-5 \times 2-2.5 \mu$ .

On leaves of *Eucalyptus pauciflora*; Australia.

COLLECTION EXAMINED: Holotype. Australian Alps, 1891, C. Walker, K. Sutton (1971) described one of the conidiophore types in this species as annellides and the other as phialides, while noting that they occur mixed together and originate from the same stroma. It is my belief

that both types are phialides but that that which produces macroconidia proliferates percurrently.

(11) *Cryptocline paradoxa* (de Not.) Arx, Verh. K. Ned. Akad. Wet., Afd. Natuurkd., Sect. II, 51: 115, 1957. Fig. 9

≡ *Myxosporium paradoxum* de Notaris, Microm. Ital. 2(10), 1841.

≡ *Gloeosporium paradoxum* (de Not.) Fuckel, Symb. Mycol. 227, 1869.

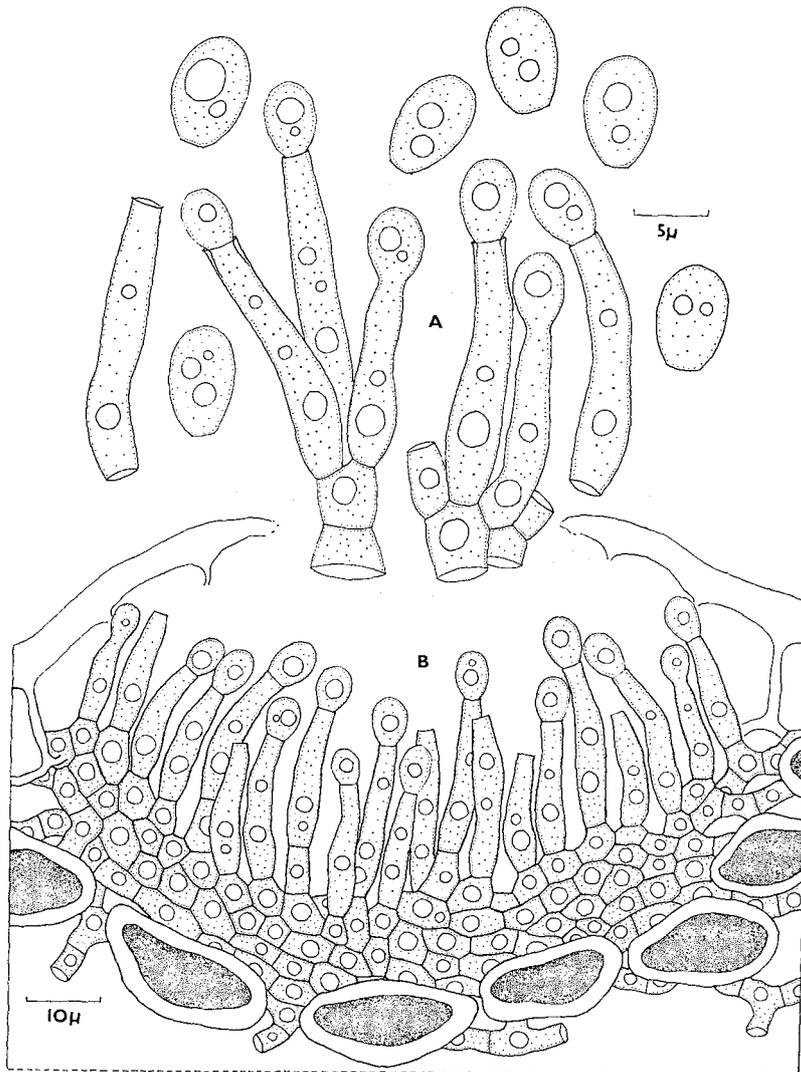


FIG. 9. *Cryptocline paradoxa*. A, Conidiophores and conidia; B, vertical section of acervulus; IMI 105570.

≡ *Gloeosporidium paradoxum* (de Not.) Petrak, Ann. Mycol. 20: 14, 1922.

≡ *Gloeotrochila paradoxa* (de Not.) Petrak, Sydowia, 1: 49, 1947.

= *Fusarium pezizoides* Desmazières, Ann. Sci. Nat. Bot. Ser. III, 18: 373, 1852.

Immersed mycelium composed of hyaline to very pale brown, septate, branched, smooth-walled hyphae, 3–4  $\mu$  wide. Acervuli abundant, gregarious, round in outline, 100–180  $\mu$  in diameter, hypophyllous, at first covered and appearing as light yellow, translucent, dome-shaped pustules, later exposed by rupture of the cuticle and epidermis. Stroma pseudoparenchymatous, immersed in the substratum, intraepidermal, composed of isodiametric, hyaline to pale yellowish brown, guttulate cells, 10–22  $\mu$  thick. Conidiophores phialidic, arising from the upper cells of the stroma, compactly arranged, straight, stout, cylindrical, hyaline, smooth-walled, guttulate, usually proliferating percurrently, 12–20  $\times$  3–5  $\mu$ . Conidia formed in succession from phialides, short, ellipsoidal to subglobose, unicellular, obtuse at the apex, truncate at the base, hyaline, smooth-walled, guttulate, 5–9  $\times$  4.5–6  $\mu$ .

On dead leaves of *Hedera helix*; Europe.

COLLECTIONS EXAMINED: (1) Desmazières, Plant. Crypt. Fr. 1817 [sub *Fusarium pezizoides* Desm.], FH; (2) J. E. Vize, Microfungi Brit. 314, Stratford-upon-Avon, England, FH; (3) de Thümen, Mycotheca universalis 679, Bayreuth, Bavaria, Germany, 1874, FH; (4) C. Roumeguère, Fungi Gallici 3382, Fontainebleau, Seine-et-Marne, France, III 1885, Feuilleaubeis, FH; (5) C. Roumeguère, Fungi selecti exs. 4184, Bagnères-de-Luchon, France, VIII 1886, C. Fourcade, FH; (6) Bozen, Tirol, Austria, 1900, F. von Höhnelt, FH; (7) Kabát et Bubák Fungi imperfecti exsiccati 283, Turnau, Czechoslovakia, 29 IV 1905, J. E. Kabát, FH; (8) Herb. Mycol. Romanicum 1536, Botanical Garden, Cluj, Romania, T. Savulescu, FH; (9) Weese Eumycetes sel. exs. 351, Neuwaldegg-Wien, Austria, 31 V 1921, J. Weese, FH; (10) Rhostryfan, Caerns., Wales, 4 VI 1963, G. Morgan-Jones, DAOM 137718; (11) University Park, Nottingham, England, 29 V 1963, G. Morgan-Jones, IMI 105570; (12) Cluny, Sône-et-Loire, France, 28 VII 1971, G. Morgan-Jones, NMW, DAOM 137717.

*Cryptocline paradoxa* is presumed to be the conidial state of *Trochila craterium* Fr.

Petrak (1947) erected the genus *Gloeotrochila* for this species. He stated that it was similar to *Cryptosporiopsis* in structure and that it could be considered a leaf form of this genus. He did not mention any similarity to *Cryptocline*. Earlier, Petrak (1922) had placed the species in *Gloeosporidium* Höhnelt. He also placed (Petrak 1923) two other species currently classified in *Cryptocline* in *Gloeosporidium*, namely *C. betularum* and *C. cinerescens*.

(12) *Cryptocline phacidiella* (Grove) Arx, Verh. K. Ned. Akad. Wet., Afd. Natuurkd., Sect. II, 51: 171, 1957.

≡ *Gloeosporium phacidiellum* Grove, J. Bot. Lond. 50: 53, 1912.

Immersed mycelium composed of hyaline to pale brown, septate, branched, smooth-walled, guttulate hyphae, 3–4  $\mu$  wide, concentrated in the epidermal cells and the adjacent subtending mesophyll. Acervuli abundant, gregarious, very occasionally confluent, round or somewhat irregular in outline, 100–280  $\mu$  in diameter, hypophyllous, at first covered by the cuticle and appearing as minute, pale orange-brown, translucent, dome-shaped pustules, later exposed by the rupture of the cuticle. Stroma pseudoparenchymatous, immersed in the substratum, subcuticular, composed of isodiametric, hyaline to light yellowish brown, guttulate cells, 8–15  $\mu$  thick. Conidiophores phialidic, arising from the upper cells of the stroma, compactly arranged, straight or somewhat flexuous, stout, cylindrical, hyaline, smooth-walled, slightly attenuated at the apex, guttulate, with a small terminal collarete, occasionally proliferating percurrently, 18–40  $\times$  5–8  $\mu$ , 3.5–4  $\mu$  wide at the extreme apex. Conidia formed in succession from phialides, oblong, unicellular, obtuse at the apex, truncate and sharply attenuated at the base, hyaline, smooth-walled, guttulate, 15–21  $\times$  5–8  $\mu$ .

On leaves of *Prunus laurocerasus*; Europe.

COLLECTIONS EXAMINED: (1) Ilam Park, Derbyshire, England, 6 VI 1963, G. Morgan-Jones, IMI 107958; (2) Llanwddyn, Mont., Wales, 24 IV 1966, G. Morgan-Jones, DAOM 137719.

This species has been illustrated by Morgan-Jones (1971b). It has been presumed to be the

ascigerous stage of *Trochila laurocerasi* (Desm.) Fr. (Gregor 1936; Grove 1937; von Arx 1957), but Morgan-Jones (1972) suggests that *Eupropo-  
lella britannica* Greenhalgh and Morgan-Jones might be its perfect state.

*Cryptocline phacidiella* has a closely similar morphology to *C. abietina*.

(13) *Cryptocline taxicola* (Allesch.) Petrak, Ann. Mycol. 23: 24, 1925.

Fig. 10

≡ *Gloeosporium taxicola* Allescher, Hedwigia, 35: 34, 1896.

Immersed mycelium composed of subhyaline to very pale brown, branched, smooth-walled hyphae, 3–4  $\mu$  wide. Acervuli abundant, scattered, or gregarious in small groups, in rows along the longitudinal axis of the leaf, elliptical in outline, amphigenous, black, 200–400  $\mu$  in diameter, at first covered, later exposed by the rupture of the cuticle. Stroma pseudoparenchymatous, immersed in the substratum, subcuticular to intra-epidermal, composed of isodiametric, very pale brown to brown cells, 15–22  $\mu$  thick. Conidiophores phialidic, arising from the upper cells of

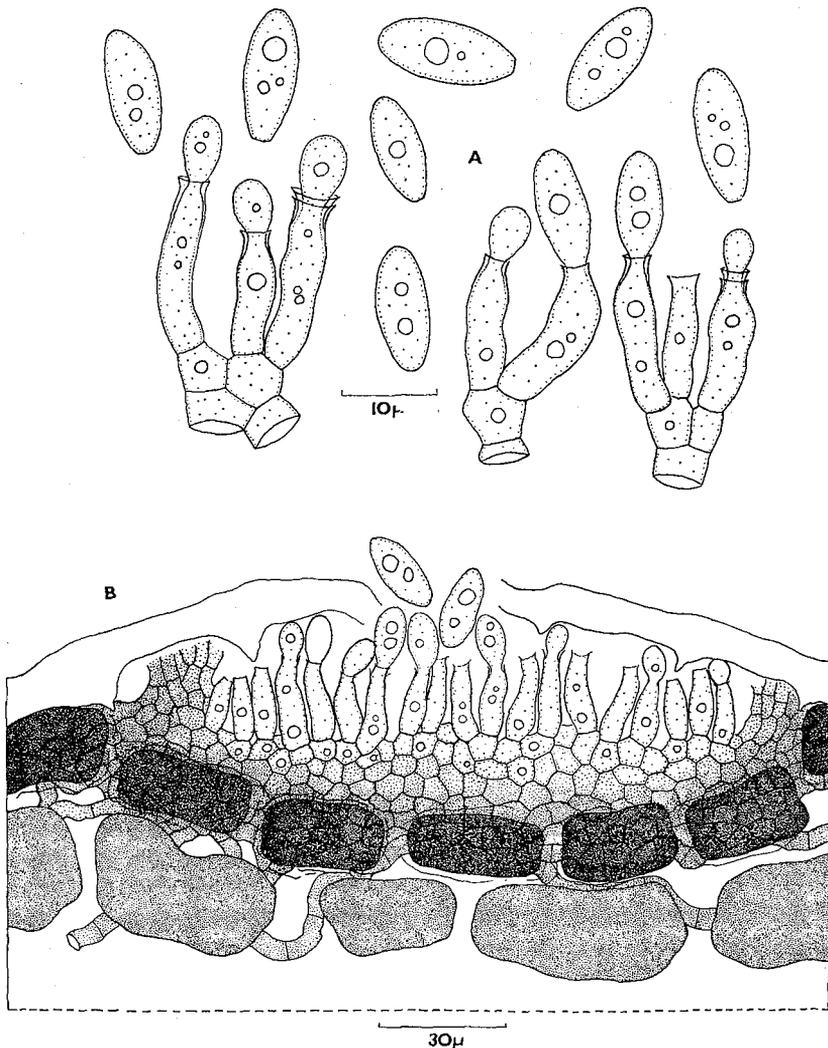


FIG. 10. *Cryptocline taxicola*. A, Conidiophores and conidia; B, vertical section of acervulus; from type.

the stroma, compactly arranged, short, cylindrical, hyaline, smooth-walled, with one or frequently two flaring, terminal collarettes, proliferating percurrently,  $13-24 \times 3.5-5 \mu$ . Conidia formed in succession from phialides, short, long-ellipsoidal or slightly ovate, unicellular, hyaline, guttulate, smooth-walled, obtuse at the apex, truncate at the base,  $10-16 \times 5-7 \mu$ .

On leaves of *Taxus baccata*; Europe and North America.

COLLECTIONS EXAMINED: (1) Type. Arboretum, Moskau. VII 1895, P. Sydow. Sydow Mycotheca Marchica 4387, B; (2) Parkanlagen, Mähr-Weisskirchen, Mähren, Czechoslovakia, XI 1924, F. Petrak, Petrak Mycotheca Generalis 1218, FH; (3) on *T. baccata* var. *canadensis*, Shelburne, N.H. (? Vt.), U.S.A., B.; (4) on *T. baccata* var. *fastiata*, Stralsund, Pommern, Germany, I II 1930, O. Bürgener, Sydow Mycotheca Germanica 2584, FH.

(14) *Cryptocline tremuloides* (Ell. and Everh.) Sutton, Commonw. Mycol. Inst. Mycol. Pap. 123: 42, 1971.

≡ *Gloeosporium tremuloides* Ellis and Everhart, Proc. Acad. Nat. Sci. Philad., 370, 1894.

≡ *Leptomelanconium tremuloides* (Ell. and Everh.) Arx, Verh. K. Ned. Akad. Wet., Afd. Natuurkd., Sect. II, 51: 142, 1957.

Immersed mycelium composed of hyaline, septate, branched, smooth-walled, guttulate, hyphae,  $3 \mu$  wide. Acervuli abundant, gregarious, occurring on brown leaf spots which have a determinate margin, appearing as dark brown pustules, round in outline,  $70-120 \mu$  in diameter, amphigenous but mostly hypophyllous, at first covered, later exposed by the rupture of the epidermis and cuticle. Stroma pseudoparenchymatous, immersed in the substratum, intra- or sub-epidermal, composed of isodiametric, hyaline to subhyaline or very pale brown cells,  $10-15 \mu$  thick. Conidiophores phialidic, arising from the upper cells of the stroma, compactly arranged, straight or slightly flexuous, cylindrical, hyaline, smooth-walled, proliferating several times percurrently, and possessing, as a result, a number of terminal, flared collarettes,  $10-30 \times 3-4 \mu$ . Conidia formed in succession from phialides, obovate, unicellular, very pale brown, smooth-walled, obtuse at the apex, attenuating to a truncate base,  $10-15 \times 5-7 \mu$ .

On leaves of *Populus tremuloides*; North America.

COLLECTION EXAMINED: Holotype. Racine, Wisc., U.S.A., 4 IX 1893, J. J. Davis, NY.

As in the case of *C. betularum*, a species which *C. tremuloides* closely resembles, the conidigenous cells have previously been described and illustrated as annellides (Sutton and Chao 1970; Morgan-Jones 1971a).

Sutton (1971) considered the species included in *Cryptocline* by von Arx (1957) to be a heterogeneous assemblage and he stated that no confident redispersions could be made until the method of conidiogenesis in *C. effusa*, the type species, was known. The present author, however, finds the genus as herein circumscribed to be remarkably homogeneous even though there are minor differences in the pattern of conidiogenesis among the species.

#### Unexamined and Excluded Species

*Cryptocline andina* Petrak, Sydowia, 4: 557, 1950.

This was described from a collection on *Miconia ? theaezans* made in Ecuador. I have not had opportunity to examine the material but, judging by Petrak's description, it appears to be a good species of *Cryptocline*.

*Cryptocline nobile* (Sacc.) Arx, Verh. K. Ned. Akad. Wet., Afd. Natuurkd., Sect. II, 51: 109, 1957.

≡ *Gloeosporium nobile* Saccardo, Michelia, 2: 153, 1880.

This is more appropriately classified in *Cryptosporiopsis* Bubák and Kabát. It has been transferred to that genus as *Cryptosporiopsis nobilis* (Sacc.) Pirozynski and Morgan-Jones, Trans. Br. Mycol. Soc. 51: 189, 1968.

*Cryptocline propinqua* (Bub. and Vleug.) Arx, Verh. K. Ned. Akad. Wet., Afd. Natuurkd., Sect. II, 51: 124, 1957.

≡ *Gloeosporium propinquum* Bubák and Vleugel, Svensk. Bot. Tidskr. 5: 346, 1911.

≡ *Septogloeum propinquum* (Bub. and Vleug.) Wollenweber, Ann. Mycol. 15: 27, 1917.

Fig. 11

Immersed mycelium composed of hyaline to pale brown, septate, branched, smooth-walled hyphae,  $2-2.5 \mu$  wide, concentrated in the epidermis and immediately subtending mesophyll. Acervuli abundant, on suborbicular leaf spots

with an irregular but distinct margin, gregarious, very occasionally confluent, round in outline, 70–130  $\mu$  in diameter, hypophyllous, appearing as light orange-brown pustules, at first covered, later exposed by rupture of the cuticle and epidermis. Stroma pseudoparenchymatous, immersed in the substratum, intraepidermal, composed of isodiametric, subhyaline to very pale brown cells, 15–28  $\mu$  thick. Conidiophores phialidic, arising from the upper cells of the stroma, short, hyaline, smooth-walled, cylindrical or somewhat flask-shaped, 7–13  $\times$  2–4  $\mu$ . Conidia formed in succession from phialides, heteromorphic; unicellular, smooth-walled, hy-

aline, ellipsoidal, slightly truncate at the base, 10–26  $\times$  2–3.5  $\mu$ , and three-septate, smooth-walled, hyaline, fusiform to falcate, 35–70  $\times$  4.5–6.5  $\mu$ .

On leaves of *Salix caprea*; Europe.

COLLECTIONS EXAMINED: (1) Holotype. Umeå, Sweden, IX 1910, J. Vleugel, Vestergren, *Micromyces rar. sel.* 1496, S; (2) Umeå, Sweden, IX 1911, J. Vleugel, Kabát et Bubák *Fungi imperfecti exs.* 736, S.

Bubák and Vleugel (apud Vleugel 1911) considered this to be the conidial state of *Cryptoderis propinqua* Bubák and Vleugel.

When von Arx (1957) classified this species in

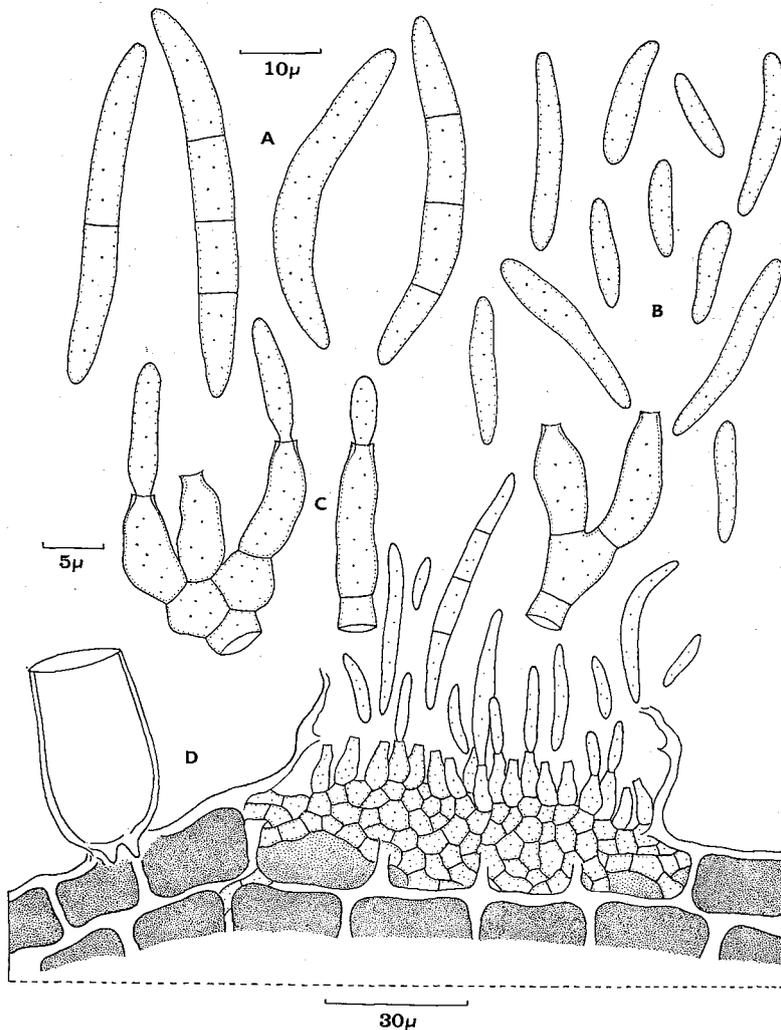


FIG. 11. *Gloeosporium propinquum*. A, *Fusarium*-like macroconidia; B, microconidia; C, conidiophores; D, vertical section of acerulus; from type.

*Cryptocline* he realized that it was not fully satisfactorily placed. He also incorrectly assumed that the large *Fusarium*-like conidia did not belong to the fungus.

A new description and illustration of *Septogloeum* Sacc., based on the type species *S. carthusianum* (Sacc.) Sacc., has recently been published (Morgan-Jones and Kendrick 1972).

It is clear that *C. propinqua* cannot properly be classified in *Cryptocline* or in *Septogloeum*. A more appropriate disposition for it, however, must await further type studies on related leaf-inhabiting melanconiaceous fungi.

### Acknowledgments

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