

gated at the tips; *asci* eight-spored, broadly clavate,  $45-60 \times 20-28 \mu$ , abruptly attenuated at base; *ascospores* biseriate,  $12.0-16.0 \times 8.5-12.0 \mu$ , hyaline to pale yellow, smooth, broadly ellipsoid, with perispore layer thin and cyanophilous; *paraphyses* filiform, septate, simple or branched,  $1.5-2.0 \mu$  below, slightly inflated, uncinuate at their apices and containing yellowish oil droplets.

TYPE: On cow dung, Radotin, Mnichovice, Czechoslovakia, Velenovsky (PR).

SPECIMENS EXAMINED: EUROPE: AUSTRIA: Sonntagesberg, on cow dung, July, 1906, von Höhnelt (FH) (TYPE PR). UNITED STATES: Wyoming: Big Horn Co.: Granite Pass, on sheep dung, 2 Sept. 1962, Luck-Allen 39485 (TRTC).

COMMENTS: *Coprotus breviascus* is morphologically similar to *C. granuliformis* and *C. ochraceus*. The broadly clavate *asci* and broadly ellipsoid *ascospores* are similar to those of *C. granuliformis*, but the latter species can be distinguished by its strongly inflated, hyaline *paraphyses* and larger, more globose excipular cells. *Coprotus ochraceus* has both larger *asci* and *ascospores*. Velenovsky (1934) cites the same figures for *C. breviascus* and *A. bilobus* but the latter appears to be a synonym of *C. ochraceus*. Contrary to the original description, we find oil droplets in the *paraphyses* of *C. breviascus*.

#### 4. *Coprotus dextrinoideus* sp. nov. Figs. 10-12

Apothecia dispersa, 0.1-0.5 mm in diametro, cupulata vel discoidea; hymenium album; margo subluteus, fuscoluteus siccatus. Excipulum e cellulis angularibus vel globosis (textura angulari vel textura globulosa), luteis, cyanophilis compositum. Cellulae marginatae elongatae,  $8.0-15.0 \times 3.0-6.0 \mu$ . *Asci* octospori, cylindracei,  $80-125 \times 18-24 \mu$ , ad apicem late rotundati, ad basem attenuati. *Ascospores* late ellipsoideae, uniseriatae, raro biseriatae,  $11.0-13.0 \times 7.5-10.0 \mu$ , "de Bary bubble" praeditae. *Paraphyses* filiformes, septatae, valde ramosae, hyalinae, guttulate.

HOLOTYPE: In fimo vaccino, Puerto Rico, West Indian Exploration No. 1, Jan.-Apr., 1923, Seaver and Chardon (NY).

Apothecia scattered, 0.1-0.5 mm in diam, cupulate to discoid, hymenium white, margin yellowish, darker on drying; *excipulum* of a textura angularis to globulosa, cells slightly

thick-walled, yellowish, cyanophilous, marginal cells elongated,  $8.0-15.0 \times 3.0-6.0 \mu$ ; *asci* eight-spored, cylindric, rounded above, attenuated below,  $80-125 \times 18-24 \mu$ ; *ascospores* uniseriate, rarely biseriate, broadly ellipsoid,  $11.0-13.0 \times 7.5-10.0 \mu$ , each with a conspicuous de Bary bubble; *paraphyses* filiform, septate, mostly branched, hyaline, with a few inconspicuous oil guttules.

HABITAT: On dung of cow, deer, antelope, wapiti, and burro.

SPECIMENS EXAMINED: MEXICO: Durango: N of Durango, on burro dung, 13 Aug. 1960, Cain 36996 (TRTC). PAKISTAN: Sind Area, on cow dung, 1 Sept. 1967, Ahmed F49069 (FLAS). PUERTO RICO: TYPE. UNITED STATES: New York: L. Placid, on cow dung, 4 Sept. 1914, Kauffman and Mains (MICH). Wyoming: Big Horn Co.: Upper Shell Canyon, on wapiti dung, 2 Sept. 1962, Cain 41267 (TRTC); on deer dung, 2 Sept. 1962, Luck-Allen 41793 (TRTC); on antelope dung, 2 Sept. 1962, Luck-Allen 42111 (TRTC). Niobrara Co.: N of Lusk, on cow dung, 2 Sept. 1964, Cain 42598 (TRTC).

COMMENTS: This species may be confused with *Coprotus disculus* on the basis of ascus and ascospore measurements. The spores of *C. disculus* are more narrowly elliptic and the *asci* are generally 20-25  $\mu$  shorter than those of *C. dextrinoideus*. In addition, the excipular cells in *C. dextrinoideus* are more pigmented, thicker-walled, and more elongated at the margins. The *paraphyses* of *C. disculus* are more inflated and without oil guttules.

#### 5. *Coprotus disculus* sp. nov. Figs. 13-15

Apothecia pellucida, alba, deinde lutea, discoidea vel lenticularia, 0.5-1.0 mm diam. Excipulum e cellulis hyalinis (textura angulari vel textura globulosa). Cellulae basillares globosae,  $20 \mu$  diam. Cellulae marginales  $8.0-12 \times 6-10 \mu$ . *Asci* octospori (rare quantuorspori), cylindracei,  $75-90 \times 10-15 \mu$ , ad apicem rotundati, ad basem attenuati. *Ascospores* anguste ellipsoideae, uniseriatae, raro biseriatae,  $12.0-13.5 \times 5.0-8.0 \mu$ , dilute luteae, "de Bary bubble" praeditae. *Paraphyses* filiformes, septatae, hyalinae, non guttulate, superne incrassatae usque  $4.0 \mu$  diam et leniter uncinatae.

HOLOTYPE: In fimo cervino, Bergen Swamp, near Rochester, New York, 5 Oct. 1947, Roger-son (CUP 37168).

*Apothecia* translucent to white, becoming yellowish discoid to lenticular, 0.5–1.0 mm in diam; *excipulum* of a *textura angularis* to *globulosa*; cells thin-walled, essentially hyaline, basal cells almost globose, up to 20  $\mu$  diam, marginal cells 8.0–12  $\times$  6–10  $\mu$ ; *asci* eight-spored, rarely four-spored; cylindric, 75–90  $\times$  10–15  $\mu$ , rounded above, attenuated below; *ascospores* uniseriate, sometimes biseriate, narrowly ellipsoid, 12.0–13.5  $\times$  5.0–8.0  $\mu$ , faintly yellowish, with one de Bary bubble; *paraphyses* filiform, septate below, hyaline, without oil guttules, with apices inflated 3.0–4.0  $\mu$  and slightly uncinatae.

HABITAT: On dung of deer, horse, cow, and small rodents.

TYPE: On deer dung, New York: Bergen Swamp, near Rochester, 5 Oct. 1947, *Rogerson* (CUP 37168).

SPECIMENS EXAMINED: CANADA: Ontario: Bruce Co.: Inverhuron, on deer dung, 8 Oct. 1961, *Cain* 38739 (TRTC). Leeds Co.: Chaffey's Locks, on deer dung, 28 Sept. 1963, *Luck-Allen* 41256 (TRTC). Oxford Co.: Benwell Swamp, Gables, on deer dung, 13 Sept. 1943, *Cain* 45718 (TRTC). Quebec: Mt. Albert, Lac Cascapedia, on horse dung, 21 Aug. 1957, *Bigelow* 63011 (DAOM). EUROPE: ITALY (N): Lombardy, on cow dung, 23 Aug. 1907, *Coll?* D6831 (CUP, MICH). UNITED STATES: New York: TYPE: Courtland Co.: McLean Bog near Dryden, on deer dung, 5 Sept. 1952, *Cain* 24411 (TRTC); Lyndonville, on cow dung, 1904, *Fairman* D450 (CUP).

COMMENTS: *Coprotus disculus* is close to *C. lacteus*. In fact, specimens of the former have been accessioned in some herbaria under the latter name. *Coprotus lacteus* differs in having shorter *asci* and *ascospores* and narrower *paraphyses*.

#### 6. *Coprotus duplus* sp. nov. Figs. 16–19

*Apothecia* alba vel leniter lutea, 0.3–0.8  $\mu$  diam, cupulata vel discoidea, leves. *Excipulum* ordinibus tribus vel quatuoribus compositum. *Cellulae* basillares usque 10–12  $\mu$  diam, hyalinae vel leniter luteae (*textura angulari* vel *textura globulosa*). *Cellulae* marginales elongatae, 10–12  $\times$  4–6  $\mu$ . *Asci* sexdecimspori, anguste cylindracei, 70–90  $\times$  10–18  $\mu$ . *Ascospores* ellipsoideae, biseriatae, leves, hyalinae vel leniter luteae, 7.5–10.0  $\times$  4.6–6.5  $\mu$ , “de Bary bubble” pra-

ditae. *Paraphyses* filiformes, septatae, non ramosae vel rarissimo ramosae, ad basem 1.8–2.0  $\mu$  crassae, superne usque 1.8–2.0  $\mu$  diam, guttulate.

HOLOTYPE: In fimo leporino, 5 mi S of Dorset, Haliburton Co., Ontario, 14 Sept. 1931, *Cain* 40026 (TRTC).

*Apothecia* white to slightly yellowish, cupulate to discoid, smooth, 0.3–0.8 mm in diam; *excipulum* of three to four layers, basal area of a *textura angularis* to *globulosa*, cells up to 12  $\mu$  in diam, hyaline to slightly yellowish, marginal cells elongated, 10–12  $\times$  4–6  $\mu$ ; *asci* 16-spored, narrowly cylindric, 70–90  $\times$  10–18  $\mu$ , dome-shaped to almost truncate above; *ascospores* biseriate, smooth, hyaline to faintly yellowish, ellipsoid, 7.5–10.0  $\times$  4.0–6.5  $\mu$ , each with a de Bary bubble; *paraphyses* filiform, septate, simple or sparingly branched, 1.8–2.0  $\mu$  below, 2.2–2.5  $\mu$  at apices, guttulate, with oil guttules small, few in number.

HABITAT: On the dung of various animals.

TYPE: On rabbit dung, 5 mi S of Dorset, Haliburton Co., Ontario, 14 Sept. 1931, *Cain* 40026 (TRTC).

SPECIMENS EXAMINED: CANADA: Ontario: Bruce Co.: Teeswater, on rabbit dung, 10 July 1932, *Cain* 40024 (TRTC); N of Kincardine, on rabbit dung, 8 Oct. 1961, *Cain* and *Luck-Allen* 41884 (TRTC). Nipissing Dist.: Lake Timagami, on porcupine dung, 19 July 1934, *Cain* 46224 (TRTC); Lake Timagami, Sand Point, on partridge dung, 12 Sept. 1936, *Jackson* 40023 (TRTC); Lake Timagami, Paradis Bay, on deer dung, 22 Aug. 1935, *Cain* 40025 (TRTC). Victoria Co.: Oakwood, on rabbit dung, 15 Sept. 1931, *Cain* 36406 (TRTC). Quebec: Duchesnay, on partridge dung, 27 Aug. 1938, *Cain* 46234 (TRTC).

COMMENTS: *Coprotus duplus* has been confused with *C. sexdecimsporus* but differs in having apothecia with less pigment, smaller more cylindrical *asci*, and smaller *ascospores*. This species also resembles *C. glaucellus* except for size of *asci* and *ascospore* number.

#### 7. *Coprotus glaucellus* (Rehm) Kimbrough Figs. 20–24

$\equiv$  *Ascophamus glaucellus* Rehm, in Rab. Krypt. Fl. 1(3): 1086. 1895.

$\equiv$  *Coprotus glaucellus* (Rehm) Kimbrough, Am. J. Bot. 54: 22. 1967.