

PLATE IV. *Lambertella jasmini* and *L. pruni*.—Fig. 1. Apothecia of *L. jasmini* on a stroma grown on PDA, three weeks after planting. Note heliotropic response of young apothecia, nat. size;

ing in the mature spores; two measurements of 50 spores each gave respectively,  $7.8-10.4 \times 4.5-6.2\mu$ , mode  $9.1 \times 5.2\mu$ , av.  $9.2 \times 5.1\mu$ ; and  $8.5-11.0 \times 4.5-6.5\mu$ , mode  $10.0 \times 5.2\mu$ , av.  $9.8 \times 5.2\mu$ ; *paraphyses* slender, two to four branched, septate, apical cells slightly clavate.

HABITAT: On stromatized hulls of *Carya ovata* (Mill.) K. Koch.

TYPE LOCALITY: Woods east of Cayuta Lake, New York, September 9, 1938.

DISTRIBUTION: Known only from the type locality.

TYPE SPECIMEN: Cornell University Pl. Path. Herb. 27881. Duplicate specimens have been deposited in the herbaria listed on p. 29.

NOTES: Abundant material of this species was first collected on September 9, 1938. The fungus has again been found in small quantities under the same tree in 1941. It can doubtless be found elsewhere within the range of its suscept.

Stromata develop and mature on potato dextrose agar in two to three weeks from date of planting with ascospores or mycelium. Mature apothecia develop in from 8 to 10 weeks from date of planting.

This species is very like *L. corni-maris* in many of its characters. The ascospores of the two species are essentially alike in size, shape and color, the guttulae of *L. hicoloriae* however disappear or are completely masked in the mature spores. The stipes of the apothecia are of a light avellaneous color in striking contrast to the dark vinaceous color of those of *L. corni-maris*. It is in the developmental characters of their respective stromata on PDA that the two species are most readily distinguishable (See Pl. I).

#### *Lambertella jasmini* Seaver and Whetzel n. sp.

Pl. IV 1-3. Text Fig. 3

*Stroma*, a thin black subcuticular semi-stroma surrounding the mummified berries of *Jasminum* or irregular areas in the leaves delimited by a black rind layer which also spreads along over the leaf veins. Rind pattern typical of the genus (Text Fig. 1 c). On PDA thin, diffuse, discoid, continuous or interrupted, olivaceous brown, covered sparingly with fibrillose aerial hyphae.

*Spermatia* not observed. This species is homothallic.

*Apothecia* one to several arising from the stroma in fruits, pedicels or leaves of the suscept, 1-5 mm. in diameter, fleshy, stout-stipitate, elastic; *disc* shallow cupulate to applanate, at first chamois color to dark olive

2, section through a piece of the stroma bearing apothecial fundamentals and mature apothecia, nat. size; 3, mummified berries of *Jasminum gracile*, bearing apothecia  $\times 2$ ; 4, apothecia of *L. pruni* on a stroma produced on PDA, eight weeks after planting, nat. size; 5, stroma from sweet cherry fruit bearing apothecia  $\times 2$ .

buff, underside of receptacle concolorous with young hymenium, fibrillose, short tips of the hyphae forming a fringe about the margin of the cup; *hymenium* at first chamois color becoming buckthorn brown just before spore discharge, a pale Isabel color immediately thereafter; *stipe* stout to

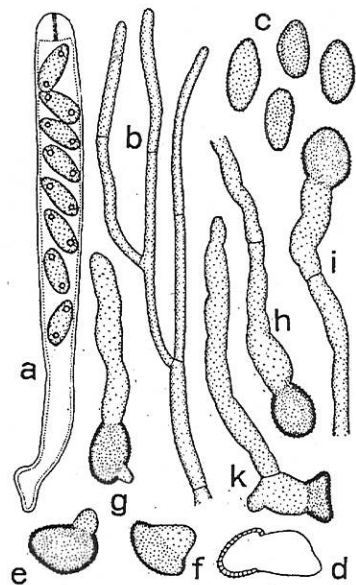


FIG. 3. *Lambertella jasmini*.—a, Ascus, containing young hyaline spores, showing the biguttulate condition and absence of wall ornamentation; b, three-branched paraphysis; c, four mature ascospores, thick walled with protruding ends of "wall plugs" showing  $\times 1000$ ; d, diagrammatic section through germinating spore to show my concept of the "wall plugs"; e-k, stages in spore germination. The spores swell considerably on germination and the "wall plugs" become more prominent. The first cell adjacent to the spore is often markedly swollen. All figures except c  $\times 900$ .

slender, usually relatively short, above concolorous with receptacle, becoming darker with age, cinnamon brown, fibrillose, puberulent, with erect rather long spreading hairs abundant near the base, the apical cells of which are often swollen and prolonged into a slender apiculus. The apothecia of this species exhibit none of the vinaceous hue so characteristic of *L. corni-marit*, presenting instead a distinct yellowish coloration; *asci* cylindrical, usually sharply attenuate in the lower third, forming a slender foot (Text Fig. 3a); apex rounded and thickened, pore faintly J+, 38 measurements  $96.0-133.2 \times 7.2-9.6\mu$ , mode  $102.0 \times 7.3\mu$ , av.  $109.5 \times 8.3\mu$ ;

8-spored, spores uniseriate; *ascospores* broadly elliptic, flattened on one side, with peg-like thickening of a darker color than the rest of the wall (Text Fig. 3c) appearing as minute punctations or low warts over the surface, hyaline when young with two prominent guttulae, becoming dark golden brown at maturity, 100 measurements  $9.9-6.4\mu \times 5.3-3.2\mu$ , mode  $8.5 \times 4.6\mu$ , av.  $8.6 \times 4.2\mu$ ; *paraphyses* hyaline, slender, 2-3 branched, septate, apical cells slightly clavate.

HABITAT: On mummied berries and leaves of *Jasminum gracile* Andr.,<sup>6</sup> and on leaves of *Citharexylum spinosum* L., Bermuda, November to January 1912, 1920, 1941, also isolated by J. M. Waterston, Bermuda Agr. Exp. Sta. from rotting fruit of the loquat, *Eriobotrya japonica* in May 1941.

TYPE LOCALITY: Walsingham, Bermuda.

DISTRIBUTION: Known only from Bermuda.

TYPE SPECIMEN: Cornell University Pl. Path. Herb. 29543 on berries of *Jasminum*, duplicate specimens of which have been deposited in the herbaria listed on p. 29, No. 29793 on fallen leaves of *Citharexylum spinosum* and No. 29437 on fruit of *Eriobotrya japonica* together with stromata and apothecia produced on potato dextrose agar from all three natural substrata are deposited in the Plant Path. Herb., Cornell University.

NOTES: The earliest collections of this species appear to be those of F. J. Seaver taken during the autumn of 1912 on mummied berries and leaves of *Jasminum gracile* (N.Y.B.G. Bermuda Explorations Nos. 1397 and 1362). These collections were very meager and are now of little value for study. It was collected again in January 1920 by Whetzel at Walsingham, Bermuda on the stromatized berries and leaves of the same suspect (Pl. Path. Herb. Cornell University Nos. 29479 and 29480) but again in very small numbers. This is the species referred to by Harrison and El-Helaly (1935:212). Both Seaver's and Whetzel's collections proving too scanty for a satisfactory description of the species, the assistance of J. M. Waterston, Pathologist of the Bermuda Experiment Station, was enlisted to obtain living material. During the late summer of 1941 he collected a large quantity of mummied berries of the Jasmine at Walsingham and sent them to me. Forcing them in moist chambers, a number of excellent apothecia developed from which a pure culture was obtained. Most of the mummied berries yielded a very similar appearing apothecial form which both Waterston and I had at first taken to be *L. jasmini* but which on critical examination proved to be a quite distinct hyaline spored stromatic discomycete. Earlier in the summer of 1941 the writer had received from Mr. Waterston a pure culture together with a small piece of the skin of a

<sup>6</sup> Bailey (Gentes Herb. 4: Fasc. 9: Art. 29: 345. 1940) has shown that Britton was in error in referring this species to *J. simplicifolium* in his Flora of Bermuda p. 285, where he cites *J. gracile* Andr. as synonymy.

rotting fruit of the loquat bearing a few apothecia of a brown-spored discomycete which was at once recognized to be a *Lambertella*. It had been thoroughly studied before the fresh apothecia and pure cultures were obtained from the mummied berries of Jasmine. A careful comparison of the two which have been grown and fruited simultaneously in pure culture leaves no doubt as to their identity. In November 1941 Waterston collected what proves to be the same species on fallen leaves of *Citharexylum spinosum*. Since the earlier collections of this species were made on berries of the Jasmine but are too scarce for critical study, the apothecial material developed at Ithaca, New York on berries from Bermuda is designated the type of this species.

That this fungus does invade and stromatize areas of the leaves of Jasmine is attested by examination of apothecia on a single leaf of my 1920 collection (Pl. Path. Herb. Cornell University No. 29479) and by my original notes made at the time of collecting. I have also received a leaf and twig of Jasmine from Mr. Waterston each showing stromata and apothecia of this species. The occurrence of this species in rotting fruits of the loquat is probably accidental rather than habitual. Its usual suscepsit is doubtless the Jasmine or *Citharexylum*. Its prompt development of apothecia in culture (2-3 weeks) from planting on potato dextrose agar in contrast to the relatively long period required for apothecial development by the other species (7 weeks to some months) is but one of several characters consonant with its tropical habitat. Its ability to thrive at and withstand relatively high temperatures is another. During the hot spell of 1941 (July and August) in the laboratory at Ithaca it grew rapidly and produced apothecia promptly while *L. corni-marit* and *L. hicoloriae* were seriously inhibited in their development.

*Lambertella pruni* Whetzcl and Zeller, n. sp.

Pl. IV 4-5 and Text Fig. 4

*Stroma* a thin, wrinkled black crust surrounding the mummied cherry, often adherent to the stone; on PDA a thin, diffuse zonate or discoid dull black crust formed at the surface above a submerged mat of ochre yellow mycelium; surface bare or covered with sparse white webby aerial hyphae; rind pattern typical of the genus (Text Fig. 1 c).

*Spermatia* globose, about  $3-4\mu$  in diameter. Known only from agar cultures where they are produced in typical naked spermodochia. This species is apparently heterothallic.

*Apothecia* gregarious, as many as 100 arising from a single stromatized cherry at maturity 1.5 mm. diam., short stipitate to sessile, fleshy, elastic; *disc* from the first patellate to convex, white furfuraceous beneath, margin fringed with short hyphal tips, when young avellaneous to wood brown; *hymenium* pale buffy brown, becoming clove brown with maturity of the

ascospores, strikingly lighter colored immediately after spore discharge; *stipe* very short, sharply constricted at point of attachment; base black; *asci* long cylindric, slightly narrowed at the very tip, which is rounded and thickened, sharply attenuate at the base, pore J+; 25 measurements

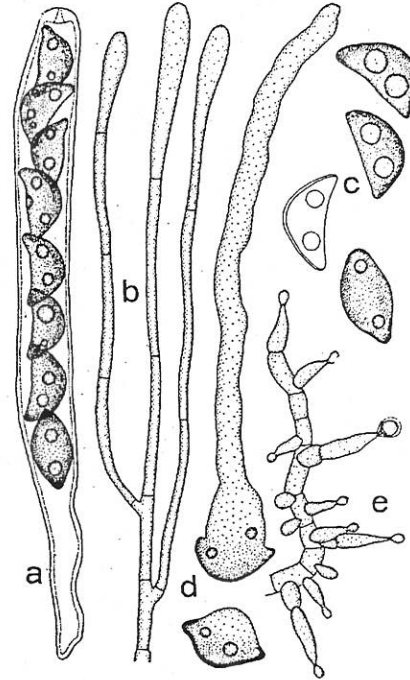


FIG. 4. *Lambertella pruni*.—a, Mature ascus with spores ready for ejection; b, paraphysis; c, mature ascospores, the two above in side view, the lowest in concave face view, the fourth in a diagrammatic optical section showing thickening of convex face  $\times 1000$ ; d, two stages in germination of the spore; e, early stage in development of the spermodochium. All drawings, except c,  $\times 380$ .

$115-150 \times 10-14\mu$ , mode  $126 \times 11\mu$ , av.  $126 \times 12\mu$ ; 8-spored, spores uniseriate; *ascospores* lunate, with broad blunt ends, the convex wall thick and dark, the concave wall thin and light colored, smooth, biguttulate, guttulae J+, golden brown becoming dark olivaceous brown at maturity; 50 meas.  $12-18 \times 7-8.4\mu$ , mode  $14 \times 8.4\mu$ , av.  $15 \times 8\mu$ , germ tube arising from the thin concave face; *paraphyses* three-branched, septate, apical cells more or less clavate and vacuolate.