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NOTES ON IOWA FUNGI. IX.

G. W. MARTIN

DELACROIXIA CORONATA (Cost.) Sacc. and Sydow. Figs. 4, 5.

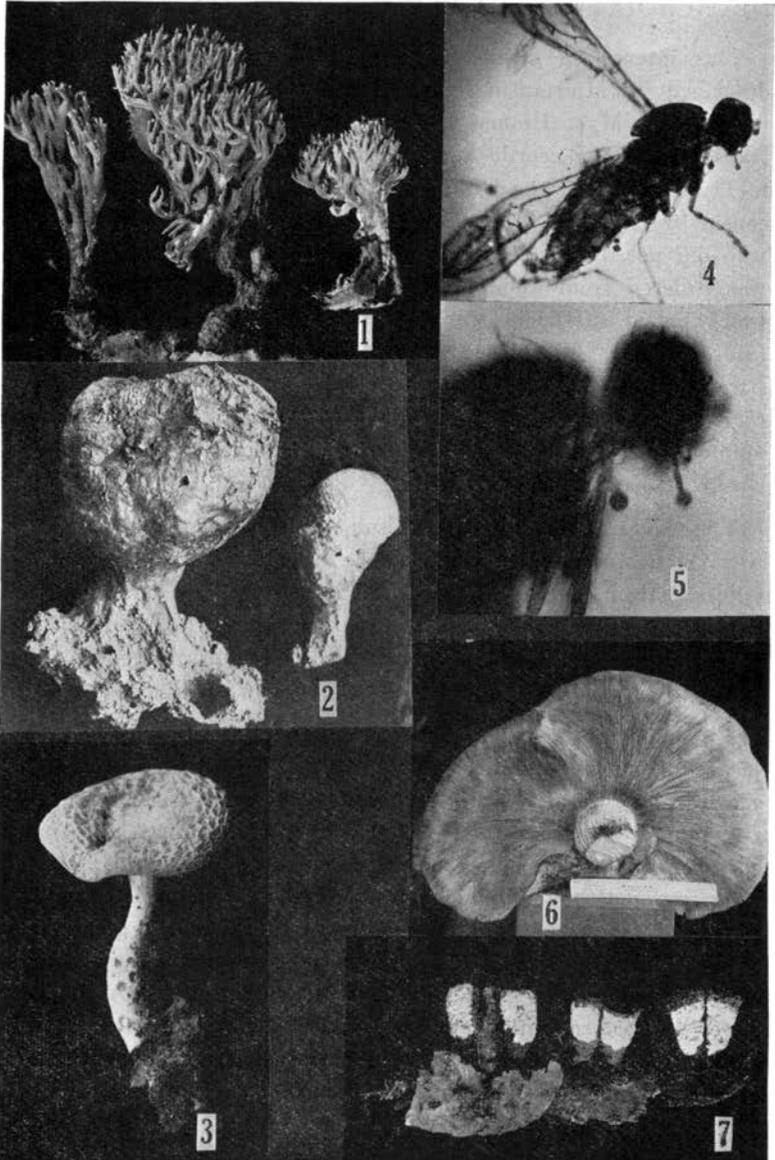
This interesting member of the Entomophthoraceae was first described by Costantin from France as *Boudierella coronata* (Bull. Soc. Myc. France 13: 38. 1897) and shortly afterwards transferred by Saccardo and Sydow (Syll. Fung. 14: 475. 1900) to *Delacroixia*. In the United States it was first isolated in Wisconsin by Gilbert (Trans. Am. Microsc. Soc. 38: 263-269. 1919), who did not, however, ascribe a name to it. A few years later it was isolated from wood in Iowa and published, on what at that time seemed sufficient warrant, as *Conidiobolus villosus* Martin (Bot. Gazette 80: 311-318. 1925). Kevorkian (Jour. Agr. Puerto Rico 21: 191-200. 1937) transferred the species to *Entomophthora*, but Couch (Am. Jour. Bot. 26: 128. 1939) expressed the opinion that it should be retained in *Delacroixia*, in which conclusion I concur.

The fungus has since been isolated in seven other localities. Kevorkian studied three strains, one from Iowa, the *Conidiobolus villosus* strain, one from Cuba and one from Holland. He found that the first two were able to infect termites when these insects were put in culture dishes in which the fungus was growing, but failed to secure infection with the strain from Holland.

Twice since the original Iowa isolation, the fungus has been secured from leaf mold near Iowa City, where it was presumably growing saprobically. In November, 1939, some wood was taken from an old spruce stump at Charles City and put in a moist chamber to develop slime molds. A few days later several small flies emerged, one of which was observed to be infected with a fungus. Examination showed that the parasite was typical *Delacroixia coronata* (Figs. 4, 5) although no trace of the fungus could be discerned on the wood. The fly was submitted to Dr. Eleanor Slifer for determination and she pronounced it to be in all probability one of the gall midges (Cecidomyidae), although the loss of the antennae in manipulation prevented definitive determination.

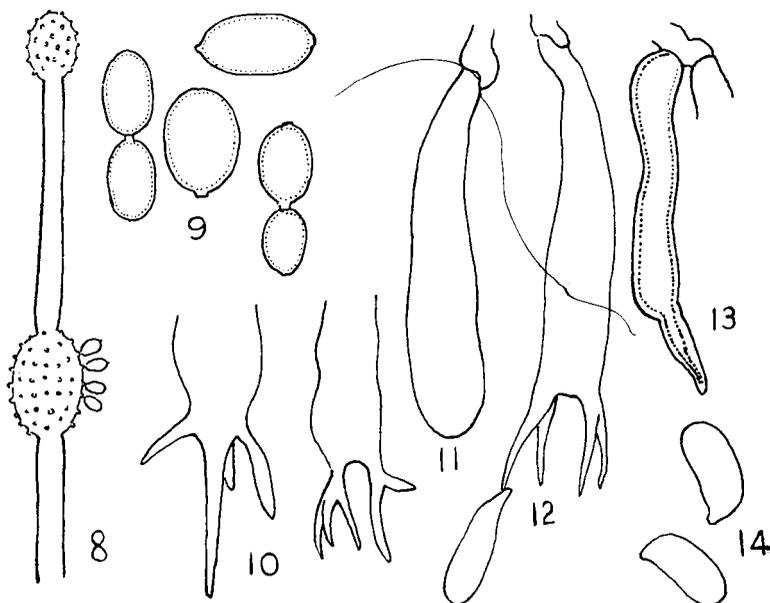
Delacroixia has been regarded as primarily saprobic, although Kevorkian's experiments have shown that it is at least a facultative

tative parasite. The present instance, while perhaps not to be regarded as a wholly natural infection, is a further suggestion that it may be a true parasite on insects.



STAMNARIA AMERICANA Masee and Morgan

This small but brilliant orange discomycete is abundant on *Equisetum laevigatum* in the vicinity of Iowa City. The *Gloeosporium* stage appears in late summer on the still erect stalks, while the apothecia appear the following spring on the same stalks, by



that time usually prostrate. Seaver (*Mycologia* 24: 3, 1932) publishes an excellent illustration and points out that the American species differs from the European *S. Equiseti*, with which it has been confused, in the substantially larger asci and spores. The spores of the Iowa collections fall within the dimensions, 24-32 x 7-9 μ , given by Seaver.

HYPOCREA LATIZONATA Peck. Fig. 7.

Originally described from Ohio (in Ellis and Everh. *N. A. Pyrenom.* 79, 1892) on the basis of specimens sent by Morgan to Peck, this species has since been reported only from Indiana, by Lohman (*Proc. Ind. Acad.* 47: 91, 1937), who presents an excellent illustration. Both the Ohio and the Indiana collections were parasitizing the cups of *Cyathus striatus* Schw. During the summer and fall of 1941 the species was fairly common at Iowa City, on the same host. The stromata are at first pure white, becoming

dingy, then creamy or pinkish—close to vinaceous buff of Ridgway—as the perithecia mature. They are very striking when seen as a pale girdle encircling the dark cups of the host. Although *Crucibulum levis* Pers. was abundant in the immediate vicinity, no evidence was found that the *Hypocrea* ever attacks it.

Lohman expresses some doubt as to the identity of the host in the case of the Indiana collection, based partly on the rather faint striations within the cups of the parasitized basidiocarps and partly on the fact that the host fructifications occurred on soil rather than on wood. In the case of the Iowa material, there can be no question of the identity of the host, since the parasitized basidiocarps, growing on very rotten wood, were accompanied by unparasitized and entirely typical examples of *Cyathus striatus*. There was some evidence of the suppression of striations in the parasitized cups. Furthermore, it is by no means uncommon to find *C. striatus* on soil, especially if it contains woody debris, hence it seems highly probable that Lohman's determination of the host was correct.

While 1941 is the first year I have noted the *Hypocrea*, in previous years I have not infrequently seen a white, mold-like growth on the cups of the *Cyathus*. I am inclined to believe that this has been the young stroma of the parasite and that the species is not uncommon in eastern Iowa.

PEZIZA AMPLISSIMA Fries

This large and handsome discomycete, better known as *Sarcosphaera coronaria* [Jacq.] Schroet., seems not to have been reported previously from Iowa. Seaver (N. A. Cup-fungi. Operc. 236. 1928) says "reaching a diameter of 6 cm." and adds "seldom collected." Velenovsky (Mon. Discom. Bohem. 353, as *Pustularia*) gives the diameter as 8-22 cm. A typical example, collected by Dr. L. W. Danielson at Pine Hollow, Dubuque County, was 12 cm. in diameter, almost spherical except for the stellately opened top. It was in its usual habitat, in humus under pines, and the subterranean development was indicated by the cleared hollow in which it was seated.

Since this species differs from other species of *Peziza* only in its more marked hypogeous habit and stellate dehiscence, which together seem insufficient to justify generic segregation, I prefer to apply Fries's name to it. In any event, the specific name applied by Jacquin seems to have no standing under the accepted rules of nomenclature.

LACHNOCLADIUM MICHENERI Berk. and Curt. Figs. 1, 10-14.

The species of *Lachnocladium* are chiefly fungi of tropical and warm temperate regions, although a few species are widely distributed in cooler areas. No species has heretofore been reported from Iowa. The present species is rather abundant in the vicinity of Iowa City, and may be common in other parts of the State but is likely to be overlooked as a whitish and somewhat wilted *Clavaria*. It may readily be distinguished from a *Clavaria* in the field, however, by its tougher texture, difficult to describe in words but quite unmistakable when known, and by the conspicuous basal mycelium from which the fructifications arise. Burt (Ann. Missouri Bot. Gard. 6:271. 1919) describes the spores as hyaline, and cites specimens from Canada, the Middle Atlantic states, Ohio and Missouri. Coker (Jour. Elisha Mitchell Soc. 42: 253. 1927) comments on the species after examining an Ohio collection, but did not see fresh material. Under the microscope, the spores appear very faintly colored but a spore print is distinctly brownish ochraceous. Burt also notes that when fresh the fungus has a bitter taste. I have tested it several times in the field and should describe the taste, not as bitter, but as slightly and tardily nauseous.

The immature basidiospores (Fig. 12) are curiously long and slender, apparently becoming shorter and thicker as they mature (Fig. 14). The hymenium contains numerous thick-walled cystidium-like structures (Fig. 13) with a slender tip, which, however, does not protrude above the general hymenial level. In addition to these, a collection made in July, 1941, contained many bodies exactly like the basidia except that they were tipped with sterigmata-like, but irregular, often enlarged and sometimes branching spikes (Fig. 10). I interpret these as aborted basidia. None were observed to bear spores. Professor Coker has seen some of my material and agrees with the determination.

LACTARIUS PIPERATUS Fries

This common species is also one of the largest in its genus. Kauffman (Agaricaceae Mich. 95. 1918) gives the diameter of the pileus as 4-12 cm. Burlingham (N. A. Flora 9: 176. 1910) says "4-12 cm. or more in diameter." A basidiocarp observed at Iowa City July 7, 1939, was 21 cm. broad, the stem massive in proportion. Other basidiocarps in the vicinity ranged from 18-20 cm. across.

PLEUROTUS ULMARIUS Fries. Fig. 6.

This large agaric is a familiar sight in late fall, growing from knot-holes or the stubs of branches of various frondose trees, particularly elms. It was illustrated by Gilman in his paper on the white-spored mushrooms of Iowa (Proc. Iowa Acad. 48: 100. 1941). Gilman quotes the description of Kauffman (Agaricaceae Mich. 659. 1918) in which the width of the pileus is given as "5-15 cm. or more." Murrill (N. Am. Flora 9: 307. 1916) says: "7.5-15 cm. broad." It is interesting to note that many of the older writers give much larger dimensions. Battarra (Fung. Arim. Hist. 44. 1759) says the pileus may exceed a foot in diameter. Bulliard (Champ. France, Pl. 510. 1790) says "sometimes up to 12-15 inches in diameter." Sowerby (Brit. Fungi, Pl. 67. 1797) makes it "frequently two or three feet in circumference" which would approach a foot in diameter. DeCandolle (Fl. France 2: 138. 1805) gives the diameter as 3-4 decimeters. In view of these figures, the modest dimensions cited by Fries (Syst. Myc. 1: 186. 1821), "3-5 inches and larger broad", seem quite modern. A specimen collected from an elm tree in Iowa City in October, 1941, exceeded all of the measurements cited. The pileus was 41 cm. (16½ inches) in width, tangentially to the point of attachment, 30 cm. across radially and weighed 2012 grams without the base of the stipe, which was too deeply imbedded in the bark to be secured.

PLEUROTUS SUBPALMATUS Fries. Fig. 3.

This striking species seems to be decidedly rare. Lloyd (Myc. Writ. 1: 51. 1901) comments on a specimen from Minnesota, which he illustrates, and notes previous collections from Kansas and Ohio. Kauffman (Agaricaceae Mich. 662. 1918) reports it as rare in Michigan. Both note that it is an anomalous *Pleurotus*. Lloyd suggests that it might be placed either in *Entoloma* or *Claudopus*; Kauffman suggests *Entoloma* and *Heliomyces*.

A specimen collected on a dead elm log in Iowa City by Mr. R. A. Dennison, July 1, 1939, is certainly to be referred to this species, although it does not agree entirely with the published descriptions. The pileus was 37 mm. broad, and since the margin was still inrolled, it had evidently not attained full development. The beautiful salmon-colored pileus (carrot-red of Ridgway, shading to flesh colored on the disk) with its gelatinous surface deeply corrugated in a reticulate pattern is unmistakable. The gills were carrot-red; the stalk, 5 cm. long, was 5 mm. thick and whitish

tinged with flesh above; the lower two-thirds was thicker and encased in a yellowish, fleshy sheath sharply separated from the stipe proper although adherent to it, and marked on the surface with brown, slightly sunken areas.

A second, and younger collection consisting of two sporophores, was found by Mr. E. A. Kurth at Wild Cat Den late in the same month. In this collection the sheath was less evident.

PISOLITHUS TINCTORIUS (Pers.) Coker and Couch, Fig. 2.

The occurrence of this interesting gasteromycete in Iowa was noted in the previous paper in this series (Proc. Iowa Acad. for 1939. 46: 94. 1940). Subsequently, I have received from Dr. H. S. Conard a splendid collection, equalling in size any specimens I have seen from the east, where the species is locally abundant in pine barrens. They were growing in disintegrated sandstone in an old quarry at Red Rock, Marion County.

GONATORHODIELLA PARASITICA Thaxter. Figs. 8, 9.

This curious and interesting hyphomycete was described by Thaxter (Bot. Gazette 16: 202. 1891) from Connecticut, as parasitizing *Hypocrea* and *Hypomyces*. Ayres (Mycologia 33: 178-184. 1941) refers to but one collection besides Thaxter's. Since the species is bright reddish brown (about tawny of Ridgway) and grows in dense mats, it is not inconspicuous, and would probably be collected more frequently were it not uncommon. We have a collection from Estherville, growing on *Tomentella* and *Polystictus*, which appears to be entirely typical. The spores are borne singly or in short chains, rather variable in size, up to 10 μ long and 6.5 μ wide, but mostly smaller. The species appeared a second time on moldy wood collected in Iowa City and placed in a moist chamber, and was secured in culture, but has not been kept.

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EXPLANATION OF FIGURES

All reproduced at magnifications indicated. Figs. 8-14 drawn with aid of camera lucida.

1. *Lachnocladium Micheneri*, $\times 2/3$.
2. *Pisolithus tinctorius* $\times 1/4$
3. *Pleurotus subpalmatus*, $\times 2/3$
- 4-5. *Delacroixia coronata* on small fly. 4, to show mycelium, $\times 44$: 5, head enlarged, $\times 103$.

6. *Pleurotus ulmarius*, $\times 1/9$.
7. *Hypocrea latizonata* on *Cyathus striatus*, $\times 2/3$.
- 8-9. *Gonatorhodiella parasitica*. 8, tip of conidiophore, $\times 310$; 9, conidia, $\times 1500$.
- 10-14. *Lachnocladium Micheneri*. 10, tips of aborted basidia; 11, young basidium; 12, basidium with immature and elongate spore at-
 $\times 1500$.