Notes on Indiana Fungi—1937

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Of the species of fungi collected in the vicinity of Bloomington this year several are especially worthy of record for interesting variations in morphology, or for their apparent rarity, or for notable extensions of reported distributions.[1] These notes consider morphological aspects of *Polyporus Berkeleyi* Fr. and *Geastrum triplex* Jung.; the occurrence of *Verticillium albo-atrum* R. & Berth. in connection with wilt of common sumach; and observations on the following species, none of which perhaps has been reported previously for the state: *Marasmius iocephalus* (B. & C.) Penn., of the Atlantic States region; *Glonium clavisporum* Seaver, which has been regarded as a species of the Gulf and Atlantic Coastal Plain flora in its northerly range from Central America; *Orbilia curvatispora* Boud.; and *Hypocrea latizonata* Pk. ex E. & E. on *Cyathus striatus* P.

Fig. 1. *Hypocrea latizonata* Pk. ex E. & E. on *Cyathus striatus* P.; x 2.

In general the more common species of fleshy fungi were relatively abundant except during the mid-summer season when expected species of Russula and Lactarius were seen infrequently or not at all.

1. *Marasmius iocephalus* (B. & C.) Penn.[2]

On July 31 ten specimens of this unusual Marasmius, odorous but beautiful, were found attached to unidentifiable decaying leaves in low, wet, wooded ground along Griffy Creek in Monroe County (5788). The

[1] The collection numbers indicated herein are accession numbers in the Mycological Herbarium, Indiana University. Materials have been deposited in other herbaria as follows: Farlow Herbarium, Harvard University, 5775, 5776; Mycological Collections, Bureau of Plant Industry, Washington, D. C., 5775; New York Botanical Gardens, 5775, 5790; University Herbarium, University of Michigan, 5775, 5788.

[2] Specific determination was kindly furnished by Dr. A. H. Smith of the University Herbarium, University of Michigan, wherein specimens of the present collection have been deposited.

fructifications were loosely gregarious; with slender yellowish white stems tomentose above and strigose below; and with caps, measuring up to 3 cm. in diameter, convex, membranous and striate, lilac to violet above and concolorous or paler below in the narrow and rather distant gills. The spores measured 6-7 x 3-3.5 μ, being typical for the species. The caps on drying became bluish gray—the color of iodine crystals as the specific name implies. When fresh caps were crushed between the fingers the odor was suggestive of Skunk Cabbage. Specimens on drying, however, gave a decidedly garlic odor which even persisted in the packets for several days. Aside from the delicate form and attractive color contrast between cap and stem, the most striking feature is the odor which Pennington (North American Flora 9:271. 1915) while recognizing alliaceous odors for other distinct but closely related species, several of which undoubtedly occur in Indiana, describes simply as "strong."

The species was first described by Berkeley and Curtis as *Agaricus iocephalus* on material collected in South Carolina. Pennington (l.c.) gives the distribution as from New York to Alabama and the habitat as upon leaves in woods or swamps. Apparently it has not been reported heretofore from the central states. The present collection, therefore, is of further and special interest for the notable extension of the known range of distribution.

2. *Polyporus Berkeleyi* Fr.

An unusually fine specimen of this giant polypore was received July 6 from Mr. George Bosley, who collected it near Marengo, Crawford County (5783). The species is usually reported as occurring near oak stumps or living oak trees with occasional mention of other species, and in the present instance Mr. Bosley reported that the fructification occurred near the base of a very old, living White Oak. Weir (Phytopathology 3:101. 1913) has noted an association with Beech in Indiana.

When fresh, the specimen measured 52 x 38 cm. and 28 cm. high, exclusive of the irregularly tuberous base which averaged 10 cm. in diameter. The single stalk supported twenty distinct, large pilei, the largest measuring 32 cm. in breadth, and about as many smaller but less distinct fertile imbrications. Basidiospores are typical, being hyaline, obscurely roughened, and subglobose, measuring 8 x 6 μ. Most of the popular treatments of the higher fungi mention fructifications of this species comparable in size, yet these—with the possible exception of Krieger's illustration (Fig. 25, The Mushroom Handbook. 1936. New York)—and the descriptions and illustrations in the technical treatments as well, indicate less massive and more loosely imbricated specimens. Other specimens in our herbarium are less complex, showing but two to five large pilei. However, all are from Monroe County.

A detailed, technical and illustrated account of the rot in oaks due to this fungus is given by Long (Jour. Agr. Research 1:122-125. 1913).

3. *Geastrum triplex* Jung.

Profuse fruiting of the large autumn earth star, *Geastrum triplex* Jung., was observed near Bloomington in October by Miss Wilma Bur-

man, who collected from the fructifications about a maple stump six unexpanded and 32 expanded specimens (5789). The collection is of interest for the fact that, while it is undoubtedly comprised of a single species, one finds among the buttons both globose and acute forms and among opened basidiocarps smooth to fibrilose-sulcate mouths on either indefinite or more or less definite circular areas, which in about half are concolorous with the endoperidium and in the other half paler. These are features of diagnostic value in the recognition of *G. Morganii* Lloyd, *G. Archeri* Berk., and *G. triplex* Jung. Perhaps the majority of the specimens in the present collection, when all features are considered, would be referred to *G. Morganii*, which Lloyd at one time considered distinct from *G. triplex*, and equally as common as that species in the vicinity of Cincinnati. Among more recent American treatments of the genus, there is little agreement on the usage of these names—some students concluding that the three represent distinct species, others placing the *G. Morganii* in the synonymy of *G. Archeri*, and others placing the two in the synonymy of *G. triplex*. The latter contention appears most feasible in view of variations in the present collection when compared with available descriptions of type specimens.

4. *Orbilia curvatispora* Boud.

What appears to be this species as it is recognized by several European students was collected in abundance in Bloomington, on July 27, from the crevices of the bark of a Black Walnut tree which had been dead for one year (5775). The clustered apothecia were concealed in the deeper fissures of the bark where they occurred largely in close relationship with the mycelium of some hymenomycete. The apothecia are somewhat darker than Boudier describes them, being yellowish brown when fresh and drying reddish brown and agreeing more or less with Rehm's conception of the species. They average under 1 mm. in diameter, and they have globular wall-cells 10 to 12 u in diameter and simple septate paraphyses noticeably and typically thickened at the apex; the asci are 35-40 x 3-4 μ and do not blue at the tip with iodine solution; and the ascospores are 7-10 (12) x 1.5 μ, slightly sigmoid or abruptly curved at one end. In comparison with descriptions of European material, the spores are shorter but agree in form, the curvature being pronounced. The species is distinct in size of apothecia and form of spores from *O. rubella* (Pers.) Karst., which occurs on Juglans and other hosts in Europe. *O. coccinella* (Sommf.) ex Fr. and *O. delicatula* Karst., which have been reported as occurring on Juglans in the eastern states, have smaller apothecia and shorter ovoid spores measuring 3-4 x 3μ.

5. *Glonium clavisporum* Seaver.

Glonium clavisporum Seaver was collected near Bloomington in November, 1936, from bark and wood of a maple log lying in a moderately dense, swampy wood lot (5790). Hysterothecia were not abundant, but the conidial stage *(Sporidesmium stygium* B. & C.) blackened the surface of the log in irregular patches extending altogether about two meters. As to size, both the hysterothecia and the conidia, in specimens taken, are under average but within the limits of the species (Lohman. Bull. Torr. Club 64:61-63. 1937). Asci and ascospores and the hy-

menium, which is yellowish green as seen with a hand lens, are typical. This is a notable extension of the known range of the species, which is tropical and subtropical and heretofore has been considered in North America a component of the Gulf and Atlantic Coastal Plain flora.

In view of present knowledge, this species is separable from *Glonium simulans* Ger., which is widespread in deciduous forest regions of the United States east of the Rocky Mountains and has smaller hysterothecia and ascospores, a paler hymenium, and no known conidial stage. Its occurrence northward in Indiana is doubtful. It may be rare in the southern part of the state. However, at least in certain localities, climatic conditions approximate those of the Coastal Plain and could be favorable to the species perhaps periodically. With respect to climate and the distribution of the species, it is interesting to note that it has been reported recently as occurring in China in the vicinity of Nanking and southward in the coastal provinces of Kiangsu, Chekiang and Fukien, climatic conditions of which approximate those of Alabama and Arkansas.

6. *Hypocrea latizonata* Pk. ex E. & E. on *Cyathus striatus* Pers.

Whereas the fruiting of species of the Hypocreaceae on agarics and polypores is commonplace, such relationship with fructifications of the Gasteromycetes is much to the contrary.

Seemingly very little is known of *Hypocrea latizonata* Pk., a species which Ellis and Everhart (North American Pyrenomycetes, p. 79-80, 1892) ascribe to Peck, based upon a collection of parasitized *Cyathus striatus* Pers. sent by Morgan from Ohio. A scant collection (5776) of this fungus was made in Monroe County early in July, consisting of seven fructifications of what appears to be *C. striatus*, although the habitat of the host is at variance with that recognized for it by students of the Gasteromycetes. The Hypocrea in all respects conforms to the original description, its stromata forming bands on the cups as the specific name implies (Fig. 1). One wonders if perhaps some specific nutritive substance limits the stroma preventing it from entirely enveloping the cup. The stromata are creamy white and closely punctate with minute brownish ostioles. The asci measure 70-80 x 4 μ, the subglobose hyaline sporules 3.5 μ and the individual ascospores 7 x 3 μ. The several cups show various degrees of development of both the host and the parasite.

It appears that a cup is parasitized early in its development, the stroma arising first opposite the base and then developing upward with the elongation of the cup. Possibly the parasite utilizes nutritive tissue which would normally serve the peridioles, for these are mostly lacking or abortive.[3] Only one of the seven cups had developed peridioles, of which five were definitely abortive and two normal in size and color; one of the latter had a few and the other an abundance of hyaline, elliptical basidiospores uniform in size and measuring 17-20 x 7.5 μ.

In all features pertaining to peridiole and basidiospores, the collection conforms to descriptions of *Cyathus striatus* Pers. The cups, however, are nearly smooth within, and they were found loosely scattered

[3] Neither Ellis and Everhart (l. c.) nor Seaver (Mycologia 2:56. 1910. Pl. 20, fig. 9-10) comment on the fertility of the Cyathus in the original collection.

on clayey silt free from any recognizable decaying debris. Lloyd (The Nidulariaceae, p. 18. Cincinnati. 1906), in discussing *C. Schweinitzii,* which is now considered a synonym of *C. striatus,* mentions the occurrence of the species on soil but considers such habit as very rare. White (Bull. Torr. Club **29**:262. 1902) describes specimens collected on the ground and on wood in Yucatan with which the present collection agrees in all respects. She refers the material to *C. Montagnei* Tul., a species not yet recognized for temperate North America, emphasizing the faintly striate character of the cups. Most authors, however, consider *C. Montagnei* to have more broadly elliptic spores and its normal habitat in South America to be bark or wood. *C. Poeppigii* Tul., which occurs on damp soil and might be found in this region, has spores twice as large. Since the cups in the present collection are diseased, certain peridial characteristics of specific value thus being obscured or possibly altered, I prefer to record them under *C. striatus* even though the occurrence of the species on soil remains problematical.

Aside from the question of identity of the host, the collection is of particular interest for the apparent infrequency of the parasite. I find in the literature no mention of *Hypocrea latizonata* or any other species of the genus on any species of the Nidulariaceae, other than the original collection referred to. If the Hypocrea is specific to Cyathus and endemic, it is surprising, indeed, that it is not recorded at least by Lloyd, who was interested in both genera. If it occurs only rarely on Cyathus and normally on decaying wood or on hymenomycetous fungi, its specific identity is not evident unless it be *Hypocreopsis tremellicola* (E. & E.) Seaver of *Tremella albida* in Ohio, with cells of the ascospores separated, or a pallid form of *Hypocrea fungicola* Karst., or *H. citrina* (P.) Fr., which is even less likely.

7. *Verticillium albo-atrum* R. & Berth. and wilt of *Rhus glabra* L.

On June 20, in Bloomington, a wilt of *Rhus glabra* L., similar to that reported recently by Fowler (Plant Disease Reporter **21**:10. 1937.) for the Smoke Tree, was observed on three shrubs, one having a spread approximately eighteen feet across with one third of the crown diseased. The following week a single wilted specimen was observed in Lawrence County (along a quarry road near Oolitic) and two cases north of Spencer in Owen County. In each instance the wilt appeared to be confined to a single primary branch, and initial wilting had occurred at the time of full flowering or shortly thereafter. From two of the shrubs in Bloomington, *Verticillium albo-atrum* R. & Berth. was consistently isolated from internodes formed in 1936 but not from the new growth. Stems yielding the fungus showed characteristic brownish streaking except in terminal growth of the current year. Streaking was apparent lower than internodes from which isolations were made. Roots were not examined. (5779.)

The disease in Bloomington resulted in complete flagging of wilted leaves, and the flower clusters terminating infected branches did not develop fruits. The twigs remained alive, however, producing in July new foliage, which attained full development and persisted without any outward signs of infection. In contrast to this condition Fowler reports for the Smoke Tree death of infected portions.