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A Note on Epicoccum

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A Note on *Epicoccum*

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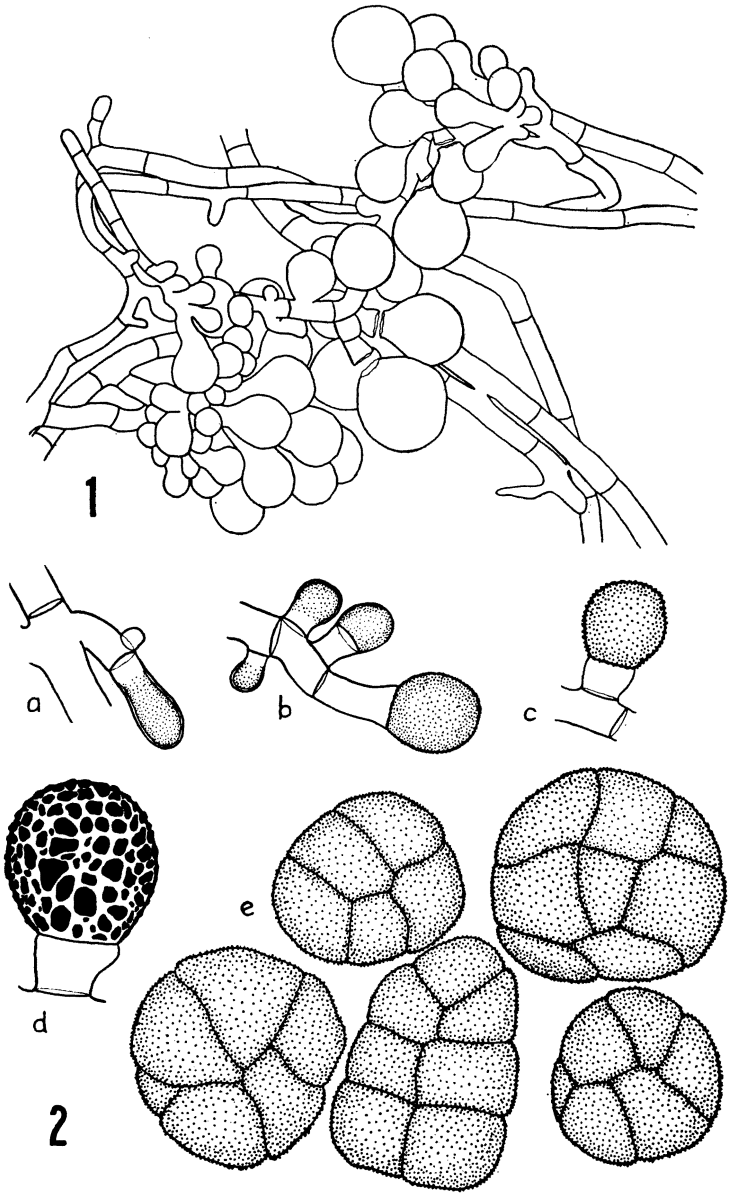
On 27 September, while making isolations from corn stalks collected near Iowa City, a fungus of the genus *Epicoccum* was isolated from a short section of stalk which had been put into a moisture chamber on September 22. The same fungus has been isolated 3 times from corn stalks since then. Attempts to determine the species led to a realization of the uncertainty concerning the species in this genus and the inadequacy of the descriptions and illustrations. The fungus under discussion was at first determined as *Epicoccum neglectum* Desm. (Ann. Sci. Nat. Bot. II. 17:95. 1842); however, Damon (1953) examined material in the Link herbarium and found that *E. neglectum* Desm. was identical with *E. nigrum Link*. Thus *E. neglectum* Desm. was reduced to synonymy and the fungus under discussion is *Epicoccum nigrum* Link (Handbuch. 3:430. 1833).

On blue-grass agar the hyaline hyphae are sparsely floccose, 1-1.5 mm high, on and immediately around the grass fragments. The hyphae are mostly on the surface or subsurface; the reverse is light reddish brown. The hyphae are variable in diameter (3-6.5μ) and anastomose frequently by short lateral branches or when crossed.

In 5 to 7 days, light yellowish brown clusters of forming conidia can be seen with the aid of a binocular dissecting microscope. The formation of a cluster begins with hyphae anastomosing and ramifying, forming a loose prosenchyma (Fig. 1). The hyphal tips swell, and lateral protuberances are pushed out along the ramifications (Fig. 2a). A first septum cuts off the protuberance, which then becomes bulbous with a thick wall attenuated toward the base (Fig. 2b). The spherical end of the protuberance is set off by the formation of a second septum parallel with the first and its wall becomes verrucose. As the immature conidium enlarges, the wall becomes echinulate (Fig. 2c) and broken up into large irregular fragments (Fig. 2d). These pieces usually break up further and the wall of a mature conidium again becomes echinulate. Muriform septations form after the conidium is about ¾ its final size. The mature conidia have 6 to 14 or more cells; each cell is capable of germinating, giving rise to a hypha. Mature conidia are 15.5-25.5μ, mostly 19μ in diameter (Fig. 2e). Conidia are in tightly packed, hemispherical clusters up to 0.25 mm in diameter (Fig. 3). The clusters are found mostly on the grass fragments, less frequently scattered over the agar and rarely in the floccose hypha. In many cases short pieces of the conidiophores are detached with mature conidia when a cluster is squashed between a cover slip and slide. The conidia begin to germinate in 1½ hours after they are placed in potato-dextrose



Legend: Figure 1. Formation of a conidial cluster (X 500).
Figure 2a-e. Conidial development (X 1000).

agar, sending out one to several germ tubes. Figure 4 shows the germinating conidia 5 hours after inoculation into potato-dextrose agar.

During development, the conidia turn from a light yellowish

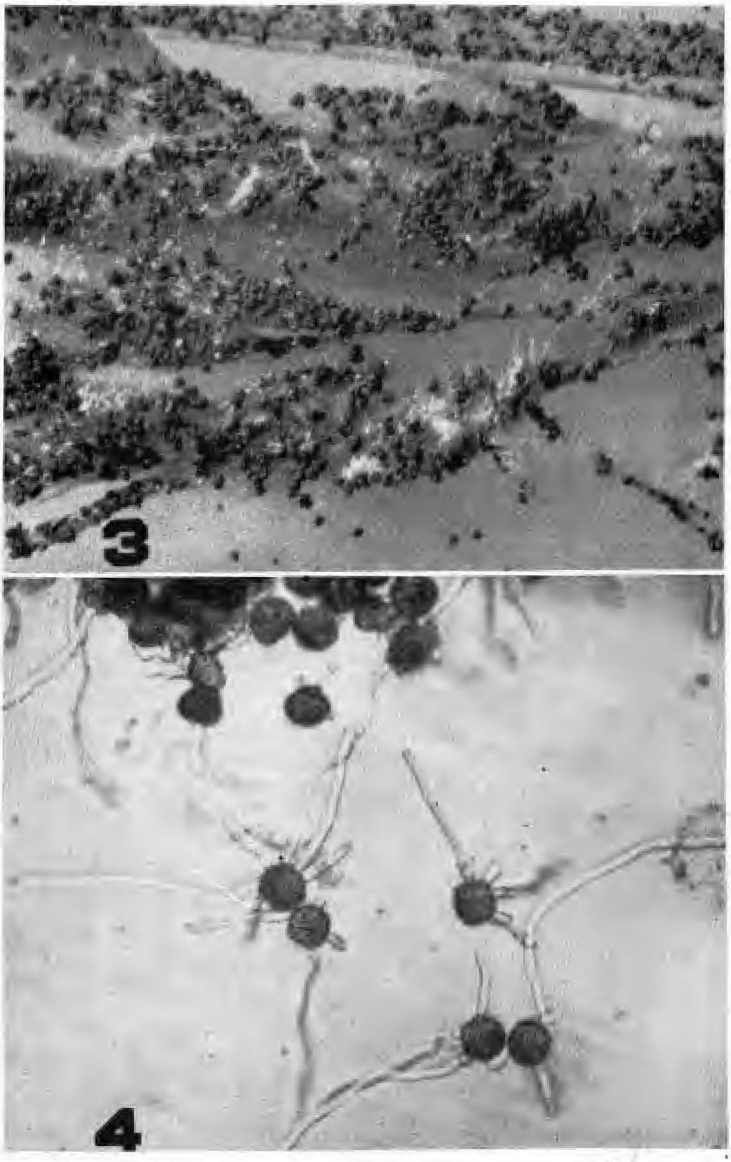


Figure 3. Conidial clusters on blue-grass agar, three weeks old (X 10).
Figure 4. Germinating conidia five hours after inoculation into potato-dextrose agar (X 320).

brown to brown and finally to a waxy black in mass. Masses of conidial clusters may range up to 5 mm in diameter.

On oat agar and potato-dextrose agar thicker tufts of floccose hyphae form which are at first hyaline; parts of the tufts turn brilliant orange and then to light dull orange. The conidia are

formed more abundantly in the floccose hyphae on these media than on blue-grass agar. Light yellowish brown pigment diffuses into the oat agar, and the reverse is deep red on potato-dextrose agar.

The above observations agree quite well with the fungus described and illustrated by Vuillemin (1931) as *E. neglectum* Desm., which he observed on the leaves of cauliflower. His measurements for the size of the clusters are smaller (90 x 125μ). He bases the variety *Brassicae* on the number of cells of the aleuriospore; the above observations of their variability casts doubt on the validity of using the number of septations in determining such a variety, since, as the aleuriospore gets older, more and more septa are formed.

The fungus was placed in the *Phaeodictyae* of the *Tuberculariaceae* by Saccardo. It forms aleuriospores (*sensu* Mason, 1937) and since it forms thick-walled conidia on lateral branches, it can be placed in Section III of Hughes' classification (1953).

It is evident that the genus *Epicoccum* has been neglected and many original species descriptions could refer to the same fungus. Saccardo lists 56 different species, many with incomplete descriptions. Many of these descriptions mention no spore septations, which are difficult to see in mature spores, but the spores do become muriform (Ainsworth and Bisby, 1954). Judging from the description and figures of *E. maritimum* Sutherland (New Phytol. 15:47. 1916), it is clearly the same fungus as described above. The descriptions of the following species could also refer to the fungus under study: *Epicoccum humicola* (Buchanan) Saccardo (Sylloge Fungorum 25:985. 1931) [=*Thyrococcum humicola* Buchanan (Mycologia 3:1. 1911)]; *E. levisporum* Patouillard (Bull. Soc. Myc. 9:164. 1893); *E. Eucalypti* P. Hennings (Hedwigia 41:311. 1902); *E. Tritici* P. Hennings (Hedwigia 43:146. 1904); *E. sulcatum* Delacroix (Bull. Soc. Myc. 8:192. 1892.)

It is suggested that original material of these and the remaining described species needs to be studied.

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