
The infected areas may be localized but more often involve one side of a leaf or an entire leaf as if the infections were systemic. *Puccinia cinnamomea* Diet. & Holw., on an unidentified terrestrial orchid in Mexico, has urediniospores 24–32 × 20–29 μ and teliospores 29–35 × 15–18 μ, but is generally similar.

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**POWDERY MILDEW OF SOYBEANS**

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Powdery mildew of soybeans is a common problem in soybeans, *Glycine max* (L.) Merr., grown under glasshouse conditions in Illinois and other areas but apparently is rarely seen in the field. The disease has seldom been reported and correspondingly little is known about the causal organism. This study was undertaken because powdery mildew was seen for the first time in the field locally in 1972 and infected plants in the glasshouse developed abundant cleistothecia (a relatively rare phenomenon) in the winter of 1972.

The earliest report of powdery mildew on soybeans is that of von Wahl (6). He reported *Erysiphe polygoni* DC. as a polyphagous mildew fungus on soybean, "*Soja maxima* (L.) Piper," but gave no information to substantiate his statement.

Lehman (3) first described powdery mildew of soybean in 1931. He treated it as *Erysiphe polygoni* from the circumstance that there were beans, *Phaseolus vulgaris* L., in the same greenhouse infected by powdery mildew and the conidia of soybean powdery mildew were the same size as those of the bean powdery mildew. He was not able to
find any cleistothecia of the fungus and was unable to infect soybeans with conidia from the bean powdery mildew.

In 1947 Lehman (4) reported that powdery mildew of soybeans is caused by a species of *Microsphaera*. This identification was based on the presence of perithecia with 3–5-times dichotomously branched appendages, but no measurements were given.

Soybeans infected with powdery mildew formed abundant cleistothecia in the glasshouse. These cleistothecia contained several asci and were 86–120 µ in diam. Their appendages (Fig. 1, 2) were 2–4 times as long as the diameter of the cleistothecia, when mature mostly 180–280 µ in total length and 7–7.5 µ thick at the base. Their tips, up to six times dichotomously branched, measured up to 60 µ from the first fork; the first branchings were at wide angles but the last at so narrow an angle as to be subparallel; they were neither thickened nor recurved, in this differing from most species of the genus.

This is in good agreement with descriptions of *Microsphaera diffusa* Cke. & Pk. as reported by Burrill and Earle (2) and by Burrill (1), and in Salmon’s monograph of the Erysiphaceae (5), pp. 161–3: *pl. 2, fig. 31–33*. Some of the material at hand has very abundant and wooly,
rather than "thin, evanescent" (2), superficial mycelium; the perithecial appendages, like those of *Erysiphe*, are often entangled or embedded in the mycelium; and many are simple, and possibly immature, while others have the branching tips broken off. It would therefore be easy to mistake such specimens for those of *Erysiphe*.

Salmon (5) reports that *M. diffusa* occurs on a number of legumes, including *Glycyrrhiza lepidota* Pursh, which is related to soybean. Burrill and Earle (2) also reported that *M. diffusa* occurs on three identified species of *Desmodium* (as well as "*Desmodium sps.*"), two of *Lespedeza*, and *Phaseolus perennis* Walt. in Illinois.

Therefore it seems clear that the causal organism of powdery mildew of soybeans in *Microsphaera diffusa* and not *Erysiphe polygoni* as originally reported.

This study was supported in part by the University of Illinois Agricultural Experiment Station.

**LITERATURE CITED**