TWO LEAF-FUNGI OF CYCLAMEN

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An inspection of any of the host lists for parasitic fungi shows that the florists' cyclamen in its many forms is remarkably free from such parasites, and one is always surprised if he finds disease or mutilated plants of any of the varieties under ordinarily good conditions of greenhouse treatment, though flower and leaf monstrosities are not infrequent. The principal diseases of the cyclamen are due to nematode root or tuber injuries and an associated rather obscure bacterial rot, and to attacks of *Thielavia* or *Atractium*. Few flower-inhabiting fungi have ever been observed on cyclamen; *Ascochyta cyclaminis* with the pycnidial *Septoria corollae*, and the conidial form of *Sclerotinia, Botrytis cinerea*. On the leaves scarcely more parasites have been found: *Septoria cyclaminis, Phyllosticta cyclaminis*, and *P. cyclaminella*, a *Glomerella* referred

to the same species as that causing bitter rot of the apple, *G. rufomaculans,* var. *cyclaminis,* though, perhaps, like many of the fungi nominally connected with that of the bitter rot doubtfully belonging to it, and with this the conidial *Colletotrichum* form. One other spot disease rather indefinitely described has been reported by Professor Halsted under the name *Phoma cyclamenae.**

In the plant houses of the University of Illinois in the winter of 1913-1914, there appeared in rather small quantity, a wilting of the older outer leaves of cyclamens at the flowering time, which, without any marked discoloration of the leaf, is attended by a frosty mildew on the under surface near the soil. There was also observed by Dr. J. T. Barrett in the autumn of 1907, a considerable epidemic of a leaf spot on cyclamen, this disease being marked by deep brown discoloration of the large affected areas on the upper surface of which small pustules occurred with extruding tendrils of colorless spores.

The disease of 1913-14 is found to be due to a mycelium that appears to be localized within the wilting parts of the leaf and that fruits by sending out tufted colorless conidiophores on the lower surface, the stomata through which these tufts protrude on the diseased area being rather conspicuously brown or red in contrast with the general whitish green of the lower leaf surface. From the ends of the conidiophores simple chains of colorless conidia reaching a length of one hundred microns or more are cut off, these chains being slightly moniliform by the constriction between the spores which remain attached together for a long time but are easily and completely disassociated in the preparation of material for examination.

No doubt can exist that this fungus corresponds to the conidial stage of many ascomycetes the mature form of which is usually found on dead leaves later, and although it violates the fundamental division of the hyaline spored Mucedineae between two-celled and many-celled forms, it is hardly to be referred elsewhere than to the form-genus *Ramularia,* many other species of which fail to show more than a single septum in the conidia. Thus far, no hyphomycetous fungus has been

*The type material of this, as I learn from Professor Halsted, has been lost.

made known for the genus *Cyclamen,* though *Ramularia* occurs on related genera of the Primulaceae. The form referred to here may be characterized as follows:

Ramularia cyclaminicola n. sp.—Hypophyllous, not (as yet) forming spots. Fertile hyphae colorless, emerging in small tufts from the stomata on the lower surface of the wilting foliage, slender, each ending in a moniliform chain of five or ten little elongated conidia. Conidia colorless, somewhat pyriform or elliptical or oblong, acute at one or both ends, 4 or 5x10 to 15 or even 20 microns, scarcely granular, two-celled at maturity. On living leaves of *Cyclamen latifolium,* cultivated in Illinois, (*Trelease,* 1914).

The foliage of some of the plants this same season was disfigured by more or less irregular dark brown dried spots but with no evidence of a fungus as the cause of discoloration. On the other hand, the spots produced in 1907, as shown by material preserved by Dr. Barrett, were fruitful, having minute, colorless one-celled spores oozing from small brown pycnidia, so as to fall into one of the form-genera *Phoma* or *Phyllosticta*—the line between which is purely arbitrary and differently drawn by different writers, the most satisfactory division apparently being that which refers all of the leaf fungi of this type to *Phyllosticta* and reserves *Phoma* for those which occur on other parts of the plant. On this basis, therefore, the present fungus falls into the genus *Phyllosticta,* differing from any of the species so far described, however, in the large size of the leaf spots that it causes—the center of these spots only being occupied by fruit of the fungus.

While the characters used to separate the various forms of *Phyllosticta* and *Phoma* are not such as to give rise to a very confident belief that they are to prove constant when much material is observed, those that the present form presents differ from those ascribed to the species of *Phyllosticta* already described as occurring on cyclamen sufficiently to make it seem desirable to give the present form a distinctive name, with the following characters:

Phyllosticta cyclaminicola n. sp.—Epiphyllous on more or less zonally shaded dark brown spots at length five to thirty millimeters in diameter, the fruiting center paler and sometimes falling away. Pycnidia brown, minute, some 10 microns in diameter, irregularly and rather sparsely distributed over the center of the spot. Pycnospores extruding in short thick tendrils, colorless, oblong, rounded at both ends, one-celled, some 3-4x6-8 microns, highly refractive. On living leaves of *Cyclamen latifolium* cultivated in Illinois. (*Barrett*, 1907.)