Infection Studies with Aecia on Berberis and Rhamnus in 1945

The infection studies with aecia on Berberis and Rhamnus undertaken in the spring of 1944 were again made possible in 1945 through the generous collaboration of the following, who collected and forwarded aecia: R.R. Hurst, Charlottetown, P.E.I.; J.R. Cowan, Nappan, N.S.; S.F. Clarkson, Fredericton, N.B.; R.A. Ludwig, Macdonald College, Que.; Dr. J.E. Jacques, Montreal, Que.; and W.H. Waddell, Guelph, Ont.

Spores discharged from aecia on barberry were sown on seedlings of wheat, oats, rye, Agrostis alba, Poa pratensis and P. compressa; spores from aecia on buckthorn were sown on seedlings of oats, Dactylis glomerata, Lolium perenne, Holcus lanatus, Calamagrostis arundinacea, C. canadensis, Agrostis stolonifera, Festuca sylvatica and Phalaris arundinacea. The distribution of the collections by provinces was as follows: aecia on barberry: Man. 2, Ont. 2, Que. 8, N.B. 7, total 19; aecia on buckthorn: Ont. 2, Que. 2, N.B. 9, total 13.

The following varieties of P. graminis were isolated: Secalis only 8, Avenae only 1, Agrostidis only 1; Avenae and Secalis 4; Secalis and Agrostidis 2; Tritici, Avenae, and Secalis 1; Avenae, Secalis and Agrostidis 1; and Avenae, Secalis and Poae 1. The single isolate of variety Tritici was identified as race 15, and isolates of Avenae were 3 isolates each of races 2, 5 and 8, and 2 isolates of race 6a.

Isolations from aecia on Berberis, summarized above, show that, as in the previous year, P. graminis var. Secalis was the predominant variety of stem rust in nearly all localities. P. graminis var. Agrostidis occurred only in aecial material gathered in N.B. P. graminis var. Poae was found in only one locality (Guelph, Ont.) and P. graminis var. Tritici occurred only in aecial material at Winnipeg, Man. Next after P. graminis var. Secalis, the variety of most common occurrence was P. graminis var. Avenae. Among the races identified, it may be noted that race 6a has not been found previously in Canada, or, as far as is known, anywhere else. It may be distinguished from race 6 by a more variable reaction on the oat variety White Tartar, and by a somewhat greater pathogenicity on some recently developed oat hybrids that are highly resistant to race 6.

Spores from aecia of Rhamnus cathartica, in every instance heavily infected seedlings of Victory oats, but failed to infect seedlings of L. perenne, D. glomerata or H. lanatus. Apparently the aecial infections on R. cathartica were largely or wholly caused by Puccinia coronata var. Avenae. Races 2 and 3, which predominated in the field in 1944 were the ones most frequently isolated from aecial infections of 1945. Besides these two races, single isolations of the rather rarely occurring races 34 and 45 were obtained. Race 45 did not occur in 1945 in collections of uredinial origin and race 34 was collected only three times.

The aeciospores from R. Frangula failed to infect Victory oats normally. In one case the oat seedlings became visibly flecked, but no rust pustules were formed. Of the 8 grass species tested, 6 were immune, but weak infections, which produced teliospores typical of crown rust, developed on a few plants of C. canadensis and A. stolonifera. Although the rust on R. Frangula can be maintained in culture on the two grass species, the weak nature of the infection indicates that they are not congenial hosts. The identity of the rust on R. Frangula has likewise not been definitely established.