THE OCCURRENCE OF UREDINIOSPORES OF CRONARTIUM RIBICOLA WITHIN THE PETIOLE OF RIBES PETIOLARE

by

A. E. Harvey & J. Y. Woo

ABSTRACT

Urediniospores of Cronartium ribicola J. C. Fisch. ex Rabenh. were observed within the petiole of Ribes petiolare L. These spores occurred internal to xylem tissues within the region of undifferentiated parenchyma cells (pith). Fungal tissues were sparse and fully differentiated sori were absent.

INTRODUCTION

Although spore forms derived from infections of Cronartium ribicola J. C. Fisch. ex Rabenh. on Ribes spp. generally occur on lower leaf surfaces, they have been observed at various unusual locations. Both uredinial and telial sori have been found on upper surfaces of leaves, on leaf petioles, young stems, bark, green fruits, floral bracts, peduncles, rachises, cotyledons, and bud scales (Colley, 1918; Spaulding, 1922; Kimme, 1938; Mielke, 1943). The only factor that the above locations have in common is their proximity to an epidermal surface. However, occurrences of fully differentiated sori containing teliospores within petioles (Colley, 1917) and urediniospores within young stems (Posey et al., 1917) negate the probability of physical proximity to plant surfaces being a requirement for spore production by this fungus.

OBSERVATIONS AND DISCUSSION

Our observations generally confirm findings cited above, but further indicate that a sorus need not be differentiated to produce urediniospores on artificially inoculated leaves of greenhouse-grown Ribes petiolare L.; up to 30% of the petioles of heavily infected leaves contained uredinial or telial sori on their external surfaces. Several of these petioles were imbedded in paraffin as whole entities to prevent
accidental transport of spores. A detailed histological examination of five of these disclosed internal urediniospores in two. Spores were binucleate and somewhat irregular (Fig. 1B). Close examination of the spore-producing site (Fig. 1A) revealed that fertile stromatic tissues varied from sparsely distributed sporogenous hyphae to well-developed stroma and a conspicuous lack of the fungus-derived encapsulating (peridial) tissues generally associated with mature sori (Fig. 1C).

Apparently, then, the fully differentiated sorus ordinarily found on the external surfaces of infected plants is a morphological adaptation of this fungus and provides for efficient, continuous production and protection of spores rather than their induction. Further, the failure of the spore-producing site to differentiate normally suggests that the differentiation of fruiting structures is strongly influenced by the immediate physical environment.

Bibliography