

ADDITIONAL RECORDS OF MYCODIPIOSIS LARVAE (DIPTERA: CECIDOMYIIDAE) FEEDING ON RUST FUNGI

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Abstract

Mycodiplosis larvae were found feeding on various spore states of the following rust fungi: Chrysomyxa pirolata Wint., Chrysomyxa woroninii Tranz., Coleosporium asterum (Diet.) Syd., Coleosporium vernoniae Berk. & Curt., Cronartium coleosporioides Arth., Cronartium comandrae Pk., Endocronartium harknessii (J.P. Moore) Y. Hiratsuka, Melampsora epitea Thum., Puccinia caricis-shepherdiae J.J. Davis, Pucciniastrum epilobii Oth., and Pucciniastrum sparsum (Wint.) E. Fisch. The larvae occurred on the pine stem rusts Cronartium coleosporioides and Cronartium comandrae on pine as well as on alternate hosts and appeared to markedly reduce the amount of rust inoculum available for dispersal.

A list of rusts and other fungi that are attacked by Mycodiplosis spp. was recently published (3). Only two of these records pertained to reports of Mycodiplosis spp. on rusts from North America. Berkenkamp (1) recently reported Mycodiplosis impatientis Felt feeding on the uredospores of Uromyces trifolii (Hedw. f. ex. DC) Lev. on various species of clover (Trifolium) in central and northern Alberta, but I am unaware of any other report of Mycodiplosis spp. feeding on rust fungi in Canada, other than that briefly mentioned in a paper by the author (4).

During surveys for pine stem rust fungi between 1965 and 1967 in southern Alberta, over 25 collections were made of Mycodiplosis larvae feeding on spores of the pine stem rusts. After receiving a comment from R.J. Gagne (personal communication, 1970) that all true Mycodiplosis feed on rusts, I made a preliminary search for other Mycodiplosis larvae in some of the rust material held in the mycological herbarium of the Canadian Forestry Service, Edmonton (CFB).

Table 1 lists Mycodiplosis material from 11 different rust fungi, in some cases on several host plants, none of which are recorded by Nijveldt (3). Mycodiplosis were collected on the spermoconial and aecial states of Cronartium coleosporioides and Cronartium comandrae on Pinus contorta, and on the uredial and telial states of these rusts on the alternate hosts. Most larval collections on the pine stem rusts were made in July and August, although some were collected as early as June 12 and others as late as September 28. Collections on the other rusts were made over a similar period of the year (Table 1).

Up to 250 Mycodiplosis larvae were often present on individual cankers of C.

comandrae. Between 25 and 75% of the cankers at two locations south of the Kananaskis Forest Experiment Station, near Seaba, Alberta, contained Mycodiplosis larvae in the years 1965 to 1968. The larvae were observed eating large numbers of spores and often caused the aeciospores to become aggregated in a mass of fine silk, which gave a mealy bleached appearance to the spores. The larvae took on the color of the spores. The larvae found on C. coleosporioides f. album were white, but they were various shades of orange and yellow when feeding on spores of C. coleosporioides, C. comandrae, E. harknessii and P. caricis-shepherdiae. The larvae did not pupate on the rusts but in the soil or duff layers. Rearings from duff material, collected around the base of C. comandrae-infected trees at one location, produced adults of Mycodiplosis fungiperda Felt and M. sp. nr. tsugae Felt, which suggests a specific connection with the larvae on the cankers of pine stem rusts.

Larvae of Mycodiplosis spp. appear to be important agents in reducing the amount of pine stem rust inoculum available for dispersal, and presumably play a similar role on the other rusts. Golenia (2) surmised that Mycodiplosis spp. may play a part in the biological control of Puccinia menthae Pers. and Uromyces valerianae Fuck. Nijveldt (3) stated that more investigation is needed to establish the value of gall midge larvae in the control of fungi. Most cecidomyiids, whose larvae are associated with fungi and especially the rusts, belong to the genus Mycodiplosis (3). Further investigation would probably show that larvae of this genus may be associated with many more rust fungi in North America.

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Table 1. Rust fungi and plant hosts from which larvae of *Mycodiplosis* were collected

Rust	Host	Spore state*	Collections	
			Location	Date
<i>Chrysomyxa pirolata</i> Wint.	<i>Pyrola asarifolia</i> Michx.	II	Alta.; Yukon	June 15, 23
<i>Chrysomyxa pirolata</i>	<i>Pyrola virens</i> Schweigg.	II	Alta.	June 21
<i>Chrysomyxa woroninii</i> Tranz.	<i>Ledum groenlandicum</i> Oeder	III	Yukon	July 27
<i>Coleosporium asterum</i> (Diet.) Syd.	<i>Aster conspicuus</i> Lindl.	II, III	Alta.	Aug. 19
<i>Coleosporium asterum</i>	<i>aster</i> sp.	II, III	Alta.	Aug. 17, Sept. 17
<i>Coleosporium asterum</i>	<i>Solidago decumbens</i> Greene	II	N.W.T.	July 28
<i>Coleosporium vernoniae</i> Berk. & Curt	<i>Vernonia altissima</i> Nutt.	II, III	Ohio	Sept. 1
<i>Cronartium coleosporioides</i> Arth.	<i>Castilleja miniata</i> Dougl.	II, III	Alta.	Aug. 13
<i>Cronartium coleosporioides</i>	<i>Pinus contorta</i> Dougl. var. <i>latifolia</i> Engelm.	0, I	Alta.	June 19-July 11
<i>Cronartium coleosporioides</i> f. <i>album</i> Ziller	<i>Pinus contorta</i> var. <i>latifolia</i>	I	Alta.	July 11
<i>Cronartium comandrae</i> Pk.	<i>Comandra umbellata</i> (L.) Nutt. ssp. <i>pallida</i> (A.DC.) Piehl	II, III	Alta.; B.C.	Aug. 17-Sept. 10
<i>Cronartium comandrae</i>	<i>Pinus contorta</i> var. <i>latifolia</i>	0, I	Alta.	June 19-Sept. 28
<i>Endocronartium harknessii</i> (J.P. Moore) Y. Hiratsuka	<i>Pinus contorta</i> var. <i>latifolia</i>	III ^I	Alta.	June 12
<i>Melampsora epitea</i> Thüm.	<i>Salix</i> sp.	II	Alta.	July 20-Aug. 30
<i>Puccinia caricis-shepherdiae</i> J.J. Davis	<i>Shepherdia canadensis</i> (L.) Nutt.	I	Alta.	July 30
<i>Pucciniastrum epilobii</i> Oth.	<i>Epilobium angustifolium</i> L.	II, III	Alta.	Aug. 11
<i>Pucciniastrum epilobii</i>	<i>Epilobium glandulosum</i> Lhm.	II, III	Alta.	July 29
<i>Pucciniastrum sparsum</i> (Wint.) E. Fisch.	<i>Arctostaphylos rubra</i> (Rehd. & Wils.) Fern.	II	N.W.T.	July 27

* 0 = spozmogonial; I = aecial; II = uredial; III = telial; III^I = aecidioid teliospores.