

UNITED STATES DEPARTMENT OF AGRICULTURE  
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A CONSPECTUS  
of  
NEEDLE RUSTS ON BALSAM FIRS  
in  
NORTH AMERICA  
by  
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*No comments*

To E. E. H

From \_\_\_\_\_

For information

For criticism X

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Please forward to \_\_\_\_\_

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The needle rusts of balsam firs form a group in which there has been considerable confusion. A study of herbarium specimens shows this, since collections under one specific name will in some instances have aecia on the current season's needles and in other cases on the needles of the previous season, or one year old. Field study has shown that the age of the needles on which aecia are found is of important diagnostic value, and not a single species is known in the Pacific Northwest with aecia normally on both the current season's and 1-year-old needles, nor is any such occurrence elsewhere in North America reported in the literature. In fact, except for Milesia psycnogrammis (Bell) Arth. the aecia of which occur on needles 2 to 8 years old, the aecia of these rusts are practically confined to needles of one season. Some of these rusts are frequently encountered in the Pacific Northwest and in order to get a clear picture, the present knowledge of their relationships was tabulated and is presented below with the hope that it may be useful to others.



Uredinia and Telia		Pyrenia and Ascia		Age of	Notes
Rust	Host	Rust	Abies host	needles with ascia	
<i>Galyptospora columnaris</i>	<i>Vaccinium</i> sps.	<i>Peridermium columnare</i>	<i>ambilis balsamea concolor fraseri grandis lasiocarpa magna mobilis</i>	current season	Causing witches' brooms on <i>Vaccinium</i> .
<i>Galyptospora</i> sp.?	<i>Vaccinium macrophyllum</i>	<i>Peridermium ornamentale</i>	<i>concolor grandis lasiocarpa mobilis</i>	1 yr.	Connection suggested by Weir (1).
<i>Melampsora humboldtiana</i>	<i>Salix</i> sps.	<i>Casana americana</i>	<i>balsamea concolor grandis lasiocarpa</i>	current season	
<i>Melampsorella elatina</i>	<i>Cerastium</i> sps. <i>Stellaria</i> sps.	<i>Peridermium elatinum</i>	<i>ambilis balsamea concolor grandis lasiocarpa magna mobilis</i>	current season	Causing witches' brooms with deciduous needles on <i>Abies</i>
<i>Pucciniastrum pustulatum</i>	<i>Epilobium angustifolium</i>	<i>Peridermium pustulatum</i>	<i>arizonica balsamea concolor grandis lasiocarpa mobilis</i>	current season	
<i>Pucciniastrum myrtilli?</i>	<i>Vaccinium</i> sps.	<i>Peridermium</i> sp. nov.	<i>ambilis</i>	1 yr.	Connection suggested by Boyce (2).

Uredinia and Telia		Pyrenia and Aecia		Age of	Notes
Rust	Host	Rust	Abies host	needles with aecia	
<i>Hyalopezora aspidiotus</i>	<i>Phegopteris dryopteris</i>	<i>Peridermium pycnoconspicuum</i>	<i>balsamea</i>	2 yrs.	
<i>Milecia pyrenograndis</i>	<i>Polypodium vulgare</i>	<i>Peridermium pycnogrande</i>	<i>balsamea</i>	2 to 3 yrs.	
<i>Milecia polystichi?</i>	<i>Polystichum munitum</i>	<i>Peridermium rugosum</i>	<i>sambilis grandis</i>	1 yr.	Connection suggested by Notson (3)
<i>Milecia krieckeriana</i>	<i>Dryopteris spinulosa</i>	<i>Peridermium krieckeriana</i>	<i>balsamea</i>	current season	(4)
<i>Milecia marginalis?</i>	<i>Dryopteris marginalis</i>	<i>Peridermium marginalis</i>	<i>balsamea</i>	current season	(5)
<i>Uredinopsis copelandi</i>	<i>Athyrium cycloserum</i> <i>Filix bulbifera</i>	<i>Peridermium balsameum</i>	<i>balsamea grandis lasiocarpa nobilis</i>	current season	
<i>Uredinopsis mirabilis</i>	<i>Woodwardia areolata</i> <i>Onoclea sensibilis</i>	<i>Peridermium balsameum</i>	<i>balsamea</i>	current season	
<i>Uredinopsis osmundae</i>	<i>Osmunda</i> spp.	<i>Peridermium balsameum</i>	<i>balsamea</i>	current season	
<i>Uredinopsis phegopteridis</i>	<i>Phegopteris dryopteris</i>	<i>Peridermium balsameum</i>	<i>balsamea</i>	current season	
<i>Uredinopsis strathlopteridis</i>	<i>Woodwardia virginica</i> <i>Struthiopteris germanica</i>	Unknown	-----		
<i>Uredinopsis macrosperma</i>	<i>Pteridium aquilinum</i> <i>pubescens</i>	<i>Peridermium pseudo-balsameum</i>	<i>sambilis grandis lasiocarpa nobilis</i>	1 yr.	



### Footnotes

- (1). Weir, J. R.: Observations on *Calypotespora columnaris* and *Peridermium ornamentale*. In *Mycologia* 18(6):274-277, pl. 34-35, Nov.-Dec., 1926.
- (2). Boyce, J. S.: A possible alternate stage of *Pucciniastrum myrtilli* (Schum.) Arth. 6 pp., typewritten, Office of Forest Pathology, Bureau of Plant Industry, Portland, Ore., Oct. 20, 1927.
- (3). Hotson, J. H.: Preliminary list of the Uredinales of Washington. In *Publications Puget Sound Biological Station of the University of Washington* 4:273-391, Aug., 1925. On page 293 Hotson suggests the possible connection of *Hilesia polystichi* and *Peridermium rugosum*. In a letter of April 12, 1926, Dr. J. H. Faull writes, "H. S. Jackson has described a *Peridermium* (*P. rugosum*) which we have examined histologically and find shows the same features as our *M. polypodophila*." This latter species was later changed to *M. pycnogrammis* (Bell) Arth. While the aecia of *P. rugosum* occur on the current season's needles they appear in the fall or occasionally in the late summer, so the needles are morphologically about 1 year old.
- (4). In *North American Flora* 7(10):686, Sept. 23, 1925, Arthur states that the aecia of *M. kriegeriana* occur on leaves 2 or more years old. In a letter of April 7, 1927, referring to the aecia of this species J. H. Faull wrote, "They are found

always on the needles of the current season." When the writer was shown a needle rust on Abies pechinata in Scotland which from field study seemed to be M. krieseriana the aecia were confined to the current season's needles.

- (5). M. marginalis Faull & Watson was published by Faull in an abstract of a paper entitled, "Fern rusts I. The genus Milesia," which appeared in the Proceedings of the Royal Society of Canada, May Meeting, 1925. In North American Flora 7(10):686, Sept. 23, 1925, Arthur evidently includes M. marginalis with M. krieseriana, judging by the fern hosts given under the last-named species. In a letter of April 7, 1927, J. R. Faull wrote, "M. krieseriana and M. marginalis are entirely distinct species, distinguished from one another by several well marked points."