

Septoria Leafspot Disease of *Mentha* spp.¹

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Peppermint (*Mentha piperita* L.) and common and scotch spearmints (*M. spicata* L. and *M. cardiaca* L.) are important crops in the muck-land region of northern Indiana. At present, more than 18,000 acres are devoted to these crops with peppermint accounting for from 10 to 12,000 acres (3). The limiting factor in the production of the mints in Indiana is a soilborne disease called *Verticillium* wilt (3). Peppermint is damaged much more severely than spearmint and many growers plant spearmint when it is no longer profitable to produce the more valuable peppermint crop. Much of the mint acreage in Indiana may eventually be devoted to spearmint.

The spearmints, especially scotch spearmint, are frequently severely defoliated by a disease that is identified as *Septoria* leafspot. This disease is more severe in second-year or older plantings and is most damaging in rank stands. The symptoms include the initiation of small, dark circular spots or irregular patches on the leaf surfaces. These lesions gradually become white to gray-white centrally bordered by a deeper brown to black zone (fig. 1). Small, black pycnidia are produced within the lesions.

Little was known concerning the identity of the *Septoria* sp. causing this disease. Davis (1) reported *S. menthicola* Sacc. and Let. as causing a leafspot on *Mentha arvensis* L. in Wisconsin. Hemmi and Kurata (2) studied a similar disease in Japan and considered the pathogen to be *S. menthae* (Thum.) Oud.

The present studies were made to identify the causal organism of the leafspot disease of scotch spearmint in northern Indiana.

Methods and Procedures

Isolations of the causal organism were made directly from diseased leaf tissues by surface sterilization with sodium hypochlorite (1%) and incubation on potato dextrose agar (PDA). Spore suspensions for studies of spore germination were prepared either directly from diseased host tissues or from cultures grown on PDA. Measurements were made of representative spore samples and the number of septations recorded.

The effect of temperature on spore germination was determined. Spore suspensions from freshly isolated cultures were placed on water agar and incubated. Three plates were prepared for each temperature treatment and observations were made at 12 hour intervals for 72 hours. The temperature ranges used were 4° C. to 36° C. in increments of 4° C.

Results

Table 1 shows the spore size and number of septations observed in this investigation and those reported from other sources. *S. menthae* and *S. menthicola* differ mainly in spore size and number of septations, but septa-

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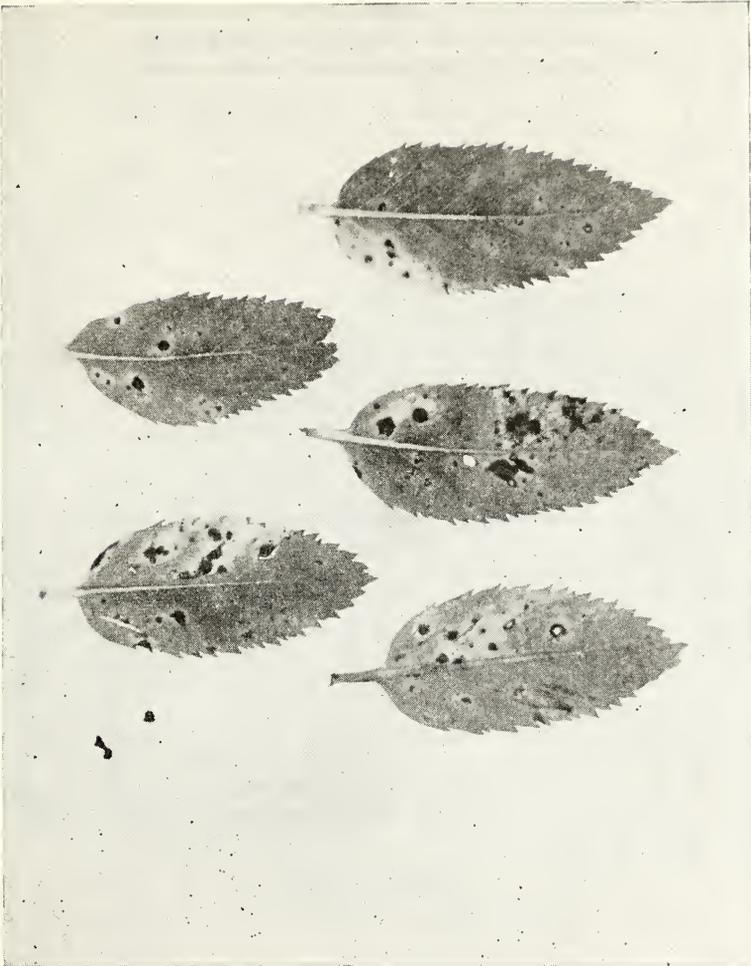


Fig. 1. Foliar symptoms of *Septoria* leafspot on scotch spearmint *Mentha cardiaca* L.

tions are frequently not observed in spores from young cultures although the spores appear mature.

Table 2 shows the rather broad temperature range at which spores germinate. After 48 hrs., germination was nearly complete at the range from 12° C. to 32° C. The optimum was much more limited when the time was reduced to 16 to 24 hrs.

Discussion

The disease symptoms and morphology of the pathogen indicate that *Septoria menthae* is the cause of the leafspot of spearmint in Indiana. *S. menthae* has not been reported previously in the United States but it is apparently widespread in Europe and Asia. Earlier investigators made

TABLE 1. Comparison of the measurements of pycnospores of *S. menthae* and *S. menthicola* given by different authors.

Source	<i>S. menthae</i>			<i>S. menthicola</i>		
	Length μ	Width μ	septa	Length μ	Width μ	septa
Allescher (a)	58	1.0-2.0	0	30-40	1.0	0
Davis				18-33	1.0-1.5	
Hemmi	19.2-64	1.4-2.7	1-5			
Lind	35.0-48	1.0	3			
Saccardo	58	1.0-2.0	0	30-40	1.0	0
Sawada	25-64	1.5-2.5	1-3			
Writers-PDA	22.0-52.0	1.5-2.0	0-5			
Mint	24.0-58.5	1.5-2.0	0-5			

(a) From Hemmi, T. and S. Kurata (see ref. 2.)

TABLE 2. Germination of pycnospores of *S. menthae* at different temperatures.

Temp./Time	12	16	20	24	48	72
4° C				0	0	0
8°				0	0	66
12°				0	87	99
16°	0	0	6	25	97	99
20°	11	51	75	94	99	
24°	14	65	83	91	100	
28°	24	80	91	94	100	
32°	12	72	84	93	98	
36°				0	0	0

little attempt to accurately identify the host species. The marked differences in symptoms induced by these two pathogens may be a means of separating the two species.

Literature Cited

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3. PULTZ, L. M. 1954. Mint Farming. Farmers' Bull. 1988. U. S. Dept. of Agr. p 2.