

## LEPTOTROCHILA MEDICAGINIS: PATTERN AND DISTANCE OF ABCOSPORE DISCHARGE<sup>1</sup>

G. Semeniuk

Department of Plant Science, South Dakota State University  
Brookings, South Dakota 57007

Ascospores of *Leptotrochila medicaginis* (Fckl.) Schuepp, which cause the yellow leafblotch disease of alfalfa (*Medicago sativa* L.), arise from apothecia that are produced after a period of adequate moisture on infected leaves that fall to the ground. The pattern and distance of their discharge, which was briefly reported earlier (4), is described here. Dry leaflets with robust apothecia were rehydrated 1-2 days on wet paper toweling within a Petri dish at 4-6 C. Thereupon, a selected leaflet was trimmed around an apothecium and the leaf piece carrying the apothecium was placed centrally on wet paper toweling adhering to an inside end wall of a rectangular, clear plastic box, 80 mm long x 65 mm wide x 35 mm deep. All inside walls and cover of the box had been previously lined with wet paper toweling. Two glass microscope slides (25 mm x 75 mm) lay centrally positioned, side by side on the box floor, and touching the end wall holding the apothecium. After 6-12 h in the laboratory (20-25 C) with the box cover slightly ajar, spores were counted in successive, cross-wise zones (1.67 mm wide) on each slide, beginning at the edge that was against the wall supporting the apothecium.

The accompanying Table 1 shows most spores were discharged as single spores. (74.8%) to a distance of 6 mm median and 16 mm maximum. Spore groups of 2-8 spores were discharged to about the same distance as most singles, with none going the maximum distance. This pattern of discharge corresponds to that designated by Walkey and Harvey (6) as group B and differs from that of *Pseudopeziza medicaginis* (3). The latter fungus, the cause of the common leafspot disease of alfalfa, discharges 70%-90% of its ascospores as doubles. The remaining are discharged as singles or as combinations of 3-8 (1, 2, 3, 5). Maximum discharge distance reported for them is 37 mm for singles and doubles and 40-70 mm for spore groups 3-8. With both pathogens the distribution frequency of different size spore groups shown in Fig. 1 do not follow a random distribution pattern. At present, no significance to pathogenesis or to reproduction on the host can be attached to the difference in ascospore discharge pattern between the two pathogens.

<sup>1</sup>Approved for publication by the Director, Agricultural Experiment Station, South Dakota State University, Brookings as Journal Series No. 2084.

\*Professor Emeritus. Present address: 109 Spring Street, Richland, WA 99352

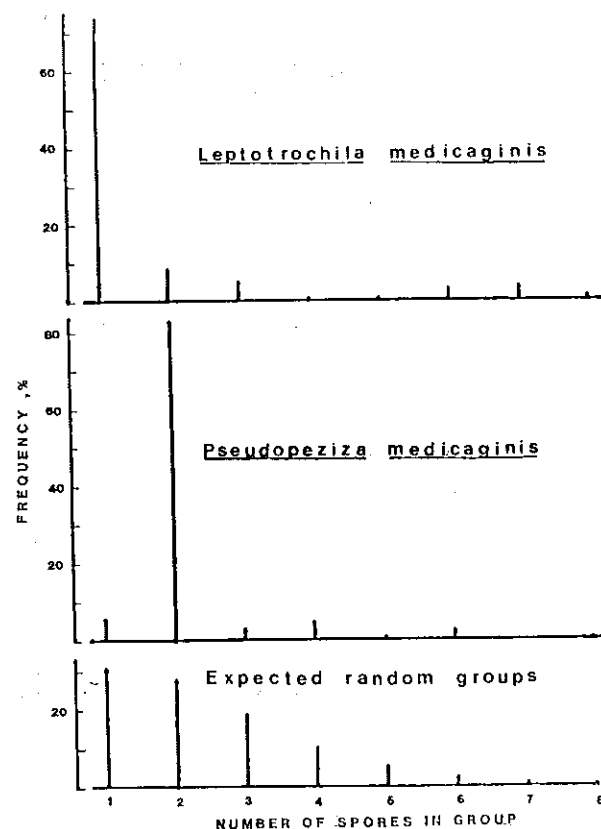


Fig. 1. Percentage of ascospores discharged as various size groups: *Leptotrochila medicaginis*, from a total of 3359 ascospores in 3 trials; *Pseudopeziza medicaginis*, from a total of 8937 ascospores obtained on 10 microscope glass slides, each exposed at different times in a field of diseased alfalfa (5); expected random distribution of 8 ascospores in groups of different sizes.

TABLE 1  
*Leptotrochila medicaginis*: Frequency of Ascospore Group Sizes  
Discharged to Various Distances<sup>a</sup>

Distance mean <sup>b</sup> mm	No. of ascospores/group								Total no. of ascospores
	1	2	3	4	5	6	7	8	
0.84	23	8	...			1			45
2.50	230	16	4		4	3		1	320
4.18	362	20	12			1	3	2	481
5.84	434	18	10	4		3	8		590
7.52	250	16	3	1		4	1	2	342
9.18	161	8	4	1					193
10.86	62	2	3						75
12.52	32	2							36
14.22	10	...							10
15.86	4	...							4
Total	1568	180	180	24	20	72	84	40	2096
%	74.8	8.6	5.1	1.1	0.9	3.4	4.0	1.9	

<sup>a</sup>Combined from 2 trials.

<sup>b</sup>Midpoint of successive zones 1.67 mm wide.

## LITERATURE CITED

- Kristinsson, H. 1967. Untersuchungen zum sexuellen Entwicklungsgang von *Pseudopeziza medicaginis* (Lib.) Sacc. und *Drepanopeziza ribis* (Kleb. v. Hohn.). *Phytopath. Z.* 60:1-40.
- Morgan, W. C., and D. G. Parbery. 1977. Ascospore liberation, germination and attachment to host surface by *Pseudopeziza medicaginis*. *Aust. J. Agric. Res.* 28:777-784.
- Schmiedeknecht, M. 1964. Mechanik und Energetik des Sporenausstosses bei *Pseudopeziza medicaginis* (Lib.) Sacc. *Phytopath. Z.* 51:29-40.
- Semeniuk, G. 1982. *Leptotrochila medicaginis*: Pattern and distance of ascospore discharge; moisture required for ascospore discharge and germination. (Abstr.) *Proc. S.D. Acad. Sci.* 61:182.
- \_\_\_\_\_. 1984. Common leafspot of alfalfa: ascospore discharge and plant infection in the field. *Phytopath. Z.* 110:290-300.
- Walkey, D. G. A., and R. Harvey. 1966. Studies of the ballistics of ascospores. *New Phytol.* 65:59-74.