

## **Platyspora pentamera, a Pathogen of Wheat**

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Published with the approval of the Director of the  
North Dakota Agricultural Experiment Station as  
Journal Series Article No. 534.

Figure 1 was printed by H. B. Caldwell.

### ABSTRACT

*Platyspora pentamera* caused severe leaf spotting on some wheats and moderate spotting on Caribou rye after being on the leaves in wet periods of 48 - 72 hours. After wet periods of 24 hours, it caused slight to moderate spotting on some wheats. After wet periods of 6 - 12 hours, it caused no spotting on any of the Gramineae tested. In numerous samples from many wheat regions *P. pentamera* was found only once reproducing on spring wheat in North Dakota and once on winter wheat in Utah.

Phytopathology 65:499-500

In 1970, *Platyspora pentamera* (Karst.) Wehm. was found reproducing on hard red spring wheat (*Triticum aestivum* L.) in the plains of North Dakota (4). Previously it had been detected only on other monocots and dicots in the higher altitudes of mountainous regions, and the subarctic (1, 2).

The object of this study was to determine whether this fungus is a pathogen of wheat and related cereals, and to observe its geographical distribution on wheat.

Single ascospores of the fungus from the 1970 spring wheat produced dense, green, mycelial colonies on potato-dextrose agar (PDA). Pathogenicity was tested using the procedures developed for the leaf spot fungus *Pyrenophora trichostoma* (3). Chopped mycelium from colonies that had just covered the surface of PDA in petri plates was applied to the leaves of wheat plants in the three-leaf to flag-leaf stage of development. These plants and uninoculated checks were incubated in a moist chamber at  $23 \pm 5$  C for 6, 12, 24, 48, and 72 hours. A minimum of ten inoculated and ten uninoculated plants of each wheat selection were used in each trial. Trials of the critical 48-hour wet period were repeated three times,

and those of 72 and 24 hours were repeated once. Triticale selections (*Triticale hexaploide* Lart.) and crested wheatgrass (*Agropyron desertorum* (Fisch.) Schult.) were tested only in the 48-hour incubation period. Following incubation the plants were dried with a fan and placed on a glasshouse bench at  $23 \pm 5$  C. Irregular yellow to light-brown leaf spots or blotches began to appear on inoculated plants within four days after inoculation, and were fully expressed (approximately 1-4 mm in diameter) at six days, at which time disease severity was rated. Check plants produced no spots. Using isolation procedures developed for other leaf spot fungi (3), *P. pentamera* was consistently reisolated from the spots. It was not reisolated from unspotted, inoculated plants or check plants.

After 6 and 12 hours of incubation, none of the tested cereals developed leaf spots. At 24 hours, the semi-dwarf spring wheats Tobari 66 and Red River 68 were moderately spotted with 10 to 20% of their leaf surface involved. Waldron spring wheat had 5 - 8% of its leaf surface spotted. Marquis spring wheat had less than 1%, and the other tested Gramineae had essentially no spotting. At 48 - 72 hours, Tobari 66, Red River 68, Waldron, and ND 495 spring wheats and Leeds durum (*Triticum turgidum* L.) were severely spotted, with 25 to 50% of their foliage covered by leaf spots. Marquis, Chris, and ND 487 spring wheats and Wells durum and Caribou rye (*Secale cereale* L.) were slightly to moderately spotted with 2 - 8% of their foliage covered by spots. Hercules durum, C306 spring wheat, five triticales selections, Larker barley (*Hordeum vulgare* L.), Lodi oats (*Avena sativa* L.), and crested wheatgrass were not spotted. These results indicated that in prolonged wet periods, *P. pentamera* is pathogenic to some wheats and other cereals, and that variation in resistance to the fungus exists within the wheat population. Natural ascosporic inoculum might produce different results. However, chopped mycelium and natural inoculum of the wheat-leaf-spotting fungus *P. trichostoma* were similar in pathogenicity (3).

In wheat samples from many areas of the United States and a few other wheat regions of the world, I have found *P. pentamera* only once reproducing on spring wheat

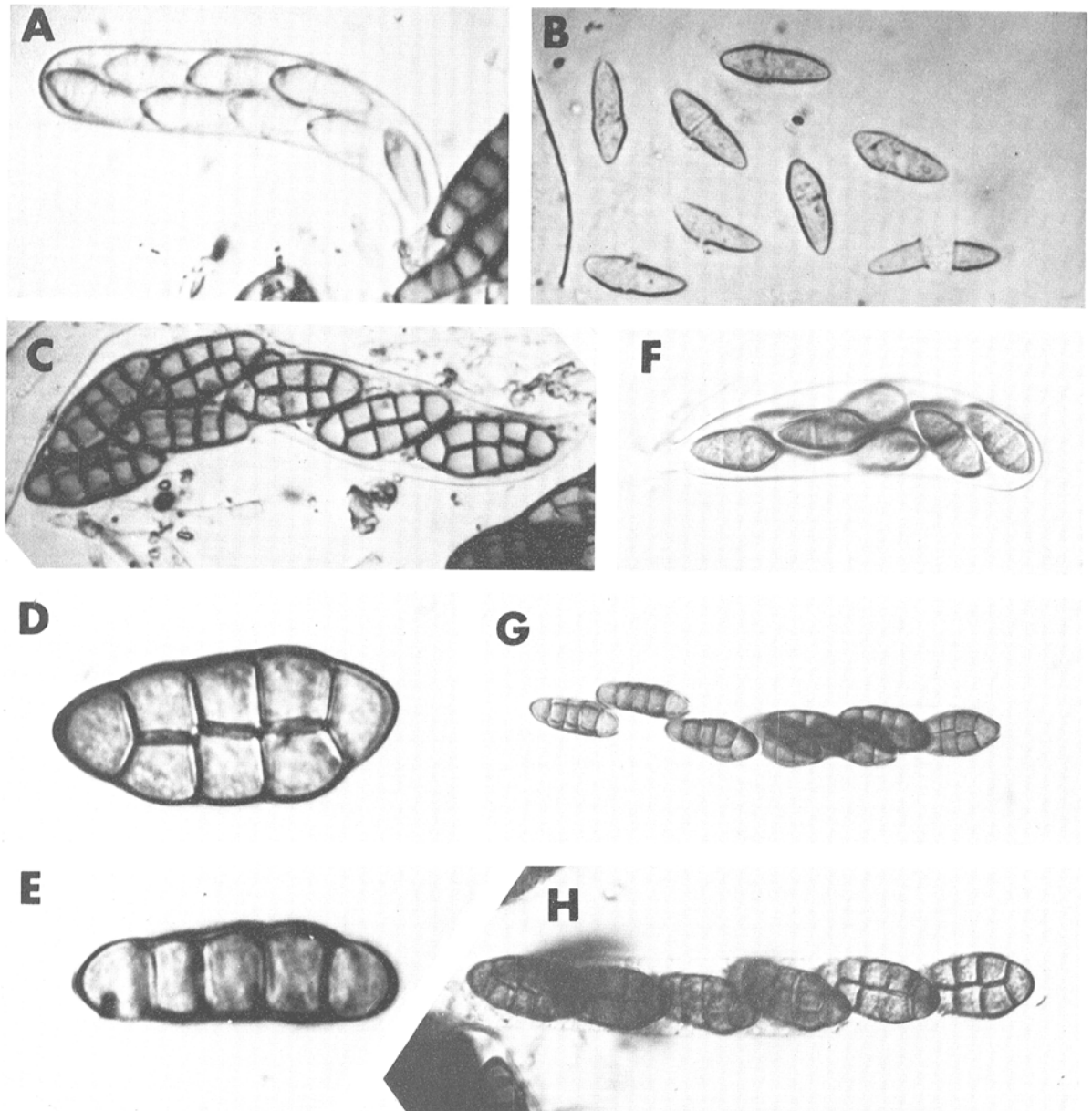


Fig. 1.—(A to H). Ascospores and asci of *Platyspora pentamera* (A to E from Utah, F to H from North Dakota): A) eight immature spores in an ascus  $\times 577$ , B) eight immature spores from an ascus  $\times 577$ , C) seven spores in an ascus  $\times 621$ , D) broad side of a spore  $\times 1424$ , E) narrow side of a spore  $\times 1424$ , F) eight immature spores in an ascus  $\times 538$ , G) eight spores in an ascus  $\times 538$ , H) six spores in an ascus  $\times 673$ .

straw in western North Dakota (4, Fig. 1) and once reproducing around nodes on culms and on leaf sheaths of winter wheat straw collected for me on July 25, 1973 by R. S. Albrechtsen in Logan, Utah (Fig. 1). Spores resembling the ascospores of *P. pentamera* have been common in the atmosphere at Fargo in eastern North Dakota (4). This pathogen's rare occurrence on wheat, and its requirement of long periods of free water for infection, suggest that it is not apt to become a serious problem on wheat. However, it may have just started in recent years to descend to the plains and colonize wheat.

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