

Septoria Tritici Blotch in Chilean Wild Oat

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ABSTRACT

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Septoria tritici blotch is one of the most economically important diseases of Chilean wheat. Abundant pycnidia of a *Septoria* sp. in wild oat plants within wheat crops make this *Septoria* sp. suspect of being involved in the epidemiology of the blotch disease in wheat. Cross-inoculation studies, morphology of conidia, and growth habit in artificial media indicated that the *Septoria* sp. in wild oats differs from *S. tritici* that damages wheat and is most likely *S. tritici* f. *avenae*.

Septoria tritici blotch, caused by *Mycosphaerella graminicola* (Fuckel) Schroeter (anamorph *Septoria tritici* Desm.), is one of the most important

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wheat diseases in Chile. Yield losses in 1980 varied from 2 to 10% of the crop, depending on location within the country (1). Wild oat (*Avena fatua* L.) is a common and noxious weed in Chile. It germinates with the first rain in the fall, before germination of winter wheat, and thus could be an overseasoning bridge for fungi able to attack both wheat and oats. Frequently, abundant pycnidia with pycnidiospores resembling those of *S. tritici* occur in the lower leaves of wild oats.

Wild oat leaves with abundant pycnidia were placed in a moist chamber for 4 hr to induce pycnidiospore liberation. The cirri of pycnidiospores were transferred to a yeast-malt agar (4 g of yeast extract, 4 g of malt extract, 4 g of

sucrose, and 15 g agar to make 1 L) and incubated for about 5 days. Spore suspensions were prepared by washing the surface of the cultures with distilled water and adjusting to a concentration of 0.5×10^7 spores per milliliter for use as inoculum. Wild oat seedlings from seed collected in Chile and wheat seedlings of the cultivar Huenufen were spray-inoculated at the two-leaf stage. After inoculation, plants were incubated in a moist chamber, where they were saturated by cold-water atomizers for 48 hr, then incubated in a growth chamber under a temperature regime of 12 hr of darkness at 2 C and 12 hr of light at 18.5 C. A similar procedure was applied with a culture of *M. graminicola* obtained from wheat in Chile.

Thirty-nine days after inoculation, pycnidia had developed in wild oat (but not in wheat) plants inoculated with the wild oat isolate and pycnidia had developed in wheat (but not wild oat) plants inoculated with the wheat isolate. Also, in a second inoculation experiment, the wild oat *Septoria* isolate failed to infect spring wheat cultivars Lakhish, Anza, Lemhi, and Baart.

Cultures of the wild oat and wheat isolates from pycnidiospores grown in

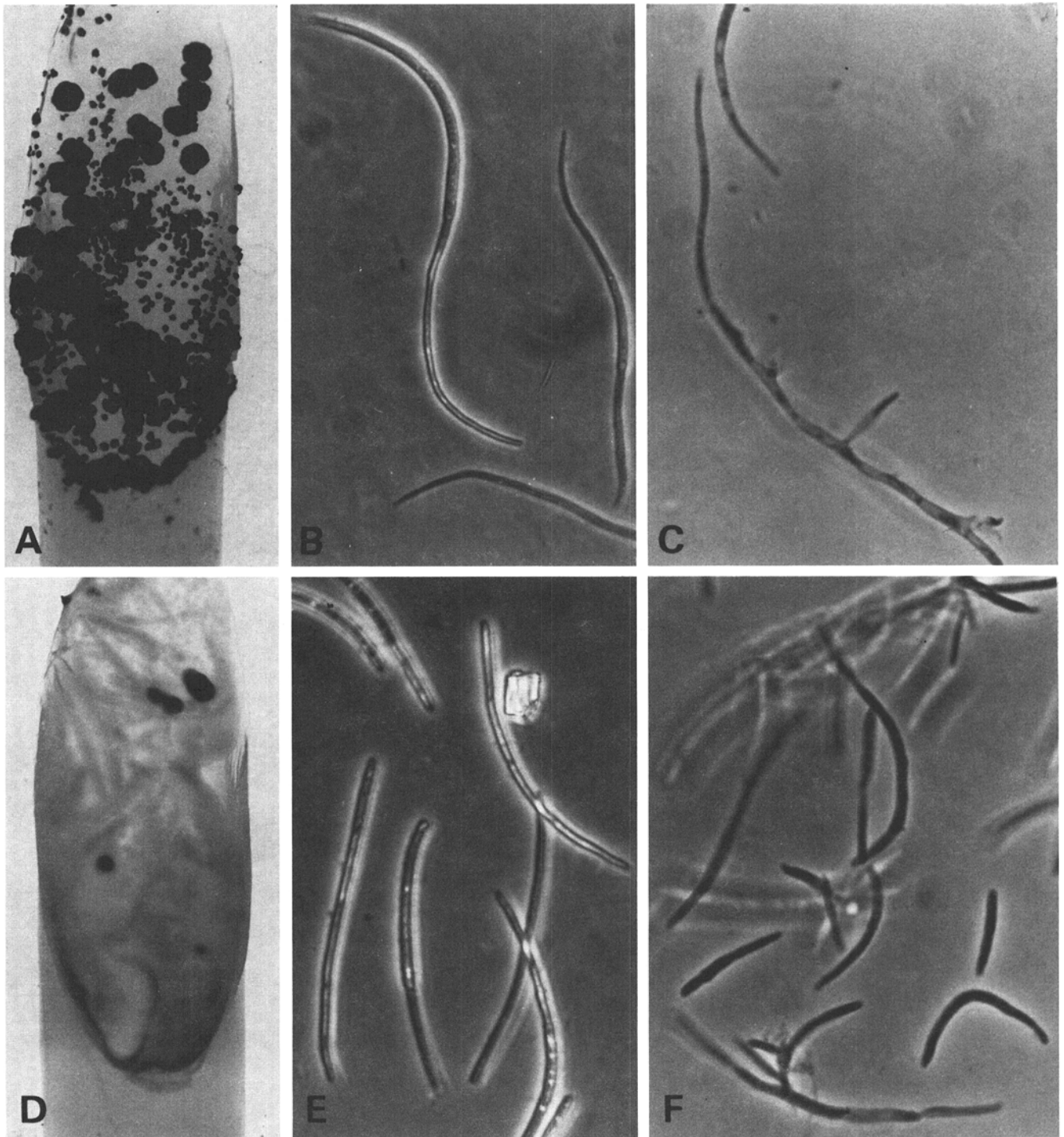


Fig. 1. (A-C) *Septoria tritici* f. *avenae* isolated from *Avena fatua*. (D-F) *S. tritici* isolated from *Triticum aestivum*. Growth of (A) *S. tritici* f. *avenae* and (D) *S. tritici* on yeast-malt agar. Pycnidiospores of (B) *S. tritici* f. *avenae* and (E) *S. tritici*. Germination and budding of conidia of (C) *S. tritici* f. *avenae* and (F) *S. tritici* on yeast-malt agar.

yeast-malt agar are illustrated in Figure 1. The wild oat *Septoria* culture formed dark green masses of filiform pycnidiospores $73.3 \pm 10.6 \mu\text{m}$ long and $2.3 \pm 0.5 \mu\text{m}$ wide. According to Sprague (2), "the spores are slightly narrower than on wheat but readily recognized by their sinuous appearance." Wheat *Septoria* cultures showed a characteristic pink

color, with abundant buds; pycnidiospores, which were shorter than those from wild oat, measured $61.5 \pm 6.7 \mu\text{m}$ long and $2.5 \pm 0.43 \mu\text{m}$ wide. We concluded that the *Septoria* sp. in the wild oat samples from Chile was *S. tritici* f. *avenae* (Desm.) Sprague and that it was not pathogenic to wheat. Thus, wild oat does not appear to be an overseasoning

bridge for *Septoria tritici* blotch on wheat.

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