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THE SECOND SHAPE OF HELMINTHOSPORIUM GRAMINEUM RABH. FUNGUS INVOLVED IN INCREASING DISEASE DAMAGE OF TORN LEAVES IN BARLEY

V.FLORIAN and I.BOBEŞ

Abstract

FLORIAN, V., I.BOBEŞ, 1989, The sexed shape of Helminthosporium gramineum RABH. fungus involved in increasing disease of torn leaves in barley. Not. Bot. Hort. Agrobot. Cluj-Napoca, XVIII-XIX, 61-66. The onset of some sclerotic formations are reported on barley straws on which the following microscopic investigations and biometrical measurements peritecia, ascia and ascospores of Pyrenophora graminea (RABH.) ITO et KURIB. were detected, representing the sexed multiplication of fungus Helminthosporium gramineum, the pathogenic factor causing leaf tearing in barley, a condition rarely encountered in nature.

Owing to the great number of peritecia on barley straw residues, we are of the opinion that the sexed multiplication of fungus represent a real danger in barley cultivation assigning the efficient control steps against this pest.

Key words: Barley, Pyrenophora graminea, Helminthosporium gramineum, peritecia, ascospores.

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Torn leaves has become one of the most harmfull foliar disease in barley last years. It has been wide-spread all over the country causing significant yield losses particularly in species cultivated in autumn or during cold and wett springs.

The unfavorable climatic conditions in Transilvania have contributed the disease to cause significant high losses especially the last five years, when the onset level ecompassed 50 percent in the districts Alba, Cluj, Mureş and Sălaj.

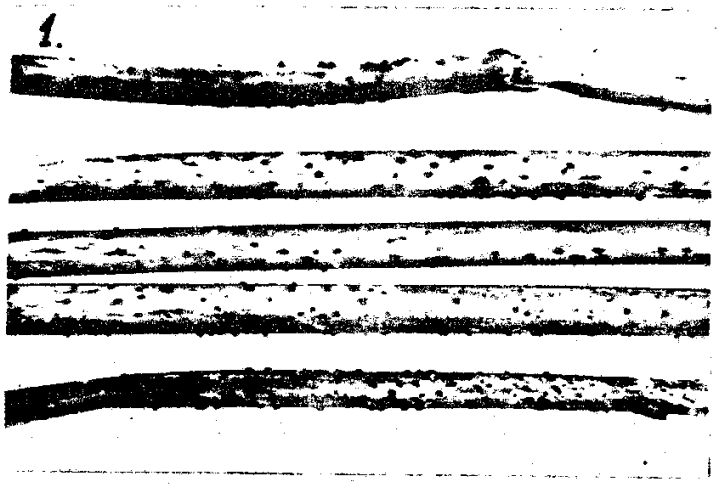

Fig.1. Pyrenophora graminea (RABH.) ITO et KURIB., peritecia on barley straws.

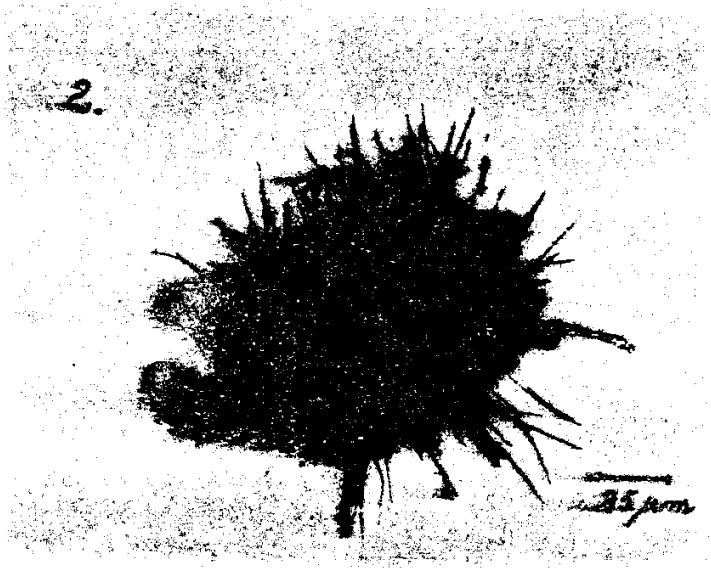

Fig.2. Pyrenophora graminea (RABH.) ITO et KURIB., peritecia

The major infective source of Helminthosporium gramineum resulted from the damaged seeds, where after the infection affected the plantlets subsequent germination. The fungal mycelium lives saprophytic also on debris of diseased plants or on stubble fields wherefrom it spreads through a conidial agency. Since, the fungus sexed shape has been considered as a minor event for the infective process (1, 3).

Considering the ever stronger onset degrees recorded last years, we went on in intensifying our investigations on the natural emergence of the sexed Pyrenophora graminea (RABH.) ITO et KURIB.

Consequently, in January 1988, on the barley straws left on fields there were detected some sclerotic formations (fig.1), in wich the microscopic examination revealed for the first time in Transilvania the sexed multiplication form of Pyrenophora graminea type.

Founded on microscopic studies and biometrical measurements performed on peritecia, asces, and ascospores we noticed as follows:

- peritecia developped on straws left on stubble fields were initially covered by an epidermid, then the front side tissu torn; they were generally globular or flattened in shape, brown-blackish, 325 to 800 µm in size (fig.2);

- a great number of fascicular asces developped inside of peritecia were round shaped at the extremity, hyaline, 200 to 400 x 30 to 45 µm in size and had 4 to 8 ascospores (fig.3).

- ascospores were yellow-brown, ellipsoid in shape, round headed, showing 3 transversal and 2 longitudinal septae inside the median zone; in front of septae the membrane was deeper located, the septae were hyaline, ascospores size varied within 45 to 70 x 20 to 31 µm.

Owing to the high frequency of peritecia on straws left on fields after harvest, especially on land under second crop of clover, a condition encountered on all fields investigated, we may point out that the very danger the sexed multiplication of fungus represent for barley cultivation requires drastic control steps against wintering of this pest, preventing thus the primary infections to appear next spring closely correlated with the full evolutive cycle of this fungus.

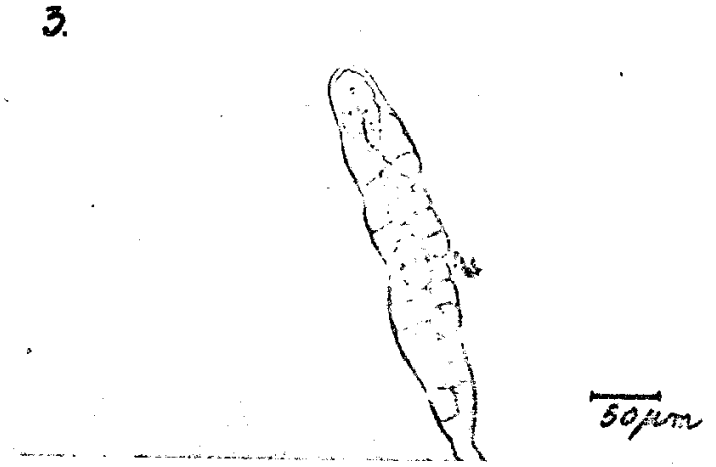

Fig.3. Pyrenophora graminea (RABH.) ITO et KURIB., asca with ascospores.

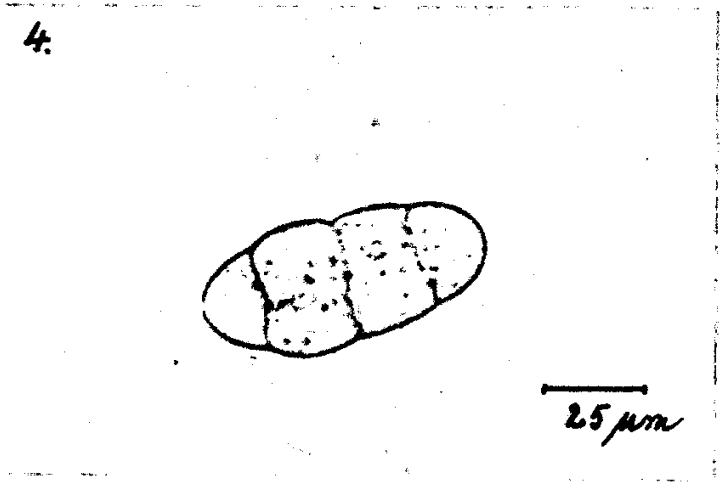

Fig.4. Pyrenophora graminea (RABH.) ITO et KURIB., ascospor.

Rezumat

FLORIAN, V., I. [illegible]S, 1989, Forma perfectă a ciupercii Helminthosporium gramineum RABH., una din cauzele agravării atacului de sfîşierea frunzelor. Not. Bot. Hort. Agrobot. Cluj-Napoca, XVIII-XIX, pp-co. Se semnalează apariţia unor formaţiuni sclerotiale pe paiele de orz, în care după cercetările efectuate la microscop şi măsurătorile biometrice, s-au descoperit peritecii cu asce şi ascospori de tipul Pyrenophora graminea (RABH.) ITO et KURIB., care reprezintă forma de înmulţire sexuată a ciupercii Helminthosporium gramineum, agentul patogen ce produce sfîşierea frunzelor de orz, formă mai rar întîlnită în natură.

Datorită numărului deosebit de mare de peritecii pe resturile de paie de orz, se consideră că forma de înmulţire sexuată semnalată are o importanţă practică deosebită, ceea ce impune ca în complexul măsurilor de combatere a acestei boli să se ia în considerare şi acest aspect.

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