

Alternaria blight of wheat in Maharashtra State, India

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Introduction

While the improvement work on wheat was mainly confined to breeding for rusts resistance since 1936 in India, and since 1942 in Maharashtra State, because of the serious menace caused by these diseases, other diseases like *Alternaria* blight etc. which were not at all serious then, were merely recorded. This trend had to be changed particularly in Maharashtra State since 1954—55 as the released rust resistant *Kenphad* wheats were found to suffer heavily in irrigated areas, due to serious outbreaks of blight disease. Isolations from blight affected specimens of *Kenphads* as well as from the affected seed of *Arnej* — 200 variety always yielded *Alternaria* species, the work on which was undertaken during 1958—60.

In India, *Alternaria* on wheat was first reported by Kulkarni (1924) from Bombay. McRae (1933) also reported it to be parasitic on leaves, causing brownish spots and also foot rot. Subsequently Galloway (1936), Mehta (1950), Gattani (1951) und Bose (1956) also reported its incidence in India. Consequent upon earlier observations in Bombay, Murty (1956) mentioned its serious outbreak on *Kenphad* wheats from sugarcane growing areas of Maharashtra. Patel and Gokhale (1957) reviewed the research work done on important diseases of wheat in India during the past 25 years where mention on *Alternaria* was also made.

Materials and Methods

The pathogenic isolate of *Alternaria* could be obtained on isolation from the affected specimens of *Kenphads* and also from affected seed of *Arnej* — 200 on potato dextrose agar. The pathogenicity of the isolates was easily proved on the *Vijay* variety of wheat. The studies on the varietal resistance, cultural and physiological characters were undertaken.

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Results

The pathogenic fungus incited the development of small specks of blight, brown to deep brown in colour, which spread longitudinally and gave rise to blight. On glumes also, greenish black coloured blotching, in very severe form, was noticed. The fungus was also found pathogenic on cabbage, chillies, *Cynadon dactylon* Pers., potato and oats besides wheat. Of the 33 wheat varieties tried, high tolerance to the fungus attack was noticed on N. P. series — 710, 718, 758, 798, 799 and I. P. 52 varieties, both in the seedling and adult plant stages. The varieties P. W. (Parbhani wheat) series — 1, 4, 5, 6, 7, 8, 10, 13 and 20, N. P. series — 711, 715, 764, 770 and 817, B. N. 177 and Niphad — 4 were moderately susceptible while varieties P. W. 18 and 19, N. P. 765, 771, 790, 792 and 797, G. K. 3—3, *Kenphad* 25, 28, 39 and *Vijay* were found to be highly susceptible.

The fungus hyphae was hyaline when young but later became grayish brown. The width was $3.9\ \mu$. Conidiophores were short or long, dark brown, erect straight, or regularly bent. They measured $91\text{--}258\ \mu$. The conidia had $2\text{--}9$ usually $4\text{--}6$, transverse and $0\text{--}5$ usually 2 , longitudinal septa. They measured from host $23\text{--}74\ \mu \times 9\text{--}12\ \mu$ and from culture on potato dextrose agar $25\text{--}44\ \mu \times 8\text{--}19\ \mu$. Chlamydo-spores measured $10\text{--}16\ \mu$.

The fungus made best growth on wheat seed decoction, oat meal, maize meal, wheat plant decoction and potato dextrose agars. It grew fairly well on other synthetic and non-synthetic media. Good sporulation was obtained on Czapeck's and Kirchoff agars. Optimum temperature range for fungus was between $26\text{--}30^{\circ}\text{C}$. Best carbon utilisation was observed in dextrin, maltose, inulin, levulose, mannitol and glycogen, although fungus made growth in all carbon compounds. Good sporulation was noticed in inulin. Fungus had a wide range of nitrogen requirement. Best growth was obtained on peptone, glycine, asparagine and creatine, although in other nitrogen compounds it formed fairly good growth. Fungus produced diastase, trypsin and cytase in large quantities and gelatinase, inulase and erepsin in fairly good quantities. The optimum pH for fungus was between 5.7 and 5.9 .

On basis of the morphological characters, the fungus was identified as *Alternaria tenuissima* Nees. Ex. Fr.

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