SHORT COMMUNICATION

# Prevalence of Cercospora Leaf Spot (CLS) in the mid hills of Uttarakhand (India)

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# Prevalence of Cercospora Leaf Spot (CLS) in the mid hills of Uttarakhand, India

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Cercospora Leaf Spot (CLS) though mostly confined to hills of Uttarakhand, can be more detrimental than blast if severe disease occurs at early stages of crop growth. As most of the test cultures of finger millet revealed high incidence of the disease at the AICRP (Small Millets) centre at Ranichauri, on extensive roving survey conducted during *kharif* 2013 it was revealed that the CLS is mostly confined to mid hills (above 1000 m) of Uttarakhand and prevalent both in Garhwal and Kummaon regions. Free hand sections of the infected tissues revealed the presence of long septate conidia. However, efforts to culture the fungus on artificial medium failed as it did not grow readily on potato dextrose agar.

**Key words:** Cercospora Leaf Spot, survey, Uttarakhand, mid hills

Finger millet is an important food and fodder crop for millions in dry regions of Africa and Asia. Several bacterial, fungal and viral diseases have been reported as major production constraints of which blast is most dreaded. However, Cercospora Leaf spot of finger millet is one of the important foliar diseases restricted to certain geographical regions only. The disease is prevalent in Himalayan foothills and mid hills of Nepal. It is reported that Cercospora leaf spot, is one of the most destructive diseases in Zambia. Yield reduction up to 40 per cent and 1000 seed weight loss by 21 per cent have been reported if the disease occurs immediately after heading. But, no yield loss if the disease incidence is around 25 per cent As the disease has been reported only from the mid hills of Uttarakhand it was felt worthwhile to survey the finger millet growing regions of the state to know the prevalence, extent and availability of any local resistant sources.

## MATERIALS AND METHODS

An intensive roving survey was carried out in Garhwal and Kummaon regions of Uttarakhand (India) during the rainy season of 2013 covering 59 villages and 69 fields in five districts *viz*., Almora, Bageshwar, Chamoli, Champawat and Tehri. Observations on the disease were recorded based on 0-5 (Grade) scale as suggested by Nagaraja *et al*. (2007). It was evident from the survey that most of the farmers had sown varietal mixtures, though few fields showed pure stands of improved varieties like PRM 1, 2 and VL 149. The symptoms of the CLS disease appeared as spots (Fig. 1) on the lower leaves, moving upwards of the plant, sometimes affecting the stem and leaf sheath. Spots elongate on leaves and leaf sheath and measure 0.5-2.0 X 2-8 mm, Olivaceous brown to dark brown margin with grayish white centre, preferentially attacking early senescing varieties.

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## RESULTS AND DISCUSSION

Free hand sections of the infected specimen revealed that the conidiophores olivaceous brown, tip dilutely coloured, straight to curved, geniculate, septation at long intervals, not branched, spore scar prominent; measuring 4-5X27-300μm. Conidia acicular, hyaline to sub-hyaline, indistinctly multiseptate, straight to curved, base truncate, tip subacute and measure 3-4 X 50- 260 μm (Fig. 2a). Further, they were straight to much curved, base obconic, tip sub obtuse multiseptate, hyaline to brown (Fig. 2b). Efforts to culture the pathogen from infected tissue on PDA failed as it did not grow readily on the culture medium.It is evident from Fig

**Fig. 1 :** CLS symptoms on leaf

3 that the disease was generally restricted to altitudes above 1000m likely because of cool humid weather. In Nepal also the disease is restricted to mid hills where mean daily temperature does not exceed $20^0$C and the rainfall is generally high. Disease is low in relay crop of maize compared to sole crop finger millet. Further, lower levels of infection were also found when transplanting of finger millet was delayed until maize was 60 days old compared with early transplanting The fungus may survive between millet crops in and on infected crop residue as spores (conidia) and fungal mycelial

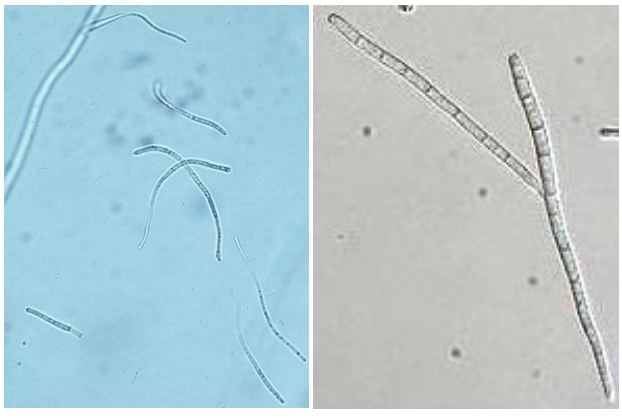

**Fig.2a**: Conidia
**Fig. 2b**: Conidium with septation

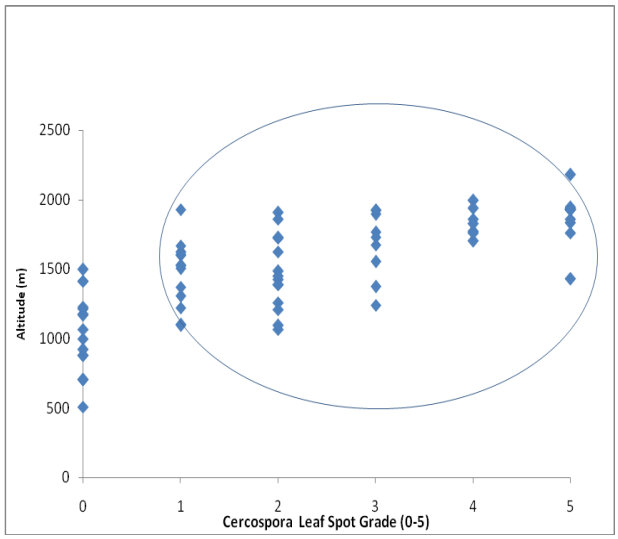


**Fig. 3 :** Occurrence of CLS at different altitudes in the hills of Uttarakhand

masses (stromata), weeds, and perhaps on alternate hosts as suggested for *C. penniseti* on pearl millet (Scwartz and Gent, 2005). However, a local monocot weed called *Musli ghaas* found on the bunds and in uncultivated areas around finger millet fields had severe leaf spots, which probably is an alternate host.Incidentally, there are good sources of resistance to this disease. Varieties GE 5016 from Africa and GE 0122 from Nepal possess satisfactory level of resistance. Of the 125 genotypes screened for their reaction to Cercospora in Nepal, lines ACC 2909-4, ACC 2929-1, ACC 2683-9, ACC 2307, SDFM 346, ZWFM-S and F/MFS-94-60 had low to moderate levels of infection Under the All India Coordinated Research Project on Small Millets at Ranichauri centre situated in the hills of Uttarakhand, studies with 851 germplasm during 2015 have revealed that nearly 287 lines were free from infection (Anon. 2016). So lines with stable resistance may be used in the crop improvement programs.

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