

RESEARCH NOTE

A new addition to sheath blight of barnyard millet caused by *Rhizoctonia solani*

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Key Words : Small millet, Barnyard millet, Sheath blight, *Rhizoctonia solani*, *Echinochloa frumentacea*

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Small millet crops provide household food and nutritional security to millions of impoverished people inhabiting in remote and inhospitable areas. Due to their unique adaptability they are grown from sea level in Andhra Pradesh to 9000 m amsl of cold arid region of Jammu and Kashmir (Yadav *et al.*, 2010). They belong to family Poaceae (Graminae) and are mostly cultivated as rainfed crops on marginal soils. Six small millets *viz.*, finger millet, barnyard millet, foxtail millet, proso millet, kodo millet and little millet are the most important small millet crops of India. Among these, barnyard millet (*Echinochloa frumentacea* (Roxb.) Link) also called as *Jhangora*, *Sawan* or *Madira* (Hindi), has emerged as very important dual purpose feed and fodder crop. Barnyard millet is grown in many countries like India, China, Japan, Malaysia, East Indies, Africa and United States of America. In India, it is grown in Madhya Pradesh, Uttarakhand, Tamil Nadu, Andhra Pradesh, Karnataka, Maharashtra and Bihar. In Uttarakhand, it is grown over an area of about 0.64 lacs

ha with annual production of 0.67 lacs tonnes (Anonymous, 2011) under rainfed conditions by small and marginal farmers in difficult conditions of cultivation at the mid-hill regions. Traditionally, the barnyard millet is used for the preparation of various products ranging from 'boiled Jhangora rice' to thick 'porridge'. Preparation of Jhangora rice along with curd and spices is called 'Chachera'. However, popping or puffing, Papad, Kachari and Sattu are the other uses of barnyard millet in Uttarakhand hills (Yadav *et al.*, 2010). Its straw provides a good quality fodder for cattle, which is an important component of sustainable hill farming system, as fodder becomes scarce during winter. It is also used as feed for caged birds. In fact, the stover of barnyard millet is the best in terms of nutritional qualities among the existing cereal stovers.

Incidentally, barnyard millet is known to be affected by several diseases like; smuts, leaf blight, etc. (Parmeter and Whitney (1970). Recently, a new disease sheath blight caused by *Rhizoctonia solani* has also been reported by Kumar and Prasad (2009). Until 2012, the pathogen was known to produce symptoms on sheath. However, during 2012, in a routine survey for diseases of small millets in district Tehri-Garhwal, the classic blight symptoms were also observed on leaves of barnyard

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millet plants. The new symptom was novel, manifested itself as oval to irregular and light grey to dark brown lesions on the leaves. As the disease progressed, the central portions of the lesions later turned white to straw coloured with narrow, reddish–brown borders, which appeared as series of copper and brown colour bands across the leaf (Fig. 1a and b). Lesions at first appeared on the leaves near soil level but rapidly extended, coalesced with one another to cover the upper leaves and caused blighting of the foliage. The incidence of the disease was recorded up to 10 per cent. High RH (~70%) and temperatures between 28^o and 30 °C are known to favour the disease development (Pall *et al.*, 1980). The weather during *Kharif* 2012 was highly conducive for the development of this disease. There was incessant heavy rainfall and temperature was also high.

The causal fungus was isolated on potato dextrose agar medium. Isolation from infected tissues on PDA yielded a dull white mycelium, which after a few days turned light brown in colour (Fig. 1c). The sclerotia were

formed in great numbers as the culture became old (Fig. 1c). In microscopic examinations, the fungus appeared septate and branched. The cells of the hyphae were barrel shaped. The branches arose more or less at right angles from below the septa and showed distinct constrictions at the point of origin (Fig. 1 d, e and f). In order to test the pathogenicity of the fungus, seedlings of barnyard millet were raised in pots. Later, 3-4 sclerotia were inoculated in the leaf sheath of one month old seedlings. Appropriate control was also maintained. Periodic observations were made on the development of symptoms. Similar symptoms were observed only on inoculated plants and the same organism was reisolated from lesions. On the basis of cultural, morphological and microscopic examinations as described by Nagaraja *et al.* (2007); Parmeter and Whitney (1970); Mehrotra and Aneja (2008); Dube (2007) and Dubey and Pandey (2008) the fungus was identified as *Rhizoctonia solani* Kuhn. The disease was reported for the first time by Kumar and Prasad (2009). The symptoms of the disease were reported only on the leaf sheaths but now the symptoms of the disease are also recorded on leaves and pathogen *Rhizoctonia solani* is isolated from the leaves. It's a new addition to the disease. On the basis of symptoms, the disease should be renamed as leaf and sheath blight of barnyard millet.

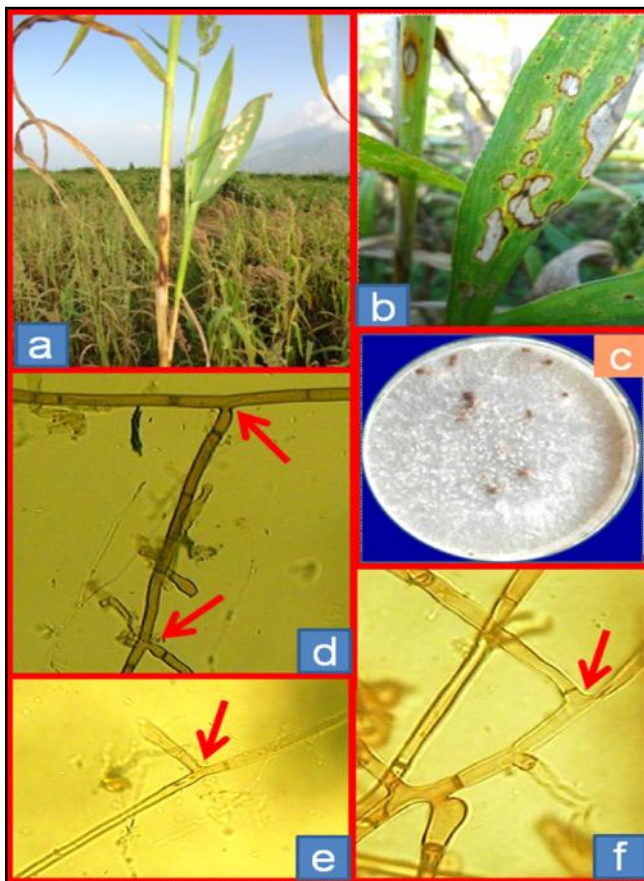


Fig. 1: Leaf and sheath blight of barnyard millet, (a and b): blight symptom on leaf and sheath, (c): pure culture of *R. solani* showing sclerotia, (d,e and f): branching of hypha at right angle.

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