

Blast of Proso Millet in India

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ABSTRACT

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Proso millet (*Panicum miliaceum* L.) was found to be affected by *Pyricularia grisea* (Cke.) Sacc. This is a new host record for the pathogen in India.

Proso millet (*Panicum miliaceum* L.), commonly known as *cheena*, is next after ragi (*Eleusine coracana* L. Gaertn.) in importance among millets in Bihar. It is highly drought resistant and has the lowest water requirement among cereals. In Bihar, the crop is grown in summer (February–June) and during the monsoon (June–September).

During the monsoon season in 1975, blast caused by *Pyricularia grisea* (Cke.) Sacc. was severe on *P. miliaceum* at the University farm near Dholi. The crop escapes the blast attack during summer seasons. The pathogen infects proso millet in the U.S.S.R. (1) and Australia (2).

MATERIALS AND METHODS

Leaves and panicles of proso millet plants with typical blast symptoms were collected. Affected portions were cut into small pieces, surface-sterilized with 0.1% mercuric chloride, and placed on host extract medium prepared by boiling 200 g of cut stems and leaves in 1,000 ml of water, solidified by adding 2% agar. Ten such plates were inoculated. The fungus was purified by single spore isolation and multiplied on host extract agar medium. No other fungi were isolated.

For testing pathogenicity, the inoculum from 1-wk-old culture was suspended in sterile water and sprayed on 2-wk-old seedlings in earthen pots. Three replications of 10 pots of five plants were inoculated. Plants in another 10 pots were sprayed with sterile water only and maintained as controls. The inoculated

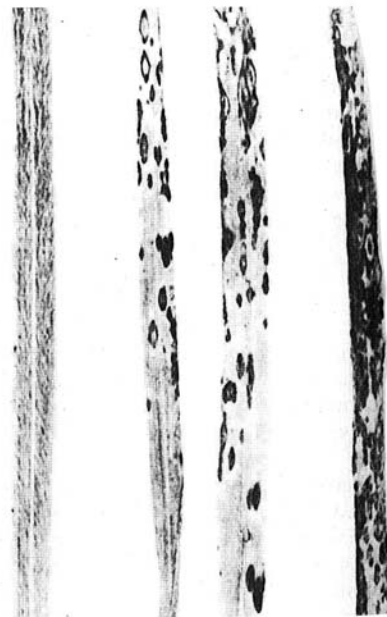


Fig. 1. Blast lesions on proso millet leaves. Healthy leaf at left.

and control plants were kept in a humid chamber for 36 hr and then transferred to greenhouse benches. Symptoms developed

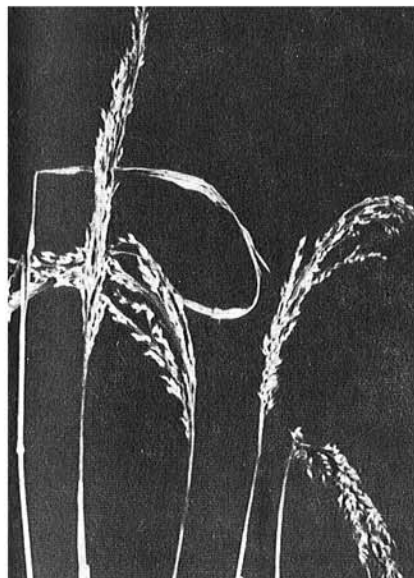


Fig. 2. Neck blast on proso millet.

a week after inoculation.

The pathogen was reisolated from the lesions and was identical with the original culture. A specimen of diseased leaves has been deposited at the Commonwealth Mycological Institute, Kew, England, as IMI 232564.

RESULTS

Symptoms. Numerous small brown flecks enlarge to form brown spindle-shaped spots on the leaves. Ash grey centers with brown margins develop later, increase in size, and coalesce to give a blasted appearance. The spots are 3–8 mm (average, 5 mm) long and 0.5–1.5 mm (average 1 mm) wide (Fig. 1).

Culm nodes blacken. Such nodes are fragile, and plants may lodge at these points. Brown to black spots appear at the panicle base; spots enlarge and often girdle the neck just below the panicles. The infected neck becomes shriveled and covered with mycelia, conidiophores, and conidia. Abundant conidiophores and conidia are formed on the nodes and the necks in wet weather.

When neck blast is severe, panicles fail to emerge. The spikelets also become infected and eventually blacken. When neck infection occurs early, the grains do not fill and the panicles remain erect. Late neck infection results in lodging of partially filled panicles, causing severe damage to the crop (Fig. 2).

Mycelium is septate and hyaline and becomes brown with age. Conidiophores are rarely branched and are often swollen at the base. The base of conidiophores are dark, shading to subhyaline at the tip.

Conidia are produced sympodially. They are usually bisepate and subpyriform, with the apical cell conical or slightly rostrate and broadest at the lower septum. The spores are apiculate or have protruding hilum at the base and are 29.9–39.9 μm (average, 33.6 μm) long and 9.1–11.6 μm (average, 9.5 μm) wide. Koch's postulates were established.

Based on these findings, we identified the fungus as *Pyricularia grisea* (Cke.) Sacc. The identification was also confirmed by the Commonwealth Mycological Institute. There is no previous record of this pathogen on proso millet in India.

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