Short Communication

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INCIDENCE AND SEED-BORNE INFECTION OF *ALTERNARIA ALTERNATA* IN GUAR SEEDS OF RAJASTHAN

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Alternaria alternata (Fr.) Keissler causing leaf spot of guar (Chand and Verma, 1968) has been found to occur on its seed (Shivanna and Shetty, 1988). A detailed account on its location inside guar seed is given in the present study.

Two hundred and twenty one seed samples of guar collected from 18 districts of Rajasthan (harvest years 1991-1994) were screened for seed-borne mycoflora using standard techniques prescribed by ISTA (Anonymous, 1985). Two naturally infected seed samples ac. nos. 7535 and 7648 were selected for histopathological studies. Asymptomatic and symptomatic seeds were handled separately following methods of component plating, cleared wholemount preparations and microtome sectioning (Singh *et al.*, 1977). Ten seeds per category per sample were used for microtomy.

The symptomatic seeds with dull brown crust (Fig. 1) occurred in 33 samples of 8 districts. *A. alternata* occurred either as spores adhered mostly to hilar region or as dormant mycelium spreading over the surface. The pathogen was recorded in 74 samples of 15 districts in incubation tests. Majority of the samples were in the range of 0.5-5% followed by 5.5-25%.

In component plating, mycelium along with conidial chains of *A. alternata* were observed only on seed coat of asymptomatic (10%) and symptomatic (40%) seeds (Fig. 2). In cleared wholemount preparations dark brown, septate, inter and intracellular mycelial network of the fungus was observed only in seed coat (65%) of symptomatic seeds (Fig. 3).

The symptomatic seeds carried inter- and intracellular mycelium in all layers of seed coat (Palisade, hourglass and parenchyma) (Fig. 5). Hilar region carried heavy inoculum of mycelium and conidia where hyphae were observed within the hilar trachieds, around the trachiedial bar and stellate parenchyma (Fig. 4).

In case of heavy infection, fungus invaded the endosperm where thick hyphal bits were observed (Fig. 7). At places cells of endosperm and cotyledons mainly near its proximal and distal ends where replaced by thick hyphal clumps (Fig. 8). The infection caused deformation and disintegration of seed coat tissues and endosperm (Fig. 6) while depletion of cell contents and cell lysis was a common feature in cotyledons.

A. alternata is a prominant pathogen of guar seeds in Rajasthan and its infection is mostly confined to seed coat both in asymptomatic and symptomatic seeds. Kunwar *et al.* (1986) observed inter- and intracellular hyphae of *A. alternata* in seed coat and endosperm of soybean seed. In severely affected guar seeds fungus revealed heavy infection in endosperm and a few superficial cells of cotyledons. Depending upon severity of seed infection, it is both extra - as well as intraembryal. If the conditions suitable for disease development continue it results into an intraembryal infection as seen in sunflower (Singh *et al.*, 1977), mustard (Sharma *et al.*, 1993). The pathogen probably gains entry in seed either through hilum or directly through palisade layer of seed coat as also observed by Sharma *et al.* (1993) in mustard seeds.

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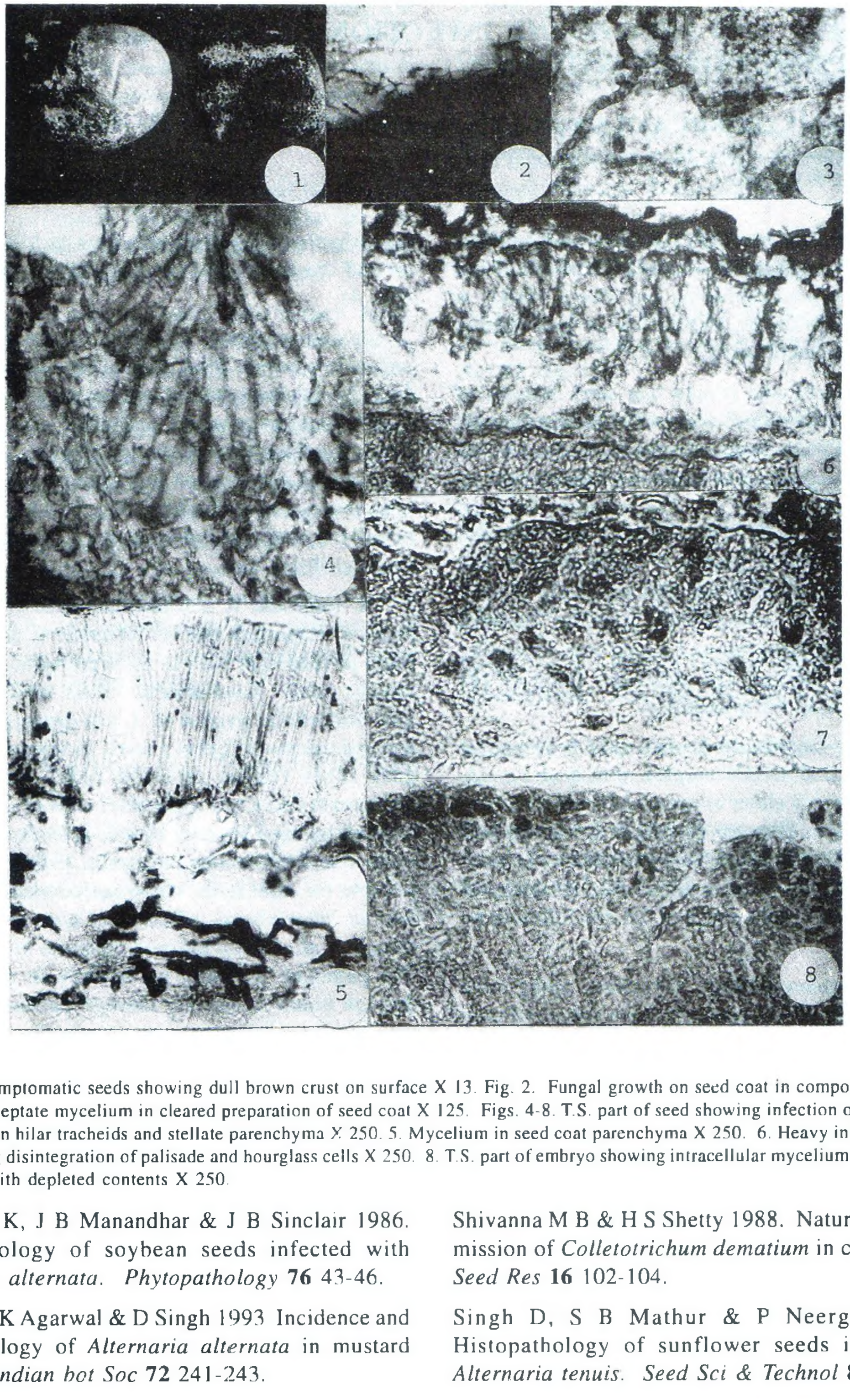

Figure 1. Symptomatic seeds showing dull brown crust on surface X 13. Fig. 2. Fungal growth on seed coat in component plating X 20. Fig. 3. Septate mycelium in cleared preparation of seed coat X 125. Figs. 4-8. T.S. part of seed showing infection of *A. alternata*. 4. Infection in hilar tracheids and stellate parenchyma X 250. 5. Mycelium in seed coat parenchyma X 250. 6. Heavy infection in seed coat showing disintegration of palisade and hourglass cells X 250. 8. T.S. part of embryo showing intracellular mycelium in cotyledons. Note cells with depleted contents X 250.

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