

## TRICHOHECIUM ROSEUM IN RAPE AND MUSTARD SEEDS OF RAJASTHAN

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*Trichothecium roseum* was recorded in incubation tests showing an incidence of 0.5-38 and 0.5-19 per cent in 9.6% and 11% seed samples of rape and mustard respectively. Conidia of *T. roseum* were observed in 5 and 11 seed samples with a spore load range of 40-16000 and 40-2460 spores/g seed respectively in the two crops in seed washing test. The mycelium of *T. roseum* was restricted to epidermis and sub-epidermis of bold-symptomless and bold-weakly discoloured seeds whereas in heavily discoloured and shrivelled-discoloured seeds, it occurred in seed coat, endosperm and embryo. The mycelium was inter as well as intracellular and caused depletion of cell contents.

**Keywords:** Mustard; Rajasthan; Rape; Seed infection; *Trichothecium roseum*.

### Introduction

*Trichothecium roseum* (Pers.) Link ex Fr. causing seed rot and seedling infection has been reported in rapeseed from Uttar Pradesh<sup>1</sup> and mustard from Punjab<sup>2</sup>. There is no detailed study on seed infection of *T. roseum* in Rajasthan hence, the present study in rape and mustard seeds was carried out.

### Material and Methods

One hundred seventy six and 271 seed samples of rape and mustard from 12 and 24 districts of Rajasthan, respectively were studied using incubation tests<sup>3</sup>. Out of these, 106 and 136 samples of rape and mustard, respectively were also studied using seed washing test<sup>4</sup>.

One sample of rapeseed (ac. no. 2935) carrying 38% natural infection of *T. roseum* was selected and its histopathology was studied following the methods of component plating, clearing and wholemount preparations (50 seeds/category) and microtome sectioning (10 seeds/category) using categorised seeds<sup>5</sup>.

### Results and Discussion

**Incidence :-** Hyaline, bicelled conidia of *Trichothecium roseum* were recorded in 5 and 11 samples of rapeseed and mustard with

spore load range of 40-16000 and 40-2460 spore/g seeds from 4 and 8 districts of Rajasthan, respectively.

Incubation studies revealed infection in 31 and 30 seed sample of rape and mustard from 21 and 17 districts with an incidence range of 0.5-38 % and 0.5-19% respectively suggesting its widespread occurrence in Rajasthan. Jain *et al.*<sup>1</sup> also reported 1-15% infection of *T. roseum* in sarson seeds from Uttar Pradesh. It has also been reported to be pathogenic in *Zinnia elegans*<sup>6</sup>, wheat<sup>7</sup> and maize<sup>8</sup> from Rajasthan.

**Histopathological Studies :-** The seeds showed light yellow discoloration and pinkish white shiny conidia on seed surface. In component plating, the growth of *T. roseum* was found on 12, 70 and 98% of seed coats (along with endosperm) in bold-symptomless, bold-discoloured and shrivelled-discoloured seeds (Fig. 1), while on 18 and 30% embryos in the last two categories.

Cleared wholemount preparations revealed thin, hyaline, branched and septate mycelium in seed coat epidermis (Fig. 2) of 10% bold-symptomless seeds. The infection in epidermis, palisade layer (Fig. 4) of seed



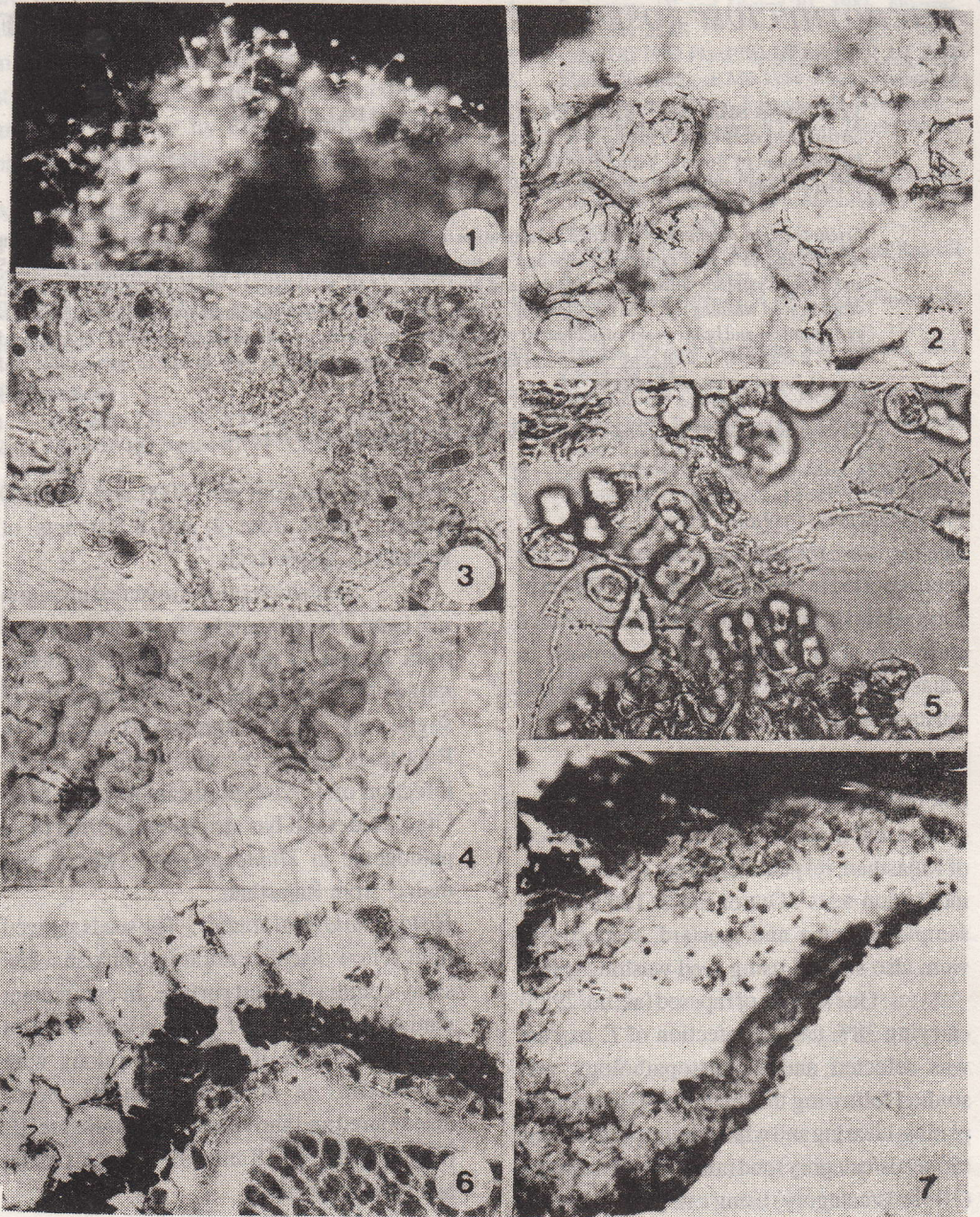


Fig. 1-7 : Histopathology of *T. roseum* infected seeds; Fig. 1. Growth of *T. roseum* on seed coat (X50); Fig. 2-5 - Seed components showing thin septate, inter and intracellular mycelium and conidia in cleared wholemount preparations; Figs. 2 & 3. Seed coat epidermis; Fig. 4. Palisade layer; Fig. 5. Cotyledonary tissue (X 250); Fig. 6. Part of L.S. of bold-discoloured seed showing mycelium in seed coat epidermis and Fig. 7. Part of L.S. of shrivelled-discoloured seed showing mycelium and conidia (X 125).



coat, endosperm and embryo (Fig. 5) was 32, 12, 9, 8% in bold-discoloured seeds and 46, 24, 17, 12% in shrivelled-discoloured seeds, respectively. Conidia of *T. roseum* were also observed in epidermal layer (Fig. 3).

Microtome sections revealed conidia of *T. roseum* and mycelial fragments in seed coat epidermis of one bold symptomless seed. In bold-discoloured seeds, the mycelium was observed in epidermis and subepidermis of 6 and 5 seeds (Fig. 6) whereas in 2 seeds, it was observed in palisade layer, endosperm and cotyledons also. In shrivelled discoloured seeds, infection in seed-coat epidermis, palisade, endosperm and embryo occurred in 9, 5, 4 and 3 seeds, respectively. Conidia were also seen in the depressions of shrivelled seeds (Fig. 7). In this category, palisade layer showed reduced thickenings of radial walls. Embryo in highly shrivelled seed was of reduced size and showed depletion of cell contents due to heavy colonization by the mycelium.

Singh *et al.*<sup>8</sup> also observed the mycelium as well as conidia of *T. roseum* in

seed coat, endosperm and embryo of miize, causing serious damage to tissues. The heavily-discoloured and shrivelled seeds failed to germinate.

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