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Germination deterrence of seeds of *Abrus precatorius* L. by the seed-borne pathogen, *Sclerotium rolfsii*

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Since ancient times, various parts of the leguminous vine, *Abrus precatorius* L., known as '*kunch*' in Bengali vernacular, is used medicinally, *viz.* emetic, vermifuge, emollient, thermogenic, antihistaminic, antiseptic, aphrodisiac, diuretic, tonic, purgative, abortifacient and antifertility agent. Also, *kunch* seeds have been traditionally used as the smallest unit of weight (*ratii)* by the goldsmiths. The plant is distributed widely throughout the South Bengal (Paria, 2005).

The ovoid seeds (6-7 mm long and 4-6 mm broad) are distinctive by their usually scarlet testa with a black spot around the sub-apical hilum. Chemical analysis of seeds of *A. precatorius* has been done by Ghatak and Kar (1932), Khan *et al.* (1961) and Gunn (1969). Presence of the protein, Abrin, has been identified which is toxic to animals. Anderson *et al.* (1972) have detected aromatic compound(s), belonging to Indole family, in the leachates from the embryos of the germinating seeds that inhibit seedling growth of a number of di- and monocotyledonous plants. As the inhibitor(s) does not affect radicle emergence, but it does affect subsequent growth of the root and shoot, it has been regarded as a sort of growth inhibitor rather than an inhibitor of germination processes. However, details of the germination and related biological aspects of *A. precatorius* seeds have not yet been worked out. The plant is reported to be distributed widely throughout the tropics (Kirtikar and Basu, 1999). For medicinal purposes, *Abrus precatorius* L is collected from the wild source. In order to formulate the strategies for its successful conservation and cultivation, studies in its seed biology have been undertaken.

Freshly harvested seeds of *Abrus precatorius* L. are primarily dormant and initially exhibit no germination until those are scarified. Scarification by 18(N) H_2SO_4 for 10 mins gave rise to 35% germination. Enhanced germination was noticed when properly scarified seeds [18(N) H_2SO_4 for 10 min] were treated with 250 ppm GA_3 for 12 hrs duration.

However, while performing the germination experiments, it had been noticed that majority of the imbibed seeds, in course of a day or two, become covered by a profuse growth of fungal mycelia and ultimately fail to germinate (Fig.1). Inspite of surface-sterilization by 0.1% $HgCl_2$ followed by scarification with 18(N) H_2SO_4, more than 50% of the seeds get perished due to this fungal growth. Despite taking all precautions the germination of the seeds were found to be constantly affected with such fungal growth.

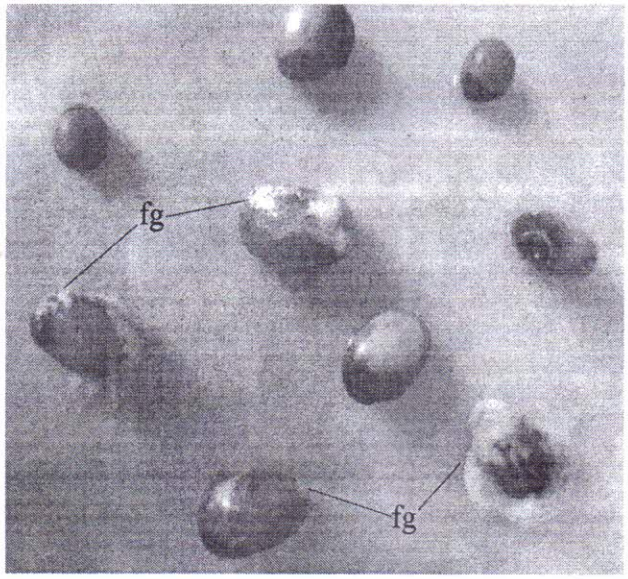

Fig. 1. Fungal growth (fg) on the surface of a number of imbibed seeds of *Abrus precatorius*

The fungal mycelia were isolated aseptically, and cultured aseptically on PDA slants and a pure line culture was sent to the Indian Agricultural Research Institute, New Delhi for its proper identification. The culture was later documented and identified as

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Sclerotium rolfsii Sacc. by the organization (ITCC, ID No. 7910.10).

The observations revealed that *Sclerotium rolfsii* is a constant associate of *Abrus precatorius* seeds as an internally seed borne fungus which has not been reported earlier. Work on deciphering the control measures of the fungus, without affecting the seed vigour, is under progress.

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