associated with the Bhima basin, coincides with the geophysically inferred infra-Trappean rift[1]. This alignment is also consistent with the 'H-6' lineament[9] inferred from Free-air-gravity anomaly patterns.

All these observations and evidences point to the conclusion that the Kurduwadi Lineament is a crustal structure with a prolonged, episodic geological history. Its parallel trend with the Raichur schist belt (more than 2000 Ma. old)[7], suggests a close association between the two, though not very clearly understood at present. The close affiliation of this lineament with the evolution of the supracrustal Bhima basin and the subsequent deformational history of these sediments in the late Proterozoic times is undeniable. The superimposed fracture system on the Deccan Traps recorded along this zone, and its implicit control on the drainage development, stands testimony to a post-Trappean (younger than 60 Ma.) episode of reactivation of this zone.

The area around Khardi is located on the intersection of the Kurduwadi Lineament, with the well known, N-S trending zone of crustal instability along the Konkan coastal strip [9-11]—highlighted by deformed Deccan Traps, geophysical anomalies, intrusives and linear array of hot-springs—which partly coincides with the 'Koyna rift'[1]. The localization of stresses in this intersection zone appears to be a more logical explanation for the recently recorded seismicity around Khardi.

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FORMATION OF PERFECT STAGE OF *RHIZOCTONIA SOLANI* KUHN CAUSING LEAF SPOT AND BOLL ROT OF COTTON

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RHIZOCTONIA SOLANI Kuhn, the imperfect state of *Thanatephorus cucumeris* (Frank) Donk, causes a widespread and destructive disease of cotton (*Gossypium* spp) in India. Because of the wide variation in morphology, pathogenicity and physiology, the taxonomy and nomenclature of *R. solani* have been source of confusion and controversy for many years. Many species of *Rhizoctonia*, viz., *R. endophytica*, *R. fragariae* and *R. callae* are very similar to *R. solani*. For the maximum precision in identification, the perfect stage of the fungus is highly essential. Despite the natural occurrence of the perfect stage on cotton stem[1], no reliable method has been devised yet for inducing perfect stage under controlled conditions. As a result many workers have relied on the vegetative and pathogenic characters of the imperfect stage for identification. It is therefore desirable that every attempt be made to discover perfect stage so that the true relationship of the fungus can be determined.

Attempts were made to induce the development of the teleomorphic stage by growing *R. solani* at 24°C on many media including Marmite potato dextrose agar, potato dextrose agar, Czapek dox agar, water agar and Corn meal agar[2]. The isolate failed to fruit under these treatments. In order to stimulate a more natural environment, petri plates of actively growing colonies were covered with sterile (autoclaved) sand and placed outside the laboratory[3,4]. In addition, a 30-day-old culture on potato dextrose agar medium was added to the soil in earthen pots during the first week of December 1987.

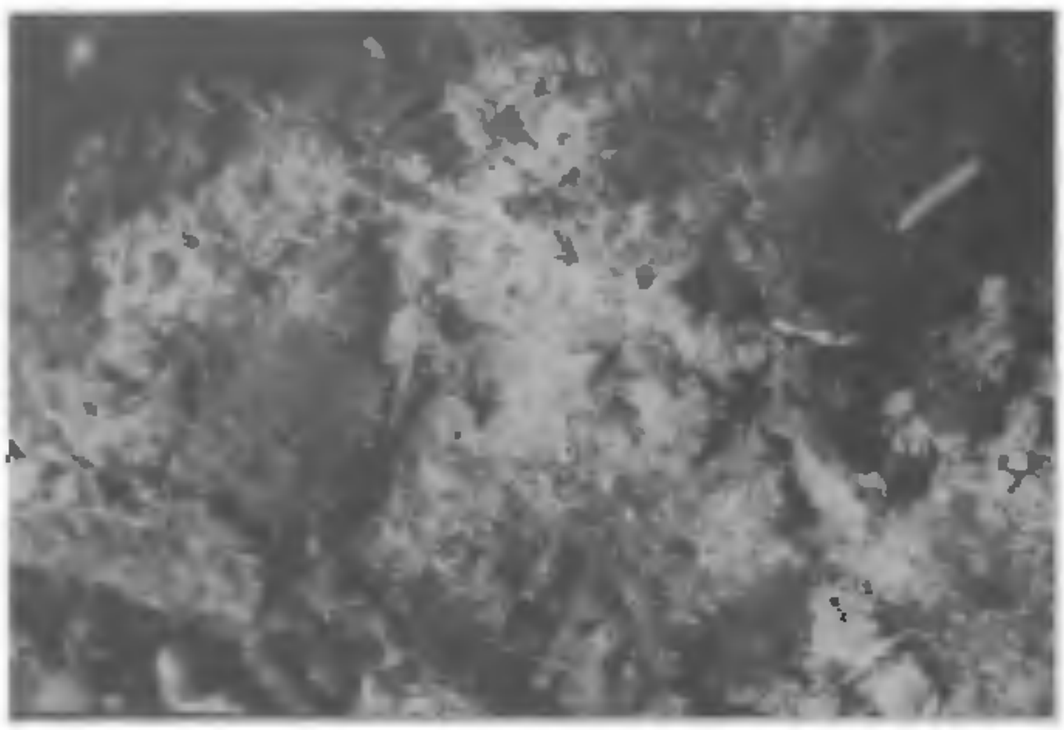

Figure 1. White encrustation of basidia formed on the surface of soil.

During this period the temperature varied from 24° to 28°C. The inoculated soil in pots was flooded to a depth of 5 cm for three days. The pots were then covered with polythene covers for 6 h daily. Sterile water was added periodically to wet the soil and observed for basidial formation.

The various methods tested for inducing formation of the perfect stage, except for the one described earlier, gave negative results. On the surface of pot culture soil, a tenous mealy to powdery, whitish grey layer of fungal growth appeared 20 days after inoculation and developed its greatest intensity in 5–10 days (figure 1). It lasted for the next 5–7 days. At the end it gradually turned brown and disappeared. It was not produced a second time in pots for several days.

Basidia were barrel-shaped, measuring 18.5 μm × 8.7 μm (average). Sterigmata usually four, rarely two, and 7.2 μm long. Basidiospores were hyaline, oval to pyriform, thin-walled and measured 6.9 μm × 4.5 μm (figure 2). The characters of the teleomorphic stage resembled closely those described by Flentje[5], Matz[6] and Lakshmanan *et al*[7], the causal organisms of stem canker of potato, Web blight of Fig and Collar rot and Web blight of cowpea respectively. The perfect stage was identified as *Thanatephorus cucumeris* (Frank) Donk. The formation of perfect stage of cotton isolate under controlled conditions has not been reported so far.

Figure 2. Basidia and basidiospores of *R. solani*.

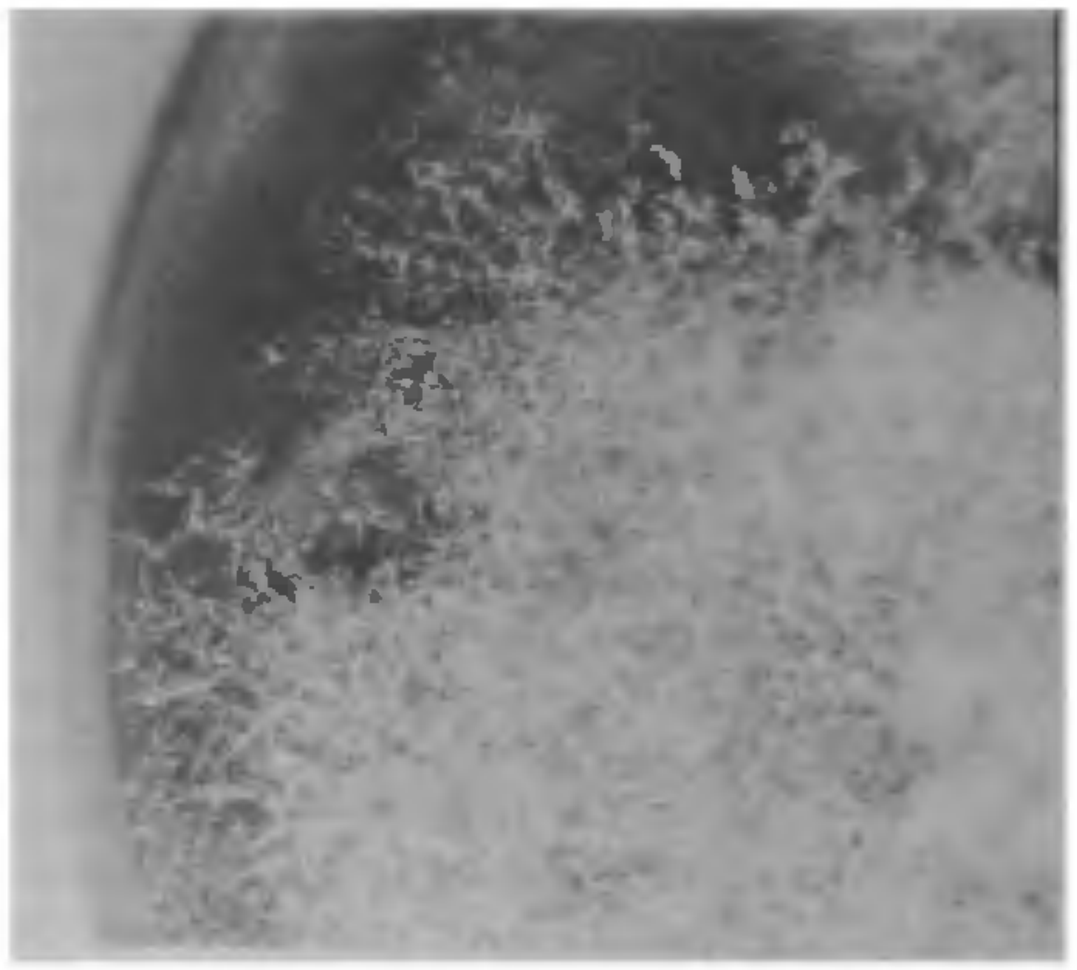

Figure 3. Formation of basidia and basidiospores in PDA medium.

Single basidiospores were isolated by suspending a bit of basidial layer from the surface of the soil, over a thin plate of 2% water agar. After germination the more widely separated spores with young mycelium attached were scooped off with a fine needle under low power microscope. They were then transferred to sterile petri dishes containing potato dextrose agar. In culture, a large number of basidia and basidiospores were formed (figure 3) seven days after incubation (28 ± 3°C).

Figure 4. Concentric zones of alternating light and dark brown symptom on cotton leaves.

Figure 5. Water soaked lesions with dark brown margin on bolls and bracts.

The pathogenicity of basidial culture was tested on cotton leaves and bolls by placing agar culture. On leaves, the affected tissues were characterized by a clearly defined, water soaked area that progressed rapidly. Within a short time the infected area collapsed and bacame flaccid, turning from a deep green to a dead brown. More or less concentric zones of alternating light and dark brown were observed (figure 4). On bolls and bracts it produced water soaked lesions with marked dark brown margin (figure 5).

In studying the possible sources of infection and means of dissemination of basidiospores to the leaves and bolls of cotton plants, artificial inoculation was made with basidial culture on the leaves of other plants growing in close proximity. A typical web blight symptom appeared on *Vigna unguiculata* L., *Phaseolus mungo* var. *radiatus* L., *Phaseolus aureus* Roxb., *Glycine Max* Merr., and *Cajanus cajan* (L.) Millsp., 20 days after inoculation. The aerial blight symptoms on these hosts appeared to be similar to that of aerial blight of snap bean[8] and soybean[9]. On paddy, typical sheath blight symptom (figure 6) appeared 10 days after inoculation. All these hosts gave evidence as a carrier of the disease, thus ensuring probable spread of basidiospores. It would seem, therefore, the infection of the cotton leaves and bolls may have occurred through dissemination of basidiospores by wind or other agencies. The pathogenicity of basidiospores lead us to consider it as of potential economic importance in cotton-producing areas.

Figure 6. Typical sheath blight symptom produced on rice.

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GROWTH REGULATORS AFFECT NECTAR-POLLEN PRODUCTION AND INSECT FORAGING IN BRASSICA SEED CROPS

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Although the role of plant growth regulators is now well established in the improvement of seed germination, promotion of plant growth, sex modi-