Figure 2. Demonstration of pathogenicity of fungus isolated from brinjal affected by *Fusarium* wilt.

The culture of the fungus has been deposited in our Department's culture collection.

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PEROXIDASE AND POLYPHENOL OXIDASE ACTIVITIES IN SORGHUM AND *PERONOSCLEROSPORA SORGHI* INTERACTION

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PERONOSCLEROSPORA SORGHI (Weston & Uppal) C. G. Shaw, causes sorghum downy mildew (SDM), a major problem in sorghum [*Sorghum bicolor* (L.) Moench] production[1-3]. Use of disease-resistant varieties is a promising method of disease control. Bhat *et al.*[4] reported hypersensitive reaction of resistant sorghum lines to *P. sorghi*. In many plant diseases, disease resistance is correlated with changes in certain oxidative enzymes such as peroxidase (PO) and polyphenol oxidase (PPO)[5-10]. The present study was undertaken to investigate changes in the activities of these enzymes in sorghum and *P. sorghi* interaction.

Sorghum lines DMS-652 (susceptible), and DMRS-I and QL-3 (resistant) were used. Seedlings were raised in 15 cm earthen pots (10 seedlings/pot) in a glasshouse. Ten-day-old seedlings were inoculated with *P. sorghi* by spraying a 5 ml conidial suspension (80,000 conidia/ml) per pot. The inoculated seedlings were covered with polythene bags. Healthy and inoculated leaves were collected separately for enzyme assay at 15, 30 and 60 h after inoculation.

One gram of sorghum leaf tissue was ground into a fine paste with 1 g of acid-washed sand in a mortar at 4°C. Five ml of cold 0.1 M sodium phosphate buffer of pH 6.5 was used for extraction. The extract was centrifuged at 6,000 *g* for 15 min at 4°C and the supernatant was used as enzyme source.

PO and PPO activities were determined by the method of Malik and Singh[11]. Protein content of the buffer extracts was determined according to Lowry *et al.*[12]

PO activity in healthy leaves of all the three sorghum lines tested was very low, ranging from 12 to 26 units/mg of protein, and did not alter significantly up to 60 h after inoculation (figure 1). Further, there is no difference in enzyme activity between resistant and susceptible lines. In contrast,

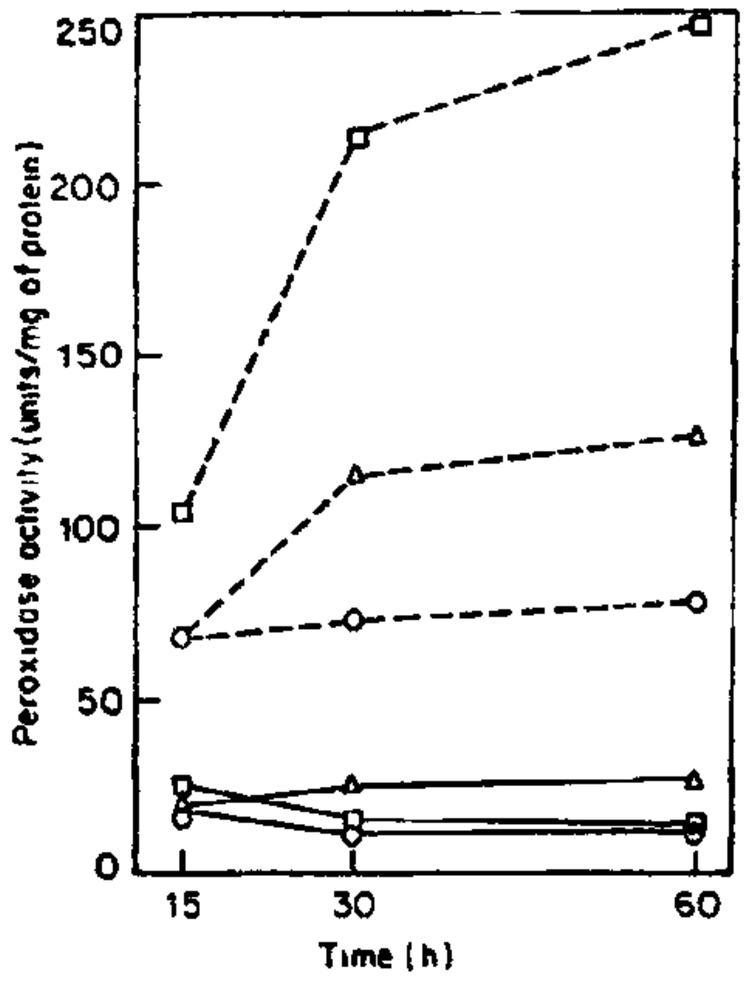

Figure 1. Peroxidase activity in healthy (solid lines) sorghum leaves and leaves inoculated with *Peronosclerospora sorghi* conidia (broken lines). (○, DMS-652; △, DMRS-I; □, QL-3.)

healthy plants of tomato resistant to *Verticillium dahliae*[13] and melons resistant to *Sphaerotheca fuliginea*[14] were reported to possess high PO activity.

Inoculation of *P. sorghi* increased PO activity in all the three sorghum lines, but the extent of increase varied among them. The highest increase in PO activity was noticed in QL-3.

PPO activity showed fluctuations similar to diurnal variation in healthy plants (figure 2A). However, in inoculated seedlings, PPO activity gradually increased over a period of time, without any fluctuation (figure 2B). The greatest increase was found in QL-3.

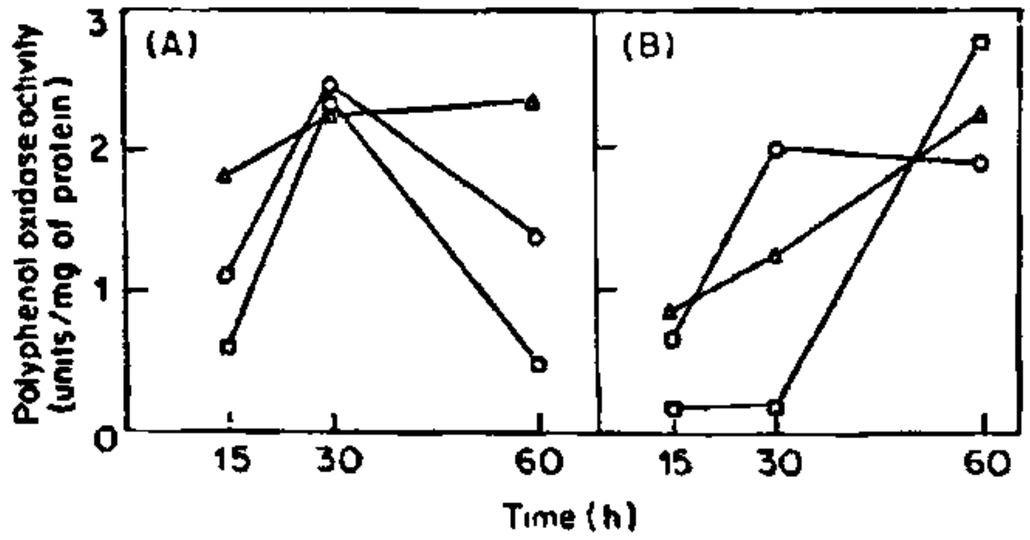

Figure 2. Polyphenol oxidase activity in (A) healthy sorghum leaves and (B) leaves inoculated with *Peronosclerospora sorghi* conidia. (○, DMS-652; △, DMRS-I; □, QL-3.)

Penetration by conidial germ-tubes of *P. sorghi* takes place through stomata within 3–4 h of inoculation[15]. Morphological differences during the process of infection were reported in leaves of susceptible and resistant sorghum cultivars only 48 h after inoculation with *P. sorghi*[16]. Our studies revealed changes in the concentration of oxidative enzymes as early as 15 h after inoculation with *P. sorghi*. The continued increase in the activity of oxidative enzymes correlates with the disease resistance of QL-3 and DMRS-I.

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RECORD OF THE GENUS *KRUGERIA* (TENUIPALPIDAE, ACARI) FROM INDIA

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BAKER and Tuttle[1] erected the genus *Obuloides* to accommodate a unique tenuipalpid mite with one-segment palp and with seven pairs of dorsal setae, two of which were dorso-centrals and the other five marginal (humeral and dorso-lateral). This monotypic genus was from Coimbatore, India, on hibiscus. However, Meyer[2] erected *Krugeria*, which, like *Obuloides*, is characterized by one-segment palps and seven dorsal setae. The setae, however, unlike in *Obuloides*, are set on tubercles and arranged as follows: three pairs of dorso-centrals and four pairs of marginals. Further, members of *Krugeria* lack the transverse suture between dorso-central setae.

Recently, we collected two females and three nymphs of *Krugeria ramosa* Meyer on *Grewia orbiculata* Rottber (Tiliaceae) near Kalyani Dam, Tirupathi, South India. This is the first record of the genus from India. *K. ramosa* has been reported by Meyer[2] on *Grewia bicolor* and *G. monticola* from South Africa. Our record on *G. orbiculata* indicates that this mite is restricted to *Grewia*, which is found only in tropical Africa, Asia and Australian regions.

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SOME HISTOCHEMICAL STUDIES ON THE NEUROSECRETORY CELLS IN THE EYESTALK OF THE CRAB *POTAMON MAGNUM MAGNUM* (PRETZMAN)

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SEVERAL morphological and histochemical studies[1-3] on the neurosecretory cells in the cerebral and thoracic ganglia of the crab *Potamon magnum magnum* have been carried out. However, the histochemical nature of neurosecretory cells in the eyestalk of this decapod crustacean has not been studied earlier.

Adult *P. magnum magnum* were obtained from the Nawaran Spring, Iraq. Extirpated eyestalks were fixed in Bouin's, Carnoy's, alcoholic leadnitrate and Elftman's fixatives. They were then dehydrated in an alcohol series, cleared in xylol and terpenol, and embedded in histowax. Sections of 8 μm were cut and stained histochemically[4,5] for carbohydrates, proteins and lipids in the neurosecretory material.

The results (table 1) indicate the presence of protein, carbohydrate and lipid in the neurosecretory material of the eyestalk of *P. magnum magnum*. Proteinaceous neurosecretory material has been detected[1-3] in the thoracic and cerebral ganglia of *P. magnum magnum*. Disulphide group-containing material has been reported[6] in neurosecretory material of axon endings in the sinus gland of *Carcinus maenas*. Proteinaceous neurosecretory material has been observed in the neurosecretory cells of *Chirocephalus diaphanus*[7,8] and *Paragrapsus gaimardii* and *Rivulogammarus syriacus*[9].

Neurosecretory material rich in proteins with SS and SH groups has been also detected[10] in the neurosecretory cells of the brain of *Artemia salina*. A hyperglycaemic hormone has been detected[11] in the neurosecretory system of the eyestalk of *Astacus leptodactylus*. Proteinaceous neurosecretory material