A NEW HOST RECORD FOR *ALTERNARIA ALTERNATA* (FR.) KEISSLER AND ITS TOXIGENIC POTENTIAL

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OCIMUM BASILICUM L. a medicinal plant growing wild in the university campus, was found to develop a leaf spot disease during the rainy season of 1986. The symptoms were circular to irregular necrotic lesions of 5–8 mm diameter, sometimes with concentric rings. The lesions coalesced to form large, irregular necrotic patches in severe cases. The pathogen was identified as *Alternaria alternata* following the characteristics given by Ellis[1]. This is the first report of its occurrence on *O. basilicum*. Since several metabolites produced by *Alternaria* species have been associated with phytotoxicity[2], an attempt was made to test the toxigenic potential of *A. alternata* and to identify the compounds responsible for phytotoxicity.

Culture filtrates of the fungus cultured in Czapek–Dox broth for 30 days were employed for testing phytotoxicity as reduction in germination of seeds and elongation of roots of tomato and also on detached leaves of tomato and *O. basilicum*. The toxic metabolites produced by the fungus were extracted with ethyl acetate and tested for phytotoxicity after separation by TLC as described earlier[3].

The reduction in germination of seeds and elongation of roots in treated samples was as high as 85% and 94% respectively compared with the control. Detached leaves of tomato and *O. basilicum* when treated with the culture filtrates exhibited epinasty with inward rolling of the leaf lamina. TLC analysis of the culture filtrates revealed the presence of two phytotoxic compounds: a brown-coloured compound, formed an elongated spot on the TLC plate with an R_f value extending from 0.25 to 0.36, and another compound with an R_f of 0.49, emitted blue fluorescence when exposed to UV light. UV spectral characteristics[4], colour reactions with ethanolic ferric chloride[5] and *p*-anisaldehyde[6], besides cochromatography with authentic sample, confirmed the identity of the brown-coloured compound as tenuazonic acid.

Although species of *Alternaria* produce many toxic metabolites, only tenuazonic acid is listed in the registry of toxic effects of chemical substances[7] and its mycotoxic nature has also been well established in recent years[8]. Natural occurrence of tenuazonic acid in blast-affected rice plants[9] and tomato paste[6] was also reported. As the leaves of *O. basilicum* are widely used to cure bowel complaints in children, headache and dullness of hearing[10], it is important to test the occurrence of toxic metabolites in infected plants.

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AN UNRECORDED POST-HARVEST DISEASE OF APPLE IN KUMAUN HILLS

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THE Kumaun hills are known for fruit and vegetable production. Apple is one of the main fruit crops of

this region. The economy of this region mostly depends on apple cultivation. A number of pathogens are responsible for spoilage of fruits in transit, storage, market and plantation[1-5]. During a survey on pre- and post-harvest diseases of fruit crops, a fruit rot of apple variety Golden Delicious, incited by *Cordana musae* (Zimm.) Höhnel during storage was detected. This disease of apple has not hitherto been reported from India.

A survey was conducted during 1986–87 in the four main fruit-growing areas of Kumaun region, viz. Bhowali, Chaubattia, Champawat and Mukteshwar. The diseased fruits collected in polythene bags from orchards, markets and storage were either used immediately or stored at 10°C. The causal organism was isolated and purified according to the method of Tandon and Bilgrami[6]. Morphological study and identification of the fungus were done[7,8]. Cultures of the pathogen were maintained on potato dextrose agar. Grangner and Horne's[9] method was used for pathogenicity test. Twenty healthy fruits of apple variety Golden Delicious were inoculated with the test pathogen and incubated at 25±2°C for 10 days. Disease symptoms and cultures were studied to establish Koch's postulates.

Disease symptoms appear as water-soaking necrotic lesions on the fruit surface and the fruit turns soft as the disease advances. The pathogen damages the mesocarp tissue, which turns into a brown to black mass of fungal hyphae and spores. In advanced stages of the disease, the whole mesocarp region undergoes decay and the pathogen sporulates enormously. The seeds of the mature fruit are also infected and show a wrinkled surface covered with spore mass (figure 1).

Figure 1. Fruit showing infection in mesocarp and on seeds.

Colonies on agar are greyish-brown, with erect conidiophores, reaching up to 4 to 5 cm in diameter within a week. Conidiophore straight, up to 210 μm long and 4–7 μm thick, usually wider at the base (7–10 μm). Conidia solitary, produced apically or subapically, obovate, 1-septate, rounded at the tip and pointed at the base.

In India, this pathogen has been reported on banana leaves from Coimbatore, causing large, oval, pale-brown spots[10]. The pathogen was isolated for the first time from diseased apple fruits in the Kumaun hills. In storage, a single infected fruit may be the source of spoilage of fruits in considerable amounts. Various kinds of injuries facilitate the entry of the pathogen during harvesting, packing and transportation.

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