PHYTOTOXIC METABOLITE FROM ALTERNARIA MACROSPORA

The leaf spot disease of cotton (Gossypium hirsutum) caused by Alternaria macrospora is a widespread and destructive disease that has affected many areas in Southern India. Alternariorisis is characterized by irregular necrotic lesions on leaves. The syndrome can be reproduced by artificial inoculation and also by the culture filtrate on leaves. Phytotoxic metabolites produced by this organism in vitro from 7-10 day old cultures grown on Richards’ medium when tested using the method of Ueno et al. (1975) showed toxicity to susceptible cotton leaves (MCU 5). The brown, necrotic lesions appeared after 16 h of treatment enlarging within 24 h resulting in vein necrosis. Affected cell walls of the subsidiary cell turned brown. The rapidity of appearance of the phytotoxic symptoms was greater when the organism was grown in potato sucrose broth for 15 days than in Richards’ medium. Culture filtrates were extracted with ether and further processed into acid, neutral and alkaline fractions as suggested by Kohimoto et al. (1976). Each fraction was partially purified by preparative TLC using benzene:acetone (2:1) as the solvent system. As many as 15 zones were partitioned under UV and tested for phytotoxicity. Between the zones, there was an UV absorbing one present in all the three fractions which was found to be most toxic. This partially purified substance has an Rf value of 0.74 to 0.76. The silica gel containing the sample was then scraped off the glass plate and placed in a small circle on the upper side of the fresh detached leaf (MCU 5) on moist filter paper in a Petri dish. The silica gel on the leaf was wetted with distilled water and incubated in a moist chamber at 27° C. The leaf was examined for the induction of vein necrosis after 16-24 hours (Ueno et al., 1975). Droplets of water with plain silica gel served as the control. Also, leaves of Cyanopsis tetragonaloba and Phaseolus vulgaris produced the same syndrome. This fraction gave positive reaction (characteristic blue colour) with Folin's reagent when followed by exposure to ammonia vapour, suggesting that this might be a phenolic acid. Further studies on the chemical nature as well as its action on the permeability of epidermal cells are underway.

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