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Management of postharvest pathogens of mandarin orange (*Citrus reticulata* Blanco) by crude and purified leaf extracts of *Xanthium strumarium*

The mandarin orange (*Citrus reticulata* Blanco) is an economically important plantation crop of Darjeeling, Sikkim, Assam, Meghalaya and Manipur states of India. The fruit is characterised by tight skin, good quality and excellent flavour. However, harvested oranges are susceptible to attack by the fungal pathogen *Fusarium moniliforme* and bacterial pathogen *Xanthomonas citri*. The aim of this study was to develop an eco-friendly alternative to harmful chemical fungicides that would control the post harvest diseases. Two antifungal compounds (1 and 2) were purified by bioassay guided fractionation from dichloromethane extract of adult leaves from *Xanthium strumarium* L. (English: Cocklebur, Family: Asteraceae) which is a common weed found abundantly throughout the world. The compounds characterized as sesquiterpene lactones were purified by repeated silica gel column chromatography and their structures were elucidated by IR, NMR (¹H and ¹³C) and ESI-MS spectroscopy data analysis. The compounds were identified as 8-*epi*-xanthatin (1) and 8-*epi*-xanthatin-1 β , 5 β -epoxide (2). *In vitro* antifungal and antibacterial activity was tested by agar diffusion and micro-dilution bioassay methods. While both compounds showed strong antagonistic activity against bacterial and fungal pathogens, 1 exhibited higher activity than 2. The purified compounds and the crude extract were further tested for their ability to control diseases in oranges caused by *F. moniliforme* and *X. citri*. Water insoluble extracts emulsified in water exhibited upto 93% disease reduction which was comparable to the fungicide bavistin. The results show that the adult leaves of *X. strumarium* may be used as a source of botanical preparation for controlling post harvest diseases of mandarin oranges.

Biography

Dipanjita Saha has completed her graduation in Biochemistry in 1991 from Calcutta University and doctoral studies from Centre for Life Sciences, University of North Bengal in 2000. She is an Assistant Professor (stage III) in Biotechnology in University of North Bengal. She has received best presentation award in several occasions and published more than 34 papers in reputed journals. She has visited USA, France, Thailand, Egypt and UK for academic purposes.

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