



RESEARCH ARTICLE

Isolation of toxin produced by *Alternaria helianthi* causing blight in sunflower

■ KALAMESH BASARIGID, K. KARUNA, Y.G. SHADAKSHARI AND B. K. ATHONI*

A.I.C.R.P. on Sunflower, Zonal Agricultural Research Station, University of Agricultural Sciences, BENGALURU (KARNATAKA) INDIA

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ABSTRACT

The pure culture of *A. helianthi* isolated from a monoconidial culture from sunflower leaves of KBSH 44 was cultured on Potato dextrose agar medium and further grown on Potato dextrose broth. Crude toxin was purified from 1000 ml of culture filtrate. The toxin was recovered as a brown powder. The toxin contained both carbohydrate and protein and was glycoproteinaceous in nature.

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*Corresponding author:

INTRODUCTION

Sunflower (*Helianthus annuus* L.), a member of Asteraceae, is a major edible oilseed crop of importance after soybean and groundnut at the global level. Sunflower oil is a combination of mono-unsaturated and poly-unsaturated fatty acids with low saturated fat levels. The versatility of this oil is recognized by cooks all over the world. It supplies more vitamin E than any other vegetable oil. Sunflower oil is odourless, which makes it useful in fragrance, aromatherapy and massage oil products. Sunflower oil is almost colourless making it ideal for use in cosmetics and other coloured products. Gulya and Masirevic (1991) listed 80 pathogens occurring on sunflower. Among these, *Alternaria* leaf spot caused by *Alternaria helianthi* (Hansf.) Tubaki and Nishihara has been considered as potentially destructive disease in many parts of the sunflower growing countries (Allen *et al.*, 1983; Morris *et al.*, 1983; Lipps and Herr, 1986).

Hansford (1943) first reported the fungus causing leaf spot of sunflower from Uganda. Since then this disease has been reported from almost all sunflower growing countries throughout the world. The severity is known to increase or

decrease depending upon the changing environmental conditions during the crop growth period.

The first record of this disease in India was simultaneously reported by Narain and Saksena (1973) and Kolte and Mukhopadhyay (1973) from Uttar Pradesh and subsequently by Anil Kumar *et al.* (1974) from Karnataka. It occurred in epidemic form with the disease severity as high as 95-100 per cent during 1988 in Southern India especially in Karnataka destroying a major area of the crop due to heavy unexpected rain during flowering and grain filling stage.

The disease has been known to cause reduction in flower size, number of seeds per head, seed yield per plant, seed weight and also oil content (Balasubramanyam and Kolte, 1980). The loss in yield varies from 11.30 to 73.33 per cent depending on the extent of infection (Reddy and Gupta, 1977). In Northern Karnataka, *Alternaria* leaf spot is known to cause more than 80 per cent of the yield loss under severe epiphytotic conditions (Hiremath *et al.*, 1990; Balasubramanyam and Kolte, 1980; Amaresh, 1997).

The fungus produces a toxic metabolite, presumably a phenolic compound, both in culture and in infected leaf tissues. Necrotic spots on leaves were produced when the toxin was