

Bioactivity guided isolation of monocerin from Setosphaeria rostrata, an endophytic fungus of Datura inoxia

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ABSTRACT

Background: Setosphaeria rostrata is a thermophilic fungus and a common plant pathogen that causes crown rot, leaf spots and root rot in grasses. In the present study, Setosphaeria rostrata. has been isolated from Datura innoxia Mill. stem sample, characterized on the basis of morphology of the culture and BLAST analysis of the sequence data of the ITS1-5.8S-ITS2 region of the nuclear ribosomal DNA. Potential anticancer and antibacterial activity was displayed by chloroform extract of Setosphaeria rostrata.

Hypothesis: This study was designed to study Setosphaeria rostrata, an endophytic fungus of Datura innoxia for the identification of biologically active secondary metabolites against cancer cell lines and bacterial pathogens.

Methods: Chloroform extract of the Setosphaeria rostrata were prepared while exploring the bioactive secondary metabolites. Anticancer and the antibacterial activity of extracts were performed. Silica gel column chromatography was used for the fractionation of crude extract. Further purification of the fungal extract fractions by using HPLC yielded a major metabolite **1**. The structures of **1** has been determined by detailed spectroscopic analysis including NMR, IR, MS, UV data and similarity with published data. Isolated compound was identified as Monocerin, screened for its effects against a panel of cancer cell lines (MIA-Pa-Ca-2, HCT-116) of different tissue origin. Antimicrobial activity was also performed against two gram negative bacteria E.coli, and Pseudomonas aeruginosa and two gram positive bacteria S. aureus, B. subtilis and a yeast C. albicans.

Results: Chloroform extract exhibited antimicrobial activity against all the pathogens tested with Minimum inhibitory concentration (MIC) of 08 µg/ml against E. coli. It also exhibited cytotoxicity against Colon cancer cell line HCT-116 having % growth inhibition of 55 at 100 µg/ml. Isolated compound monocerin has antimicrobial activity against S. aureus, B. subtilis, P. aeruginosa and C. albicans and cytotoxic activity against HCT-116.

Conclusion: Monocerin produced by Setosphaeria rostrata is responsible for the bioactivity shown by crude chloroform extract and may act as potential lead for designing more potent analogs.