Taylor & Francis
Taylor & Francis Group

ISSN Print: 0972-060X
ISSN Online: 0976-5026

Antifungal Activity of Essential Oil of *Commiphora molmol* Oleo Gum Resin

Kahkashan Perveen*, Najat A. Bokhari, Iram Siddique, Sarah A. I. Al-Rashid
King Saud University, Department of Botany and Microbiology,
College of Science, Riyadh-11451, Saudi Arabia

Received 23 March 2018; accepted in revised form 22 June 2018

Abstract: The present study was undertaken to explore the effect of essential oil hydrodistilled from oleo gum resin of *Commiphora molmol* in inhibiting the growth of plant pathogenic and post-harvest fungi. The essential oil was obtained by hydrodistillation of resins of *C. molmol*, its chemical composition was determined by GC-MS analysis and antifungal potential was evaluated against *A. flavus, Cladosporium* sp.*, A. alternata, F. oxysporum* and *F. solani*. GC-MS analysis of myrrh essential oil reveals the presence of 15 compounds. The leading compounds were curzerene (41.81 %), furanoeudesma 1,3-diene (18.8 %) and caryophyllene (14.3 %). Myrrh essential oil inhibited the growth of all tested fungi. The maximum zone of inhibition by myrrh essential oil was observed for *F. solani* (27.8 mm), followed by *F. oxysporum* (26.0 mm), *A. alternata* (25.8 mm), *Cladosporium* sp. (25. 8 mm) and the least was for *A. flavus* (10.0 mm). The percent reduction in the germination of spores was 76.75 %, 73.5 %, 71.0 %, 70.25 % and 67.5 % for *F. solani, Cladosporium* sp., *A. alternata, F. oxysporum* and *A. flavus,* respectively. The MICs and MFCs values of myrrh essential oil were 1.25 µl/ml and 2.5 µl/ml for *F. solani, Cladosporium* sp., *A. alternata, F. oxysporum*, whereas, it was 2.5 µl/ml (MIC) and 5 µl/ml (MFC) for *A. flavus.* The present study proves that myrrh essential oil has a potential to qualify as an alternative of synthetic fungicides, especially managing the post-harvest fungal infection.

Key words: Myrrh essential oil, GC-MS analysis, antifungal activity, plant pathogenic fungi.

Introduction

Commiphora molmol Engl. belongs to family Burseracea and is a native of desert areas of Northern Africa and the Middle East. Myrrh is an aromatic resinous exudate of *Commiphora* plant. Myrrh is used to flavor the food products, adding fragrance to perfumes, also an ingredient of cosmetics [1]. Curzerene, caryophyllene oxide, α-pinene, dipentene, limonene, furanoeudesma 1,3-diene, curzerenone, lindestrene and menthofuran are some of the chief components identified in the myrrh oil [2]. Traditionally, myrrh is used to treat arthritis, digestive disorders, schistosomiasis, respiratory infection, leprosy and syphilis [3-5]. Arab history shows many medicinal uses of myrrh such as treating wounds, intestinal parasites, diarrhea, and cough and chest aliments [6]. Presently, *Commiphora* sp. has been reported for anti-parasitic [7], antimicrobial [8-11] and anti-inflammatory [12,13] activity. Essential oil of oleo gum resins of myrrh has been reported for having antimicrobial properties. Essential oil of *C. mukul* inhibited the growth of several gram positive and gram negative pathogenic bacteria [14]. Carvalhinho *et al.* [15] observed that *Candida albicans* strains isolated from the mouth of several patients were susceptible to the myrhh oil. In a study, myrrh oil and its constituent *cis*-nerolidol (0.01 %) proved to inhibit the biofilm formation by *S. aureus* [16]. Ali investigated the the antifungal activity of essential oil of *C. molmol* [17]. The investigation showed that growth of the storage fungi, *Aspergillus flavus, A. niger* and *Penicillium citrinum* was significantly inhibited by the myrrh essential oil [17]. Literature re-

*Corresponding author (Kahkashan Perveen)
E-mail: < kperveen@ksu.edu.sa >