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Full Length Research Paper

Antimicrobial efficacy of *Rheum palmatum, Curcuma longa* and *Alpinia officinarum* extracts against some pathogenic microorganisms

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The use and search for antibiotics and dietary supplements derived from plants have accelerated in recent years. Three plants, used traditionally as medicine and as food additive in Saudi Arabia, were collected and extracted with either methanol or n-butanol. The used plants were *Rheum palmatum, Curcuma longa* and *Alpinia officinarum*. The plant extracts were screened for their inhibitory effects on seven bacterial and five fungal genera using agar well diffusion method. It was shown that methanol extract was more effective as compared to n-butanol extracts. The minimum inhibitory concentrations (MIC) of the methanol extracts of the used plants ranged from 50 to 175 µg/ml. No toxicity was found using *Artimia salina* as test organism. Antitumor activity against Ehrlich ascites carcinoma was recorded only for *C. longa* extract.

Key words: Antimicrobial, antibiotic, *Rheum palmatum, Curcuma longa, Alpinia officinarum*, toxicity, minimum inhibitory concentrations, Ehrlich ascites carcinoma.

INTRODUCTION

Nowadays, there is a need to find naturally occurring substances with antimicrobial activity as an alternative to available antibiotics due to several serious problems such as growing drug resistance of bacteria or undesirable side effects of antibiotics (Ushimaru et al., 2007). Plants have been shown to be a rich source of antimicrobial agents, as they produce a wide variety of secondary compounds as natural protection against microbial attack (Urszula et al., 2010). Different plant extracts are employed for their antibacterial, antifungal and antiviral activities and it is know that more than 400,000 species of tropical flowering plants have antimicrobial activities (Odugbemi, 2006). Different plant parts are used for medical purposes including rhizomes, bulbs, leaves, roots, borks and peels (Anne-Catherine, 2007). *Alpinia officinarum, Curcuma longa* and *Rheum palmatum* have been used for a long time in Saudi Arabia as tradition medicinal plants but their antimicrobial activities were poorly discussed. *A. officinarum,* widely cultivated in South East of Asia, belongs to the family Zingeberaceae. The most active part of the plant is the rhizome which is characterized by dark reddish brown color and strong aromatic odor. Ethnomedical uses of this rhizome are found to be against rheumatism and children whooping cough (Kirtikar and Basu, 2001; Srividya et al., 2010). *C. longa* is a medicinal plant that is botanically related to family Zingiberaceae (Chattopadhyay et al., 2004). It possesses properties like antioxidant, anti-inflammatory, antiplatelet and antimicrobial effects in addition to cholesterol lowering activity (Shaguflanaz et al., 2010). *Rheum genus* belongs to the family Polygonaceae and it is popularly used for many therapeutic purposes. The extract was more active against reference strains of Gram negative and positive bacteria *(*Urszula et al., 2010).

The continuous evolutions of bacterial resistance to currently available antibiotics have necessitated the search for novel and effective antimicrobial compounds

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