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Antibacterial and Antifungal Activities of Crude Extracts from *Launaea arborescens*

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Abstract: The antimicrobial and antifungal properties of several crude extracts from the aerial parts of *Launaea arborescens* were investigated by the disc diffusion method. The aqueous and methanolic extracts demonstrated a good broad spectrum antimicrobial activity.

Key words: *Launaea arborescens*, Asteraceae, antibacterial, antifungal activity, disc diffusion method

INTRODUCTION

Launaea arborescens, is herbaceous plant belonging to Asteraceae family, Which is widely distributed in west Algerian sahara. The aerial part is used in folk medicine for treating diarrhoea fever, gastrointestinal tracts and various diseases^[1-3]. Due to the notable medicinal value of *L. arborescens*, it was considered of interest to carry out a phytochemical and antimicrobial investigation of this specie, thus, the aerial parts of this plant were studied and the results leading to the antimicrobial screening are presented in this study^[4,5].

MATERIALS AND METHODS

Plant materials and extraction: The whole plants of *Launaea arborescens* (vernacular name. Oumlbina) collected in March 2000 from Bechar (hammada, oued saoura) south of Algeria. The botanical identification and a voucher specimen is conserved at the phytochemical herbarium of Phytochemical and Organic Synthesis Laboratory of university center of Bechar under to accession number CA99/25^[3]. The aerial parts were separated and oven dried (overnight), the plants were grounded into powder from using the grinder. Extraction using soxhlet apparatus, reflux with several solvent (water, heptane, ethyl acetate, ethanol, methanol, methylene chloride, chloroforme) or distilled for 6 h was performed^[5,6].

Water, ether, dichloromethane, chloroforme, ethyle acethyle ethyle, methanol, hepthane extracts (yields: 11, 5, 9, 10, 13, 17 and 6% of air dried plant material, respectively).

Microorganisms and medium: The micro organisms used in this present study were fungi (*C. albican*, *Saccharomyce cerevisiae*); bacteria (*E. coli*, *S. aureus*,

P. aereginosa and *Klebseila entercocus*). All microorganism were from clinical isolates, a fungi microorganism were grown in saboreus medium and bacteria microorganisms were grown in Muller Hinton agar medium^[7].

Antimicrobial sensitivity test: Sterile 6.0 mm diameter blank disc were used to impregnate of two dilutions of the extracts (water, methanol). Discs were stored at -5°C prior to use. Tests were performed by the disc diffusion method. Extract impregnated discs were placed on agar and incubated either at 37°C for 24 to 48 h for bacteria or 25°C for 24 h. Antibacterial and antifungal activities were then measured indicated by the clear zones of inhibition. The results were compared with antibiotic and antifungal drugs^[8].

RESULTS AND DISCUSSION

Antifungal activity of *Launaea arborescens* extracts: Three crude extracts showed varying degrees of antifungal activity, Methanol extract of plant showed high activity (Table 1) against of al organism tested. The growth of *C. albican* was inhibited by both the ethyle acethyle and aqueous extracts of plant.

The rest of the crude extract did not show significant antifungal activity and the methanol crude extracts were showed a high antifungal activity. The present screening investigation has revealed a high rate of antifungal inhibition when selecting the part of plant utilized in traditional medicines, Some results obtained suggest the possible correlation the traditional uses of *L. arborescens* and their activity.

Antibacterial activity of *Launaea arborescens* extracts: The methanol and aqueous extracts of aerial parts had a significant inhibitory of all bacteria tested

Table 1: Antibacterial and antifungal activity of the concentrated extracts from aerial part of *Launea arborescens*

Microorganisms		Zone of inhibition (mm)						
		W	E	C	D	A	H	M
<i>Staphylococcus aureus</i>	ATCC 4157	13	-	-	-	-	-	-
<i>Escherichia coli</i>	ATCC4157	12	-	16	-	-	-	16
<i>Klebsiella pneumonia</i>	NCTC 9528	-	-	-	-	-	-	30
<i>Pseudomonas aeruginosa</i>	ATCC 9027	13	-	-	-	13	-	-
<i>Enterococcus faecalis</i>	NCTC 8156	13	-	-	-	-	-	27
<i>Saccharomyces cereviceae</i>	-	13	-	-	-	14	-	24
<i>Candida albican</i>	-	-	-	-	-	-	-	29

W: water, E: ether, C: chloroform, D: dichloromethane, A: ethyl acetyl ethyl, H: heptane, M: methanol.

Table 2: Antibacterial and antifungal activity of the diluted methanolic extracts from aerial part of *Launea arborescens*

Microorganisms		Zone of inhibition in mm (MeOH extract)		
		The concentrated extract	The diluted extract 10%	Chloramphenicol: 10 µg mL ⁻¹
<i>Staphylococcus aureus</i>	ATCC 4157	15	12	18
<i>Escherichia coli</i>	ATCC4157	16	14	19
<i>Klebsiella pneumonia</i>	NCTC 9528	30	25	26
<i>Pseudomonas aeruginosa</i>	ATCC 9027	-	-	24
<i>Enterococcus faecalis</i>	NCTC 8156	27	23	0
<i>Saccharomyces cereviceae</i>	-	24	11	NT
<i>Candida albican</i>	-	29	12	NT

NT: Not tested

(Table 1 and 2). The rest extracts of plant showed no activity for all bacteria. Ethyle acetylene exhibited significant antibacterial activity against *Pseudomonas aeruginosa*, methanol extract of plant showed a high antibacterial activity, but no significant activity against *S. aureus*, *P. aeruginosa*, the aqueous extract showed the highest activity against *S. aureus*, *P. aeruginosa* and the methanol extract showed the highest activity against all tested standard microorganisms. The aqueous extract are generally richest in antibacterial agents, Infection caused by *P. aeruginosa* are among difficult to treat with conventional antibiotics^[9]. The growth of *P. aeruginosa* was inhibited by aqueous crude extract of aerial part of *L. arborescens*. The activity of most extracts against *S. aureus*, another human pathogen, qualify this plant for further investigation of their bioactive compounds.

The results indicated that methanol and aqueous aerial part extracts of *Launea arborescens* were active against some human pathogens such as *S. aureus*,

Pseudomonas aeruginosa. The methanolic extract showed the highest activity against all tested standard microorganisms. This probably explains the use of extracts of this plant in traditional medicine against a number of infections for generations. Consequently, we propose a detailed study of this plant in order to determine their pharmacological effect, active compounds as well as their mechanism of action.

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