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Antimicrobial Activity of Aerial Part Crude Extracts from *Limoniastrum feei*

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Abstract: Due to the notable medicinal value of *Limoniastrum feei*, it was considered of interest to carry out phytochemical and antimicrobial investigations of this specie. The antimicrobial activity of several crude extracts of leaves, stem and Twig parts of *Limoniastrum feei* was evaluated by disc diffusion method. Crude extract of this medicinal plant tested against fungi (*C. albican* and *Saccharomyce cerevisiae*) and bacteria (*E. coli*, *S. aureus*, *P. aeruginosa*, *K. pneumoniae* and *E. fecalis*). A broad spectrum of antimicrobial activity was exhibited by the methanol extracts of leaves, stem and Twig of *Limoniastrum feei*. The results were comparable to standard antifungal drug at equivalent concentration. The methanol extract exhibited higher antibacterial activity than water and acetone extract from leaves. *C. albican* showed resistance to all extract of stem. Based on these results, it can be concluded that this plant has antimicrobial activity, which is as patent as standard antimicrobial drugs against certain microorganisms.

Key words: Antimicrobial, antibacterial, antifungal, *Limoniastrum feei*, *Plumbaginaceae*

INTRODUCTION

One of the medicinal plants used to treat gastric infections is *Limoniastrum feei*. The plant is native to southeast of Algeria (Saoura region of Bechar) northern Africa^[1-3].

The other uses of *Limoniastrum feei* are as an antibacterial, for treatment bronchitis, stomach infection^[4]. A previous investigations revealed that methanol extract from limoniastrum feei leaves contained potential antifungal agent against *C. albican* and antibacterial agent against *E. coli*. These results prompted us to tested *in vitro* a several extracts of aerial part of *Limoniastrum feei* and compared with commercial antifungal drug and antibiotic chloramphenicol^[4].

MATERIALS AND METHODS

Plant materials and extraction: The whole plants of *Limoniastrum feei* were collected in March 2000 from kenadza (region of Bechar) 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 No. CA99/14^[5]. The leave, stem and twig 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 and chloroforme) or distilled for 6 h was performed^[6].

Microorganisms and medium: The micro organisms used in this present study were; fungi (*Candida albicans* and *Saccharomyces cerevisiae*), bacteria (*Escherichia coli*, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae* and *Enterococcus fecalis*).

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 60 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 24-48 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^[7].

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RESULTS AND DISCUSSION

Antifungal activity of *Limoniastrum feei* extracts: Three crude extracts showed varying degrees of antifungal activity, methanol extract of leaves and Twig showed high activity against of all organism tested (Table 1 and 2).

The growth of *C. albican* was inhibited by both the Heptane extract of stem (Table 3). The rest of the five crude extracts did not show significant antifungal activity and the methanol crude extract of Twig and leaves were showed a high antifungal activity (Table 1 and 2). 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 *Limoniastrum feei* and their activity.

Antibacterial activity of *Limoniastrum feei* extracts:

The methanol extracts of leaves and Twig had a significant inhibitory of al bacteria tested (Table 1 and 2). The rest extracts of Twig showed no activity for al bacteria (Table 2). Six extracts of stem exhibited significant antibacterial activity (Table 3), methanol

extract of stem showed a high antibacterial activity against *S. aureus*, *P. aeruginosa* and *E. coli*, the Heptan extract of stem showed the highest activity against *K. pneumoniae* (Table 3). None of the stem extracts inhibited the growth of *E. fecalis* (Table 3) and the methanol extract showed the highest activity against all tested standard microorganisms.

The methanol extract are generally richest in antibacterial agents, Infection caused by *P. aeruginosa* are among difficult to treat with conventional antibiotics^[8]. The growth of *P. aeruginosa* was inhibited by methanol crude extract of aerial part of *Limoniastrum feei*.

The activity of most extracts against *S. aureus*, another human pathogen, qualifies this plant for further investigation of their bioactive compounds. Strains of *E. coli* have been identified which are capable of the colonizing the gastrointestinal tract and producing potent enterotoxins^[9]. The pathogenesis of the resulting illness resembles that of cholera.

On the basis of the present results, It may concluded that the crude extracts of this plant exhibit significant antimicrobial activity and properties, that support folkloric use in the treatment of some diseases as broad spectrum

Table 1: Inhibition zones (mm) of leaves extracts

Microorganism		Zone of inhibition (mm)							Chloramphenical
		W	E	D	C	A	H	M	
<i>S. aureus</i>	ATCC4157	15.0	R	R	R	R	R	30.0	18
<i>P. aeruginosa</i>	ATCC9027	11.0	R	R	R	R	11	R	26.5
<i>E. coli</i>	ATCC4157	R	R	R	R	13	R	R	25.5
<i>K. pneumoniae</i>	NCTC9528	R	R	R	R	R	R	R	23.0
<i>E. fecalis</i>	NCTC8156	14.5	R	R	R	R	R	R	23.5
<i>S. cerevisiae</i>	-	R	R	R	R	R	R	R	24.0
<i>C. albican</i>	-	R	R	R	R	R	R	R	19.0

Table 2: Inhibition zones (mm) of Twig extracts

Microorganism		Zone of inhibition (mm)							Chloramphenical
		W	E	D	C	A	H	M	
<i>S. aureus</i>	ATCC4157	R	R	R	R	R	R	R	19.0
<i>P. aeruginosa</i>	ATCC9027	R	R	R	R	R	R	R	21.0
<i>E. coli</i>	ATCC4157	R	R	R	R	R	R	R	20.0
<i>K. pneumoniae</i>	NCTC9528	R	R	R	R	R	R	R	25.0
<i>E. fecalis</i>	NCTC8156	R	R	R	R	R	R	R	24.5
<i>S. cerevisiae</i>	-	R	R	R	R	R	R	R	22.5
<i>C. albican</i>	-	R	R	R	R	R	R	R	26.0

Table 3: Inhibition zones (mm) of stem extracts

Microorganism		Zone of inhibition (mm)							Chloramphenical
		W	E	D	C	A	H	M	
<i>S. aureus</i>	ATCC4157	R	14.5	R	R	13	R	R	28.0
<i>P. aeruginosa</i>	ATCC9027	R	R	17	16	15	R	R	37.5
<i>E. coli</i>	ATCC4157	4	R	R	13	R	R	R	32.0
<i>K. pneumoniae</i>	NCTC9528	R	R	R	R	R	37.0	R	24
<i>E. fecalis</i>	NCTC8156	R	R	R	R	R	R	R	0
<i>S. cerevisiae</i>	-	R	R	R	R	R	R	R	NT
<i>C. albican</i>	-	R	R	R	R	R	21.5	R	NT

W: Water, E: Ether, C: Chloroforme, D: Dichloromethane, A: Ethyle Acetyle, H: Heptane, M: Methanol, NT: Not Tested, R: Resistant

antimicrobial agents. 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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