Mar. Üniv. Ecz. Der.,
12 (1), 15 - 18 (1996)

J. Pharm. Univ. Mar.,
12 (1), 15 - 18 (1996)

ALNUS GLUTINOSA subsp. *GLUTINOSA* VE *OTANTHUS MARITIMUS* ÜZERİNDE ANTİBAKTERİYEL VE ANTİFUNGAL ARAŞTIRMALAR

ANTIBACTERIAL AND ANTIFUNGAL INVESTIGATIONS ON *ALNUS GLUTINOSA* subsp. *GLUTINOSA* AND *OTANTHUS MARITIMUS*

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SUMMARY

In this study, the antibacterial and antifungal effects of the petroleum ether, chloroform and ethanol extracts, prepared from the aerial parts of *Alnus glutinosa* (L.) Gaertner subsp. *glutinosa* (Betulaceae) and *Otanthus maritimus* (L.) Hoffmans. & Links (Compositae) are investigated.

No significant inhibition zones have been found against the 6 yeasts and 8 bacteria investigated in the extracts of both of the two plants.

ÖZET

Bu çalışmada, *Alnus glutinosa* (L.) Gaertner subsp. *glutinosa* (Betulaceae) ve *Otanthus maritimus* (L.) Hoffmans. & Links (Compositae) bitkilerinin topraküstü kısımlarından hazırlanan petrol eteri, kloroform, etanol ekstrelerinin antibakteriyel ve antifungal etkileri incelenmiştir.

Her iki bitki ekstreleri de incelenen 6 maya ve 8 bakteri üzerinde anlamlı bir etki göstermemiştir.

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INTRODUCTION

The leaves of *Alnus glutinosa* (L.) Gaertner subsp. *glutinosa* (Betulaceae) have been used as diurethic and the barks for constipation and tonic in folk medicine (1). The plant content is lupenon, glutinon, taraxerol and β-sitosterin (2). There is no record about the usage of *Otanthus maritimus* (L.) Hoffmans. & Links (Compositae) in folk medicine. It is known to contain amides (3).

In this work we investigated the antibacterial and antifungal effects of these two plants, *A. glutinosa* and *O. maritimus*.

MATERIALS AND METHODS

A. glutinosa subsp. *glutinosa* was collected from the seashore of Gümüşdere (Domuzdere) village, on July 22nd,1993 and *O. maritimus* was collected from Çilingoz beach, on June 23rd, 1994. Plants were identified by Prof. E. Tuzlacı and voucher specimens are kept in the Herbarium of the University of Marmara, Faculty of Pharmacy (MARE 4066, 4415).

The aerial parts of the plants are air-dried and powdered. 200 g powder of *A. glutinosa* and 180g powder of *O. maritimus* are extracted with petroleum ether, chloroform and ethanol respectively. The extracts are concentrated and dried.The dried residues are dissolved in DMSO and Filter Paper Disc Diffusion method for assessing the antibacterial and antifungal activities is applied to them (4).

Used microorganisms

1. Bacteria: *Staphylococcu epidermidis* ATCC 1228, *S. aureus* ATCC 29213, *S. aureus* ATCC 25923, *Escherichia coli* ATCC 25922, *Pseudomonas aeruginosa* ATCC 27853, *Streptococcus pyogenes* NCTC 10870, *Listeria monocytogenes* Kuen 135, *Corynobacterium diphtheriae*.

2. Yeasts: *Candida pseudotropicalis* Kuen 1015, *C. guilliermondii* Kuen 998, *C. krusei* Kuen 1001, *C. albicans* ATCC 10231, *C. glabrata* CBS 2730, *C. tropicalis* Kuen 1024.

The Filter Paper Disc Diffusion method is spread according to N.C.C.L.S. rules. 24 hour cultures containing 10^8 ml microorganisms are used. The extract amount is prepared as 0.2 mg / disc in DMSO. The incubation time is 24 hours at 37^{0}C. Miconazole (0.5μg / disc) for the yeasts and Ceftazidime (30μg / disc) for the bacteria are used as standards and DMSO is used as controls. Sabouraud Dextrose Agar, Sabouraud Dextrose Broth for the yeasts and Mueller Hinton Agar, Mueller Hinton Broth for the bacteria are used as media.

TEST ORGANISMS	TESTED MATERIALS						STANDARD
YEASTS	Petroleum ether		Chloroform		Ethanol		Miconazole
	A.gluti-nosa	*O.mariti-mus*	*A.gluti-nosa*	*O.mariti-mus*	*A.gluti-nosa*	*O.mariti-mus*	
C. albicans	-	-	-	-	-	-	15
C. tropicalis	-	-	-	-	-	-	25
C. pseudotropicalis	-	-	-	-	-	-	28
C. glabrata	-	-	-	-	-	-	15
C. krusei	-	-	-	-	-	-	12
C. guilliermondii	-	-	-	-	-	-	27

inhibition zone diameter (mm). -: No inhibition.

Table-1 : Antifungal activity of *A. glutinosa* and *O. maritimus* extracts

TESTORGANISMS	TESTED MATERIALS						STANDARD
BACTERIA	Petroleum ether		Chloroform		Ethanol		Ceftazidime
	A.gluti-nosa	*O.mariti-mus*	*A.gluti-nosa*	*O.mariti-mus*	*A.gluti-nosa*	*O.mariti-mus*	
S. epidermidis	-	-	-	-	-	-	27
S. aureus 29213	6	-	-	-	-	-	23
S. aureus 25923	-	-	-	-	-	-	23
S. pyogenes	-	-	7	-	-	-	32
L. monocytogenes	-	-	7	-	-	-	24
C. diphtheriae	-	-	-	-	-	-	22
E. coli	-	-	-	-	-	-	35
P. aeruginosa	-	-	-	-	-	-	32

inhibition zone diameter (mm). -: No inhibition.

Table-2 : Antibacterial activity of *A. glutinosa* and *O. maritimus* extracts

RESULTS AND DISCUSSION

Table 2 indicates that only inhibition zones against *Staphylococcus aureus* 29213 in the petroleum ether extract of *A. glutinosa* and against *Streptococcus pyogenes* and *Listeria monocytogenes* in the chloroform extract of the same plant are to be seen among the 8 bacteria investigated, but these are not considered to be significant. *O. maritimus* however, shows no inhibition zones against the 8 bacteria investigated.

No inhibition zones are to be seen against the 6 yeasts investigated in both of the plants (Table 1).

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(Received August 11, 1996)