

HELIOTROPIUM HIRSUTISSIMUMUN ANTİBAKRİYEL VE ANTİFUNGAL ETKİLERİ

ANTIBACTERIAL AND ANTIFUNGAL EFFECTS OF HELIOTROPIUM HIRSUTISSIMUM

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SUMMARY

Heliotropium species have been used as chloretic, antipyretic and cicatrizing.

In this study, the antibacterial and antifungal effects of the petroleum ether, chloroform and ethanol extracts, prepared from the aerial parts of *Heliotropium hirsutissimum* Grauer (Boraginaceae) are investigated.

Inhibition zones have been found against *Candida albicans*, *C. tropicalis*, *C. pseudotropicalis* and *C. guilliermondii* among the 6 yeasts and against only one strain of *Staphylococcus aureus* among the 8 bacteria investigated.

ÖZET

Heliotropium türleri safra arttırıcı, ateş düşürücü ve yara iyi edici olarak kullanılmaktadır.

Bu çalışmada, *Heliotropium hirsutissimum* Grauer (Boraginaceae) bitkisinin topraküstü kısımlarından hazırlanan petrol eteri, kloroform ve etanol ekstratlarının antibakteriyel ve antifungal etkileri incelenmiştir.

İncelenen 6 maya arasında *Candida albicans*, *C. tropicalis*, *C. pseudotropicalis* ve *C. guilliermondii* 'ye karşı inhibisyon zonları saptanırken incelenen 8 bakteri arasından yalnızca *Staphylococcus aureus* 'a karşı inhibisyon zonu gözlenmiştir.

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INTRODUCTION

Heliotropium hirsutissimum Grauer (Boraginaceae) grows in Bulgaria, Greece, N. Africa, Syria and Turkey. It is an east Meditterean element(1).

Heliotropium species have been used for their chloretic, antipyretic and cicatrizing activities. Also its juice is used against warts, snakebites and scorpionbites in folk medicine(2). They are known to contain pyrrolizidin alkaloids (heliotrine, lasiocarpine, europine, supinine) (3).

The aim of this report is to find out the antibacterial and antifungal effects of *H. hirsutissimum*.

MATERIALS AND METHODS

The plant was collected from Muğla, Bodrum, Yalıkavak (Gökçebel) on July 28th,1994. The plant is identified by Prof. E.Tuzlacı and a voucher specimen is kept in the Herbarium of the University of Marmara, Faculty of Pharmacy (MARE 4557).

The aerial parts of the plant are air-dried and powdered. 160 g powder is 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: *Staphylococcus 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, *Corynebacterium 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°C. Miconazole (0.5µg / disc) for the yeasts and Cefazidime (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
<i>C. albicans</i>	-	-	7	11
<i>C. tropicalis</i>	-	-	6	11
<i>C. pseudotropicalis</i>	8	-	-	30
<i>C. glabrata</i>	-	-	-	10
<i>C. krusei</i>	-	-	-	8
<i>C. guilliermondii</i>	11	9	6	28

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

Table-1 : Antifungal activity of *H. hirsutissimum* extracts

TEST ORGANISMS	TESTED	MATERIALS		STANDARD
BACTERIA	Petroleum ether	Chloroform	Ethanol	Ceftazidime
<i>S. epidermidis</i>	-	-	-	30
<i>S. aureus</i> 29213	-	9	-	26
<i>S. aureus</i> 25923	-	-	-	24
<i>S. pyogenes</i>	-	-	-	30
<i>L. monocytogenes</i>	-	-	-	18
<i>C. diphtheriae</i>	-	-	-	17
<i>E. coli</i>	-	-	-	27
<i>P. aeruginosa</i>	-	-	-	29

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

Table-2 : Antibacterial activity of *H. hirsutissimum* extracts

RESULTS AND DISCUSSION

Among the 6 yeasts investigated inhibition zones against *C. albicans* and *C. guilliermondii* in the petroleum ether extract, against *C. tropicalis*, *C. albicans* and *C. guilliermondii* in the ethanol extract and against *C. guilliermondii* in the chloroform extract have been seen (Table 1).

Whereas only one inhibition zone against *S. aureus* in the chloroform extract is seen among the 8 bacteria (Table 2).

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