



*Candida albicans*

*C. guilliermondii* (2006) Yeast  
*C. krusei* (Mirhendi) Dimorphic  
*C. parapsilosis* (*C.pseudotropicalis*) Mycelial  
*C. kefyr* Mycelial  
*C.tropicalis glabrata* *C.albicans* form (pH)

° 35

Czapek's Dox Agar  
 عن الأوساط الزراعية الحاوية مواد نشوية مثل أكار طحين الذرة و وسط أكار  
 Corn Meal Agar و وسط أكار (Odds ، 6.5)  
 Potato Dextrose Agar (1979)  
 : *C. albicans*  
 Germ Tube Production Adherence  
 Phospholipase Production Proteinase Production  
 (2000، Kevin و Gary ؛ 2001، Abu-Elteen) Phenotypic Switching

Pharmacognosy

Aspirin(Thebuslic salicyat structure)  
 ( ) Opioids willow (Salix)  
 (steroid structures) *Opium poppies*  
 ( *Thymus vulgaris*) thyme  
 Lamiaceae (Labiaceae) ( *Mentha piperita* )Peppermint  
 aromatic undershrubs 3200 200  
 : (2006 Mills )

( 97)

-3 2010- -18

2011-

0.1 (NaCl)

Sabouraud

15

10

20

Dextrose Ager(SDA)  
 1000

(4-2) ° (30-25)

**Phospholipase assay:**

18 (2001) Abu-Elteen  
 5 /  $10^6$   
 10 Haemocytometric Counter  
 4 ° 37 Egg Yolk  
 (Pz (precipitation zone) value)

**Adherence assay :**

(2000) Abu-Elteen  
 (Cotton Swabs)  
 20 (PBS) Phospha buffer saline  
 / 250 5  
 4 PBS 20  
 haemocytometric Counter PBS  
 /  $10^6 \times 5$  0.5 /  $10^5 \times 2$   
 ° 37 90 0.5

Ketaconazole Nystatin Fluconazole  
*C. albicans*  
 Minimal inhibitory concentration (MIC)  
 Minimal Fungicidal Concentration (MFC)  
 Broth dilution method  
 10 0.0010  
 Dimethyl Sulphoxide  
 / 50-0.05 100  
 2 12 /  
 2 (SDB) Sabouraud Dextrose broth  
 / 50  
 )  
 0.5 . ( ) ( ° 30 )  
 48  
 MFC . MIC  
 0.1  
 (SDA) Sabouraud Dextrose Ager

30 °  
48  
MFC  
Shadomy (1985).

:

(  
(1999) Abu Ghadeib Shtayeh  
100  
100  
15  
35  
24  
3000  
10 /  
60 ° (Oven)  
20- °  
0 ، 20 ، 40 ، 60 ، 80 ، 100  
0.22 (Millipore Filter) /  
%80  
:  
**Cellulas toxicity**  
0.8 (1994) Ursella Xin-guo  
0.2  
37 ° 30 1  
/ 1000 5  
( ) Hemolysis

·

: *C. albicans*

0.01  
37 ° 7-3  
50 Sabouraud Dextrose Ager (SDA)  
(1993) El-Kady  
SDA / 100 ، 80 ، 60 ، 40 ، 20  
5  
7 SDA  
/ 2 Nystatine  
( SDA)

30 – 28

( )

-:

-

100× \_\_\_\_\_ =

:

CRD

0.05

LSD

SPSS

: *C. albicans*

(1998) Jack Cletus

*C. albicans*

*C. albicans*

SDA

*C.albicans*

° 37

7-3

) ° 25 3

Glucose –yeast extract-peptone

( )

(4.0-8.0)X(3.5-6.0) (

(6-4)

48-24

3-2

germ tube

° 37

12-8

(1)

. (1996 Milne ؛ 1998 Jack Cletus)

## . 1

قابلية تمثيل السكريات		قابلية تخمر السكريات					أنواع المبيضات	تكوين أنبوب الأنيبات	تكوين الأبراج المنتشرة	خاصية النمو السطحي	
Lactose solution	Starch solution	Glucose	Galactose	Sucrose <sub>2</sub>	Maltose	Glucose					Galactose
-	+	+	+	v	+	+	v	-	+	+	<i>C.albicans</i> s

V : متغير الفحص + : موجب الفحص - : سالب الفحص

*Candida albicans*

( 52) %69.3

*C.albicans* ( 2010 ) Satana

%73.1

% 42.55 *C.albicans* (2007) Gravina

(2007 Erturan Erkose)

*C.albicans*

(2000 Kevin Gary)

:

*C.albicans*

*C.albicans* (2)

Al- Abeid

، % 22 *C.albicans* ( 2004 )

(Fibrillar layer)

(1992 Klotz)

. (2001 Wood)

## .2

Pz	*	
33	15	1
33	18	2
33	17	3
32	19	4
33	17.5	

\*

## :Phospholipase

*C.albicans**C.albicans* (2)Phospholipase  
(Precipitation zone)(Ca<sup>+2</sup>)  
(Egg Yolk)

.(2001

Abu-Alteen)

:

*C.albicans*

Fluconazole

(3)

(2006)

Nystatin Ketaconazole

/ 32 Nystatin  
*C.albicans* / 25 Nystatin

.(2003

Godoy 2005

Devkatte)

.*C.albicans*

## MFC MIC . 3

µg/ml MFC	µg/ml MIC		
50	12.5	Fluconazole	<i>C.albicans</i>
50	25	Ketaconazole	
50	25	Nystatin	

:

(4)

(*In vitro*)

(Hemolysis)

(2006 Mills)

. 4

-	-	
-	-	
+	+	
-	+	

( ) : - ( ) : +

***C.albicans***

(2004) Abu-shanab  
 Ateeq-ur-Rehman  
 2 Nystatin / 100 (2009)  
 %100 / 80 (5)  
 20 %75.53 / 100 /



جدول 5. الفعالية التضادية للمستخلصات الكحولية والمستخلصات الاسيتونية والمستخلصات المائية الباردة والمستخلصات المائية الحارة لنبات الزعتر ضد *C.albicans*

	اقطار نمو المستعمرات (ملم)							التركيز مليغرام / مل طريقة الاستخلاص
	100	80	60	40	20	0	السيطرة	
تداخل الطريقة LSD =3.37 والتركيز	2.5	5.5	10.5	12.5	14.5	44.0	0.0	المستخلص المائي البارد
	1.5	3.5	4.5	9.5	13.0	44.0	0.0	المستخلص المائي الحار
	0.0	0.5	2.0	4.0	11.5	47.0	0.0	المستخلص الكحولي
	0.5	1.0	2.5	7.5	12.5	42.0	0.0	المستخلص الاسيتوني
P<0.05	LSD التركيز=1.68							LSD الطريقة=1.146

(6)

100	2 Nystatin	100	94.38%
20		20	66.66%

جدول 6. الفعالية التضادية للمستخلصات الكحولية والمستخلصات الاسيتونية والمستخلصات المائية الباردة والمستخلصات المائية الحارة لنبات النعناع ضد *C.albicans*

	اقطار نمو المستعمرات (ملم)							التركيز مليغرام / مل طريقة الاستخلاص
	100	80	60	40	20	0	السيطرة	
تداخل الطريقة LSD =3.37 والتركيز	3.5	5.5	5.5	8.5	13.0	39.0	0.0	المستخلص المائي البارد
	3.0	3.5	5.5	8.5	13.0	44.0	0.0	المستخلص المائي الحار
	0.5	2.0	5.0	9.5	13.0	44.5	0.0	المستخلص الكحولي
	2.0	3.0	3.5	10.5	17.5	43.0	0.0	المستخلص الاسيتوني
P<0.05	LSD التركيز=1.68							LSD الطريقة=1.146

. 2006.

- Abu- Shanab, B., G. Adwan, D.Abu-Safiya, N. Jarrar, and K. Adwan. 2004. Antibacterial activities of some plant extracts utilized in popular medicine in Palestine. *Turk. J. Biol.*, 28:99-102.
- Abu-Elteen, K. H., A. Z. Elkarmi, and M. Hamad. 2001. Characterization of phenotype – based pathogenic determine of various *Candida albicans* strains in Jordan. *Jpn. J. Infect. Dis.*, 54. 292-236.
- Abu- Elteen, K. H. 2000. Effects of date extract on adhesion of *Candida* species to human buccal epithelial cells in vitro. *J. Oral Pathol. Med.*, 29, 200-205.
- AL-Abeid, H.M., K.H. Abu-Elteen; A.Z. Elkarmi and M.A. Hamad. 2004. Isolation and Characterization of *Candida* spp. in Jordanian Cancer patients:prevalence, pathogenic determinants, and antifungal sensitivity. *Jpn. J.Infect. Dis.*, 57: 279-284.
- Ateeq-ur-Rehman ,Abdul Mannan ,Sania Inayatullah ,M.Zaeem Akhtar ,Mazhar Qayyum ,and Bushra Mirza . 2009. Biological evaluation of eild thyme(*thymus setpyllum*) . *pharmaceutical Biology* .47(7):628-633.
- Brooks, G.F., J.S. Butel and S.A. Morse. 2001. Jawed, Mel nick and Adel berg's, Medical Microbiology. 22 ed . McGraw - Hill, New York.
- Cletus P. Kurtzman and Jack W. Fell. 1998.The Yeasts, A Taxonomic Study, Fourth edition. New York. Oxford.
- Devkate A N, G B .Zore and SM . Karuppayil.2005. Potential of plant oil inhibition of *Candida albicans* growth. *FEMS Yeast Research*, 5:867-73.
- El-kady, J.A., S.S. El-Maraghy and E.M. Mohamed. 1993. Antibacterial and antidermatophyte activity of some essential oils from spices. *Qatar Univ. Sc. J.*, 13(1): 63-69.
- Erkose G and Erturan Z . 2007 .Oral candida colonization of human immunodeficiency virus infected subjects in Turkey and its relation with viral load and CD4 T-lymphocyte count. *Mycoses* . 50:485-490.
- Fidel, P.L., J.A. Vazquez and J .D. Sobel 1999. *Candida glabrata*: Review of epidemiology, Pathogenesis and Clinical disease with camparison to *C.albicans*. *Clin . Microbial .Rev.* 12 (1): 80 -96.
- Gary, C. and K.Kevin. 2000. Adherence Mechanisms of *Candida albicans* . *Brit. J. of Biomed. Sci.*, P.1-4.
- Godoy P, I.N .Tiraboschi and LC Severo. 2003 .Species distribution and antifungal susceptibility profile of *Candida* spp. Bloodstream isolates from Latin American Hospitals. *Men Inst Oswaldo Cruz Riode Janeiro*. 98: 401-5.
- Gravina ,Haylen Gonzalez ,Evelyn Gonzalez de Moran .Olga Zambrano,Maran Lozano Chourio, Sofia Rodriguez de Valero , Sandra Robertis and Luz Mesa . 2007. Oral Candidiasis in children and adolescents with cancer Identification of candida spp. *Med Oral Patol Oral Cir Bucal*.
- Klotz, S.A. 1992.Fungal adherence to the vascular compartment: acritical step

- in the pathogenesis of disseminated candidiasis. *Clin. Infect. Dis.* 14:340-347.
- Mills Edward, Jean-Jacques Dugoua, Dan Perri, and GideonKoren .2006. Herbal Medicines in Pregnancy and Lactation .An Evidence-Based Approach, London and New York.
- Milne, L.J.R. 1996. Fungi in: Mackie and MacCartney Practical Medical Microbiology. Collee, J.G; A.G. Fraser; B.P.Marmion & A. Simmons. (eds). 14<sup>th</sup> ed. Churchill Livingstone, London.
- Mirhendi ,H .Makimura ,K .Khoramizadeh and M,Yamaguchi H.2006. A one enzyme PCR-RFLP assay for identification of six medically important *Candida* species .*Jpn J. Med. Mycol.* ;47:225-9.
- Odds, F.C. 1979. *Candida* and Candidosis. Leicester University press. London. PP.381.
- Satana, Dilek, Gonca Erkoşe Genc and Zayre Erturan.2010. The antifungal susceptibilities of oral candida spp isolates from HIV-infected patents . African Journal of Microbiology Research, Vol.4 (6), pp466-470.
- Santos, L.C.D., G.F. Castro; L.P.R. Souza and R.H.S.Oliveira. 2001. Oral manifestation related to immunosuppressant degree in HIV- positive children. *Braz. Dent. J.*, 12 (12): 135-138.
- Shtayeh, M.S.A. and S.I. Abu-Ghdeib. 1999. Antifungal activity of plant extract against dermatophytes. *J. Mycoses.* 42:665-672.
- Shadomy, S. E.Ingroff, and R.Y. Cartwright. 1985. Laboratory studies with antifungal agenst : Suseptibility test and bioassays In:Manual of clinical microbiology.Lennette, E.H.; Balows , A.; Hausler ,W.J. and shadomy ,H.J. (eds)Am. Soci .Microbiol. 4<sup>th</sup> ed.ch.104.
- Wood, J.P. 2001. *Candida albicans* and other species and Candidiasis .MMI 410, 3/27/01, Electornic version (Internet) [[http://www. Amedo .com/medicine/infd /jbacter.htm](http://www.Amedo.com/medicine/infd/jbacter.htm)].
- Xin – guo, H. and M.Ursella. 1994. Antifungal compounds from *Solanum nigrescens*, *J. Ethnopharm*; 43:173 – 177.

**INHIBITION ACTIVITY OF PLANT EXTRACT *Thymus vulgaris*  
AND *Mentha piperita* AGAINST *Candida albicans***

Hadi A.M. Al- Saidy\*

N.G. Al-zebedee\*\*

I.K.M. Danbuss\*\*

\*Animal Resources Dept. - College of Agriculture - Diyala Univ.

\*\*Biology Dept.- College of Pure Sciences – Diyala Univ.

**ABSTRACT**

The results of this study showed that there was high activity for extract plants *Thymus vulgaris* and *Mentha piperita* against *Candida albicans* ,The infection ratio of Candidiasis that found in Diyala province was 69.3 % . In studying some virulence factors for *Candida albicans* were the average activity adherence ratio with epithelial cells was 17.5, and activity average Phospholipase %33. The Minimal Fungicidal Concentration (MFC) of antifungal (Flucanazole, Ketacanazole, Nystatin) was 50 µg/ml.

AL- coholic extracts (Ethanol70%) for thyme and Peppermint gave better compared to the activity thyme is better activity than Peppermint extract: In rate 100 mg /ml for the thyme alcoholic extracts (Ethanol70%) give the highest inhibition ratio 100% while in concentration 20 mg/ml for cold water extract Peppermint plant gave the lowest inhibition ratio 66.66%.

The concentration 80,100 mg/ml for the alcoholic extracts of thyme and also the concentration 100 mg/ml for alcoholic extracts (Ethanol70%) of Peppermint showed similar activity to Nystatin (2mg/ml) in inhibition of *C.albicans* .

**Key words :** *Thymus vulgaris* , *Mentha piperita* , *Candida albicans*.