

(1) (1) (1)

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Barnett

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Candida

10

API

Candida

%21.66

krusei

Saccharomyces

Geotrichum capitatum

%16.66

lusitaniae

magnolia

%11.66

Rhodotorula minuta

cerivisiae

Candida famata

%8.33

Candida

%5

lipolytica

Candida

%3.33

Candida kefir

Rhodotorula mucilaginosa

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Detection and Classification of local isolated Yeasts from whey in some Syrian Governorates

M. Ayass⁽¹⁾; S. Yazji⁽¹⁾ and A. Alhaj-Ali⁽¹⁾

ABSTRACT

Sixty yeasts spp. were isolated from samples of whey which collected from different locations in Syria. These yeasts were classified morphologically according to Barnett's and physiologically by API technique to identify the species of Yeasts, where had found 10 classified yeasts as follows:

Candida krusei is the most of yeasts which founded in whey with 21.66 %, and in the Second rank is *Candida lusitaniae* with 16.66 %. the third rank came (*Geotrichum capitatum*, *Saccharomyces cerevisiae*, *Rhodotorula minuta*) with 11.66%, after that the *Candida magnolia* is ranked in the fourth rank by distributing with 8.33%. as soon as the *Candida famata* came in the fifth rank with 6.66%, and in the sixth rank we founded *Candida lipolytica* with 5%, finally the *Rhodotorula. mucilaginosa* and *Candida. kefir* came in the last rank with 3.33%, so we noticed the variety of the yeasts in the studied locations in Syria.

Key Words : Whey, Yeasts, Morphologically, Physiologically.

(1) Food Science, Faculty of Agriculture, Damascus University, Syria.

(Sim and Hang 1996)

1836 .

Saccharomyces cerevisiae

.(Pretorius, 2000)

(Richard and Robinson 2002) (Hocking and Faedo 1992) .

(Martin *et al.*, 1999)

(Covadonga *et al.*, 2002)

Mansour *et al.*, 1993)

(Roostita and Fleet, 1996; Ben-Hassan and Ghaly, 1994;

(Speer, 1998) %8-3

.(Mawson, 1994; Gonzales, 1996)

(Inchaurredo *et al.*, 1994)

Kluyveromyces

Cristiani *et Grba et al.*, 2002)

1970 Lodder (*al.*, 2000)

Barnett 2000
90 60

Bio Merieux

API 20 C AUX

19

(Verweij *et al.*,1999) 48

Bio Merieux

(Espinel *et al.* 1998)

API

.(Covadonga *et al.*, 2002) .

system API Candida
198

%71.7 %91.4

.(Bernal *et al.*, 1998)

API

Barnett

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10

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: -2
(Scharlau Chemie S.A – SPAIN) -
(Potato peptone 4 g/L, Glucose 20 g/L, Agar 15 g /L)
(Sisco Research Labs – INDIA) -
(Protein substances < 5%, Loss on drying <5%, Nacl < 1%)
(Scharlau Chemie S.A – SPAIN) -
(Malt extract 13, Dextrine 2.5,Gelatin peptone 5, Agar 15) g/L
(New Brunswick Scientific - USA) -
- - -
- - Lab Tech - USA (- -) -
. PI (- -) -
: -3

3 28

. 48 24 28

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: 1-4
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-(- -) : -
(Barnett *et al.*, 2000) -
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: (21 -14 - 7 - 3)
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 8
 28
 : -
 4
 (21-14 -7 -3) 28
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 (- - -)
 :API 2-4
 5
 suspension 3 5
 2 medium
 24
 cmedium 100
 100 7
 100 API
 24 API
 . 72
 API

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(1)

(Barnet

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(2000

(1)

								Barnett		
								<i>Geotrichum</i>	7	1
								<i>Candida</i>	13	2
								<i>Candida</i>	10	3
								<i>Candida</i>	4	4
								<i>Candida</i>	5	5
								<i>Saccharomyces</i>	7	6
								<i>Rhodotorula</i>	7	7
								<i>Candida</i>	3	8
								<i>Rhodotorula</i>	2	9
								<i>Candida</i>	2	10

...

API		(2)																				
		O	GLU	GLY	2KG	ARA	XYL	ADO	XLT	GAL	INO	SOR	MDG	NAG	CEL	LAC	MAL	SAC	TRE	MLZ	RAF	
<i>Geotrichum capitatum</i>		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Candida krusei</i>		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Candida lusitaniae</i>		-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Candida famata</i>		-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Candida magnoliae</i>		-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
<i>Saccharomyces cerevisiae</i>		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
<i>Rodotorula minuta</i>		-	+	+	+	+	-	-	-	-	-	-	-	-	+	+	+	-	+	+	+	-
<i>Candida lipolytica</i>		-	-	+	+	-	-	+	-	-	-	-	-	-	+	+	+	-	-	-	-	-
<i>Rhodotorula mucilaginosa</i>		-	+	+	-	+	+	-	+	+	-	-	-	-	-	+	-	+	+	+	+	+
<i>Candida kefir</i>		-	+	-	-	-	+	-	-	-	-	+	-	-	-	-	+	-	+	-	-	+

: API (1) -2

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(-)

<i>Saccharomyces cerevisiae</i>	7	<i>Geotrichum capitatum</i>	7
<i>Rhodotorula minuta</i>	7	<i>Candida krusei</i>	13
<i>Candida lipolytica</i>	3	<i>Candida lusitaniae</i>	10
<i>Rhodotorula mucilaginosa</i>	2	<i>Candida famata</i>	4
<i>Candida kefir</i>	2	<i>Candida magnolia</i>	5

.(Barnett 2000)

(Jakobsen and Narvhus 1996) (Gadaga *et al.*, 2000)
(Caballero *et al.*, 1995) (Deak and Beuchat . 1996)
(Shah *et al.*, 1993)

api® 20 C AUX BIO M E R I E U X

REF: 1

Origine / Source / Herkunft /
Origen / Origen / Προέλευση /
Ursprung / Oprindelse / Pochodzenie :

45 h	0	GLU	GLY	2KG	ARA	XYL	ADD	XLT	GAL	INO	SOR	MDG	NAG	DEL	LAC	MAL	SAC	TRE	MLZ	RAF	
72 h	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	1	2	4	1	2	4	1	2	4	1	2	4	1	2	4	1	2	4	1	2	4
	0			0			4			0			0			0			0		

Autres tests / Other tests / Andere Tests /
Otras pruebas / Altri test / Outros testes /
Άλλες εξετάσεις / Andra tester /
Andre tests / Inne testy : 0040000

Ident. / Ταυτοποίηση : Geotrichum Capitatum

api® 20 C AUX BIO M E R I E U X

REF: 3

Origine / Source / Herkunft /
Origen / Origen / Προέλευση /
Ursprung / Oprindelse / Pochodzenie :

45 h	0	GLU	GLY	2KG	ARA	XYL	ADD	XLT	GAL	INO	SOR	MDG	NAG	DEL	LAC	MAL	SAC	TRE	MLZ	RAF	
72 h	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	
	1	2	4	1	2	4	1	2	4	1	2	4	1	2	4	1	2	4	1	2	4
	0			0			0			0			1			0			0		

Autres tests / Other tests / Andere Tests /
Otras pruebas / Altri test / Outros testes /
Άλλες εξετάσεις / Andra tester /
Andre tests / Inne testy : 0000100

Ident. / Ταυτοποίηση : Candida Krusei

api® 20 C AUX BIO M E R I E U X

REF: 6

Origine / Source / Herkunft /
Origen / Origen / Προέλευση /
Ursprung / Oprindelse / Pochodzenie :

45 h	0	GLU	GLY	2KG	ARA	XYL	ADD	XLT	GAL	INO	SOR	MDG	NAG	DEL	LAC	MAL	SAC	TRE	MLZ	RAF	
72 h	-	+	+	+	+	-	+	-	-	-	+	-	+	+	+	+	+	+	+	-	
	1	2	4	1	2	4	1	2	4	1	2	4	1	2	4	1	2	4	1	2	4
	6			3			1			2			3			7			1		

Autres tests / Other tests / Andere Tests /
Otras pruebas / Altri test / Outros testes /
Άλλες εξετάσεις / Andra tester /
Andre tests / Inne testy : 6312371

Ident. / Ταυτοποίηση : Candida lusitaniae

:		
.Geotrichum capitatum	(1)	-1
.Candida krusei	(3)	-2
.Candida lusitaniae	(6)	-3
	(2)	
		.API

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GLU: D- GLUCOSE MDG : Methyl-a D – Glucopyranoside
 GLY: GLYCEROL NAG: N- Acetyl-Glucosamine
 2KG: calcium 2 Keto – Gluconate CEL: D- CELLOBIOSE
 ARA: L – ARABINOSE LAC: D- LACTOSE
 XYL: D- XYLOSE MAL: D- MALTOSE
 ADO: ADONITO SAC: D- SACCHAROSE (sucrose)
 XLT: XYLITOL TRE: D-TREHALOSE
 GAL: D- GALACTOSE MLZ: D- MELEZITOSE
 INO: INOSITOL RAF: D- RAFFINOSE
 SOR: D- SORBITOL

: **-3**

	<i>Candida krusei</i>	(3)	
%16.66	<i>Candida lusitaniae</i>		%21.66
	<i>Saccharomyces cerivisiae</i>	<i>Geotrichum capitatum</i>	
<i>Candida</i>	%11.66		<i>Rhodotorula minuta</i>
	%8.33		<i>magnolia</i>
<i>Candida</i>		%6.66	<i>Candida famata</i>
<i>Rhodotorula. mucilaginosa</i>		%5	<i>lipolytica</i>
	.%3.33		<i>Candida . kefyra</i>

(3)

<i>Candida krusei</i>	13	21.66
<i>Candida lusitaniae</i>	10	16.66
<i>Geotrichum capitatum</i>	7	11.66
<i>Saccharomyces cerevisiae</i>	7	11.66
<i>Rhodotorula minuta</i>	7	11.66
<i>Candida magnoliae</i>	5	8.33
<i>Candida famata</i>	4	6.66
<i>Candida lipolytica</i>	3	5
<i>Rhodotorula mucilaginosa</i>	2	3.33
<i>Candida kefyr</i>	2	3.33

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(4)

%50 *Candida krusei* *Geotrichum capitatum*
 %60 *Candida lusitaniae* *Candida krusei*
 %30 *Candida magnoliae*
 %40 *Candida famata*
 %30 *Candida lipolytica*
 %20 *Candida lusitaniae* *Candida krusei*
Saccharomyces cerevisiae *Candida lusitaniae* *Candida krusei*

(4)

<i>I</i>	10	10	10	10	10	10
<i>Candida krusei</i>	2	3	3	2	1	2
<i>Candida lusitaniae</i>	1	2	3	1	1	2
<i>Geotrichum capitatum</i>	1	3	1	1	0	1
<i>Saccharomyces cerevisiae</i>	1	1	2	1	1	1
<i>Rhodotorula minuta</i>	2	1	1	1	2	0
<i>Candida magnoliae</i>	1	0	0	3	1	0
<i>Candida famata</i>	0	0	0	0	4	0
<i>Candida lipolytica</i>	1	1	1	0	0	1
<i>Rhodotorula mucilaginosa</i>	1	0	0	1	0	0
<i>Candida kefyr</i>	1	0	0	0	0	1

.		-1
.		-2
.	5 4	-3
.	<i>Candida krusei</i>	-4
<i>Candida lusitaniae</i>	<i>Candida krusei</i>	-5
	<i>Geotrichum capitatum</i> <i>Saccharomyces cerevisiae</i>	
	<i>Rhodotorula minuta</i>	
	<i>Candida magnolia</i>	-6
	<i>Candida famata</i>	
<i>Candida famata</i>		-7
	<i>Rhodotorula minuta</i>	-8
	<i>Geotrichum capitatum</i>	
	<i>Candida kefir</i>	-9
	<i>Rhodotorula mucilaginosa</i>	

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