

- - -
2010/04/01
2010/10/19

(pH)

40C⁰ pH=4
Km= 2.5x 10⁻² mol/l

%62-20
%79 -66
(

) substrates

% 34-32
-55

%.%65

:

Effective Factors of Dormant Seeds Lipase Activity in Gota Castor Bean

M. Darakli and A. Malo

Department of Chemistry, Faculty of Sciences, Damascus University, Syria

Received 01/04/2010

Accepted 19/10/2010

ABSTRACT

The present work was undertaken to study the properties and variations in the activities of castor bean lipase under different conditions.

Enzymes were extracted from dormant seed by phosphate buffer, then characterizations were conducted.

Analysis showed gradual differences in the pattern of enzyme activities.

Optimum activity of the enzyme was at pH=4, temperature 40°C, $K_m = 2.5 \times 10^{-2} \text{ mol/l}$. The reaction velocity increased in direct proportion to the enzyme concentration. Castor bean oils and sunflower oils were the best substrate for the enzyme.

Calcium, Magnesium, Ammonium, and Potassium ions enhance the enzyme, while Zinc and Ferric ions inhibited enzyme activities.

Oils were extracted by two methods and gave different yields, the higher percentage was in Soxhlet method.

Key word: Lipase, Castor bean seeds, Enzymes, Lipase properties.

Metabolism

(Substrate)

%100

.(2010) .

(EC 3.1.1.3)

Triacylglycerols (TAG)

free fatty acid

mono or

glycerol

diacylglycerol

.(Kaussar, 1981)

(Shoshi and Harry, 1974)

Optimal

:

pH=4-5

(Kaussar, 1981)

(Km)

:

)

(

U-32R (BOECO)

BUCHI Rolavapor) Shaking Incubator 303

(ORION 420 A PH meter) (R110

(Panasonic MX-J220P) (max 160 g) artorius

(Ms1 Mini Shaker IKA)

(Shenstone England PhilipHarris Limited)

Hetodry Winner 3

:

M.Altschul *et al.*,)

(1960

:

-1

:

)

.(

(2006)

-2

:

60C⁰

20

.(25 -20)

-3(Robert L, Allen J.St and M.Altschul
)

1960)

(

.(pH=7 0,1M)

.+4C⁰

(/ 5000)

20 +4C⁰

(pH=7 0,1M)

/ 2000

.(Hetodry Winner 3)

lyophilization

-4

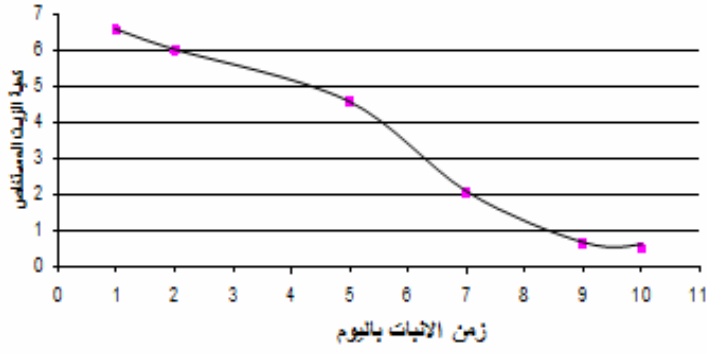
()
 pH=9.5 pH-meter 0.05N
) %1
 ()
 :
 .pH=8 250 -
 -
 -
 -
 -
 (Shoshi and Harry, (Victor N. Enujiugha 2004) pH=4.3
 pH=4 250 (1974
 (Khor, Tan and Chua 1986) 2.5 -
 " "
 (Robert L, Allen J.St 10 40C⁰ -
 Shoshi and 30 (Ory, 1969) 20 and M.Altschul 1960)
 10 Harry 1974)
 5 -
 1:1 -
 pH=9.5 0.05 -
 NaOH -
 (1968) :

$$X = \frac{(NV_2 - NV_1) 10}{H}$$
 :N :
 :H
 : V₂
 : V₁

(1)

-1

24
30-25
24



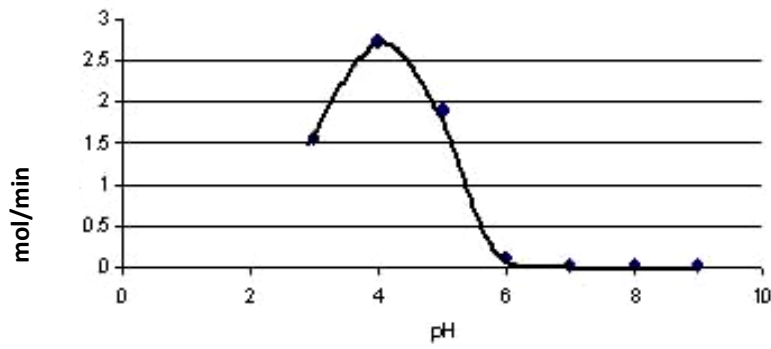
(1)

(1)

%30 % 23 %30
%55

(2)

-2



(2)

(2)

pH=3

pH=5

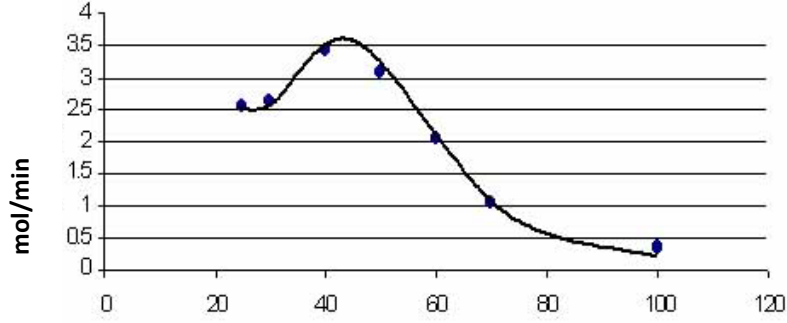
pH=4

pH

.6

-3

:(3)



(3)

-4

V_{max}

-

K_M

K_m

:

-

$[S]$ v

.(MARANGONI 2003) $y = ax + b$:

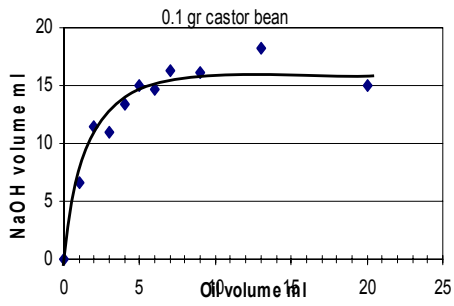
V_{max}

/

0.1

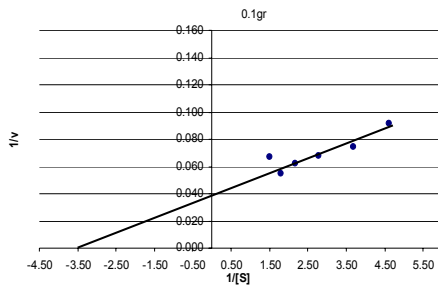
0.5

0.25



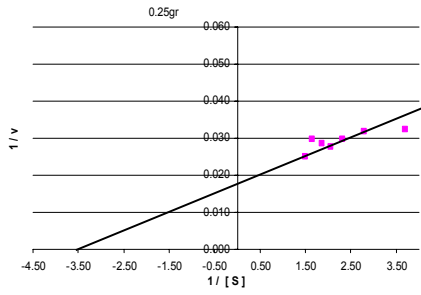
0.1

(4)



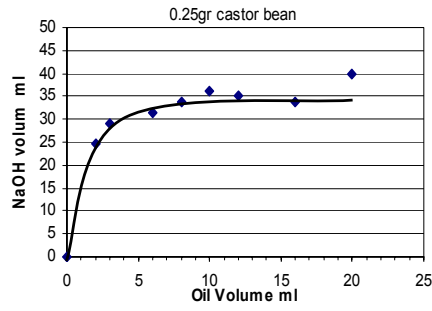
0.1

(4-a)



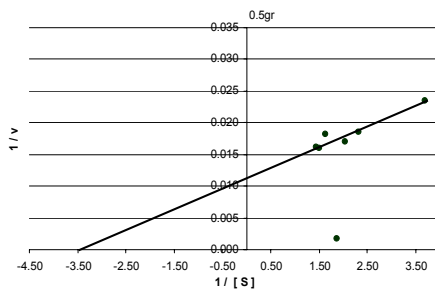
0.25

(5-a)



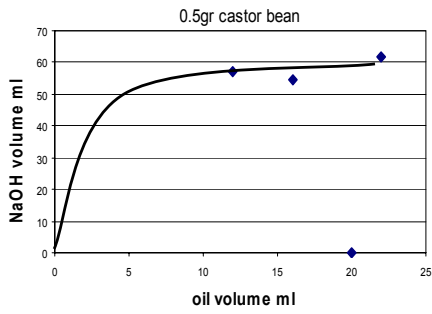
0.25

(5)



0.5

(6-a)



0.5

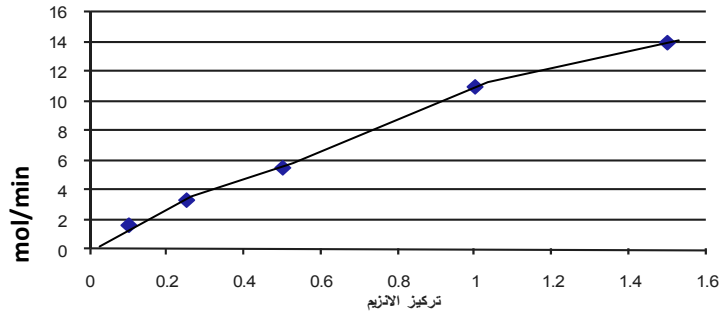
(6)

(7)

-5

40C⁰

pH=4



(7)

:

-6

KCl

MgCl₂

CaCl₂

(0.2 M : 0.08 M 0.02 M)

NH₄Cl

.FeCl₃

ZnCl₂

0.25 :

8 pH=4

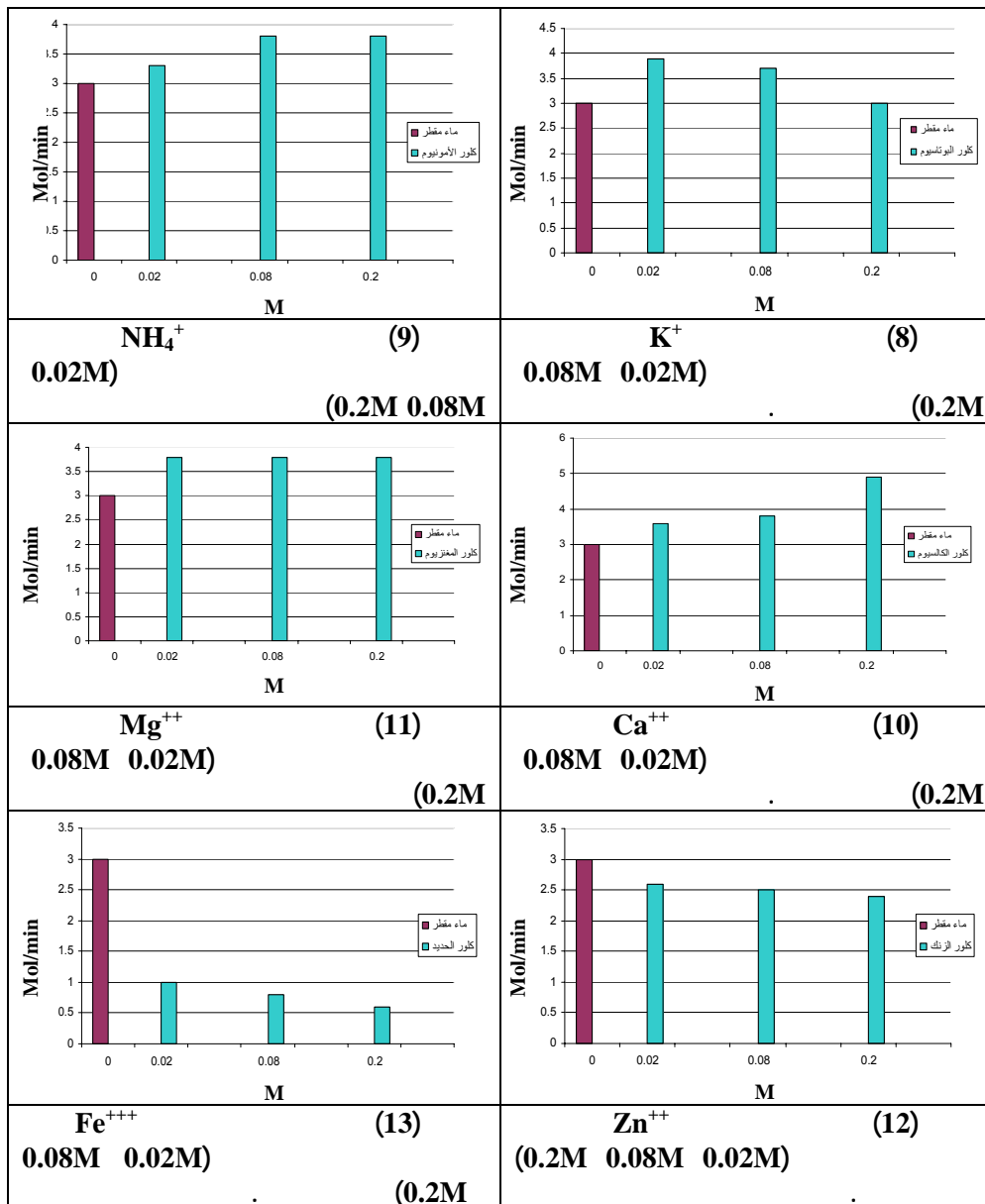
4

5

2.5

.(

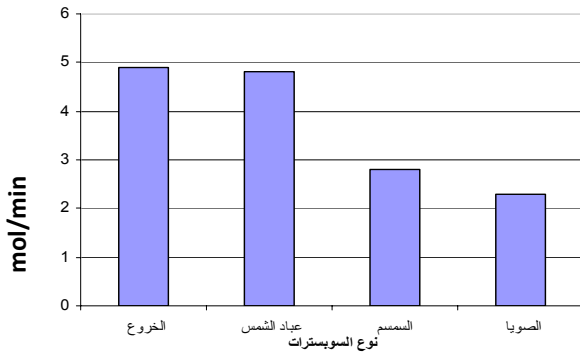
5



:

-7

:



)

(14)

.(

:

-1

(Ombrello, 2006)

.%34-%32.6

.%65-%55
(U.G.AKPAN, 1999)

%30

% 30

%23

% 55
(1) %75

	(2010)	
(AcetylCo- A)A-		β -
.(2010) ()		
:	(2)	-2
pH=5	pH =4	pH =3
.6	pH	
	(Ory, 1969)	
	4	
	(Shoshi and Harry 1974)	
	.pH=5	
:		-3
	(Kaussar, 1981)	
	(3)	
	50°C	40°C
	70°C	25°C
		"Denaturation"
:(Km)		-4
		(6-5-4)
	(6-a) (5-a) (4-a)	
	.Km = 0.25 mol/L	K _m

...

(7) : -5

: -6

(0.02M) (8)
0.08M %30
0.2% %24

(0.02M) (9)
0.2 M %10
%27 0.08M

(0.02M)
0.08M %20
0.2 M %27
(10) %62
(0.2M 0.08M 0.02M)
%25

(11)
(0.2M 0.08M 0.02M)
0.2M %21.5
0.02M %16.5 0.08M
(12) %12

(13)
72.7% 66%) (0.2M 0.08M 0.02M)
(79%
-7

(14)

M. BarrosI)

(Macedo 2010 FleuriII

.85-95%

Ricinolein

pH=4

40C⁰

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