

(cellulase)**SSF**

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<i>A.nadulans</i>	biocout	<i>T.harzianum</i>
(30C° 4 days, pH = 5.2)		
	cellulase	PDA
	()	(SSF)
	<i>T.harzianum</i>	endoglucanase
1.48U/ml <i>A.nadulans</i>		1.54U/ml
		/ (14.8) (15.4)
	exoglucanase	<i>T.harzianum</i>
(0.159U/ml) <i>A.nadulans</i>		0.416U/ml
		/ (1.59) (4.16)
<i>A.nadulans</i>	β -glucosidase	<i>T.harzianum</i>
(5.61U/ml) (6.45U/ml)		
		/ (56.1) (64.5)

Abstract

Two cellulolytic fungi (*T.harzianum*) isolated from the Pesticide (biocout) And (*A.nadulans*) was isolated from a soil of tomato farm, were grew on PDA (4 days ,pH = 5.2 and 30C°),for cellulase production. Cellulase produced using SSF technology by incubation of cotton textile residues (carbon source).

Three type of cellulase were produced :

- Endoglucanase give high activity on the 7th day of incubation for *T.harzianum* (1.54 U/ml) , while *A.nadulans* give at the same day (1.48U/ml) , and they give total activity (15.4 and 14.8/gm carbon source) respectively.

- Exoglucanase give an observed highest activity for *T.harzianum* in the 7th day of incubation (0.416U/ml), while *A.nadulans* have (0.159U/ml) in the same day. Having total activity (4.16 and 1.59/gm carbon source) respectively.
- While β -glucosidase on the other hand , *A.nadulans* give an enzymatic activity higher than *T.harzianum* (6.45 and 5.61) U/ml respectively , and the total activity values for the two fungus are (64.5 and 56.1) / gm carbon source.

B- Exo- 1,4- β -D- glucosidase (Exo-1,4- β -D- glucose gluconohydrolase)

(E.C.3.2.1.74)

3. β -Glucosidase (β - D-glucoside glucohydrolase) ,(E.C.3.2.1.21)

cellobiase .

¹⁰10

1

(synergism)

5

²(

endoglucanase

exoglucanase

()

3

cellulase

(CBH II)

(CBH I)

exoglucanase

β -Glucosidase

()

1. Endo – 1, 4- β -D-glucanase (Endo – 1, 4- β -D-glucan 4- gluconohydrolase) or CMCCase. (E.C.3.2.1.4)

2. Exo – 1,4- β -D-glucanase

A- Exo-cellobiohydrolase (Exo-1,4- β -D-glucan cellobiohydrolase)

FPAase

(E.C.3.2.1.91).

6

(20\$/Kg) (LSF)

()

¹⁸*S.pulveruletum*

cellulase
endoglucanas(T_{3b}, T_{3a}, T_{2b}, T_{2a}, T₁)

¹⁹ *M. verrucaria*

Trichoderma

T. resei

Aspergillus

14(SCP)

T. harzianum

A. nidulans (biocout)

()

4 PDA
pH=5.2 ° 30
10

¹⁶ *B. Circulans*
¹⁷ *C. Thermocelillum*

(6-5)

° 4

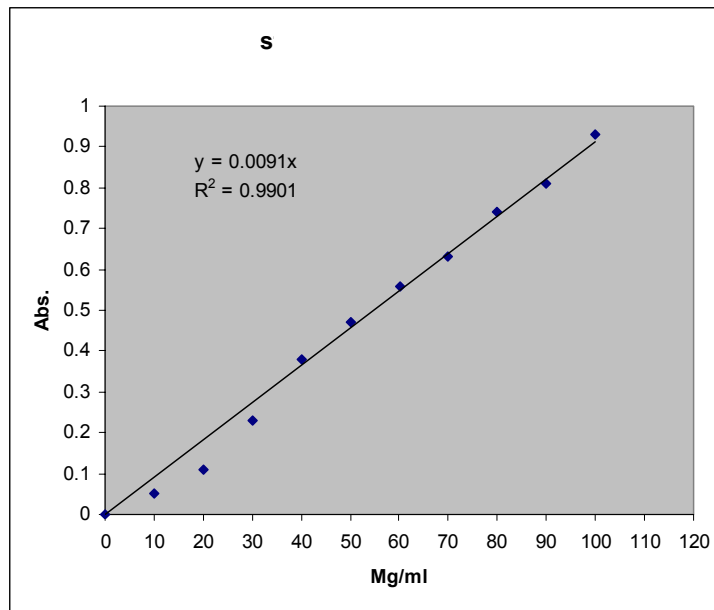
(cellulases)

1

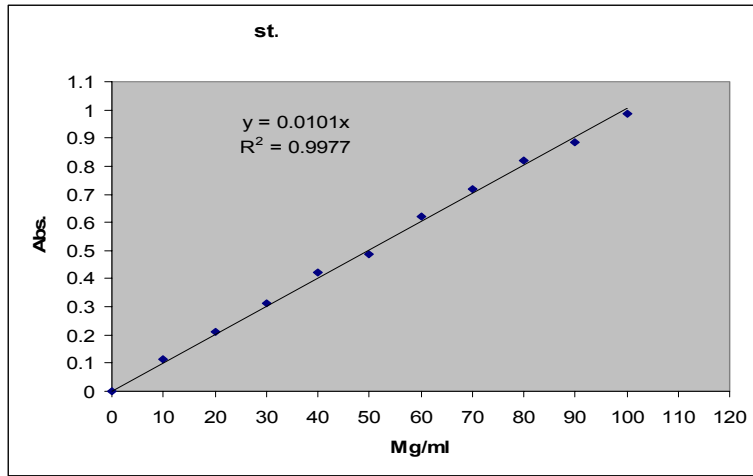
pepton e	CoCl ₂	ZnSO ₄ .7H ₂ O	MnSO ₄ .H ₂ O	FeSO ₄ .7H ₂ O	CaCl ₂	MgSO ₄ .7H ₂ O	Urea	(NH ₄)SO ₄	KH ₂ PO ₄	المادة
0.8	0.02	0.014	0.016	0.05	0.3	0.3	0.3	1.4	2	gm/l

:
 ° 45 (SSF)
 1) 2
 DNS 3 250 ()
²¹(Miller) 20
 10 Autoclave
 10 1 ° 121
 550nm %2
 UV-Visible *A.nadulans T.harzianum*
 spectronic .21D
Exoglucanase(FPase)) ° 30
 - :²⁰ ()
 2 /
 (pH=5.2) 10
 Whatman No.1 :
 (1X6 cm)
 2 20
 1 ° 45 30
 3
 DNS
 (Miller) (whatman No.1)
 10 10 / 3000
 . 550nm :²⁰ **Endoglucanase**
 - :²² **β- Glucosidase** (Na- 4.5
 (p- PNBG 1) CMC)
 nitrophenyl- β-D-glucoside) %0.5
 0.30126) 10Mm .(pH=5.2
 0.5

(10.20.30.40.50.60.70.80.90.100.) μ g/ml 1 100/
 g/ml (pH=5.2)
 30
 1 3
 ° 45
 (1M) 2
 . DNS
 . 440nm
 (glucose standard curve)
 .1 550nm (100mg/100ml)



(1)
 (10, 20,30,40,50, 60, 70, 80, 90,100) μ g/ml p- nitro phenol
 p-nitro
 2 5mM phenol
 1M Na₂CO₃ 2 50mM
 440nm pH 5.2
 2
 . 2



p-nitro phenol (2)

1.54U/ml

A.nadulans

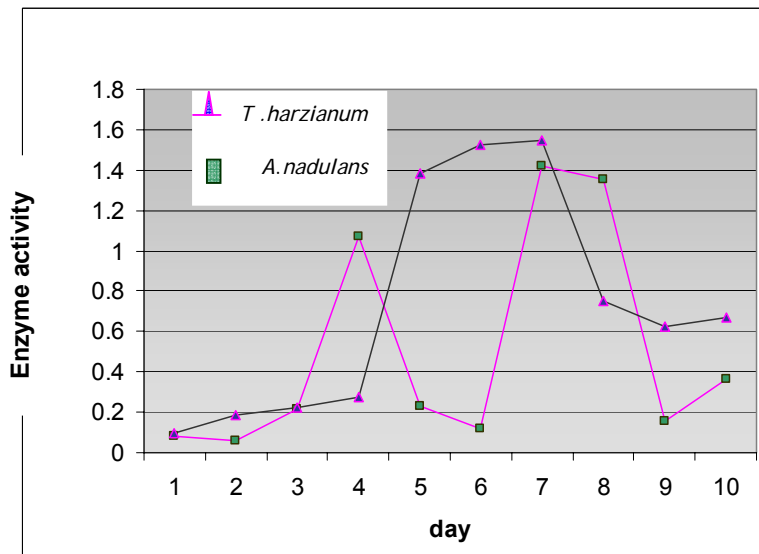
: endoglucanase (CMCase)

(3)

. 1.48U/ml

T.harzianum

endoglucanase(CMCase)



endoglucanase (3)

A.nadulans

/

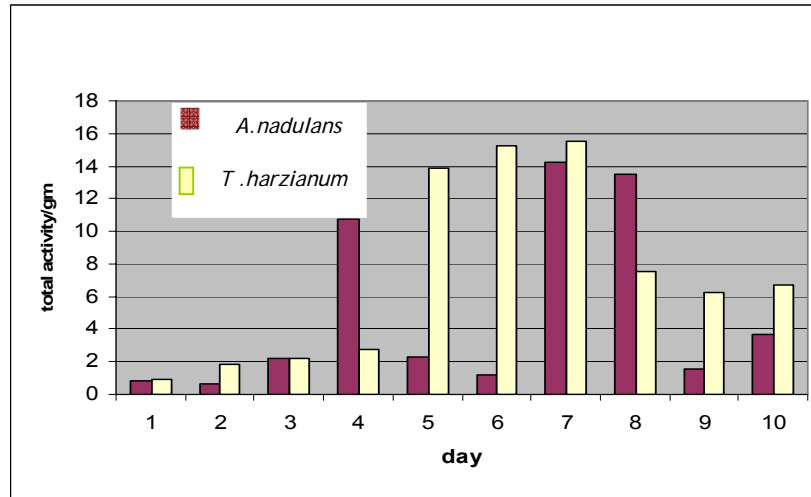
/ 14.8

endoglucanase

(4)

. 15.4

T.harzianum



/endoglucanase (4)

A. niger 3U/ml
 27 10gm/l
 0.824U/ml
 28

Trichoderma
 endoglucanase
 cellulase

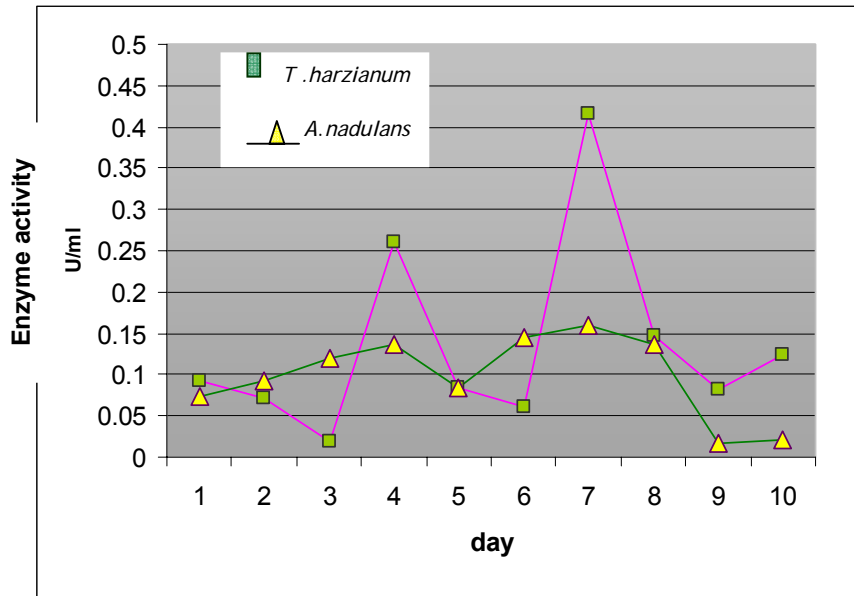
: exoglucanase (FPase)

T. harzianum
 exo-glucanase
 0.416U/ml

Aspergillus
 23, 24, 25 *trichoderma*
 cellulase

A. nardulans
 0.159U/ml

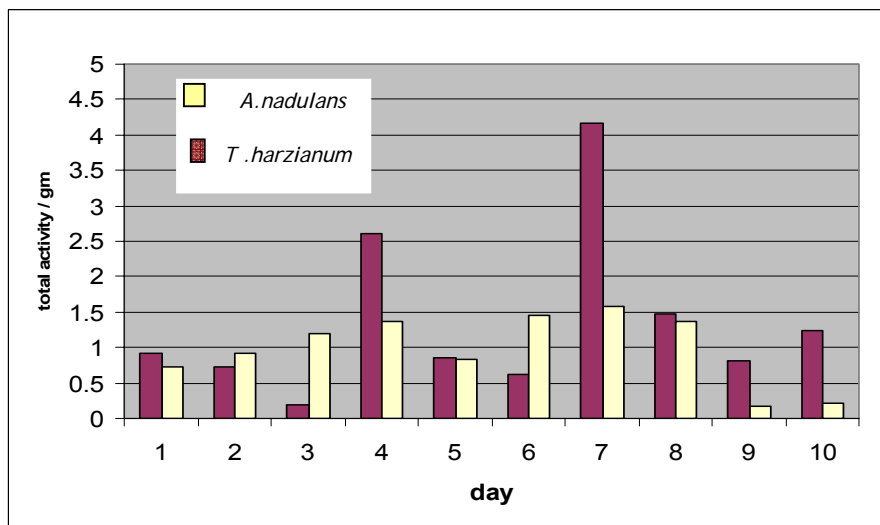
T. ressei
 4.8U/ml
 26
T. harzianum



exo-glucanase (5)
(1.59 4.16)

.(6)

A.nadulans *T.harzianum*



/ exo-glucanase (6)

A.fumigatus *A.niger*)

³²(0.340U/ml 0.288U/ml

()

^{29,30}cellulase

Exoglucanases

³⁰ *Bacillus.spp*

.(1.08IU/mg protein)

²⁷*T.harzianum*

³¹ *T.ressei*

0.40U/ml

T.harzianum

: β -glucosidase

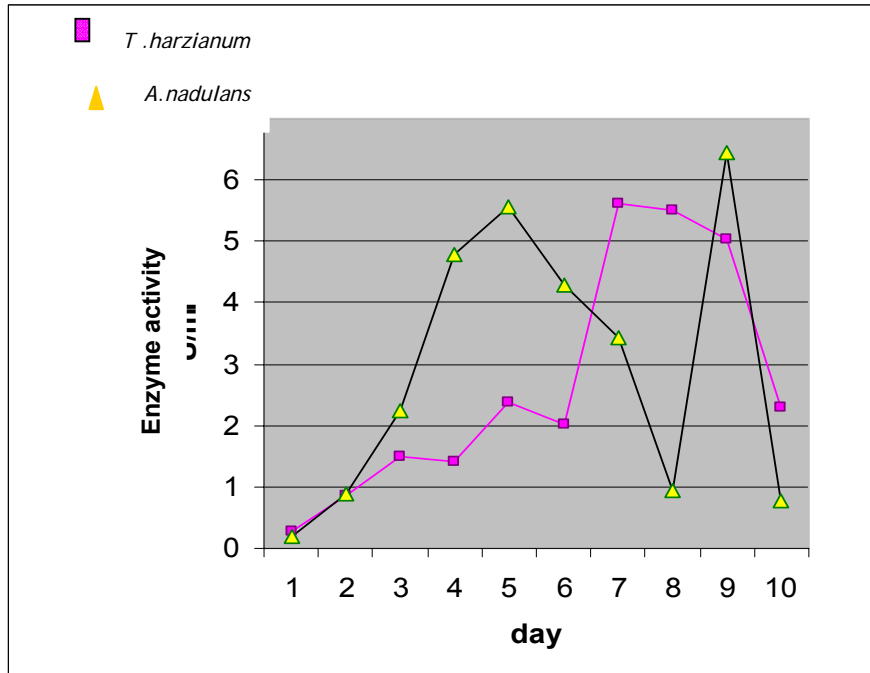
(5)

5.61U/ml

A.nadulans

β -glucosidase

6.45U/ml



β -glucosidase

(7)

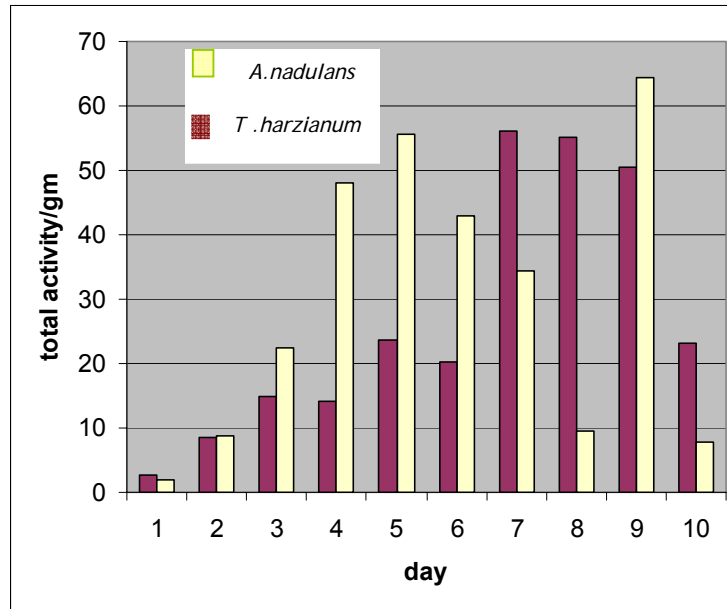
/ 56.1

/ 64.5

A.nadulans

. (endo-exo glucanase)

T.harzianum



/ β -glucosidase (8)

3.07U/ml
. LSF

Aspergillus

*A.nadulans*³⁴ *A.niger*³³
(*A. Terreus*³⁶ *A. oryzae*³⁵
³⁷*trichoderma*

mixed

⁴⁰culture

A.niveus

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A.niger

³⁸

sanders

²⁸*A.niger*

1.32U/ml

⁴⁰ (*A.niger*

&T.ressei)

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