

Nicotiana tabacum L.

Lactuca sativa L.

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MS *Lactuca sativa* L.
BA NAA / 1.0 / (10 50 100 150)
NAA BA / 1.0 MS
MS / 50 / 1.0 NAA BA
%63 35 (2.150)

(DNA, RNA)

(IR)

Effect of Tobacco *Nicotiana tabacum* L. Water Extracts in Growth and Regeneration *Lactuca sativa* L. leaves Callus and Isolation Nicotine from it

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ABSTRACT

The present study aimed to show the role of variable concentrations of tobacco water extract (10·50·100·150) in initiation, growth and regeneration of leaves callus of lettuce (*lactuca sativa* L) plant by using MS 1.0mg/L of BA and NAA. The best medium was (MS + 1.0 mg/L BA and NAA +50mg/ml of tobacco extract), in which the fresh weight of callus reached 2.150 mg after 35 days of culture and with regeneration rate reached 63%. Also the result referred that nucleic acid (DNA, RNA), proteins and carbohydrate were greatly affected by tobacco water extracts and it varied with extract concentrations. As to carbohydrate content was varied with the increase or decrease in protein and nucleic acid content. The Detection and isolation of Alkaloid nicotine from the alcoholic extraction of lettuce were analyzed by (IR) where exhibited activity nicotine as bands.

Keywords: Tissue culture, callus, tobacco extract, nicotine isolation.

(*Nicotiana tabacum* L.)

4000

(Charlton,2004)

(Davis and Fraunhofer, 2003)

%75

(Rizvi *et al.*, 1989)

(Yazdani and Bagheri, 2011)

.(1981)

(Koppad and Shivanna, 2010)

(2009)

Methylsalicylate

.....

.(David *et al.*,1998)

(Kumar *et al.*, 2004)

(Puchooa and Ramburn, 2004)

(1990)

Ijaz *et al.*, 2012; Zoltán *et al.*,)

(Puchooa and Ramburn, 2004)

(2011

2010

Alabi

.(Fajerska and Ciarkowska, 2012)

Codiaeum variegatum

(2010)

(BA,TDZ)

(*Taxus brevifolia*)

(Vinoth *et al.*, 2012)

paclitaxel

.(Khosoushahi *et al.*, 2011)

.(Alabi *et al.*, 2010)

() *Lactuca sativa L.*

%96

%95

%6.4 ()
 .(2004) 10 [:] (2):(1)
 .(Murashige and Skoog, 1962) MS
 2 ± 25
 . 8 16 1500
 / 1.0 BA)
 (Murakami and Oka, 2006) . (/ 1.0 NAA +
 2 ± 25 . /
 . 8 16 1500
 -2
 (*Nicotiana tabacum* L.) (1)
 3 100
 15 / 3000 (Centrifuge)
 (Harborne,1973) 3 100
 . (/ 10)
 -3
 150,) (MS)
 -: / (100, 50, 10
 + / 1.0 BA) MS -أ
 .(/ 1.0 NAA
 NAA / 1.0 MS -ب
 .
 BA / 1.0 MS -
 . MS -

.....

-4

(35)

-5

%50

%50

4-3

-6

(Cherry, 1962)

RNA DNA

Giles and) DNA

DNA

(Mayer,1967

.DNA

RNA

-7

(Schacterle and Pollack, 1973)

650

(Lowry *et al.*,1951) Lowyer

-8

-) (Herbert *et al.*, 1971)

488

(

-9

(Herborne,1973)

%2

%96

-10

-1.10

Mayer's reagent

HgCl₂

60

(5)

5

KI

1.308

(2009

) 100

10

-2.10

10

5

245

(Steven *et al.*, 2004) %96

(IR)

-3.10

Infrared Bruker Co. Germany

0.1

.(KBr)

.(Freidhelm and Karl, 1989)

charts

/ 1.0

MS

1-1

BA NAA

MS

(1)

/ 1.0

BA NAA

35

BA NAA

/ 50

MS

2.15

.(1)

.....

MS BA NAA
 .(2) %63 10 / 50
 NAA BA

BA NAA MS :1
 35 *Lactuca sativa*

				* ()			
%		%			BA /	NAA /	/
-	-	-	-	0.090±0.503	1.0	1.0	0.0
-	-	12	2	0.147±0.586	1.0	1.0	10.0
-	-	63	10	0.120±2.150	1.0	1.0	50.0
-	-	6	1	0.037±0.813	1.0	1.0	100.0
-	-	20	3	0.260±1.286	1.0	1.0	150.0

(-)

/ 4 *

MS 2-1

.NAA BA

(DNA and RNA) (2)

MS DNA RNA 35
 / (11.9 105.0) / 50
 / 1.560

BA NAA MS BA NAA
 / 1.400

0.420 / 50 MS

BA NAA

MS

:2

Lactuca

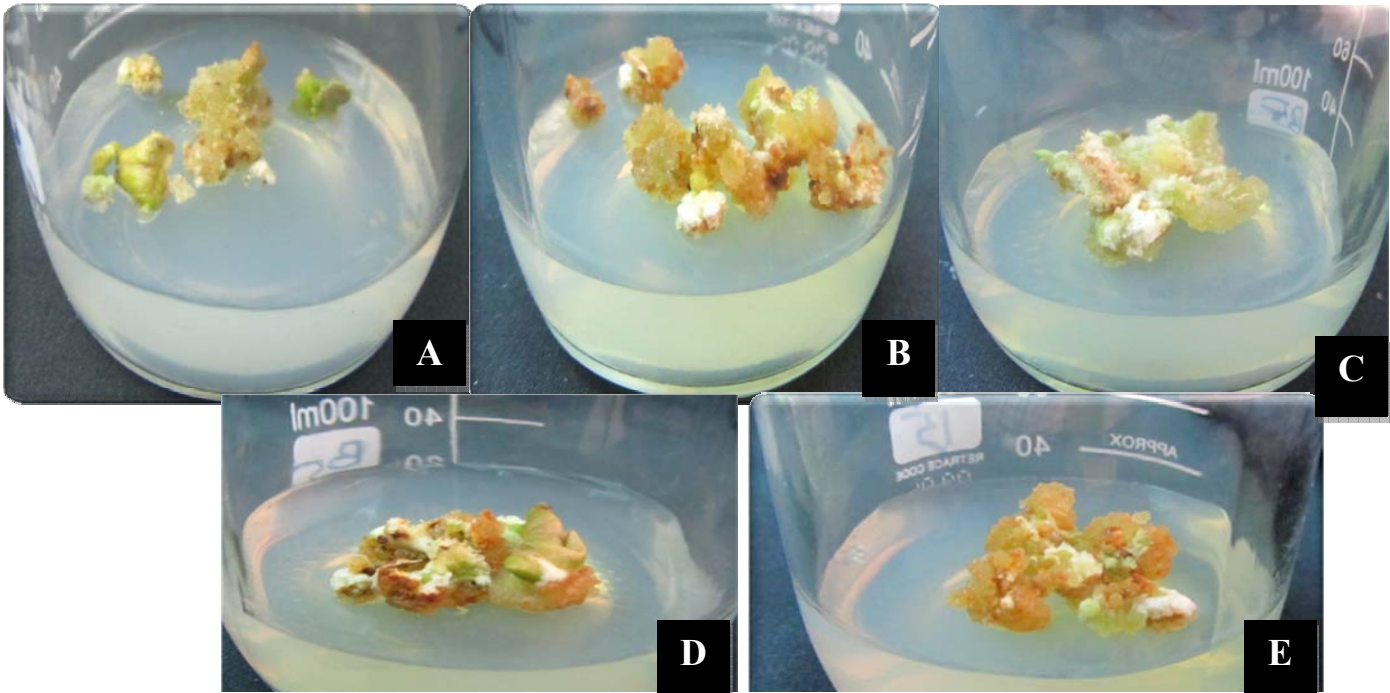
35

sativa

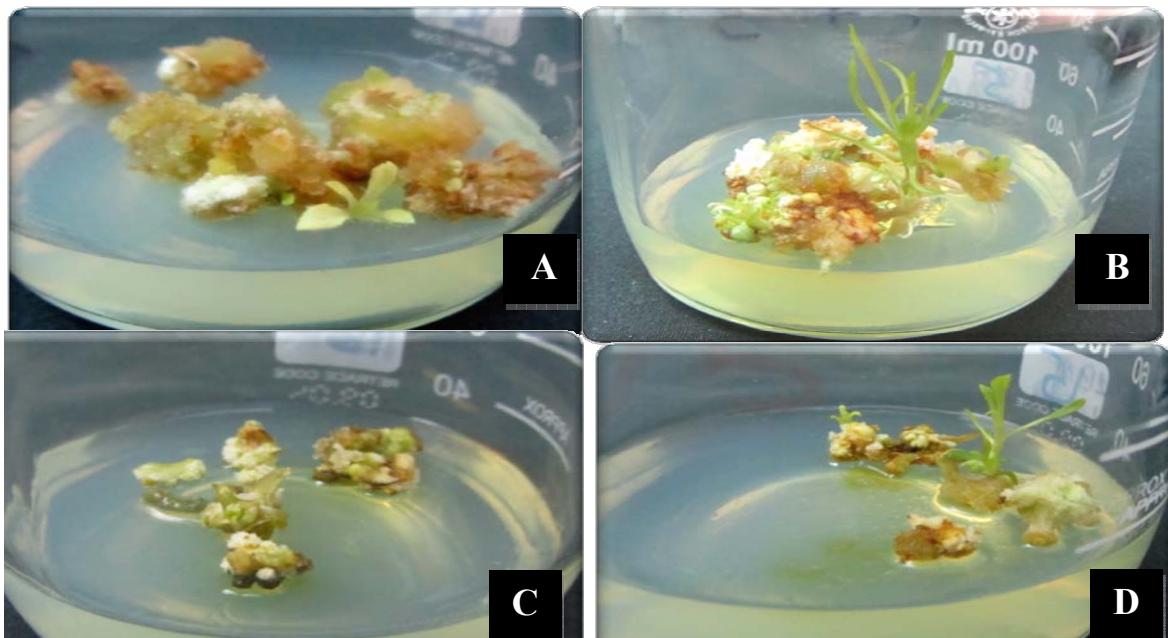
* /	* /	* /		MS		
		DNA	RNA	BA /	NAA /	(/)
0.236±1.400	0.096±0.900	0.300±4.1	0.233±40.29	1.0	1.0	0.0
0.070±0.630	0.038±1.032	0.483±4.6	0.483±41.18	1.0	1.0	10.0
0.080±0.420	0.047±1.560	0.614±11.9	0.616±105.0	1.0	1.0	50.0
0.121±0.735	0.032±1.236	0.738±5.1	0.794±61.2	1.0	1.0	100.0
0.010±0.490	0.021±1.450	0.225±7.1	0.225±90.0	1.0	1.0	150.0

/ 4 •

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	BA	NAA	/	1.0	MS	:	1
-B	MS	-A			35		
MS-D	/	50+	MS	- C	/	10 +	MS
	/	150 +	MS	- E	/	100 +	



	NAA	BA	/	1.0	MS	:	2
50 +	MS	-B	/	10 +	MS-A		
/	150 +	MS	-D	/	100 +	MS -C	/

NAA / 1.0 MS 2-1

(3)

NAA NAA / 1.0
35

NAA

1.737 (/ 100)

(3)

NAA MS
(%7.0) NAA / (150,10)
/ (100 50) NAA

/ 10

NAA

(4)

63.0 93.0

NAA MS :3

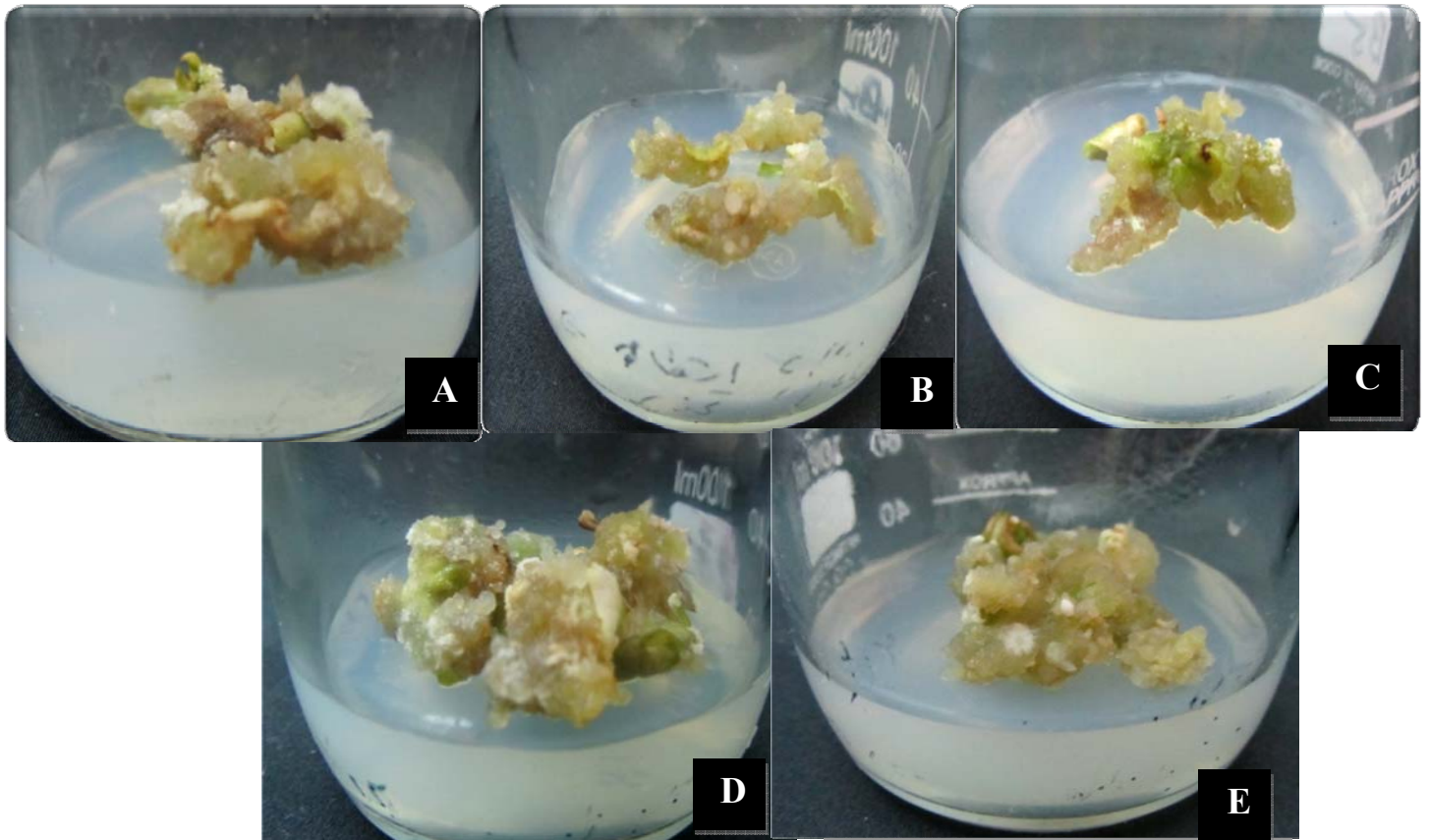
35 *Lectuca sativa*

*		*		* ()			
%		%			BA /	NAA /	(/)
93.0	15.0	—	—	0.055±1.422	—	1.0	0.0
63.0	10.0	7.0	1.0	0.124±0.870	—	1.0	10.0
—	—	—	—	0.028±0.782	—	1.0	50.0
—	—	—	—	0.537±1.737	—	1.0	100.0
—	—	7.0	1.0	0.454±1.484	—	1.0	150.0

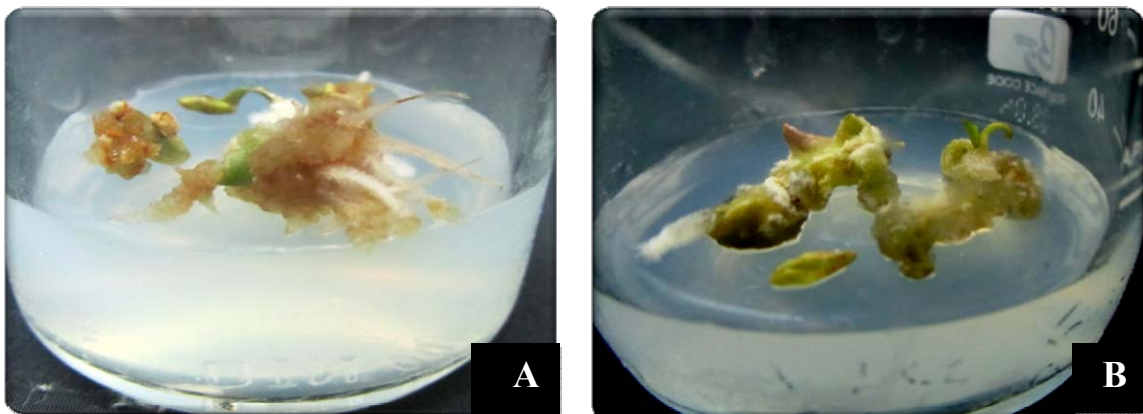
(-)

/ 4 *

.....



	NAA	/	1.0	MS		:3
-B			-A	35		
D	/	50	-C	/	10	
	/	150	-E	/	100	-



/	1.0	NAA	MS	-A	:4
			35		
/	1.0	NAA	MS	-B	
			35	/	10

2-2

.NAA

(4)

(DNA RNA)

MS

NAA

/ 100

1.098

/

(11.04) DNA

/

(95.60)RNA

/

0.500

/

50

/

NAA

MS

:4

Lactuca

35

sativa

*	/	/		BA /	NAA /	(/)
		DNA	RNA			
0.133±0.448	0.037±0.934	1.693±10.67	1.696±94.70	0.0	1.0	0.0
0.170±0.420	0.036±0.934	0.026±9.44	0.026±91.50	0.0	1.0	10.0
0.085±0.500	0.027±0.912	0.220±6.45	0.220±88.55	0.0	1.0	50.0
0.617±0.350	0.016±1.098	0.300±11.40	0.300±95.60	0.0	1.0	100.0
0.035±0.449	0.015±0.988	0.332±10.09	0.332±94.70	0.0	1.0	150.0

/ 4 *

BA

/

1.0

MS

1-3

/

1.0

BA

(5)

35

BA

.....

1.454 BA / 150
 .(5)

BA / 50
 .(6) .%12.5 %25

BA MS :5
 35 *Lactuca sativa*

				* ()			
%		%			BA /	NAA /	(/)
-	-	-	-	0.097±1.304	1.0	0.0	0.0
-	-	6.6	1	0.208±1.073	1.0	0.0	10.0
12.5	2	25	4	0.290±1.393	1.0	0.0	50.0
-	-	-	-	0.170±0.945	1.0	0.0	100.0
-	-	-	-	0.241±1.454	1.0	0.0	150.0

(-) *

/ 4 *

2-3

.BA

(6)

DNA RNA

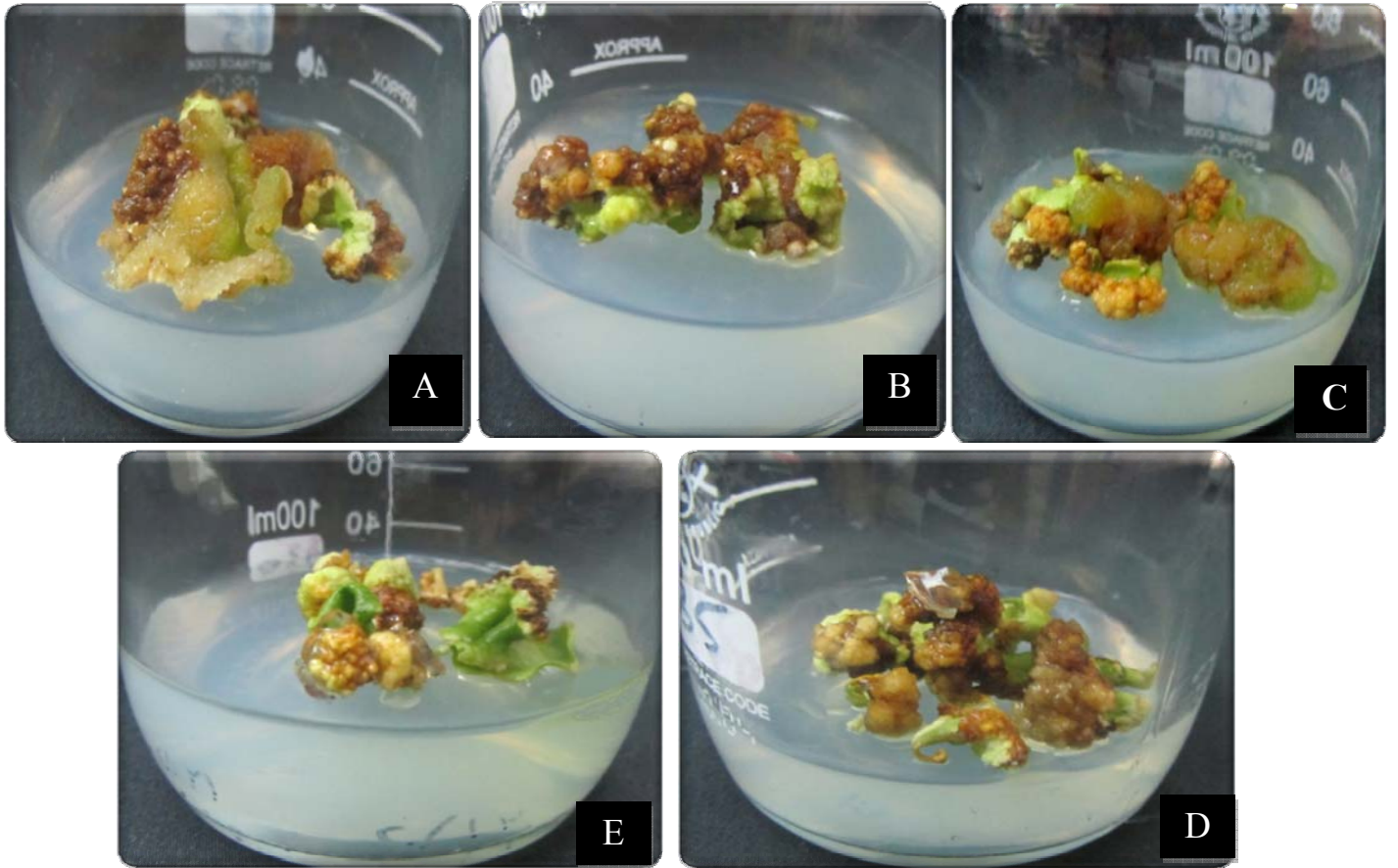
RNA

10.70 DNA / 97.6 RNA / 2.240 / 150 DNA
 / 35 BA MS
 / 100 / 0.703

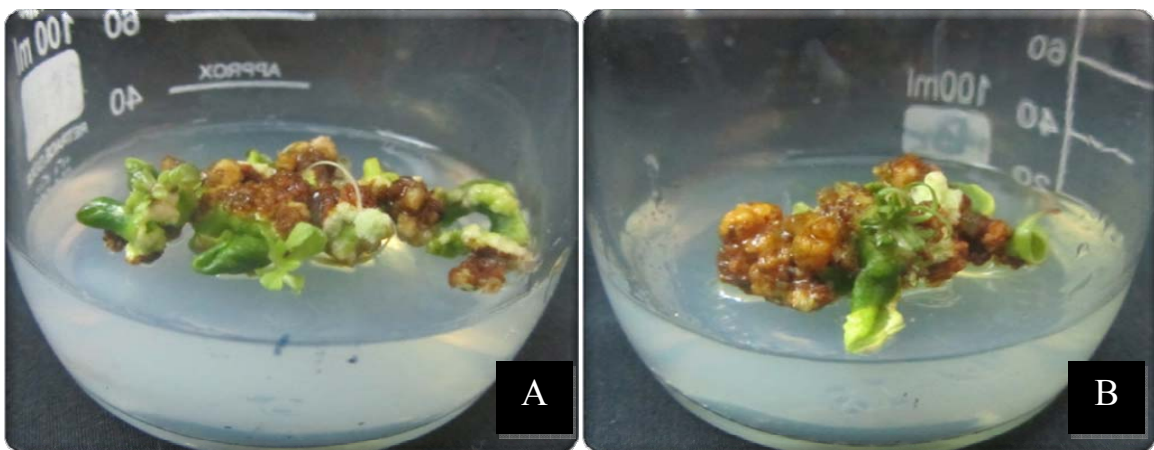
BA**MS****: 6***Lactuca sativa***35**

/	/	/				
		DNA	RNA	BA /	NAA /	(/)
0.071±0.560	0.096±1.069	0.775±9.55	0.775±94.7	1.0	0.0	0.0
0.004±0.455	0.112±1.505	0.476±7.75	0.496±93.5	1.0	0.0	10.0
0.163±0.504	0.046±2.022	0.180±10.0	0.180±95.2	1.0	0.0	50.0
0.012±0.703	0.130±0.957	0.135±7.12	0.135±85.8	1.0	0.0	100.0
0.202±0.450	0.061±2.240	0.577±10.70	0.577±97.6	1.0	0.0	150.0

/ 4 *



		BA	/	1.0	MS		:5
/	10	-B			-A	35	
/	100	-D			/	50	-C
					/	150	-E



	/	1.0	BA	MS		-A :6
				35	/	50
1.0	/	1.0	BA	MS		-B
				35	/	

MS

-4

(7)

BA NAA

BA NAA

MS

:7

35

Lactuca sativa

%		%		* ()	BA /	NAA /	(/)
—	—	—	—	0.090±0.50	1.0	1.0	0.0
—	—	—	—	—	—	—	10.0
—	—	—	—	—	—	—	50.0
—	—	—	—	—	—	—	100.0
—	—	—	—	—	—	—	150.0

(-)

/ 4 *

-5

MS

.(7)

-6

-6.1

(Pelletier and Aneja, 1968)

.....

- 6.2

Nicotine

(254)

(λ Max)

.2.740 (λ Max)

-6.3

2923.93

IR

.()

(C=C)

3081.86

.()

(C-H)

.()

(C-H)

3060.30

(C-N)

1028-1069

.1601-1649

() (C=N)

(8)

.()

(CH₃)

2852.36

3422.47

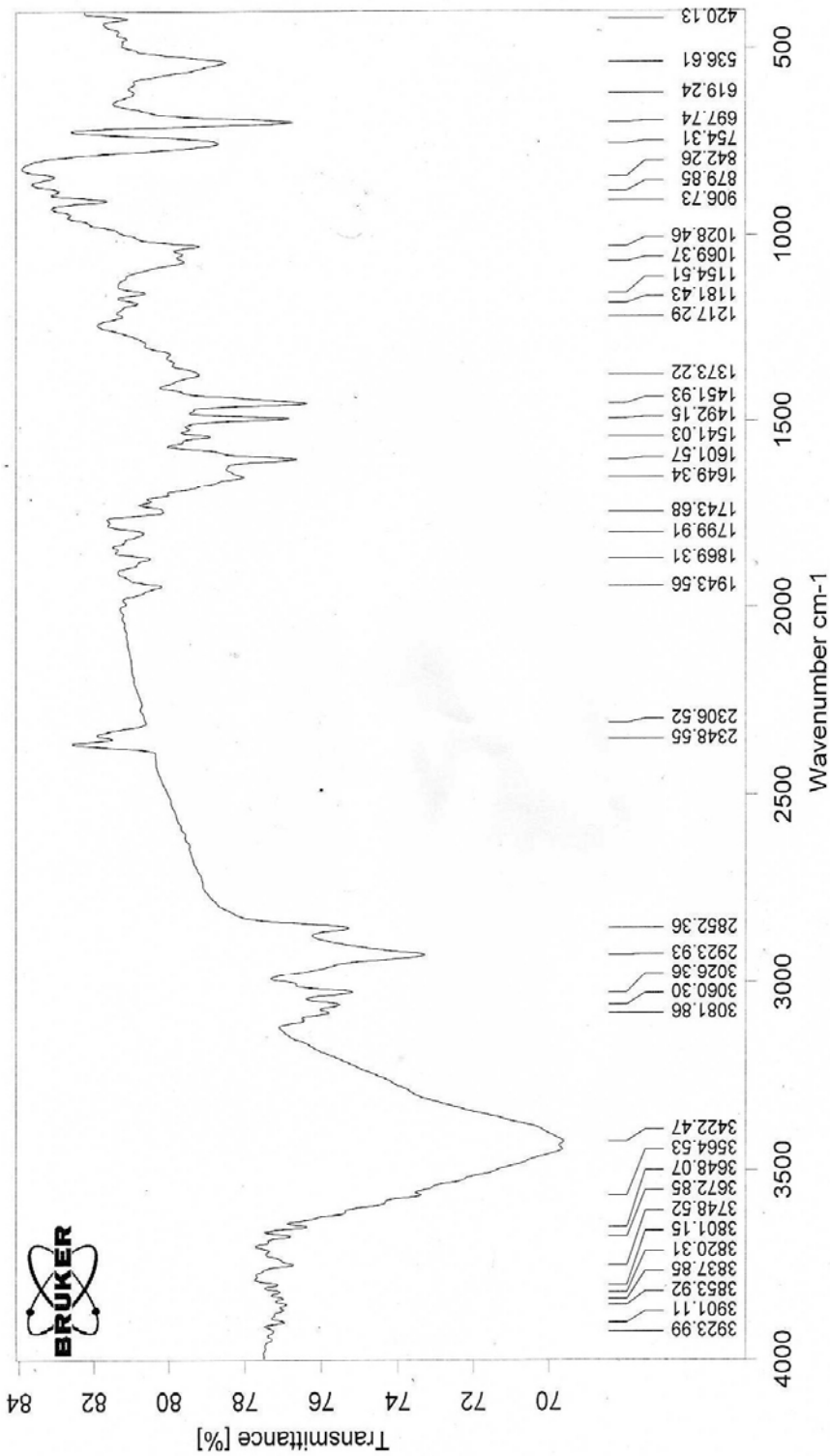
(C-N-C)



:7

/ 50

MS



:8

MS

(IR)

.....

(1990) ()
(pyrimidine) (purine)
(1990)

Nicotine .
(coenzyme) (nicotine acid) niacin
(Beyl, 2010)

Puchooa and) BA NAA
(Ramburn ,2004

(Tabata *et al.*, 1971)
DNA

(Garden Guide, 2012)

MS

NAA BA / 1.0

/ 50

2.15 BA NAA

(Fojerska and Ciarkowska, 2012)

Carbon

Carbon dioxide

monoxide

(Wanda and Ehow, 2012)

NAA BA MS

/ 50 10 %63

MS

Hexitols

)

.(1990

(Dubey, 2006)

nicotine acid nicotine

NAA

NAA

Alabi

Garden croton

.(Hartmann *et al.*, 2002)

)

(1987

RNA

DNA

)

(2009

(Helguson and Miller, 2005) DNA RNA

.(Leopoild and Kriedmann,1975)

(1990 1987)

.....

BA / 1.0)

MS

.(NAA / 1.0 +

" "

(Eliasson *et al.*, 1996 ; Koppad and Shivann, 2010) .

(2009)

IR

Nicotine

Nicotine

IR

(2009)

.(1990)

.(2004)

. *Lactucasativa*

1,3,7 trimethylxanthine .(2010)

21

.*Helianthus annuus* L.

.105-87 (4)

2ip

.(2010)

-607 (4)51

. *Phoenix dactylifepa*

.612

DNA , (1987)
Helianthus annuus L. RNA
 (2009)
 (3) 3 Nicotine
 (2009)
 .99 -91 (3) 22 (*Nigella sativa* L.)
 " (1981)
 " (1990)
 " (2009)
terrestris L.(fruit) *Tribulus*
 .319-319 (2)14 .

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