(N-Substituted Phthalimides)

Lactuca sativa L.

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(2012 / 1/ 9 2011/ 10 /31)

-N

N-substituted phthalimides

(*Lactuca sativa* L.)

10^{-4} 3×10^{-6} $(10^{-8} \ 10^{-6} \ 10^{-4})$ MS
 (B) (BA) 4×10^{-6} (NAA)
 N-2(2-Carboxy phenyl) phthalimid (A)
 10^{-8} N-2(2- hydroxyphenyl) phthalimid
 (A) 10^{-6}
 BA NAA
 MS
 3×10^{-6} NAA $10^{-6} \ 10^{-4}$ (B A)
 (23.06 23.30) BA B A 10^{-8}
 21.45 60 18.73

B	A	10^{-4}	10^{-6}	18.86
10^{-4}		(	4×10^{-6})	BA

Behavior of some N-Substituted Phthalimides Derivatives as Plant Growth Regulators in the Initiation and Regeneration of Lettuce *Lactuca sativa* L. Callus

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ABSTRACT

The effect of two synthetic phthalimides derivative compounds on the response of Lettuce seedling stem explants with single node was studied by addition to MS medium alone or with 3×10^{-6} M Naphthalene acetic acid (NAA) or with 4×10^{-6} M Benzyl adenine (BA).

The results indicated that the addition of 10^{-4} M of N-2(2-hydroxy phenyl) phthalimide compound (A) N-2-(2-carboxy phenyl) phthalimide compound (B) alone to MS solid medium increased the regeneration of shoots from seedling stem segments containing single node. However, addition of 10^{-8} M of both compounds enhanced root formation. results showed that callus induced when 10^{-6} M of compound A added to MS medium .

Addition of 10^{-4} M and 10^{-6} M of both compounds A and B separately with the presence of 3×10^{-6} M NAA encouraged callus formation as in the standard medium, callus fresh weight was 23.30g and 23.06 g in the medium contains 10^{-8} M of compound A or B with 4×10^{-6} M BA respectively, compared with 18.73g for the callus grown on standard medium after 60 days of growth. Whereas the fresh weight of callus grown on MS medium with addition of compound A or B alone reached 21.45g and 18.86 g respectively. addition of compound A and B separately with 4×10^{-6} M of BA enhanced shoot differentiation without formation of roots and from all the concentrations used 10^{-4} M of compound A was the best.

Keywords: phthalimides, plant growth regulators, *Lactuca sativa* L.

(Abdellatef and Khalafallah, 2008 ; Kapapakis and Alderson, 2003)

.(2010)

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.(2005 2002 1998)

(Tanaka *et al.*, 1992) phthalimide

(Lal and Jaiswal, 1988)

(Fasulo *et al.*, 1985) tropane

Morusnigra L.

phthalimide

GA₇ GA₄ phthalimide

(Gott and Thomas 1986)

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:

N-2-(2-Carboxy phenyl) :B

N.2-(2-hydroxy phenyl) phthalimide :A

phathalimide

(N-substituted phthalimides) phthalimides

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-N

(Al-Khaffaf, 1999)

—

—

(1)

.

N-substituted phthalimides

:1

N-2-(2-hydroxy phenyl) phthalimide :A

N-2-(2-Carboxy phenyl) phthalimide :B

(Al-Kaffaf, 1999)

Preparation of phthalimide

(0.1 mole) (Substituted aromatic amines)

Acetic acid

(14gm, 0.1 mol) phthalicanhydride

.()

N-substituted-phthalimides

–N

(acetic acid-water)

–

(1)

(B A)

phthalicanhydride

N-substituted-phthalimide

=B

R

= A

R

.Physical properties of the compounds :1

Compound	R	M.P. C°	Yield Gm	Yield %	Formula	Element analysis calculation observed %		
						C	H	N
A	N-2(2-phenol)	230-232	23.3	87.9	C ₁₄ H ₉ NO ₃	70.29	3.79	5.85
						70.20	3.00	5.70
B	N-2(2-benzoicacid)	222-223	18.0	62.5	C ₁₅ H ₉ NO ₄	67.41	3.37	5.24
						67.47	3.52	5.70

(Al-Khaffaf, 1999)

(%96) *Lactuca sativa*. c.v. Longiflora
(6%) NaOCl .

(5) (:) 2-1.5
(1998) (8-7)

(Arnon and Hoagland, 1944) Hoagland Arnon

°2±20
8 16

B A

(1-0.5) 20

(Murashige and Skoog, 1962) MS

B A
(10⁻⁸ 10⁻⁶ 10⁻⁴)

(3×10⁻⁶) (NAA)
BA NAA MS (4×10⁻⁶) (BA)

(1998) 4×10⁻⁶ 3×10⁻⁶
(.MSt)

45

(1.5-1) .

B A MS

4×10⁻⁶ 3×10⁻⁶ BA NAA

60-30

BA NAA A

A

(2)

(45)

10^{-6}

A

Al-)

phthalimides

(Moore, 1979)

.(Khaffaf, 1999

(2)

A

10

10^{-4}

45

(0.5)

10^{-8} 10^{-6}

10^{-6}

5.5 5 4 3

2.5 6 8 3

(- 2)

.(0.7) (2)

A

Phthalimides

NAA 3×10^{-6} .(Fasula *et al.*, 1985)

A

(2)

10^{-6}

.....

:2

3×10^{-6}

A

45

BA

4×10^{-6}

NAA

BA+					NAA+											
													●			(
	/		/					/			/					
+	-	-	1.2		+	1.5		2.2 Δ	2	+	-	-	0.5		10 ⁻	
+	-	-	1	2	++	1		1.6		++	6	3	5.0 Δ	3	10 ⁻	
++	1.1	1	1.5	2	+	2.13		3	2	+	2.5		5.5	4	10 ⁻	
					++	-	-	0.7	2	(MSt)						

++

+

-

•

Δ

NAA

2.13 1.0 1.5

10^{-8} 10^{-6} 10^{-4}

2

(2) (2)

10^{-8} 10^{-6} 10^{-4}

3 1.6 2.2

NAA

(Miginiac *et al.*, 1994; Scott, 1972)

(Moor, 1979)

(1998)

4×10^{-6}

BA

NAA

10^{-8}

BA

(1.2)

10

(2) BA

10^{-8}

BA

10^{-4}

.(-2)

1.1

(1)

A

A

(3)

10^{-6}

(19.9)

(-3)

60

MS

21.54

. (Kapapakis and Aderson, 2003)

3×10^{-6}

10^{-6}

BA

4×10^{-6}

10^{-8}

(-3)

(3)

NAA

23.3

.(-3)

60

(18.73)

.....

60

:2

		:	MS		
.	(	) BA	4×10^{-6}	NAA	$3 \times 10^{-}$
				A	10^{-4} -
.	NAA		3×10^{-6}	A -	
.	BA		4×10^{-6}	A -

A MS : 3

60 4×10^{-6} BA 3×10^{-6} NAA

A MS -

NAA -

BA -

(4×10^{-6} BA 3×10^{-6} NAA MS) : MSt

BA NAA MS B

:

(B)

10^{-8} (4) BA NAA

10^{-6} (3.75) (6)

.(-4)

B 3×10^{-6} NAA

(4) (-4)

NAA 10^{-6} 10^{-4}

10^{-8}

(10) (6.5) 5

.(-4) (8)

(B) BA

NAA

. 10^{-8} 10^{-4}

.(-4)

NAA

)

BA (Siwach *et al.*, 2011 1990

.(2002)

.....

3×10^{-6} NAA B
45 4×10^{-6} BA

BA+				NAA+										
														(
/		/			/		/			/		/		
-	-	1	1	++	1.6		3	3	+	1.16	3	Δ 3.6	4	1
1	1	1.5	4	++	4		5	2	++	2.5	3	Δ 6.8	2	1
-	-	0.5	2	+	8		Δ 6.5	5	+	3.75	6	Δ 5.1	3	1
					++	-	-	0.7	2					

+

-

.

•

++

Δ

60

:4

MS
: (BA 4x10⁻⁶ NAA MSt3x10⁻⁶) B -
. NAA 3x10⁻⁶ B -
. BA 4x10⁻⁶ B 10⁻⁴-

B

BA NAA (B)

60 30

60 10^{-4} 12.19

10^{-6} 10^{-4} B (-5) (5)

NAA 3×10^{-6}

18.75 (18.54 18.86)

(-5) 60

BA 4×10^{-6} 10^{-8} B (23.06)

B (-5)

BA NAA

.(5)

.(Neumann *et al.*, 2009)

.(2010 2001)

MS B

.

B A

() :5
BA 3×10⁶ NAA B
60 30 4×10⁻⁶

BA+		NAA+					B ()
()		()			()		
60	30	60	30	60	30		
20.60 ± 1.032	8.41 ± 0.558	18.86 ** ± 0.869	7.96 ± 0.648	12.19 *** ± 0.247	6.99 • ±0.522	10 ⁻⁴	
21.76 ± 0.900	7.12 ± 0.356	18.54 * ± 0.670	5.95 ± 0.196	10.02 ** ± 0.265	5.69 ±0.530	10 ⁻⁶	
23.06 * ± 0.998	12.48 ± 0.468	10.26 × +* ± 0.689	5.81 ± 0.421	9.89 * ± 0.762	5.08 ±0.245	10 ⁻⁸	
		18.73 * ±1.135	7.28 0.640	(MSt)			

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S.E± ×

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B			MS		:5
60	4×10^{-6}	BA	3×10^{-6}	NAA	
	B	MS		-	
		NAA		-	
		BA		-	
BA	3×10^{-6}	NAA	MS)	: MSt	
			(4×10^{-6}		

- (2005)
- Lactuca*) PDA
- .12-1 (7) 16 . (*sativa* L.
- .(2002)
- (*Lactuca sativa* L.)
- .(2010)
- Nigella sativa* L.
- .(1990)
- .(1998)
- 9 .
- .24-14 (2)
- Kin 2,4-D .(2010)
- (3)21 . *Nigella sativa* L.
- .23-1
- .(2002)
- Lactuca sativa* L. cv. *Longiflora*
- .97-87 (5)7 .
- (2001)

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