

()

ACC (IAA)

*

(// : // :)

$\times \text{cfu.ml}^{-1}$

()

(

IAA)

()

IAA+++

ACC

IAA+++

ACC+++

(P<0.001)

Sm Rlv Rlp

IAA

IAA

Bj

Rlt

-ACC+++ و IAA+++

(-ACC⁻⁻⁻)

IAA+++

(P<0.001)

()

ACC (IAA)

PGPR :

()

(mg kg-1)

()

PGPR

()

()

()

()

Auxin

IAA

(PGPs)

(IAA)

IAA

()

(L-TRP)

-

IAA

()

()

L-TRP

IAA

L-TRP

()

..... (IAA)

/

()

IAA

()

L-TRP

(C2H4)

)

()

/

()

(

L-TRP

()

(IAA)

()

()

L-TRP

(/ × mg kg-1)

()

1. L-Triptophan

... ACC (IAA) :

PGPR

(ACC)

()

ACC .

()

(.)

:

(SAM) - -

SAM

- ACC

ACC .() ACC SAM

ACC

Bradyrhizobium, Rhizobium

(.)

Sinorhizobium Mesorhizobium

()

:

ACC (PGPR)

YEMB

ml

°C

ACC.()

ACC

()

IAA

()

()

(

°C

(.)

(PGPR)

YEMB

ACC

(OD)

UnicoTM)

(1100,USA;

)

(OD - CFU)

(

× cfu ml

-
1. Aminocyclopropane-1-Carboxylic acid:ACC
 2. Yang Cycle
 3. Adenosyl-I-Methionine Synthetase: SAM-Synthetase

() (IAA)
(CD) (HD)³

(HD/CD)

(.) IAA

IAA

(/ / / / /)

IAA

IAA

()

/ × /

()

IAA

LB

) IAA LB

(

IAA

)

(

IAA

()

mM

LB

(L-TRP)

)

(× cfu ml⁻¹)

(LB)

(°C)

mm

LB

IAA

μl

(/)

mm

()

IAA

/

ACC

(.)

/

IAA

()

RMM

RMM

IAA

-
3. Hilo Diameter
 4. Colony Diameter
 5. Rhizobia Minimal Medium (RMM)

-
1. Luria – Bertani
 2. Salkofski

... ACC (IAA) :

) p0B0 (P1,P0) (/ M) ACC μ l
 (N.C) ()
) P1B0 μ l RMM
 ((/ M) NH4Cl
 (P.C)
 B3 (PC)
 -ACC- IAA+++ RMM
 (NH4Cl) ACC)
 B6 (NC)
 IAA- _ACC+++

ACC	ACC	ACC	°C
		()	
		(+) +	
		(++) +	
		(+++)+	RMM + ACC
		(++++)+	(RMM) (RMM + NH4Cl)

() ACC
 :

()

PGPR

SC647

RCBD Contrast SAS V 6.12

(%)

(B6 B1)

(B5 B1)

IAA

-
- 1 .Positive Control(P.C)
 - 2 .Negative Control(N.C)

IAA

(IAA)

LB

IAA (% /)

PGPR

IAA+++

()IAA

IAA+++

IAA

(%)

LB-TRP

LB

/

NaCl

PGPR

-

-PGPR							
ACC	P-Solubilization	Sid	IAA	HCN	%S.E		
						()	B0
+4		3			121	R125 Sm	B1
+2.7	403					R419 Mc	B2
-			2.7			R254 Rlp	B3
-				5		R340 Rlv	B4
+4	368	1.25	2.7			R320RIv	(Mixed) B5
+2	302	1.25	1.33			R307Rlp	
-	315.6	1.33	1.08	5		R375 Mc	
-		3.8	1.25			R490 Rlv	
+3					121	R164 Sm	B6

HCN

IAA

(mg l-1)

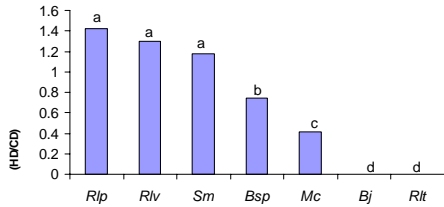
ACC

... ACC (IAA) :

LB-TRP		IAA		IAA			
()	LB	IAA+		0	1	2	3
		(%)					
R.leguminosarum	bv.phaseoli	/	/				
	bv.viciae	/	/				
	bv.trifolii	/	/				
Sinorhizobium meliloti		/					
Mesorhizobium ciceri (& M.mediterraneum)		/	/				
Bradyrhizobium japonicum							
B. spp(groundnut)			/				

IAA	LB-TRP	(MS)	(DF)
(SOV)			***

(P<0.001)	/		***



IAA (%)

Rlp ACC

IAA Sm Rlv

(HD/CD) IAA

IAA (P<0.001)

(HD/CD) IAA

%

HD/CD Rlp

³Sm ²Rlv

B.sp HD/CD

Rlv,Rlp

Mc (Sm

⁶Rlt ⁵Bj

IAA

1. R.leguminosarum bv.phaseoli(Rlp)
2. R.leguminosarum bv.viciae(Rlv)
3. Sinorhizobium meliloti(Sm)
4. Mesorhizobium ciceri(Mc)
5. Bradyrhizobium japonicum(Bj)
6. R.leguminosarum bv.trifolii(Rlt)

PGPR		ACC		
		ACC +		
()				(%)
R.leguminosarum	bv.phaseoli			/
	bv.viciae			/
	bv.trifolii			/
Sinorhizobium meliloti				
Mesorhizobium ciceri (& M.mediterraneum)				
Bradyrhizobium japonicum				
Bradyrhizobium. spp(groundnut)				/

- -

SANDY LOAM	
16.0	%Clay
20.2	% Silt
63.8	% Sand
7.88	pH
0.83	ECe (dS m-1)
23.5	SP
17.13	%F.C
0.49	%O.M
4.5	Ca2+ (mel -1)
0.6	Mg2+ (mel-1)
2.0	Na+(mel -1)
0.13	K+(mel -1)
8.47	% CCE
0.081	%N(total)
887.2	P-total (mg/kg)
2.52	P-ava.(mg/kg)
3.6	* Fe-ava.(mg/kg)
150	**PSM(Cells gr-1soil)
31	S.meliloti (Cells gr-1soil)

DTPA *

Phosphate Solubilizing Microorganisms **

ACC		PGPR	
()			
	ACC		()
ACC			
	ACC		(% /)
	%	%	Mc Sm
			ACC+++
			Rlv Rlp

ACC			
ACC			(P<0.001)
ACC			
(PGPR)			
(SOV)	(DF)	(MS)	/ ***
			/ ***
			/
(P<0.001)	/		***

... ACC (IAA) :

) - ACC
(%)
Sm

, B3 ()
ACC IAA+++
()
(

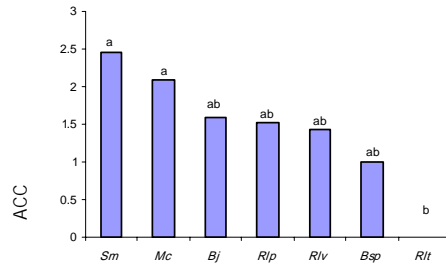
ACC
Bsp
()

(P<0.05)

B3

B3

(B3)



ACC

)
(%

B3

ACC
/

ACC+++

B1 B3()

RMM-

B1

(RMM-NH4Cl)
()

ACC

B3 IAA

B3
(ACC) IAA+++
ACC +++ B6

L- ()
IAA (/ ×) TRP

(mg/kg)

(P<0.05)

ACC

.()

(PGPR)

.()

PGPR

)

(" "

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