

THE EFFECT OF INDOLE-3-ACETIC-ACID AND BENZYL AMINO PURINE CONCENTRATIONS ON MATOA (*Pometia pinnata*) GROWTH IN VITRO



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INTRODUCTION

- Matoa has become a symbol of Papua New Guinea and has potential and benefits but is not widely cultivated on a large scale. Matoa seed germination, initially 100%, will decrease to 86.67% after four days of storage due to a decrease in water content. Matoa plant generative propagation takes about six years, while grafting takes four years to bear fruit.
- Benzyl Amino Purine (BAP) is a cytokinin growth regulator that, combined with Indole Acetic Acid (IAA) from the auxin group, stimulates the growth of shoots, roots, and leaves.



MATERIALS AND METHOD

- The research took place at the Laboratory of Biotechnology and Tissue Culture, Faculty of Agriculture, Sebelas Maret University, Surakarta, from June 2021 to January 2022.
- This study employed a completely randomized design (CRD) with a factorial arrangement of 2x4 factors, yielding 16 treatment combinations, each repeated three times.
- The first factor is IAA concentration, which has four levels: 0 ppm, 0.5 ppm, 1 ppm, and 1.5 ppm. The second factor is BAP concentration, which has four levels: 0 ppm, 2 ppm, 4 ppm, and 6 ppm.

CONCLUSION

- The addition of 1.5 ppm IAA is the optimum concentration to stimulate the emergence of roots while 1 ppm IAA shows optimal results in promoting the growth of the number of roots.
- A combination of 0.5 ppm IAA and BAP 4 was able to accelerate the time of leaf emergence while 1.5 ppm IAA and BAP 6 were able to provide optimal results in producing the highest number of leaves.
- A high growth rate in root emergence time, leaf emergence time, number of roots, and number of leaves.
- A correlation between the number of leaves and stem nodes, indicating that the growth of matoa explants is interrelated.

References

- [1] Effira N, Anwar A, Yusniwati. 2018. Seed physiological changes matoa (*Pometia pinnata*) during storage. International J Of Environment Agriculture And Biotechnology (IJEAB) 3(6). Doi:10.22161/ijeab/3.6.31.
- [2] Siagian TV, Hidayat F, Tyasmoro SY. 2019. The effect of giving doses of npk and biological fertilizers on the growth and yield of shallot (*Allium ascalonicum* L.). J Production Plant 7 (11): 2151-2160
- [3] Yuniastuti E, Widodo CE, Samanhudi, Delfianti MNI. 2018. Effect of benzyl amino purine and indole-3-acetic acid on the propagation of *Sterculia foetida* in vitro. J IOP Conf. Series: Earth and Environmental Science 142:1-6.

1. Shoot emergence time

Concentration of IAA (ppm)	Root Time (DAP)
0	6,416a
0,5	5,667a
1	5,750a
1,5	2,250b

Notes: ppm (parts per million), DAP (Days After Planting), and numbers beginning with the same letter in each treatment showed no significant difference at the 5% DMRT level.

RESEARCH RESULT

2. Leave appear

IAA (ppm)	BAP (ppm)				Average of IAA
	0	2	4	6	
0	4,67 bcd	3,00 bcd	5,67 bcd	6,00 bc	4,83
0,5	6,00 bc	4,67 bcd	2,00 d	3,00 cd	3,92
1	5,33 bcd	5,67 bcd	8,33 ab	9,67 a	7,25
1,5	7,67 ab	5,33 bcd	9,67 a	10,67 a	8,33
Average of BAP	5,92	4,67	6,42	7,33	+

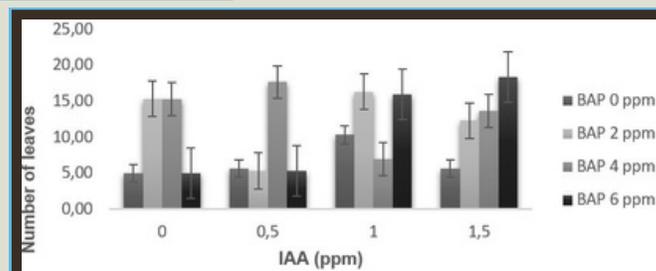
Notes: ppm (parts per million), numbers in each treatment that are followed by the same letter indicate that there is no significant difference at the 5% level DMRT, (+) there is an interaction.

3. Number of roots

Concentration of IAA (ppm)	Number of roots
0	1,083b
0,5	1,833b
1	4,500a
1,5	1,416b

Notes: ppm (parts per million), DAP (Days After Planting), and numbers beginning with the same letter in each treatment showed no significant difference at the 5% DMRT level.

4. Number of leaves



Histogram of the Effect of IAA and BAP Concentrations on the Amount of Leaves on Matoa Explants.



IAA 0 ppm+ BAP 6 ppm

IAA 0 ppm+ BAP 2 ppm

IAA 0,5 ppm+ BAP 2 ppm

IAA 0,5 ppm+ BAP 4 ppm

IAA 1,5 ppm+ BAP 6 ppm