



UNIVERSITI PUTRA MALAYSIA

***EFFECT OF DIFFERENT CONCENTRATION OF BAP ON INDUCTION OF
POLYEMBRYONY IN JACKFRUIT
(ARTOCARPUS HETEROPHYLLUS Lam.) SEEDS***

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BY

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This project report entitled **Effect of Different Concentration of BAP on Induction of Polyembryony in Jackfruit (*Artocarpus heterophyllus Lam.*) Seeds**, is prepared by **Muhammad Al-Zubair Bin Ahmad Yusoff** and submitted to the Faculty of Agriculture in fulfilment of the requirement of PRT4999 (Final Year Project) for the award of the degree of Bachelor of Agricultural Science.

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ABSTRACT

The jackfruit is one of the popular tropical fruits throughout the world. Its scientific name is *Artocarpus heterophyllus* Lam. and it belongs to the Moraceae family. It is native to India and grows wild in the rain forests of Western Ghats of India. The jackfruit tree is eaten fresh as dessert. In Malaysia, the jackfruit is grown as a commercial commodity or grown as mixed commodity with few other fruit types such as durian, rambutan, duku and other fruits in traditional village. The jackfruit is usually propagated vegetatively using bud grafting technique. This technique requires the use of rootstock and selected scion materials. Currently the rootstock plants are raised from germinated seedlings where its seeds are collected from various clones throughout Malaysia. Due to its heterozygous behaviour, variation could be high among the seedlings and this can affect the performance of the scion when the jackfruit tree starts to bear fruits. Induction of polyembryony on jackfruit seeds can be an alternative approach in cloning and mass produce the jackfruit rootstock materials. This experiment is conducted to determine the best 6-Benzylaminopurine (BAP) treatment in inducing and increasing polyembryony on jackfruit's seeds. Prior to germination, the seeds are soaked for two hours in various BAP treatments (0 mg/L, 10 mg/L, 15 mg/L, 20 mg/L, 25 mg/L and 30mg/ L) and then planted in trays containing sand. They are left for germination for eight weeks. The experiment is conducted using Randomized Complete Block Design (RCBD). It is observed that BAP treatments at 20 to 25 mg/L showed the highest percentage of polyembryony (62.5%) but the mean number of seedling induced per seed did not increased.

ABSTRAK

Nangka merupakan salah satu buah-buahan tropika yang terkenal di seluruh dunia. Nama saintifik bagi nangka adalah *Artocarpus Heterophyllus Lam.* dan ia tergolong dalam kategori *Moraceae*. Nangka berasal dari negara India dan tumbuh meliar di hutan hujan di Ghats Barat India. Kebiasaannya, buah nangka dimakan sebagai pencuci mulut. Di Malaysia, nangka ditanam sebagai komoditi komersial atau komoditi campuran yang dicampur dengan beberapa jenis buah-buahan lain seperti durian, rambutan, duku dan buah-buahan tradisional. Nangka biasanya dibiakkan secara tampang menggunakan teknik cantuman tunas. Teknik ini memerlukan penggunaan batang bawah dan bahan keturunan terpilih. Pada masa kini, tumbuhan batang bawah ditanam dari benih bercambah di mana benih tersebut dikumpul dari pelbagai klon di seluruh Malaysia. Oleh kerana ia bersifat heterozigot, variasi boleh berlaku dalam kalangan anak-anak pokok dan keadaan ini boleh menjejaskan prestasi dahan apabila pokok nangka mula berbuah. Induksi *polyembryony* pada biji nangka boleh dijadikan pendekatan alternatif dalam pengklonan dan penghasilan biji nangka. Eksperimen ini dijalankan untuk menentukan rawatan terbaik bagi 6-Benzylaminopurine (BAP) dalam mendorong dan meningkatkan *polyembryony* pada biji nangka ini. Sebelum percambahan, benih direndam selama dua jam di dalam pelbagai rawatan BAP (0 mg / L, 10 mg / L, 15 mg / L, 20 mg / L, 25 mg / L dan 30mg / L) dan kemudian ditanam di dalam dulang yang mengandungi pasir. Mereka dibiarkan untuk percambahan selama lapan minggu. Eksperimen ini dijalankan menggunakan Randomized Complete Block Design (RCBD). Pemerhatian menunjukkan bahawa rawatan BAP pada 20 hingga 25

ml / L memberikan peratusan tertinggi *polyembryony* (62.5%) tetapi purata bilangan anak benih yang dihasilkan oleh setiap benih tidak meningkat.



CHAPTER 1

INTRODUCTION

The jackfruit is a prominent fruit tree in some tropical and subtropical region. It has a scientific name *Artocarpus heterophyllus Lam.* and belongs to the Moraceae family. This plant originates from India where it grows in the Western Ghats of India (Craig and Harley, 2006). The Western Ghats, a rich wellspring of biodiversity for various plant species, harbors a wide assorted qualities of jackfruit trees. Other than India, jackfruit is regularly grown in Burma, Malaysia and to a significant degree in Brazil. CAB International (1999) reported that the jackfruit is devoured in such amounts by a few families in Asia, especially in the south Indian region of Kerala and in Sri Lanka. In this region, they grow no less than several jackfruit trees as lawn trees.

About 25 clones of jackfruit were listed in Malaysia with the Department of Agriculture (DOA) since 1960. There are six clones unequivocally prescribed for Jackfruit planting in Malaysia which are Clone J29, Clone J 31, Clone Tekam Yellow, Clone Mantin and the most recent one is Clone J33 (Nangka Madu). Uncle Hong Crystal clone is the best clone in Johor but it is not yet listed with the Department of Agriculture (DOA) of Malaysia. Clone J29 has a larger fruit size weighing up to 10 kg for each fruit while J31 clone is little in size with 6 kg weight for every fruit and it has a strong smell. J33 is the most recent clone listed and has a fare quality standard for new utilization.

The jackfruit is usually propagated vegetatively using bud grafting technique. This technique requires the use of rootstock and selected scion materials. Currently the rootstock plants are raised from germinated seedlings where its seeds are

collected from various clones throughout Malaysia. Due to its heterozygous behaviour, variation could be high among the seedlings and this can affect the performance of the scion when the jackfruit tree starts to bear fruits. Induction of polyembryony on jackfruit seeds can be an alternative approach in cloning and mass produce the jackfruit rootstock materials. Because of that, this study is being conducted to determine the best BAP treatment in inducing polyembryony in jackfruit (*Artocarpus heterophyllus Lam.*) seeds.



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