

## ***In vitro* PROPAGATION OF SELECTED MALAYSIA CASSAVA (*Manihot esculenta* Crantz) VARIETIES BY USING NODAL EXPLANTS**

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### **ABSTRACT**

Cassava (*Manihot esculenta* Crantz) is one of the perennial shrub belongs to Euphorbiaceae family and is widely found in Africa and Asia. In Malaysia, Cassava is an important industrial crop for starch processing and other common industrial products such as animal pellets and for food industries. Hence, an *in vitro* propagation technique by using rapid shoot multiplication is needed to produce these highly demand industrial crop. This study aims to compare the shoot multiplication of three local Malaysia Cassava varieties which were Putih, Sawah and Baloi by using Murashige and Skoog (MS) media supplemented with plant growth regulators of 6-Benzylaminopurine (BAP) at 0.5, 1, 2, and 3 mg/L with or without 1-Naphthaleneacetic acid (NAA) at 0.01 mg/L. The results showed that the best media for the induction of shoot multiplication and leaves was MS media supplemented with 1.0 mg/L BAP + 0.01 mg/L NAA for all varieties. The best media for induction of shoot height was MS media free of BAP and NAA. The results also revealed that the shoot multiplication, induction of shoot height and induction of leaves were inhibited by high concentration of BAP with or without combination of NAA for each Cassava varieties.

**Key words:** *In vitro*, *Manihot esculenta*, shoot multiplication, nodal explant

### **INTRODUCTION**

*Manihot esculenta* or also known as Cassava, Tapioca, Manioc, Yuca (Spanish), and Ubi Kayu (Malay) is a perennial woody shrub from Euphorbiaceae family which is native to Central and South America (FAO, 2000). Cassava is categorized as an important source of carbohydrate after rice and corn which provides important component of diet to more than 800 million of people around the world (Richardson, 2013). In Asia, the main countries which produced highest Cassava tuber in fresh form are Thailand which are (29.19 million mt in 1.18 ha land) followed by Indonesia (20 million mt in 1.05 ha land) (MyAgri, 2015). Cassava contains high level of cyanogenic glucosides in all parts of plant with the highest distribution is on the leaf part which can determine the sweetness or bitterness of the Cassava tuber roots (O'Hair, 1995). Cassava cultivation in Malaysia has

faced a lot of problems including its susceptibility to diseases such as leaf spots, bacterial blight and white root disease (Sahadevan, 1987). *In vitro* propagation techniques is used to overcome the problems in cultivation of Cassava by selecting disease-free mother plants, produce large amount of plantlets from disease-free mother plants, and to shorten the growth cycle of Cassava (Dugassa & Feyissa, 2011). In Malaysia, Cassava is used for industrial purpose which is mainly for starch processing and other common industrial products such as animal pellets and for food industries such as monosodium glutamate and manufacturers of glucose (Lian & Idris, 2000). According to Department of Agriculture (DOA) Sarawak (2015), the Cassava industry for production of chip and snack has been increasingly in demand and been a source of income generation for small scale farmers which are really promising (DOA Sarawak, 2015). Hence, tissue culture propagation technique is needed for the rapid production of plantlets which have uniform genetic characteristics and free from

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