

Meristem Culture of *Aloe vera* Linn. and its Acclimatization

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ABSTRACT---- *Aloe vera* Linn. is an ornamental plant that have many advantages, namely anti diabetic, cure malnutrition, anti constipation. Therefore, it is important to propagate it by tissue culture method. In this study, shoot meristem was used as an explants. After shoots developing from the meristem, they were subcultured onto rooting media. Then the plantlets were acclimatized.

Keywords---shoot meristem, *Aloe vera* Linn., acclimatization

1. INTRODUCTION

Aloe vera Linn. (crocodile tongue) is included into Liliaceae family. It is an ornamental plant and planted in pot or in house yard.



Figure 1. *Aloe vera* Linn.

The leaves, root and flower have been used for recover headache, diabetic, constipation, malnutrition, pertussis. They contain Aloin, barbaloin, isobarbaloin, aloe-emodin, aloenin, aloesin [8]. Figure 1 shows an *Aloe vera* plant.

It is necessary to propagate the *Aloe vera*, because of their advantages, Therefore, in this study, meristem of *Aloe vera* was cultured. Meristem culture has benefits as follow [1-7]

1. The plants will be pathogen free because donor plant do not contain vascular bundle. Vascular bundle is able to carry the pathogen.
2. The plants will be genetically stable because meristem is a differentiated tissue.
3. The plants will not be callusing. Therefore, it will reduce somaclonal variation.

The purpose of this study was to propagate the *Aloe vera* so that pathogen free, genetically stable and reduce somaclonal variation.

2. MATERIAL AND METHODS

Mersitem culture and multiplication

1. The explant (shoot) was surface sterilized by 96% alcohol for 30 second and 20% chlorox for 3 minutes. Then, the explants was washed by sterile water 4 times.
2. The scale of the shoot was opened under stereomicroscopy until 0.2-0.5 mm shoot mersitem was obtained.
3. The shoot meristem was cultured on initiation media MS containing 1 g/l active charcoal for 2 weeks.
4. Thereafter, the shoot was subcultured on MS media supplemented with 0.5 mg/l BAP and 0.025 mg/l NAA for multiplication.

Rooting and acclimatization

1. After multiplication, the shoots were subcultured onto MS rooting media containing 3 ppm IBA.
2. After plantlet developing, the plants were acclimatized by covering them with plastic bag.

3. RESULT AND DISCUSSION

Based on the method above, plantlets of Aloe vera developed. Figure 2 shows the plantlets of Aloe vera. Its appearance is similar as plant of Aloe vera in the yard.



Figure 2. Plantlet of Aloe vera Linn.

Aloe vera contains vitamin A, B, B2, B3, B12, C,E, choline, inositol and folic acid. Besides, it also contains macro and micronutrients, namely Ca, Mg, K, Na, Fe, Zn and Cr. In addition, several kind of enzymes were found in Aloe vera, such as amylase, catalase, carboxypeptidase, bradykinase.

Those nutrient, vitamins and enzymes could act as natural antioxidant. Therefore, people who consume Aloe vera could avoid disease like cancer disease. The antioxidants good for supporting immunity of our body [9] (<http://tarmediadi.blogspot.com/2011/08/cara-menanam-lidah-buaya-dan-manfaatnya.html>). Consequently, Aloe vera could cure cancer disease naturally.

The Aloe vera during acclimatization is shown in figure 3 and 4.



Figure 3. One plant of Aloe vera during acclimatization



Figure 4. Six plants of Aloe vera during acclimatization

According to information in the following website <http://www.slideshare.net/guest800e180/plant-tissue-culture-of-aloe-vera>, Aloe vera is a fairly well known herbal preparation with a long history of use. It is widely used in modern herbal practice and is often available in proprietary herbal preparations.

It has two distinct types of medicinal use. The clear gel contained within the leaf makes an excellent treatment for wounds, burns and other skin disorders, placing a protective coat over the affected area. This action is in part due to the presence of aloectin B, which stimulates the immune system

The second use comes from the yellow sap at the base of the leaf. The leaves are cut transversally at their base and the liquid that exudes from this cut is dried. It is called bitter aloes and contains anthraquinones which are a useful digestive stimulant .

Aloe is used in many skin care products because of its ability to stimulate healthy cell growth and repair damaged tissues. Most people think of using Aloe only on their skin because that is all they know about

- Used for the treatment of chronic constipation.
- Aloe extract may be useful in the treatment of diabetes.
- Contains numerous vitamins and enzymes which have anti-microbial activities.

□ Uses in cosmetics :

- It is beneficial for the cosmetic products such as make up, anti-wrinkle creams, facial masks, skin conditioners and lipsticks.
- The leaf extracts are used in skin-care cosmetic products.

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