

**PROCEEDING INTERNATIONAL CONFERENCE ON ENVIRONMENT AND  
HEALTH : “INTEGRATING RESEARCH COMMUNITY OUTREACH AND SERVICE  
LEARNING”**

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## INITIATION OF CALLUS CULTURE OF CANTALOUPE MELON (*Cucumis melo* L.) AND DETECTION OF ITS BETA-CAROTENE CONTENT

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### ABSTRACT

Cantaloupe Melon (*Cucumis melo* L.) is a fruit plant riching in antioxidant beta-carotene. Perhaps, production of beta-carotene can also be achieved by first initiating callus culture of the plant in suitable medium, propagating them, and extracting the compound it produce. This research was a preliminary effort aimed to examine it. The results of this research showed that the optimum medium for callus culture initiation from cotyledon of Cantaloupe Melon and its propagation was Murashige Skoog (MS) with the addition of 1 mg/L benzyl adenine (BA) and 1.5 mg/L naphthalene acetic Acid (NAA). The beginning of stationary phase on calluses' growth curve was chosen as a harvest time of calluses, based on the theory that beta-carotene as a secondary metabolite is usually be produced much at that phase. The results demonstrated that stationary phase began at the end of week fourth, so the time was decided as the harvest time of calluses. Beta-carotene was then extracted from calluses by maceration technique. The existence of the compound in extract was tested using Thin Layer Chromatography (TLC) and Fourier Transformed-Infrared Spectroscopy (FTIR). The data showed that the compound existed in the extract. The concentration of the compound in it was needed to determine further.

**Keywords :** *Cantaloupe Melon, beta-carotene, callus cultures, Thin Layer Chromatography (TLC), Fourier Transformed-Infrared Spectroscopy (FTIR)*

### INTRODUCTION

Cantaloupe melon (*Cucumis melo* L.) is a plant giving many benefits for human in culinary as well as in health, both in tropic and subtropic countries. Its popularity has been increasing further after World Health Organization classified it as one of the world's healthiest fruits due to its abundant antioxidant content, namely beta-carotene.



**Figure 1.** The fruit of Cantaloupe melon (*Cucumis melo* L.)

Beta-carotene can prevent us from suffering a cancer due to its antioxidant activity that hinder free radicals to react with our body tissues. Among all kinds of melon, Cantaloupe is considered as the healthiest melon. The fruits of this melon, orange in color, contain beta-carotene and lycopene in relatively large

naphthalene acetic acid was the optimum media for callus culture initiation as well as calluses' growth.

2. The existence of beta carotene was indeed detected in the callus of Cantaloupe melon in addition to its fruit's flesh.

## REFERENCES

- Ardiana, D.W. (2009). Teknik Pemberian Benzil Amino Purin untuk Memacu Pertumbuhan Kalus dan Tunas pada Kotiledon Melon (*Cucumis melo* L.). Buletin Teknik Pertanian 14(2):50-53.
- Christiani; Suryowinoto, M. (1989). Respon Penambahan NAA dan Kinetin Terhadap Pertumbuhan dan Perkembangan pada Budidaya Jaringan Melon. BPPS-UGM.
- Gandjar, I.G. dan Rohman, Abdul (2009). Kimia Farmasi Analisis. Yogyakarta: Pustaka Pelajar. Hal.220-255.
- Harimbi, Setyawati (2004). Proses Ekstraksi Beta-Karoten dari Ubi Jalar dengan Pelarut Aseton. Jurnal Teknologi Institut Sains dan Teknologi Akprind. Lembaga Penelitian.
- Hidayati, Asmah (2011). Identifikasi, Karakterifikasi dan Ekstraksi Beta-Karoten dari Ipomea batatas Sebagai Suplemen. Universitas Muhammadiyah Malang.
- Sukmawati, F dan Efendi, D. (2009). Induksi Embrio Somatik Melon (*Cucumis melo* L.) pada Berbagai Media dan Zat Pengatur Tumbuh. Makalah Seminar Departemen Agronomi dan Hortikultura Fakultas Pertanian-Institut Pertanian Bogor.
- Zulkarnain (2009). Kultur Jaringan Tanaman. Cetakan Pertama; Jakarta: PT. Bumi Aksara