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ANTITUMOR EFFECTS OF *PANDANUS CONOIDEUS* IN *IN VITRO* AND *IN VIVO* STUDIES

Toshiaki NISHIGAKI^{1,2}, Kunitaka HIROSE³, Ingrid S. Surono⁴ and Hidekazu SHIGEMATSU^{1,2}

1. Department of Histopathology, School of Medicine, Shinshu University (3-3-1 Asahi, Matsumoto, Nagano 390-8621 Japan)
2. Research Association of Tropical Medicinal Plants (1286-18 Yamato, Azusagawa, Matsumoto, Nagano 390-1701 Japan)
3. Effector Cell Institute (4-7-7 Aobadai, Meguro, Tokyo 153-0042 Japan)
4. SEAMEO RECFON, University of Indonesia (Salemba Raya 6, Jakarta, 10430 Indonesia)

ABSTRACT: *Pandanus conoideus* (Buah Merah) is exclusively grown in Papua island and its neighbour areas and indigenous people has been utilizing its extract oil (SBM) as functional food for thousand of years. We have first found relatively high quantity of carotenoids which consists of alpha- and beta-carotene as well as alpha- and beta-cryptoxanthin in SBM. Beta-cryptoxanthin is a novel micronutrient associated with reducing risk of some types of cancers. However, antitumor effect of SBM has not been well examined. We evaluated antitumor potentials of SBM *in vitro* and *in vivo*. In the *in vitro* study, proliferation of human non-small lung cancer cells, A549 were inhibited by SBM at more than 500 µg/mL in MTT assay. The *in vivo* antitumor activity of SBM was evaluated using mouse Sarcoma180, mouse Lewis lung cancer (LLC) and A549 models. In all animal model assays, SBM demonstrated significant antitumor effects in either tumor volumes or tumor weights. Experiment using nude mice in A549 assay demonstrated that antitumor effect of SBM may not be associated with immunological involvement. We conclude that Buah Merah has higher potentials in prevention of cancers, especially lung cancer.

Key words : *Pandanus conoideus*, Buah Merah, carotenoid, beta-cryptoxanthin, Sarcoma180, Lewis lung cancer, non-small lung cancer A549

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MIKROFLORA YANG BERPERAN PADA FERMENTASI SPONTAN UBI KAYU SERTA KARAKTERISTIK FISIK TEPUNG YANG DIHASILKAN

Microflora Involved in Spontaneous Retting Fermentation of Cassava and Physical Characteristics of The Flour

Yuliasri Ramadhani Meutia, Enny Hawani Loebis

Balai Besar Industri Agro, Jl. Juanda No. 11 Bogor 16122
email: cabi@bbia.go.id

ABSTRACT: *The studies about bacteria which involved during retting (fermentation) of cassava are still limited in Indonesia. The aim of this research is to study about the microflora which involved during retting of cassava and also to explore the effect of this spontaneous fermentation upon the amylograph properties on the fermented cassava flour. The fermentation process run for 4 days, MRSB / MRSA used as isolation media then the isolates identified using API® 50 CHL. The result showed that Lactobacillus plantarum dominated as microflora which involved on the 1st and 2nd day, and on the 3rd day the fermentation of cassava was dominated by Lactobacillus delbrueckii ssp. delbrueckii. On the last day of fermentation Lactococcus lactis ssp. lactis was dominated. Increase in fermentation time has also increased the stability of paste which was investigated by the increase of maximum viscosity and gel strength in the fermentation of cassava flour.*

Keywords: Cassava, Fermentation, Lactic Acid Bacteria, Flour, Amylograph

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PENGARUH PENGGUNAAN TEPUNG CAMPURAN TERHADAP MUTU NUGGET AYAM

The Effect of the Mixed Flour to the Quality of Chicken Nugget

Eko Susanto, Nami Lestari, Mirna Isyanti dan Sumadyo Rahardjo

Balai Besar Industri Agro (BBIA)
Jl. Ir. H. Junada No. 11 Bogor 16122

ABSTRACT : *Nugget is a product which can be produced from maced meat from chicken or fish with some ingredient and filler, eventhough nugget can be produsced whithout filler. In this research was carried out by adding wheat flour mixed with cassava based products i.e. mokaf, tapioca and cassava flour. The result showed that by adding filler do not affect the organoleptic test such as taste, colour, texture and odour but the treatments was affect the nugget quality. The best quality of nugget was produced with addition of mixed filler from 25% wheat flour and 75% mokaf. The product has 15 % protein, 12,9 % fat and 27,7 % carbohydrate. It is meet the requirement of SNI 01-6683-2002 for chicken nugget.*

Key words : modified cassava flour/mokaf, batter and breading, pre-frying, deep fat frying

Penelitian / *Research*

METODE ANALISIS SENYAWA AKTIF DALAM JAHE (*Zingiber officinale*)
MENGUNAKAN HPLC

Method for HPLC Analysis of Active Compounds in Ginger (Zingiber officinale)

Yus Maria Novelina.S, M. Maman Rohaman, Hendra Wijaya

Balai Besar Industri Agro (BBIA)
Jl. Ir. H. Juanda No. 11, Bogor 16122

ABSTRACT: Ginger (*Zingiber officinale*) is one of herb plant which contains various of active compounds, which is proved has function to human health. In Indonesia, there are 3 main ginger varieties, those are: giant ginger (*Zingiber officinale* var. *officinale*), emprit ginger (*Zingiber officinale* var. *amarum*), and red ginger (*Zingiber officinale* var. *rubrum*). Each of them has different characteristic and function. The problems which often occurs are ginger counterfeiting, often mixed with other gingers. This counterfeiting difficult to be detected with conventional test method. Therefore needed study about characteristic of each ginger with HPLC so counterfeiting able to be traced. A sensitive and accurate high-performance liquid chromatography (HPLC) method has been developed to determine the quantity of active component in the methanolic extract of *Zingiber officinale*. Bioactive component was separated on Pursuit C18 Column (250 mm x 4.6 mm, Particle size: 5 µm) with gradient system of water and acetonitrile as mobile phase. The calibration plot was linear in the range of 0.10-150 mg/L, of 6-, 8-,10-gingerol and 6-shogaol and the correlation coefficient of 0.9998 was indicative of good linear dependence of peak area on concentration. The limit of detection (LOD) of 6-gingerol, 8-gingerol, 6-shogaol and 10-gingerol respectively were 2,34, 1,06; 1.25, and 0,67 mg/L and limit of detection (LOD) were 7,81: 3,53: 4,18 and 2,29 mg/L respectively. The developed HPLC method was found selective, precise and accurate, and can be used for routine analysis of gingers in the quality control laboratories.

Keywords : Ginger (*Zingiber officinale*), HPLC , 6- gingerol, 8- gingerol, 10-gingerol, and 6-shogaol

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Ulasan Ilmiah/Review

ANTIOKSIDAN: MEKANISME KERJA DAN FUNGSINYA DALAM TUBUH MANUSIA

Antioxidants: Mechanism of Action and Its Function in Human Body

Hendra Wijaya dan Lukman Junaidi

Balai Besar Industri Agro (BBIA)
Jl. Ir. H. Juanda No. 11, Bogor 16122

ABSTRACT: *Antioxidant could be defined by several means. Antioxidant is a substance that could postpone and delay oxidation of molecule substrate in human body, i.e: protein, carbohydrate, lipid and DNA, by oxidant. Antioxidant that works in the human body's biological systems is called a biological antioxidant. Biological antioxidants can be grouped into: 1) enzymatic antioxidants (endogenous), 2) non-enzymatic antioxidants (endogenous), and 3) antioxidants from food (exogenous). Enzymatic antioxidants (endogenous) include superoxide dismutase, catalase, glutathione peroxidase, glutaredoksin, tioredoksin, peroksiredoksin, and coenzyme Q10. Non-enzymatic antioxidants (endogenous) include glutathione, uric acid, bilirubin, α -lipoic acid. Some examples of antioxidants from food (exogenous) are carotenoids, vitamin E and vitamin C. Those antioxidants are able to work in hydrophobic and hydrophilic cellular environment so as to form a strong network of cooperation in preventing the occurrence of oxidative damage. Some of the functions of antioxidants in the human body that can be expressed are: preventive defense the human body against oxidants, strong defense system against free radicals, prevent the occurrence of atherosclerosis in blood vessels, regulation of metabolism such as disabling lipoksigenase.*

Keywords: biological antioxidant, endogenous antioxidants, enzymatic antioxidants, non-enzymatic antioxidants exogenous antioxidants