

Program & Abstracts

International Conference 2016

Food Innovations : ASEAN Economic Community Challenges



Jakarta-Indonesia, 21st – 23rd September 2016



organized by :



SEAFAST
CENTER



Department of
Food Science
& Technology

in conjunction with :



Food ingredients
Asia



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International Conference
Food Innovation: AEC Challenges
September 21 – 22, 2016, Jakarta - Indonesia

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ORGANIZERS



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In order to develop a Food Technology in Indonesia, IAFT (PATPI), an acronym of Indonesian Association of Food Technologists (Perhimpunan Ahli Teknologi Pangan Indonesia), was formed in 1967 at Bogor, West Java. This association is a professional organization that gather experts or professionals in the field of food technology, as well as other related areas. IAFT members come from universities, research centers, government agencies or private sectors and food industries.

IAFT is the only Indonesia representative of professional organization in the food field for IUFoST (International of Food Science and Technology). In addition, IAFT becomes a member of FiFSTA (the Federation of Institute of Food Science and Technology in the ASEAN) and gets the recognition of IAFT as Allied Organization No. 27 by the IFT (the Institute of Food Technologists), USA.

PATPI engaged in the field of food technology including the application of basic sciences such as chemistry, physics and microbiology as well as the principles of engineering, economics and management on all food supply chain, start from the farm to table. Food supply chain covers the aspects of raw materials handling, processing, preservation, packaging, storage, distribution, quality control, safety, acceptability, new food product development, also nutrition and public health.



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At Bogor Agricultural University (IPB), nutrition & food research and education programs have been developed for over 30 years. Previously, there were several Centers associated with nutrition and food science and technology. Food Technology Development Center (FTDC) was established at IPB in 1979. Then, in 1985; Inter University Center for Food and Nutrition was established and further developed into Center for Food and Nutrition Studies (CFNS) in 1992. Other centers related to nutrition, food science and technologies were also established; namely Center for Food and Nutrition Policy Studies (CFNPS; 1987) and Center for Assessment of Traditional Foods (CATF, 1997). Due to the reorganization and consolidation process at Bogor Agricultural University; at 2004, the centers were consolidated and merged into one center named Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center.

SEAFAST Center is designed to develop a national and regional system of partnership in the area of food agricultural science and technology development. In general, The Center is directed to bring together the university, governmental, donor and business sectors to focus on the improvement of food science and technology issues for Indonesia and other ASEAN countries. IPB has mandated SEAFAST Center to be a regional center focusing on the improvement of food quality, nutrition and safety through science and technology.



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The Department of Food Science and Technology at Bogor Agricultural University (IPB) is one of the oldest Food Science Departments in Indonesia. The Department was founded in 1964 under the Faculty of Agricultural Engineering and Technology, previously named as the Department of Agricultural Product Technology. After 1981, the name was changed until now as the Department of Food Science and Technology (DFST). The Department has core competence in the areas of food science and food technology, especially in food chemistry, food microbiology, food process engineering, food analysis, food quality and food safety.

DFST has achieved excellences in teaching and research to ensure the high quality incoming students. In addition, the department also has excellences in research performance, curricula, educational process, graduate performance, internal management and organization, and the creation and expansion of mutual partnerships with government and private sectors in both national and international scale. Moreover, DFST has adopted the food science curriculum recommended by the United States Institute of Food Technologists (IFT) since 2003. Since 2010, the Department has become the first study program approved by IFT outside North America and got the recognition from International Union of Food Science and Technology (IUFoST) since 2013. This adoption and approved status consequently caused DFST as a major player in the development of food science and technology education in Indonesia and its region. The Department of Food Science and Technology has a vision to become a leading higher educational institution with international quality as well as be a trend setter in food science and technology.


					ICAPRD (Indonesian Center for Agricultural Postharvest Research and Development) FSQ-O13
15.00 - 15.30	Afternoon Break and Posters/Display Viewing				
15.30 - 16.20	Concurrent Session 4 a. Novel Approaches in Food Safety and Quality	Concurrent Session 2b. Innovations in Food Processing	Concurrent Session 3. Advances in Nutrition and Health	Concurrent Session 4 b. Novel Approaches in Food Safety and Quality	
15.30 - 15.40	Bioactive Compounds and Functional Properties of Flour Composites from Banana Corm, Sweet Potato and Black Sumanti Debby Moody Padjadjaran University FSQ-O14	Effect of Size Particle on Functional Characteristic of Asia Flour-Rich Fibre Ranti Futiawati Bogor Agricultural University FP-O19	Anti-Cervix Cancer and Antioxidant Activity of Edible Seaweeds <i>Halimena durvile</i> Obtained from Coastal Area of North Sulawesi Grace Sanger Sam Ratulangi University NH-O14	Application of Semipolar Fraction Cocoa (Theobroma cacao L.) Shell Extract as Meat Preservative in Room Temperature Storage Indira Lanti Kayaputri Padjadjaran University FSQ-O19	
15.40 - 15.50	Characteristics of Amino Acids from Meretrix meretrix, Pholas dactylus and Babylonia spirata Meat as Raw Material Asadatuln Abdullah Bogor Agricultural University FSQ-O15	Improvement of Dark Chocolate with The Addition of Green Tea and Soy Powder Yusep Ikrawan Pasundan University FP-O20	The Characteristics of Functional Biscuits from Modified Arrowroot Starch (Maranta arundinaceae L) with Squash Damat University of Muhammadiyah Malang NH-O15	Nanocomposite Coating Based on Carrageenan and ZnO Nanoparticles to Maintain The Storage Quality of Mango Bayu Meindrawan Bogor Agricultural University FSQ-O20	
15.50 - 16.00	Isolation and Identification of Microorganism in Ozonated Broccoli (Brassica oleraceae L.) during Storage Tita Rialita Padjadjaran University FSQ-O16	The Effect of Temperature and Heating Times on Emulsion Stability of Kuah Laksan as Traditional Food from Palembang Yuli Hartati Polytechnic of Health FP-O21	Enhancement of Total Phenolic Content and Antioxidant Activity Off Fermented Rice Bran From Inpari 6, Inpari 30 And Inpari 1 Rice Varieties with Rhizopus oligosporus Syifa Fauziyah Bakrie University NH-O17	Exploration of Antimicrobial Activity from Marine Microalgae Tetraselmis Chuii Extract as a New Source of Functional Food Jaya Mahar Maligan Brawijaya University FSQ-O21	




Certificate of Appreciation

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FOOD INNOVATIONS : ASEAN ECONOMIC COMMUNITY CHALLENGES
Jakarta – Indonesia, 21 – 23 September 2016


Christopher Eve
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Puspo Edh Giriwono, Ph.D
Chairman of Organizing Committee

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**ANTI CERVIX CANCER AND ANTIOXIDANT
ACTIVITY OF EDIBLE SEAWEEDS *Halimenia
durvilae* OBTAINED FROM COASTAL AREA OF
NORTH SULAWESI**

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Montolalu L.A.D.Y

Faculty of Fishery and Marine Science, UNSRAT Manado.



INTRODUCTION

Cervix cancer is the commonest cancer cause of death among women in developing countries.¹ Mortality due to cervical cancer is also an indicator of health inequities, as 86% of all deaths due to cervical cancer are in developing, low- and middle-income countries.

Based on the data of GLOBOCAN project in 2012, 235,000 death cases caused from cervical cancer from a total of 14,067,894 new cancer cases and 8,201,575 death cases were recorded worldwide (Internasional Agency for Research on Cancer (2015)).

Various treatments have been made to cure cancer, including surgery, chemotherapy, radiotherapy, and targeting therapy. But, all of these procedures have side effects, such as vomiting, malaise, anemia and susceptibility with infection.

At present has been found some anti virus drug such as podophyllin or trichloroasetat acid, which used in USA and Europa. However the price of sintetic drug is too high and show side effect, therefore the people trigered to use traditional drug from natural product, that have been used for long time. (Syukur & Hernani, 2000)

Nowday, the use of natural product is a complementer alternatif to treatment breast cancer, cervix cancer and vagina cancer. In Indonesi there are 61.8 % patient of cervical cancer used natural from plant beside comercial drug (Radji et al., 2010).

Seaweed or macro algae contents bioactive compounds, such as phenols, fatty acid and dietary fiber that can prevent degenerative diseases (inflamation, diabetes, cardiovasculer, hypertency, cancer) (Sanger *et al*, 2018).

Halimena durvilae is a red edible seaweed, it grows abundantly in Indonesia, especially in North Sulawesi, in South East Asia is cultivated used by human as food, it is usually served raw as salad. this seaweed has mot yet use for healthy, because there are not report its bioactive activity The main objective of the present study was to evaluate antioxidant activity and Anti-cancer cervix activity.

Most experimental data indicate that free radicals have a role in the initiation and promotion of cancer (Cross et al. 1987). Initiation and promotion of tumors involve changes in DNA either as a result of an inherited genetic anomaly or damage to the DNA strand.

In view of the association between DNA damage and carcinogenesis, it is likely that any agent capable of modifying DNA could be carcinogenic. Free radicals fall into this category.

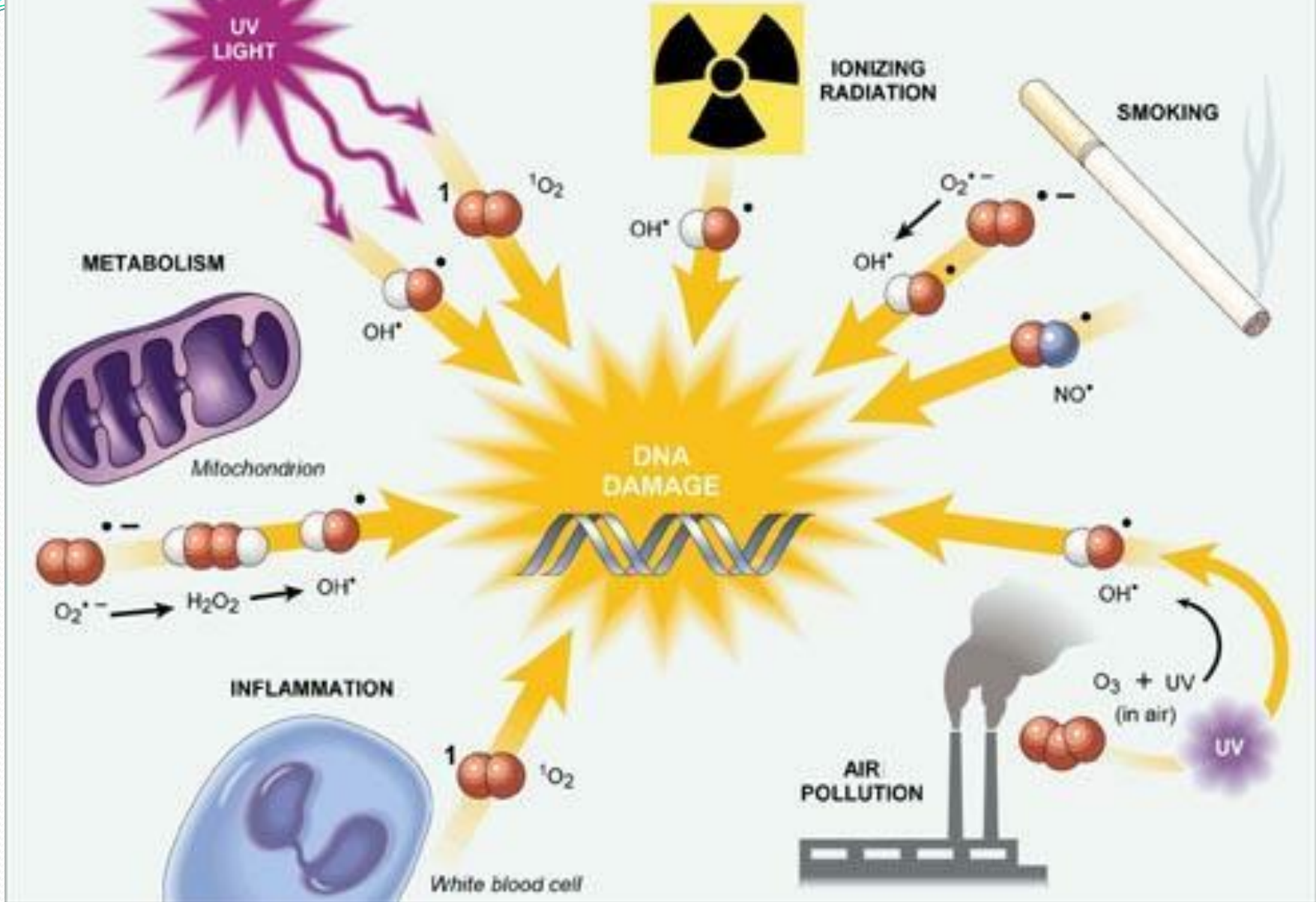
Other than direct damage to DNA by free radicals, oxidative damage to lipids and to proteins such as DNA repair enzymes could also lead to DNA mutations

Type of Free radicals

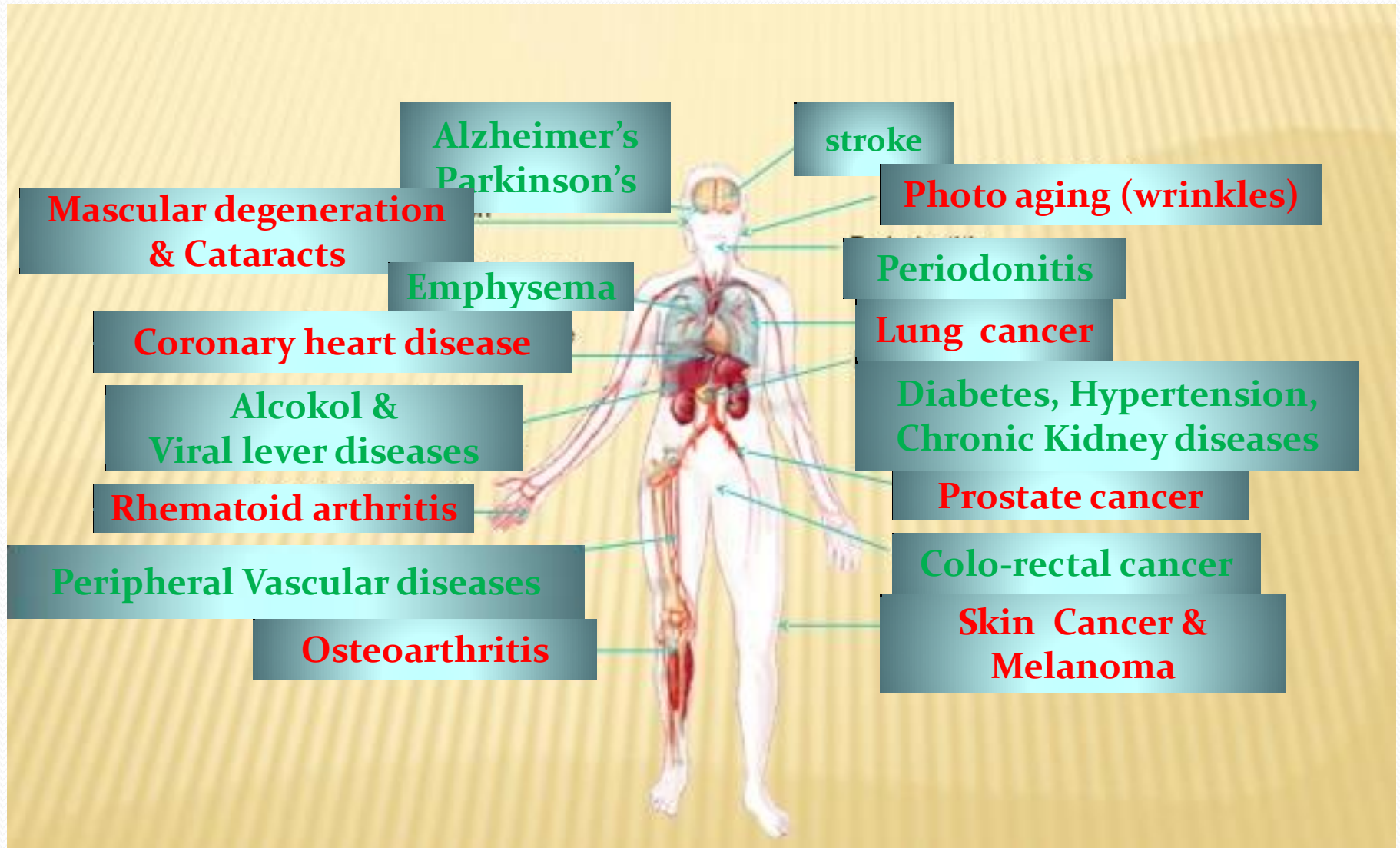
superoxide anion (O^{2-}),
hydroxyl radical ($\cdot OH$),
peroxyl radical ($ROO\cdot$),
Alcoxil radical ($RO\cdot$),
Lipid peroxil radical ($LOO\cdot$),
hydrogen peroxide, ($HOOH$)
nitric oxide radical (NO),
Singlet oxygen.

These molecules are unstable and highly reactive, and can damage cells by chain reactions, such as lipid peroxidation or formation of DNA adducts that could cause cancer-promoting mutations or cell death.

Formation of free Radicals



Free Radical diseases

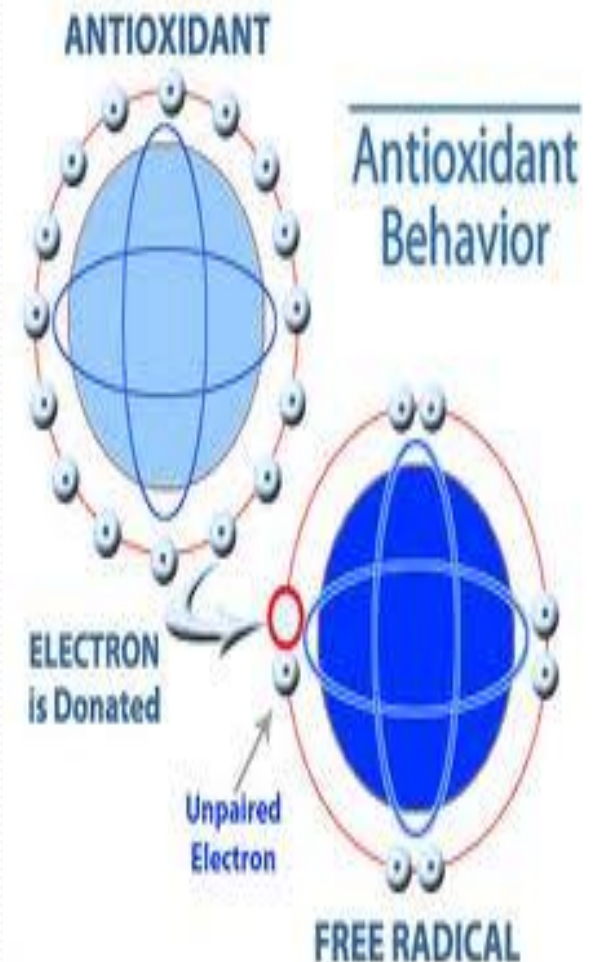


Antioxidant

Antioxidant is a molecule capable of inhibiting the oxidation of other molecules.

Oxidation is chemical reaction that transfers electron or hydrogen from a substance to an oxidation agent.

Oxidation reaction can produce free radicals. These radicals can start chain reaction



The function of antioxidant

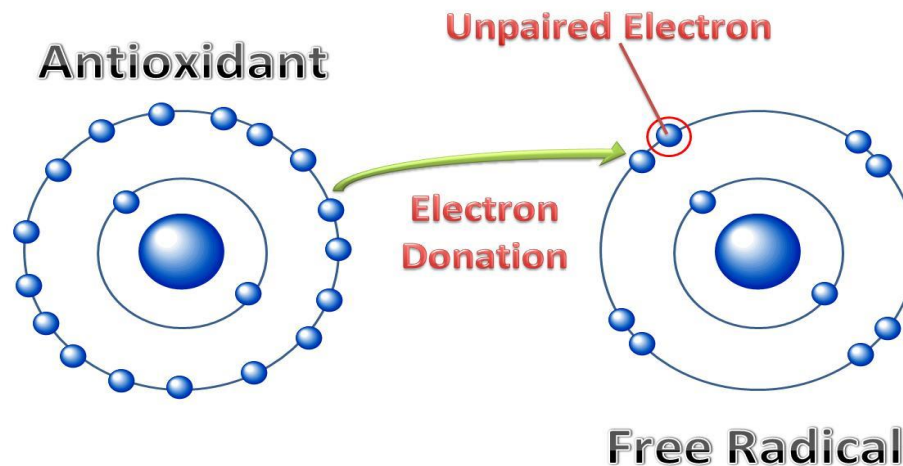
- Slow or prevent damage to body cells
- May improve immune function and lower risk for infection and cancer.

Example: Carotenoids

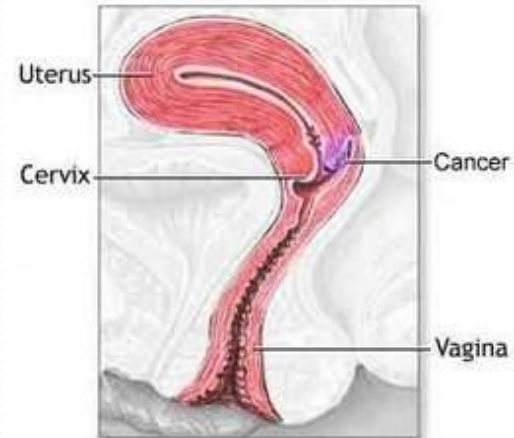
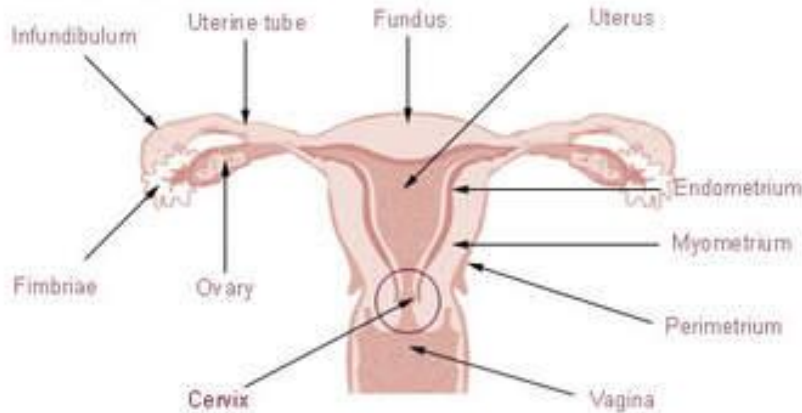
Vitamin C

Vitamin E

Found in colorful fruit/veggies and grains.



Uterus and Uterine tubes



The cervix located in the lower part of the uterus, the place where a baby grows during pregnancy. The virus spreads through sexual contact. Cervical cancer caused by HPH (Human Pappyloma virus). HPV comprise more than 200 types of infections, among which the high-risk HPV types 16 and 18 are the main cause and account for about 70% of cervical cancer. Most women's bodies are able to fight HPV infection. You're at higher risk if you smoke, have had many children, use birth control pills for a long time, or have HIV infection.

Normal cells become cancer cells through a wide range of genetic changes, and this process generates many different types of cancer . However, most cancer types share similar characteristics, and these must be studied to progress anticancer drug discovery and cancer treatment.

Hanahan and Weinberg identified six major targets in human tumors: self-sufficiency in growth signals, insensitivity to growth-inhibitory (antigrowth) signals, evasion of programmed cell death (apoptosis), limitless replicative potential, sustained angiogenesis, and tissue invasion and metastasis

Marine compounds that play a role in some of the hallmarks described by Hanahan and Weinberg. Then, they have classified marine natural product as growth inhibitors and anti-tubulin agents, inducers of apoptosis and autophagy, and anti-angiogenic, anti-migration, anti-invasion and anti-metastatic agents. In addition, due to their relevance in signal transduction pathways, a supplementary family that includes inhibitors of proliferation and of mitogen-activated protein kinases (MAPKs) are also included.

Cytotoxicity test toward cancer is a general basic test for anticancer drug and chemopreventive compounds. One of method that used generally for in vitro cytotoxicity test is MTT method . This method is based on reduction reaction of MTT reagent (3-(4,5-dimethylthiazole-2-yl) 2,5- diphenyltetrazolium bromide) which catalyzed by dehydrogenase succinate enzyme in human cell.

MATERIALS AND METHODS

Material

Halimena durvila was collected from Arakan Manado Indonesia in the period February 2015 respectively. The sample was thoroughly washed with seawater and fresh water to remove epiphytes and dirt particles. They delivery to laboratory and were stored at -20°C. Until further use.

Chemicals and reagents

1,1-diphenyl-2-picrylhydrazyl (DPPH), MTT (3-(4,5-dimethylthiazol-2-yl)-2,5 diphenyl tetra-zolium bromide), hella cell ((ATCC CC2 were purchased from Sigma Aldrich, All other solvent and chemicals were of analytical grade

Preparation of sample extract

Freeze sample extracted using methanol overnight for 3 times at room temperature, filtered with filter paper Whatman No. 1 and concentrated down at 40°C by rotary evaporation. The extract obtained was decantation using ethyl acetate and fractionated continuously using hexane, chloroform and water, after that they were evaporated. Extract and fraction storage at -20°C for further analysis.

Method of analysis

1. Antioxidant activity using of stable 1,1-diphenyl-2-picrylhydrazyl (DPPH) radicals assay.
2. Anti-cancer cervix using MTT (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetra-zolium bromide) assay.

Statistical analysis

All experiments were conducted in triplicate (n=3).

The means of parameters anticancer and antioxidant activity present as mean \pm standard deviation. The data were analyzed by using Statgraphic Centurion IX software.

RESULT & DISCUSSION

- Extract of seaweed



1. Scavenging radical dpph

The result of analysis shows that DPPH radical scavenger of water fraction was highest, followed with chloroform, methanol and hexane

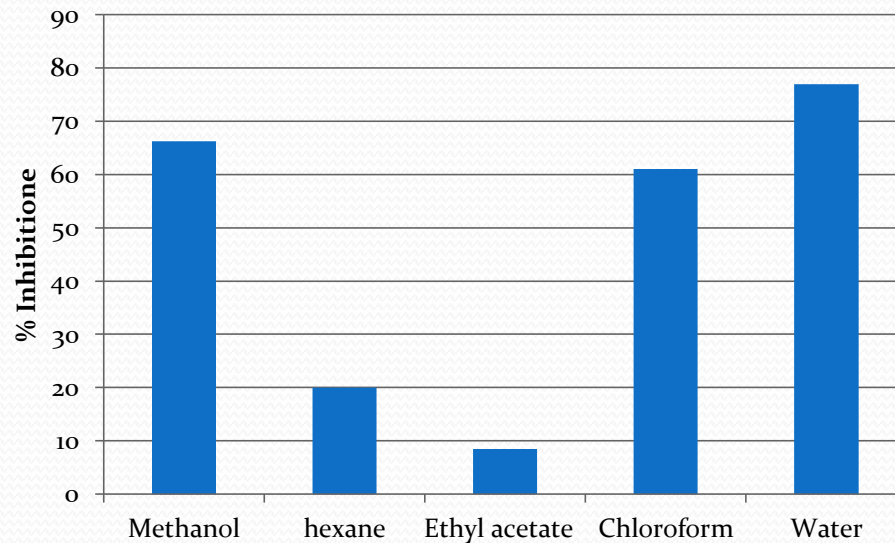
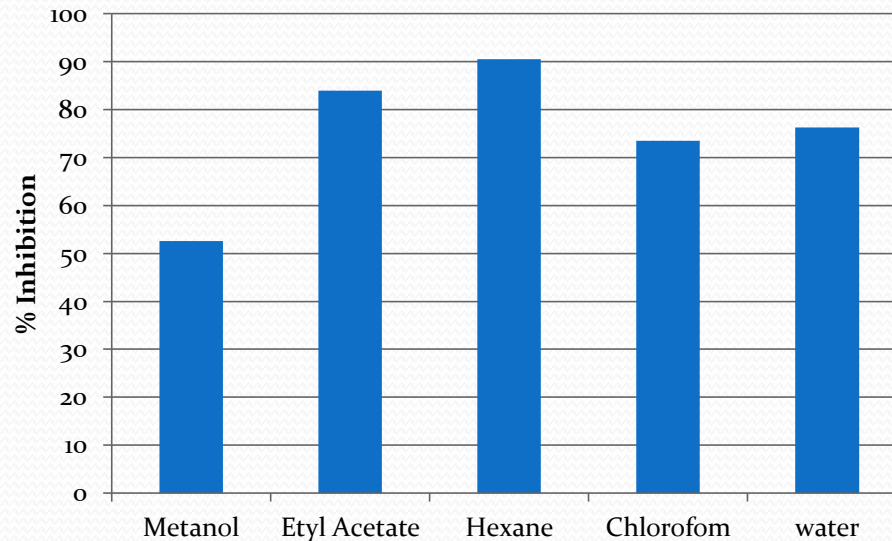


Fig.2. DPPH radical scavenging activity (%) of total methanolic extract and fractions obtained from *H. durviae*

• Anti-cancer servix activity

- The result shows that anti-cancer activity of hexane fraction was highest.



- **Fig.3. Anti-cancer cervix activity (% inhibition) of total methanolic extract and fractions obtained from *H. durvillae***

The research respectively showed the highest cytotoxicity to against HeLa cell was the hexane fraction, with inhibition activity of $93.05 \pm 5.4\%$ ($125 \mu\text{g}/\text{mL}$). The highest antioxidant activity against free radical was water fraction, $\text{IC}_{50} 5.18 \pm 0.4 \text{ mg}/\text{mL}$.

Edible seaweeds contain appreciable amounts of polyphenols which are effective antioxidants and may have particular biological activity. For example, polyphenol-rich extracts and isolated phlorotannin compounds have been shown to inhibit proliferation of cancer cells and influence anti-inflammatory responses (Yuan *et al.*, 2005; Kim *et al.*, 2009).

Carragenan is polysaccharide sulfate from saccharide sulfat of D-galactose and 3,6-anhydro-D-galactose extracted from red alga has been used in industry pharmacy, cosmetic and food. Many research showed Carragenan have activity to against few virus such as HIV, HSV and influenza virus. Carragenen especially L-carragenan are more potensial against HPV infection than heparin. Sulfat polysaccharide of red alga are effective inhibit pseudovirion HPV virus in IC_{50} 0,27 $\mu\text{g/mL}$

Caragenan with compound that have sama structure such as dextran can prepared as vaksin-peptida HPV vaxine (Buck et al., 2006)

Buck *et al* (2006) reported that the sulfated polysaccharide agar derived from red algae could also effectively block HPV pseudovirion infection with the IC₅₀ value of 0.27 µg/mL. In addition, carrageenan and its structurally related compounds such as dextran can also serve as adjuvants for enhancing peptide-based HPV vaccine potency . Iota carrageenans possess good anti-HPV activities in vitro and in vivo, we suppose that the sulfated galactose structure and the optimal sulfate content are very important for anti-HPV actions of carrageenans.

CONCLUSION

In the present study can be concluded that *H.durvilae* has bioactive compound which have function as an anti-oxidant and anti-cervix cancer, so it can utilized as a source of natural antioxidant.

The sulfated polysaccharides derived from red algae especially carrageenans merit further investigation as novel anti-HPV agents in the future.

This study is useful to future research to isolate and identified bioactive compound that responsible for highest antioxidant or anti-cancer servix.

Thank you

