1st INTERNATIONAL CONFERENCE ON ANTIOXIDANTS AND DEGENERATIVE DISEASES

3-4 JUNE 2015

ISTANA HOTEL

KUALA LUMPUR

MALAYSIA

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Welcome Note

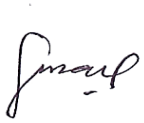
A very warm welcome to all participants and invited speakers to the 1st International Conference on Antioxidants and Degenerative Diseases (ICADD 2015). This conference is hosted by Antioxidants, Ageing and Degenerative Diseases Research Group, the National University of Malaysia (UKM), together with the Faculty of Medicine, UKM.

The conference committee has put together a truly unique programme which includes a series of state-of-the-art plenary lectures that will be presented by local and international renowned experts from all over the world. For free communication and poster presentations, we received abstracts from at least 15 countries such as Japan, Republic of Korea, Taiwan, India, Sri Lanka, Indonesia, Singapore, Thailand, Turkey, Egypt, Saudi Arabia, Bangladesh, USA, Europe and Malaysia. We believe that this conference will be an excellent platform to merge molecular biology research and clinical applications, in delivering new updates in antioxidants and degenerative diseases and will certainly provide a networking opportunity for researchers and clinicians to enhance their knowledge and collaboration in research.

We would like to thank the Government of Malaysia and Universiti Kebangsaan Malaysia particularly Faculty of Medicine, UKM for their support, the sponsors for their generous contributions and all organising committee members for their hard work in the organisation of this conference. We hope that this conference will be memorable, highly educational and inspire the participants to conduct truly transformative research in the future.

Thank you,

Dr. Mohd Hanafi Ahmad Damanhuri
Chairman
1st International Conference on Antioxidants & Degenerative Diseases
ICADD 2015



Prof. Dr. Suzana Makpol
Co-Chairman
1st International Conference on Antioxidants & Degenerative Diseases
ICADD 2015

3 JUNE 2015
MAHKOTA 2 BALLROOM

0730 - 0830	Registration of participants	
0830 - 0915	**PLENARY 1** **The Insulin-Like Effect of Lipoic Acid on Brain Ageing and a Mouse Model of Alzheimer's Disease** *Professor Dr. Enrique Cadenas (School of Pharmacy, University of Southern California, USA)* Chairperson: Professor Dr. Yasmin Anum Mohd Yusof	
0915 - 1015	Opening Ceremony	
1015 - 1030	Tea Break	
1030 - 1145	**Symposium 1** Theme: **Antioxidants in Metabolic Diseases** Chairperson: Professor Dr. Yoshikazu Yonei, Associate Professor Dr. Norzana Abd Ghafar	
	1030 – 1055	**Antioxidants and Metabolic Syndrome** *Professor Dr. Nafeeza Mohd Ismail (Faculty of Medicine, Universiti Teknologi MARA, Malaysia)*
	1055 - 1120	**Antioxidants and Cardiovascular Disease: Clinical Perspective** *Dr. Abdul Rashid Abdul Rahman (An Nur Specialist Hospital and Malaysian Institute of Garduate and Higher Training)*
	1120 - 1145	**Antioxidants and Metabolic Diseases: Clinical Concept** *Associate Professor Dr. Norlaila Mustafa (Faculty of Medicine, Universiti Kebangsaan Malaysia, Malaysia)*
1145 - 1230	**PLENARY 2** **Modulation of Redox Balance by Antioxidants in Carcinogenesis** *Professor Dr. Ah-Ng Tony Kong* *(Ernest Mario School of Pharmacy, Rutgers, The State University of New Jersey, USA)* Chairperson: Professor Dr. Paul W. Sylvester	
1230 - 1300	Sponsored Lunch Talk by Perkin Elmer **New Techniques for Fluorescence Microscopy in Quantitative Pathology** *Mr. Chris Johnson*	
1300 - 1400	Lunch	
1400-1515	**Symposium 2** Theme: **Antioxidants in Degenerative Diseases** Chairperson: Professor Dr. Suzana Makpol, Professor Dr. Ikuo Tooyama	
	1400 - 1425	**Synergistic Effects of Omega-3 Polyunsaturated Fatty Acids in Chemoprevention and Chemotherapy** *Professor Dr. Hye-Kyung Na (College of Human Ecology, Sungshin Women's University, Korea)*
	1425 - 1450	**Antioxidants in Degenerative Diseases: Special Focus on Honey** *Professor Dr. Gan Siew Hua (School of Medical Sciences, Universiti Sains Malaysia, Malaysia)*
	1450 - 1515	**DNA Methylation in Ageing, Disease Risk and Cancer** *Dr. Holger Heyn (Bellvitge Biomedical Research Institute, L'Hospitalet de Llobregat, Spain)*
1515 - 1600	**PLENARY 3** **Extension of the Healthspan by Antioxidants: True of False?** *Professor Dr. Yoshikazu Yonei (Department of Medical Life Systems, Doshisha University, Japan)* Chairperson: Professor Dato' Dr. Wan Zurinah Wan Ngah	
1600 - 1730	**Free Communication 1** Chairperson: Dr. Goon Jo Aan, Dr. Norwahidah Abd Karim	
1730 - 1745	Tea Break	

4 JUNE 2015
MAHKOTA 2 BALLROOM

0730 - 0815	Interactive Breakfast Workshop Title: **Enhancing Antioxidant and Natural Product Research** Moderator: *Professor Dr. Mohd Ilham Adenan (Universiti Teknologi MARA, Malaysia)* Panels: *Professor Dr. Ibrahim Jantan (Universiti Kebangsaan Malaysia, Malaysia),* *Professor Dato' Dr. Wan Zurinah Wan Ngah (Universiti Kebangsaan Malaysia, Malaysia),* *Professor Dr. Zhari Ismail (Universiti Sains Malaysia, Malaysia)*	
0830 - 0845	Sponsored Breakfast Talk by Straits Scientific **Personalised Cytometer for Multicolour Experiment** *Ms Toh Xue Yun*	
0845 - 1015	**Free Communication 2** Chairperson: Associate Professor Dr. Zakiah Jubri, Associate Professor Dr. Azman Abdullah	
1015 - 1100	**PLENARY 4** **Antioxidant Vitamins and Cancer Prevention: Is It Still Relevant?** *Professor Dr. Paul W. Sylvester (School of Pharmacy, University of Louisiana at Monroe, USA)* Chairperson: Professor Dato' Dr. Wan Zurinah Wan Ngah	
1100 - 1145	Tea Break & Poster Judging	
1145 - 1300	**Symposium 3** Theme: **Updates in Technology in Antioxidants Research** Chairperson: Professor Dr. Aishah Adam, Professor Dr. Ibrahim Jantan	
	1145 - 1210	**Integrative Approach in Natural Products Research to Discover Lead Antioxidant and Anti-Inflammatory Principles for Development of New Drugs and Herbal Medicines** *Professor Dr. Ibrahim Jantan (Faculty of Pharmacy, Universiti Kebangsaan Malaysia, Malaysia)*
	1210 - 1235	**Oxidative Stress as a Potential Marker of Risk to Degenerative Diseases** *Professor Dato' Dr. Wan Zurinah Wan Ngah (Faculty of Medicine, Universiti Kebangsaan Malaysia, Malaysia)*
	1235 - 1300	**Developing Antioxidants for Clinical Trials** *Professor Dr. Zhari Ismail (School of Pharmaceutical Sciences, Universiti Sains Malaysia, Malaysia)*
1300 - 1400	Lunch	
1400 - 1445	**PLENARY 5** **Targeting Antioxidant Pathways in Neurodegeneration** *Professor Dr. Ikuo Tooyama (Molecular Neuroscience Research Center, Shiga University of Medical Science, Japan)* Chairperson: Dr. Mohd Hanafi Ahmad Damanhuri	
1445 - 1530	**PLENARY 6** **Antioxidants Research: The Way Forward** *Professor Dr. Young-Joon Surh (College of Pharmacy, Seoul National University, Korea)* Chairperson: Professor Dr. Nafeeza Mohd. Ismail	
1530 - 1645	**Symposium 4** Theme: **Future Research Direction of Antioxidants in Health** Chairperson: Professor Dr. Ah-Ng Tony Kong, Associate Professor Dr. Norlaila Mustafa	
	1530 - 1555	**Natural vs. Synthetic Antioxidants for Health and Diseases** *Professor Dr. Aishah Adam (Faculty of Pharmacy, Universiti Teknologi MARA, Malaysia)*
	1555 - 1620	**Modulation of Gene Expression by Antioxidants to Delay Ageing** *Professor Dr. Suzana Makpol (Faculty of Medicine, Universiti Kebangsaan Malaysia, Malaysia)*
	1620 - 1645	**Conservation of Natural Antioxidants for Sustainability** *Professor Dr. Mohd Ilham Adenan (Atta-ur-Rahman Institute for Natural Product Discovery, Universiti Teknologi MARA, Malaysia)*
1645 - 1715	Closing Remarks and Award of Prizes	

NP-30

The Effect of Persea Americana Mill Juice on Serum Homocysteine and Plasma Malondialdehyde Levels in Streptozotocin (STZ)-Induced Sprague Dawley Rats

Yuniastuti A and Iswari R

Biology Department, Faculty of Mathematic and Sciences Semarang State University (UNNES) Semarang, Central Java, Indonesia

Background: Diabetes mellitus (DM) associated with increased level and oxidative activity of homocysteine (Hcy) that cause oxidative stress. Plasma malondialdehyde (MDA) known as a marker oxidative stress. Persea Americana Mill is folate contain and required to decrease Hcy level. Folate acting as methyl donor in metabolism of Hcy to be methionine, and prevent oxidative stress. The objective of our study is to demonstrate the effect of 50-days gradual dose Persea americana Mill juice on the decreased of plasma Hcy and MDA levels in Sprague Dawley rats induced by STZ.

Methods: An experimental study with a randomized controlled group pretest post-test design. Subject population was SD rats induced by 40 mg/kg weight i.p of STZ. Forty two samples were divided into 6 groups (C+,C-, X0, X1, X2 and X3). Serum Hcy was measured by Enzyme linked Immunoabsorbent Assay (Elisa), and plasma MDA by TBARS method. Data was analyzed by Wilcoxon and Kruskal Wallis test.

Results: Serum level of Hcy before and after supplementation in group C+: 19 µmol/L and 18 µmol/L, C-: 29 µmol/L and 33 µmol/L, X0: 27 µmol/L and 21 µmol/L respectively; group X1: 28 µmol/L and 24 µmol/L, respectively; group X2: 29 µmol/L and 20 µmol/L respectively, groups X3: 25 µmol/L and 18 µmol/L respectively. Serum Hcy levels was significantly different in group X3 before and after 5ml Persea Americana Mill juice (p=0,000). Serum Hcy level decreas in treatment and control group not significant different (p=0,762). Plasma MDA levels before and after treatment in group C+: 27 µmol/L and 26 µmol/L respectively; group C-: 34 µmol/L and 38 µmol/L respectively, group X0: 34 µmol/L and 35 µmol/L respectively; group X1: 30 µmol/L and 18 µmol/L respectively, group X2: 29 µmol/L and 18 µmol/L respectively; grouo X3: 25 µmol/L and 14 µmol/L respectively. Decrease of plasma MDA level significantly different between treatment and control (p=0,018).

Conclusion: Persea Americana Mill juice in SD rats induced by several dose of STZ can reduce serum Hcy level and on plasma MDA level, this might be concern with other source of oxidative stress beside lipid peroxide caused by Hcy.

Keywords: Persea Americana Mill, malondialdehyde, homocysteine

Effect of *Persea Americana Mill* Juice On Serum Homocystein And Plasma Malondialdehyde Levels On Stertozotocyn Induced Sprague Dawley Rats

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Abstract

Background: Diabetes mellitus (DM) associated with increased level and oxidative activity of homocystein (Hcy) that cause oxidative stress. Plasma malondealdehyde (MDA) known as a marker oxidative stress. Persea Americana Mill is folate contain and required to decrease Hcy level. Folate acting as methyl donor in metabolism of Hcy to be metionein, and prevent oxidative stress.
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Conclusion: Persea Americana Mill juice in SD rats induced by several dose of STZ can reduce serum Hcy level and on plasma MDA leve, this might be concern with other source of Oxidative stress beside lipid peroxide caused by Hcy

Keyword: Persea Americana Mill, Malondeladehyde, homocystein

INTRODUCTION

Diabetes mellitus adalah penyakit multifaktorial, merupakan sindroma hiperglikemia kronis dan gangguan metabolisme karbohidrat, lemak serta protein yang disebabkan insufisiensi sekresi ataupun aktivitas endogen insulin atau keduanya (Sivakumar&Subramanian, 2009). Prevalensi diabetes di dunia meningkat dengan cepat. Tahun 2010 diperkirakan 221 juta penduduk dunia menderita diabetes, dan pada tahun 2025 meningkat menjadi 300 juta (Liu et al., 2007) atau lebih di mana kawasan dengan potensial terbesar berada di Asia dan Afrika (Truccp, 2005; Bouwen & Ilse, 2005).

Diabetes Mellitus (DM) menyebabkan peningkatan insiden kesakitan dan kematian di seluruh dunia akibat komplikasi hiperglikemi. Komplikasi hiperglikemi jangka panjang berhubungan dnegan risiko thrombosis, aterosklerosis dan penyakit kardiovaskular. Tujuh puluh sampai delapan puluh persen penderita DM meninggal karena penyakit vaskuler (Wild et al., 2004).

Homosistein (Hcy) merupakan faktor risiko independent penyakit kardiovaskular. Pada pasien DM peningkatan Hcy dihubungkan dengan disfungsi endotel, resistensi insulin, makroangiopati dan nefropati. Autooksidasi Hcy dapat menghasilkan reactive oxygen species (ROS) berupa superoksid dan hidrogen peroksida. Hasil penelitian sebelumnya menyimpulkan bahwa Hcy menginduksi kerusakan sel sebagian besar melalui hydrogen peroksida. Kadar Hcy plasma yang tinggi menyebabkan peningkatan peroksidasi lipid (Dwivedi & Sarkar, 2010). Peroksidasi lipid dapat ditentukan oleh kadar malaondealdehyde (MDA).

Hiperglikemi terjadi akibat gangguan oksidasi glukosa dan penurunan biosintesis serta ekskresi insulin pada tikus yang diinduksi stz (Szkudelski, 2001).

Gejala diabetes ditunjukkan dalam beberapa hari pada hewan coba tikus yang diinduksi STZ intraperitoneal (i.p) dengan dosis 40 mg/kgBB (Ramesh & Pugalendi, 2006). Streptozotocyn (stz) merupakan antibiotik spektrum luas dan bersifat sitotoksik terutama terhadap sel beta pankreas. Injeksi stz menyebabkan degenerasi sel beta pankreas ditandai dengan perubahan karakterisitk insulin dan glukosa darah (Szkudelski, 2001; Abeeleh et al., 2009).

Tanaman berkhasiat obat telah banyak dipelajari secara ilmiah, yang secara klinis terbukti bermanafaat bagi kesehatan, selain itu obat tradisional yang berasal dari tumbuhan memiliki efek samping yang jauh lebih renadah tingkat bahayanya dibanding obat-obat kimia (Muslihah, 2006). Buah Alpukat (*Persea Americana Mill*) merupakan salah satu tanaman yang telah dikenal sebagai buah yang berkhasiat untuk menurunkan kadar kolesterol total dan sekaligus mampu mempertahankan HDL yang dapat melindungi peyakit jantung (Bangun, 2005).

Alpukat mengandung omega-9 asam oleat, vitamin A, vitamin B1, vitamin B3, vitamin B5, vitamin B6, vitamin B9 (asam folat), vitamin C, vitamin E, flavonoid, fosfor, zat besi, kalium, magnesium, dan glutation. Buah alpukat sangat kaya kandungan asam folat. Asam folat sebenarnya adalah vitamin B9 yaitu bagian dari vitamin B kompleks, merupakan jenis vitamin yang larut dalam air. Belum pernah dilaporkan manfaat buah alpukat teradap penyakit diabetes.

METHOD

Penelitian ini merupakan jenis penelitian eksprerimental laboratorium, menggunakan rancangan *pre test-post test only controlled group design.* Hewan coba tikus jantan strain Sprague Dawley sebanyak 42 ekor dibagi menjadi 6 kelompok,

yaitu kelompok K(+) merupakan kelompok kontrol yang tidak diinduksi stz diberi pakan standar dan air, K(-) kelompok kontrol yang diinduksi stz dan hanya diberi pakan standar, P0: kelompok kontrol tanpa diinduksi stz tetapi diberi alpukat 10 ml/kgbb/hari, P1: diinduksi stz dan diberi alpukat 10 ml/kgBB/hari, P2: diinduksi stz dan diberi alpukat 15 ml/kgBB/hari, P3: diinduksi stz dan diberi alpukat 20 ml/kgBB/hari. Induksi stz sebesar 40 g/kgBB/hari dilakuakan selama 4 hari. Penelitian dilakukan di laboratorium Fisiologi, Biologi Unnes. Tikus diinduksi stz selama 4 hari. Bahan yang digunakan dalam penelitian ini adalah alpukat, pakan standar, dan streptozotocin ALX-380-010 dari ALEXIS Corporation. Alat-alat: kandang tikus, spuit insulin 1cc, tabung hematokirt, spektrofotometer.

Data yang diperoleh selanjutnya dilakukan uji statistik dengan program *SPSS for windows versi 17,0* menggunakan uji *Wilcoxon* dengan taraf signifikansi 0,05 (Dahlan, 2010).

RESULT AND DISCUSSION

Kadar Homocystein

Rerata kadar Hcy sebelum dan setelah pemberian jus alpukat disajikan pada tabel 1.

Tabel 1. Rerata Kadar Hemosytein sebelum dan setelah perlakuan jus alpukat pada kelompok tikus Sprague Dawley µmol/L

Kelompok	Kadar Hemocystein (µmol/L)	
	Sebelum perlakuan	Setelah perlakuan
K(+)	(19±1,24)	(18±1,14)
K(-)	(29±2,37)	(33±1,24)
P0	(27±1,59)	(21±1,40)
P1	(28±1,07)	(24±2,06)
P2	(29±1,25)	(20±2,08)
P3	(25±1,66)	(18±1,13)

Uji Wilcoxon digunakan untuk menganalisis pengaruh pemberian juas alpukat terhadap kadar Hcy sebelum dan setelah perlakuan pada masing-masing kelompok, didapatkan perbedaan yang bermakna hanya pada kelompok pemberian jus alpukat 20 g/kgBB/hari (X3) dengan nilai p=0,00. Kelompok kontrol dan kelompok perlakuan tidak berbeda signifikan dengan nilai p=0,0762

Kadar homosistein yang tinggi dalam darah (homosisteninemia) pada kejadian diabetes mellitus merupakan faktor risiko terjadinya komplikasi kardiovaskular. Penelitian in vitro menunjukkan bahwa Hcy toksis pada sel endotel melalui peningkatan produksi H_2O_2 mempengaruhi sistem pertahanan antioksidan dan merangsang peroksidasi lipid (Wijekoon et al., 2007).

Hasil penelitian menunjukkan pemberian jus alpukat 20 ml/kgBB/hari dapat menurunkan kadar Hcy serum secara signifikan. Pengaruh pemberian jus alpukat dosis bertingkat yaitu 10 ml/kgBB/hari dan 15 ml/kgBB/hari memberikan pengaruh yang tidak signifikan. Hal ini terjadi karena pemberian juas alpukat yang mengandung asa folat dapat menurunkan kadar Hcy serum. Penurunan kadar Hcy serum karena asam folat menyebabkan peningkatan remetilaasi Hcy sehingga menurunkan Hcy dalam sirkulasi. Folat merupakan mikronutrien utama pada starus Hcy. Suplementasi folat digunakan sebagai pengobatan untuk menurunkan konsentrasi Hcy.

Penelitian ini didukung oleh hasil penelitian Huang et al (2001) yang menyatakan bahwa setelah 4 minggu pemberian folat, peningkatan kadar Hcy berhubungan dengan penurunan pemberian dosis folat. Kadar Hcy paling tinggi dijumnpai pada kelompok yang tidak mendapatkan folat dan kadar Hcy terendah pada kelompok folat 8 ppm.

Kadar Malondealdehyda (MDA) sebelum dan setelah perlakuan disajikan pada tabel 2.

Tabel 2. Rerata Kadar Malondealdehyde (MDA) sebelum dan setelah perlakuan jus alpukat pada kelompok tikus Sprague Dawley (µmol/L)

Kelompok	Kadar MDA (µmol/L)	
	Sebelum perlakuan	Setelah perlakuan
K(+)	(27±1,17)	(26±2,27)
K(-)	(34±1,28)	(38±1,74)
P0	(34±1,23)	(35±2,38)
P1	(30±2,56)	(18±2,13)
P2	(29±2,33)	(18±2,09)
P3	(25±2,85)	(14±1,56)

Analisis uji Wilcoxon digunakan untuk menganalisis pengaruh pemeberian jus alpukat terhadap kadar MDA plasma sebelum dan setelah oerlakuan pada masing-masing kelompok, terdapat perbedaan yang bermakna antara kelompok kontrol dan kelompok perlakuan.

Pengukuran konsentrasi MDA telah digunakan sebagai indikator kerusakan oksidatif pada lemak tak jenuh sekaligus sebagai indikator keberadaan radikal bebas. Hiperglikemi yang terjadi pada DM ikut terlibat dalam pembentukan radikal bebas. Hiperglikemi menyebabkan autoosidasi glukoas, glikasi protein dan aktifitas jalur metabolism poliol yang selanjutnya mempercepat pembentukan ROS.

Pemberian jus alpukat 20 ml/kgBB/hari selama 50 hari dapat menurunkan kadar MDA. Hal ini karena buah alpukat mengandung asam folat. Folat berperan sebagai donor metal pada metabolism Hcy menjadi metionin sehingga autooksidasi Hcy yang menghasilkan disulfide teroksidasi, dua proton (H+) dan dua electron (e-) yang merangsang pembentukan ROS tidak terjadi, sehingga tidak terbentuk radikal bebas yang bisa menimbulkan stress oksidatif akibat Hcy.

CONCLUSION

Persea Americana Mill juice in SD rats induced by several dose of STZ can reduce serum Hcy level and on plasma MDA leve, this might be concern with other source of Oxidative stress beside lipid peroxide caused by Hcy

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ICADD2015
KUALA LUMPUR, MALAYSIA

UNIVERSITI KEBANGSAAN MALAYSIA
The National University of Malaysia

CERTIFICATE OF ATTENDANCE

This is to certify that

Dr. Ari Yuniastuti, M.Kes.

has participated in the

International Conference on Antioxidants & Degenerative Diseases

held on

3rd & 4th June 2015

at

Istana Hotel, Kuala Lumpur

CHAIRMAN OF ICADD 2015	DEAN & DIRECTOR OF HOSPITAL CHANCELLOR TUANKU MUHRIZ, UKM MEDICAL CENTER	CO-CHAIRMAN OF ICADD 2015