ISBN : 978-602-96839-1-2
978-602-96839-3-6

International Conference On Medicinal Plants

The Future of Medicinal Plants:
From Plant to Medicine

Organized by

DAAD
Deutscher Akademischer Austauschdienst
German Academic Exchange Service

ISBN : 978-602-96839-1-2
ISBN of Volume 2 : 978-602-96839-3-6

PROCEEDING OF INTERNATIONAL CONFERENCE ON MEDICINAL PLANTS

in occasion of

the 38th Meeting of National Working Group on Indonesian Medicinal Plant

21-21 July 2010
Surabaya, Indonesia

Editor :

Elisabeth C. Widjajakusuma

Organizing Committee

FACULTY OF PHARMACY
WIDYA MANDALA CATHOLIC UNIVERSITY

in collaboration with
National Working Group on Indonesian Medicinal Plants
and German Academic Exchange Service

PREFACE

The International Conference on Medicinal Plants in occasion of the 38th Meeting of National Working Group on Medicinal Plant was held on the campus of Widya Mandala Catholic University in Surabaya during 21-22 July 2010. Over 300 participants had many fruitful discussions and exchanges that contributed to the success of conference. The present volume Proceedings (Volume 2) includes the papers presented at the conference and continues where Volume 1 leaves off.

The 192 abstracts that were presented on two days formed the heart of the conference and provided ample opportunity for discussion. Of the total number of presented abstracts, 63 of these are included in the Volume 1 and 58 in this proceedings volume. Both of the Conference Proceedings cover all aspects on key issues related to medicinal uses of plants, their active ingredients and pharmacological effects, production and cultivation of medicinal plants.

We appreciate the contribution of the participants and on behalf of all the conference participants we would like to express our sincere thanks to plenary speakers, Dr. Mona Tawab, Prof. Henk van Wilgenburg, Prof. Tohru Mitsunaga, Prof. De-An Guo, dr. Arijanto Jonosewojo, SpPD FINASIM, Dr. Bambang Prayogo, Mr. Jimmy Sidharta, Ir. Dwi Mayasari Tjahjono, S.Pd, Dipl. Cidesco,Dipl. Cibtac , and everybody who helped to make conference success and especially to our sponsors

National Working Group on Indonesian Medicinal Plants (POKJANAS TOI)
German Academic Exchange Service (DAAD)
PT. Landson
PT. Gujati 59
PT. Pasifik Sarana Cantik
PT. Herbal Plus
PT. Kaliroto

May you all be richly rewarded by the LORD.

All in all, the Conference was very successful. The plenary lectures and the progress and special reports bridged the gap between the different fields of the development of medicinal plants, making it possible for non-experts in a given area to gain insight into new areas. Also, included among the speakers were several young scientists, namely, students, who brought new perspectives to their fields. I hope this proceedings will promote the interdisciplinary exchange of knowledge and ideas in medicinal plant and related industries.

Dr.phil.nat. Elisabeth Catherina Widjajakusuma
Conference Chairman

ISBN : 978-602-96839-3-6(vol 2)

ANTIOXIDANT ACTIVITY OF FLAVONOIDS COMPOUND FROM KELOR LEAVES (*MORINGA OLEIFERA*)

Marsah Rahmawati Utami[1*], Lusiani Dewi Assaat[1], Supratno[1], Jorion Romengga[1], Yusridah Hasibuan[1], Irmanida Batubara[2]

[1]Post Graduate Students in Mayor of Chemistry[1], Department of Chemistry,
[2]Faculty of Mathematics and Natural Sciences, Bogor Agriculture University, Indonesia
[*]Corresponding author: mobile: +6285285969055, e-mail: mru@chemist.com

Abstract: Kelor (*Moringa oleifera*) had been investigated that consists of tannins, flavanoids, saponins, and alkaloids which usually have antioxidant activity. The aim of this investigation is to determine antioxidant activity of flavanoid compound from kelor leaves. Antioxidant activity was determined by 2,2-diphenil-2-picrylhydrazyl (DPPH) free radical scavenging method. The result showed that from 13 fraction of ethanol extract, fraction 11 was the most active fraction for antioxidant activity (IC_{50} 147.3 µg/ml). The fraction 11 had been separated by preparative TLC and consists of four components (F 11.1, 11.2, 11.3, and11.4). F11.1 was analysed by TLC and quercetine as a standard, showed that F11.1 gave the same retention factor (Rf) value with quercetine. FTIR Identification showed that F11.1 content –OH stretch (3429 cm^{-1}), C-H aliphatic (2924 cm^{-1}, 2854.2 cm^{-1}), C=O stretch (1637.96 cm^{-1}), overtone or combination bands (2426.45; 2362.47; 2337.98cm^{-1}), C=C ring stretch (1450 cm^{-1}), C-O stretch (1109.90 cm^{-1}).

INTRODUCTION

Moringa oleifera Lam. (horseradish, drumstick tree, kelor, marangghi, moltong, parrongge) is a highly valued plant, distributed in many countries of the tropics and subtropics. It has an impressive range of medicinal uses with high nutritional value. Different parts of this plant contain a profile of important minerals, and are a good source of protein, vitamins, beta-carotene, amino acids and derivate of phenol.

Various parts of kelor are generally known for their multiple pharmacological activities. A leaf extracts show hypocholesterolaemic (Gupta *et al.* 1999), Hypotensive, antioxidant, and anti-ulcerative activity (Siddhuraju and Becker, 2003). The dry pods are *adequate to use as a substratum for laboratory animal bedding. The seeds show antifungal* and antibacterial (Eilert et al. 1981), antitumor (Murakami et al. 1998), anti-inflammatory, diuretic, antispasmodic and larvicide's activity against the mosquito which transmits dengue and yellow fever. The seeds of this plant are also employed for water purification (Okuda *et al.*, 2001). Gupta and coworkers (1999) showed that the roots were able to depress the central nervous system, cause analgesia and potentate the analgesic effect of morphine.

Phytochemical investigation isolated the bioactive compounds from the seeds of kelor and found to have glycosides such as niazimicin and niazirin, beta-xyterol and 41% moringa oil (which was found to contain high level of unsaturated fatty acids similar to olive oil) (Mukarazami *et al.*, 1998). Phytochemistry analysis of leave's extract demonstrated the presence of the common phytoconstituents like tannin, saponins, flavanoids, terpenoids, and glycoside (Nepolean et al. 2009).

MATERIALS AND METHODS

Plant materials and chemicals

Kelor leaves were collected from Bogor, Indonesia.

Preparation of kelor extract

The dried and powdered kelor leaves were extracted with n-hexane for three days. The residue was extracted with ethanol 70% for three days. The extracts were filtered using Whatman 40 and concentrated in vacuum at 40°C using a rotary evaporator. The extract yields were then calculated.

Fractionated ethanol extract by column chromatography

Sum of 1.5 g of semi-solid masses of ethanol extract were separated by column chromatography using step gradient method (methanol-ethyl acetate as a mobile phase). Each fraction concentrated in vacuum at 40°C using a rotary evaporator to yield semi-solid masses whose weights were determined.

Antioxidant assay (Batubara et al. 2009)

The antioxidant assay used in this study adopted a free-radical-scavenging activity using the 2,2-diphenyl-1-picryl-hydrazyl (DPPH) test. Each fraction were diluted in ethanol to make final concentrations of 25, 50, 100, 150, 200, and 250 µg/ml. 100 µl of DPPH solution (11.8 mg DPPH in 100 ml ethanol) was added to each well plate. After 30 min, the absorbance of the mixture was measured at 490 nm. The positive control was ascorbic acid while ethanol was used as the blank. The inhibitory activity was calculated according to the following equation:

$$\text{Inhibition}\ (\%) = [1 - (A_{sample} - A_{control})/(A_{blank} - A_{control})] \times 100\%.$$

where A_{sample} is the absorbance of the sample, $A_{control}$ is the absorbance of ascorbic acid as control and A_{blank} is the absorbance of ethanol as the blank. Each fraction concentration of the fractions and positive control were tested in duplicate.

RESULTS AND DISCUSSION

Sum of 13 fractions had been separated from ethanol extract of kelor leaves. The rendement and retention factor (Rf) value of the fractions are presented in Table 1.

Table 1 Rendement and Rf value for the fractions of ethanol extract

Number of Fraction	Rendement (%)	Flavanoid test	R_f value
1	7.06	+	0.12, 0.95, 0.88, 0.75
2	5.3	-	0.98, 0.90, 0.85, 0.78
3	4.58	-	0.96
4	2.99	+	0.93, 0.88
5	1.28	+	0.96
6	21.19	+	0.94, 0.86
7	2.8	-	0.98, 0.91, 0.84, 0.75
8	9.97	+	0.95, 0.85
9	3.15	-	0.94
10	1.61	+	0.93, 0.82
11	5.32	+	0.93, 0.86, 0.81, 0.75
12	12.91	-	0
13	5.87	-	0

Each of fractions was tested with flavanoid test and antioxidant activity. Fraction 11 was the most active fraction for antioxidant activity (IC_{50} 147.3 µg/ml). Relation between fractions concentration and % inhibition are presented in Fig.1.

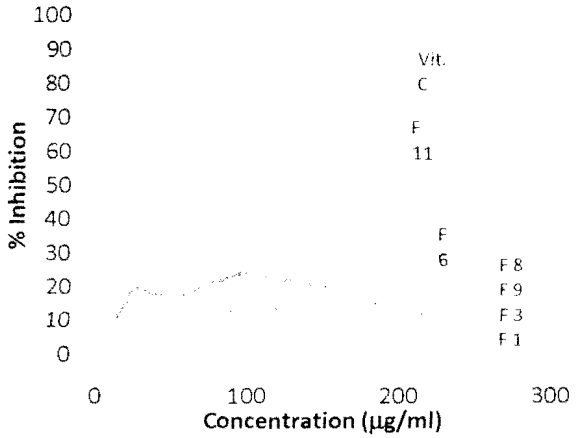

Fig. 1 Relation between fraction concentration and % inhibition

Fraction 11 had been separated by preparative TLC (methanol: ethyl acetate: water as mobile phase). The separation was obtained four components (F11.1, F11.2, F11.3, and F11.4). Each of fraction was analysed by TLC (with quercetine as a standard). F11.1 showed the same resolution with quercetine (Rf = 0.93). FTIR identification showed that *F11.1 content –OH stretch (3429cm^{-1}), C-H aliphatic (2924 cm^{-1}, 2854.2 cm^{-1})*, C=O stretch (1637.96 cm^{-1}), overtone or combination bands (2426.45; 2362.47; 2337.98cm^{-1}), C=C ring stretch (1450 cm^{-1}), C-O stretch (1109.90 cm^{-1}). FTIR spectrum of F11.1 is presented in Fig 2.

Fig. 2 FTIR spectra of F11.1

CONCLUSION

Fraction 11 from this study demonstrated as the best antioxidant value. Fraction 11.1 was analysed by TLC and had the same resolution with quercetine as standard (Rf = 0.93). FTIR identification of F11.1 showed F11.1 content functional group –OH, C-H aliphatic, C=O, aromatic, and C-O.

ACKNOWLEDGEMENTS

We would like to thank Prof. Dr. Ir. Latifah K. Darusman, Dr. Irmanida Batubara, and Muhammad Yusuf, who have supported us throughout this research.

REFERENCES

Batubara I, Tohru M, Hideo O. 2008. Screening antiacne potency of Indonesian medicinal plants: antibacterial, lipase inhibition, and antioxidant Activities. *J. Wood Science*. **55**.230-235.

Eilert U, Wolters B, Narsdtedt A.1981. The antibiotic principle of seeds of *Moringa oleifera* and *Moringa stenopetala*. *Planta Med*. **42**. 55-61

Gupta M, Mazumder UK, Chakrabarti S. 1995. CNS activities of methanolic extract of *Moringa oleifera* root in mice. *Fitoterapia*. **70**. 244-50.

Murakami A, Kitazono,Y, Jiwajinda S Koshimzu, K & Ohigashi, H. (1998). Niaziminin, a thiocarbamat from the leaves of *Moringa oliefera*, Holds a strict structural requirement for inhibition of tumor-promoter induced Epstein Barr Virus Activation. *Planta Medica*, **64**, 319-323.

Nepolean P, Anitha J, Renitta RE. 2009. Isolation, analysis, and identification of phytochemicals of antimicrobial activity of *Moringa oleifera* Lam. *Current Biotica*. 3.1

Okuda T, Baes AU, Nishijima W, Okada M. 2001. Isolation and characterazation of coagulant extracted from *Moringa oleifera* seed by salt solution. *Water Reasearch*. **35**. 405-410.

Pal SK, Mukherjee PK, Saha P. 1995. Studies on the antiulcer activity of *Moringa oleifera* leaf extract on gastric ulcer models in rats. *Phytother Res*. **9**.463-465.

Siddhuraju P, Becker K. 2003. Antioxidant properties of various solvent extracts of total phenolic constituents from three different agroclimatic origins of drumstick tree (*Moringa oleifera* Lam) leaves. *J. Agric. Food Chem*. **51**. 2144-2155.