

Ten Commonly Available Medicinal Plants in Malaysia with Potential Sun Protection Factor and Antioxidant Properties – A Review

Noor Diyana Ibrahim¹, Lay Jing Seow^{2,*}, Mahendran Sekar², Nur Najihah Izzati Mat Rani¹, Pei Teng Lum²

Noor Diyana Ibrahim¹, Lay Jing Seow^{2,*}, Mahendran Sekar², Nur Najihah Izzati Mat Rani¹, Pei Teng Lum²

¹Faculty of Pharmacy and Health Sciences, Royal College of Medicine Perak, Universiti Kuala Lumpur, Ipoh - 30450, Perak, MALAYSIA.

²Department of Pharmaceutical Chemistry, Faculty of Pharmacy and Health Sciences, Royal College of Medicine Perak, Universiti Kuala Lumpur, Ipoh - 30450, Perak, MALAYSIA.

Correspondence

LJ Seow

Department of Pharmaceutical Chemistry, Faculty of Pharmacy and Health Sciences, Royal College of Medicine Perak, Universiti Kuala Lumpur, Ipoh - 30450, Perak, MALAYSIA.

E-mail: ljseow@unikl.edu.my

History

- Submission Date: 10-12-2021;
- Review completed: 16-01-2022;
- Accepted Date: 25-01-2022.

DOI : 10.5530/pj.2022.14.57

Article Available online

<http://www.phcogj.com/v14/i2>

Copyright

© 2022 Phcogj.Com. This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International license.

ABSTRACT

Background: Malaysia has a diverse range of medicinal plants that utilized to make effective nutritional, folk medicine, and cosmetic preparations. Natural antioxidants obtained from medicinal plant extracts have recently gained popularity as protective ingredients in sunscreen formulations due to their safety, wide range of biological effects on skin, and environmental sustainability in absorbing Ultraviolet (UV) radiation and preventing skin damage. Prolonged exposure to UV rays may cause skin damages like sunburn, photoaging, erythema, edema, wrinkle, and skin cancer. Natural sunscreen products are becoming more popular among consumers who are becoming more aware of the risks of excessive UV and chemicals in beauty and personal care products. **Objective:** This review aimed to provide brief information about ten commonly available medicinal plants in Malaysia with potential sun protection factor and antioxidant properties. **Methods:** In the present review, the relevant literatures were an extensive search from various scientific database including Pubmed, Google Scholar, ScienceDirect and Scopus. Ten commonly available medicinal plants in Malaysia such as *Graptophyllum pictum*, *Moringa oleifera*, *Mangifera indica*, *Zanthoxylum rhetsa*, *Andrographis paniculata*, *Sonneratia caseolaris*, *Camellia sinensis*, *Morinda citrifolia*, *Nephelium lappaceum* and *Murraya koenigii* were included based on its potential sun protection factor (SPF) and antioxidant properties. **Results:** All the ten medicinal plants reported in this review found to have potential antioxidant activities due to the presence of phenolic and flavonoid content in the extracts. All of these findings well correlated to their potential SPF. The *M. indica* extracts had the highest SPF value among the ten plant extracts reported in this review, with a value of ≥ 30 . This is considered high sun protection action. Extracts of *A. paniculata*, *M. citrifolia*, *C. sinensis*, and *G. pictum* have a moderate photoprotective effect (SPF value of ≥ 15). Sun protection activity was low in *M. oleifera* and *S. caseolaris* (SPF value ≤ 2). **Conclusion:** The identification of natural antioxidant and photoprotective ingredients from medicinal plants has demonstrated as a potential natural sunscreen product in protecting UV radiation against damaging UV rays, and therefore recommended to utilize them to replace synthetic chemicals in cosmetics development in the future.

Key words: Medicinal plants, Antioxidant, Total phenol, Total flavonoid, Sun protection factor.

INTRODUCTION

Skin is the outer layer and largest organ of the human body that provides UV protection. UV radiation is a type of electromagnetic radiation that emitted by the sun in the form of waves or particles with varying wavelengths and frequencies.¹ UV radiation generally divided into three subtypes: UVA (320-400 nm), UVB (290-320 nm) and UVC (200-290 nm).² The ozone layer absorbs UVC before it reaches the planet, however the ozone layer does not totally filter off UVA and UVB. Hence, both UVA and UVB contribute for the harmful effects on human skin due to the sunburn and accelerates skin aging.^{1,3} Excessive radiations of sunrays may initiate the generation of reactive oxygen species (ROS) or free radicals, which induce the oxidative damage and impairment of the antioxidant system. As the consequences, this extensive and chronic UV exposure proven lead to skin side effects such as erythema, edema, photoaging, sunburn, lines and wrinkles, photosensitivity, immunosuppression and carcinogenesis.¹

Daily use of sunscreen before outdoor activities is the one-step to prevent the skin against the harmful effects of UV radiation and the rising

demand for sun protection creams has boost the market growth of sun protection products. However, sunscreen today consist of several synthetic UV filter molecule. Along with the increasing concern on healthy, beauty skin as well as hot weather and pollution, the consumption of products with sunscreen ingredients have reached 87% of global market in 2016.⁴ Consumer demands has go beyond simple UV protection to natural ingredient and simpler formulation.⁵ Unfortunately, majority products in the existing market are formulated from synthetic active ingredients such as titanium oxide, benzophenone, bisdisolizole disodium which is potentially hazardous for long-term use.⁶

Nowadays, natural substances extracted from plants have been gaining attraction as protective agents incorporated into cosmetic formulations due to their safety, responsible for multiple biological effects on skin and environmental sustainability.⁷ Natural constituents have been considered a photoprotection agent because they can prevent UV-ROS or free radical formation and associated lipid peroxidation (LPO) and act as a stimulant in the first phase of photosynthesis due to their potentially important biological antioxidants like Vitamin C, Vitamin E, flavonoids, carotenoids, phenolic acids, and enzymes (Figure 1).^{8,9}

Cite this article: Ibrahim ND, Seow LJ, Sekar M, Rani NNIM, Lum PT. Ten Commonly Available Medicinal Plants in Malaysia with Potential Sun Protection Factor and Antioxidant Properties – A Review. Pharmacogn J. 2022;14(2): 444-455.