

Oral presentation: 117

Determination of photoprotective potential in sunscreen formulations with different concentrations of *Olox zeylanica* (Mella) extract

C. E. Liyanaarachchi¹, M. Napagoda^{1*}, S. Malkanthi¹, K. Abayawardana¹, S. Witharana² and L. Jayasinghe³

¹Department of Biochemistry, Faculty of Medicine, University of Ruhuna, Galle 80000, Sri Lanka

²Faculty of Engineering, Higher Colleges of Technology, PO Box 4793, United Arab Emirates

³National Institute of Fundamental Studies, Kandy 20000, Sri Lanka

*mayurinapagoda@yahoo.com

The ultra-violet (UV) component of the solar radiation can cause various deleterious effects on the human skin. The occurrence of wide range of dermatological diseases are correlated with the excessive exposure to UV radiation, out of which, skin cancers are more lethal than the others. Skin cancer is a result of chronic exposure to the UV radiation, but there are many acute effects such as hyperpigmentation, erythema and weakening of immunological functions. The best method to avoid UV exposure is to abstain from outdoor activities during the daytime, however, this is not always possible and practicable. Thus, the topical application of synthetic sunscreens has been widely adopted as a preventive measure despite the number of adverse effects associated with these products. In this respect, the development of herbal sunscreen products devoid of undesirable harmful effects as alternatives to the synthetic sunscreens would be highly beneficial. Therefore, the present study focuses on the development of herbal sunscreen formulations using different concentrations of aqueous-methanolic extract of *Olox zeylanica* and the evaluation of photoprotective potency in each formulation. The aqueous-methanol extract was prepared using dried leaves of *O. zeylanica*. Thereafter, sunscreen formulations were developed by incorporating this extract at different concentrations (*ie.* 25%, 50% and 75%) to the aqueous-cream base. The UV absorbance of each preparation was measured between 260-400 nm and the sun protective factor (SPF) was calculated according to the Mansur equation. Calculation of SPF is an evaluation method of how much photoprotection is given by a sunscreen product and our observations revealed that the formulation with 25% of the extract possesses the lowest SPF. In the other end, the formulation containing 75% of the extract has the highest SPF which gives an indication that when the extract concentration is higher, the protection from UV radiation is also higher. The photostability of this formulation was also evaluated by calculating SPF after exposing it to the direct sunlight for 7, 14 and 21 days. Since there was no significant reduction in the SPF value within the stipulated time period, the formulation exhibited photostability. Based on the preliminary observations, it is possible to hypothesize the presence of UV absorbing organic molecules in the *O. zeylanica* extract. Therefore, experiments are in progress to identify these secondary metabolites and also to increase the efficacy and bioavailability of the formulation using nanotechnology.

Keywords: *Olox zeylanica*, photoprotection, photostability, sun protective factor, ultra-violet radiation

Acknowledgement: This work was supported by National Science Foundation, Sri Lanka under the research grant RG/BS/2017/05