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Formulation of Antioxidants Rich Herbal Cream using Leaf Extract of *Ocimum tenuiflorum* (krishna thulsi) and Evaluation of *In vitro* Antioxidant Activity

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Background: Herbal cosmetics have gained considerable attention comparatively with synthetic cosmetic products. *Ocimum tenuiflorum* is a well-known medicinal plant widely used in Indian traditional medicinal and cosmeceutical preparations.

Objectives: To formulate novel herbal cream using *O. tenuiflorum* leaf extract and evaluate *in vitro* antioxidant activity.

Methods: The crude extract of 70% aqueous acetone was prepared by steeping method and the total phenolic, flavonoid contents of the extract were evaluated by using Folin-Ciocalteu assay and aluminum chloride colorimetric method, respectively. *In vitro* antioxidant activity was determined by 2,2-diphenyl-1-picrylhydrazyl (DPPH) and ferric-reducing antioxidant power activity (FRAP) assay. The herbal creams (F1-F4) were formulated by incorporating the freeze-dried powder of the extract to the cream base and essential oils (Eucalyptus and Lavender) followed by evaluation of *in vitro* antioxidant activity with compared to a commercial product. The physical stability parameters (pH, odour, phase separation, appearance and colour) were also tested at room temperature.

Results: The results of the total phenolic and flavonoid contents for the extract were 1973.8±2.9 mg Gallic acid equivalents (GAE)/ 100 g fresh weight (FW) of leaves and 1879.8±14.2 mg Catechin equivalents (CAE)/ 100 g FW of leaves, respectively. Radical scavenging activity was 10.7±0.1 mmol Trolox equivalents/ 100 g FW of leaves and ferric reducing antioxidant power was 25.3±0.2 mmol Fe(II) equivalents/ 100 g FW of leaves, respectively. There were no remarkable changes in the physical parameters tested during the time observed. Among the different formula tested, F4 was selected as the most stable formula with the highest antioxidant activity measured by DPPH assay (6.8±0.1 mmol Fe(II) equivalents/ 100 g weight of cream) and FRAP assay (3.4±0.1 mmol Fe(II) equivalents/ 100 g weight of cream).

Conclusions: The results revealed that *O. tenuiflorum* leaf extract tested was rich with phenolics and flavonoids which would have contributed to reveal highest antioxidant activity of the F4 cream formulation.

Keywords*: Antioxidant activity, DPPH assay, FRAP assay, Ocimum tenuiflor*