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Effect of drying methods on the total flavonoid content, total phenolic content and total antioxidant capacity of five plant leaves with potential use in cosmetics

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Drying is the most common and fundamental method for post-harvest preservation of medicinal plant materials. It allows the quick conservation of medicinal qualities of plant materials in an uncomplicated manner. However, the instability of some flavonoids and phenolic compounds in medicinal plants which exhibit potent antioxidant activity and wide range of pharmacological properties may indicate a sensitivity to different drying treatments. In this sense, it is important to determine the factors that can preserve these crucial bioactive compounds of plant materials during the drying process. Therefore, the objective of the present study was to determine the effect of hot air oven drying, solar drying and shade drying on bioactive ingredients of five cosmetic potential plant leaves. Leaves of *Centella Asiatica* (L.) Urb., *Senna alata* (L.) Roxb., *Justicia adhatoda* L., *Ocimum tenuiflorum* L., *Hibiscus rosa-sinensis* L. were dried to a constant weight using shade drier at 30-35 °C, solar drier at 30-40 °C and hot air oven at 40 °C. Folin- Ciocalteu method, aluminum chloride colorimetric assay and phosphomolybdate assay were employed to analyse the total phenolic content, total flavonoid content and total antioxidant capacity of ethanolic extracts of leaves respectively. All assays were performed in triplicate. Results showed that significantly higher flavonoid content, phenolic content and antioxidant capacity of solar dried leaves of *O. tenuiflorum* and *H. rosa-sinensis* in comparison with hot air oven drying and shade dried samples. Solar dried *C. asiatica* and *S. alata* leaves showed high flavonoid content and antioxidant capacity while the phenolic content was high in shade dried leaves of *S. alata* and oven dried leaves of *C. asiatica* respectively. In contrast, *J. adhatoda* showed the maximum flavonoid content in shade drying samples, the highest phenolic content in solar dried leaves and the maximum antioxidant capacity in oven dried leaves. Moreover, there were no significant differences ($p > 0.05$) among drying methods in terms of antioxidant capacity and phenolic content of *J. adhatoda*. and antioxidant capacity of *C. asiatica*. Thus, it can be concluded that, not only drying temperature and duration but also the plant species and types of metabolites present in plant materials determine the effect of drying method on bioactive compounds. Finally, solar drying of medicinal plant materials using solar drier would be an economical, efficient and effective drying method for preserving bioactive compounds present in leaves of above-mentioned plant materials.

Keywords: Antioxidant, Cosmetic potential plants, Drying, Flavonoid, Phenolic

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