Investigating the total phenolic content, anti-aging, anti-acne and anti-hyperpigmentational effects of Jordanian horsetail (*Equisetum ramosissimum)*: An *in vitro* study.

Study by
Noor Sabah Abed Savaya
Supervised by Co-supervised by
Dr. Reem Isaa Dr. Wamidh Talib

Abstract

Previous studies showed varied traditional uses of horsetail plant (*Equisetum ramosissimum Desf.*) with numerous pharmacological effects. This study was conducted in order to investigate the presence of different phytochemical contents, total phenolic content, in addition to potential anti-aging, anti-acne and anti-hyperpigmentational effects of *E. ramosissimum Desf.* Using different extraction methods. The arial part of the authorized *E. ramosissimum Desf.* Species available in The Hashemite Kingdom of Jordan was extracted using maceration and soxhlet methods, utilizing four solvents with different polarities (water, aqueous methanol, ethanol and ethyl acetate). Preliminary qualitative phytochemical screening tests detected the presence of different compounds with variations between extracts. The total phenolic content, antioxidant, *anti-propionibacterium acne* and tyrosinase inhibitory effects were determined, using the standard methods for each. Among the tested extracts that showed the presence of phenolic compounds, aqueous/methanol extract has shown the highest total phenolic content, equivalent to Gallic acid, for 1 mg/ml concentration (0.675 mg/ml). Also the mentioned extract contains flavonoids, tannins, alkaloids and saponins with highest antioxidant (IC_{50}=0.125 mg/ml) and anti-tyrosinase ($IC_{50=}$ 1.125 mg/ml). While the ethanol extract showed total phenol content of (0.394 mg/ml), in addition to the presence of flavonoids, tannins, alkaloids and saponins. The later extract had most potent anti-*P. Acne* effect (MIC= 3.125 mg/ml and MBC= 6.25 mg/ml). Other extracts, including water and ethyl acetate showed low total phenolic content with weak biological effects. This study revealed that *E. ramosissimum Desf.* Aqueous/methanol extract is a potential anti-aging and anti-hyperpigmentational agent, while the ethanol extract is a potential anti- *P. acne* agent. These findings should be taken further to determine the specific phytochemical contents in each extract, in order to enable their use in the manufacturing of pharmaceutical formulations designed for treating of varied skin disorders.