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Phytochemical analysis and preliminary pharmacological evaluation of horse apple as a sustainable source for bioactive isoflavones

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The fruit of *Maclura pomifera* tree (Raf.) Schneid. (family Moraceae), commonly known as horse apple, has traditionally been used as an insect repellent and its extract is a strong antioxidant. The major constituents of horse apple are the prenylated isoflavones pomiferin and osajin which are responsible for its antioxidant activity as well as other activities, such as cardioprotective and antitumor effects. The tree grows in Southern United States and the Midwest and produces its fruits in abundance during late summer and fall making it a rich and sustainable source for medicinally useful natural products. The first goal of this project was to identify horse apple sources and the best sample preparation procedures leading to extracts with high isoflavone content. The second goal was to investigate the activity of horse apple in new targets for certain disease conditions. To achieve the first goal, a reversed-phase HPLC method was developed, validated and applied to determine the effect of geographical location, degree of development and sample preparation on the levels of pomiferin and osajin in horse apple. For the second goal, the total methanolic extract was evaluated in two panels of *in vitro* assays for anti-inflammatory activity (inhibition of iNOS and NF- κ B/induction of NAG), and inhibition of tau protein fibrillation. Phytochemical analysis indicated that the isoflavone content in horse apple may exceed 5% of dry weight and that the degree of maturity of the fruit has a significant effect on its isoflavone content. Some promising results were also obtained from the preliminary *in vitro* evaluation of the total extract.

Biography

Ehab A. Abourashed graduated with a Bachelor of pharmaceutical sciences at Cairo University, Egypt. He obtained his Masters and PhD degrees from the Universities of Tennessee and Mississippi, respectively. He worked as senior scientist at GlaxoSmithKline and director of quality assurance at ElSohly Labs, USA. He was a faculty member at King Saud University prior to joining the College of Pharmacy at Chicago State University. He has more than 80 publications and presentations on natural products isolation, structure determination and microbial transformation as well as phytochemical, biochemical and environmental analysis. He is a member of many professional and honor societies.

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