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## Herbal plant decoctions and the potential for efficacious disease therapy: A study on lyophilized *Brickellia cavanillesii* (Asteraceae)

## Etetor Roland Eshiet

SEEED (Sustainable Energy Environmental and Educational Development), USA

The use of complementary and alternative medicine (CAM) in disease therapy has increased exponentially in recent years. Therbal plant decoctions, an integral component of CAM, are a veritable source of alternative medicine. Treatment using herbal extracts constitutes a tremendous resource for alternative remedy especially at disease onset. A scientific investigation of traditional herbal plants may provide valuable leads for the development of alternative drugs and therapeutic remedies. The dearth of valid ethnobotanical information on herbal plants used in disease therapy remains an impediment to the utilization of CAM by clinicians. Factors such as improper identification and standardization of these herbal plants constitute a potential reason for concern. Consequently, it is imperative that studies are undertaken to assure the quality, efficacy, and safety of these plants. Our plant of interest, *Brickellia cavanillesii* (Asteraceae), one of the more popular herbal plants consumed in Central America, Mexico, and the southwestern parts of the USA for the treatment of Type 2 diabetes mellitus, is believed to possess hypoglycemic and anti-oxidative properties. Unfortunately, little is known about its chemical composition. This study investigates the lyophilized extracts of *B. cavanillesii* in an attempt to elucidate its use as a therapeutic agent; chromatographic methods were utilized to analyze the methanolic extract of lyophilized *Brickellia cavanillesii*. The identified compounds were found to be the primary constituents of the essential oils of many plants and flowers. Essential oils are employed widely in traditional disease remedies.

etetoreshiet@yahoo.com

## Biofortified, selenium enriched, fruit and cladode from three *Opuntia* cactus pear cultivars grown on agricultural drainage sediment for use in nutraceutical foods

John L Freeman<sup>1, 2</sup>, Cecil Stushnoff<sup>3</sup>, Spencer S Walse<sup>1</sup>, Tatiana Zuber<sup>3</sup>, Soo In Yang<sup>4</sup>, Ingrid J Pickering<sup>4</sup> and Gary S Bañuelos<sup>1, 2</sup> <sup>1</sup>Agricultural Research Services, USA <sup>2</sup>California State University Fresno, USA <sup>3</sup>Colorado State University, USA <sup>4</sup>University of Saskatchewan, Canada

Three different cultivars of drought, salt and boron (B) tolerant *Opuntia ficus-indica* (Cactus pear) were grown in poor-quality agricultural drainage sediment high in salt, B and selenium (Se) that originated from the Westside San Joaquin Valley. Nutritional contents were then measured in these Cactus pear fruit (purple, red, or orange-colored) and vegetative cladodes (modified stem-like leaves) compared to the same cultivars grown adjacent on a low saline sandy loam soil. After harvesting fruit and cladodes, the mineral nutrients, chemical speciation of Se, total phenolics, vitamin C and antioxidant status were analyzed. The results demonstrated positive nutritional changes in both cladodes and fruit within the Cactus pear cultivars when grown on agricultural drainage sediment compared to those grown on normal soil. Under these conditions Cactus pear plants contained nutraceutical qualities and represent a useful anti-carcinogenic Se-enriched chemotherapeutic food crop for providing advanced dietary seleno pharmacology in order to help fight human diseases.

jfreeman@intrinsyx.com

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