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Bioactive, nutritive compounds and their antioxidant characteristics of Pepper (*Capsicum chinense*) leaves under-utilized in human diets

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Abstract

Capsicum chinense pepper fruits, seeds and pericarps have been widely studied for their antioxidants and therapy benefits. However, little is known about the dry and wet leaves as it relates to the presence of phenolic compounds, carotenoids, chlorophylls and essential fatty acid compositions. There is also scant information related to their nutritional, health, medicinal, pharmaceutical and economic value. The dearth of information can be attributed to minimal availability of data that demonstrate the benefits of these compounds in human and animal diet. We investigated phenolics, carotenoids, chlorophylls and fatty acid profile (s) of the wet and dry leaves of *Capsicum chinense* pepper fruits and compared data obtained to three stages of fruits of the plant. We found that high concentrations of PUFA, MUFA, UFA and small amounts of SFA were present in wet and dry green leaves when compared to green, orange-yellow, and red fruits, both wet and dry. The major fatty acids observed were palmatic, stearic, oleic, linoleic and α-linolenic acids with α-linolenic acid significantly dominant in the leaves, whereas linoleic acid was dominant in the fruits. Carotenoids and chlorophylls were markedly high in content. The most prevalent carotenoids in the human diet such as violaxanin, lutein, xanthophyll, zexanthanin were observed to be abundant in wet leaves and fruits. From this lipid and bioactive compounds pattern, we believe that these compounds have antioxidants; anti-inflammatory and pro inflammatory properties that could help reduce cardiovascular related diseases and serve as good sources of provitamin A for reduction of night blindness. The leaves' nutritional, health and medicinal applications/benefits stem from these compounds and can now be well explained. The application of *Capsicum chinense* in traditional folk medicine in Africa is prevalent. This study is the first investigation of its kind into the fatty acids, bioactive characteristics of *Capsicum chinense* leaves and their possible health implication to consumers.

Biography

Daniel A. Abugri is an Instructor in Biochemistry and General Chemistry Laboratory, and a Laboratory Coordinator in the Department of Chemistry in Tuskegee University, USA. He obtained his B.Sc. in Applied Chemistry from University for Development Studies, Navrongo, Ghana and his Master's in Chemistry from Tuskegee University. Daniel is also currently a Ph.D. student in Integrative Bioscience program in Tuskegee. Prior to enrolling at the graduate school, he worked as a study coordinator in Navrongo Health Research Center, Ghana, on Malaria and other infectious diseases for 3 years. Through his work at the center, Daniel developed interest in food and nutritional issues, and natural dietary supplements. Currently, some of his research areas include ethnomedicine, food chemistry; immunology, dyes, parasitology, natural products in drug development and nutritional biochemistry. Daniel has presented many of his research works in international and national conferences and symposiums and has published over 8 papers in high impact peer reviewed Journals. He is also a technical reviewer and serves on the editorial teams of several top journals in food science.