Saint Xavier University

Comparative Analysis of Antioxidant and Anti-amyloidogenic Properties of Various Polyphenol Rich Phytoceutical Extracts

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Abstract

Though the underlying cause of Alzheimer’s Disease (AD) is not completely understood, it is widely hypothesized that the formation of toxic amyloid-β (Aβ) protein fibrils is a major contributor to the disease’s pathology and progression. Many phytoceutical compounds have been shown to disrupt Aβ toxicity and aggregation, including various types of polyphenolic compounds. The polyphenols responsible for these effects have also been shown to display significant antioxidant activity, which contributes to their anti-amyloidogenic effects. In this study, three plants with various documented health benefits attributed to polyphenolic compounds were investigated. These plants, traditionally used for their numerous health benefits in Asian countries, include: Curcuma Longa (Turmeric), Camellia Sinensis (Green Tea), and Scoparia Dulcis (Sweet Broomweed). The antioxidant activities of crude, polyphenol rich phytoceutical extracts from these plants were analyzed using a 2,2-diphenyl-1-picrylhydrazyl (DPPH) assay. The efficacy of these extracts in the prevention of Aβ fibril formation is then shown in an attempt to establish a correlation between antioxidant activity and Aβ aggregation. While the anti-amyloidogenic activities of C. Longa and C. Sinensis have been explored, effects of S. Dulcis have not yet been reported. A comparative analysis of the antioxidant and anti-amyloidogenic capabilities of the respective polyphenol rich extracts is discussed.