Antioxidant potential of water hyacinth (Eichornia crassipes): In vitro antioxidant activity and phenolic composition

The aims of the present study were (a) to extract and quantify the main phenolic acids and tocopherols from the petiole, leaves, and flowers of Eichornia crassipes; (b) to evaluate the antioxidant capacity of the extracts in four in vitro systems (1,1-diphenyl-2-pycryl-hydrazyl [DPPH] radical scavenging ability, iron chelating activity, reducing power, and prevention of oxidation in a liposome model system); and (c) its effectiveness in retarding lipid peroxidation in fish oil by accelerated stability test. Significant differences were observed in total and individual phenolic contents and in the antioxidant activities of extracts from the various parts of E. crassipes. Out of the 11 phenolic acids analyzed, ethanolic extracts contained high amounts of gallic, protocatechuic, gentisic, and p-hydroxybenzoic acid, whereas, water extracts contained less amounts of a varied number of phenolic acids. Ethanolic extracts of flower, which contained the highest total phenolic content, were found to have high DPPH radical scavenging activity and reducing power. However, ethanolic extracts of leaf exerted a high Fe2+ chelating activity and also inhibited lipid peroxidation process both in liposomes and fish oil. Our results demonstrate that E. crassipes, an underutilized aquatic weed, could be a potential natural antioxidant source for food, feed, and pharmaceutical applications. © 2013 Copyright Taylor & Francis Group, LLC.