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Antioxidant activity of the dihydrochalcones Aspalathin and Nothofagin and their corresponding flavones in relation to other Rooibos (Aspalathus linearis) Flavonoids, Epigallocatechin Gallate, and Trolox.

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Abstract

The antioxidant activity of rooibos flavonoids, including the dihydrochalcones aspalathin and nothofagin and their corresponding flavone glycosides, was evaluated using the ABTS radical cation, metal chelating, and Fe(II)-induced microsomal lipid peroxidation assays. Epigallocatechin gallate (EGCG) and Trolox were used as reference standards. Optimized geometric conformers of aspalathin and nothofagin, in addition to calculated physicochemical properties, were considered to explain interaction with the microsomal membrane structure and thus relative potency of the dihydrochalcones. The most potent radical scavengers were aspalathin (IC50 = 3.33 microM) and EGCG (IC50 = 3.46 microM), followed by quercetin (IC50 = 3.60 microM) and nothofagin (IC50 = 4.04 microM). The least effective radical scavengers were isovitexin (IC50 = 1224 microM) and vitexin (IC50 > 2131 microM). Quercetin (IC50 = 17.5 microM) and EGCG (IC50 = 22.3 microM) were the most effective inhibitors of lipid peroxidation. Aspalathin (IC50 = 50.2 microM) and catechin (IC50 = 53.3 microM) displayed similar potencies. Nothofagin (IC50 = 1388 microM) was almost as ineffective as its flavone glycoside analogues.

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