Inhibition of Monoamine Oxidase B (MAO-B) by Chinese Herbal Medicines

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Abstract

Monoamine oxidase (MAO) catalyzes the oxidative deamination of biogenic amines accompaned by the release of H2O2. Two subtypes, MAO-A and MAO-B, exist on the basis of their specificities to substrates and inhibitors. The regulation of MAO-B activityis important in the treatment of neurodegenerative diseases. Twenty-seven species of plants used in traditional Chinese medicines, selected from an enthnobotanical survey, were used in an investigation of their inhibitory effect on MAO-B in rat brainhomogenates. The 50% aqueous methanol extracts of four active extracts, Arisaema amurense, Lilium brownii var. colchesteri, Lycium chinense, and Uncaria rhynchophylla, exhibited the best activity and selectivity towards MAO-B with IC50 values of 0.44, 0.29, 0.40, and 0.03 mg/ml, respectively. A kinetic study of MAO-B inhibition by the four extracts using the Lineweaver-Burk plot for each active extract revealed the IC50 concentrations, and results show that: Ki = 0.59 mg/ml for A. amurense forthe mixed-type mode, Ki = 0.58 mg/ml for L. brownii var. colchesteri for the mixed-type mode, Ki = 5.01 mg/ml for L. chinense for the uncompetitive mode, and Ki = 0.02 mg/ml for U. rhynchophylla for the uncompetitive mode. These may therefore be candidates for use in delaying the progressive degeneration caused by neurological diseases.