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Neuroprotective effects of phlorotannins isolated from a brown alga, Ecklonia cava, against H2O2-induced oxidative stress in murine hippocampal HT22 cells.

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Abstract

Exposure of neurons to hydrogen peroxide (H(2)O(2)) results in oxidative stress and the activation of a cascade of intracellular toxic events resulting in oxidation, lipid peroxidation, and Ca(2+) elevation, ultimately resulting in cell death. In this study, we attempted to characterize the neuroprotective effects of phlorotannins isolated from Ecklonia cava, including phloroglucinol, eckol, triphloroethol A, eckstolonol, and dieckol, against H(2)O(2)-induced cell damage in murine hippocampus neuronal (HT22) cells. We measured the reactive oxygen species (ROS) and lipid peroxidation levels and evaluated the resultant cell death and alterations in Ca(2+)-concentrations. All phlorotannins were to scavenge intracellular ROS and repress ROS accumulation, thus preventing lipid peroxidation. Consquently, all phlorotannins reduced H(2)O(2)-induced cell death in HT22 cells. Moreover, phlorotannins inhibited H(2)O(2)-induced Ca(2+) release. This study provides a new useful strategy for preventing neuronal H(2)O(2)-induced oxidative stress.