

Neuroprotective effects of antioxidant constituents isolated from *Opuntia ficus-indica* var. *saboten* Makino

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Opuntia ficus-indica var. *saboten* Makino (Cactaceae) is a tropical or subtropical plant that has been widely used as folk medicine for the treatment of diabetes, asthma, burn, edema and gastritis. The purposes of the present study were to identify antioxidant constituents from fruits and stems of the plant cultivated in Cheju island, Korea, and examine their *in vitro* neuroprotective activities. Using a chromatographic fractionation method, ten chemical constituents were isolated from ethyl acetate extracts. By means of chemical and spectroscopic methods, those were identified as eight flavonoids such as kaempferol (**a**), quercetin (**b**), kaempferol 3-methyl ether (**c**), quercetin 3-methyl ether (**d**), narcissin (**e**), dihydrokaempferol (**f**), dihydroquercetin (**g**) and eriodictyol (**h**), and two terpenoids such as 3-oxo- α -ionol- β -d-glucopyranoside (**i**) and roseoside (**j**). Among the isolated compounds, compounds **c**, **e** and **h**, **j** were those reported for the first time from the plant. Compounds **b**, **d** and **g** showed DPPH free radical scavenging activities with IC₅₀ values of 28, 19 and 31 μ M, respectively. Compounds **d** and **g** also inhibited iron-dependent lipid peroxidation with IC₅₀ values of 2.4 and 3.5 μ M. In a primary rat cortical neuronal cell culture system, compounds **b**, **d** and **g** inhibited xanthine/xanthine oxidase-induced (IC₅₀ values of 18.2, 2.1 and 54.6 μ M) and H₂O₂-induced (IC₅₀ values of 13.6, 1.9 and 25.7 μ M) cytotoxicities. In addition, compounds **d** and **g** inhibited NMDA-induced excitotoxicity by 21 and 33%, and only compound **d** inhibited growth factor withdrawal-induced apoptosis by 31% at a tested concentration of 3 μ M. The results suggest that the antioxidant constituents with *in vitro* neuroprotective activities may serve as lead chemicals for the development of neuroprotective agent.