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Pharmacognosical Study on Biofunctional Molecules from Medicinal Foodstuffs

Masayuki Yoshikawa
(Kyoto Pharmaceutical University)

Many foodstuffs are known to have not only nutritive and taste values but also medicinal value, and they are prescribed in various traditional medicinal preparations. During the course of our pharmacognosical studies on biofunctional molecules in natural medicines, we have characterized a number of constituents with various biological activities from medicinal foodstuffs. This article focuses our recent studies on the following spices and edible herbs.

Through bioassay-guided separations, 1) Two potent α-glucosidase inhibitors, salacinol and kotalanol, were isolated from several *Salacia* sp. plants and their structural-activity relationships were examined. 2) Diterpenes, carnosol, carnosic acid, *etc*. from *Salvia officinalis* and *Rosmarinus officinalis* substantially inhibited pancreatic lipase activity and carnosic acid (10 mg/kg) significantly inhibited the serum triglyceride elevation in olive oil-loaded mice. The inhibitory activity is nearly equal to that of an antiobestic medicine, orlistat, and also carnosic acid reduced the gain of body weight and the accumulation of epididymal fat weight in high fat diet-fed mice after 2 weeks. 3) Several sesquiterpenes, costunolide, polygodial, *etc*. were isolated from *Laurus nobilis* and *Tasmannia lanceolata* as the gastroprotective constituents. In particularly, polygodial showed very potent protective effects on gastric lesions induced by ethanol (ED_{50} = 0.029 mg/kg, *p.o.*), aspirin, HCl, *etc*. Structural requirements of those active constituents for the activities and their mechanisms of action were investigated. 4) Flavonoids and phenylpropanoids from *Chrysanthemum indicum* and *Alpinia galanga* exhibited potent inhibitory activity on antigen-IgE-mediated degranulation in RBL-2H3. The flavonoids and phenylpropanoids also inhibited the antigen-IGE-mediated TNF-α and IL-4 production, both of which participate in the late phase of type I allergic reactions. These phenylpropanoids were found to show much more stronger inhibitory activity than an antiallegic medicine, tranilast, on ear passive cutaneous anaphylaxis reaction in mice.