

Search for Natural Products with Collagenase Inhibitory Activity

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In order to maintain the elasticity of the skin it is important to prevent reduction of collagen with collagen decomposition enzyme (collagenase). Search and development of a compound with collagenase inhibitory activity is therefore one effective method for aging prevention of the skin. During our studies on search for new biologically active natural products from unexploited tropical plants, marine algae, and nudibranchs, here we investigated a search for collagenase-inhibitory substances from natural resources. As a result of our screening program against collagenase inhibitory activity using extracts of 92 medicinal tropical plants, 100 marine algae, and 27 nudibranchs, we selected 7 plants, 6 algae, and 3 nudibranchs as active samples. The leaves of *Melastoma polyanthum* (Melastomataceae), collected in Thailand, were extracted methanol, and the methanol extract was successively partitioned with ethyl acetate and water. The ethyl acetate soluble fraction, which was found to be active against collagenase inhibitory test, was subjected to repeated chromatographies on silica gel column and reverse-phase HPLC to isolate four flavonoids, kaempferol 2,4-di-*O*-(*trans*-p-coumaroyl)- β -D-galactopyranoside, 3-*O*-kaempferol 2-*cis*-p-coumaryl-6-*trans*-p-coumaryl- β -D-galactopyranoside, 3-*O*-kaempferol 2-*trans*-p-coumaryl-6-*cis*-p-coumaryl- β -D-galactopyranoside, and 3-*O*-kaempferol 6-galloyl- β -D-galactopyranoside, and these compounds exhibited collagenase inhibitory activity. From a brown alga *Ishige okamurai* (Ishigeaceae), collected at Boso Peninsula, a phlorotannin, diphlorethohydroxycarmalol, was first isolated as a naturally occurring form and was fully characterized here, while from another brown alga *Undaria pinnatifida* (Phaeophyceae), two sterols, 24-methylenecholesterol and fucosterol, were isolated. From a nudibranch *Pleurobranchus hirasei* (Pleurobranchidae) collected also at Boso Peninsula, a sterol peroxide, 5,8 α -epidioxy-5 α -cholest-6-en-3 β -ol, was obtained and identified on the basis of spectral data. While extracts of these algae and nudibranchs showed collagenase inhibitory activity, isolated sterols did not show the inhibitory activity and active components of these extracts have not been isolated yet.