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Saponins Isolated from the Leguminosae Plants

Sam Sik Kang

Natural Products Research Institute and College of Pharmacy, Seoul National University, 28 Yeunkun-dong, Chongno-ku, Seoul 110-460, Korea

Legumes are important agricultural and commercial crops characterized by root nodules formed as a result of the symbiotic relationship with nitrogen-fixing rhizobia. Due to the economic significance the chemistry of some of these species has been well recognized. Soybeans and processed soy products, which contain isoflavonoids and saponins, are of wide interest for their multifaceted biological effects. Oleanene-glucuronide saponins are found in many plant-derived foods, the most concentrated source being legumes.[1] The dietary intake for saponins has been estimated at 15 to 240 mg daily, depending on the amount and type of legumes consumed.[2] Plant species containing saponins have long been used in folk medicines. Further, it is noted that a number of traditional Chinese drugs contain more saponins than alkaloids. These saponins have been associated with a variety of biological activities. As part of our phytochemical studies on the chemical constituents of medicinal plants, we have characterized triterpene saponins from Leguminous plants such as *Melilotus officinalis*,[3] *Caragana chamlagu*,[4,5] *Lathyrus japonicus*[6] and *Echinosophora koreensis*.[7] Azukisaponin II and V from *M. officinalis*,[3] araloside A (= chikusetsusaponin IV), kalopanax saponin F,[4] hemsloside Ma3 and a new saponin, caraganoside A[5] from *C. sinica*, azukisaponin II and V, and a new saponin, lathyrus saponin from *L. japonicus*,[6] and 3-O-α-L-rhamnopyranosyl(1→2)-β-D-galactopyranosyl(1→2)-β-D-glucuronopyranosyl kuzusapogenol A from *E. koreensis*[7] have been isolated. Azukisaponin V exhibited inhibitory action on leucocyte migration in inflammation.[3] Araloside A (= chikusetsusaponin IV), kalopanax saponin F, and hemsloside Ma3 were only isolated from *Aralia* species.[1] Isolation of these saponins from Leguminosae plant is the first instance and of interest from the chemotaxonomical point of view. The structures of two new saponins were determined as 3-O-β-D-xylopyranosyl(1→2)-[β-D-glucopyranosyl(1→3)]-α-L-arabinopyranosyl oleanolic acid 28-O-β-D-glucopyranosyl ester for caraganoside A[5] and soyasapogenol B 3-O-β-D-glucopyranosyl(1→2)-β-D-

glucopyranosyl(1→2)-β-D-glucuronopyranoside for lathyrus saponin.[6] *Echinosophora koreensis* is a deciduous perennial shrub, which is native to Korea and closely related to the genus *Sophora*. The genus *Echinosophora* is composed of only a species. In a continuing study, we have isolated two new oleanene-glucuronides together with two known ones from *E. koreensis*. This lecture will focus on the isolation and structure elucidation of saponins from this plant.

References

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