

산딸나무 열매로부터 분리한 2차대사산물의 생리활성 검증

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Nam-In Baek^{1*}**Objectives**

Cornus kousa Burg. (Cornaceae), a deciduous tree distributed in the mountains of Korea, China, and Japan, is in flower from May to June. Its fruits are red or pink, 2-3 cm in diameter and very delicious, and the seeds ripen from July to August. In Korea the fruits of this plant have traditionally been used as a hemostatic agent as well as for the treatment of diarrhea. Recently, the immuno-regulatory properties of *C. kousa* fruits extract have been reported. Our phytochemical study on the fruits of this plant led to isolation and structure determination of a new lignan glycoside together with several known compounds, such as six lignans, seven triterpenoids, four flavonoids, five sterols, and some lipids

Materials and Methods

¹H-NMR (400 MHz), ¹³C-NMR (100 MHz) and 2D-NMR spectra were recorded on a Varian Unity Inova AS-400 FT-NMR spectrometer. Methanol-*d*₄ with TMS as an internal standard was purchased from Sigma. RPMI Medium 1640, Dulbecco's Modified Eagle Medium and Penicillin-Streptomycin were purchased from GIBCO. FBS was from Hyclone. MTT and DMSO were purchased from Sigma. The methanol extract was fractionated into an EtOAc layer, an *n*-BuOH layer and a H₂O layer through solvent fractionation. The repeated SiO₂, ODS and Sephadex LH-20 c. c. of EtOAc fractions yielded twenty-two compounds (1-22).

Results

From the results of spectroscopic data including EIMS, FABMS, UV, IR, ¹H and ¹³C-NMR, DEPT and 2D-NMR (COSY, HSQC, HMBC), the chemical structure for the new lignan glycoside was determined as (7'S, 8'R)-dihydrodehydrodiconiferyl alcohol-4'-O- β -D-xylopyranoside (1), named cornuskoside A; for the lignans as (+)-pinoresinol (2), (-)-balanophonin (3), (+)-laricresinol (4), erythro/threo-guaiacylglycerol- β -coniferyl aldehyde ether

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(5), (7'S, 8'R)-dihydrodehydrodiconiferyl alcohol (6); for triterpenoids as ursolic acid (7), corosolic acid (8), taraxasterol (9), betulinic aldehyde (10), tormentic acid (11), ajunolic acid (12), nigaichgoside-F1 (13); for flavonoids as kaempferol (14), astragalol (15), hyperin (16), isoquercitrin (17); and for sterols as β -sitosterol (18), stigmasterol (19), 6 α -hydroxystigmast-4-en-3-one (20), 6 β -hydroxystigmast-4-en-3-one (21) and daucosterol (22). They were the first to be isolated from *C. kousa*. Their cytotoxic activities were assessed using MTT assay. Lots of lignans and triterpenoids showed the cytotoxicity against HCT-116, HeLa, MCF-7, SK-MEL-5, SK-OV-3 tumor cell lines. Also, compounds 7, 8, 10 and 11 revealed relatively high hACAT-1inhibitory activity with the value of 46.2 \pm 1.1%, 46.7 \pm 0.9%, 41.5 \pm 1.3% and 60.8 \pm 1.1% at the concentration of 100 μ g/mL, respectively. Our results suggest that the fruits of *C. kousa* might be a good source for anti-cancer, anti-hypercholesterolemia, and anti-atherosclerosis agents.

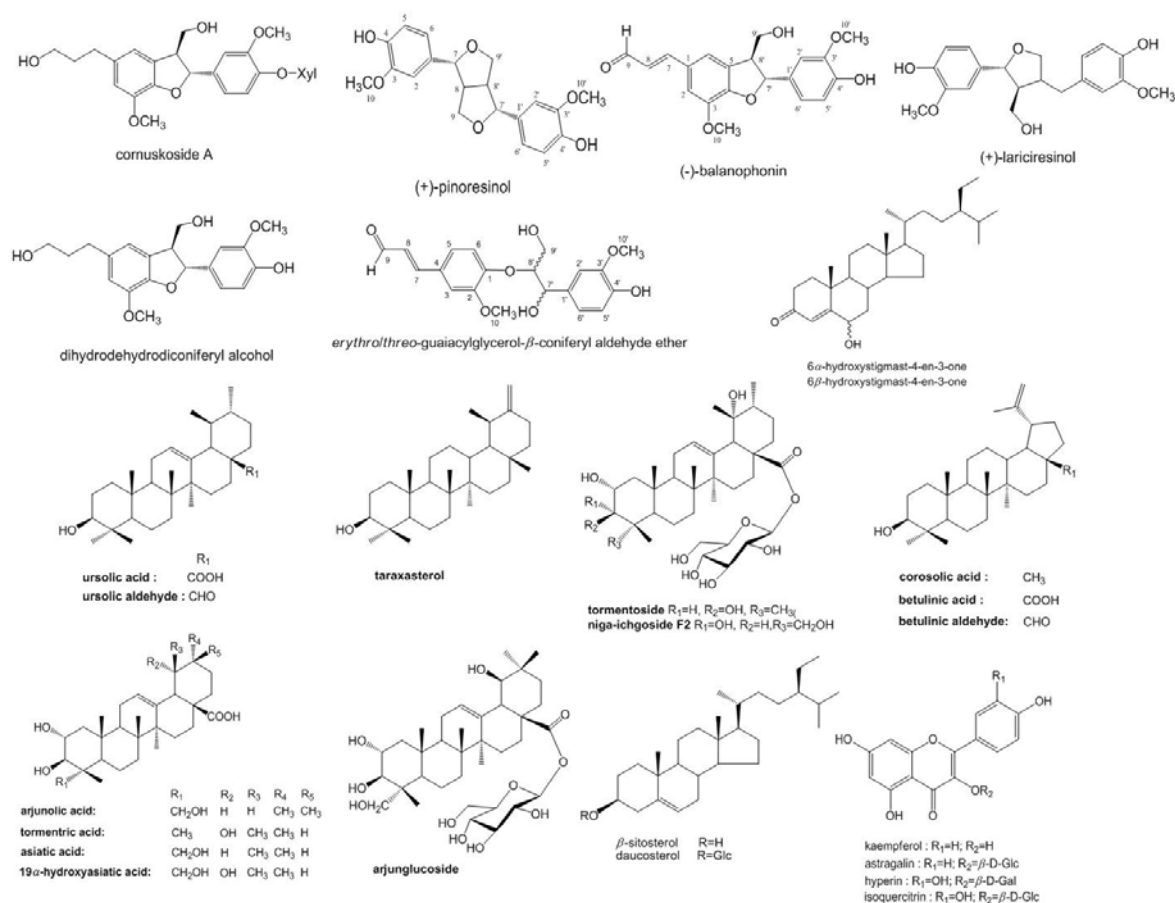


Figure. Chemical structure of isolated compounds from the fruits of *Cornus Kousa*.