[*Phytochemistry*, **46**, 1423-1429 (1997)] [Lab. of Pharmacognosy]

Prenylated Xanthonoids from *Calophyllum apetalum*.

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Three new xanthonoids, apetalinones A-C, were isolated from the roots of *Calophyllum apetalum*, as well as the known compounds, calozeyloxanthone and zeyloxanthone. The stem bar of this species yielded a new xanthonoid, apetalinone D, and another known xanthonoid, tomentonone. Five know xanthones (3,8-dihydroxy-1,2-dimethoxy-, 1,3-dihydroxy-2,5-dimethoxy-, 1,5-dihydroxy-, 1,3,5-trihydroxy-2-methoxy- and 1,3,5-trihydroxyxanthone) and two flavonoids ((-)-epiafzelichin and (-)-epicatechin) were also characterized as constituents in the stem wood. Among them, apetalinone A was a novel xanthone with 1,1-dimethylallyl ether moiety, which indicated a new biosynthetic pathway including Claisen rearrangement and Diels-Alder reaction.

[*Phytochemistry.*, **46**, 1431-1437 (1997)] [Lab. of Pharmacognosy]

Flavonoids from the Root and Stem of *Sophora tomen*tosa.

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In previous chemosystematic studies in the genus *Sophora* (Leguminosae), we have characterized the structures of flavonoids and stilbenoids of eight species of *Sophora* plants. Some flavonoids have been found to have potent antimicrobial activity against methicillin resistant Staphylococcus aureus. In this paper, we described the isolation and structural determination of 20 flavonoids including five new compounds from the root and stem of *S. tomentosa* collected in U.S.A.

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Dimethylallyl Diphosphate : Kaempferol 8-Dimethylallyl Transferase in *Epimedium diphyllum* Cell Suspension Cultures.

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The enzymatic formation of des-O-methylanhydroicaritin from dimethylallyl diphosphate and kaempferol was investigated in the cell-free extract of *Epimedium diphyllum* cell suspension cultures. The enzyme catalysing the dimethylallyl group transfer to C-8 position of kaempferol was membrane-bound and required a divalent cations such as Mg^{2+} and Mn^{2+}.The enzyme showed a very broad pH optimum in the alkaline region, pH 7.5 to 11.0. It required dimethylallyl diphosphate as a sole prenyl donor, but had a rather broad substrate specificity for the prenyl acceptor. Not only kaempferol, but also quercetin (39 %), apigenin (60 %) and luteolin (34 %) were prenylated, whereas kaempferol glycosides, naringenin and genistein were not prenylated. These results suggested that the prenylation reaction of kaempferol precedes the glycosilation step in epimedoside A biosynthesis. The apparent Km values for dimethylallyl diphosphate and kaempferol were 0.58 and 0.13 mM, respectively.

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BDNF and NT-3 Modulate Expression and Threonine Phosphorylation of Microtubule-associated Protein-2 Analogues, and Alter Their Distribution in the Developing Rat Cerebral Cortex.

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Effects of brain-derived neurotrophic factor (BDNF) and neurotrophin (NT)-3 on the expression of structure or synapse-associated proteins were examined in the developing rat cerebral cortex. Following ventricular administration of BDNF or NT-3 at embryonic days (E) 16, expression of microtubule –associated protein (MAP) 2 of 280 kDa was enhanced at E18 and/or 20, and threonine phosphorylation of MAP 2 analogues of 120 and 66 kDa was modulated in different ways. NT-3 basically altered the distribution of MAP2 proteins at E20. These suggest that NT-3 and BDNF play a role for regulating production and phosphorylation of MAP2 analogues during development of the rat cerebral cortex.