

[Phytochemistry, 46, 1423-1429 (1997)]

[Lab. of Pharmacognosy]

Prenylated Xanthonoids from *Calophyllum apetalum*.Munekazu IINUMA,* Tetsuro ITO, Hideki TOSA, Toshiyuki TANAKA, Ryoko MIYAKE
and Veliah CHELLADURA

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 bark of this species yielded a new xanthonoid, apetalinone D, and another known xanthonoid, tomentonone. Five known xanthonoids (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 xanthonoid with 1,1-dimethylallyl ether moiety, which indicated a new biosynthetic pathway including Claisen rearrangement and Diels-Alder reaction.

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[Lab. of Pharmacognosy]

Flavonoids from the Root and Stem of *Sophora tomentosa*.Toshiyuki TANAKA,* Munekazu IINUMA, Fujio ASAI, Masayoshi OHYAMA
and Charles L. BURANDT

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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[Lab. of Pharmacognosy]

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

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The enzymatic formation of des-O-methylanthrocaritin 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 glycosylation step in epimedin A biosynthesis. The apparent K_m values for dimethylallyl diphosphate and kaempferol were 0.58 and 0.13 mM, respectively.

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[Lab. of Molecular Biology]

**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.**Hidefumi FUKUMITSU, Akiko OHASHI, Atsumi NITTA, Hiroshi NOMOTO and
Shoei FURUKAWA*

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 MAP 2 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.