

E2-12: Chemical investigation of *Myristica zeylanica*

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Myristica zeylanica is a large tree found in the lowland rain forests. It is the only endemic species among the 3 *Myristica* species found in Sri Lanka. Both *M.zeylanica* and *M.dactyloides* are known as Malaboda in Sinhala and their decoctions made out of bark and leaves are being widely used in folk medicine. The chemistry of *M.fragrans* has been extensively studied since the beginning of the 20th century due to its versatile biological activity. In previous studies chemistry of *M.dactyloides* was discussed but there are no previous reports on the chemical investigations of *M.zeylanica*.

Plant materials of *M.zeylanica* were collected from Kanneliya and the identification was carried out at the National Herbarium at Royal Botanic Gardens, Peradeniya.

The sequential hot solvent extractions of the dried and crushed root bark (600g) of *M.zeylanica* were carried out with hexane, dichloromethane and methanol. Fractionation of the concentrated hexane extract (3.8g) was carried out by Flash chromatography followed by small-scale column chromatography, Prep. thin layer chromatography to give 12 major compounds. The structures of 4 of these pure compounds were identified and confirmed as (I), (II), (III) and Sitosterol while the tentative structure was proposed for another compound.

Identities of compounds were established by mmp, co-TLC, IR, NMR and MS comparisons. NMR spectral data were recorded on Varian 60Hz and Bruker 200 MHz spectrometers. IR spectra were recorded on a Shimadzu IR-460 instrument in KBr disks unless otherwise stated and the MS spectra were recorded on a Shimadzu QP-1000A spectrometer, Prep. TLC was carried out on Merck Kieselgel 60 F₂₅₄. Flash and medium pressure column chromatography were carried out on Merck Kieselgel 60 (230-400 mesh ASTM).

Hot hexane extract (3.8g) was chromatographed over silica gel and eluted with hexane - CH₂Cl₂ - methanol by gradually increasing the polarity gradient. Colourless crystalline solid eluted with hexane-CH₂Cl₂(1:1) was further purified by prep. TLC to give β-sitosterol (43mg).

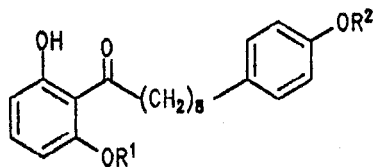
Elutions with CH₂Cl₂ in hexane (50-75%) gave a pale yellow gummy mixture which on separation by column chromatography followed by prep. TLC gave 1-(6-hydroxy-2-methoxyphenyl)-9-(4'-hydroxyphenyl)nonan-1-one(I)(107mg) and a new compound.

The gummy mixture eluted with CH₂Cl₂ in hexane (75-100%) further purified by phenolic wash with 5% NaOH followed by prep. TLC gave 3,4-dimethyl-2,5-bis(4-hydroxy-3-methoxyphenyl)terahydrofuran (II) 63mg).

Elution with pure CH_2Cl_2 was recrystallized from CH_2Cl_2 -hexane to give 1-(2,6-dihydroxyphenyl)-9-(4'-hydroxyphenyl) nonan-1-one(III) (34mg).

Methylation of compound (III) with $\text{MeI}/\text{K}_2\text{CO}_3$ in acetone at room temp. gave compound (I) and 1-(6-hydroxy-2-methoxyphenyl)-9-(4'-methoxyphenyl)nonan 1-one (IV) as major products after usual work up procedure followed by prep. TLC.

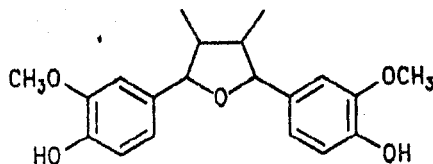
Chemical investigation of both *M.dactyloides* and *M. zeylanica* showed that some of the major compounds are common to both species. Although these results provided good evidence to support the use of both species for the same purpose in the system of Ayurvedic medicine, it is important to note that there is a considerable difference in the chemistry of minor components of the 2 species.



(I) $\text{R}^1: \text{CH}_3, \text{R}^2 = \text{H}$

(III) $\text{R}^1: \text{R}^2 = \text{H}$

(IV) $\text{R}^1: \text{R}^2 = \text{CH}_3$



(II)