STRUCTURE OF STEROIDS
IN Stelechocarpus burahol Hook f. & Thomson STEM BARK
Struktur steroid dalam kulit batang
Stelechocarpus burahol Hook f. & Thomson

Clara Sunardi
Faculty Mathematic and Natural Sciences, Padjadjaran University
Kampus Jatinangor, Bandung-Indonesia
e-mail: clara_s_sunardi@yahoo.co.id

ABSTRACT
Natural steroids can be used for pharmaceutical production. Especially served as starting material for their partial synthesis of sex hormones, including the oral contraceptives. In this research, steroid was obtained as by-products found during isolation and identification of cytotoxic compounds from Stelechocarpus burahol Hook f. & Thomson stem bark. The steroid mixture appears as white powder, consist of 3 steroid components: Δ5-ergostenol, stigmasterol, and β-sitosterol. Structure elucidation has been done using GC-MS and 1H-NMR spectroscopic. The result was compared with literature standard.

Key words: steroid, Stelechocarpus burahol

INTRODUCTION
Steroid extracted from plants has important roles on cortison hormon synthesis or sex hormon. For example, diosgenin from dioscorea plant can be synthesized to become progesterone through Marker Degradation. Progesteron hormon is highly needed for family planning. In this research, steroid compound was found during isolation and identification of cytotoxic compound from burahol stem bark, Stelechocarpus burahol Hook f. & Thomson (Clara, 2003). The steroid was obtained in non toxic fraction against Artemia salina Leach (Brine shrimp lethality bioassay), the E2-5 fraction. In dilution process of E2-5 fraction using methanol, there was white crystall that gave positif reaction to vanilin-H2SO4 reagent.
METHODS

Material

EI and CIMS (direct) and HRMS were determined on JMS AX500 mass spectrometer at 70 eV. $^1$H-NMR spectrum was recorded at 400 MHz and 100 MHz on a JEOL Lambda 400 instruments using DMSO-d6. TLC chromatographic analysis was out on precoated Silica gel 60 F254 plates (E. Merck). Whereas visualization of the TLC plates was performed using Vanillin – H2SO4 spray reagent, and UV Lamp 254 nm. Fraction E$_{2-5}$

Method

Fraction E$_{2-5}$ was diluted in methanol, resulted in white crystal. This crystal was recrystalized with aceton, obtaining SB$_4$ as white needle crystal, and was monitored by Thin Layer Chromatography, using reference standard stigmasterol and β-sitosterol. Afterwards SB$_4$ was identified by using $^1$H-NMR and GC-Mass Spectrometry.

RESULT AND DISCUSSION

Compound SB$_4$ was obtained as white needle crystal, the TLC chromatogram showed one spot which give positive reaction to the steroid by using vanillin-H2SO4 spray reagent, giving violet color. The 1H-NMR spectrum performed a specific characteristic for the existence of steroid component. (Fig. 1).

The GC chromatogram showed 3 peaks with comparative of the peak width 1:4.1:6.1 (Fig.2). The first peak has 33.68 minutes retention time, that in the EI – MS spectrum has similirity type with 5,2-dien-3-ol (3β-22E) or stigmasterol, MW 412, with 96% equality (Fig. 4). The third peak has 34.56 minutes retention time, that in the EI – MS spectrum has similarity type with (23S)-ethylcholest-5-en-3-β-ol or β-sitosterol, MW 414, with 99% equality (Fig. 5).

It can be concluded that SB$_4$ (white needle crystal) is a mixture of 3 steroid compounds that consist of Δ5-ergostenol, stigmasterol and β-sitosterol. According to The Merck Index, 2001, the structures of the 3 steroids are in Fig. 6, 7, and 8.
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Figure 3. MS spectrum Peak 1 (RT=33.68 minutes) identic with $\Delta^5$ergostenol

Figure 4. MS spectrum Peak 2 (RT=33.98 minutes) identic with stigmasterol

Figure 5. MS spectrum Peak 3 (RT=34.56 minutes) identic with $\beta$-sitosterol

Fig. 6. Structure of $\Delta^5$ergostenol (The Merck Index, 2001)

Fig. 7. Structure of Stigmasterol (The Merck Index, 2001)

Fig. 8. Structure of $\beta$-sitosterol (The Merck Index, 2001)
LITERATURES