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Research Article

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Isolation and elucidation structure of stigmasterol glycoside from *Nothopanax scutellarium* Merr leaves

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ABSTRACT

Stigmasta-5,22-dien-3-O-β- D- galactopyranoside has been isolated from ethyl acetate fraction of Nothopanax scutellarium Merr leaves. Extraction method used in this study was the maceration. Separation of compounds were done by column chromatography and thin layer chromatography (TLC). The purification of compound was tested by melting point test and structure elucidation performed using spectroscopy method (UV-Vis, IR, 1D and 2D NMR).

Keywords: *Nothopanax scutellarium Merr*, elucidation, stigmasta-5,22-dien-3-O-β- D galactopyranoside.

INTRODUCTION

Nothopanax scutellarium Merr often used as traditional medicine for treating wounds, difficult urination, inflammation, and hair growth [1]. treating mastitis disease, skin injury and hair loss [2] . This Plant is one of the plants from the family Araliaceae. In the previous study reported that, in this family contain triterpenes and saponins compounds [3]. In plants *Nothopanax scutellarium* Merr found three triterpene compounds and acetylenat compounds [4], three oleanene -oligoglikosida compounds that nothopanaxosida A, B, and C, and acetylenat panaxynol compound [5].

EXPERIMENTAL SECTION

Plant material

The *Nothopanax scutellarium* Merr leaves was collected from Batusangkar village, West Sumatera, Indonesia. It was identified in Herbarium of Andalas University (ANDA).

Chemicals

Ethyl acetate, n-hexane, methanol, silica gel 60 (0,063-0,200 mm). All other chemicals used in this study were of analytical grade.

Instrumentation

Thermoscientific FTIR, Gallenkamp apparatus, Column chromatography, TLC, UV light 254 and 365 nm, Shimadzu® UV1700 spectrophotometer, 1D dan 2D NMR spectra were recorded on a JEOL spectrometer (500 MHz).

PROCEDURES

Extraction and isolation of Leaves *Nothopanax scutellarium* Merr

Nothopanax scutellarium Merr powder (2500 grams) extracted by maceration with n-hexane, etyl acetat, and methanol respectively. Weight of each extract are n-hexane (55 g), etyl acetat (155 g) and methanol (74 g). Extracts of etyl acetat was subjected to column chromatography with gel silica (230-400 mesh).

Elucidation was carried out by gradient polarity system from 100% hexane to 100% methanol. Each fraction was monitored by TLC. Collected fractions were monitered and recombined based on TLC profiles. The same pattern of every stains on TLC were combined and then produced 29 (A-C') fractions.

Fraction X was purified with hexane and etyl acetate. The result is a pale- white powder. The purity of isolated compound was tested by melting point test and elucidation of structure was carried out by using NMR spectrophotometer (^{1}H and ^{13}C NMR).

Figure 1. Pictures of *Nothopanax scutellarium* Merr

RESULTS AND DISCUSSION

The compound obtained, is a pale- white powder, mp 281-282 °C, giving an indication of steroid base on Liebermann-Burchard test. Spectrum UV; λmaks at 202 nm; IR v_{max} cm^{-1}: 3364.66 (OH), 2930.85 (CH) 1645.71 (C=C),1021.25 (C-O). ^{1}H NMR (500 MHz, DMSO) 1.76 & 0.96 (2H, m, H-1), 1.52 & 1.37 (2H, m, H-2), 3.46 (1H, m, H-3), 1.89 & 1.14 (1H, d, H-4), 5.32 (1H, d, H-6), 1.92 & 1.46 (2H, m, H-7), 1.51 (1H, m, H-8), 0.95 (1H, m, H-9), 1.22 & 1.16 (2H, m, H-11), 1.92 & 1.13 (1H, m, H-12), 1.09 (1H, m, H-14), 1.48 & 0.97 (2H, m, H-15), 1.63 &1.13 (2H, m, H-16), 1.04 (1H, m, H-17), 0.67 (3H, s, H-18), 0.98 (3H, s, H-19), 2.02 (1H, m, H-20), 0.99 (3H, d, H-21), 5.17 (1H, dd, H-22), 5.04 (1H, dd, H-23), 1.50 (1H, m, H-24), 1.63 (1H, m, H-25), 0.82 (3H, d, H-26), 0.80 (3H, d, H-27), 1,01 &1,03 (2H, d, H-28), 0.81 (3H, d, H-29), 4.22 (1H, d, H-1'), 3,37 (1H, m, H-2'), 3.11 (1H, m, H-3'), 3.06 (1H, m, H-4'), 3.37 (1H, m, H-5'), 3.57 & 3.46(1H, m, H-6'), 4.89 (1H, s, 2'OH), 4.92 (1H, s, 3'OH), 4.85 (1H, s, 4'OH), 4.43 (1H, s, 6'OH). ^{13}C NMR (500 MHz, DMSO) 37.3618 (C-1), 31.9440 (C-2), 77.4323 (C-3), 39.6987 (C-4), 140.9957 (C-5), 121.7283 (C-6), 29.7979 (C-7), 31.9940 (C-8), 50.1527 (C-9), 36.7704 (C-10), 21.6522 (C-11), 38.8403 (C-12), 42.2836 (C-13), 55.8662 (C-14), 24.4278 (C-15), 29.0539 (C-16), 56.7914 (C-17), 12.3905 (C-18), 19.3916 (C-19), 40.0325 (C-20), 21.4996 (C-21), 138.5921 (C-22), 129.3590 (C-23), 51.1256 (C-24), 31.8773 (C-25), 21.1180 (C-26), 19.6491 (C-27), 25.5871 (C-28), 12.6766 (C-29), 101.2972 (C-1'), 70.6220 (C-2'), 77.2892 (C-3'), 73.9985 (C-4'), 73.0828 (C-5'), 61.6178 (C-6'). NMR data were comparison to those reported in the literature [6]. Compound was identified as stigmasta-5,22-dien-3-O-β- D galactopyranoside (can be seen in Figure 2)

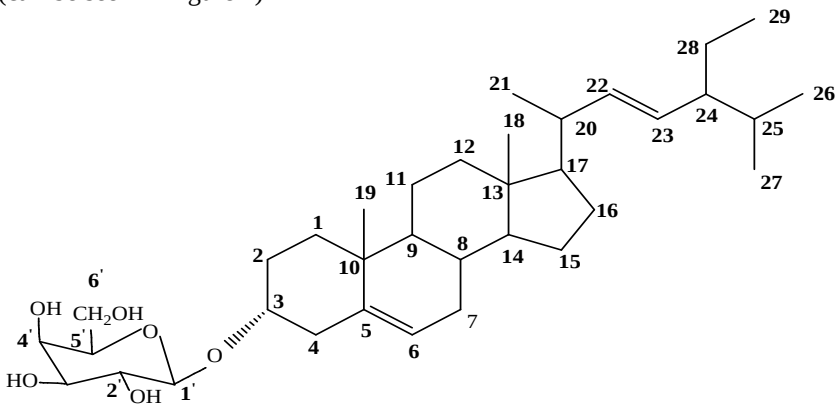

Figure 2. Structure of stigmasta-5,22-dien-3-O-β- D galactopyranoside

CONCLUSION

Based on the analysis of spectroscopy UV,IR ^{1}H-NMR and ^{13}C-NMR, the isolated compound from *Nothopanax scutellarium* Merr etyl acetate extract was stigmasta-5,22-dien-3-O-β- D galactopyranoside .

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