- Short communication

Phytochemical Studies on the Leaves of *Xylia dolabriformis*

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Three compounds were isolated from the petroleum ether extract of the dried leaves of *Xylia dolabriformis*. Based on the spectral evidence, their structures were determined to be taraxerol (**1**), taraxerone (**2**) and stigmasterol. This is the first report of occurrence of these compounds from *X. dolabriformis*.

Xylia dolabriformis Benth locally known as Lohakath is a big tree belonging to the family Leguminosae. The plant is widely distributed in the coastal forest and hill tracts of Bangladesh, India and Burma[1, 2] and has been used in folk medicine to treat gonorrhea, diarrhea, vomiting and ulcers[3]**.** Previous investigations resulted in the isolation of tannins, oil and triterpene[3]. As part of our chemical investigation on Bangladeshi medicinal plants, we report, herein, the isolation and structure elucidation of two pentacyclic triterpenes taraxerol (**1**), taraxerone (**2**) and a steroid, stigmasterol from the petroleum ether extract. The structures of these compounds were determined by spectral and chemical analyses. The presence of triterpenoid skeleton in both of compounds 1 & 2 was suggested by the violet vanillin sulfuric acid test[4].

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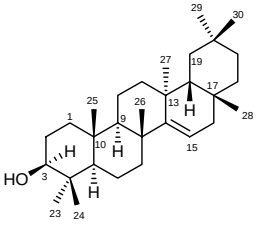
The ^{1}H-NMR spectra were recorded using a Bruker AMX-400 (400 MHz in deuterated chloroform and the chemical shifts were referenced to the residual nondeuterated solvent signal. Column chromatography (CC) was performed on Kieselgel 60, (70-230 mesh, Merck). Precoated silica gel (60 PF_{25}) plates were used for analytical purposes. The leaves of *X. dolabriformis* were collected from Savar, Dhaka during March 2008 and identified by Ms. Bushra Khan, Senior Scientific Officer, Bangladesh National Herbarium. A voucher specimen has been deposited in Bangladesh National Herbarium (DACB accession no. - 32761) Dhaka, Bangladesh. The dried and powdered leaf (725 gm) of *X. dolabriformis* was extracted with petroleum ether, dicholomethane and methanol sequentially using a Soxhlet apparatus. The concentrated crude petroleum ether extract (4.05 gm) was subjected to column chromatography by using gradients of petroleum ether/ethyl acetate, then ethyl acetate, followed by a gradient of ethyl acetate/methanol and finally with methanol to afford a total of 35 fractions (each 200 mL). Fractions 21, 15 and 29 upon repeated washing with petroleum ether gave compounds **1** (10 mg), **2** (15 mg) and stigmasterol (15 mg), respectively as amorphous solid.

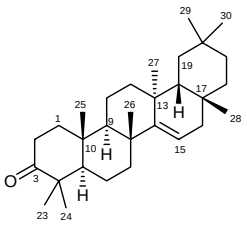
Taraxerol (**1**): Colorless crystal; ^{1}H-NMR (400 MHz, $CDCl_3$): δ 5.52 (1H, dd, J= 8.0, 3.2 Hz, H-15), δ 3.19 (1H, dd, J= 9.2 Hz, H-3), 1.08 (3H, s, Me-8), 0.97 (3H, s, Me-10), 0.94 (3H, s, Me-20α), 0.92 (3H,

s, Me-4β), 0.90 (6H, s, Me-4α, Me-20β), 0.82 (3H, s, Me-13), 0.80 (3H, s, Me- 17). Taraxerone (**2**): White mass; ^{1}H-NMR (400 MHz, $CDCl_3$): δ 5.55 (1H dd, J= 8.0, 3.2 Hz, H-15), 2.56 (m, H-2a), 2.32 (m, H-2b), 1.13 (3H, s, CH_3), 1.08 (3H, s, CH_3), 1.07 (3H, s, CH_3), 1.06 (3H, s, CH_3), 0.95 (3H, s, CH_3), 0.91 (3H, s, CH_3), 0.90 (3H, s, CH_3), 0.82 (3H, s, CH_3). Stigmasterol: Colorless needles; ^{1}H-NMR (400 MHz, $CDCl_3$) spectral data was identical to published values.[5]

The ^{1}H-NMR spectrum of compound **1** showed eight three proton singlets at δ 0.80, 0.82, 0.90, 0.90, 0.92, 0.94, 0.97, and 1.08. These were attributed to the methyl group protons at C-17, C-13, C-4α, Me-4β, C-20α, C-10, C-8 respectively. The double doublet (J=3.2 Hz, 8.0 Hz) centered at δ 5.52 attributable to the olefinic proton at C-15. The broad doublet (J= 9.2 Hz) centered at δ 3.19 could be assigned to the oxymethine proton at C-3. The large coupling of this proton (H-3) with the vicinal methylene protons suggested a *β* (beta) orientation of the hydroxyl group at C-3. The above ^{1}H-NMR signals suggested the presence of a typical pentacyclic triterpene skeleton. This was identified as *β*-taraxerol by comparison these data with those reported previously for taraxerol.[4, 6]



1



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The structure of compound **2** was elucidated by direct comparison of its spectral data with that of compound **1.** Although, the ^{1}H-NMR spectral data of **2** was in close agreement to that of **1**, except the resonance at δ 3.19 for the oxymethine proton at C-3 in the spectrum of **1**, was absent in **2**. This suggested that the hydroxyl group at C-3 in compound 1 was replaced by a carbonyl function. On the basis of the above spectral features, compound **2** was characterized as taraxerone, the identity of which was further substantiated by comparison of its spectroscopic data with published values.[7,8] The third compound was characterized as stigmasterol by comparison of its ^{1}H-NMR spectral data with published values[5] as well as by co-TLC with an authentic sample.

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