Gas Chromatography Mass Spectrometry Studies of *Sarcococca Saligna*

I. NAEEM AND N. KHAN*
Department of Chemistry, Quaid-i-Azam University, Islamabad, Pakistan.

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Summary: Ethanolic extract of *Sarcococca saligna* when analyzed by gas chromatography-mass spectrometry yielded a chromatogram showing six molecular ion peaks corresponding to phytol and α-tocopherol. Trimethylsilyl ethers of hexose sugars, aldohexopyranose and ketohexofuranose was also inferred through their TMS derivatives. All the compounds are being reported for the first time from this plant.

Introduction

The evergreen shrub *Sarcococca saligna* Muel, *S.pruniformis Lindl.* belonging to family Buxaceae is abundant in the north-west region of Pakistan [1]. The leaves of this plant are used for the treatment of rheumatism and fever in the indigenous system of medicine[2].

A number of stereoidal alkaloids of pregnane type have been isolated from leaves and reported to show various biological activities [2-8]. The leaves also contain a terpene betulin [9,10]. The crude extract of the aerial parts of this plant has also been reported to be active against a number of bacteria. Some alkaloids are also present in the aerial parts [11,12].

The present work describes gas chromatography-mass spectrometric identification of some compounds other than alkaloids from aerial parts e.g. fatty acid esters, α-tochopherol and two carbohydrates in the form of their trimethylsilyl ethers. These compounds have not earlier been reported from this plant.

Results and Discussion

Naturally occurring carboxylic acids are generally found as methyl esters but gas chromatography-mass spectrometric analysis of ethyl alcohol extract of *Sarcococca saligna* resulted in identification of both methyl and ethyl esters. As the extraction of the plant material was carried out under neutral conditions, the presence of ethyl ester along with methyl ester of the same acids cannot be attributed to the presence of artifacts.

The identification of compounds I-VI was confirmed through comparison of their respective mass spectra with published data[13].

Ketohexofuranose trimethylsilyl ether (VII) gave molecular ion at m/z 480, a more intense peak at m/z 217 than that at m/z 204 indicating a furanose sugar [14]. Aldohexopyranose trimethylsilyl ether (VIII) showed a molecular ion at m/z 540 and an ion at m/z 437, corresponding to ($M^{+\bullet}$-TMSOC$^{\bullet}H_2$), a more intense peak at 204 and less intense at m/z 217, indicating aldohexose [15]. The compound was identified by comparison.

Experimental

Aerial parts of the plant were collected from Kuldana and Changla Gali, Murree Hills, Pakistan and specimen was deposited for identification in the herbarium of Department of Biological Science, Quaid-I-Azam University, Islamabad, Pakistan (Accession No. 0780). The dried and chopped material repeatedly was extracted with ethanol . The crude ethanolic extract was subjected to GC-MS. All GC-MS spectra were measured on MS 212 with data system SS 3300 and INCOS 50XL, Finnigan MAT, column SE 54-CB (25m long, 0.32 mm diameter, temp. variation 150° (3 min) – 280° (5 min), 10°/min). It gave a chromatogram, which showed following the six peaks.

I) Palmitic acid methyl ester, retention time 5:10 (min:sec), m/z 270 ($M^{+\cdot}$, $C_{17}H_{34}O_2$), 239 (M^{+}–31), 199, 185, 157, 143, 129, 113, 99, 71, 74, 59, 57.

II) Palmitic acid ethyl ester, retention time 5:29 (min:sec), m/z 284 ($M^{+\cdot}$, $C_{18}H_{36}O_2$), 241 (M^{+}–43), 239(M^{+}–45), 227, 199, 185, 171, 157, 143, 129, 113, 101, 59, 57.

III) Phytol , retention time 6:40 (min:sec), m/z 296 ($M^{+\bullet}$, $C_{20}H_{24}O_2$), 278 (M^{+}–18), 263

*To whom all correspondence should be addressed.

(278–CH_3), 250, 236, 222, 196, 179, 165, 152, 132, 111, 95, 81, 71 (100%), 57, 43.

IV) Linolenic acid methyl ester , retention time 6:48 (min:sec), m/z 292 ($M^{+\cdot}$, $C_{19}H_{32}O_2$), 277 (M^+–15), 261, 250, 199, 138, 222, 204, 191, 163, 143, 135, 121, 108, 101, 95, 73, 67, 55.

V) Linolenic acid ethyl ester, retention time 7:04 (min:sec), m/z 306 ($M^{+\bullet}$, $C_{20}H_{34}O_2$), 277, 261, 238, 222, 204, 191, 163, 143, 135, 121, 108, 101, 95, 73, 67, 55.

VI) α-Tochopherol , retention time 17:10 (min:sec), m/z 430 ($M^{+\cdot}$, $C_{29}H_{50}O_2$), 205 ($C_{13}H_{17}O_2$), 163 ($C_{10}H_{13}O_2$).

Formation of trimethylsilyl ether was carried out according to reported procedure[14] and the chromatogram gave the following peaks:

VII) Ketohexofuranose (TMS) , retention time 11:11 (min:sec), m/z 480 ($M^{+\cdot}$), 437 ($M^{+\cdot}$-CH_2-OTMS), 347 (437-TMSOH), 248, 247, 217 (11%), 159.

VIII) Aldohexopyranose (TMS), retention time 11:25 (min:sec), m/z 540 ($M^{+\bullet}$), 445 ($M^{+\bullet}$-CH_3-TMSOH), 437 217, 204 (100%).

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