

This article was downloaded by:

On: 30 January 2011

Access details: Access Details: Free Access

Publisher *Taylor & Francis*

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



## Spectroscopy Letters

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713597299>

### GLC-Mass Spectroscopy of Distilled Alkaloids of *Haloxylon Persicum*<sup>1</sup>

F. J. Muhtadi<sup>a</sup>; M. M. A. Hussan<sup>a</sup>

<sup>a</sup> College of Pharmacy, University of Riyadh, Riyadh, Saudi Arabia

**To cite this Article** Muhtadi, F. J. and Hussan, M. M. A. (1981) 'GLC-Mass Spectroscopy of Distilled Alkaloids of *Haloxylon Persicum*<sup>1</sup>', *Spectroscopy Letters*, 14: 3, 207 — 215

**To link to this Article:** DOI: 10.1080/00387018108062577

URL: <http://dx.doi.org/10.1080/00387018108062577>

## PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

GLC - MASS SPECTROSCOPY OF DISTILLED ALKALOIDS  
OF *HALOXYLON PERSICUM*<sup>1</sup>

F.J. Muhtadi and M.M.A. Hassan,

College of Pharmacy, University of Riyadh, Riyadh,  
Saudi Arabia.

**Key Word Index** — *Haloxylon Persicum*; *Chenopodiaceae*; GLC -  
Mass spectroscopy; Distilled alkaloids.

---

**Abstract** — GLC-Mass spectrometric study of the distilled alkaloids of *Haloxylon persicum* which grows wild in Saudi Arabia reveals the presence of cotinine as a minor alkaloid as well as anabasine which is a major alkaloid and nicotine which is also a minor alkaloid. The presence of both anabasine and nicotine has been previously established by other means. The occurrence of cotinine in the plant furnishes a supporting evidence for the presence of nicotine in *Haloxylon persicum*.

---

INTRODUCTION

*Haloxylon Persicum* Bunge. (Family *Chenopodiaceae*) grows wild in a specific saline area (near the Red sea coast)<sup>a</sup>, and attains up

---

1. An abstract of this research has been presented at the International Research Congress on Natural Products as Medicinal Agents, Strasbourg, France, July 6-11, 1980.

<sup>a</sup> Voucher specimen is available in the herbarium of College of Pharmacy, Riyadh University.

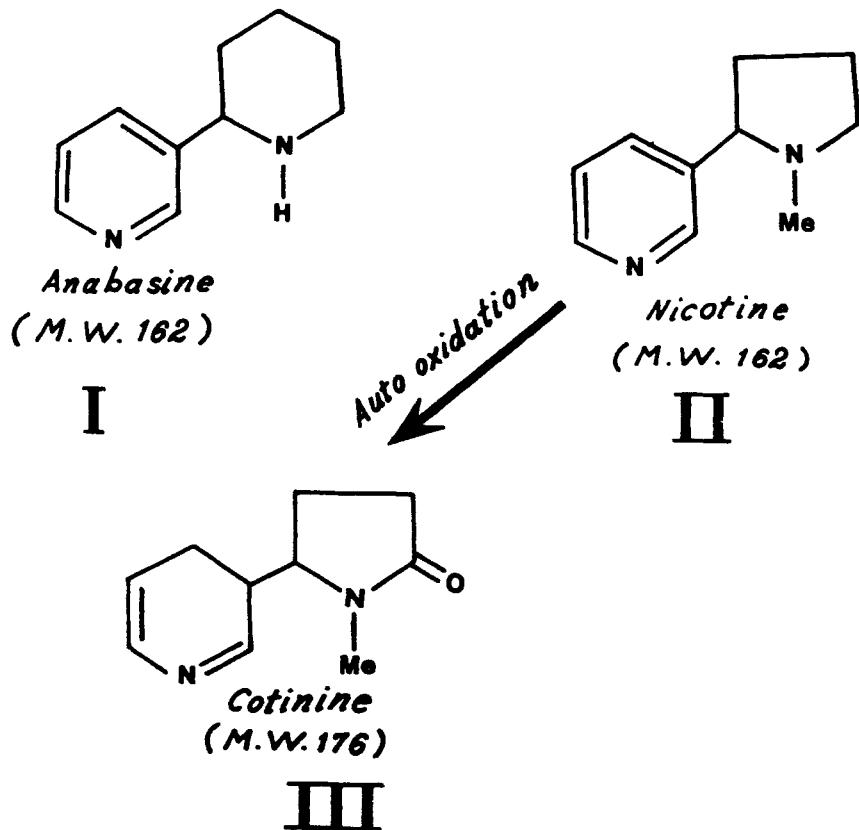
to 40 cm. long [1] caused death among grazing animals. For this reason we have investigated this plant for its chemical content. It was found to contain a high percentage of alkaloids (5.4%). Anabasine was isolated and found to be the major alkaloidal principle (constitutes almost 90% of the total alkaloids [2].

In the present investigation we wish to confirm the presence of both anabasine and nicotine by GLC-Mass spectrometry. We also wish to report the identification of a third alkaloidal constituent by this technique.

#### RESULTS AND DISCUSSION

We have earlier established the presence of anabasine (by physical and chemical means) in *Haloxylon Persicum* in higher percentage than other commercial plant sources of anabasine. Nicotine was also identified by TLC analysis as a minor alkaloid. Its detection in *Haloxylon Persicum* furnished the first report of its occurrence within the family Chenopodiaceae. A third minor unidentified related alkaloid was also detected [2]. The present work was carried out to confirm the previously reported results as well as to identify the third alkaloid.

For this purpose the distilled total alkaloids have been subjected to GLC-Mass spectrometric analysis. Under the same conditions reference anabasine, nicotine and a mixture of both were also analysed. The GLC trace (Fig. 1) revealed a major component (retention time 3.59 min.) and a minor component (retention time 3.47 min.).



Scheme 1

It is to be noted that, although reference anabasine as well as reference nicotine gave slightly different retention times, yet a mixture of both (concentration dependant) gave the same retention time.

Under the area of the major component (retention time 3.59 min.), two mass fragmentation patterns were obtained both with  $M^+$  162 a.m.u. one of which was identical to that of reference anabasine I (Fig. 2) and the other was identical to reference nicotine II (Fig. 3) (3). The minor

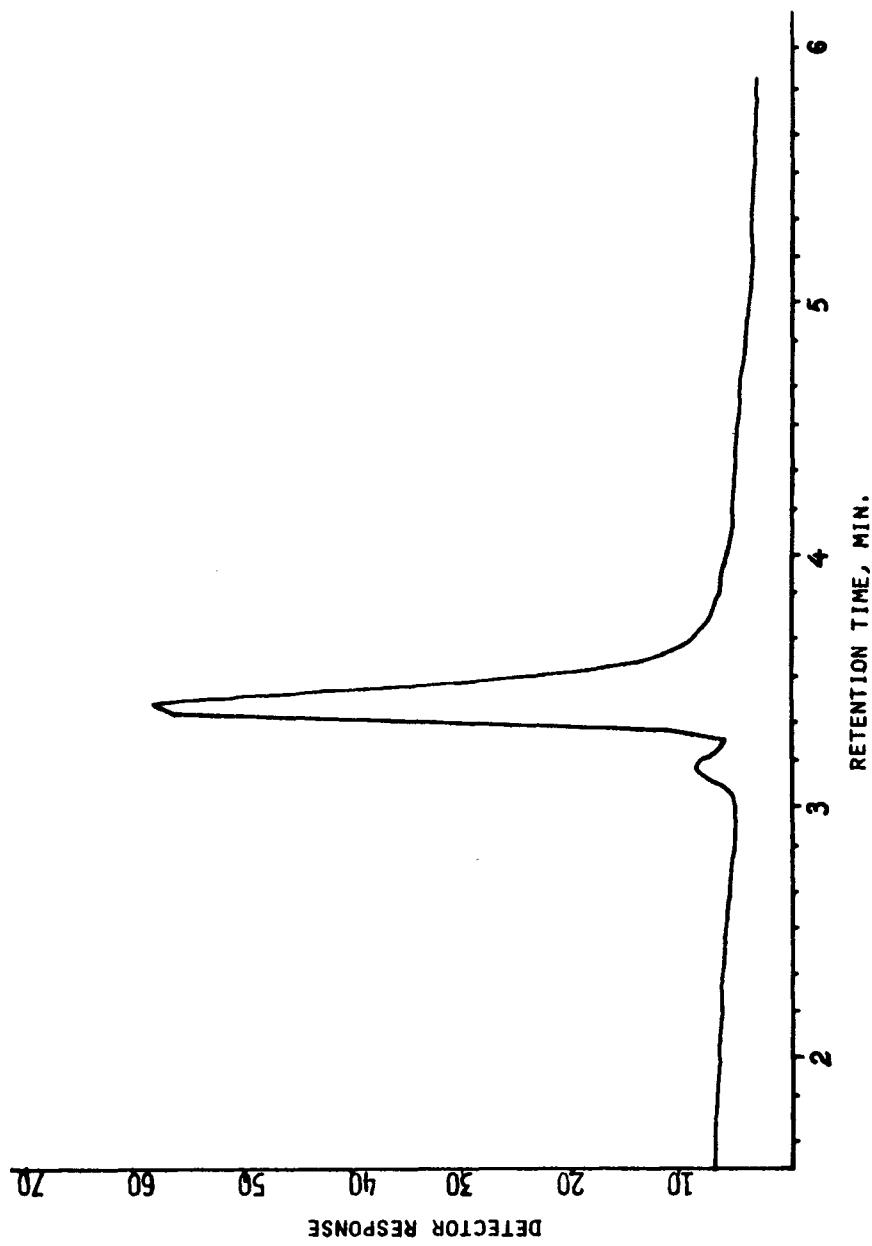


FIG. 1. GLC-MASS OF DISTILLED ALKALOIDS OF HALOXYLON PERSICUM.

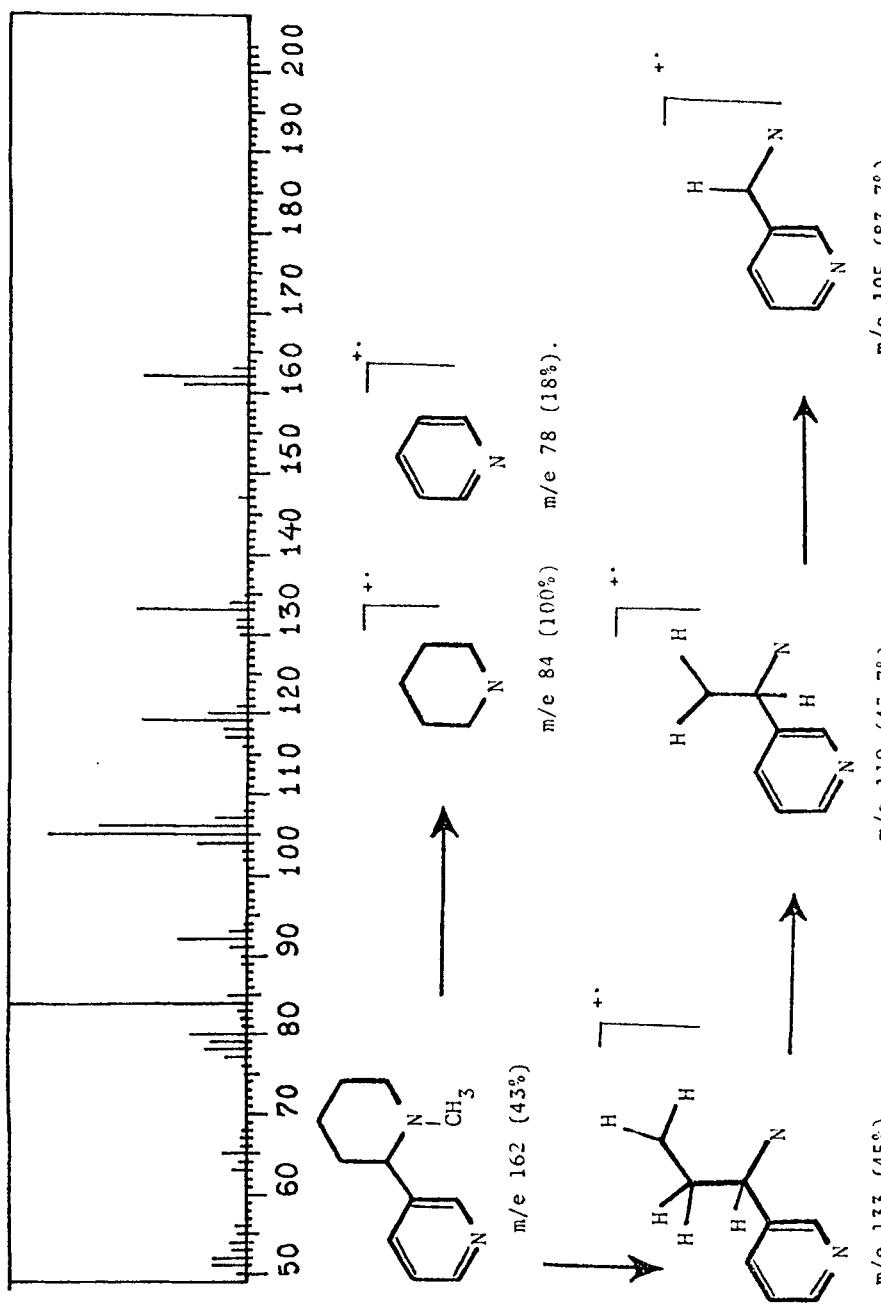


Fig. 2  
Mass Spectrum of Anabasine

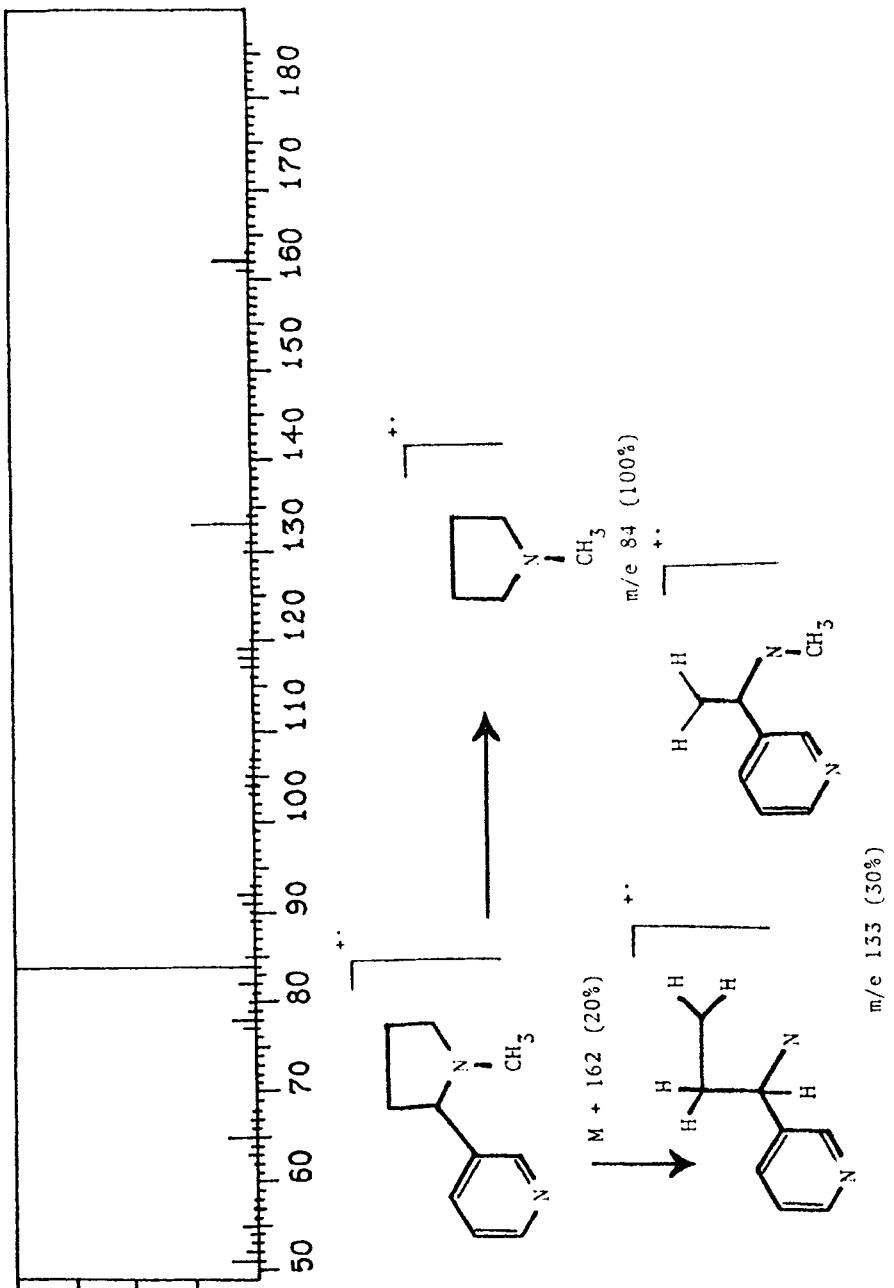


Fig. 3  
Mass Spectrum of Nicotine

component (retention time 3.47 min.) showed a mass fragmentation pattern with  $M^+$  176 a.m.u. and this was attributed to continue III (Fig. 4).

Cotinine which is an autoxidation product of nicotine (4), its presence is supporting evidence for the occurrence of nicotine.

#### EXPERIMENTAL

##### I) Extraction of the Alkaloids.

The dried powdered herb (1 Kg) was defatted with pet. ether (B.P. 60-80°). The defatted material was exhaustively extracted with alcohol (90%). The alcoholic extract was concentrated under vacuum, acidified and extracted with chloroform. The aqueous layer was basified with ammonia and the liberated bases were extracted with chloroform which was removed under vacuum. The resulting oily residue was fractionally distilled. The fraction boiling at 279-282° was collected and used for subsequent investigation.

##### II) GLC-Mass Spectrometry.

The distilled alkaloids were subjected to GLC-Mass spectrometric analysis using Ribermag GC/MS/DS Model R 10-10, Nermag, S.A. instrument. Reference Anabasine, Nicotine and a mixture of both were also run under the same conditions.

##### GLC Conditions:

3% methyl silicone polymer (SE-30) on chromosorb WHP 100-180 mesh, packed on glass column of 2 m. long and 2 mm. diameter. The oven temperature which started from 150° was programmed at 10°/

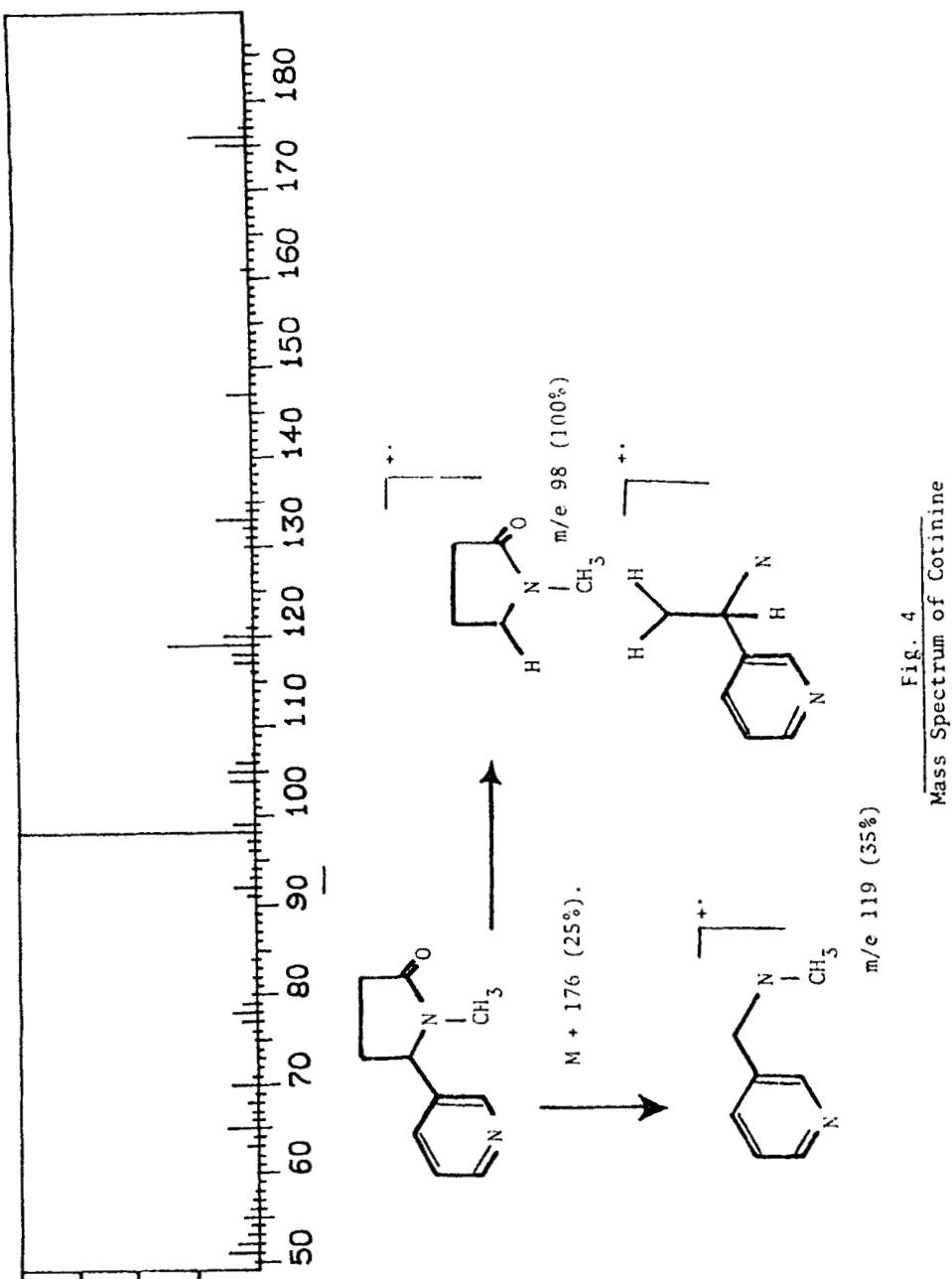


Fig. 4  
Mass Spectrum of Cotinine

min. up to 240°. The injection port temperature was 240° and interface temperature 300°. Helium flow rate was adjusted to 20 c.c/min.

MS Conditions:

Mass spectra were obtained with electron impact mode (EI) with an electron energy 70 ev. The mass range was scanned from 50 to 450 a.m.u.

REFERENCES

- [1] Migahid, A.M. "Flora of Saudi Arabia" 2nd. ed., Vol. 1, "Riyadh University Publication" (1978).
- [2] Habib, A.A.M.; Hassan, M.M.A. and Muhtadi, F.J. *J. Pharm. Pharmac.*, 26, 837 (1974).
- [3] Stenhagen, E.; Abrahamsson, S. and McLafferty, F.W. "Registry of Mass Spectra" Data, 490, Wiley, New York, N.Y., (1974).
- [4] Enzell, C.R.; Wahlberg, I. and Aasen, A.J. *Fortschritte D. Chem. Org. Naturst.* 34, (1975).

Received: December 10, 1980  
Accepted: February 12, 1981