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Isolation and characterization of 2, 4 - dihydroxynonane from *Adhatoda vasica*

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ABSTRACT

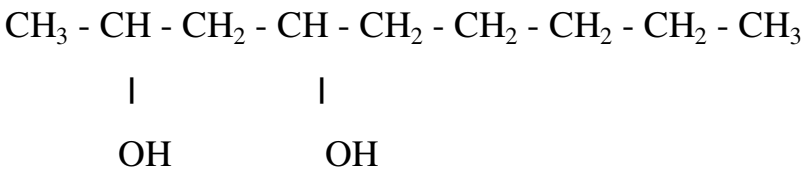
A new dihydroxy alcohol has been isolated from the aerial part of the Adhatoda vasica. The compound was identified as 2,4- dihydroxynonane on the basis of spectral land chemical studies.

Key words: Adhatoda vasica, Alcohol, Spectral analysis.

INTRODUCTION

Adhatoda vasica is one of the two Indian species of genus Adhatoda of the family Acanthaceae known for its medicinal properties. Adhatoda vasica is commonly known as Adulsa, Arusa, Bakas or Malabar nut tree. It is dominant vegetation of hilly areas and throughout the planes of India. The extracts of adhatoda vasica have been used against various chest ailments and its weedicide properties[2 – 5], It is reported to the rich source of vasicine, vasicinone, oscine, pegamine. quinazoline alkalord and other bioactive constituents. It is well known drug in Ayurvedic and Unani system of medicine and is recommended against various chest ailments like bronchitis, asthama, tuberculosis, cough etc[6 – 8].

This paper describes the isolation and structure elucidation of aliphatic dihydroxy alcohol (2,4- dihydroxynonane) from the benzene extract of the aerial part of Adhatoda vasica.



2,4- dihydroxynonane

EXPERIMENTAL

Plants of adhatoda vasica were collected from nearby villages of Jamshedpur. Plant was identified by Dr.V. K. Singh Department of Botany, Jamshedpur and voucher specimen was deposited in the herbarium of the department.

The leaves of adhatoda vasica were dried in the month of December in shade and then dried in oven at 30 – 40 ^{0}C for 2 hours. The dried plant material was then subjected to size reduction to coarse powder using grinding mill. About 500 grams of dried coarsely powdered leaves were packed in a soxhlet. The leaves were defatted with petroleum ether and then extracted with benzene.

Isolation and purification

The benzene extract (15 ml) was adsorbed in 5 grams of silica gel (60-120 mesh) with the help of rotatory evaporater. This adsorbed silica gel was then introduced into the column (30×500 mm) prepared with the help of silica gel (60-120 mesh). The elusion was carried out with mixture of benzene and acetone (1:5). The eluents obtained were monitored by TLC and fractions showing a single spot of the compound was characterised with the help of thinlayer chromatography and spectral data along with sharp melting point (52°C).

RESULTS AND DISCUSSION

Melting point was determined in soft glass capillaries in an electrothermal melting point apparatus and are uncorrected, IR spectra were recorded on Perkin Elmer 577 spectrophotometer using KBr pellets, ^{1}H – NMR spectra (300 MHz), ^{13}C NMR spectra (100 MHz) in $CDCl_3$ as solvent and TMS as in internal standard, silica gel G is used for TCL and spots were visualized by exposure to iodine & UV lamp.

Spectral Data

IRmax. (KBr)

A broad band at 3412cm^{-1} (2.95 µm) is due to H banded O-H stretching, C-H stretching due to methyl and methylene groups appear at 2921cm^{-1} (3.43 µm) and 2851cm^{-1} (3.51 µm). The broad band at 1620cm^{-1} (6.24 µm) is the region of overtone and combination bands. A sharp peak at 1467cm^{-1} (6.83 µm) is due to C-H bending and a peak at 1378cm^{-1}(7.28 µm) is due to C-H stretching vibration. The absorption band at 771cm^{-1} (13µm) indicating out of plane bending of the O-H group and sharp band at 725cm^{-1}(13.9 µm) is due to methylene rocking. The ^{1}HNMR ($CDCl_3$, 300 MHz) shows signals for terminal methyl groups at ä 0.85and ä 0.89, the signal at ä 1.25 for methylene units. The signal at ä 1.55 indicates the presence of CH-OH group in the molecule.

The ^{13}C –NMR ($CDCl_3$, 100MHz) exhibited signals for all nine carbon atoms present in molecule. The signals at 29.71, 14.12, 22.70, 29.37 and 31.9 ppm are due to C-1, C-6, C-7, C-8, and C-9 carbon atoms. The signals at 76.57, 77.42, 76.99 and 66.70 ppm indicates the presence of C-2, C-3, C-4, and C-5 carbon atoms. MS (EI, 70 ev): m/z 159 [M – H], 316, 324, 480 also confirms the structure of the compound (Found C, 67.59, H, 12.57, O, 20.10, calculated. For $C_9H_{20}O_2$: C, 67.50, H, 12.50, O, 20.00).

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REFERENCES

1. Rahman Atta-ur *et al ; Natural Product letters* **10**: 249-256 (1997).
2. Khan Khurshid A., Sinha Neeta and Zakaria M., *J. Chemtracks.* **11**(2): 449-456 (2009).
3. Khan M.H. *et al., Sarhad Journal of Agriculture* **8**(1): 71-74 (1992).
4. Siddiqui M. B. and Husain W., *Filoterpia*, **65**(1): 3 -7 (1994).
5. Sethi D., Nathan *et al., Filoterpia* **68**(3): 233-237 (1997).
6. Nandkarni K. M. ; The Indian Materia Medica I & II, Popular prakashan Pvt. Ltd. Bombay (1976).
7. Chopra R. N., Chopra I.C, Verma B. S; Supplement to Glossary of Indian Medicinal plants (1969).
8. Cruz J. L. D., Namlikaran A. Y. Kohate C.K, *Indian Drug* **17**(4): 99-101 (1980).