International Journal of Engineering, Management and Humanities (IJEMH)
Volume 3, Issue 1, pp: 309-313 ISSN: 2395-5252 www.ijemh.com

Isolation of A New Compound from *Alstonia Scholaris* R. Br. (Stem Bark)

[1]Dr. Laxmi Kant Sharma, [2]Dr. Atul K. Bhatnagar, [3]Dr. V. K. Singh
[1]Former Principal, St. Xavier's PG College, Phagi, Jaipur., [2]Retd. Associate Professor in Chemistry, Seth RL Saharia Government PG College, Kaladera, Jaipur, [3]Retd. Associate Professor in Chemistry, Government College, Rajgarh, Alwar.

Date of Submission: 14-03-2022 Date of Acceptance: 28-03-2022

ABSTRACT:
A new compound has been isolated from stem bark of plant *Alstonia Scholaris* using column chromatography from the chloroform fraction are namely Alscholide and Structure of compound was elucidated on the basis of spectral data.

Key Words: Alstonia Scholaris, Alscholide, Column chromatoraphy.

I. INTRODUCTION

Alstonia scholaris R. Br. Belong to Apocynaceae family is known as "saptparni" in India is a medicinal, distributed throughout the tropical and subtropical region of the world. In Jaipur, Rajsthan (India) several species of *Alstonia* are being used by the Ayurvedic medicinal system [1]. □-amyrin acetate isolated from bark of *Alstonia scholaris* have been reported for suppression of fertility in male albino rats [2]. Lupeol acetate isolated from *Alstonia scholaris* has shown antifertility effects in male albino rats [3]. □-amyrin linoleate and a-amyrin palmitate isolated from this *Alstonia sps.* have been reported for non-competitive inhibitor of trypsin and chymotrypsin [4]. Root extract of this plant is reported for cytotoxic activity against human lung cancer cells adenocarcinoma and large cell carcinoma [5] and for the treatment of malaria [6, 7]. The plant extract is also reported to exhibit anti-inflammatory activity [8], anti-plasmodial activity [9].

The medicinal importance of *Alstonia* sps. leads us to chemical screening and identification of compounds in search of active constituents. During identification process a new compound has been obtained.

ISOLATION OF COMPOUND:

Stem bark of plant *Alstonia scholaris* was collected, shade dried and grinded to powder. This powder was extracted with methyl alcohol for approximately 50 hrs. Methanol was removed by distillation leaving behind a brown sticky mass. This brown mass was treated with acetonitrile for the removal of fats, waxes etc. This brown fat removed mass was re-extracted with chloroform. Solvent chloroform was removed and dry 20 gm of extract was subjected to column chromatography for the isolation of chemical components. For this purpose a column of 1.5m in height with 2.5cm diameter filled with 500 g silica gel G (60-120 mesh) was used. This column was eluted with various solvents and solvent mixtures in their increasing polarity. When column was eluted with solvent mixture of petroleum ether and benzene in ratio 3:1 this compound was obtained.

II. EXPERIMENTAL:

Spectral Observations of Compound: Compound 1 has shown R_f value 0.846 in pet ether acetone (4+1) system has been calculated for $C_{29}H_{42}O_3$.Compound 1 has shown its melting point at 124°C

MS (M/Z) : 439 (M^-), 438 (M), 425 (M^-), 409 (base peak), 393, 379, 365, 353, 339, 325, 313, 297, 271, 257, 231, 218, 203, 189, 175 etc.

^{1}H NMR (δ, ppm) : ($CDCl_3$) : 0.80 (3H, s), 0.83 (3H, s), 0.87 (3H, s), 0.90 (3H, s), 1.03 (3H, s), 1.61 (2H, t), 1.13 to 1.90 (remaining 21 protons), 3.21 (1H, s), 4.66 (1H, s), 4.71 (1H, s), 5.18 (1H, s).

^{13}C NMR (δ, ppm) : ($CDCl_3$) : 38.8 (C-1), 27.4 (C-2), 78.8 (C-3), 124 (C-4), 150 (C-5), 145 (C-6), 109 (C-7), 79 (C-8), 156 (C-9), 37.1 (C-10), 121 (C-11), 47.2 (C-12), 47.1 (C-13), 52.3 (C-14), 46.8 (C-15), 35.0 (C-16), 34.7 (C-17), 48.0 (C-18), 38.6 (C-19), 35.6 (C-20), 145 (C-21), 115 (C-22), 10.0 (C-23), 30.4 (C-24), 18.0 (C-25), 26.1 (C-26), 15.5 (C-27), 28.1 (C-28), 55.2 (C-29).

III. RESULT AND DISCUSSION:

Compound Alscholide

The elemental analysis and molecular weight determination suggested the molecular

International Journal of Engineering, Management and Humanities (IJEMH)
Volume 3, Issue 1, pp: 309-313 ISSN: 2395-5252 www.ijemh.com

formula for this compound as $C_{29}H_{42}O_3$. The base peak was observed at m/e 409. The number of protons were calculated to be 42 and ^{13}C NMR spectrum showed 29 signals for the carbon atoms on the basis of the molecular formula.

^{13}CNMR spectra of the compound has shown absorbance at δ78.8 and δ79. These values have been assigned to C-3 and C-8 carbon atom respectively, to which –OH are attached. Proton attached to C-3 atom has shown absorption in ^{1}HNMR spectra at δ3.21. The absorption has been appeared has broad double doublet. Since proton is not attached to C-8 atom therefore in this reason only one absorption have been shown by ^{1}HNMR.

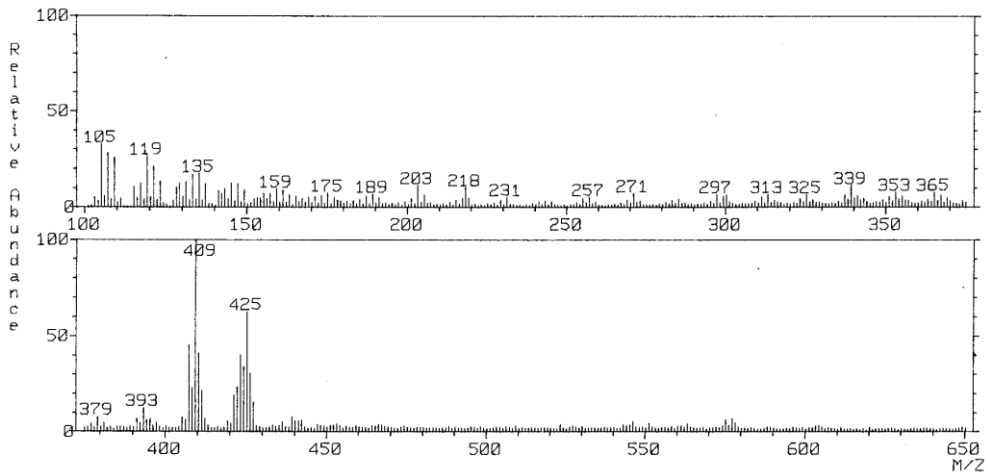
^{13}C spectra showed absorption at δ109 and δ145. These values have been assigned to C-7 and C-6. Carbon atom olefinic proton attached to C-7 atom is further confirmed by ^{1}HNMR spectra in which the proton has shown absorption at δ5.18 [10].

^{13}CNMR spectra showed absorption at δ115 and δ145 which have been assigned to exocyclic olefinic C-21 and C-22 carbon atoms respectively. The olefinic nature was confirmed by ^{1}HNMR spectra in which 2 protons have shown absorptions at δ4.66 and δ4.71 respectively. These absorptions are the charactertics absorptions of olefinic exocyclic protons. Protons methylene (-CH_2) group attached to olefinic C atom have appeared at δ1.61 which indicates the attachment of –CH_3 group to C-21.

^{13}CNMR spectra have shown 2 absorption at δ121 and δ156 these absorption assigned to C-11 and C-9 atom where double bond is present. Both the C-atoms are tertiary one and protons are not attached to them

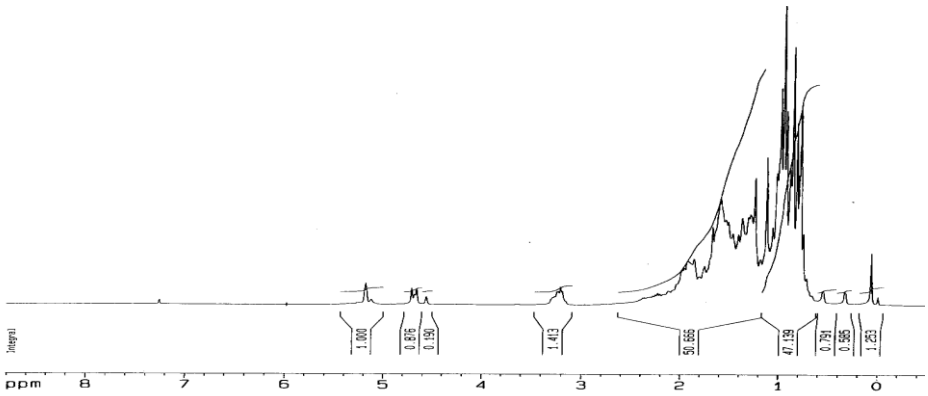
The ^{13}CNMR spectra has also shown absorption at δ124 and δ150 these absorption have been assigned to C-4 and C-5, C atom. C-4 carbon atom is attached to –CH_2 group which is numbered as C-29 has shown absorption at δ55.2 because of oxygen atom attached to C-29 atom. This O atom is further attached to C-6 carbon atom [10] forming a ring structure.

Absorption of protons attached to C-24, C-25, C-26, C-27 and C-28 have been observed at δ0.80, δ0.83, δ0.87, δ0.90, δ1.03 for 5 methyl groups were confirmed.

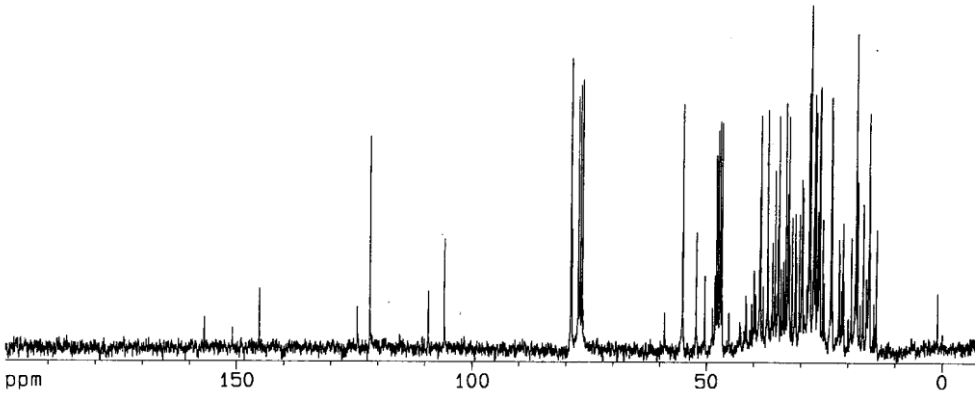


Mass Spectra of the Compound

International Journal of Engineering, Management and Humanities (IJEMH)
Volume 3, Issue 1, pp: 309-313 ISSN: 2395-5252 www.ijemh.com

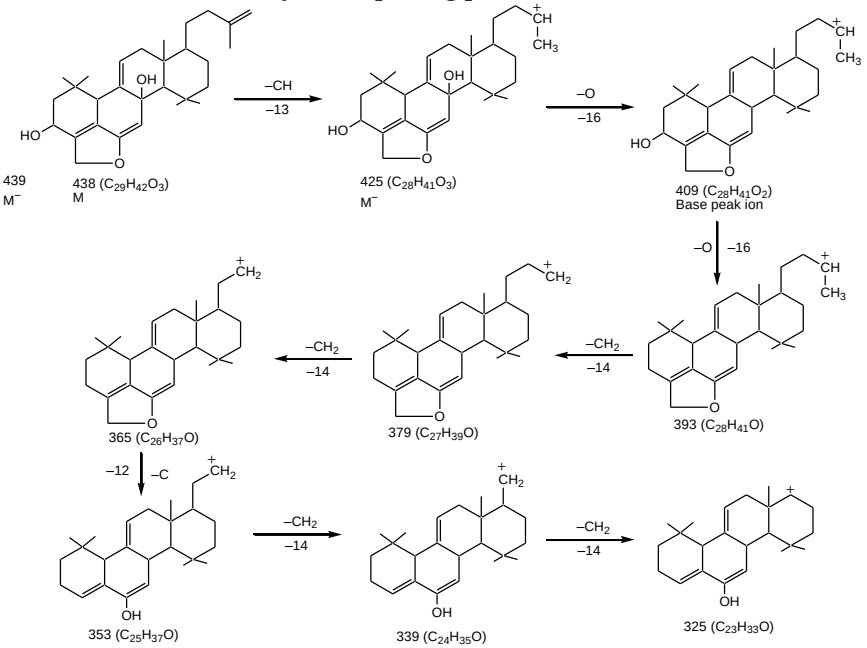


^{1}H NMR spectra of the Compound

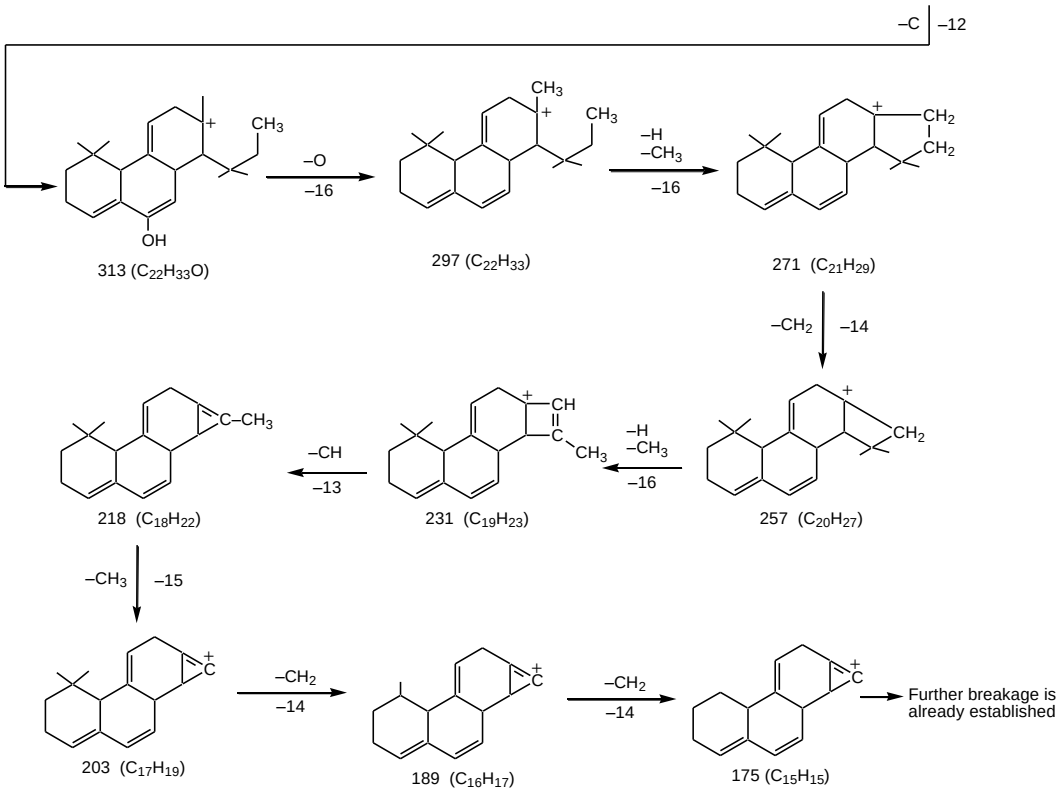


^{13}C NMR Spectra of the Compound

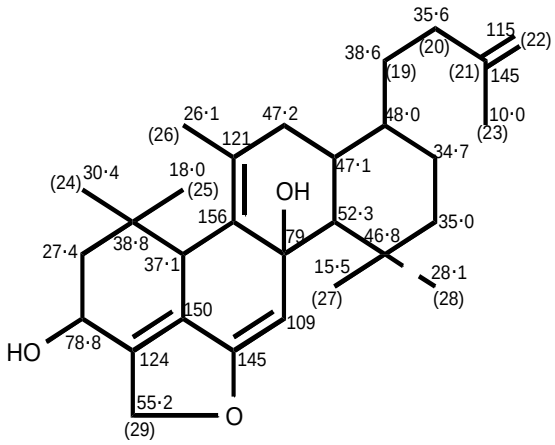
Further structure has been confirmed by mass splitting pattern.



International Journal of Engineering, Management and Humanities (IJEMH)
Volume 3, Issue 1, pp: 309-313 ISSN: 2395-5252 www.ijemh.com



On the basis of above discussion following structure has been proposed for this compound is named as Alscholide.



Compound Alscholide

REFERENCES:

[1]. M. D. Dassanayake. "A Revised Handbook of the Flora of Geylox. IV edition ***Amerind Publishing Co. Ltd, New Delhi.*** 1982.

[2]. R. S. Gupta, A. K. Bhatnager, Y. C. Joshi, Rakhi Sharma, and Aruna Sharma., "Suppression of Fertility in Male Albino Rats Following a-Amyrin Acetate Administration". ***Pharmaceutical Biology*** ; 2004;

[3]. R. S. Gupta, A. K. Bhatnager, Y. C. Joshi, Rakhi Sharma, and Aruna Sharma., "Induction of Anti-fertility with Lupeol Acetate in Male Albino Rats". ***Pharmacology*** 2005.

[4]. A. Rajic, G. Kweitio-Okai, T. Macrides, R. M. Sandeman, D. S. Chandler, G. M. Polya., "Inhibition of serine proteases by anti-inflammatory triterpenoids". ***Planta Med.*** 66; (2000); 206-210.

[5]. N. Kaewpradub, P. J. Houghton, E. Eno-Amooquaye, P. J. Burke., "Activity of extracts and alkaloids of Thai *Alstonia* species against human lung cancer cell lines". ***Planta Med***, 63; (1997); 97-101.

[6]. J. E. Sexton., "The Alkaloids Chemistry and Physiology". ***Academic Press, New York***. 8th Edition; (1965); 159.

[7]. G. Gandhi, V. K. Vinayak., "Preliminary evaluation of extract of *Alstonia scholaris* bark for *in vivo* antimalarial activity in mice". ***J. Ethnofarmacology***. 29; (1990) 51-57.

[8]. G. Arunachalam, D. Chattopadhyay, S. Chatterjee, A. B. Mandal, T. K. Sur and S.

C. Mandal., "Evaluation of anti-inflammatory activity of *Alstonia macrophylla* Hall ex A. DC. leaf extract". ***Phytomedicine*** 9; (2002); 632-635.

[9]. N. Kaewpradub, G. C. Kirby, J. C. Steele, P. J. Houghton., "Antiplasmodial activity of extract and alkaloids of *Alstonia* species from Thailand". ***Planta Med.*** 65; (1999); 690-694.

[10]. José L. Marco, Benjamín Rodríguez, Conrad Pascual, Giuseppe Savona, Franco Piozz., "Teuscorodin, teuscorodonin and 2-hydroxyteuscorolide, neo-clerodane diterpenoids from *teucrium scorodonia*. ***Phytochemistry*.** 22 (3); 1983; 727-731.