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A NOVEL PENTACYCLIC TRITERPENOID ISOLATED FROM *CARALLUMA ATTENUATA ROOT*

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ABSTRACT

From the root of *Caralluma attenuata* belonging to the family *Asclepiadaceae*, a novel pentacyclic triterpenoid was isolated. Its structure was elucidated on the basis of spectroscopic data. This is the first report of such novel pentacyclic triterpenoid from *Caralluma attenuata* root.

KEY WORDS: *Caralluma attenuata*, *Asclepiadaceae*, pentacyclic triterpenoid.

INTRODUCTION

In the course of our investigation on chemical constituents of *Carallumas* we have isolated a number of triterpenoids and flavanoids. Isolation and characterization of oxypregnane glycosides[1,2], pregnane gylcosides[3-9], triterpene saponins[10,11], flavonoids[12], pregnane esters[13] bisdesmosidic glycosides[14,15], flavone glycosides[16], were earlier reported from the same genus. We here by report the isolation and structural elucidation of a novel pentacyclic triterpenoid derivative from *Caralluma attenuata.*

EXPERIMENTAL

The plant material of *Caralluma attenuata* was collected in Tirumala forests during Nov-2009.

MPs uncorrected IR ν_{max}^{KBr} cm^{-1}, UV λ_{max}^{EtOH} nm, ^{1}HNMR □ppm, 300 MHz $CDCl_3$, CC and TLC on silica gel.

2.1 Spectral Data

2.1.1 U.V λ_{max}^{EtOH} 204 &206 nm

2.1.2 IR ν_{max}^{KBr} 3423.00, 2919.20, 2849.56, 1706.75, 1467.53, 1377.97, 1262.33, 1172.24, 1099.64, 1022.87, 801.57, 723.74 cm^{-1}

2.1.3 *^1H NMR □□□ppm* 9.8, 4.072, 4.055, 4.039, 3.880, 3.667, 2.436, 2.417, 2.400, 2.306, 2.288, 2.269, 2.174, 2.133, 2.100, 2.046, 1.628, 1.612, 1.595, 1.558, 1.225, 1.035, 0.896, 0.881, 0.864, 0.806. ppm

2.1.4 MASS [M^+] m/z 515, 471.6, 459.5, 455.3, 441.5, 439.4, 429.4, 415.3, 410.5, 409.5, 338.5, 282.4.

2.2 EXTRACTION AND ISOLATION

The air dried roots of *Caralluma attenuata* were powdered and extracted with hexane, benzene, acetone and methanol in a soxhlet extractor.

n-hexane extract 28gms was subjected to column chromatography using silica gel 10-40 mesh. It is eluted with benzene, benzene and methanol mixtures. Last part of benzene fractions (56-82) yielded a white solid which showed two close moving spots on TLC. These fractions were rechromatographed using chloroform and methanol. Chloroform:methanol 98:2 fractions on recrystallisation using benzene and Acetone yielded a white crystalline solid 25 mg MP 119^{0}C with Rf 0.16 (benzene as developing solvent). This was analysed by spectral data.

3.1 RESULTS AND DISCUSSIONS

The compound was isolated as white crystalline needles with M.P.119^{o}C and analysed for $C_{34}H_{58}O_3$ [M^+] m/z 514 The compound showed positive test for Libermann-Burchard reaction, Salkowski test, indicating it to be a steroid/terpenoid.

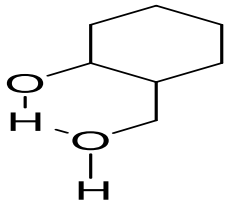
It gave orange red precipitate with 2,4 DNP and pink colour with schiffs reagent showing the presence of aldehye group.

The U.V. spectrum showed □max at 204, 206 nm indicating absence of conjugated double bonds.

The IR spectrum showed strong absorption at □$_{max}$ 3423 cm^{-1} as a broad peak indicating presence of bonded –OH. There is shift of this band with dilution, this indicates presence of intramolecular hydrogen bonding. A one proton down field signal at □□3.880 (1H,d) and at

□□4.055 (1H,t) indicated the presence of secondary hydroxyl and primary hydroxyl similar to the pentacyclic triterpenoid isolated from the same plant [11]. 2^0 hydroxyl group is □-hydroxyl which is supported by a (1H m) signal at □ 3.667.

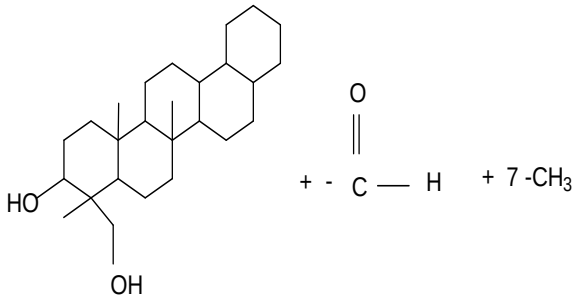
The ^{1}HNMR spectrum showed the characteristic ring protons ranging from □ 0.6-1.8 indicating the presence of pentacyclic triterpenoid.[17] This suggested the pentacyclic teiterpenoid with 2^0 hydroxyl group at 3rd position and a 1^0 OH at 4th which is further supported by possibility of intramolecular H-bonding.



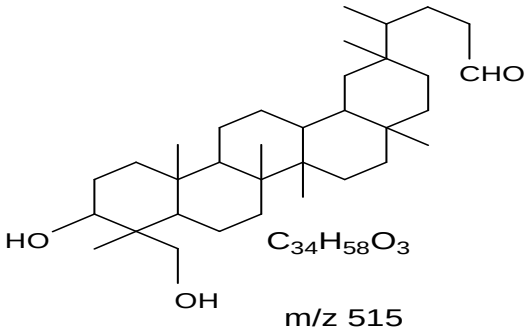
Thus, it accounts for 22 carbons of pentacyclic ring , a carbonyl 'C' and a primary and secondary OH accounting for 23 'C' and 3'O' in molecular formula.

^{1}HNMR showed peaks at□ □□□0.806, 0.864, 0.881, 0.881, 0.896 1.035, 1.255 and 2.046 ppm each corresponding to three protons indicating the presence of seven methyl groups

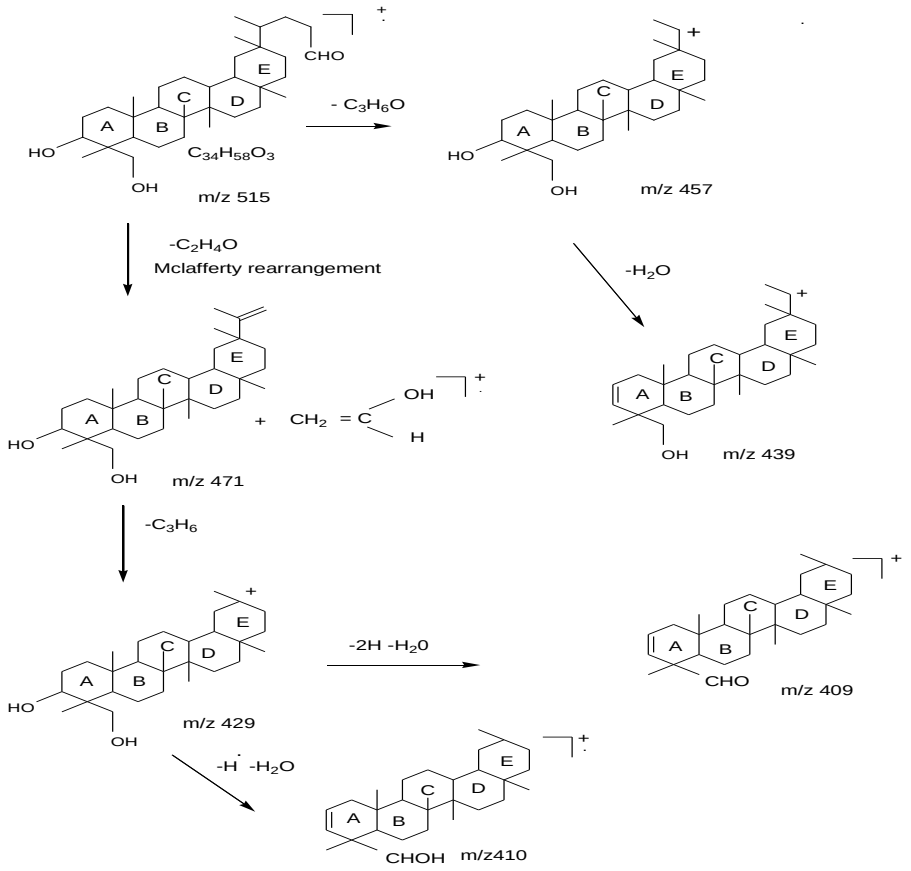
Thus, partial structure of the compound can be



Based on the triterpenoids isolated from the same plant[11] the positions of the methyl were assigned and the structure is assigned as



This structure is further supported by the mass spectral fragmentation as given in scheme-I. This terpenoid is isolated and reported for the first time from this plant as well as from nature.



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