

## Isolation of Long Chain Aliphatic Compound from *Momordica Diocia* (Roots)

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### ABSTRACT

From *Momordica diocia* (root), compounds were isolated. their structures were established on the basis of spectral studies. and identified as 8- hydroxyoctyl pentadec -15 enoate (1), 5- hydroxy eicos-10- none (2), 5-hydroxy nonyl decanoate (3).

**Keywords:** *Momordica diocia*, cucurbitaceae, roots, ethanol extract.

### INTRODUCTION

*Momordica diocia* commonly known as "Golkandra" belongs to family cucurbitaceae<sup>(1-3)</sup>. The plant distributed throughout India. The plant is used in traditional medicinal system<sup>(3-5)</sup>. The Seed used in head troubles, jaundice, heart diseases, diabetes. The seeds of *M.diocia* shown antibiotic activities<sup>9</sup>. The leaves of plants has anthelmantic properties. The whole dried powdered fruit effective for hypoglycemic activity. Its roots, leaves, seeds and whole plant are used as medicines<sup>6-8</sup>. The seeds of *M diocia* investigated and found that it contains triterpene, glycosides, alkaloids, essential oil, saponins and momordicin<sup>10-11</sup>. In this paper we report the isolation and Characterization of Compound (1), (2) & (3). These compounds isolated from ethanol extract of *M. diocia* (roots).

### MATERIALS AND METHODS

The roots of *M. diocia* were collected from the nearby area of Ujjain city. And Identified by the authorities, the roots were washed, air dried and ground to a coarse powder.

Extraction and isolation: The powdered roots (5 kg) were extracted in a soxhlet extractor exhaustively with ethanol (15 Lit. 3 times) at room temperature. The dark brown mass was obtained which was labeled as ethanol extract of *M.diocia* and keep in refrigerator.

Investigation of Ethanol Extract: The qualitative TLC benzene: methanol: acetic acid (8:2:1,v/v)) analysis of this extract reveals the presence of separable composition. For separation of composition (ethanol extract) subjected to column chromatography on alumina Gr.III column. Elution with hexane, hexane:benzene, benzene and increasing order of polarity. The hexane : Benzene (7:3) fraction afforded compound(1). The Methanol:ethylacetate fraction and benzene: ethylacetate fraction further subjected to rechromatography afforded compound (2) and (3)

Melting points differs, IR spectra were recorded on KBr <sup>1</sup>HNMR spectra (200 MHz) in CDCl<sub>3</sub> were determined

with TMS as an internal reference. The column chromatography were carried out on alumina Gr.!!! and TLC on silica gel G. spots were visualized exposure to iodine vapour or charring with H<sub>2</sub>SO<sub>4</sub>-vanillin spray.

Compound( 1) 8- hydroxyoctylpentadec -15 enoate(1) MP 89<sup>o</sup>C, CHCl<sub>3</sub>:MeOH, Rf=0.78 Hexane:ether :acetic acid(6:4:1,v/v) C<sub>23</sub>H<sub>44</sub>O<sub>3</sub> M<sup>+</sup> 368IR, KBr, cm<sup>-1</sup>,3415,2960,2924,2854,1734,1624,1463,1383,1262,1095,1025,854,803,732-20,679cm<sup>-1</sup>.

<sup>1</sup>HNMR spectrum (200 MHz TMS, CDCl<sub>3</sub>, δ) At δ0.89(t,6H,2-CH<sub>3</sub>),1.25(s,20H,10CH<sub>2</sub>,1.65), (s,1H,OH),1.60(m,10H,5-CH<sub>2</sub>),2.30(t,2H,CH<sub>2</sub>-Co-o),3.65,(m,1H,CHOH),4.09(t,2H,CH<sub>2</sub>0-Co),5.3(t,2H,CH=CH)

EIMS:m/Z(ret.int.,%),M<sup>+</sup>368(2.5),353(3.7),340(2.4),312(3.3),308(4.0),284(13.9),279(5.8),266(31.4),256(31.4),238(4.12),226(1.20),212(2.3),203(2.10),167(6.4),128(12.2),124(1.3),110(60.0),97(70.0),83(80.5),71(56.0),57(100),44,(51.8)

Compound (2) (8:2 benzene: ethylacetate fraction) 5-hydroxy eicos-10- none (2) MP 78<sup>o</sup>C, CHCl<sub>3</sub>:MeOH, Rf=0.48 benzene:MeOH:acetic acid(8:2:0.1,v/v) C<sub>29</sub>H<sub>40</sub>O<sub>2</sub>, M<sup>+</sup>312 IR,KBr,cm<sup>-1</sup>,3448,2960,2924,2854,1734,1624,1463,1383,1262 1093,1025, 845, 803, 732-720, 679cm<sup>-1</sup>. The <sup>1</sup>HNMR(200MHZ,CDCl<sub>3</sub>,TMS,δ)

δ 0.96(t,6H,2-CH<sub>3</sub>),δ1.25(s,24H,12-CH<sub>2</sub>),δ1.56 (s,1H,OH),δ1.6(m,4H, - 2-CH<sub>2</sub>),δ2.39(t,4H,2-CH<sub>2</sub>, to keto group),δ3.7(m,1H-CHOH).

EIMS:m/Z(ret.int.,%),M<sup>+</sup>312(3.1),298(3.8),284(7.9),270(4.5),255(12.3) 240,(6.0),225(3.1),222(1.3),213(4.2),202(2.9),184(1.01),168(28.2),154(5.2),139(8.3),129(36.7),110(40.1),91(70.7),77(42.1),57(100),44(80.9).

Compound(3), 5-hydroxy nonyldecanoate(3).MP 113<sup>o</sup>C, CHCl<sub>3</sub>:MeOH,Rf=0.58 benzen: Et<sub>2</sub>O :acetic acid (8:2:1,v/v) C<sub>28</sub>H<sub>56</sub>O<sub>3</sub> M<sup>+</sup> 440 IR, KBr, cm<sup>-1</sup>3448,2923,2853,1737,1464,1377,770&722cm<sup>-1</sup>

<sup>1</sup>HNMR spectrum (200 MHz TMS, CDCl<sub>3</sub>, δ)δ0.96(t,6H,2-CH<sub>3</sub>),1.25(s,38H,19-

CH<sub>2</sub>), 1.60(S, 6H, -CH<sub>2</sub>OOH&ester  
 group), 2.30(t, 2H, CH<sub>2</sub>-CO-O) 3.66(m, 1H-  
 CHOH), 4.14(t, 2H, CH<sub>2</sub>-OCO)  
 EIMS: m/z (ret. int., %), M+ 440(5.2), 412(3.2), 381(2.3), 348(2.4), 321(3.4), 293(4.1), 283(3.4), 265(2.1), 264(2.1), 239(1.2), 237(3.4), 210(4.2), 197(3.5), 184(2.7), 168(10.2), 154(14.0), 132(19.6), 124(12.0), 110(56.7), 96(42.1), 84(50.0), 70(24.0), 57(100), 43(2.5).

## RESULT AND DISCUSSION

Compound (1) 8- hydroxyoctylpentadec-10-enoate, MP 89<sup>o</sup>c (CHCl<sub>3</sub>, MeOH), (RF=0.46, hexane; ACOH 6:4:1, v/v analysed for C<sub>23</sub>H<sub>44</sub>O<sub>3</sub> [M<sup>+</sup>]368<sup>-1</sup>, it showed IR bands at 3415-3425cm<sup>-1</sup>·1734cm<sup>-1</sup>, and 1624 cm<sup>-1</sup> indicative of the presence of OH group, ester group and olefin bond in the compound(1) <sup>12-13</sup>The <sup>1</sup>H NMR spectrum of (1) The signal at 0.89(t, 6H, 2-CH<sub>2</sub>) for two terminal CH<sub>3</sub> protons. the signal at 1.25(S, 20H, 10-CH<sub>2</sub>) assigned the -CH<sub>2</sub>-protons, multiplet at 1.60(m, 10H, 5-CH<sub>2</sub>) assigned the methylene group attached to the carbinolic proton. Triplets at δ 2.30(t, 2H, CH<sub>2</sub>-CO-O) and δ 4.09(t, 2H, CH<sub>2</sub>O-CO) assigned the position of methylene proton adjacent to ester group. Multiplet at δ 3.65(m, 1H) for carbinolic proton. Triplet at δ 5.3 (t, 2H) olefinic proton. All the evidences suggested that the compound (1) is aliphatic unsaturated hydrocarbon having ester group. at δ 5.3 (t, 2H, CH=CH) for olefinic proton. 2-O-CO) oxomethylene group proton at δ 2.30 (t, 2H, CH<sub>2</sub>-CO-O). The exact position of ester group -OH group and olefinic were ascertained<sup>13</sup>. from mass spectrum it showed a M+ at m/z 368 from above evidence the structure of compound(1) <sup>15</sup>as identified as 8- hydroxyoctylpentadec-15 enoate(1). Compound (2) MP 78<sup>o</sup>c, molecular weight determination from mass spectrum established its molecular formula as C<sub>20</sub>H<sub>40</sub>O<sub>2</sub> M<sup>+</sup> 312 it showed IR bond at 3406 cm<sup>-1</sup>, 2920, 2852, 1706, 1469cm<sup>-1</sup>). Indicate long chain aliphatic hydroxyl ketone <sup>12-13</sup> suggested that long chain aliphatic hydroxyl ketone, The <sup>1</sup>H NMR spectrum showed peak at 0.96 (t, 6H), d 1.25(s), dδ 2.39(t, 6H) at δ 1.6 (m, Bδ 3.7 (m, 1H) for carbinolic proton δ 1.56 (s, H) for -OH proton δ 2.39 (t, 4H, 2-CH<sub>2</sub>, to ketogroup) δ 3.7 (M, 14), -CHOH) <sub>2</sub> δ 1.6 (m 4H, -2-CH<sub>2</sub>) δ 1.56 (S 14 COH) δ 1.25 (S, 24H, 12-CH<sub>2</sub>) δ 0.96 (t, 6H, 2-CH<sub>3</sub>) <sup>14</sup>. The molecular ion peak at m/z 312 (15)C<sub>20</sub>H<sub>40</sub>O<sub>2</sub> Compound (2) identified 5- hydroxyl iecos-10-none<sup>15</sup>. Acetylation of Compound (2) 40mg was heated with AC<sub>2</sub>O (25ml) and pyridine(10ml) over a steam bath. The completion of the reaction was tested on TLC. The reaction mixture was worked out by usual method to afford acetate derivative has MP 78<sup>o</sup>c its IR spectrum showed band at 1750 cm<sup>-1</sup>

Compound (3) MP.113<sup>o</sup>C analysed for C<sub>28</sub>H<sub>56</sub>O<sub>3</sub> [M<sup>+</sup>] 440 it showed IR bands 3448 cm<sup>-1</sup> and 1737 cm<sup>-1</sup> indicative of the presence of -OH group and ester group<sup>12-13</sup>. The <sup>1</sup>H NMR spectrum Resonated different signal at δ 4.4 (t, 2H, CH<sub>2</sub> -OCO), δ 3.66 (M, 1H, -CHOH) δ 2.30 (t, 2H, CH<sub>2</sub>Co<sub>2</sub>) δ 1.60 (S, 6H, B-CH<sub>2</sub> to -OH & ester group), δ 1.2515, 38H, 19-CH<sub>2</sub>), δ 0.96 (6H, 2-CH<sub>3</sub>) <sup>14</sup>. The molecular ion peak at m/z 440 the presence of relatively high abundant fragment at 132 formed by b-cleavage and hydrogen transfer clearly indicated the position of -OH and ester group<sup>15</sup>. Compound (3) identified as-hydroxy nonyl decanoate(3).

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