

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⁽¹⁻³⁾. The plant distributed throughout India. The plant is used in traditional medicinal system⁽³⁻⁵⁾. The Seed used in head troubles, jaundice, heart diseases, diabetes. The seeds of *M.diocia* shown antibiotic activities⁹. 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 medicines⁶⁻⁸. The seeds of *M diocia* investigated and found that it contains triterpene, glycosides, alkaloids, essential oil, saponins and momordicin¹⁰⁻¹¹. 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 ¹HNMR spectra (200 MHz) in CDCl₃ 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 H₂SO₄-vanillin spray.

Compound(1) 8- hydroxyoctylpentadec -15 enoate(1) MP 89^oC, CHCl₃:MeOH, Rf=0.78 Hexane:ether :acetic acid(6:4:1,v/v) C₂₃H₄₄O₃ M⁺ 368IR, KBr, cm⁻¹,3415,2960,2924,2854,1734,1624,1463,1383,1262,1095,1025,854,803,732-20,679cm⁻¹.

¹HNMR spectrum (200 MHz TMS, CDCl₃, δ) At δ 0.89(t,6H,2-CH₃), 1.25(s,20H,10CH₂), 1.65(s,1H,OH), 1.60(m,10H,5-CH₂), 2.30(t,2H,CH₂-Co-o), 3.65(m,1H,CHOH), 4.09(t,2H,CH₂-Co), 5.3(t,2H,CH=CH)

EIMS:m/Z(ret.int.,%), M⁺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^oC, CHCl₃:MeOH, Rf=0.48 benzene:MeOH:acetic acid(8:2:0.1,v/v) C₂₉H₄₀O₂, M⁺312 IR, KBr, cm⁻¹, 3448, 2960, 2924, 2854, 1734, 1624, 1463, 1383, 1262, 1093, 1025, 845, 803, 732-720, 679cm⁻¹.

The ¹HNMR(200MHZ, CDCl₃, TMS, δ)

δ 0.96(t,6H,2-CH₃), δ 1.25(s,24H,12-CH₂), δ 1.56 (s,1H, _OH), δ 1.6(m,4H, - 2-CH₂), δ 2.39(t,4H,2-CH₂, to keto group), δ 3.7(m,1H-CHOH).

EIMS:m/Z(ret.int.,%), M⁺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^oC, CHCl₃:MeOH, Rf=0.58 benzen: Et₂O :acetic acid (8:2:1,v/v) C₂₈H₅₆O₃ M⁺ 440 IR, KBr, cm⁻¹3448, 2923, 2853, 1737, 1464, 1377, 770&722cm⁻¹

¹HNMR spectrum (200 MHz TMS, CDCl₃, δ) δ 0.96(t,6H,2-CH₃), 1.25(s,38H,19-

CH₂), 1.60(S, 6H, -CH₂OOH&ester
 group), 2.30(t, 2H, CH₂-CO-O) 3.66(m, 1H-
 CHOH), 4.14(t, 2H, CH₂-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^oc (CHCl₃, MeOH), (RF=0.46, hexane; ACOH 6:4:1, v/v analysed for C₂₃H₄₄O₃ [M⁺]368⁻¹, it showed IR bands at 3415-3425cm⁻¹·1734cm⁻¹, and 1624 cm⁻¹ indicative of the presence of OH group, ester group and olefin bond in the compound(1) ¹²⁻¹³The ¹H NMR spectrum of (1) The signal at 0.89(t, 6H, 2-CH₂) for two terminal CH₃ protons. the signal at 1.25(S, 20H, 10-CH₂) assigned the -CH₂-protons, multiplet at 1.60(m, 10H, 5-CH₂) assigned the methylene group attached to the carbinolic proton. Triplets at δ 2.30(t, 2H, CH₂-CO-O) and δ 4.09(t, 2H, CH₂O-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. 2O-CO) oxomethylene group proton at δ 2.30 (t, 2H, CH₂-CO-O). The exact position of ester group -OH group and olefinic were ascertained¹³. from mass spectrum it showed a M+ at m/z 368 from above evidence the structure of compound(1) ¹⁵as identified as 8- hydroxyoctylpentadec-15 enoate(1). Compound (2) MP 78^oc, molecular weight determination from mass spectrum established its molecular formula as C₂₀H₄₀O₂ M⁺ 312 it showed IR bond at 3406 cm⁻¹, 2920, 2852, 1706, 1469cm⁻¹). Indicate long chain aliphatic hydroxyl ketone ¹²⁻¹³ suggested that long chain aliphatic hydroxyl ketone, The ¹H 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-CH₂, to ketogroup) δ 3.7 (M, 14), -CHOH) ₂ δ 1.6 (m 4H, -2-CH₂) δ 1.56 (S 14 COH) δ 1.25 (S, 24H, 12-CH₂) δ 0.96 (t, 6H, 2-CH₃) ¹⁴. The molecular ion peak at m/z 312 (15)C₂₀H₄₀O₂ Compound (2) identified 5- hydroxyl iecos-10-none¹⁵. Acetylation of Compound (2) 40mg was heated with AC₂O (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^oc its IR spectrum showed band at 1750 cm⁻¹

Compound (3) MP.113^oC analysed for C₂₈H₅₆O₃ [M⁺] 440 it showed IR bands 3448 cm⁻¹ and 1737 cm⁻¹ indicative of the presence of -OH group and ester group¹²⁻¹³. The ¹H NMR spectrum Resonated different signal at δ 4.4 (t, 2H, CH₂ -OCO), δ 3.66 (M, 1H, -CHOH) δ 2.30 (t, 2H, CH₂Co₂) δ 1.60 (S, 6H, B-CH₂ to -OH & ester group), δ 1.2515, 38H, 19-CH₂), δ. 0.96 (6H, 2-CH₃) ¹⁴. 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 group¹⁵. Compound (3) identified as-hydroxy nonyl decanoate(3).

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