


40. Okano, S., Private communication.
76. Zechmeister, L., Progress in the chemistry of Natural Products (WienSpringer verlag, New York), 26, 190-244 (1968).
73. Levie, D., Jain, M.K. and Shapay-Gabrielith, S.R.,
74. The Wealth of India, VI, 323-25 (1962), (CSIR Publication,
New Delhi).
75. Chopra, R.N., Nayar, S.L. and Chopra, I.C., Glossary of
Indian medicinal plants, 163-64 (1936).
77. Kurasawa, O., Hyoshono, K., Takashi, T. and Takashi, K.
78. Kurasawa, O., Tetsuro, T. and Takashi, T., Chem. Lett.,
6, 621-4 (1978).
82. Clarke, H.T., Organic analysis, Orient Longmans Ltd.,
New Delhi, 91-92 (1966).
85. Roller, C.H., Smith, R.A., Harris, G.S. and Walker, J.W.,
86. Dresakorn, C.H. and Briner, M., Pharm. Acta. Helv., 20,
139 (1953).
88. Silverstein, R.M. and Bassler, G.C., Spectrometric
Identification of organic compounds, John Wiley
89. De Silva, L.E., Stocklin, W. and Geissman, T.A.,


Dear Dr. Srivastava,

You will be happy to note that the revised manuscript of your paper entitled, "The New Limonoids from the Ruts of Melia azedarach Linn." has been accepted for publication in Section B of the journal and rendered press ready with necessary editorial modifications. Since some of the changes made are major, the edited manuscript enclosed may kindly be examined carefully, got retyped in double spacing on a good quality paper, and returned to us immediately along with the retyped manuscript in duplicate. You are at liberty to correct any ambiguity in the edited version. The retyped manuscript should be checked thoroughly before sending to us for any possible errors since incorporation of any corrections/changes afterwards will not be possible unless highly desirable. The paper will be sent to the press after getting the retyped manuscript from you.

Thanking you,

Yours sincerely,

Encl: As above

(Dr. S.A.I. RIZVI)
Editor

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P.S.:
NEW LIMONOIDS FROM THE ROOTS OF MELIA AZEDARACH L. INV.

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Chemical and spectral evidences are presented for the structures of salannin, a new limonoid, 6-acetoxy-7 α-hydroxy-3-exo-14β, 15β-epoxymelias-1, 5-diene and a new limonoid glycoside, 6-acetoxy-3β-hydroxy-7-exo-14β, 15β-epoxy melias-1,5-diene-3-O-β-D-glucuronopyranoside isolated from the roots of Melia azedarach Linn.

Melia azedarach Linn (Meliaceae) is a medicinal plant employed in our indigenous system of medicine.¹ As a result of an extensive study² on Meliaceae plants, a large number of bitter principles have been isolated and classified as 'limonoids'. Melia azedarach has been found to contain nimbín³, and the related principles salannin⁴, azadirone, azadiradone and epoxy azadiradone⁵, melianone and melianol⁶, meliantriol⁷, nimbolide⁸ and meldenin⁹. On reviewing the literature it has been found that no systematic chemical investigation has been made on the roots of Melia azedarach Linn. In this paper we report the isolation and structure elucidation of two new limonoids besides salannin (I) from the roots of this plant. The structures of the new limonoids have been established as 6-acetoxy-7α-hydroxy-3-exo-14β, 15β-epoxymelias-1,5-diene (II) and 6-acetoxy-3β-hydroxy-7-exo-14β, 15β-epoxymelias-1,5-diene-3-O-β-D-glucuronopyranoside (III) on the basis of chemical and
spectroscopic studies. Compounds of such structures rather rarely occur in nature. Both compounds II and III were found to exhibit antimicrobial activity.

Compound-I, after chromatographic purification, was obtained as a TLC-pure crystalline substance, m.p. 167-9°; (α) D +25° (CHCl₃); analyzed for C₂₅H₄₄O₉(M⁺
at m/z 596); UV (NαOH): 208 nm. IR spectrum exhibited bands at 1740 (acetate and methyl ester), 1710 (tiglic acid ester), 2945, 1495 and 865 cm⁻¹ (furan ring). Alkaline hydrolysis with 2N NaOH (30 ml) for 2 hr gave salaminic acid, m.p. 220-21°C (lit.10, m.p. 221°C).

(α) D +25° (CHCl₃) [Found: C, 68.1; H, 7.4. C₂₆H₅₄O₇; C, 68.1; H, 7.4%]. The mother liquor of the hydrolysate deposited tiglic acid, m.p. 62-63°C, identified by direct comparison and co-TLC with an authentic sample.

Methylation of salaminic acid with CH₂N₂ afforded a methyl ester, m.p. 202-4°C (lit.4, m.p. 201-5°C); (α) D +25° (CHCl₃) (lit.4, + 133°) [Found: C, 68.7; H, 7.6. C₂₇H₅₆O₇; C, 69.6; H, 7.6%]. Acetylation of the methyl ester with Ac₂O/Py at room temperature for 10 days gave methyl salaminate diacetate, m.p. 230-33°C (lit.4, m.p. 232-34°C); (α) D +25° (CHCl₃) (lit.4, + 126°) [Found: C, 67.0; H, 7.2. C₂₉H₅₄O₉; C, 66.9; H, 7.2%].

Thus compound-I was identified as salaminic acid; the identity was further supported by mass spectrum exhibiting peaks at m/z 596 (M⁺), 541 (M⁺-55), 313 (M⁺-83) and 496 (M⁺-100).
Compound-II on chromatographic purification followed by attempted crystallization with benzene-pet. ether yielded a pure colourless amorphous solid, m.p. 115-16°; (α)\textsubscript{D}\textsuperscript{30} -70° (CHCl\textsubscript{3}), analysed for C\textsubscript{26}H\textsubscript{34}O\textsubscript{6}; UV (CHCl\textsubscript{3}); 240 (ε 3000, substituted hydroxydienophenol acetate) and 217 nm (ε 10000, furan ring). Its IR spectrum displayed bands characteristic of hydroxyl function (3450), enol acetate (1768, 1710-1725 and 1220), α, β-unsaturated carbonyl group (1690) and furan ring (2940, 1495 and 865 cm\textsuperscript{-1}). The NMR spectrum of II exhibited signals for β-substituted furan ring (δ 6.42, 7.22 and 7.36, H, each one proton) five tertiary methyls (0.88, 0.89, 1.15, 1.22 and 1.29, each 3), a secondary hydroxyl (4.00, s)\textsuperscript{10-12} one acetate group (2.00, s, three protons), 14β, 15β-epoxide ring (3.62, s, J=10 Hz, one proton) and a -CH=CH- function (7.26, a, J=10 Hz, H-1 and 5.90, a, J=10 Hz, H-2).\textsuperscript{3-11} The mass spectrum showed major fragments at m/z 466 (M\textsuperscript{+}), 451 (M\textsuperscript{+}-15), 448 (M\textsuperscript{+}-18), 407 (M\textsuperscript{+}-59), 399 (M\textsuperscript{+}-67),
396 (\(N^+ - 68\)), 385 (\(N^+ - 61\)), 371 (\(N^+ - 95\)), 342 (\(N^+ - 124\)),
317 (\(N^+ - 149\)), 305 (\(N^+ - 163\)), 251 (\(N^+ - 215\)),
and 191 (\(N^+ - 273\)). On acetylation
\((\text{Ac}_2\text{O/Py})\) under reflux II yielded a diacetate (IV),
m.p. 124-26\(^\circ\); PMR : \(\delta\) 2.30 and 2.12 (each \(\alpha, 6H, 2 \times \text{CH}_3\)); IR : 1720 cm\(^{-1}\) (ester CO) \[\text{Found: C, 70.9; H, 7.00. \text{C}_{10}\text{H}_{16}\text{O}_7 \text{requires C, 70.9; H, 7.1%}}\].

Oxidation of II with \(\text{CrO}_3 - \text{C}_2\text{H}_5\text{N complex}^{11,12}\) gave a
ketone (V), m.p. 136-38\(^\circ\); (\(\alpha\)\(\_D^{30}\) -60\(^\circ\); UV (CHCl\(_3\))
220, 245 (sh), 320 nm; IR : 1770 (enol acetalate) and
1700 cm\(^{-1}\) (\(\alpha\), \(\beta\)-unsaturated carboxyl) which was
identical to cedrelone acetalate \(\text{litr.}^{14}\) m.p. 136-39\(^\circ\)
and (\(\alpha\)\(\_D^{30}\) -56\(^\circ\)). The ketone (V) on treatment with 2M
NaOH (40 min) afforded cedrelone (VI), m.p. 209-43\(^\circ\)
and (\(\alpha\)\(\_D^{30}\) -63\(^\circ\) \[\text{litr.}^{14}\) m.p. 209-44\(^\circ\) and (\(\alpha\)\(\_D^{30}\) -64.5\(^\circ\)];
UV (CHCl\(_3\)) : 218 and 260 nm shifting to 320 nm in the
presence of NaOH. The above chemical and spectral
studies show that the compound-II has a structure
closely related to cedrelone and its derivatives\(^{14}\)
and meldenin.\(^9\)

Additional support for the suggested
structure (II) was obtained from the fact that-II
on mild hydrogenation (5% Pd-C) gave the expected
dihydrogenated product (VII), m.p. 130-64\(^\circ\) (d);
(\(\alpha\)\(\_D^{30}\) -72\(^\circ\) (CHCl\(_3\)); UV (CHCl\(_3\)) : 212 and 279 nm;
IR : 3450 (OH), 1770, 1725-50, 1220 (enolic acetalate),
1710 (cyclohexane), 2940, 1500, 860 (furan ring); PIR
( 6 ) 0.68, 0.82, 1.12, 1.20, 1.28 (each 2; 15H, 5 x 2),
3.99 (s, 1H, OH), 2.00 ( s, 1 x OAe), 6.35, 7.20, 7.40
( G, furan ring protons), 3.65 (d, H-15) [Found: C, 71.8;
H, 7.7. C_{28}H_{36}O_{6} requires C, 71.8; H, 7.7%]. Compound-
VII on oxidation with CrO_{3} - C_{2}H_{5}OH complex^{11,13}
furnish dihydrodesrelone acetate (VIII), m.p. 176-79°,
( \alpha \text{D}^{30} -73° [lit.^{14} m.p. 176-80° and ( \alpha \text{D}^{20} -76°]
(Found: C, 72.1; H, 7.3. Cale. for C_{28}H_{34}O_{6}: C, 72.1;
H, 7.3%). Deacetelylation of VIII with 2N NaOH afforded
dihydrodesrelone (IX), m.p. 210-13°, ( \alpha \text{D}^{30} - 55°
[lit.^{14} m.p. 211-14° and ( \alpha \text{D}^{20} -60°]; UV (CHCl_{3}) : 210
and 279 nm (Found: C, 75.6; H, 7.6. Cale. for
C_{26}H_{32}O_{4}: C, 75.6; H, 7.3%). Thus compound-II was the
structure of 6-acetoxy-7\alpha-hydroxy-1-ene-14B, 15B-
epoxymeline-1,5-dim.
Compound-III on crystallization from pet. ether - benzene furnished a yellowish white microcrystalline solid, m.p. 144-46°, [α]D at 642, analysed for C_{34}H_{42}O_{12} \text{ (α)} \text{D}^{30} = 68.5°. It responded positively to the reactions characteristic of glycosides. The glycosidic formed an acetate (Ac_2O/Py), m.p. 103-11° and a methyl ether (Me_2SO_4-K_2CO_3), m.p. 150-53°. Its IR spectrum indicated the presence of hydroxyl function (3440, br), enolic acetate (1770, 1726-50 and 1228), carboxylic (1710) and carbonyl (1690) groups, furan ring (2942, 1.00 and 860) and a glycosidic linkage (825 cm^{-1}). The P spectrum displayed signals for five tertiary methyls (6.0, 0.78, 0.83, 0.96, 1.22 and 1.40, 3H, each t), an acetate function (2.02, t, 3H), 14B, 15B- epoxide function (3.62, t, J=10 Hz, 1H, H-15), allylic proton (6.18, δ, J=10 Hz, H-11; 6.90, δ, J=10 and 6Hz, H-2; and 3.95, δ, J=6Hz, H-5)), a β-substituted furan ring (6.40, 7.20 and 7.39, 1H each), sugar proton (4.3 - 5.00 m, 6H) and a carboxylic group (11.00, δ, 1H).
Acid hydrolysis (7% H₂SO₄) of III afforded a genin, m.p. 280-83° (d) and a sugar identified as D-glueuronic acid (see PC) together with a small quantity of D-glueuronolactone, m.p. 176-77° (lit.¹⁵ m.p. 177°). The genin (X) which analysed for C₂₆H₄₁O₆ exhibited in its UV spectrum absorption bands at 240 (ε 8000; substituted diophenol acetate) and 217 nm (ε 10000; furan diane system).¹⁶⁻¹⁹

Its IR spectrum indicated the presence of hydroxyl (3450, br), enolic acetate (1770, 1725-30 and 1220) and carbonyl (1679) function and a furan ring (2940, 1500 and 865 cm⁻¹). The PMR spectrum showed the presence of five tertiary methyls (δ, 0.78, 0.84, 0.95, 1.20 and 1.39, 3H each β), one acetate function (2.00, 3H), 148, 153-epoxide ring (3.60, δ, J=10 Hz, 1H, H-15), allylic protons (6.16, δ, J=10 Hz, H-1; 6.92, δδ, J=10 and 6 Hz, H-2; and 5.90, δ, J=6 Hz, H-3) and β-substituted furan ring (6.39, 7.21 and 7.59, all each one proton) in X. The mass spectrum of X showed peaks at m/z 466 (M⁺), 451 (M⁺-H₂O), 446 (M⁺-H₂O), 407 (M⁺-OAc), 399 (M⁺-C₆H₄O), 398 (M⁺-C₆H₄O), 385 (M⁺-C₆H₄O), 374 (M⁺-C₆H₄O), 342 (M⁺-C₆H₄O), 317 (M⁺-C₆H₄O), 303 (M⁺-C₁₀H₁₁O₂), 249 (M⁺-C₁₄H₁₇O₂) and 191 (M⁺-C₁₆H₁₉O₄). The genin (X) on acetylation (Ac₂O/Py) under reflux formed an acetyl derivative (XI), m.p. 123-25°, the PMR spectrum of which displayed signals for two acetate groups as singlets at 8 2.30 and 2.03. Deacetylation (2N NaOH) of X afforded the diol (XII), m.p. 180-82°(d) which showed UV absorption at 279 nm (ε 100000) undergoing batochromic shift to 326 nm (ε 5000) in the presence of HCl thereby indicating...
presence of a dihydrophenol function in XII. The UV absorption maxima of X and XII were consistent with the presence of dihydrophenol type function in ring-B of a tetracyclic triterpene similar to other melissanes (limonoids) and related compounds. \(^{20}\) Acetylation (\(\text{Ac}_2\text{O/Fy}\)) of XII under reflux yielded a product identical (m.p., m.m.p. and co-TLC) with XI, indicating the presence of one secondary hydroxyl and one acetyl group in X. Chromium trioxide-pyridine complex \(^{11,13}\) or Jones' oxidation of X afforded V, m.p. 156-57\(^\circ\) which on treatment with \(\text{NaOH} (2\%)\) gave cedrelone VI, m.p. and m.m.p. 212-14\(^\circ\), the identity of which was further confirmed by conversion into known derivatives such as monoaacetate (m.p. 156-57\(^\circ\); lit. \(^{14}\) m.p. 156-59\(^\circ\)) and methyl ester (m.p. 206-9\(^\circ\); lit. \(^{16}\) m.p. 207-10\(^\circ\)). Mild catalytic hydrogenation (Pd-C) of VI afforded the dihydrocedrelone (IX), m.p. 212-13\(^\circ\) (lit. \(^{14}\) m.p. 211-14\(^\circ\)) while its complete hydrogenation (Pt-AcOH) produced the hexahydrocedrelone, (XIII), m.p. 220-23\(^\circ\) (lit. \(^{14}\) m.p. 222-25\(^\circ\)). Treatment of VI with alkaline (NaOH) \(\text{H}_2\text{O}_2\) gave an epoxide (XIV), identical with 1,2-epoxycedrelone, m.p. 226-27\(^\circ\) (lit. \(^{14}\) m.p. 222-28\(^\circ\)). Compound VI on treatment with NaOH-KOH gave an acid (XV) similar to isocedrelonic acid, m.p. 290-95\(^\circ\) (d) [lit. \(^{14}\) m.p. 295-300\(^\circ\)(d)]. Treatment of V with BF\(_3\)-etherate afforded the isocedrelone acetate, m.p. 222-26\(^\circ\) (d) [lit. \(^{14}\) m.p. 223-27\(^\circ\)(d)].
Based on the above evidences the structure of the ganin has been established as 6-acetoxyl-3β-hydroxy-7-ene-14β, 15β-epoxymialized-1, 5-diene (X) which has not been reported so far in literature.

The periodate oxidation\(^{20,21}\) of III in 90% ethanol at room temperature consumed 2 mol of periodate with the liberation of 1 mol of formic acid per mol of the glycoside after 60 hr, indicating the presence of D-glucuronic acid in pyranose form. The hydrolysis of III with amylase enzymes at 45° for 18 hr liberated D-glucuronic acid (co-FC) and the ganin X (m.p., m.m.p. and co-TLC) showing the presence of β-linkage. Thus, on the basis of the above study, the limonoid glycoside was assigned the structure of (III) which has structural features of rare occurrence in nature.

\[ \text{III): } R^3 = \text{glucuronic acid; } R^4 = \text{Ac} \]

\[ \text{(X): } R^3 = \text{H; } R^4 = \text{Ac} \]

\[ \text{(XI): } R^3 = R^4 = \text{Ac} \]

\[ \text{(XII): } R^3 = R^4 = \text{H} \]
Experimental Procedure

Melting points were determined on a melting point apparatus (Tochinoval, New Delhi). Specific rotations were taken in chloroform solution at room temperature unless otherwise specified, on a Perkin-Elmer 141 polarimeter. IR spectra in KBr were recorded on a Perkin-Elmer 157 spectrophotometer (\( \nu \max \) in cm\(^{-1}\)). 90 MHz PMR spectra in CDCl\(_3\) on a Varian A instrument using TMS as internal standard (chemical shifts in S, ppm), and mass spectra on a Perkin-Elmer Hitachi RMU OR instrument.

Isolation of limonoids

The powdered roots of M. amedanchar (5 kg) procured from the United Chemicals and Allied Products, Calcutta, November and identified by Botanical Survey of India, Allahabad circle (UP), was extracted with rectified spirit and the extract (40 litres) concentrated to 400 ml under reduced pressure. It was poured into water (1 litre) and segregated into water soluble and water-insoluble fractions. The water insoluble fraction was successively extracted with pet.ether (b.p. 60–80°) and benzene which yielded compounds I and II respectively. Compound–I was purified over silica column using \( \text{C}_9\text{H}_6–\text{CHCl}_3 \) (5:5) as eluant and crystallized as colourless crystals (yield 980 mg). Compound–II was also purified over silica column using CHCl\(_3\) as eluant and crystallized as a colourless amorphous solid from \( \text{C}_9\text{H}_6–\text{pet.ether} \) (yield 3g). The water soluble was concentrated to 300 ml on a water-
bath, the concentrate defatted with pet. ether (b.p. 60-80°) and extracted with benzene. The benzene extract was concentrated under reduced pressure and pet. ether (b.p. 60-80°) added to it while hot giving III as a yellowish white amorphous solid which was passed through a neutral alumina column, eluted with CHCl₃ - C₆H₆ (5:5) and crystallized as light yellowish white microcrystals from benzene-pet. ether (b.p. 60-80°), yield 3.8 g; TLC: Rₓ 0.51 (C₆H₆ - MeOH; 8:2), 0.72 (CHCl₃ - MeOH; 8:2) and 0.22 (C₆H₆ - CHCl₃; 9:1)(Found: C, 63.4; H, 6.3. C₃₄H₄₂O₁₂ requires C, 63.6; H, 6.5%). It formed an acetate (100 mg glycoside + 5 ml Ac₂O + 5 ml C₃H₅N; yield 65 mg) (Found: C, 62.5; H, 6.2. C₄₀H₄₆O₁₅ requires C, 62.5; H, 6.3%) and a methyl ether (100 mg glycoside + 6 ml Me₂SO₄ + 4g K₂CO₃; yield 35 mg) (Found: C, 65.3; H, 7.2. C₃₈H₅₀O₁₂ requires C, 65.3; H, 7.2%).

Acid hydrolysis of III

To a solution of III (3.2 g) in abs. ethanol (30 ml) 7 ml H₂SO₄ (100 ml) was added and the mixture refluxed for 6 hr on a water-bath, poured into ice-cooled water (200 ml), kept at room temperature for 24 hr, and diluted with water (100 ml). The precipitated genin (X) was filtered. The filtrate was neutralized (BaCO₃), filtered, and the filtrate concentrated, kept at room temperature for five days, and filtered to remove a small amount of the deposited white crystalline matter. The filtrate showed the presence of D-glucuronic acid (Rₓ 0.12 in nBAW, 4:1:5 and 90-PC). The crystalline white compound was found to be D-glucuronolactone, m.p. 176-77° (lit.)
Study of the genin (X)

It was purified over neutral Al₂O₃ column (CHCl₃), and attempted crystallization from C₆H₆ - pet. ether furnished a colourless amorphous powder (yield 2.8 g); TLC : R₂ 0.83 (CHCl₃ - H₂O; 8:2) and 0.43 (C₆H₆ - CHCl₃; 7:3) (Found : C, 72.1; H, 7.3. C₂₆H₃₄O₆ requires C, 72.1; H, 7.3%).

It formed an acetyl derivative (XI) (100 mg of X + 4 ml Ac₂O + 5 ml C₆H₅N ; 4 hr on a water bath) which crystallized from acetone-ether as colourless prisms, m.p. 123-25° (Found : C, 70.9; H, 7.0. C₅₀H₅₆O₇ requires C, 70.9; H, 7.1%). IR : 1775, 1720, 1222, 1690, 2935, 1505 and 860; PFR : 0.79, 0.35, 0.90, 1.25 and 1.40 (each g, 15H, 5 x H), 3.65 (d, J=10Hz, 1H, H-4), 6.15 (q, 1H, J=10Hz, H-1), 6.92 (dd, 1H, J=10 and 6 Hz, H-2), 3.92 (d, 1H, J=6 Hz, H-3), 6.33, 7.32 and 7.40 (each g, 3H, furan-H), 2.30 (g, 3H, COCH₃), and 2.03 (s, 3H, COCH₃); MS : m/z 530(M⁺), 493, 490, 449, 441, 440, 427, 413, 384, 359, 345, 307, 149 and 191.

Acetylation of X to afford the diol (XII)

The genin (X; 100 mg) in MeOH (10 ml) was hydrolyzed with 2N NaOH (5 ml) under reflux for 30 min to give XII as plates from C₆H₆ - CHCl₃, m.p. 180-32° (d); its IR spectrum lacked the band for acetate group (Found : C, 73.6; H, 7.5. C₂₆H₂₈O₅ requires C, 73.6; H 7.5%). Acetylation of XII (Ac₂O/Py) gave XI (m.p., d.m.p. and co-TLC).
Jeffrey oxidation of X to give cedrelone acetate (V):

A portion (2 g) of X in C\textsubscript{6}H\textsubscript{5}N (23 ml, dried by refluxing with, and distilling from BaO) was added with stirring to CrO\textsubscript{3} (2 g, dried in vacuo over P\textsubscript{2}O\textsubscript{5}) and C\textsubscript{5}H\textsubscript{5}N (80 ml). The mixture was stoppered and left overnight. It was then poured into water and extracted with ether (800 ml). The ethereal extract was washed with water, dried (MgSO\textsubscript{4}) and evaporated to give a gummy mass which was purified over silica gel column (ether). The resultant ketone (V) (yield 980 mg) crystallized as light yellow prisms, m.p. 156-57°; UV (CHCl\textsubscript{3}) \lambda 223, 245 (sh) and 322 nm; IR : 2938, 1770, 1730, 1705, 1690, 1510, 1220 and 862 cm\textsuperscript{-1}; PMR : 0.73, 0.84, 0.95, 1.20 and 1.38 (each s, 15H, 5 x Me), 3.62 (d, J=10 Hz, 1H, H-15), 5.90 (d, J=10 Hz, 1H, H-2), 7.21 (d, J=10 Hz, 1H, H-1), 6.33, 7.29 and 7.37 (each q, 3H, furan-H) and 2.06 (q, 3H, COCH\textsubscript{3}) (Found: C, 72.4; H, 7.0. Cals. for C\textsubscript{28}H\textsubscript{32}O\textsubscript{6}: C, 72.4; H, 6.9%)

Jones' oxidation of X also gave V (m.p., m.m.p. 156-57°).

Decarboxylation of V to give cedrelone (VI)

Compound V (900 mg) in NaOH (85 ml) and 2H NaOH (60 ml) was refluxed for 40 min to give VI as rhombo from CHCl\textsubscript{3}-NaOH, m.p. 212-14°, ( CC\textsubscript{D}\textsuperscript{30} - 65°; IR : 3450 (OH), 3125, 1503 and 880 (furan ring), 1600 and 1685 (C=O); PMR : 0.90, 0.98, 1.16, 1.25 and 1.28 (each q, 15H, 5 x Me), 3.98 (d, J=10 Hz, 1H, H-15), 5.90 (d, J=10 Hz, 1H, H-2), 7.25 (d, J=10 Hz, 1H, H-1), and 6.35, 7.31 and 7.42 (each q, 3H, furan-H); MS : m/z 422 (M\textsuperscript{+}), and
402 (M -H₂O) (Found: C, 74.0; H, 7.3. Calc. for C₂₆'H₃₀O₉: C, 75.9; H, 7.3%).

Antimicrobial activity of compounds II and III

The antibacterial and antifungal properties were assayed by the method of Marazzella et al. Compound II exhibited a strong antibacterial activity against *Salmonella paratyphi*, *Vibrio cholerae*, *Bacillus subtilis*, and *Candida albicans*, and may find use as a drug. The limonoid glycoside (III) also showed positive effect on all the organisms given in Table 1 and can be used as a drug.

Table 1

Antibacterial and Antifungal Activities of the Glycoside (III)

<table>
<thead>
<tr>
<th>Organisms</th>
<th>Zone inhibition in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>At concentration (μg)</td>
</tr>
<tr>
<td></td>
<td>controls 100 80 60 40 20</td>
</tr>
<tr>
<td><strong>Antibacterial activity</strong></td>
<td></td>
</tr>
<tr>
<td><em>Vibrio cholerae</em></td>
<td>12 20 16 15 14 10</td>
</tr>
<tr>
<td><em>Klebsiella pneumoniae</em></td>
<td>8 17 11 10 9 8</td>
</tr>
<tr>
<td><em>Salmonella typhimurium</em></td>
<td>8 15 14 12 10 9</td>
</tr>
<tr>
<td><em>Escherichia coli</em></td>
<td>10 17 16 14 13 12</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>9 18 16 15 10 9</td>
</tr>
</tbody>
</table>

**Antifungal activity**

<table>
<thead>
<tr>
<th>Organisms</th>
<th>Zone inhibition in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>At concentration (μg)</td>
</tr>
<tr>
<td></td>
<td>controls 100 80 60 40 20</td>
</tr>
<tr>
<td><em>Microsporum canis</em></td>
<td>16 19 18 17 15 12</td>
</tr>
<tr>
<td><em>Trichophyton mentagrophytes</em></td>
<td>14 20 19 16 15 13</td>
</tr>
<tr>
<td><em>Candida albicans</em></td>
<td>16 18 17 15 13 12</td>
</tr>
<tr>
<td><em>Aspergillus fumigatus</em></td>
<td>10 16 15 14 10 8</td>
</tr>
<tr>
<td><em>Cryptococcus neoformans</em></td>
<td>12 20 18 17 15 14</td>
</tr>
</tbody>
</table>

*Including the size of the paper disc 6 mm.*
Acknowledgement

The authors are thankful to the Director, CDRI, Lucknow for microanalyses and spectral data, Prof. G.P. Mishra, Head, Department of Botany, University of Saugar for antimicrobial activity, and to the Ministry of Health and Family Welfare, New Delhi for the award of a junior Research fellowship to one of them (H O G).
References:


Te: Authors of Abstracts for
Organic Chemistry Section
of the 3rd Annual Conference
of ICC, Dharwad, October-1983

From: Dr. P.R. Singh
Professor of Chemistry
Indian Institute of Technology
KANPUR-208 016

Dated: July 27, 1983

Dear Colleague:

On behalf of the Indian Council of Chemists, I am pleased to inform you that the following Abstract of your contributed paper has been accepted for oral/poster presentation at the 3rd Annual Conference of the Indian Council of Chemists scheduled to be held at Dharwad, subject to editorial revision/modification.

Authors: Santosh K. Srivastava...and...Har. C. Gupta
Title: A New Flavonone Glycoside......... of Melia Azedarach

It has been decided on behalf of the ICC that the authors coming to Dharwad for oral presentation of their papers should be advised to bring standard size slides as far as possible, to facilitate a meaningful presentation of each paper in about 10-12 minutes. Similarly, authors coming to Dharwad for poster presentation of their papers should prepare the poster of each paper on a good quality thick white paper of the size 3'x2' written/drawn in thick letters with black ink.

All authors coming to Dharwad for either oral presentation or poster presentation of their contributed papers are advised to thoroughly rehearse the presentation in their own research groups before-hand specially with reference to complete and clear presentation of each paper in not more than 10-12 minutes. It is expected that there will be a brief discussion on each paper when it is presented by one of the authors.

Looking forward to the pleasure of meeting you at Dharwad.

Yours sincerely,

(P.R. Singh)
Scientist-in-charge icc
Sectional President
Section of Organic Chemistry
ICC-1983 Session, Dharwad.
A NEW FLAVANONE-GLYCOSIDE FROM THE ROOTS OF MELIA AZEDARACH

Santosh K. Srivastava and Hari O. Gupta
Department of Chemistry, University of Sagar, Sagar 470.003 (M.P.)

Abstract

The air-dried and powdered roots of *Melia azedarach* was extracted with rectified spirit. The spirit extract was concentrated and poured into water. The water-insoluble fraction was extracted with methanol. The methanol extract gave a glycoside, m.p. 320° (dec.), analysed for C_{28}H_{34}O_{15}. Acid hydrolysis (7% H_{2}SO_{4}, AR) of the glycoside afforded 5, 7-dihydroxy-4'-methoxy-flavanone (m.p., m.m.p., and CO-TLC) and D-maltose (Rf and CO-FC). The comparative physico-chemical studies of the glycoside and the aglycone proved its identity as 7-hydroxy-4'-methoxy-flavanone-5-O-β-D-maltopyranoside. The periodate oxidation and almond enzyme hydrolysis further confirmed the above proposed structure of the glycoside.