Asian Journal of Chemistry Vol. 19, No. 4 (2007), 3304-3306

NOTE

Isolation of Chemical Constituent from *Justicia aurea*

SHARAD KUMAR SRIVASTAVA* and FATEH BAHADUR
K.N. Government Post Graduate College, Gyanpur-221 304, India
E-mail: dr_sharad@rediffmail.com

β-Sitosterol has been isolated for the petroleum ether extract and choline from the ethanolic extracts of *Justicia aurea*. The structures were established by spectral analysis and m.p. determination.

Key Words: *Justicia aurea*, β-Sitosterol, Choline.

The genus Justicia[1] (fam. Acanthaceae) comprises of about 300 species world wide and nearly 50 species in India out of which more than 20 species have been investigated chemically and biologically. Literature review indicated that many species of genus Justicia are chemically well investigated like *J. simplex*[2,3], *J. pectoralis*[4,5], *J. flava*[6,7], *J. neessi*[8,9], *J. ciliaia*[10,11], *etc.* and found to be rich in many phytoconstituents mainly lignans, triterpenoids, phenolics alkaloids, flavanoids and steroids.

They have been explored biologically and found to be exhibit diverse biological activities of which the most neteworthy are cytotoxic, antiviral, antimicrobial, *etc.*

Justicia aurea is a shrub widely distributed in the tropical areas. It is a semi woody erect bush, which is about 1.5 m in height. The leaves of the plant are large and lanceolate, 15-20 cm long. They are arranged in opposite decussate manner. The flowers of the plant appears in summer and rains. They are yellow in colour, 5 cm long as terminal clusters corrola is bilabiate.

Melting points were measured on a Toshniwal apparatus in open capillaries and were incorrected. UV spectra were determined Jasco Model 7800 UV-Vis spectrophotometer IR spectra were recorded using IR spectrophotometer (Jasco, Japan) in KBr Pellets. NMR spectra were taken in $CDCl_3$ and DMSO-d_6. Silica gel used for column chromatography and other solvents and chemicals used were of Qualigens fine chemicals TLC experiments were conducted with silica gel G (13 % calcium sulphate as binder) of Qualigen fine chemicals.

The aerial parts of the plant were dried and reduced to coarse powder and extracted thoroughly with petroleum ether (60-80ºC) by soxhalation. The extract was concentrated and kept for 24 h and a brown solid mass deposited. A part of this solid was dissolved in hexane and column chromatographed over silica gel with solvents of increasing polarity.

Compound **1**, m.p. 130-131ºC, was isolated from the plae brown solid obtained by keeping the petroleum ether extract for 24 h. The solid was dissolved in hexane and column chromatographed over silica gel with solvents of increasing polarity. Benzene elute and C_6H_6: $CHCl_3$ (1:1) elute on crystallizing with acetone afforded shiny white very fine needle shaped crystals. UV λ_{max} (EtOH): 230, 270, 280, 292, 338 sh (nm). IR ν_{max} (KBr), 3456, 3387, 2932, 1641, 1466, 1377, 1109, 802, 459, 418, ^{1}H NMR ($CDCl_3$): δ 0.7 (s), 0.81 (s), 0.88 (d) 0.97 (s), 1.02 (s), 1.12 (s), 1.28 (s), 1.50 (d), 1.61 (s), 1.80 (m), 1.94 (m), 2.11 (d), 2.27 (s), 2.33 (s), 3.59 (m), 5.18 (m), 5.47 (d).

^{13}C NMR: δC, 140.865, 138.425, 129.378, 121.793, 56.839, 56.135, 50.229, 45.951, 42.375, 39.883, 37.337, 36.579, 36.254, 34.833, 31.974, 31.757, 29.806, 29.264, 28.343, 26.176, 24.388, 23.142, 21.192, 19.892, 19.458, 19.133, 18.862, 11.931 ppm, m.s. m/z = 4/4. The above data is similar to β-sitosterol. It was further confirmed to be the same by mmp, Co-TLC and superimposed, IR with the authentic sample.

Compound (JA-2) was obtained from the alcoholic extract of the plant. TLC of *n*-BuOH soluble portion showed presence of many compounds that gave positive coloured reaction with Dragendorff's reagent (DD) or $FeCl_3$ or both but negative colour reaction with Ehrlich's reagent. PLC afforded JA-2, a straw yellow coloured hygroscopic solid with R_f 0.18 in BAW (4:1:2) which developed pink colour with DD. UV λ_{max} (EtOH) 222, 262 (sh) ^{1}H NMR (D_2O) exchange δ1.4(t). 3.3 (9H, m) 1.9 (1H, S), from the TLC behaviour and spectral data and Co-TLC this compound was confirmed to be choline. The pet ether: C_6H_6 (50:50) elute gave a gummy white solid (JA-3) with mp 64-65ºC. This was a mixture of two compounds of with R_f = 0.3 and 0.9 in pet ether:benzene (1:2). It gave positive colour reaction with H_2SO_4. This may be aliphatic in nature UV λ_{max} (EtOH) : 237.269 (sh).

Benzene elute on PLC gave a compound (JA-4) which developed blue colour with DD R_f 0.34 in $CHCl_3$: C_6H_6 (8:2). It may be same nitrogenous compound. UV λ_{max} (EtOH) 220, 274 (sh), 309 (sh) nm, MeOH in $CHCl_3$ elute gave a dark brown band which was separated into methanol soluble and insoluble portions. Methanol soluble portion was further fractioned in cold hexane soluble and hexane insoluble portions. The cold hexane soluble portion was a mixture of 4-5 compounds (all $FeCl_3$ positive) from which a blue florescent compound (JA-5) was isolated by PLC in EtOAc: C_6H_5

(4:1) R_f 0.4, which showed blue fluorescence under UV lamp and positive colour reaction with $FeCl_3$. This may be phenolic in nature. UV λ_{max} (EtOH) 214, 279 nm.

The pet ether extract on PLC and Rep PLC in $CHCl_3$: benzene (8:2) gave three fluorescent compd. (JA 6, JA-7, JA-8).

JA-7 showed green fluorescnece R_f 0.25 gave white solid. UV λ_{max} (EtOH) 211, 232.5, 261 (sh) nm. JA-8 showed pink fluorescence R_f 0.34 in $CHCl_3$, C_6H_6 (8:1) UV λ_{max} (EtOH) 247, 254, 260 nm. JA-8 showed pink fluorescent R_f 0.16 gave green gummy solid. UV λ_{max} (EtOH) 238, 247, 254, 260, 408, 665 nm.

The marc left after pet ether extraction was extracted with ethanol by soxhalation. This extract was dried and separated into aq. part and solvent ether part.

PLC of the aqueous part afforded a straw yellow coloured hygroscopic crystals that is $FeCl_3$ positive with R_f 2.3 in BAW (4:1:2). It may be phenolic in nature. UV λ_{max} (EtOH) : 226.5, 275 nm.

ACKNOWLEDGEMENTS

The authors are thankful to the Department of Chemistry, K.N. Government P.G. College, Gyanpur, Bhadohi and Prof. R.S. Srivastava, Department of Pharmaceutics, I.T., B.H.U., Varanasi, India.

REFERENCES

1. The Wealth of India, Council of Scientific and Industrial Research, New Delhi, Vol. 5, p. 302 (1959).
2. S. Ghosal, S. Banerjii and R.S. Srivastava, *Phytochemistry*, **17**, 370 (1978).
3. S. Ghosal, S. Banerjii and R.S. Srivastava, *Phytochemistry*, **18**, 503 (1979).
4. D. Rajasekhar, G.V. Subbaraju, K. Ravikumar and K. Chandramohan, *Tetrahedron*, **54**, 13227 (1992).
5. R. Babu, J. Kavitha and G.V. Subbaraju, *Indian J. Chem.*, **40B**, 864 (2001).
6. S.J. Smolenski, H. Silinin and N.R. Fransworth, *Lioydia*, **38**, 497 (1999).
7. A.K. Wahi, *J. Res. Indian Med.*, **9**, 15 (1974).
8. D. Rajasekhar, M. Vanisree and G.V. Subbaraju, *Indian J. Chem.*, **38B**, 713 (1999).
9. G.V. Subbaraju, D. Rajasekhar, J. Kavitha and J.I. Jimenz, *Indian J. Chem.*, **40B**, 313 (2001).
10. S.-H. Day, N.-Y. Chiu, L.-T. Tsao, J.-P. Wang and C.-N. Lin, *J. Nat. Prod.*, **63**, 1560 (2000).
11. C.L. Chen., C.F. Chiou, B.J. Shiesh and J.C. Ou, *J. Chin. Med.*, **9**, 45 (1998).
12. B.N. Sastri, The Wealth of India Council of Scientific & Industrial Research, New Delhi, Vol. 5, p. 312 (1959).
13. The Wealth of India, Raw Material, Publication and Information Directorate (PID), New Delhi, Vol. 1, p. 75 (1985).

(*Received*: 29 July 2006; *Accepted*: 1 February 2007) AJC-5407