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BIOACTIVE COMPOUND FROM LEAVES PART OF *LANTANA CAMARA*

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ABSTRACT

Lantana camara is regarded both as a notorious weed and a popular ornamental garden plant has found many parts of the world. The methanolic extract of the leaves of Lantana Camara yielded a flavonoid. The compound was characterized as 5, 7-dihydroxy-6,4′-dimethoxyflavone on the basis of IR,UV, and NMR(^{1}H, ^{13}C) spectral studies.

KEYWORDS: Lantana Camara, Flavonoid.

INTRODUCTION

Plants remained, however, great sources of therapeutic agents until the beginning of the 19th century but, only in the last decades has thereBeen an intensified interest from the pharmaceutical industry, institutes and research groups in chemical and pharmacological studies of plants in search of knowledge with respect to their therapeutic properties and to new active principles[1,2]. With development of chemistry in the last century, plants have been looked upon as sources of new therapeutic agents[3]. This investigation still continues and newer drugs of plants origin are being discarded every year. A large number of plants have been screened in last three decades for their chemical constituents as well as for pharmacologically active principles [4,5]. Flavonoids are used for their therapeutic properties several plants have been screened for their various antibacterial, antifungal, antiviral, and antioxidant properties[6]. Lantana camara is regarded both as a notorious weed and a popular ornamental garden plant and has found various uses in folk medicine for the treatment of chicken pox, measles, asthma, ulcers, swellings, eczema

and high blood pressure in many parts of the world [7,8]. Some taxa of the widely variable Lantana camara complex are toxic to small ruminants and this effect has been associated with the types and relative amounts of some triterpene ester metabolites[9]. However, Lantana camara also produces a number of metabolites in good yields and some have been shown to possess useful biological and parmacological activities includes antimicrobial, antioxidant, anti-cancer , anti- helmentic, cytotoxicity, wound healing, anti ulcerogenic and many more activity[10,11,12].

METHOD

Sample Collection, Extraction and Isolation

Plant Lantana camara collected from the Sanjivani Ayurvedic Nursery Bhopal. Plant leaves of Lantana camara were crushed and extracted with successive solvent extraction method with soxhlet apparatus. In this research, taken dried 100gm of powered plant materials and extracted with 90% methanol by soxhlet extractor at 60°C for 96 hours. The solution was filtered and concentrated under reduced pressure by rotator evaporator till constant mass is obtained at 400C. Column chromatography was performed on a classic 20 cm long × 2 cm diameter glass column packed with 50 g Silica gel of 60-120 mesh size as stationary phase and Crude drug were further subjected to column chromatography and eluted with specific solvent $CHCl_3$:CH_3OH (1:1) obtained fraction, followed by a gradient of $CHCl_3$:CH_3OH (4:1) to obtain fraction and this was collected and had yield compound 5mg. The compound yielded a positive Shinoda test and alcoholic solution $FeCl_3$.

Instrumentation

IR spectroscopy was performed on a Perkin-Elmer 1710 infrared fourier transformation spectrometer. Ultraviolet absorption spectrum was recorded on a Perkin-Elmer Lambda Bio 20 UV spectrometer. NMR spectra were recorded on a Bruker AVANCE DRX- 300. Chemical shifts are shown in δ values (ppm) with tetramethylsilane (TMS) as an internal reference. Column chromatography was performed using silica gel (Merk 7749).

RESULTS

On the bases of IR,UV and NMR spectroscopy results are concluded as follows

IR (KBr) νmax cm-1: 3389, 1727, 1375, 1243, 1035, 811.

UV (MeOH) λmax: 254 and 332 nm.

^{1}H NMR ($CDCl_3$) δH: 7.11 (2H, d, J 8.9 Hz, H-3', H-5'), 8.04 (2H, d, J 8.9 Hz, H-2', H-6'), δH 3.86 (3 H, s, 4'-OMe), 3.76 (3H, s, 6-OMe), δH 13.04 (s, 5-OH), 6.87 (1H, s, H-3) and 6.62 (1H, s, H-8).

^{13}C NMR (CDCl3) δ: 163.3 (C-2), 103.0 (C-3), 182.1 (C-4), 152.7 (C-5), 131.4 (C-6), 157.4 (C- 7), 94.3 (C-8), 152.4 (C-9), 104.1 (C-10), 122.8 (C-1′), 128.3 (C-2′/6′), 114.5 (C-3′/5′), 162.3 (C- 4′), 59.3 (6 –OCH_3), 55.1(4′ –OCH_3).

DISCUSSION

The compound was isolated from the methanolic extract by eluting the column with chloroform: methanol (4:1) mixture. The compound showed a positive ferric chloride and Shinoda test for flavonoids, indicating that the compound may be a flavonoid[13,14].These results also suggested that the compound is a flavonoid derivative with a free hydroxyl group at C-5. IR spectra of the compound showed absorption bands for hydroxyl group (3398 cm^{-1}), chelated α, β–unsaturated carbonyl attached with aromatic nucleus (1727, 1591, 1448 cm^{-1}), methoxy group (1035 cm^{-1}), and p substituted benzene ring (811 cm^{-1}) functionalities [15].The 1H NMR spectrum of the compound exhibited a signal at δ13.04 (1H, s), attributed to a chelated hydroxyl group. Further, a signal observed at δ 8.59 (1H, s) was due to a phenolic hydroxyl group. The 1H NMR displayed one singlet at δ 6.87 that could be assigned to an H-3 proton and also displayed one singlet at δ 6.62 that could be assigned to an H-8 proton. The three singlets were observed in the range of δ 3.86 - δ 3.76 (6H, s) assigned to the two methoxy groups. The 1H NMR also demonstrated two protons doublets at δ 8.04 (2H, d, J, = 8.9 Hz), 7.11(2H, d, J,= 8.9 Hz), assignable to H-2′/H-6′ and H-3′/H-5′ protons16. The appearance of two doublets and their coupling constant values are further in agreement with the methoxy group at C-4′. The UV spectrum of the compound, displayed λmax at 254 and 332 nm that could be assigned to flavones. In view of these spectral data, the compound was identified as 5,7-dihydroxy-6,4′-dimethoxyflavone (Fig.1). This structure was further confirmed by 13C NMR spectral studies. The 13C NMR spectrum of the compound showed a total of 15 signals for 17 carbons. A signal was observed at δ 182.1 and was allocated to C-4. Signals observed at δ 59.3 and 55.1 were ascribed to 2 methoxy groups at C-6 and C-4'. An additional 2 signals were observed resonating at δ 128.3 and δ 114.5 attributed to C-2′/C-6′ and C-3′/C-5′, respectively.

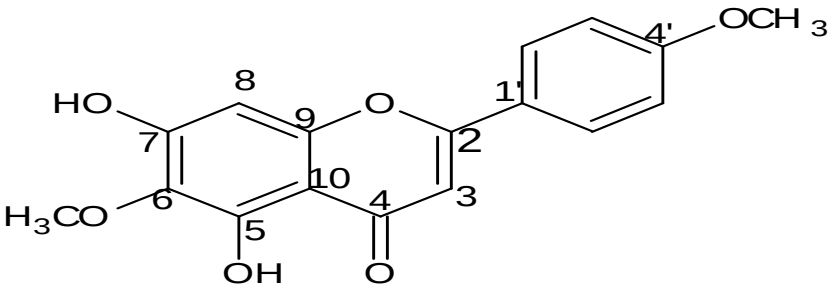

Fig 1: 5,7 -Dihydroxy-6,4′-Dimethoxyflavone

CONCLUSION

We have successfully isolated a bioactive flavonoid compound from the plant Lantana camera. On the basis of these spectral data, the compound was identified as 5, 7-dihydroxy-6, 4′ -dimethoxyflavone.

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