

Characterization of Plumerone, present in the Stem Bark of *Plumeria Dichotoma* (Medicinal Plant), on the basis of Spectral Studies

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Abstract: Chemical investigation of the stem bark of *plumeria dichotoma* which is a medicinal plant, afforded α -amyrin, lupeol acetate plumericin and plumerone etc. All these chemicals are used as medicine and have some biological activity such as antifertility activity, antimicrobial, anticancer etc.

Keywords: Plumerone is used as antifungal, anti-inflammatory, antimicrobial, anti-HIV, anticancer, algicidal, antileukemic etc. Plumerone is present in the stem bark of *plumeria dichotoma* belongs to family Apocynaceae and commonly known as Naag-champa. Plumerone is used as medicine for the cure of diarrhea and venereal disease

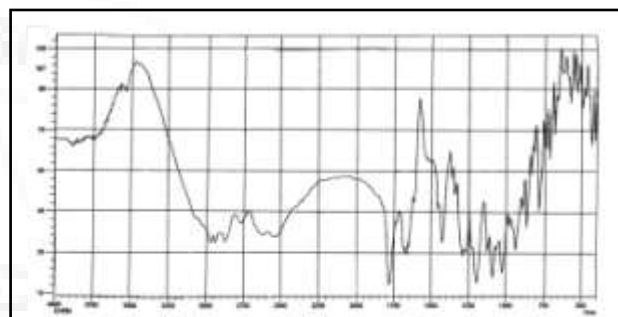
1. Introduction

Mass spectrum of compound Plumerone established molecular formula as $C_{15}H_{16}O_5$, because its M^+ peak was observed at m/z 276 and sixteen protons were appeared in 1H NMR spectrum and fifteen carbons in ^{13}C NMR spectrum.

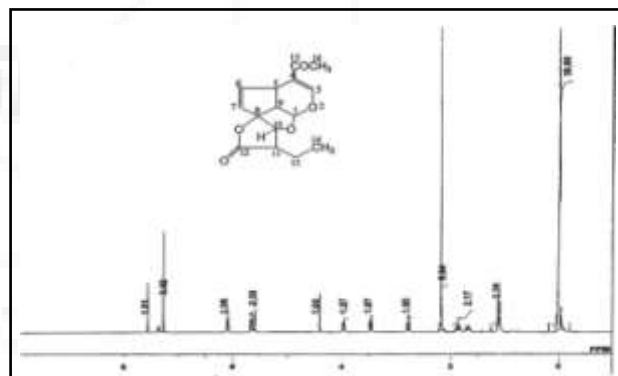
The IR spectrum (KBr, Cm^{-1}) showed characteristic absorption at 1770, which confirms the presence of $>C=O$ stretching of acetyl group. The presence of $>C=C<$ stretching was confirmed at 1690. The absorption at 2940 confirms at presence of $C-H$ stretching of methyl group. The presence of ether linkage was confirmed by observing the absorption at 1190 and 1080.

In the proton NMR spectrum (δ ppm, $CDCl_3$) a singlet at 7.55 was assigned for one proton present at C-3 position. A double doublet at 6.10 ($J=7.50, 2.22$ Hz) was established for a proton located at C-6 position. The double doublet at 5.67 ($J=2.19$ Hz) was established for an olefinic proton at C-7 position. The protons present at C-1 and C-10 positions were assigned as a doublet at 5.61 ($J=5.85$ Hz) and a singlet at 4.41 respectively. A triple doublet and a multiplet was observed at 3.98 ($J=9.69, 2.01$ Hz) and 3.47, confirmed the presence of the protons present at C-5 and C-9 respectively. The proton present at C-11 position showed a multiplet at 2.77. The three protons of acetyl group showed a singlet at 2.17. The two methylene protons at C-13 position were observed at 1.87 and 1.67 as separate multiplets. A triplet at 1.11 for three protons was assigned for the methyl group at C-14 position.

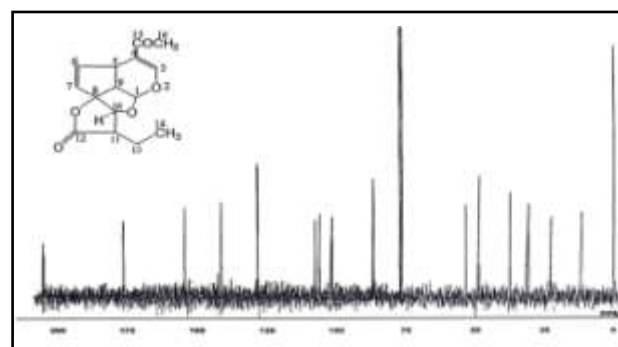
The ^{13}C NMR spectrum (δ ppm, $CDCl_3$) showed two signals at 205.41 and 30.95 were assigned for C-15 and C-16 respectively. Signals at 154.56, 106.14, 128.34 and 141.16 indicates the presence of olefinic carbon atoms i.e. C-3, C-4, C-6 and C-7 respectively. A signal at 176.67 was assigned for carbonyl carbon atom (C-12). The other signals were observed at 101.51 (C-1), 37.57 (C-5), 107.69 (C-8), 53.73 (C-9), 86.80 (C-10), 48.79 (C-11), 22.72 (C-13) and 11.92 (C-14).



IR Spectrum of Plumerone



1H NMR Spectrum of Plumerone



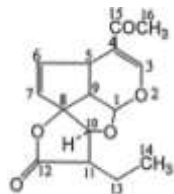
^{13}C NMR Spectrum of Plumerone

On the basis of above discussion and spectral data compound was identified as plumerone (13-dehydroxy-15-deoxy allamandicin).

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Plumerone

2. Isolation

Compound Plumerone was obtained as white solid with 5% methanol in chloroform. The solvent was removed and it was crystallized from petroleum ether and benzene in the ratio of 1:3, as a white solid. Its melting point was found to be 243°C and $R_f=0.68$ in chloroform and methanol (4.5:0.5) solvent system.

3. Conclusion

Plumerone is very useful chemical found in stem bark of *Plumeria Dichotoma* which is a medicinal plant and have biological activity for cure of several diseases.

References

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