



Chromatographic analysis of a medicinal plant (*Plumeria rubra* L.) for bioactive constituents

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Abstract

In the present paper phytochemical analysis of *Plumeria rubra* L. of family Apocynaceae has been made using chromatographic method. The results revealed the presence of medicinally important components. Earlier evidences confirmed that the identified chemical constituents are bioactive and contribute medicinal as well as physiological properties to the plant studied.

Key Words: Phytochemical; *P. rubra* Chromatography

Introduction

In the past few decades the development and introduction of synthetic drugs like antibiotics has caused a shift from studies in natural products of synthetic drugs. Though this position has not materially changed, certain recovery of interest in medicinal plants has been recorded as a result of a series of alkaloids from various medicinal plants which have found uses in the treatment of various forms of cancer, blood pressure, cardiac arrhythmias and mental ailments¹. The drugs derived from plants still form the mainstay of medicinal treatment in the developing countries. There are several factors for the continued popularity of traditional remedies. One is their ready availability and cheapness, compared to the synthetic drugs of the developed countries. An interesting survey referred to Farnsworth and co-workers showed that even in the industrialized countries, about 25% of all prescription drugs contain active principles that are still extracted from higher plants.² There is yet another point that may be stressed here in justification of well planned systematic studies in this field in a

big way. Whatever has so far been done by way of researches in drug plants sums up to little more than scratching the according to a recent survey, hardly 2% of the 191,000 species of flowering plants have been examined for alkaloids, let alone the other important chemical categories of active constituents. They may appear a baffling task, but certainly no more baffling than the task of those who have devoted themselves to the study of synthetics. Because on an average around three to four thousands synthetic substances have to be prepared and pharmacologically screened before arriving at one with any therapeutic value, and even that lucky find has usually a short lived career.³

Form the foregoing consideration it is quit evident that studies on medicinal plants continue to offer a vast and attractive field of research for chemists and presently serve as the mainstay for providing a big reservoir of physiologically active constituents for human welfare. The central institute of medicinal and Aromatic Plants, Lucknow has been established in U.P. with the provision of all possible modern sophisticated facilities for carrying out bioassay directed isolation and structure elucidation of natural products.⁴ Taking into account the facts stated above the present work has been undertaken on the isolation and structural elucidation of new natural products from a medicinal plant.

Material and methods

Several analytical techniques are required for qualitative and quantitative analysis of plant's bioactive products. Most important techniques which commonly used are thin layer chromatography (TLC), High Performance Thin Layer Chromatography (HPTLC). Gas Liquid Chromatography (GLC) and High Performance Liquid Chromatography (HPLC) etc. However, the purpose of the present investigation was to develop chromatographic methods for the medicinal plants.⁵ Therefore, HPLC and HPTLC methods were used in carrying out the present investigation.

HPLC is a separation method in which a mixture of components is resolved into its constituents parts by passage through a chromatographic column. It is carried out by passing the mobile phase containing the mixture of the components, through the stationary phase, which consists of a column packed with solid particles.⁶

All the chemical and materials of HPLC used throughout the chromatographic analysis were of standard grades from B.D.H.E. Merck and Sigma. The solvents used in the work were purified by conventional distillation procedures.

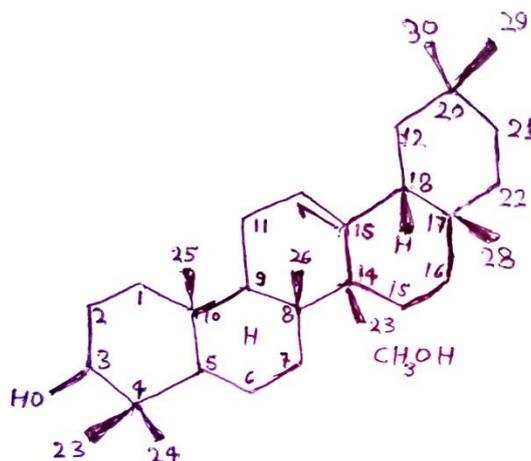
Result and Discussion

The Present paper deals with the chemical studies on a medicinal plant *Plumeria rubra* L. or two bio-active triterpenes of amyrin series, namely rubrinol Urs-12-ene-3, 50-diol (3 β) and 6 α -hydroxy-12-epi-oleanic acid. A further new triterpene 3 α , 27-

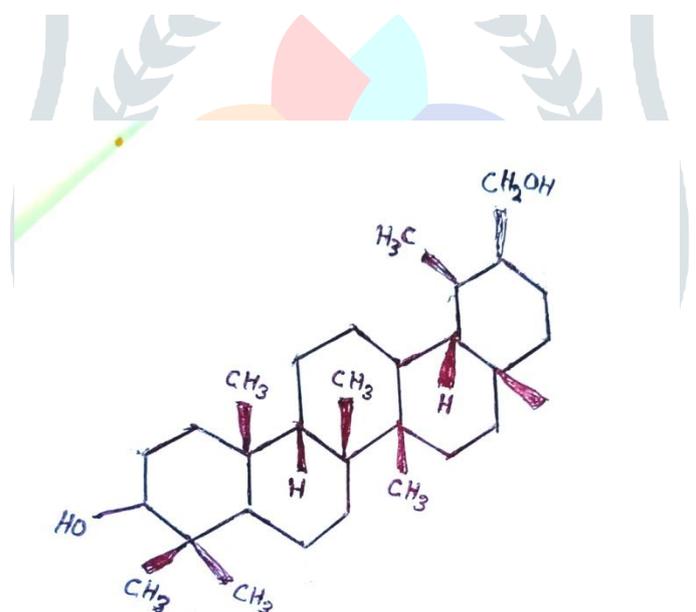
dihydroxy-12-oleanene was also isolated but its activity could not be determined due to paucity of material. In addition, three known triterpenes have been isolated for the first time from this species.

Triterpenes isolated from *P. rubra* L.

1. 3 α , 27-dihydroxy-olean-12-ene

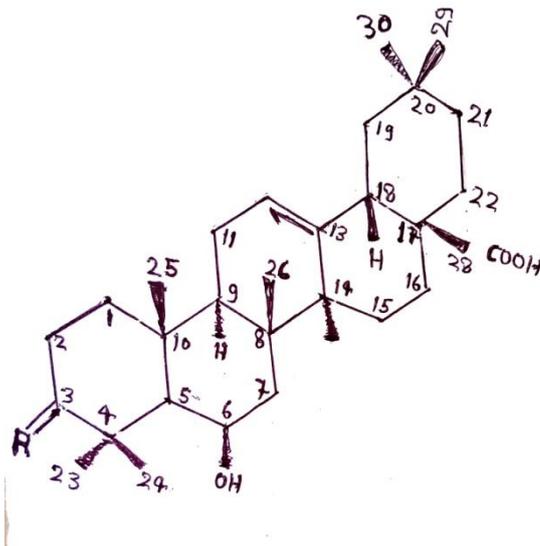


2. Rubrinol



The compound has been found to be active against two G (+) and two G (+) organisms namely bacillus anthracis , corynebacterium pseudodiphthericum pseudomonas aeruginosa and pseudomonas pseudomalliae . it also showed antitumor activity causing 54% reduction in tumor formation as against DMSO which was devoid of nosa and pseudomonas pseudomalliae . it also showed antitumor activity causing 54% reduction in tumor formation as against DMSO which was devoid of any inhibitory activity.⁷

3. 6 α -hydroxy -3-epi-oleanic acid.



It showed antibacterial activity against three G(+) and one G(-) organisms namely bacillus anthracis, sta phylococcus epidermidis, streptococcus agalactiae and shigella boydii.⁸

Triterpenes isolated for the first time from p. rubra L.

1. Taraxasterol acetate
2. Cycloart -22-ene -3 α -,25-diol
3. Oleanolic acid

Conclusion

Plytochemicals are non-nutritive plant chemicals that have protective or disease preventive properties .they are nonessential nutrients ,meaning that they are not required by the human body for sustaining life.it is well known that plant produce these chemicals to protect themselves but recent research demonstrate that they can also protect humans against diseases. There are more than thousand known phytochemicals. Some of the well- known phytochemicals are lycopene in tomatoes , isoflavones in soy and flavanoids in fruits .

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