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Extraction and identification of pentacyclic compound β - Amyrin(Terpenoid)

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Abstract

Terpenoids are synthesized from acetate units and as such they share their origins with fatty acids. They have also shown antimicrobial activities. This is important due to the increase in antibiotic resistant bacteria, which is occurring globally and at an alarming rate. Terpenoid, β -amyrin was isolated from a chloroform extract of *Euphorbia hirta*. Chemical structures of the isolated compounds were identified (mp. 197-197.5 °C; R_f value, 0.26; yield, 0.020 mg/gdw) by TLC and spectroscopic data.

Key words: *Euphorbia hirta*, β -amyrin, TLC.

INTRODUCTION

Euphorbia hirta is found in Australian, Western Australia, Northern Territory, Queensland, New South Wales, naturalized in Central America, Africa, Indomalaya and throughout the India. It is an herb of Euphorbiaceae family, grows up to 50 cm tall with greenish yellow or white flower. Plants are used to treat colic troubles, chronic bronchitis respiratory tract inflammations dysentery, cough, asthma, worms and vomiting pulmonary disorders. It is also eaten as vegetables [1]. This plant is a good source of terpenoids.

The triterpenoids are a large and diverse class of naturally-occurring organic chemicals. Triterpenoids, a major group of active principles in medicinal plants are non-saponification lipid derived from a C₃₀ acyclic compound squalene or a related precursor. Plant terpenoids are used extensively for their aromatic qualities.

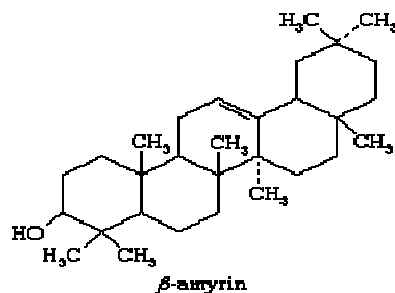


Fig: 1

The expansive array of structures and functionalities β -amyrin has been evolved in nature provide an excellent pool of molecules for use in human therapeutics. Many therapeutic properties including anticancer, antiparasitic, antiallergenic, antispasmodic, antihyperglycemic. It is used as Herbicide and fungicide. β -amyrin used as antibiotic in medicines. In Fragrance industry it is used as major ingredient [2].

The structures of many of the pentacyclic triterpenes are known in full detail that of β -amyrin exemplifies the important structural features of this class of substances.

The attempt has been made to isolate bioactive compound from *Euphorbia hirta* Linn. (Euphorbiaceae Family).

MATERIALS AND METHODS

Euphorbia hirta Linn was collected from the garden of University of Rajasthan, Jaipur and identified by Herbarium, Botany Department, University of Rajasthan, Jaipur, India. 25 gm dried and powdered test samples were Soxhlet extracted 60⁰ C in pet ether and benzene in succession for 24 h. The extracts were concentrated to dryness *in vacuo*. Resultants green coloured semisolid was subjected to TLC analysis (Silica gel G, 0.2-0.3 mm, thickness; solvent system : benzene-ethyl acetate, 1:1) Chromatograms were visualised first by exposing to I₂ vapour. These were sprayed with 10% H₂SO₄ followed heating, revealing each extract to be the mixture of 3-5 compounds [3]. The entire isolated compound from the fraction was crystallized and subjected for co-tlc, mp., mmp. and IR spectra for identification.

RESULTS AND DISCUSSION

The rate of discovery of new terpenoids has increased over the last ten years largely as a result of the increase in the sophistication of separation and analytical techniques. β -amyrin was isolated and identified on the basis of mp. 197-197.5⁰C; R_f value, 0.26; (yield, 0.020 mg/gdw) IR: V^{cm-1}/max. 3600, 3000, 2938, 2920, 1488, 1376, 1040, 1292, 1185, 1160, 963 cm¹.

Terpenoids are active against bacteria, fungi, viruses and protozoa [4-10].

Anti-inflammatory effect of α , β -Amyrin from *Protium heptaphyllum* was reported by Holanda [2]. From the fresh whole plants of *Ixeris debilis* and *I. dentata* aliphatics and Triterpenoids (acetates of α -amyrin, β -amyrin) were isolated [11]. β -amyrin was identified from *Arabidopsis thaliana* [12].

CONCLUSION

Bioactive compounds from medicinal plants are easier to produce and less expensive. Triterpenoids have a largest group of natural plant products, where as the group terpenoids, an enormous range of plant substances biosynthetically derived from the molecule of isoprene. β -amyryn can be extracted from *Euphorbia hirta*, which is used as anticancer, antiparasitic, antiallergenic, antispasmodic, antihyperglycemic and as herbicide, fungicide and antibiotic in medicines.

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