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A review on medicinal importance of *Alysicarpus monilifer*

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ABSTRACT

For achieving the superlative ends consisting of morality, prosperity, artistic values and sacred freedom, health is considered as a precondition. The main components of the model of positive healthiness are preventative and curative aspects of disease. Therapeutic plants engaged an important place in the socio-cultural, spiritual and medicinal field of rural people of India. One such medicinal plant is *Alysicarpus monilifer* also known as Krishna barani/Chitra barani, is a Fabaceae family. The various ailments of *Alysicarpus monilifer* is Analgesic effect, Hepatoprotective effect, Anti inflammatory effect. Research works are going on to discover the wide area of applications of *Alysicarpus monilifer.* This review article delineates the therapeutic effectiveness *Alysicarpus monilifer.*

Keywords: *Alisicarpus monilifer L. (DC.),* Stigmasterol, Ursolic acid, Alysinol, Usnic acid, Methyl β-Orsellinate.

1. INTRODUCTION

The vital healthcare requires of more than 80% of universal population depend primarily on plant medicine as estimated by the World Health Organisation [1].

Plants are one of the most important sources of medicines; the use of medicinal herbs has become an important part of daily life despite the progress in modern medical and pharmaceuticals research. Approximately 3000 plants species are known to have medicinal properties in India [2].

Over the last few years, researchers have aimed at identifying and validating plant-derived substances for the treatment of various diseases. Interestingly it is estimated that more than 25% of the modern medicines are directly or indirectly derived from plants [3].

Alysicarpus monilifer L. (DC.) (Papilionaceae), commonly known as Samervo (Gujarati) or Juhi ghas (Hindi), is a turf forming legume and native to Africa and Asia. In India it is distributed throughout the plains- Madras, Jammu, Bombay, Punjab, Gujarat- except Kutch and Bulsar, Madhya Pradesh and Uttar Pradesh. It is a prostate, procumbent or decumbent perennial herb; stem of which is around s12- 60cm long, woody at the base. It is a branched; branches are terete clothed with covering trichomes. The herb is up to 50cm in length and hairy when young [4, 5].

2. BOTANICAL DESCRIPTION [6]

Scientific Name: *Alysicarpus monilifer* (L.) DC.

Synonyms: *Hedysarum moniliferum* L.

Family: *Fabaceae*

Sub family: *Faboideae*

Tribe: *Desmodieae*

Sub tribe: *Desmodiinae*

3. MORPHOLOGICAL DESCRIPTION

Low growing, much branched, annual or perennial herb, 5–15 (–50) cm tall. Leaves simple; ovate, elliptical or lanceolate, cordate at the base, 2.5–7.5 cm long, prominently nerved, glabrous or sparsely pubescent beneath. Racemes spicate, axillary and terminal, 1–15 cm long;flowers lax to dense along racemes. Pods distinctly moniliform, 3- to 5-jointed, 1–2 cm long, calyx not longer than first joint; glabrous or sparsely pubescent; articles 2.5–3 mm long and 2–3 mm wide, with a smooth to reticulate surface sculpture.

4. DISTRIBUTION

Native to:

Africa: Ethiopia, Madagascar, Niger, Somalia, Sudan.
Asia: India, Pakistan, Philippines.
Indian Ocean: Mauritius, Réunion.

5. MOISTURE

Perennial types from India are found in areas with 600–1,500 mm annual rainfall, and annual types from Sudan in areas with 200–400 mm, and a short (<3 months) growing season.

6. TEMPERATURE

Mainly tropical lowlands (0–1,000 m asl) with average daily temperature range of 26–29ºC. Perennial types are readily frosted but annuals because of early maturity largely avoid frost.

7. COMPATIBILITY (with other species)

Appears best suited in combination with less vigorous grasses. Heavy grazing or extreme dry seasons that set back companion grasses may enhance legume persistence and spread. Seedling regeneration has been successful at low to medium rainfall sites in a sub-humid environment on the tropic where competition from grass was not extreme.

8. MEDICINAL USES

- *Alysicarpus monilifer* has been used in indigenous system of medicine as anti-inflammatory and in stomach-ache [7].
- An antidote to snake bite [8, 9].
- It is also used in skin diseases and as a diuretic [10, 11].
- The leaves are used in fever [12] and jaundice[13].
- The leaf juice is used for the improvement of eye sight and earache [14].
- The entire plant is used for the treatment of renal calculi [15].
- Root of this plant is widely used in kidneys diuretics, leprosy and pulmonary troubles [16]
- Leaves and seeds are used for leucoderma [17]
- Root sweet substituted for liquorice [18]
- Eczema [19].
- Diarrhea [20].

9. EXTRACTION PROCEDURE[21]

9.1. Hot Continuous Extraction (Soxhlet)

In this method, the finely ground crude drug is placed in a porous bag or "thimble" made of strong filter paper, which is placed in chamber E of the Soxhlet apparatus (Figure 2). The extracting solvent in flask A is heated, and its vapors condense in condenser D. The condensed extractant drips into the thimble containing the crude drug, and extracts it by contact. When the level of liquid in chamber E rises to the top of siphon tube C, the liquid contents of chamber E siphon into fl ask A. This process is continuous and is carried out until a drop of solvent from the siphon tube does not leave residue when evaporated. The advantage of this method, compared to previously described methods, is that large amounts of drug can be extracted with a much smaller quantity of solvent. This effects tremendous economy in terms of time, energy and consequently financial inputs. At small scale, it is employed as a batch process only, but it becomes much more economical and viable when converted into a continuous extraction procedure on medium or large scale.

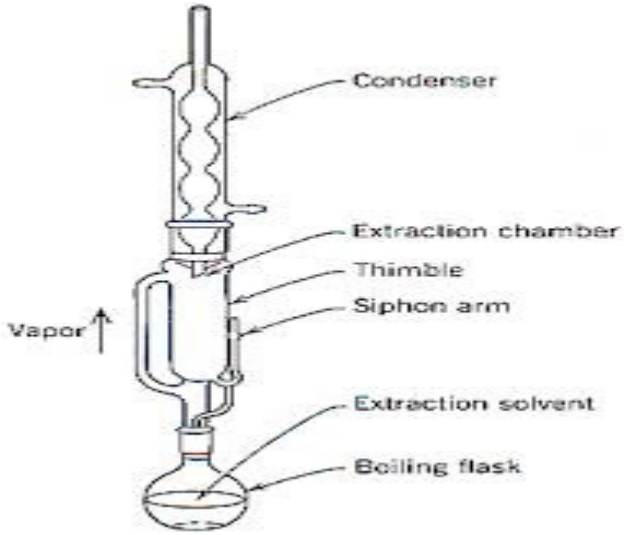
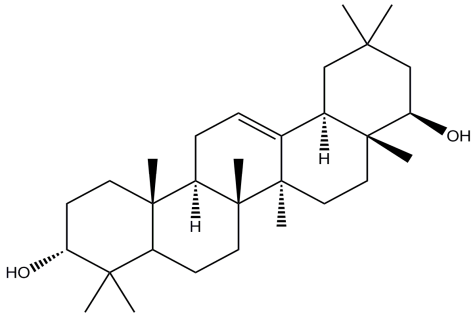


Figure - 1: Soxhlet Apparatus

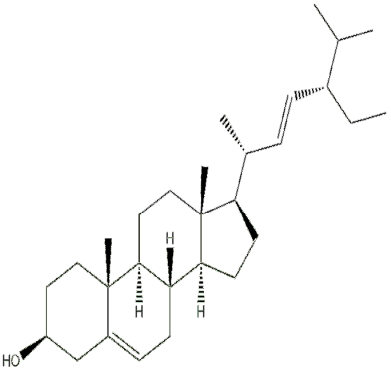
10. REPORTED COMPOUNDS ON *Alysicarpus Monilifer*

10.1. Alysinol



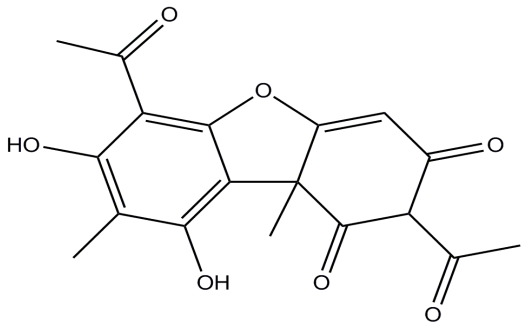
3alpha, 22beta-dihydroxy-olean-12-ene

10.2. Stigmasterol

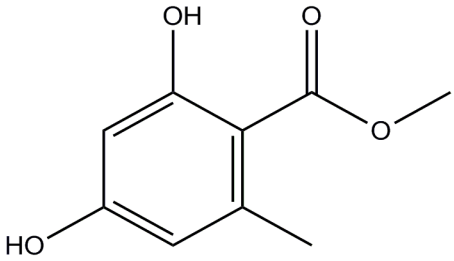


(3S,8S,9S,10R,13R,14S,17R)-17-[(E,2R,5S)-5-ethyl-6-methylhept-3-en-2-yl]-10,13-dimethyl-2,3,4,7,8,9,11,12,14,15,16,17-dodecahydro-1H-cyclopenta[a]phenanthren-3-ol

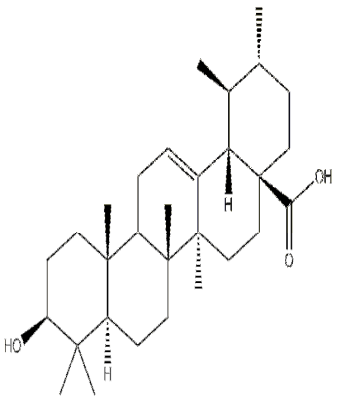
10.3. Usnic acid



10.4. Methyl β-Orsellinate

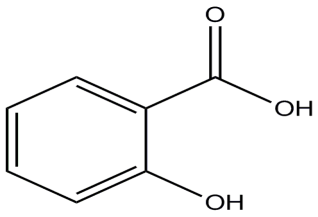


10.5. Ursolic acid



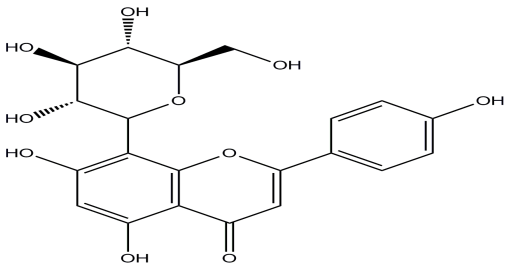
(1S,2R,4aS,6aR,6aS,6bR,8aR,10S,12aR,14bS)-10-hydroxy-1,2,6a,6b,9,9,12a-heptamethyl-2,3,4,5,6,6a,7,8,8a,10,11,12,13,14b-tetradecahydro-1H-picene-4a-carboxylic acid

10.6. 2- Hydroxy benzoic acid



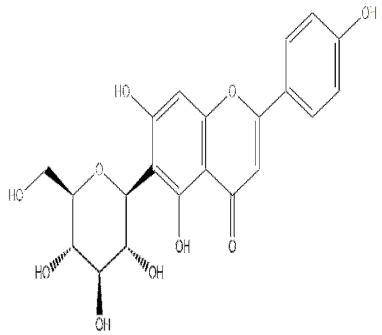
2-hydroxy benzoic acid

10.7. Vitexin



8-C-Glucosyl-apigenin

10.8. Isovitexin



5,7-dihydroxy-2-(4-hydroxyphenyl)-6-[(2S,3R,4R,5S,6R)-3,4,5-trihydroxy-6-(hydroxymethyl)oxan-2-yl]chromen-4-one

11. PHARMACOLOGICAL ACTIVITY

11.1. Anti inflammatory activity [23]

In the present study methanolic extract of aerial parts of *Alysicarpus monilifer* L. (DC.) (Papilionaceae) was screened for anti-inflammatory activity in carrageenan induced rat paw edema[1]. The methanol extract was evaluated for their anti-inflammatory activity on a carrageenan-induced rat paw edema model. Inflammation was induced in the rats using 100 µL of 1% carrageenan (wt/vol) in distilled water. This was injected into the plantar surface of the rat's left hind paw. To evaluate the topical antiinflammatory activity of the formulation, 3 groups of animals (n = 6) with carrageenan-induced paw edema were examined. The test drug was given i.p on the paw. The increase in paw volume was measured before (time 0) and 1, 2 and 3 hours after carrageenan administration. The difference between the two readings was taken as the volume of the edema and % inhibition was calculated using the formula mentioned below: % Inhibition in edema = Where, A= Mean paw volume in untreated control group; B= Mean paw volume of treated.

11.2. ANALGESIC ACTIVITY [24-26]

In the present study, methanolic extract of aerial parts of *Alysicarpus monilifer* L. (DC.) (Papilionaceae) was screened for analgesic activity using Tail flick Hot plate method. The study revealed that Methanol extract in higher doses gives more analgesic activity as compared to that in low dose in both hot plate and tail flick methods.

11.2.1. Tail flick method of evaluation for analgesic activity

The animals were divided into six groups of 6 animals each. Group I served as control. Group II served as standard and were injected Indomethacin (20 mg/kg) intraperitonially. Group III and IV were treated orally with methanolic extract of 200 and 400 mg/kg body weight

respectively. After one hour, the tip of tail was kept at the radiant heat source. The response time was noted as the sudden withdrawal of the tail from the heat source. Cut off time of 10 seconds was maintained to avoid damage to the tail for all groups. The time required for flicking of the tail, was recorded, to assess response to noxious stimulus. Data were statistically analyzed by analysis of variance (ANOVA) with the level of significance set at $p< 0.05$. Critical differences between means were evaluated by Dunnett's multiple comparison test and Student's t-test at $p< 0.05$. Hot plate method of evaluation for analgesic activity[13,14]: The animals were divided into six groups of 6 animals each. Group I served as control. Group II served as standard and were injected Indomethacin (20 mg/kg) intraperitonially. Group III and IV were treated orally with methanolic extract of 200 and 400 mg/kg body weight respectively.

11.2.2. Hot plate method of evaluation for analgesic activity

The animals were individually placed on the hot plate maintained at 55 ± 1°C, one hour after their respective treatments. The response time was noted as the time at which animals reacted to the pain stimulus either by paw licking or jump response, whichever appeared first. The cut off time for the reaction was 15 seconds to avoid damage to the paws. Data were statistically analyzed by analysis of variance (ANOVA) with the level of significance set at $p< 0.05$. Critical differences between means were evaluated by Dunnett's multiple comparison tests and Student's t-test at $p< 0.05$.

11.2.3. HEPATOPROTECTIVE ACTIVITY [27]

The Wistar albino rats of either sex were divided into six groups of six animals (n=6) each. Group-I served as normal control and received vehicle (Sodium CMC) + olive oil suspension in the ratio of 1:1 (1 ml/kg.p.o) once daily for 3days. Group-II served as hepatotoxin treated group (negative control), received vehicle on 1st and 2nd day and CCl_4 (1ml/kg s.c. suspended in olive oil in the ratio of 1:1) on the third day. Group-III (positive control) received. Silymarin (50mg/kg. i.p. suspended in sodium CMC) once daily for 3 days and CCl_4 (1ml/kg s.c.) on the third day. The three test groups (IV-VI) received oral administration of 80% methanolic extract of *Alysicarpus monilifer* whole plant at doses of 200, 400 and 800 mg/kg p.o in sodium CMC suspension once daily for 3 days followed by CCl_4 (1mg/kg s.c) on the third day as per Kurma and Mishra, (1997); Suresh kumar and Mishra, (2005) with slight modification. 24 h after CCl_4 treatment, blood was collected from all the groups, and allowed to clot for the separation of serum. The blood was centrifuged at 3000 rpm for 15 min to separate the serum. The serum was used for estimation of bio chemical parameters such as serum Glutamic oxaloacetic transaminase (SGOT) and serum glutamic pyruvic transaminase (SGPT), alkaline phosphatase (ALKP) and total bilirubin (TBL). All the determinations were carried out using standard kits by an autoanalyser.

12. CONCLUSION

The plant is the one of the ingredient of many formulations which has been used to recover from physiological, bacterial diseases or even from cancer. Only few researchers worked on the different extracts of the plant on few of the diseases occurring in human being. Still many pharmacological activities of the plant remain to be explored. Therefore further research is needed to explore its components and for *in vivo* and *in vitro* regeneration method, so maximum utilization of plant can be done for human welfare.

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