

COMPREHENSIVE REVIEW ON ACANTHOSPERMUM HISPIDUM (BRISTLYSTARBAR)

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Abstract: *Acanthospermum Hispidum* commonly known as Bristly starbur (Family:-*Asteraceae*) It is the annual plant and it is found in topical America. This plant is cited as a weed in cotton culture in Brazil. It is also used as medicinal plant. The leaf and the flowering tops of the plant have the antimicrobial activity. The crushed herb is used in the form of the paste to treat the skin ailments and leaves juice is used to relieve the pain of fever. The hydroalcoholic extract of leaves and flowering tops gives activities against wide range of pathogenic bacteria. A literature revealed some notable pharmacological activities of the drug like antifungal, antimicrobial, antitrypanosomal, immunomodulator, abortifacient, and antileishmanial. The above review is an attempt to highlight the various traditional and ethno botanical uses as well as the various pharmacological and phytochemical reports on *Acanthospermum Hispidum*.

Keywords: Bristly Starbur, phytopharmacological, ethnobotanical, hydroalcoholic.

A. INTRODUCTION

Acanthospermum Hispidum (Bristly starbur), hispid starbur, goat's head is an annual plant in the Family *asteraceae* which is native in tropical America. It is an important medicinal plant of India. It is found as a weed along the roads and in moist habitats throughout India. The common name of this plant is known as kandlemullau. This species of medicinal plant is easily identified and grows in large quantity during the rainy seasons in Brazil. It is amenable to cultivation without loss of its phytochemical profile and toxicological studies have shown its safety as medicine. As such pharmacological value granting quality control of final product. The preparation recommendation for usages and dosage that both safety and efficacy to the users. This plant has important medicinal properties. The crushed herb is used to prepare a paste to treat the skin infection and the leaves juice is reportedly used to relieve fever.

I. History: Bristly starbur appears to have been introduced into Florida in ship ballast at Pensacola in the 1800s. The scientific name of this plant is *Acanthospermum* is Greek words (*acantha*-thorn) and (*sperma*- Seed) and referred as the prickly fruit *Hispidum* in Latin which means rough shaggy, prickly or Bristly.

II. Synonyms:

Acanthospermum Hispidum (bristly starbur, goat's head, hispid starbur, starbur)

Kingdom - Plantae Order-

Asterales Family -*asteraceae*

Genus - *Acanthospermum*



Fig 1: Acanthospermum Hispidum

III. General Description:

- It is branched herb up to 60cm tall.
- The stem of plant is covered by bushy hairs and small glandular hairs.
- They are scattered throughout the stems.
- The leaves are elliptic and 1.5cm to 7cm long.
- The flowers are typical of the aster or Daisy family each head has 5-9 ray flowers.
- The petals are pale yellow and 1.5mm long.
- The disc of flower in the center of the head.
- The fruits are flattened and triangular shaped and spiny and 5cm to 10cm in length.
- The fruit is covered with the hooked hair's curved pair of spines at the top.
- Each fruit excluding the terminal spines is about 4mm long.
- These have additional common name good head.

IV. Distinguishing Characteristics:

Hairy stem yellow-green fruits with the hooked spine like hair's and the fruits are arranged in the form of star's flat likeshape.

V. Range:

The plant is found in the northern south america. it mainly found in Brazil grows in disturbed place in open eucalyptus forest, vine forest and other many type vegetation. It is mainly introduced in the South America to both India and Africa which is the source of large number of popular names of the plant is also found in the tribal area of Koraput and Malkangiri district. Due to its role as an invasive weedy species on agricultural lands it has been the subject of many publications in India other countries.

VI. Ecology:

The plant grows in the wide range of soil and climatic conditions. It is mainly grow in light textured soil and also grow in the heavy textured soil. It is unplanned growing plant found roadsides, pastures, waste areas, around corrals and along railroad. The seeds and leaves of the plants are containing to other plant. In general the plant's seeds are dormant in the soil about the eight years. The seeds are germinated according to rainfall and climatic factor. by incubation in dark for 10- 30 days. The fertilization of soil used for cultivating this plant with 15% urban compost, addition of ammonia, phosphate and potassium (40-20-40). The seed germination will germinate on a wide variety of soils from sandy to clay.

VII. Propagation:

Seed is spread when adhered to clothing as a contaminant of hay and fodder. A prolific seeder, however seeds are reported to be relatively short lived, approximately three years.

VIII. Reproduction:

The transition from the flowering to the fruiting phase of this plant is very rapid demonstrating a metabolic

property of reproduction of chemical defenses flowering period is from Feb- April.

IX. Uses:

1. It is medicinal plant.
2. Used in the traditional medicine for the treatment of Jaundice, malaria, vomiting cephalgias, Fever, snake bite, epilepsy, stomachache constipation, hypo – biliary, microbial infection, viral infection.
3. The phytoconstituent are used in the treatment of skin ailments to treat cough, bronchitis.

A. Pharmacological activities

I.P lemonica stated that the aqueous extract of the plant have abortive and teratogenic effect. The female wistar rats were treated with the aq. extract of *Hispidum* having dose frequency 0.150, 300 and 600 mg and the dose significant dose is not changed. No internal malformations were observed in fetuses at term. The tendency of the pregnancy to continue or terminate did not change with the treatment.

i) Antiplasmodial activity:

S .Saon et.al (2003) investigated that alkaloids extract of *Acanthosperum Hispidum* have Antiplasmodial activity. The extract is tested in-vitro against two clones of plasmodium falciparum the W2 significant inhibitory activity was observed with a. hispidum. The IC 50 value of the alkaloids extract was in the range 25-670 mg/ml. These results indicate that p. falciparum wild strain were more sensitive to the alkaloid extract than strains maintained in continuous culture. The extract exhibit good in vitro antimalarial activity and weak cytotoxicity against three human cell lines.

ii) Antiviral activity:

Artur Summerfield et.al investigated the antiviral activity of *Acanthosperum Hispidum*. They found that incubation of the herpes viruses' pseudorabies virus (PRV) and bovine herpes virus 1 during infection of cell cultures with an extract prepared from the leaves of *Acanthosperum Hispidum*. Paired productive replication of these viruses in a concentration dependent manner whereas propagation of classical swine fever virus foot and mouth disease virus and vaccinia virus was not affected. In contrast viral gene expression was not inhibiting by the extract of virions into the target cell.

iii) Antimicrobial activity:

T.C Fleischer (2003) reported that the ethanolic extract of the leaves and flowering tops of *Acanthosperum Hispidum*. T.C. showed varying degree of pathogenic bacteria. The activity resided mostly in the polar fraction of the alcoholic extract. Being only slight in the non-polar fraction. No activity was observed for the aqueous extract of the fresh plant material.

iv) Antidiarrheal activity:

Abdukararim Agunu et.al investigated that the aqueous methanol extracts of *Acanthosperum Hispidum* (7.3% (w/w) have pharmacological activity against diarrhea. They found that the effect of the plant extract (0.5-3.0 mg/ml) the extracts showed smooth muscle relaxation at high doses (2.0-3.0 mg/ ml) there is no proportionate increase in the extract of *Acanthosperum Hispidum*.

v) Anthelmintic activity:

Hare Krishna Roy (2010) reported that various concentration (5-25mg/ml) of each extract of *Acanthosperum Hispidum* along with the reference sample were subjected for anthelmintic activity study the qualitative test revealed that the petroleum ether extracts contained only terpenoids but chloroform and hydro alcoholic extract exhibited the presence of saponins but amino acids and steroids were absent. All the extracts showed anthelmintic activity when compared with petroleum ether and chloroform extract the anthelmintic activity of hydro alcoholic extract was comparable with reference drug.

B. Phytoconstituent of *Acanthospermum Hispidum*

- The petroleum ether extracts of the plant contain only terpenoids but chloroform and hydroalcoholic (ethanol 70%) extract exhibited the presence of carbohydrates, alkaloids, glycosides, flavonoids, tannins and saponins but amino acids and steroids were absent.
- The sesquiterpene lactones in a hispidum are chemically distinct from other sesquiterpenoids due to the presence of an a methylene lactone system many containing carbonyl alpha – beta – unsaturated and epoxies which are part of a larger family of compounds with a spectrum of biological activity including anti- microbial and anti-tumor activities.
- *Acanthospermum hispidum* contain a non-crystalline melampolides acanthospermal B.
- The sweetness of *Acanthospermum Hispidum* was traced due to large amount of sugar and polyols by taste- guided fractionation, which was identified and quantified using gas chromatography.
- The leaves of *acanthospermum hispidum* contain polyphenolic compounds which is responsible for activity
- It also contains tricontane, N- dimethoxyflavone .
- Two new flavones, namely 5,7,2,5 tetrahydroxy- 3,4- and 5- acetoxy – 5,2,7- trihydroxy-3.

C. Conclusion

Acanthospermum Hispidum has been ethnomedicinally used as therapeutic agent for a variety of disease as we have illustrated in this systematic review the pharmacological studies conducted on *Acanthospermum Hispidum* indicates the immense potential of the plant in the treatment of diarrhea as an antiviral, antimicrobial, antitumor, Anthelmintic and many more carbohydrates, alkaloids, glycosides, flavonoids, tannins, terpenoids and saponins are responsible for its pharmacological activities. From the literature survey it was found that the leaves extract are more beneficial. Also the isolation of phytoconstituent has been done on areal parts but no work has been done on the stem part and particularly on root's so this part has to be explored by the researchers.

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