Available online on www.ijppr.com
International Journal of Pharmacognosy and Phytochemical Research 2019; 11(4);240-243
doi:10.25258/phyto.11.4.1

ISSN: 0975-4873

Review Article

Launaea pinnatifida Cass. A Species of the Controversial Drug *Gojihva*: Comprehensive Review

Makwana H T, Pandya D J*

School of Pharmacy, RK University, Rajkot, Gujarat, India.

Received: 5th Jan, 19; Revised 22nd Apr, 19; Accepted 15th Jul, 19; Available Online:25th Aug, 19

ABSTRACT

According to the Ayurvedic literature *Launaea pinnatifida* Cass is belong to the class of controversial drug *Gohjiva*. This plant is well known and valuable herb as per the traditional and Ethnobotanical information. This plant has been used since ancient time as herbal remedy for jaundice, diuretic, blood purifier and hepatoprotective action by the tribal people of the Western Ghats. However, the plant remains largely unexplored. Systematic pharmacognostical and phytochemical evaluation of the plant by means of standardization leads to the generation of data which is useful for future reference. The traditional medicinal activities suggest that it may yield important bioactive phytoconstituents. Present work dealing with the compilation of available data of *Launaea pinnatifida (L. Pinnatifida)* including pharmacognostical work, phytochemical studies and pharmacological work. Microscopic evaluation confirmed the presence of the lignified cork cells parenchyma with prismatic crystals. The histochemical study of root powder confirms the existence of mucilage, tannins, starch, lignin and crystals. Pharmacognostical studies revels the presence of many primary and secondary metabolites including carbohydrates, alkaloids, amino acids, glycosides, steroids and tannin in root powder. As far as phytochemical study is concern; only few phytochemical constituents have been isolated from *L. pinnatifida* including Taraxasterol from leaves taraxeryl acetate from the roots. Apart from this; triterpenoid saponins along with known compounds glutenol and hopenol B were isolated from Methanolic extract of seed of *L. pinnatifida*. Ethanol fraction of the leaves of *L. pinnatifida* has reported potent hepatoprotective activity, antimicrobial, antifungal and antioxidant activity.

keywords: *Launaea pinnatifida*, Gojihva, Pharmacognostical.

INTRODUCTION

L. pinnatifida also recognized as *Launaea sarmentosa* (Willd.) it has been traditionally used as a folk herbal remedy for the many diseases. It is native to coastal areas in Africa (east coast), Madagascar, the Seychelles, Mauritius, India, Sri Lanka and Southeast Asia[1].

Launaea is one of the species of the controversial drug "Gojihva"

Species considered as Gojihva:

Elephantopus scaber Linn.
Onosma bracteatum Wall
Launaea pinnatifida Cass.
Anchusa strigosa Labill
Macrotomia benthamii: Kashmiri Gaozaban
Coccinia glauca

Pharmacognostical Profile[2]

Taxonomical Categorization

Kingdom: Plantae
Sub kingdom: Phanerogams
Division : Angiosperms
Class : Eudicots
Subclass : Asterids
Order : Asterales
Family : Asteraceae
Subfamily: Cichorioideae
Tribe : Cichorieae (Lactuceae)
Subtribe : Sonchinae
Genus : *Launaea*
Species : *Launaea pinnatifida Cass.*

Local Name: Garjibhi (Gujarati), Pathri (Marathi), Beach launaea, Sagar pathari.

Species: *Launaea pinnatifida Cass.*

Range: Coastal range of Arabian Sea including India (from Gujarat, Maharashtra, Goa, Karnataka and Kerala), Sri Lanka and Madagascar costal range[2].

Habitat: On sandy beaches and dunes.

Mainly 54 species belong to Genus *Launaea Cass*. and family Asteraceae were identified. Mainly such plants are found in sandy and saline habitat or nearby beaches area. Fresh leaves are generally slight greenish in colour with bitter taste *(Figure 1).* As per the description given the Bhavprakash Nighantu, Leaves of the Gojihva plants is rough and thick in nature. Detailed translation of the Sanskrit *Sloka* is gojihva is also known as gojika, gobi and dravika. Gojihva mainly used in the treatment of cough, cold, fever heart and blood related problems. Decoction of the plant is useful for the brain disorders and work as a memory enhancer.

Organoleptic characteristics of root of L. Pinnatifida (dry and fresh form)

The fresh roots are yellowish to brown in colour, smooth to touch, aromatic in odour and sweet in test[4]. Dried roots are light brown in colour, rough texture and sweet in smell and taste.

**Author for Correspondence: himanshu23makwana@gmail.com*

Morphological characteristics of root of L. Pinnatifida

L. pinnatifida is also known as *Launaea sarmentosa* belong to family Asteraceae is creeping, perennial procumbent herb. [1]Commonly found near Indian coastal line. Size of leaflets is about 10 to 15 cm with tooth shape. Taste of leaves are slightly bitter having characteristic odour.

On the basis of flower structure and morphological features (*Figure 1 & 4*). Rooting at inter node is the preliminary diagnostic characteristic of *L. pinnatifida* from other species of *Launaea* genus E.g. *Launaea procumbens* etc. Root is hard and semi woody. Fresh root exudates white to brownish milky latex[4]. Length of the roots is about10 cm to 1 m long and diameter of 0.5 to 2 cm. Initially young roots are woody and soft in nature, slightly yellowish in colour which turns to brownish during maturity of plant where as dried roots (*Figure 5*) are hard and dark brown to light brownish in colour, fairly cylindrical to round in shape with aromatic odour. Texture is rough and fibrous to semi woody in nature.

Macroscopic studies of root of l. Pinnatifida

Transverse section of the roots indicates the presence of parenchyma in the cork region along with laticiferous cells and prismatic crystals. Cortical cells confirm the presence of tannins and starch grains. Vascular bundle is centrally arranged and also occupied 50% of the TS[4]. Sieve tube is situated in between phloem and xylem with companion cells. Medullary rays also present in the TS which extended from centre to cortex region consist of starch grains and prismatic cells and having multi serrate structure with barrel shape. There is absence of pith in root.

Diagnostic microscopic features of the roots of *L. pinnatifida* root powder (*Figure 6*) is the presence of pitted and lignified parenchymatus cell in vascular bundle. Simple parenchyma cell and fibers are present in cortex part. Presence of the starch grain in cortex region and medullary rays contains tannins in the cortical region[4].

Physicochemical Constants

All the physicochemical parameters were evaluated as per the guideline given in Ayurvedic Pharmacopoeia of India (API).

Moisture Content

The high amount of moisture content in the sample promotes the micro bacterial growth or else affects the preservation time of plant material specially roots. Moisture content of drug was calculated to be 5.78% w/w.

Ash Value

Ash value is indirectly the measure of inorganic and salt material present in the herbal raw material and ash value was found to be 12.45% w/w[4].

Water and Alcohol Extractive Value

For the absorption of the drug and bioavailability prospective Water and alcohol extractive value is indicative parameters hence was done and found to be 15.30 % w/v & 9.78% w/v respectively for root sample.

Petroleum Ether Solubility

Petroleum ether solubility gives the idea about the fixed oil content of the drug which was found to be 2.35% w/v.

pH

pH of sample was found to be 6.10 which clearly denotes that root sample is marginally acidic in nature[4].

Heave Metal

There was no finding of heave metals like arsenic, lead and mercury but cadmium results was bit higher in sample (0.5530 ppm) not complies with limits given in API (0.05-0.2 ppm). Main cause of the result was may be contamination of soil from where plant collected. There are many resins for the heavy metals like Water, pesticides and air.

Preliminary Phytochemical Studies

Preliminary phytochemical studies of root of *launaea pinnatifida* revealed the presence of alkaloids, carbohydrates, amino acids steroids and tannins whereas leaves confirms the presence steroids, alkaloids, terpanoids, glycosides, flavonoids and tannins[5]. Through literature review, it has been found that this plant is not much exploited in the direction of phytochemical evaluation and its Bioactivity-guided isolation of different fractions of root and leaves extracts. The information available is mainly concern with its traditional use,

Taraxasterol has been isolated from leaves and taraxeryl acetate from the roots of the L. *pinnatifida.* Apart from this, triterpenoid[6] saponins 3-O _-L-rhamnopyranosyl-(13)-O-L-arabinopyranosyl (13)-O-Dgalactopyranosyl spergulatriol along with known compounds glutenol and hopenol-b were isolated from Methanolic extract of seed of *L. pinnatifida*[6].

Some attempts was made by the researchers on phytochemical nature of the plants belong to genus *Launaea Cass.* They have reported that diversity of secondary metabolites present in *Launaea Cass*. Genus including steroids, triterpenoid saponins, terpanoids, sesquiterpene lactones, flavonoids, coumarins, phenolic compounds and flavones glycosides.

Pharmacological Activity

L. pinnatifida is also reported to possess galactagogue, soporific, diuretic, aperients properties and also used as a substitute for Taraxacum[7].

According to the traditional uses the plant is given as a lactagogue. Juice of the plant is tonic, diuretic, aperients; applied in rheumatic affections and given as a soporific to children[2-7].

As far as pharmacological studies have been concern this plant possess the antioxidant[9], Antimicrobial[5] and hepatoprotective[10].

70% ethanolic extract of leaves and root extract of *L. Pinnatifida* has already reported hepatoprotective activity against CCl_4 induced hepatic injury in rats. Different fraction of *L. Pinnatifida* leaves extract also possess significant anti-oxidant activity among that ethyl acetate fraction had promising antioxidant activity[10].

Antifungal activity of triterpenoid saponins and glutenol and hopenol-b from methanolic extract of seed of *L. Pinnatifida* also were studied[6].

L. pinnatifida ethanolic extract shown antipyretic effects by reducing temperature 36.68 ◦c at concentration 400 mg/kg by brewer's yeast induced model with respect to standard drug acetyl salicylic acid by 35.89◦c[11].

Figure 1: Fresh leaves of Launaea pinnatifida plant

Figure 2: Dried leaves powder of Launaea pinnatifida plant

Figure 3: Flowers of Launaea pinnatifida plant

Figure 4: Fresh roots of Launaea pinnatifida plant

Figure 5: Dried roots of Launaea pinnatifida plant

Figure 6: Dried roots powder of Launaea pinnatifida plant

L. pinnatifida exhibits anti analgesic effects at significant reaction time of 6.93 sec. With respect to standard drug Pentazocine at 7.62 sec[11].

L. pinnatifida ethanolic extract has reported anti-inflammatory effects by Carrageenan induced hind paw enema model in rats and the results indicates that dose of 400 mg/kg exhibits maximum inhibition of 32.48% while standard drug Indomethacin also inhibits 40.13% of inflammation[11].

Due to insufficient data regarding phytochemical profile of plant it is not clear that which phytochemical constituents are responsible. So more scientific and systematic evaluation regarding phytochemical study will be needed this may result in to development of a potent and therapeutically active formulation. Also such data may support the traditional claim.

Antioxidant assay was carried out on different assay including DPPH assay, Ferric reducing assay and Hydroxyl radical scavenging assay all the results indicates remarkable antioxidant activity of *L. pinnatifida* ethanolic extract hence *L. Pinnatifida* is best source for natural antioxidant[9].

Ethnobotanical or Traditional Uses

Due to the galactagogue[2] property this plant is given to feeding mothers after pregnancy and child birth mainly in a lehya preparation[3]. This plant is mainly well known in the tribal area for abdominal disorder and urinary infection. *L. Pinnatifida* having reported tonic, diuretic, soporific and aperient properties[12].

Whole plant is effective in rheumatoid arthritis, joints problems and gout. Leaf preparations are used by the fisherman to cure the skin injuries caused by fish spikes[4]. This plant is also fed to buffaloes to increase milk production due to galactagogue property[2]. Mainly *L. Pinnatifida* decoction is used to treat the skin related diseases.

Hence *L. Pinnatifida* whole plant is very well known traditionally and Ayurvedic point of view due to numbers of benefits to human health.

CONCLUSION AND DISCUSSION

Launaea pinnatifida is stoloniferous and creeping herb with rooting at internodes and likely to spread near sandy coast area. Fresh root exudates white to brownish milky latex which is viscous and sticky in nature. Microscopic observation of roots of plant indicates the presence of the lactiferous cells, tannins content, pitted vessels, calcium oxalate crystals, simple fibers and absence of pith. Preliminary phytochemical studies of root of *launaea pinnatifida* revealed the presence of alkaloids, carbohydrates, amino acids steroids and tannins.

Methanolic extract of *L. Pinnatifida* is also effective source of drug for Anti pyretic, Anti-inflammatory and Anti analgesic activity also possess hepatoprotective activity. Which phytochemical are responsible for the activity is still unclear due to lake of detailed phytochemical studies and scientific data.

ACKNOWLEDGEMENT

I would like to offer my special thanks to School of Pharmacy, RK University and Phyto Life Sciences Pvt. Ltd for their valuable technical support on this reseach work. Special thanks should be given to Dr.Devang pandya sir, my research project guide for his professional guidance and valuable support.

REFERENCES

1. Jstor.org (homepage on the internet) JSTOR plant science; 2000-2011 ITHAKA. Available from: http://plants.jstor.org/flora/ftea004644. Last accessed on 2018 Nov 20 .
2. Yusriya S, Harisha CR, Shukla VJ, Acharya RN. A pharmacognostical and pharmacological evaluation of a folklore medicinal plant "Kulhafila" *Launaea sarmentosa* (Willd) Schultz Bip. ex Kuntze). MD (Ayu) Dissertation, IPGT and RA, Gujarat Ayurved University, Jamnagar. 2011.
3. Chunekar KC, Pandey GS (1999): Bhavprakash Nighantu. Chaukhambha Bharti Academy, Varanasi-Patna. pp. 457-458.
4. Salih Y, Harisha CR, Shukla VJ, Acharya R. Pharmacognostical evaluation of *Launaea sarmentosa* (Willd.) schultz-bip. ex Kuntze root. Ayu. 2013 Jan;34(1):90.
5. Talele CD, Patil SV. Phytochemical screening of *launaea pinnatifida* leaves extract. International Journal of Pharmacology and Biological Sciences. 2017 Aug 1;11(2):21.
6. Yadava RN, Chakravarti N. New antifungal triterpenoid saponin from *Launaea pinnatifida* Cass. Indian Journal of Chemistry. Vol. 48B. January 2009.pp.83-87.
7. Pullaiah T. Encyclopedia of world medicinal plants. Vol. 1. Regency; 2006. p. 1217.
8. Nadkarni KM: Indian Materia Medica, Vol 1. Mumbai: Popular Prakashan; 1982:729
9. Nagalapur SK, Paramjyothi S. *In vitro* antioxidant activity of activity of *launaea pinnatifida* cass leaves. In vitro. 2010;5(1):105-8.
10. Pokharkar RD, Takate SB, Deshmukh RD, Gite VN. Hepatoprotective activity of *Launaea pinnatifida* against CCl_4 induced hepatic injury in rats. Pharmacologyonline. 2007;2:128-33.
11. Raju GS, RahmanMoghal MM, Hossain MS, Hassan MM, Billah MM, Ahamed SK, Rana SM. et al. Assessment of pharmacological activities of two medicinal plant of Bangladesh: *Launaea sarmentosa* and *Aegialitis rotundifolia roxb* in the management of pain, pyrexia and inflammation. Biological research. 2014 Dec;47(1):55.
12. Cheriti A, Belboukhari M, Belboukhari N, Djeradi H. Phytochemical and biological studies on *Launaea Cass. genus (Asteraceae)* from Algerian Sahara. Phytochemistry. 2012;11.