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Review Article

CONCEPTUAL RECAPTURE OF *GOJIHVA* (*ONOSMA BRACTEATUM* WALL.)

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ABSTRACT

Aim: To collect and comprehensively review information available regarding the medicinal use of *Gojihva.* **Background:** *Gojihva /Gowjaban* is a very useful medicinal plant commonly used for fever, cough, bronchitis, rhinitis, stomatitis & weakness of cardiac muscles. This plant is used by *Unani, Ayurveda* and other traditional systems of medicine. A lot of research has also been conducted on this plant exploring its pharmacological utilization. Though there are few review articles available on this plant but no review has comprehensively covered all aspects of *Gojihva.* **Materials and Methods:** This review is in a narrative format and done from literature and publications relevant to *Gojihva* that were identified through a systematic search of major computerized medical databases. **Conclusion:** *Gojihva* is concluded to have more than 20 *Samhita* based indications -*Aanushastra, Vistravan in Vran, Jihwa roga, Mukha Roga, Kushtha, Vran Ropan, Granthi Pralepa, Jwara, Sarpa Vish, Lutta Vish, Mushika, Vish Upadrava, Alarka Vish, Grahi, Hridya Roga, Kasa, Shwasa, Pratishyaya, Aaruchi, Prameha & Mutrakricha. Gojihva* also possesses Analgesic Effect, Anti-Ageing Effect, Antioxidant Effect and Free Radical Scavenging Capacity, Antimicrobial /Anti-Leprotic Effect, Antifungal/Antibacterial Effect, Antidepressant /Anxiolytic Effect, Antidiarrheal/ Anti-Spasmodic Effect, Anti-Asthmatic/Anti- Inflammatory Effect, Anti-Cancerous Effect, Psycho-Immunomodulatory Effect, Acetyl-Cholinesterase Inhibitory Activity, Herbicidal Effect & Cardioprotective/Anti-Hypertensive Effect. **Clinical significance:** *Samhita* based indications of *Gojihva* are compared with Article concluded effect and then areas of further reseach are identified in drug *Gojihva.*

INTRODUCTION

Gojihva widely used in Ayurvedic medicine, the traditional medical system of India, is commonly known as *Goji, Gaozaban, or Sedge*. It is commonly used for fever, cough, bronchitis, rhinitis, stomatitis, jaundice, constipation, epilepsy, kidney disease & weakness of cardiac muscles by the tribal people of the Western Ghats[1]. According to early literature, the aerial part of *Gojihva* is known traditionally for the treatment of asthma and bronchitis and was imported from Iran. *Gojihva* is considered among controversial drugs. The botanical sources of *Gojihva* are considered as[2]:

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

Among them the species which had maximum correlation with those mentioned in *Samhitas* are *Onosma bracteatum* Wall. & *Elephantopus scaber* Linn.

In Gujerati, *Elephantopsus scaber* Linn (Compositae) was the plant known as *Jaljibhi & Gojibhi*, which corresponds with Sanskrit *Gojihva.* It is known as *Gobhi* in Hindi which is also the descendent of *Gojihva.* And so, it was non-controversial. But the leaves of *Elephantopsus scaber* are smooth not hirsute and this comes in the way of accepting it as *Gojihva*. In Unani medicine there is one plant known as *Gowjaban* or *Onosma bracteatum* Wall. (Boraginaceae) the meaning is very clear 'like cow-tongue' and it is

tempted to accept this as true *Gojihva* plant as leaves of this are hirsute so this seems to be the true *Gojihva* as mentioned in *Samhitas* as the very name *Gowjaban* is the exact translation of the Sanskrit word *Gojihva*.

Dr. Bapa Lal Vaidya has mentioned it in two forms as *Gojihva* as *aushadha* and *Gojihva* in *shak varga* as *Gobhi*. *Gojihva aushadha* is plant which has leaves like cow tongue / hirsute rough is *Gaujaban* of Unani named as *Onosma bracteatum* Wall. – Boraginaceae. This *Gawjaban* can't be eaten as leaves are very hirsute. *Gojihva shak* which is used in eating is plant called *Jal-jibhi or Gojibhi* in Gujrati *(Elephantopsus scaber* Linn. – Compositae) with smooth leaves used as vegetable[3].

Table 1: *Gojihva Aushadha* and *Gojihva Shak*

Gojihva Aushadha ***Onosma bracteatum* Wall. – Boraginaceae**	***Gojihva Shak*** ***Elephantopsus scaber* Linn. – Compositae**
Gojihva/Gawjaban – like cow's tongue *Kharparni*- Hirsute rough	*Galjibhi, Gojilata* (Bengali), *Pathre* (Marathi), *Bhonpathre, Gojibhi* (Gujrati), *Gobhi* - Smooth leaves

Among the species *Onosma bracteatum* Wall. & *Elephantopus scaber* Linn. *Gojihva* has been mentioned by *Acharya Charaka* in *Shak Varaga*[4]. *Acharya Sushruta* mentioned it as *Goji Shak* and in form of *Goji patra* for *Vistravanadi karma*[5]. *Acharya Vagbhata* described it as *Shak* and *Aushada* both[6,7]. *Abhidhan Manjari* mentioned it as a *Shak*[8]. *Abhidhan Rattan Mala* mentioned it as *Aushadh*[9]. *Amarkosh* mentioned it in *Aushada Varga*[10]. It is mentioned in *Kaiyadev Nighantu* as *Gobhi* which is considered as *Elephantopus scaber* Linn. By *Acharya* P.V. Sharma in Hindi commentary[11]. In *Bhavprakash Nighantu* it has been mentioned and described by commentator Padmashri Proff. Krishanachand Chunekar as *Gojihva Shak* as *Launaea pinnatifida* Cass. And *Gojihva Aushadha* as *Onosma bracteatum* Wall.[12]. *Gojihva* has been described by *Madanpal Nighantu's* hindi commentator as *Gojihva-Gaojiwan- Onosma bracteatum* Wall. and *Gojihva Shak-Mayurshikha-Elephantopus scaber* Linn.[13]. *Raj Nighantu* of Pandit Narhari by Dr.Indradev Tripathi described it as *Elephantopus scaber* Linn.[14]. *Gunarattan Mala* of Bhavmishra by Dr. Kailashpati Pandey described it as *Gobhi- Elephantopus scaber* Linn. & *Vangobhi- Gojihva-Onosma bracteatum* Wall.[15]. *Nighantu Adarsh* by Bapa Lal Vaidhya described it as *Gaujiwan- Onosma bracteatum* Wall.[16]. *Priya Nighantu* by P.V. Sharma described it as *Gaujiwan- Onosma bracteatum* Wall.[17]. Acharya Yadavji Trikamji mentioned it as *Gaujiwan-Onosma bracteatum* Wall.[18]. *Sandigdh Aushadh Shastra*[19], *Unani Dravyaguna Sharstra*[20], Ayurvedic Pharmacopeia of India[21], Materia Medica of Western India[22] considered it as *Gaujiwan- Onosma bracteatum* Wall., so same has been studied for its pharmacological utilization.

MATERIALS AND METHODS

This literature review was compiled from ayurvedic text, relevant modern science books, research published articles both from print and electronic resources. Computerized medical databases E- Samhita, PubMed., Google Scholar, Medline, Embase, Mantis were searched using these keywords: *gojihvA, gojI, Gojihwa, Gojihva* etc. Results of these searches were reviewed with respect to medicinal uses of *gojihva* and other important aspects.

Review Results

Plant Discription

Gojihva (Onosma bracteatum Wall.- Boraginaceae), also known as *Gaozaban* or *Sedge* The genus *Onosma* includes about 150 species distributed worldwide[23].

Synonyms[24]

Sansk. : *Darvipatra, Gauajihva, Kharaparni, Gauji*
Assam. : *Lisanusaur*
Beng. : *Gojialata, Dadisha*
Eng. : Cow's Tongue/ *Lisanussoar*, Sedge herb
Guj. : *Bhonpathari, Galajibhi*
Hindi. : *Gaujaban, Gojiya*
Kan. : *Shankha Huli, Aakalanalige, Gojaba*
Mal. : *Kozhuppu*
Mar. : *Govjaban, Paatharee*
Ori. : *Kharsan, Kharaptra*
Punj. : *Kazban*
Tam. : *Kharaptra, Dharviptra, Kozha*
Tel. : *Yeddunaluka*
Urdu. : *Gaozaban*

Taxonomical Classification[25]

Kingdom : Plantae, Plants;
Subkingdom : Tracheophytes
Super division : Angiosperms ;
Division : Eudicots;
Class : Asterids;
Order : Boraginales;
Family : Boraienaceae;
Sub family : Boraginoideae;
Genus *: Onosma;*
Species *: Bracteatum;*

Botanical Description

a) Macroscopic

Habitat and ecology: The plant requires well-drained, light soil so found on sun-facing slopes like Western Himalayas and Central Himalayas from Kashmir to Kumaon between the altitudes of 3500-4500 m. In Himachal Pradesh, it has been found from the districts of Kangra, Chamba, Kinnaur and Lahaul and Spiti.

Distinguishing features: It is a perennial, hirsute or hispid herb with narrow leaves[26].

Life cycle: The plant flowers during the months of August-September. Fruiting takes place in September-October.

Morphology[27]**:** It is a large, herbaceous perennial shrub of 40 cm height.

Stem is simple hairy, arising from a cluster of radical leaves, with a black, woody rootstock, 2.5-5 cm in diameter, terminating in a knotty head from which arise several stems, erect or ascending. Stem is rough due to white, hard, hispid hairs and cicatrices, and longitudinal wrinkles; colour greenish-yellow; fracture, short; odour and taste not characteristic.

Root is purplish red from inside and the stem is simple and rarely branched, thickly studded with calcareous tubercles and armed with bristles.

Leaves are entire, thick, petiolate, lanceolate to ovate-lanceolate, 12-30 cm long, 1.5-3.5 cm broad, acuminate tubercle-based hispid hairs present on both surfaces; greenish to light yellow on top and white beneath. The lower leaves are stalked, narrow lanceolate, rough, bristly hairy above and paler silky white beneath. The upper leaves are smaller in size.

Flowers are deep blue, later turning purplish in colour, trumpet shaped, silky, glomerate cluster and are thickly covered by white stiff bristles. The nutlets are ovoid and rough.

b) **Microscopic:**[28] **Stem** - shows single-layered epidermis, covered with thick cuticle, some epidermal cells elongate to form long, warty, tubercle-based unicellular hairs, cortex differentiated in two zones, 5-7 layered outer collenchyma, 3-4 layered inner parenchymatous cells, consisting of thin-walled, round to oval cells; phloem composed of usual elements; phloem fibres absent; xylem consisting of usual elements, vessels mostly solitary or rarely 2-3 in groups having spiral thickening, and fibres and tracheids having blunt tips and simple pits; xylem ray not distinct: pith consisting of round, thin-walled, parenchymatous cells.

Leaf-Midrib -single layered epidermis with thick cuticle and long warty, tubercle-based unicellular hairs present on both surfaces followed by 5-7 layers of collenchymatous and 3-4 layers parenchymatous cortical cells; vascular bundle situated centrally. **Lamina**- isobilateral, single layered epidermis on either surface covered with thick cuticle, long warty, tubercle-based, simple, unicellular hairs present on both surfaces; palisade 2 layered, spongy parenchyma 8-10 layered, stomata paracytic

Powder- Greenish-brown; shows groups of ovale to polygonal, thin-walled straight epidermal cells; spiral vessels; a few fibres entire or in pieces, elongated with blunt tips; long warty, tubercle-based unicellular hairs and a few paracytic stomata.

Image 1- Dry Sample of *Onosma Bracteatum* Wall.

Phytochemistry[29]

O. bracteatum is reported to have valuable chemical constituents like carbohydrates, fatty acids, glycosides, flavonoids, tannins and phenolic compounds. During bioassay-guided isolation, two known benzoquinones, allomicrophyllone and ehretiquinone along with three novel benzoquinones designated as ehretiquinones B-D were isolated from *O. bracteatum*.

Ayurvedic indications

Table 2: Properties and Action of *Gojihva*

Ref.	*Rasa*	*Guna*	*Veerya*	*Vipaka*	*Prabhava*
A.N.[30]	*Tikta*	-	*Sheeta*	*Katu*	*Kapha-pitta-nashan*
K.N.[31]	*Kashaya, Tikta, Madhura*	*Laghu*	*Sheeta*	*Madhura*	*Vatta-karaka, Kapha-pitta-nashan*
D.N.[32]	*Kashaya, Tikta*	-	*Sheeta*	*Katu*	-
B.P.N.[33]	*Kashaya, Tikta*	*Laghu, Mridu*	*Sheeta*	*Madhura*	*Vattala, Kapha-pitta-hara*
M.P.N.[34]	-	*Laghu*	*Sheeta*		*Vattala, Kapha-pitta-hara*
R.N.[35]	*Katu*	*Tivra*	*Sheeta*		*Pitta-nashan*

Table 3: *Gojihva* in Samhita's

Book	Reference	Indication	Synonyms
Charak Samhita[36]	*CH. SU. 27/97-98*	*Aanpaanvidhi –Gojihwa Shak* *Tikta Rasa, Katu Vipaka,* *Sheeta Virya, Kapha-Pitta Har*	*Darvipatrika*
	CH. CH. 21/84-85	*Visrap Chikitsa-Gojihwa Shak Ghrit*	
	CH. CH. 23/220	*Vish Chikitsa-Gojihwa Shak Lepa*	
	CH. CH. 25/89	*Vran Chikitsa-Vran Ropan-Gojihwa Shak*	
Sushrut Samhita [37]	*SU. SU. 08/15*	*Aanushastra-Goji*	*Gojihwa*
	SU. SU. 08/18	*Vistravan-Goji Patra*	*Gojihwa*
	SU.SU. 46/262	*Aanpaanvidhi-Tikta Shak- Goji Shak*	*Darvipatrika, Karkasha, Dirghpatra, Gojibhi*
	SU.SU. 46/264	*Aanpaanvidhi-Gojihvika* *Kshaya Rasa, Madhura Vipaka* *Sheeta Virya, Pitta Har*	
	SU. CH. 09/11	*Kushthchikitsa-Goji*	*Gojihwa*
	SU. CH. 17/19	*Visarpika nadi stan roga- Vran Prakshalan- Gojihvika Mool*	
	SU. CH. 18/05	*Granthi Chikitsa- Goji Patra Pralepa*	*Gojihvika, Shankhotak*
	SU. CH. 18/32-33	*Granthi Chikitsa-Vistravan-Goji Patra*	*Darvipatrika, Shankhotak*
	SU.CH. 19/44-45	*Updansh Chikitsa-Goji Shak-Vran Ropan*	*Gojihwa*
	SU.CH. 22/19-20	*Mukha Roga-Goji Patra -Rakt Vistravan*	*Gojihwa*
	SU.CH. 22/45	*Mukha Roga- Jihwa Roga- Goji Patra Gharshan In Tikka*	
	SU. KALP. 06/04	*Dandubhiswiniyakalp, Goji Shak*	*Gojihwa*
	SU. KALP. 07/29	*Mushik Kalp-Goji Ghrit*	*Gojihwa*
	SU. U. 24/28	*Pratishyay Chikitsa- Goji*	*Gojihwa*
	SU. U. 39/252	*Jwar Chikitsa-Gojihwa Shak*	*Gojishak*
Astang Samgraha[38]	*AS. SU. 07/105*	*Aanroopa*	
	AS. CH. 02/08	*Jwar*	
	AS. U. 30/49	*Vran*	
	AS. U. 39/03	*Guhaya Roga-Vran Ropan*	
	AS. U. 42/42	*Sarp Vish Chikitsa -6th Vega*	
	AS. U. 44/37	*Luta Visha*	
	AS. U. 46/61	*Mushika Alarka Visha*	
	AS. U. 47/21	*Visha Upadrav*	
Astang Hridya [39]	*AH. SU. 06/77*	*Aanpana*	*Godhumika, Darvipatrika*
	AH. CH. 01/94	*Jwar Chikitsa- Gojihva In Tikka*	
	AH. U 38/40	*Mushika Alarka Visha*	
Abhidhan Manjari [40]	*05/784*	*Shuk Dhanya Shak*	
	03/25	*Ekarth Varga Shak*	
Abhidhan Rattan Mala [41]	*06/84*	*Kustha*	
Amarkosh[42]	*DWITIYA 01/119*	*Van-Aushadhi Varga*	

Kaiyadev Nighantu[43]	*01/733-735*	*Graahi, Hridya, Kassa, Aruchi, Shwas, Prameha, Jwara, Vrana.*	*Darvipatrika, Darvika, Kosthamulika, Gobhi, Goli, Bhumikalika*
Nighantu Shesh[44]	*02/259*	*Gulam Kanda*	*Shringberi, Darvika, Bhumikalika, Kharpardini*
Paryayratanmala[45]	*598*		*Darvipatrika*
Bhav-Prakash Nighantu[46]	*04/250*	*Guduchyadi varga- Grahini, Hridya, Prameha, Kassa, Vrana, Jwara.*	*Gojika, Gobhi, Darvika, Kharpardini*
	10/32	*Shak varga-* *Kustha, Prameha, Mutrakricha, Jwara*	
Madan Pal Nighantu[47]	*01/292*	*Abhayadi varga- Grahini, Hridya, Prameha, Kassa, Vrana, Jwara*	*Gojika, Gobhi, Darvika, Swarpardini*
	10/67	*Dhanya varga-*	
Raj Nighantu[48]	*04/86-87*	*Shavahyadi varag-* *Vran Ropan* *Dant & Visha Roga*	*Kharpatri, Pratna, Darvika, Adhomukha, Dhenujihwa, Adahpushpi*
Saraswati Nighantu[49]	*01/44*		*Gojika, Gobhi, Darvika, Kharpardini*

A total of more than 55 articles were found using the search method described above and below effects were found in *Onosma bracteatum* Wall.

a) Analgesic Effect[50]

Imran H et al. 2018 concluded that *Onosma bracteatum* Wall. possesses significant central and peripheral analgesic activity by tail flick test and acetic acid induced writhing test at the doses of 50, 100, 250 and 500mg/kg body weight respectively in animal model.

b) Anti-Ageing Effect[51]

Umer Farook et al. 2019 concluded that the isolated benzoquinones molecules from *Onosma bracteatum* Wall. have the ability to be employed as a potential therapeutic agent against age-related diseases and the results indicated it significantly extended the replicative lifespan of K6001 yeast model.

c) Antioxidant Effect and Free Radical Scavenging Capacity[52]

Ekta Menghani et al. 2012 concluded that the methanolic extract of *Onosma bracteatum* Wall. shows antioxidant activity, free radical reducing power, hydrogen peroxide scavenging activity and 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging capacity at concentrations (102µg to 10-3 µg/ ml), due to high content of saponin, tannin and alkaloids.

d) Antimicrobial /Anti-Leprotic Effect[53]

Shiv Shankar Gautam et al. 2015 concluded that fruit extracts of *Onosma bracteatum* Wall. showed varying levels of bactericidal activity extracted with petroleum ether, acetone, methanol, and aqueous solvents. The methanol extract showed maximum activity ranged between 12.6 ± 0.28 and 20.6 ± 0.28 mm at 200 mg/ml. The antifungal activity noted highest with 24.74% inhibition by methanol extract at 250 mg/ml.

e) Antifungal/Antibacterial Effect[54]

Abida Yasmine et al. in 2018 concluded that all four fractions (n-hexane, methanol, ethyl acetate and aqueous fraction) of *Onosma bracteatum* Wall. leaves showed moderate antibacterial activity against tested bacteria compared to positive control. *Staph aureus* and *Pseudomonas aureuginosa* were most susceptible than *E-coli*. Antifungal activity of four fraction samples showed that methanol, n-hexane and ethyl acetate fraction were effective, while aqueous fraction showed no antifungal activity against *Candida albicans.*

f) Antidepressant/Anxiolytic Effect[55]

Hafiz Mohhamad Asif et al. in 2019 concluded that *Onosma bracteatum* Wall. possesses anxiolytic and antidepressant properties by using open field, elevated plus maze, force swimming, and tail suspension test in Swiss albino mice(male) were fed orally with hydroalcoholic extract at different doses 50, 100, and 200 mg. Outcome demonstrated that plant at the dose of 200 mg/kg body weight showed significant potential which was similar to that standard diazepam and fluoxetine.

g) Antidiarrheal/ Anti-Spasmodic Effect[56]

G. P. Choudhary et al. 2012 concluded that ethanolic extract of *Onosma bracteatum* Wall. Possesses anti-diarrhoeal effect at the doses of 250 and 500 mg/kg b.w, using castor oil and magnesium sulphate induced diarrhoea models in mice.

h) Anti-Asthmatic/Anti- Inflammatory Effect[57]

Kalpana Govind bhai Patel et al. 2007 evaluated the effect of aerial parts of *Onosma bracteatum* Wall. on bronchial hyperreactivity by various *in vitro* studies on tracheal strip and histopathological studies of egg albumin-sensitized guinea pigs. The results suggest

that ethanolic extract of *O. bracteatum* (5 mg/kg, p.o., for 15 days) decreases bronchial hyperresponsiveness by decreasing the infiltration of inflammatory mediators like eosinophils, neutrophils in bronchoalveolar lavage fluid / BALF, inhibiting histamine release from lungs of sensitized guinea pigs and by decreasing airway inflammation.

i) Anti-Cancerous Effect[58]

Prakash Jondhale et al. 2016 concluded that some of the extract of *Onosma bracteatum* Wall. possesses the anti-cancerous activity. Out of all chloroform extracts of *Gojihwadi* samples only GKG10 of conc. 5mg/disc shown maximum inhibition zone. In benzene extracts of *Gojihwadi* samples only GKR of conc. 10mg/disc showed maximum inhibition zone & GKG10 of conc. 5mg/disc next to it.

j) Psycho-Immunomodulatory Effect[59]

Badruddeen et al. 2012 concluded that the extract of *Onosma bracteatum* Wall. showed a protective effect against the stress induced immune deficiency disorders (eg. asthma and rheumatoid arthritis) and abnormal memory disorders which included dementia in SD rats. In *O. bracteatum* treated rats, the % alternation, retention transfer latency, size of the spleen and liver, TLC, and the agglutination increased whereas the acquisition transfer latency, size of the kidney, total paw oedema, AChE activity and circulating glucose were significantly decreased in comparison with the stress control.

k) Acetyl-Cholinesterase Inhibitory Activity[60]

Muhammad Ashraf et al. 2011 concluded that maximum AChE inhibitory activity was found in methanolic extract of *Onosma bracteatum* Wall. (59.73±5.29%) with a stock solution of 1mg/ml was prepared in 100 mM tris buffer pH 7.4 for all 50 plant extracts used in the screening of enzyme inhibitors.

l) Herbicidal Effect[61]

Joham Sarfraz Ali et al. 2017 concluded that the plants extract of *Onosma bracteatum* Wall. produce oxidative stress to the seedlings and plants that eventually results in toxicity and allelopathic effect and can be a good candidate for natural herbicide either in form of extracts or the allelopathic compounds isolated from this plant species, which can be used as replacement of expensive and harmful synthetic herbicide.

m) Cardioprotective/Anti-Hypertensive Effect

Arya Vikrant et al. 2011 concluded that secondary metabolites like carotenoids, triterpenes, flavonoids, cardiac glycosides, alkaloids saponins, polyphenols, terpenoids, fatty acids *etc* were responsible for cardioprotective activity & the leaves of *Onosma bracteatum* Wall. have Tannins, Glycosides, Resins & Alkaloids which also possesses cooling and astringent activity[62].

Sadia Ata et al. 2011 conducted a preliminary study is providing baseline information about elemental contents of medicinal plants & concluded that the leaves of *Onosma bracteatum* Wall. used as Tonic, Refrigerant, relieves heart palpitation, stomach and bladder treatments. It is also recommended for relieving heart palpitation that might be due to presence of higher contents of calcium[63].

DISCUSSION

Gojihva have *Samhita* based indications - *Aanushastra, Vistravan in Vran, Jihwa roga, Mukha Roga, Kushtha, Vran Ropan, Granthi Pralepa, Jwara, Sarpa Vish, Lutta Vish, Mushika, Vish Upadrava, Alarka Vish, Grahi, Hridya Roga, Kasa, Shwasa, Pratishyaya, Aaruchi, Prameha & Mutrakricha. Gojihva* also possesses Analgesic Effect, Anti-Ageing Effect, Antioxidant Effect and Free Radical Scavenging Capacity, Antimicrobial /Anti-Leprotic Effect, Antifungal/Antibacterial Effect, Antidepressant/ Anxiolytic Effect, Antidiarrheal/ Anti-Spasmodic Effect, Anti-Asthmatic/Anti- Inflammatory Effect, Anti-Cancerous Effect, Psycho-Immunomodulatory Effect, Acetyl-Cholinesterase Inhibitory Activity, Herbicidal Effect & Cardioprotective/Anti-Hypertensive Effect.

Table 4: Comparison Between Ayurvedic Indications and Article Concluded Effects

Ayurverdic Indication	Article Concluded Effects
Aanushastra, Vistravan in Vran, Jihwa and Mukha roga	-
Kushtha	Antimicrobial /Anti-Leprotic Effect
Vran Ropan	Analgesic Effect, Antimicrobial Effect, Antifungal/ Antibacterial Effect
Granthi Pralepa	Analgesic Effect, Antimicrobial Effect, Antifungal/Antibacterial Effect
Jwara	Analgesic Effect, Antimicrobial Effect, Antifungal/ Antibacterial Effect
Vish- Sarpa, Lutta, Mushika, Vish Upadrava and Alarka	Analgesic Effect, Antimicrobial Effect, Antifungal/ Antibacterial Effect
Grahi	Antidiarrheal/ Anti-spasmodic Effect

Hridya	Cardioprotective/Anti-hypertensive Effect
Kasa, Shwasa, Pratishyaya	Anti-asthmatic/Anti- inflammatory Effect, Psycho-Immunomodulatory Effect
Aaruchi	-
Prameha	-
Mutrakricha	Diuretic Effect
-	Anti-Ageing Effect, Antioxidant Effect and Free Radical Scavenging Capacity
-	Antidepressant/Anxiolytic Effect
-	Anti-Cancerous Effect
-	Psycho-Immunomodulatory Effect
-	Acetyl-Cholinesterase Inhibitory Activity
-	Herbicidal Effect

CONCLUSION

Gojihva is concluded to have more than 20 *Samhita* based indications and nearly 13 Article concluded effects. Amomg them, *Aanushastra, Vistravan in Vran, Jihwa and Mukha roga, Aaruchi and Prameha* are *Samhita* based indications on which there is none availability of appropriate study, which may act as area of further research.

CLINICAL SIGNIFICANCE

Areas of further reseach are identified in drug *Gojihva* by comparing *Samhita* based indications with Article concluded effects.

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