



A Review of Ethnomedicinal Uses of *Heterophragma Adenophyllum* wallich ex. G. Don

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ABSTRACT:

Background: *Heterophragma adenophyllum* (wallich ex. G. Don.) is a synonym of *Fernandoa adenophylla* (Wall. ex. G. Don.) commonly known as Katsagon or Marodphali, belongs to the family Bignoniaceae. The whole plant is considered to be clinically important and used as antidiabetic, amenorrhea, premature ejaculation, night emesis, antimicrobial, antifungal, antiseptic and skin disease.

Material And Methods: A present review was carried out to collect all available information on ethnomedicinal claims of *Heterophragma adenophyllum* (wallich ex. G. Don.) from published literatures, books like Medicinal plants of Gujarat, Reviews on Indian medicinal plants, The wealth of India NISCAIR, etc. also books related to ethnobotany and ethnomedicinal, Google scholar, PubMed, etc. Ethnomedicinal uses of *Heterophragma adenophyllum* (wallich ex. G. Don.) were collected from all available ethnomedicinal plants-related books, floras, published research articles, etc.

Result: It is reported in many states in India, widely distributed at Matheran and Mahabaleshvar in Maharashtra, Aasam and Saurashtra region of Gujarat, Punjab, Tamilnadu, Maharashtra, Rajasthan. Its root, leaves, and the whole plant are recommended in 12 different diseases both externally and internally (Table 2).

Conclusion: *Heterophragma adenophyllum* (wallich ex. G. Don.) need to explore with the help of detailed investigation, especially through pharmacological properties. As per ethnomedicinal claims *Heterophragma adenophyllum* (wallich ex. G. Don.) can be an alternative to *Stereospermum suaveolens* DC. (*Patala*).

Keywords: *Heterophragma adenophyllum* (wallich ex. G. Don.), *Stereospermum suaveolens* DC., *Patala*

INTRODUCTION

In Ayurvedic formulary of India, *Dashamool* drugs are used in maximum i.e. 82 formulation out of total 635. It is estimated that about 8000 metric tons of *Dashamoola* roots are used annually by Ayurvedic industry. Annual trade for *Patala* is 1000-2000 MT. and it is listed in 178 medicinal

plant species in high volume trade sourced from tropical forests. It is included in most vulnerable group of species that needs immediate management focus. *Patala* is one of potent drug from *Dashamoola* group which is used single as well as in compound Ayurvedic formulation. It is



included in *Brihatpanchmoola*. An established botanical source of *Patala* is *Stereospermum suaveolens* DC. belonging to the family Bignoniaceae. The Bignoniaceae or trumpet creeper family, is a family of flowering plants comprising of about 650-750 species in 116-120 genera. Members of the family are mostly trees and shrubs, and more rarely lianas and herbaceous plants in 116-120 genera. *Patala* is extensively used by *Ayurveda*, Folk, Homeopathy, Siddha, and Unani system of medicine. *Charaka Samhita*, *Sushruta Samhita*, *Ashtangasamgraha*, and *Ashtangahridaya* mention 109, 70, 155 and 114 formulations of *Patala* respectively. According to National Medicinal Plants Board, *Patala* comes in the list of 178 high volumes traded medicinal plants (>1000 MT per year). Due to this high demand and less availability of *Patala*, there is a need to find and promote the usage of equally efficient alternate species for use and especially which is geographically available in different areas.

Plant Description

Heterophragma adenophyllum (wallich ex. G. Don.) belongs to same family of *Patala* that is Bignoniaceae. A handsome tree, 30-50 ft. with whitish fissured bark. Leaves:- large, 2-3 ft. long, pinnate. Leaflets:- elliptic, entire, acute, glabrous above, Pubescent beneath, 5-7 no. , 12-14 inch long, subsessile. Panicle:- 8-10 inch diam., stout, many-fld. Bractes:- ½ inch, narrowly lanceolate, deciduous. Flowers:- large, yellowish brown, in terminal panicles. Calyx:- ¾ to 1 inch, rusty tomentose, irregularly 5 – lobed half- way down. Corolla:- brown- yellow densely wooly- tomentose without, mouth 2 inch diam., lobes hardly crisped or crenate. Anther:- cells nearly separate, pendulous. Capsules:- up to 3 ft. long & 1 inch diam., cylindrical, curved, 2 valved, cork- screw like; septum flat. Seeds:- compressed, winged, 1 ½ by 1/3 – ½ inch.^{1,2}

MATERIALS AND METHODS

Collection of plant material

Heterophragma adenophyllum (wallich ex. G. Don.) was identified with the help of different flora and authenticated by the Pharmacognosy expert and its fresh leaf sample were collected from its natural habitat (Longitude: 70 ° 49' 25.0176" and Latitude: 22 ° 48' 43.1604"), Morbi, Gujarat, India. Samples were collected in mature condition during october 2022., herbarium specimen was deposited at the institute museum with the reference number (ITRA.phm-6365/2023-24). The material was also preserved in FAA-Formaldehyde Alcohol Glacial Acetic Acid (90:5:5) for

botanical studies. The collected plant were washed with potable water and dried under shade, powdered through a mechanical grinder and sieved (60 mesh). The coarsely powdered sample was kept in an airtight glass container for its Pharmacognostical and analytical evaluation.

In the present study, information was collected for the drug *Patala* and *Heterophragma adenophyllum* (wallich ex. G. Don.) regarding ethnomedicinal claims by using the books with special references from various flora, books of medicinal plants, compiled from books on Ethnomedicinal which are available and related articles from the internet were referred.

Data collection

In the present study, information was collected for the drug *Patala* and *Heterophragma adenophyllum* (wallich ex. G. Don.) regarding ethnomedicinal claims by using the 41 books with special references from various flora, books of medicinal plants, compiled from books on ethnomedicinal which are available and related articles from google scholar, PubMed, etc. were referred. plant description, uses, chemical constituents, availability etc. were found in 6 books Among 41 books.

Study Selection

1. Inclusion criteria:
Publications that described the use of *Stereospermum suaveolens* DC. and *Heterophragma adenophyllum* (wallich ex. G. Don.) to treat many disease conditions either human or animal or used as food i.e. having any economic value were included in the review. This includes both external and internal applications with no language restrictions and date limitations.
2. Exclusion criteria:
Other species of *Heterophragma* were excluded from the present review.

RESULTS

Local Name:

Heterophragma adenophyllum (wallich ex. G. Don.) is known by 15 names like Katsagon, Parul, Marodaphali etc. in 9 different languages as per table no. 1.

Area of reporting:

Heterophragma adenophyllum (wallich ex. G. Don.) is a species of flowering plant in the family Bignoniaceae that is native to the Andaman islands, India (Assam and other states), Bangladesh, Myanmar, Cambodia, Laos, Peninsular malasia, Thailand and Vietnam. In India it is

available at especially Matheran and Mahabaleshvar in Maharashtra, Assam and Saurashtra region of Gujarat, Punjab, Tamil Nādu, Rajasthan.

Parts used:

Root, Leaves, Flowers and whole plant of *Heterophragma adenophyllum* (wallich ex. G. Don.) are used in whereas disease condition either internally or externally.

Dosage forms:

It is observed that root, leaves, and whole plant of *Heterophragma adenophyllum* (wallich ex. G. Don.) are used in two dosage forms either internal or external form. In internal form mostly taken is in decoction form.

Therapeutic uses:

Heterophragma adenophyllum (wallich ex. G. Don.) observed to be used in 12 different disease conditions. It is exclusively used as antidiabetic, amenorrhoea, premature ejaculation, night emesis, antimicrobial, antifungal, antiseptic and skin disease etc. as per table no.2. The wood is elastic and used for making bows and for furniture such as Katsagon. fruits can be cooked, and flowers are consumed as fresh vegetables. Thus, it is observed that it has more beneficial and a vast range of therapeutic claims.

Previous research work: (table no.3)

Anti-oxidant :- The leaf total methanolic oven dried extract showed higher antioxidant activity compared to bark methanolic oven dried extract and thus, the outcome of the present study suggest that the therapeutic activities of leaf methanolic extract of *Heterophragma adenophyllum* (wallich ex. G. Don.) be attributed to its antioxidant property.

Anti-microbial:- The present study aimed to screen the *in vitro* antimicrobial activity of ethyl acetate fraction isolated from the leaves of *Heterophragma adenophyllum* (wallich ex. G. Don.) against *Escherichia coli*, *Salmonella enterica*, *Staphylococcus aureus*, *Bacillus anthracis* and *Klebsiella pneumonia* broad spectrum microorganism. From the results of the zone of inhibition it was concluded that the ethyl acetate fraction was pushes *in vitro* antimicrobial activity while results of minimum inhibitory concentration, it was revealed that all bacterial strains were sensitive towards selected fraction for the study.

Termiticidal and protozoidal activity:- The present research was planned to assess the toxic nature of leaves extract of *Dalbergia sissoo*, *Heterophragma adenophyllum*, *Grewia asiatica* and *Punica granatum*

against subterranean termite *Heterotermes indicola*. *D. sissoo* leaves extract was found to be very effective than other plants extract used in study. So the toxicity of these plants can be expressed in following order: *Dalbergia sissoo* > *Heterophragma adenophyllum* > *Grewia asiatica* > *Punica granatum* leaves extract against mortality and protozones of *H. indicola*.

Muscle relaxant, sedative and analgesic:- In these study isolation of methyl,1,2-dihydroxy-2-(3-methylbut-2-en-1-yl)-3-oxo-2,3-dihydro-1-carboxylate(1), from the roots of *Heterophragma adenophyllum* (wallich ex. G. Don.). The isolated compound 1 was evaluated for *in vivo* muscle relaxant, sedative, and analgesic potential in Swiss albino mice. Result revealed that the isolated compound 1 exhibited a dose and time- dependent muscle coordination (51%) and a significant (p<01) sedative effect. It also showed a considerable (p<0.5) analgesia after 30 min of post treatment and was maintained for up to 120 min of experimental duration.

Anti-inflammatory:- in the current research, four isolated constituents namely lapacho (1), peshawaraquinone (2), indanone derivatives (3), α - lapachone (4) of *Heterophragma adenophyllum* (wallich ex. G. Don.) were tested for anti-inflammatory effect using the carrageenan and histamine- induced paw edema paradigm. Positive result of carrageenan and histamine-induced paw edema and molecular docking study reveal anti-inflammatory activity of *Heterophragma adenophyllum* (wallich ex. G. Don.)

Anti-hypertensive:- *Heterophragma adenophyllum* (wallich ex. G. Don.) ethanolic extract orally administered to Wistar rats. Result reveal that HAE could lower the blood pressure.

Method of administration of *Heterophragma adenophyllum* (wallich ex. G. Don.)

- 1) In Thai, the leaves are used for external treatment of skin diseases.
- 2) As an ingredient in message oils, it is supposed to ease muscular tension.
- 3) Roots are used in Piles, constipation and also prescribed as drink in viper bite.

Comparative Ethnomedicinal claims of *Stereospermum suaveolens* DC. and *Heterophragma adenophyllum* (wallich ex. G. Don.):-

1. Anti-hyperglycemic and antioxidant activity
2. Anti- inflammatory activity
3. Antimicrobial activity
4. Antidiabetic

5. Pain
6. Antianalgesic
7. Vomiting
8. Snake bite

DISCUSSION

A drug, if the unknown is like poison, weapon, fire and thunderbolt while if known is like nectar. A drug is unknown by its name, form, properties and administration responsible for complications.³ To avoid these complications proper identification, collection, storage and processing of the drugs are necessary. Hence identification tools of a particular drug play a very important role in therapeutic effect. Various ethnomedicinal claims regarding *Heterophragma adenophyllum* (wallich ex. G. Don.) were found in different parts of India like Maharashtra, Gujrat, Assam, Kerala, Karnataka, etc. Different part-wise uses of *Heterophragma adenophyllum* (wallich ex. G. Don.) is found in various tribal communities of India. Individual uses of leaves and roots are found, whereas uses of the whole plant are also observed. Maximum uses of whole plant of *Heterophragma adenophyllum* (wallich ex. G. Don.) are found in compared to leaves and roots. The whole plant is considered to be clinically important and used as antidiabetic, amenorrhea, premature ejaculation, night emesis, antimicrobial, antifungal, antiseptic and skin disease.⁴ *Heterophragma adenophyllum* (wallich ex. G. Don.) is an important medicinal plant which is used in traditional medicine for the treatment of muscular tension and pain.⁵ Its root is prescribed as drink in viper bite, and its wood tar is used in various skin diseases.⁶ *Heterophragma adenophyllum* (wallich ex. G. Don.) used in traditional medicine as an ingredient in massage oils to ease muscular tension. Roots are used for the treatment of constipation, piles as well as a drink in viper bite. The wood is elastic and used for making bows and for furniture such as Katsagon. Leaves are used for external treatment of skin diseases, fruits can be cooked, and flowers are consumed as fresh vegetables.⁷ Its use as a medicine is found all over India even though not found in classical Ayurvedic books. In the present study, the maximum uses of the whole plant are found i.e, the Whole plant has maximum applications in 09 disease conditions. The root- 03 and leaves – 01. As per found the ethnomedicinal claims of *Heterophragma adenophyllum* (wallich ex. G. Don.) can be alternative for *Stereospermum suaveolens* DC. as *Patala*.

CONCLUSION

As per ethnomedicinal claims *Heterophragma adenophyllum* (wallich ex. G. Don.) used in various disease conditions. and also have a good therapeutic effect. Used of the whole plant was seen repeatedly. As per claims, high demand for this species happens, to overcome the demand there is a need to be explored in different geographical locations. *Heterophragma adenophyllum* (wallich ex. G. Don.) is having same family as the botanical source of *Patala. Stereospermum suaveolens* DC. and can be substituted after a detailed investigation.

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Conflicts Of Interest- Nil

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REFERENCES

1. The wealth of india NISCAIR, Raw Material Vol- V, Pg-41
2. Hooker J.D, Flora of British India, Vol.IV, Bishen Singh Mahendra Pal Singh, Dehradun, 1997, pg. 381
3. Acharya YT, Agnivesha, Charaka Samhita of Acharya Charaka, Dridhbala kit, Sutra Sthana Ch.1 Ver. 124, Chaukhambha Orientalia, Varanasi, Reprint Edition 2005. P.23.
4. Shah Z.A, Peshawaraquinone a Novel Naphthoquinone and a New Indanone from the stem of *Heterophragma adenophyllum* Seem, PNRI, 2006.
5. Abdullah S.M. Alijohani et. al., Density functional theory, molecular docking and in vivo muscle relaxant, sedative, and analgesic studies of indanone derivatives isolated from *Heterophragma adenophyllum*, Journal of Biomolecular structure and dynamics. 87(2004)
6. Jassbi A.R et. al., Novel Naphthoquinones from *Heterophragma adenophyllum*, Helvetica chinica acta – Vol. 87(2004)
7. Tareq Abu-Izneid et.al., Anti- inflammatory and in silico Docking studies of *Heterophragma adenophyllum* seem stem constituents 2005.
8. Bakshi G P. Medicinal plant in india , Naya prakasha, Culcutta, India, Published in Sep. 2001, Vol. 2 , Pg. 314
9. Shah Z.A, Peshawaraquinone a Novel Naphthoquinone and a New Indanone from the stem of *Heterophragma adenophyllum* Seem, PNRI, 2006.

10. Abu-Izneid T et.al., Anti-inflammatory and in silico Docking studies of *Heterophragma adenophyllum* stem constituents 2(3), 302, 2012
11. Surana V, et. al., American journal of pharmatech research, June – 2016. ISSN: 2249-3387
12. Akhtar M.S, Canadian journal of Applied Sciences 2(3), 302, 2012
13. Munazza Perveen, et. al. International Journal of Biosciences, ISSN: 2220-6655(print), 2222-5234 (online), Vol. 19, NO.1, p. 55-64, 2021
14. Abdullah S.M. Aljohani, et. al. Journal of Biomolecular Structure and Dynamics, ISSN(print) (online) Journal homepage: <https://www.tandfonline.com/loi/tbsd20>.
15. Surana V, et. al. *in vitro* antimicrobial screening of isolated ethyl acetate fraction from *Heterophragma adenophyllum* leaves, American Journal Of Pharmatech Research, 2019;9(03). ISSN: 2249-3387
16. Bhatt M.F, et. Al., Journal of Pharmacy Research, Vol. 11 – Issue 11- 2017

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Table 1. Local Name of *Heterophragma adenophyllum* (wallich ex. G. Don.)⁸

Sr.no	State name	Local name
1.	English	Katsagon
2.	Hindi	Padramora
3.	Gujarati	Podal
4.	Bengali	Parul
5.	Marathi	Padal
6.	Orissa	Boro. Patulee
7.	Tamil	Padari
8.	Telagu	Kaligottu, kokkesa, podira
9.	Aasam	Dhopa-Paruli
10.	Common name	Katsagon, Marodphali, Pethan, Karen wood

Table 2. Ethnomedicinal claims of different useful parts of *Heterophragma adenophyllum* (wallich ex. G. Don.)

Sr.no.	Name of disease	Part used	Dosages form	Int /Ext.
1.	Antidiabetic ⁹	Whole plant	-	Int.
2.	Amenorrhoea	Whole plant	-	Int.
3.	premature ejaculation	Whole plant	-	Int.
4.	night emesis	Whole plant	-	Int.
5.	Antimicrobial	Whole plant	-	Int.
6.	Antifungal	Whole plant	-	-
7.	Antiseptic	Whole plant	-	-
8.	skin disease	Whole plant, Leaves	-	-
9.	muscular tension and pain ¹⁰	Whole plant	oil	Ext.
10.	viper bite	Root	Decoction	Int.
11.	constipation	Root	Decoction	Int.
12.	Piles	Root	Decoction	Int.

Table 3: review of previous research work:

Sr.No	Part used	Dosage form	Study
1.	Leaves and bark	methanolic extract	Antioxidant ¹¹
2.	Leaves and Seeds	Aqueous and methanolic extract	Antimicrobial ¹²
3.	leaves	Extract	termiticidal and protozoidal activity ¹³
4.	Root	Isolated compound	Muscle relaxant, sedative and analgesic ¹⁴
5.	Stem	Isolated compound	Anti-inflammatory ¹⁵
6.	Aerial part	ethanolic extract	Antihypertensive ¹⁶



Whole plant of *H. adenophyllum*



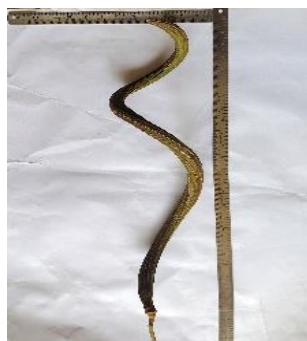
Bark of *H. adenophyllum*



Leaves of *H. adenophyllum*



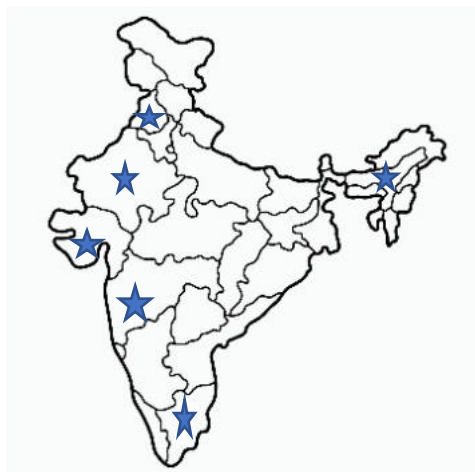
Flower of *H. adenophyllum*



Fruit of *H. adenophyllum*



Herbarium of *H. adenophyllum*



- Area of reporting:-**
- Punjab
 - Rajasthan
 - Gujarat
 - Tamil-nadu
 - Assam