



## A review on phytochemical profile of *Pseudarthriaviscida* (Salaparni): A valued medicinal plant

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### ABSTRACT

The development of rapid and accurate methods of screening the plants for particular chemicals has immensely speeded up the phytochemical Investigation. Plants have potent phytochemicals with medicinal importance since time immortal. India is a rich bio resource of well-known medicinal plants practiced traditionally for use of herbal Medicine. It is generally estimated that over 6000 plants in India are in use in traditional, folk and herbal, medicine representing about 75% of the medicinal needs of the third world Countries. One such medicinal herb used in Indian Ayurvedic systems of medicine is *Pseudarthriaviscida* (Salaparni). A review of phytochemical profile of *Pseudarthriaviscida* has been presented considering its ethno-medicinal Importance.

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### KEYWORDS

*Pseudarthriaviscida*;  
Phytochemical screening;  
Ethnomedicinal properties.

### INTRODUCTION

Plant and plant products are being used as a source of medicine since Long. India has about 45,000 plant species and among them many have been claimed to possess medicinal properties. The need for scientific validation of these useful medicinal plants is very essential. The importance of ethno-pharmacological investigation in the discovery of new therapeutic agents from plants has been discussed extensively<sup>[1]</sup>. The herbal medicines are getting more importance in the treatment of inflammation because of the toxic effect of the current therapy used to treat those inflammation using synthetic drugs. Herbal medicines are less toxic and less costly when compared to the synthetic drugs. The present study

will help the industry to produce herbal drug with less side effect, less costly affordable and more effective in the treatment of inflammation. Finally the phytochemical screening or elucidation of the bioactive compounds from the plant would be effective drug against inflammation<sup>[1,2]</sup>.

According to WHO, approximately 80 % of the population in developing countries depends on traditional medicine, mostly plant drugs for their primary health care Needs. The all India ethno-biological survey (AIES) carried out by the ministry of environment and forests revealed that 7,500 plant species belonging to 386 families are used by 4,635 ethnic communities for health care across the country<sup>[2]</sup>.

It is important mentioning that the combinations

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of diversity of secondary metabolites are responsible for importing a medicinal action potential of a particular Plant<sup>[24]</sup>.

Researchers all over the world are crazy investigating pharmacological studies on herbs/medicinally important Plants. It has become every imperative to conserve the genotypes of few such medicinal herbs, because they are on verge of extinction because of ruthless collection and harvesting of medicinal plants for production of Medium<sup>[25]</sup>.

### PSUEDARTHRIAVISCIDA : A VALUED MEDICINAL PLANT

*Pseudarthriaviscida* is the preferred source of the raw drug, 'Salaparni' in the Ayurveda system of Medicine. The plant is known as 'Mooliva' in Malayalam and is one among the 'Dasamoola' of Ayurveda<sup>[9]</sup>. *Pseudarthriaviscida* belongs to the family *Fabaceae* or *Leguminosae*<sup>[21]</sup>. It is commonly called as 'Salaparni' and is sweet and bitter in taste, sweet in the post digestive effect and has hot Potency. It alleviates all the three Doshas. It possesses heavy and oily attributes whose roots are commonly used by the tribes of Madhya Pradesh for wide purpose<sup>[6]</sup>. *Pseudarthriaviscida* had been widely used for its reported biological activities in indigenous system of Medicine. It has antipyretic, aphrodisiac and rejuvenates properties and is used in the diseases like fever, bronchial asthma, hemorrhoids, edema, diabetes mellitus, diarrhea and Tuberculosis<sup>[18]</sup>.

### Taxonomical classification of *Pseudarthriaviscida*:<sup>[22]</sup>

Kingdom	Plantae
Phylum	Tracheophyta
Class	Magnoliopsida
Order	Fabales
Family	Fabaceae
Genus	<i>Pseudarthria</i>
Species	<i>Pseudarthriaviscida</i>

### Vernacular names of *Pseudarthriaviscida*:<sup>[23]</sup>

Parts used: Whole plant, Roots.

Family: Leguminosae

The Leguminosae is one of the largest families of flowering plants with 18,000 species classified

TABLE 1 : Vernacular names of *Pseudarthriaviscida*

Regions/ Language	Names
Sanskrit	<i>Prsniparni, Chitraparni, Salaparni, Sanaparni</i>
English	<i>Viscid pseudarthria</i>
Hindi	<i>Pidhavan, Deerkhamoola, Ekamoola, Chapakno</i>
Tamil	<i>Nirmalli</i>
Telugu	<i>Nayakuponna, Muyyakuponna</i>
Malayalam	<i>Mooliva</i>

into around 650 genera<sup>[26]</sup>. Out of which about 163 genera and 1,252 species that are used as sources of medicinal Plants. Amongst the sources of oriental herbal medicines, Leguminosae is fourth largest family in terms of number of medicinal genera and species that are used following Graminaeae, Compositae and Orchidaceae<sup>[27, 28]</sup>.

Genus: *Pseudarthria*<sup>[20]</sup>

*Pseudarthria* is a genus of flowering plants in the legume family; Fabaceae. It belongs to the subfamily Faboideae, and contains some 6 species: *Pseudarthria confertiflora* (A. Rich.) Baker, *Pseudarthria crenata* Hiern, *Pseudarthria agifolia* Baker, *Pseudarthria hookeri* Wight & Arn., *Pseudarthria macrophylla* Baker, *Pseudarthriaviscida* (L.) Wight & Arn.

Synonyms: *Hedysarum viscidum*<sup>[19]</sup>.

### Geographical distribution

*Pseudarthriaviscida* (Linn.) belonging to the family of *Fabaceae*. It is distributed in all over India<sup>[8]</sup>. It is distributed throughout south India, up to 900m in the hills and also in Gujarat<sup>[19]</sup>.

World distribution: Sri Lanka and peninsular India, especially throughout in the state of Kerala<sup>[9]</sup>.

### Botanical description

The plant is perennial, diffuse, prostrate, stems 60-120 cm long, slender, more or less clothed with soft whitish Hairs<sup>[19]</sup>. Annual or perennial diffuse subshrubs, branches slender, stem and branches with greyish-white Hairs. Leaves 3-foliolate, leaflets 7-10 x 5-7 cm, broadly ovate, apex acute, base rounded, densely hairy; stipulates; petiole to 7 cm long; stipule Lancelets. Flowers small, in terminal or axillary racemes or panicles; calyx 2-lipped, 2



*Pseudarthriaviscida* in natural habitat.



Flowering Twig of *Pseudarthriaviscida*.



Roots of *Pseudarthriaviscida*.

mm long, lobes lancelet; petals red or pink, standard 6 mm dim, orbicular, retuse; wings 3 mm long, oblong; keel glabrous; stamens 9 + 1; ovary sessile, many ovule; style inflexed. Pods -3 x 0.4-5 cm, oblong, compressed, viscid hairy; seeds 3-5, subreniform, brownish-black<sup>[9]</sup>.

**Habitat:** Moist deciduous forests, scrub jungles, forest plantations and Plains.

**Flowering & Fruiting:** October-February.

Average dry weight (per 100gms): Small/Young (root from 15-25 plants), Medium (root from 8-20 plants), Mature/Large (root from 5-10 plants)<sup>[9]</sup>.

### ETHNO-MEDICINAL USES

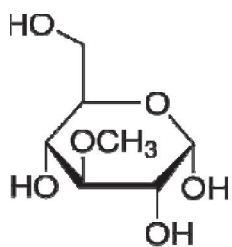
*Pseudarthriaviscida* has been widely used for its reported biological activities in indigenous system of medicine<sup>[18]</sup>. Traditionally plant is use in cases of biliousness, rheumatism, excessive heat, intestinal poison, fever, diarrhea, asthma, heart diseases, worms and Piles. Roots of *Pseudarthriaviscida*

were evaluated for anti-diabetic activity against alloxaninduced diabetes in albino Rats<sup>[19]</sup>. *Pseudarthriaviscida*(L.) wightand arn (*Fabaceae*) is a Shrub. The Roots are astringent, emollient, thermogenic, digestive, constitutive, anthelmintic, anti-

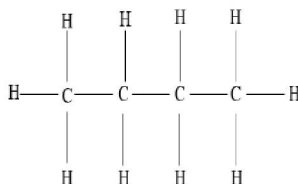
**TABLE 2 : List of several compounds identified in *Pseudarthriaviscida***

Sr. No.	Compound
1	3-O-Methyl- glucose
2	Butane -1,1- diethoxy-3-butanone
3	d-Mannitol-1- decylsulfonyl
4	n- Hexadecanoic acid
5	Oleic acid
6	Oxirane tetra decyl
7	Tetradecanoic acid
8	Undecanoic acid
9	Rutin
10	Quercetin
11	Gallic acid
12	Ferrulic acid
13	Caffeic acid

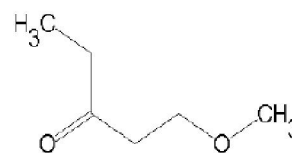
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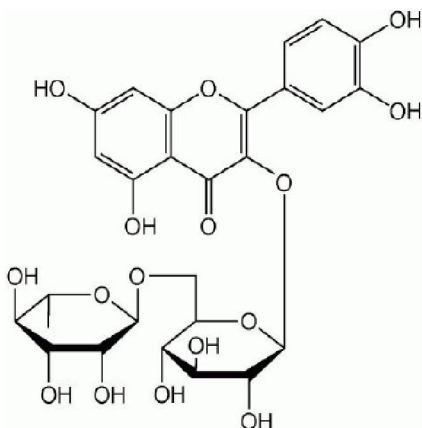
3-O-Methyl- glucose



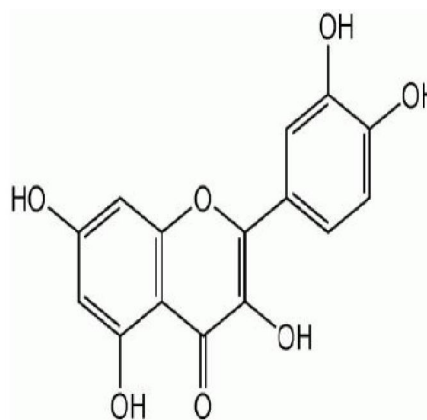
Butane -1



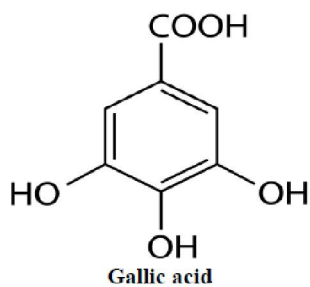
1-diethoxy-3-butanone



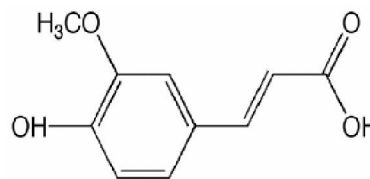
Rutin



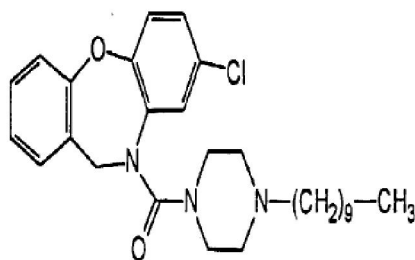
Quercetin



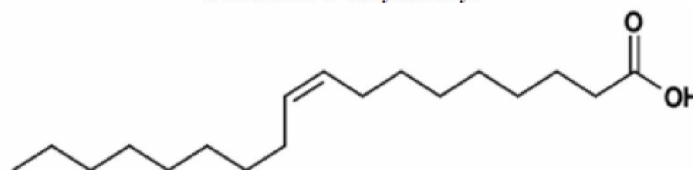
Gallic acid



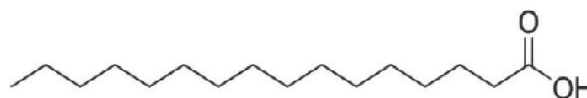
Ferrulic acid



d-Mannitol-1- decylsulfonyl



Oleic acid



n- Hexadecanoic acid

inflammatory, aphrodisiac, cardio tonic, febrifuge and also used as a Rejuvenating tonic. The extracts of leaf, root, stem and callus obtained from *Pseudarthriaviscida* showed significant inhibitory activity against some fungal pathogens causing major diseases in crop plants and stored food Grain<sup>[4]</sup>. It is proved also to be antioxidant and Anti-hypertensive<sup>[3]</sup>. Although some scientific investigations have been undertaken to validate the local uses of this plant, there seems to be no report on the analgesic and anti-inflammatory activities of the roots of the Plant. The traditional uses of *Pseudarthriaviscida* include the treatment of fever, inflammatory and painful Conditions<sup>[11]</sup>. Plant is used in the preparation of ayurvedic medicines namely, 'Dashamoolaristam', 'Mahanarayana Talia' and 'Anutailam' etc<sup>[5,14]</sup>. The roots are astringent, thermogenic, digestive, anthelmintic, anti-inflammatory, diuretic, aphrodisiac, nervine tonic. They are useful in vitiated conditions of cough, bronchitis, asthma, tuberculosis, helminthiasis, diarrhea, inflammation, cardiopathy, fever, gout, diabetes, hyperthermia and general Debility<sup>[7]</sup>. Because of its high therapeutic values, we have made an attempt to investigate anti microbial properties of the whole plant of the *Pseudarthriaviscida*<sup>[8]</sup>.

### PHYTOCHEMISTRY OF PSUEDARTHRIAVISCIDA

Root and leaves contain proteins, tannins and flavonoids and also showed significant inhibitory activity against some fungal pathogens causing major diseases in crop plants and stored food Grains<sup>[19]</sup>. 43 compounds have been identified from *Pseudarthriaviscida* extract and the major chemical constituents are cis-vaccenic acid (16.47%), sitosterol (13.73%) and stigma sterol (6.24%)<sup>[4]</sup>. Phytochemical screening revealed the presence of flavonoids, proteins, tannins, and phenol Compounds<sup>[11]</sup>. The chemical constituents of the plant are petrocarpanoids, gangetin, gangetinin and Desmodin. Seven alkaloids viz. N, N-dimethyltryptamine and its Nb-oxide, hypaphorine, hordenine, candicine, N-methyltyramine and phenylethylamine have been reported from Roots<sup>[10]</sup>. A new antifungal isoflavonoid,

phytoalexin, desmocarpin, isolated together with genistein, 2-hydroxygenistein, dalbergioiden, diphsolone and kievitone from fungus inoculated leaflets, its structure Determined<sup>[18]</sup>. Gallic acid, caffeic acid, rutin, quercetin and ferulic acid are phenolic Compounds. Structurally they have phenol groups which serve as a source of readily available hydrogen atoms such that the subsequent radicals produced can be delocalized over the phenol Structure<sup>[13]</sup>. The interest of these compounds is due to their pharmacological activity as radical scavengers. They have proved to have potential preventive and therapeutic effects in many Diseases. These five phenols are widely distributed in the plant kingdom. In this study, HPLC with UV detector was used for determination of gallic acid, caffeic acid, rutin, quercetin and ferulic acid in the root extract of *Pseudarthriaviscida*<sup>[16]</sup>.

### List of several compounds identified in Pseudarthriaviscida<sup>[15]</sup>.

### CONCLUSION

Plants are considered as important starting source for the drug industry due to presence of diverse phytochemicals having potential therapeutic Value. In the present review, we have made an attempt to represent taxonomical information, ethno medicinal uses, geographical distribution and phytochemistry of *Pseudarthriaviscida*, a species of medicinal herb used in the Indian system of Medicine. Extensive biochemical analyses using advanced spectroscopy tools such as NMR, EMR, and FTIR along with X-ray crystallography studies have resulted in the detection and isolation of a wide variety of the phytochemical constituents from different parts of the Plant. Presence of wide range of chemical compounds showing therapeutic potential indicates that it can be a useful source for herbal formulations and drug Industries. Establishment of pharmacognostic profile will assist in standardization of quality, purity and sample Identification. Thus, further investigations in regards to evaluate more phytochemicals from the *invitro* cultured cells, tissues of the medicinal plants in needed to be undertaken. Thus, the

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information provided in the present review will help as an important basic segment for development of effective medicines.

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### REFERENCES

- [1] A.Afolayan, J.Meyer, M.Taylor, D.Erasmus; Journal of Ethnopharmacol, **56**, 165-169 (1997).
- [2] N.Dubey, R.Kumar, P.Tripathi; Current Science, **86**, 37-41 (2004).
- [3] K.Hansen, U.Nyman, U.Smitt, A.Adersen, L.Gudiksen, S.Rajasekharan, P.Pushpangadan; Journal of Ethnopharmacol, **48**, 4345 (1995).
- [4] H.Hemla, S.Ravi; International Research Journal of Biological Sciences., **1**(5), 57-65 (2012).
- [5] K.Kirtikar, B.Basu; Indian Medicinal Plants, International Book Distributors, Dehradun, 748 (1987).
- [6] K.Rajendran, A.Shirwaikar, K.Srinivasan; Asian Journal of Pharmaceutical and Clinical Research., **4**(1), 56 (2011).
- [7] K.Nadkarni; Indian MateriaMedica, Popular Prakashan, Bombay, 1017, (1976).
- [8] N.Baskar, K.Jaiganesh, R.Nepolean, N.Selvakumar; International Journal of Pharmaceutical and Chemical Sciences, **1**(4), (2012).
- [9] N.Sasidharan; [KFRI] Kerala Forest Research Institute, Phytochemical characterization and evaluation of the medicinal plant Moovila for resource enhancement, Peechi, Thrissur, KFRI Research Report, **296**, (2007).
- [10] M.Pellegrino, B.Christophe, G.Rene, R.Michele, M.Michele, H.Dominique, N.Michela, R.Gard; Diabetes, American Diabetes Association, **47**, (1998).
- [11] P.Khatale, A.Manikrao, M.Vijabaskar, T.Shivkumar, Prafulla M.Sabale; Pharmacology online, **1**, 1153-1159 (2011).
- [12] V.Ravi, T.Saleem, S.Patel, J.Raamamurthy, K.Gauthaman; International Journal of Applied Research in Natural Products, **2**(2), 33-36 (2009).
- [13] K.Robards, P.Prenzier, G.Tucker, P.Swatsitang, W.Glover; Food Chemistry, **66**, 401-436 (1999).
- [14] V.Sivarajan, I.Balchandran; Ayurvedic drugs and their Plant Source, Oxford and IBH publishers, New Delhi, 414 (1994).
- [15] R.Thinagarar, M.Suriyavathana; Asian Journal of Pharmaceutical and Clinical Research, **6**(2), (2013).
- [16] R.Thinagarar, M.Suriyavathana; European Journal of Molecular Biology and Biochemistry, **1**(1), 1-6 (2014).
- [17] M.Vijaybaskaran, P.Sajeer; International Journal of Chemistry Research, **2**(4), (2011).
- [18] M.Vijayabaskaran, P.Sajeer, P.Perumal; International Research Journal of Pharmacy, **2**(4), 141-144 (2011).
- [19] V.Masirkar, V.Deshmukh, J.Jadhav, D.sakarkar; Research Journal of Pharmacology and Technology, **1**(4), (2008).
- [20] Pseudarthria; The Plant List, Version 1. Retrieved 5 April, 2014, from: <http://www.theplantlist.org/browse/A/Leguminosae/Pseudarthria/>, (2010).
- [21] International Code of Botanical Nomenclature, Article 18, paragraph 5, states: The following names, of long usage, are treated as validly published: Leguminoceae (nom. alt.: Fabaceae, type: Faba Mill. [= Vicia L.]). When the Papilionaceae are regarded as a family distinct from the remainder of the Leguminosae, The name Papilionaceae is conserved against Leguminoceae.
- [22] *Pseudarthriaviscida* (L.) Wight & Arn., ILDIS World Database of Legumes in the Catalogue of Life in the Catalogue of Life Partnership: Catalogue of Life. Retrieved 26 May, 2014, from: <http://www.gbif.org/species/119036162>.
- [23] Flowers of India, Retrieved, 4 April, 2014, from: <http://www.flowersofindia.net/catalog/slides/Salaparni.html>
- [24] H.Deshpande, S.Bhalsing; International Journal of Pharmaceutical Science and Health Care, **1**(4), (2014).
- [25] M.Nayar, A.Sastry, (Eds); Red data book of Indian Plants, Botanical Survey of India Kolkata, **2**, (1998).
- [26] R.Pohill, P.Raven; Advances in legume Systematics, Int.Legume Conf., Proc. Kew, England.Minis.Agric., Fisheries and Food.Richmond, England, **1**, 1-425 (1981).
- [27] P.Puhan, R.Prasad; Pakistan Journal of Biological Sciences, **15**, 477-483 (2012).
- [28] Y.We, H.Keng; Illustrated dictionary of Chinese medicinal Herbs, CRC Publications; Sebastopol, 184 (1992).