



A Comprehensive Review of *Flemingia strobilifera* (LAM.)

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Abstract

The traditional systems of medicine plays a significant role in our health care system for the betterment of manhood. *Flemingia strobilifera* (Lam.) is used as herb in Ayurvedic medicine since ancient time. *Flemingia strobilifera* (Palas) belongs to the family Fabaceae, grown wildy in many parts of India. The plant is used highly by the countryside and ethnic people in curing various disorders. *Flemingia strobilifera* has an effective natural origin that has a tremendous future for research. The novelty and applicability of *Flemingia strobilifera* are hidden. Such things can be removed through modern research. The present article describes various traditional and medicinal utility of the plant and an attempt was made to gather information about the chemical composition of the plant or its species and/or its constituents.

Keywords: *Flemingia strobilifera*; Traditional Uses; Medicinal Uses; Phytochemistry

Introduction

Flemingia strobilifera (L.) W.t. Aiton, family Leguminosaea (Fabaceae) (Figure 1), is also known as 'Wild Hop', in Marathi: Kanfuti; commonly known as Kusrunt in Hindi; Kanphuti or Bundar in Marathi; Nallabaddu, Kannad in Telugu; Kumalu, kumbiliteri in Malayalam; Makhioti in Assam; Simbusak in Bihar [1].

It grows almost throughout India, Andaman and Nicobar Islands, ascending to an altitude of 4,500 ft. In Himalayas from Simla and Kumaon, mounting to 8000 ft. to Assam, Khasla, Chittagong, Siam, Malacca and Ceylon. Dehradun and Siwalik range, Bundelkhand, from Sind, Rajasthan and Bengal to South India and in Maharashtra region [1].

Ahmad, Hasan and Mahmood [2] reviewed that this is one of the antiurolithic plants from Fabaceae family.

Morphology

It is an erect shrub, 5 - 10 ft high, with slight terete branches silky towards their tips. Leaves 3 - 4 inch long, oblong or ovate-lanceolate, acute, rounded at the base; lateral nerves 8 - 10 pairs; petioles half inch; stipules lanceolate, scarious. Racemes terminal, 3 - 6 inch long, the slender zigzag rachis rusty-pubescent; bracts 1 inch long, shortly stalked, deeply cordate, usually cuspidate at the apex. Calyx-teeth lanceolate, pilose, exceeding the tube. Corolla yellowish or greenish-white. Pod about half inch, oblong, turgid, finely downy, 2-seeded [3]. The root of *Flemingia strobilifera* is cylindrical or slightly tortuous. Root is earthy brownish in color its surface was fissured, rootlets and with presence of lenticels. Seeds are two, shiny and black. Flowering and fruiting time is Jan to March [4]. The flowers recemes, white or pinkish, covered by large folded bracts [5].



Figure 1: *Flemingia strobilifera* natural habitat.



Figure 2: *Flemingia strobilifera* flower in natural habitat.



Figure 3: *Flemingia strobilifera* bracts (fresh and dried) in natural habitat.

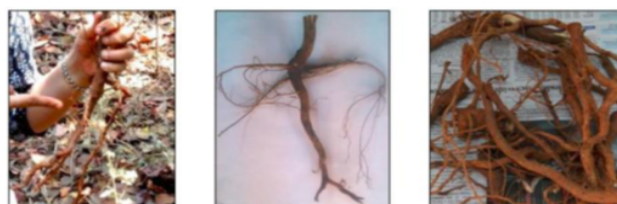


Figure 4: *Flemingia strobilifera* fresh roots in natural habitat and after drying.

Traditional uses

- Flower:** The flower of *Flemingia strobilifera* is traditionally used as an antitubercular and used to stuff into pillows to induce sleeping at night in hyperactive children [6].
- Leaves:** The leaves of *Flemingia strobilifera* is traditionally used in Java as vermifuge for children [7]. In the Philippines a decoction/infusion of the leaves and flowers is prescribed by “curanderose” against tuberculosis [8]. Arabians use it in cosmetics, as anthelmintic and as a remedy for coughs and cold [3,9]. In Malaysia, fever is contained by bathing the patient with a decoction of the leaves [10]. Pizon., *et al.* reviewed that Subanen Tribe used leaves for treatment to reduce internal inflammation, Mayoma, cancer and cough [11].
- Stem:** The stem bark is traditionally used to treat inflammatory diseases. In Nepals the juice of the bark is given in the dose of four teaspoons twice daily [12].
- Root:** It is reported that roots of *F. strobilifera* are used by Santals in epilepsy, insomnia, hysteria and to relieve pain [7-14]. In Burma the roots of *Flemingia strobilifera* are used to treat epilepsy [8]. The Assamese take a small portion of the root of *Flemingia strobilifera* in order to induce sleep and it is said, in case of severe pain heavy sleep is brought on according to the amount of root taken, without ill effects [15]. In India, root paste applied externally to body swellings. In Nepal, Root juice (fresh roots crushed in cup of water) is taken for treating diarrhea and dysentery. In Trinidad and Tobago, it is used for kidney problems [16]. Pizon., *et al.* reviewed that Subanen Tribe used roots for treatment of

cough, diabetes, cancer and tuberculosis [11]. Root decoction is given in menstrual irregularities [27].

- **Tuber:** Tikdar, *et al.* profiles that tuber paste taken orally to cure from dysentery [18].

Medicinal uses

Medicinal plants certainly have countless importance to human health in the treatment of variety of diseases [11].

- **Flowers:** Taqueer and Itankar evaluated anti-inflammatory activity of aerial of plant using methanolic and hydro alcoholic extracts [19].
- **Seeds:** Shreedevi and Patel mentioned the use of seed as an oral contraceptive [20].
- **Leaves:** Anil, Dora, Gahlot and Tripathi studied anthelmintic activity of methanolic extract of leaves [21]. Madan, *et al.* mentioned that decoction of *Flemingia strobilifera* leaves are used as a health tonic by rubbing it on the body [1]. Pizon, *et al.* studied *in vitro* antioxidant activity of 80% hydromethanolic and aqueous extract of leaves [22]. Quevedo, *et al.* studied effect of ethanolic extract of leaf on blood cholesterol level [23]. Anil Kumar, *et al.* studied Hepatoprotective effect of Chloroform extract of leaf on paracetamol induced hepatotoxicity [24]. Ramachandran, Clement and Maxwell studied cytotoxic effect of petroleum and chloroform extract of leaves [25]. Taqueer and Itankar evaluated anti-inflammatory activity of aerial of plant using methanolic and hydro alcoholic extracts [19].
- **Roots:** Nemkul, Bajracharya and Shrestha reported *in vitro* antimicrobial activity of roots using Hexane and 70% Methanol extract using GC-MS technique [26]. Soe, Thein and Oo evaluated wound healing property using 70% ethanolic root extract [27]. Kavita G, Vijay KL, Shivesh J studied anticonvulsant activity of ethanol extract of root [28]. Thakur, *et al.* studied anxiolytic effect of aqueous extract of root [29]. Anil kumar KV studied anti ulcerogenic property of chloroform extract of root [30]. Chen, *et al.* 1991 studied antioxidant activity of methanolic extract of root of *Flemingia philippinensis* [31]. Madan, *et al.* (2010) studied antioxidant activity of methanolic and butanolic roots extracts [32]. Hsieh, *et al.* studied antioxidant activity of aqueous extract of root [33]. Madan, *et al.* studied antimicrobial activity of methanol, bu-

tanol and dichloromethane extract of root [34]. Mahato and Chaudhari evaluated antibacterial activity of methanolic extract of leaves [35].

- **Stems:** Taqueer and Itankar evaluated anti-inflammatory activity of aerial of plant using methanolic and hydro alcoholic extracts [19].

Phytochemistry

Gahlot, Lal and Jha studied extracts of ethanolic extracts of root for phytochemical screening for presence of total phenolics content which possess Antioxidant activity [36]. Nemkul, Bajracharya and Shrestha studied extracts of Hexane and aqueous methanolic extracts of root which shows the presence of polyphenols and terpenoids with Antimicrobial activity [26]. Jeong, *et al.* evaluated phytoestrogen for estrogenic effect [37]. Shailajan and Mascarenhas evaluated Kaempferol from ethanolic extracts of aerial parts *Flemingia tuberosa* with roots showing maximum content of Kaempferol [38]. Madan, Gullaiya, Singh and Kumar performed review of previous chemical studies which showed that flavonoids, flavonoid glycosides, chalcones, epoxychromenes and pterocarpanes are main constituents found in *Strobilifera* species [1]. Pizon, Nuneza, Mylene and Senarath studies aqueous and hydromethanolic extracts of leaf for total phenolics content and studied Antioxidant property of the leaves [22]. Hua, Zhai, and Zhongdong performed review on different classes of compounds present in genus *Flemingia* Roxb which states the presence of main groups: flavones, triterpenes accompanied with sterols and anthraquinones [39]. Pizon antin, Nuneza, Uy and Senaratha studied aqueous and 80% methanolic extract of leaf of *Flemingia strobilifera* for determination of total phenolic content; where aqueous extract shows high phenolic content in comparison of hydromethanolic extract; however, hydromethanolic extract exhibited high antioxidant activity [22]. Mahajon B, Remadevi R, Sunil Kumar KN, Ravishankar B performed preliminary analysis of root of *Flemingia strobilifera* which showed presence of carbohydrate, coumarins, flavonoids, phenols, quinine, saponins, tannins and terpenoid [40]. Mascarenhas, Shailajan and Menon studied antioxidant and Hepatoprotective activity of ethanolic extracts of aerial parts of *Flemingia tuberosa* using Kaempferol as a phytomarker [41]. Madan, Singh, Kumar, Kohli, Mir and Ahmad isolated Flavanone, Genistin and β -sitosterol-D glucoside from methanol, butanol and dichloromethane root extracts of *Flemingia strobilifera* [34]. Gahlot, Lal and Zha studied total phenolic

content considering per mg of Gallic acid equivalent and Flavonoid content per mg of Quercetin equivalent with *in vitro* antioxidant activities of *Flemingia* species (*chappar*, *macrophylla*, *strobilifera*) [36]. Shailajan and Mascarenhas studied data on sensitivity and linearity for phytochemical constituents such as Quercetin for total flavonoid, Gallic acid for total phenolics, bismuth nitrate pentahydrate for total alkaloids, Diosgenin for total saponins and Linaliol for total terpenoids in *Flemingia tuberosa* [38]. Gahlot, Jha and Lal performed pharmacognostical standardization of root of *Flemingia chappar* for presence of steroids, flavonoids, tannins and carbohydrates [5]. Lai, Tsui., *et al.* studies methanolic extract of root of *Flemingia macrophylla* for identification of phytoconstituents such as genistine, β - sitosterol, stigmasterol etc. [42].

Conclusion

Since ancient time, plants are being used as remedies for various ailments. Herbs are natural remedies used to get physiological functions normal which are affected by diseases. It is very essential to have a proper research work of medicinal plants and to know their probable impacts for the improvement of health and hygiene through an eco- friendly system. Now days interest in research of photoactive from plants sources is increasing because of their versatile health benefits. Findings obtained from such research may lead to validation of traditionally used medicinal plants since ancient time, plants are being used as remedies for various ailments. Herbs are natural remedies used to get physiological functions normal which are affected by diseases. It is very essential to have a proper research work of medicinal plants and to know their probable impacts for the improvement of health and hygiene through an eco-friendly system. Now days interest in research of phytoactives from plants sources is increasing because of their versatile health benefits. Findings obtained from such research may lead to validation of traditionally used medicinal plants full usage of these plants.

The present review reveals that the plant *Flemingia strobilifera* is used in treating various ailments. A detailed research work in the characterization and standardization is strongly required for this potential plant in developing its various formulations in combination with other useful plants which can be valuable for human and animal wellbeing. This comprehensive review will be used to explore much depth about this plant known by the name "Wild Hop".

Conflict of Interest

The authors declare no conflict of interest.

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