



## A Review on Pharmacological Activities of *Flemingia strobilifera*

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### ABSTRACT

The genus *Flemingia* (family Fabaceae) is made up of more than forty species worldwide. In India, 15 species, including *Flemingia strobilifera*, represent this genus. A major medicinal plant, *Flemingia strobilifera* (R.Br.), commonly known as Kusrun, is found in Sind, Rajputana, Bengal, South India, and Andamans. In folk medicine, several plants of this genus have been used to treat fever, diarrhoea, indigestion, and vermifuge. It is documented that the plants have antimicrobial, anthelmintic, anticancer, anti-rheumatic, and anti-inflammatory, antioxidant and antihistaminic activities. Past chemical studies have shown that the major constituents present in this genus are flavonoids, flavonoid glycosides, chalcones, epoxychromenes and pterocarpans.

**Keywords:** *Flemingia strobilifera*, Flavonoids, Chalcones, Anthelmintic, Anti-inflammatory.

### INTRODUCTION

*Flemingia strobilifera* (Fabaceae) an important medicinal plant, is commonly known as Kusrun and is found in Sind, Rajputana, Bengal, South India, and Andaman. Literature reveals that the various parts such as its bracts, leaves, flowers, and roots of the plant *Flemingia strobilifera* found to be useful in folkloric medicine for its different pharmacological activities such as leaves and flower for tuberculosis, roots for epilepsy, hysteria and swellings, root juices for diarrhea and dysentery. Arabians use it in cosmetics, as anthelmintic and as a remedy for coughs and cold. Methanolic extract of *Flemingia strobilifera* was found to be a source of natural antioxidant to prevent progress of various oxidative stresses. Previous Phytochemical investigations reported various chalcones, flavonoid glycosides, aurone glycosides and epoxy Chromenes<sup>2</sup>.

**Family:** Fabaceae

**Synonyms:** *Flemingia chappar* Benth, *Flemingia bracteate* Wight, *Flemingia macrophylla* (Willd.) Merr, *Flemingia lineata* (L.) Aiton.

### Distribution<sup>3</sup>

*Flemingia* should be native to the Old World's tropical and subtropical regions. It is distributed globally to Australia from Africa via Indo-Malaysia. It is found throughout and on Andaman Islands in India at lower elevations. The genus *Flemingia* contains about 42 species. Although it is distributed all over the globe, China has found maximum diversity. There are 16 species reported from China, and one variety. In India, 15 species found in different states, similarly in other countries, different species recorded as in Burma, 16 species, 11 species in Thailand, 10 species in Laos, 8 species in Vietnam, 8 species in Bhutan, 3 species

in Bangladesh, 3 species in Cambodia and 5 species in Nepal. Naturally, *Flemingia* is found in South-East Asia, Southern China, Taiwan, India and Sri Lanka in sub-humid (sub-) tropics (rainfall 1100-3500 mm / year with up to 6 dry months), from sea level up to 2000 m of altitude.

### Plant Discription<sup>4</sup>

An erect shrub with a number of branches 1.2-3 m. High; slender, terete branches, pubescent to the tips. Leaves 1-foliolate; 0.6-2.5 cm petioles. Large pubescent; scarious, 6-8 mm large, caduceous, lanceolate. Subcoriaceous, minutely gland-shaped leaflets, 9-14 by 4-5 cm, ovate-oblong, acute, green and glabrous or almost above, pale and more or less silky-pubescent (especially on the nerves) below, rounded or truncated base; 8-10 pairs of main nerves, very conspicuous on the lower side; stipels 0. Simple or branched racemic flowers in axillary and terminal 7.5-15 cm long, closely arranged along a slender pubescent zigzag rachis; large, membranous, persistent, glabrescent, broadly orbicular-ovate, shortly acuminate, 1.3-2.5 cm. Long, usually wider than long, cordat at the base, conspicuously nervous and reticulously veined, stalked, folded over each bract and containing 2 or more small flowers. Calyx 6mm. long, pubescent; teeth linear, acute, veined, longer than the tube. Corolla white, 1cm. long; standard 8mm. broad, auricled. Pods 10 by 5 mm., oblong, turgid, mucronate, densely pubescent, completely concealed by the bracts. Seeds 2 (rarely 1), dark brown, marbled.

### Chemical Constituents<sup>5</sup>

Biochemical analyses show the presence in *Flemingia strobilifera* of chalcone, flavonoid glycosides, aurone glycosides, epoxy chromenes, lipids, phenolic compounds, tannins and phytosterols<sup>5</sup>. In the root of *Flemingia strobilifera*, preliminary phytochemical analysis showed

the presence of carbohydrates, coumarins, flavonoids, phenol, quinine, saponins, tannins and terpenoids. The roots are rich in different secondary metabolite groups. This could be responsible for the plant-derived medicinal functions<sup>6</sup>.

## Pharmacological Actions

### Cytotoxicity activity<sup>7</sup>

It has been confirmed that the 70 percent ethanol extract from the root of *Moghania philippinensis* (M. philippinensis) has cytotoxic activity in culture against P-388 lymphocytic leukemic cells. *Philippinensis* was also found to have substantial estrogenic activity when tested for its effect on human breast cancer cell proliferation of MCF-7.

### Anthelmintic activity<sup>8</sup>

For anthelmintic activity, petroleum ether, chloroform, alcoholic and aqueous extracts of *Flemingia strobilifera* leaves were evaluated. The results showed significant anthelmintic activity in the alcoholic extract, both alcoholic and chloroform extracts showed significant anthelmintic activity compared to other extracts. As a standard drug, piperazine citrate was used.

### Antioxidative activity<sup>9</sup>

Pan et al., 2005 compared the antioxidant effect of Glycine radix extracts showing increased activity in DPPH-determined free radical-scavenging activity, reduction of hemoglobin-catalyzed lipid auto-oxidation and inhibition of lipoxygenase (LOX) and cyclooxygenase (COX)-catalyzed arachidonate oxidation compared to *Flemingia* extract activity.

### Antimicrobial activity<sup>10</sup>

The antimicrobial activity of the roots of *Flemingia strobilifera* against some bacteria and fungi was done. *Flemingia* flavanone (8, 3'-diprenyl-5, 7, 4'-trihydroxy flavanone), Genistin (5, 4'-dihydroxy isoflavone 7-O-glucoside) and  $\beta$  - sitosterol-D glucoside were isolated from the extracts. *Flemingia* flavanone had significant antimicrobial activity against Gram-positive (*S.aureus*, *S.epidermidis*, MRSA), Gram-negative (*Ps. aeruginosa*, *E. coli*) and *C.albicans*. Genistin was moderately active in Gram-positive, Gram-negative bacteria and fungi.

### Analgesic activity<sup>11</sup>

Anil kumar et al., 2011 studied *Flemingia strobilifera's* potent analgesic activity at 300, 500 and 1000 mg / kg dose rates. Even in the first hour of the test, the *Flemingia strobilifera* demonstrated significant analgesic activity at a low dose of 300 mg / kg. *Flemingia strobilifera's* analgesic activity at 300 mg / kg was nearly comparable to that produced by acetylsalicylic acid, while at 500 mg / kg and 1000 mg / kg dose levels. *Flemingia strobilifera* had a stronger analgesic effect than the reference drug and also had a higher analgesic duration and intensity than acetylsalicylic acid at a dose rate of 1000 mg / kg.

### Anti-ulcerogenic properties<sup>12</sup>

Anil kumar KV documented the anti-ulcer effect of *Flemingia strobilifera* root chloroform extract. Water immersion induced ulcer in rats has evaluated the anti-ulcer effect. *Flemingia strobilifera* root chloroform extract pretreatment at 15 and 30 mg / kg body wt level. Increased levels of gastric mucosal glutathione, total protein content. In this analysis, the decreased rates of glutathione are increased with *Flemingia strobilifera* root treatment chloroform extract, suggesting an improved antioxidant status, reduced lipid peroxidation with increased protection against ulcer.

### Anti-inflammatory activity<sup>13</sup>

Anil kumar et al., 2011, also studied *Flemingia strobilifera's* anti-inflammatory activity. Carrageenan-induced paw edema method evaluated anti-inflammatory activity. Flavonoid is known to inhibit prostaglandin synthetase enzyme, in particular endoperoxidase, and to produce anti-inflammatory effects.

### Antidiabetic activity<sup>14</sup>

The inhibitory effects of plant phytochemicals against carbohydrate hydrolysing enzyme, including polyphenols, have been observed to contribute to the reduction of post-prandial hyperglycemia in diabetic management.

## CONCLUSION

It is observed that the tribes of India used different parts of *Flemingia strobilifera* to treat 24 different conditions of disease. While classical texts did not mention the use of this plant for medical use, various parts such as leaf, seed and whole plants have also been used with root in ethno-medicinal practice. Different parts of *Flemingia strobilifera* are used to treat conditions such as fever, acidity, dysentery, diarrhea, epilepsy, hysteria, dermal, etc. It is used by different tribes in 17 different Indian states, i.e. Andrapradesh, Gujarat, Sikkim, Madhya Pradesh, Assam and so on. It is used in the treatment of diseases in different counties.

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