Review Article

Fire Flame Bush, Shiranjitea (*Woodfordia fruticosa* L.) with Folklore Therapeutic Reputation in Ecstatic Intensified Wellbeing

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**A B S T R A C T**

*Woodfordia fruticosa* L., belonging to family Lythraceae is an ecologically as well as economically important shrub species of tropical dry mixed forests. *Woodfordia fruticosa* L. is endemic to India. It is used as ingredient in many products for its medicinal values. At the same time, it is also used as a fermenting agent in Asava and Arihsita (such as Dashamoolarishta). Present study report on the economic and medicinal uses of *Woodfordia fruticosa*. *Woodfordia fruticosa* can be categorised as an important minor produce as the entire plant has some or the other uses; to specify flower, inflorescence, leaves and barks particularly possess tremendous medicinal properties. *Woodfordia* is a accepted source of ayurvedic drugs throughout India. The flowers are acrid, astringent, styptic, depurative, utreine sadative, constipating, antibacterial, corrective of urinary pigments, febrifuge and alexeteric. They are useful in the conditions of kapha and pitta, leprosy, burning sensation, skin diseases, diarrhoea, dysentery, fever, headache, hemorrhoids, herpes, internal hemorrhage, leukorrhea, liver disorders, menorrhagia, ulcers, wounds. Juice of leaves are used in bilious sickness. They are also valued as a stimulant in pregnancy. Dried flower powder is used in ulcers and wounds to reduce the discharge and promote granulation. The extracts of *Woodfordia fruticosa* flowers showed the presence of carbohydrates, gums, flavonoids, sterols and phenolic compounds/tannins. Extracts and metabolites of this plant, particularly those from flowers and leaves, possess useful pharmacological activities. There is no adverse effect on usage of this plant. A wide range of chemical compounds including tannins (especially those of the macroyclic hydrolysable class), flavonoids, anthraquinone glycosides and polyphenols are found in the plant, which renders Fire Flame Bush its pharmacological properties. The astringent properties of the herb are effective in treating skin disorders, superficial wounds and cuts. As a nervous central nervous system stimulant, Fire Flame Bush relieves depression and lethargy. This is bush is largely used in native medicine. This enters into the composition of many preparations, decoctions, churnas and ghris for various diseases, but chiefly dysentery and diarrhoea by reason of its being highly astringent⁵. The juice of its fresh flowers applied on the forehead, reduces the headache. Utilization and economics of the plant has been discussed, with some investigatory findings added therapeutic nuance have been delineated in the present manuscript. A comprehensive account of the chemical constituents and the biological activities is presented and a critical appraisal of the ethno pharmacological issues is included in view of the many recent findings of importance on this plant.

**Keywords:** Deciduous shrub; Ethnopharmacological issues; Febrifuge; Alexeteric; Stimulant; Tannin; Astringent; Oenothein B; HMQC; Flavonol glycosides; Antioxidant activity; DPPH; FRSA; RPHPLC; TBARS; TPC; Antifertility activity

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1. Introduction
A much-branched, beautiful shrub, with fluted stems and long, spreading branches commonly occurring throughout North India and sometimes cultivated in gardens for its flowers, but very conspicuous on dry, rocky hillsides from December to May, when the masses of little fiery bells give a bright touch of colour to the drab terrain (Figure 2). It is common in Sri Lanka, South Konkan and on the Ghats and ascends the Himalayas to 1500 m, but is rarer in South India. It is a deciduous shrub, usually with a much-fluted stem. The grey bark is exceedingly thin and peels off in flakes or fibrous strips.1,3 The leaves are lanceolate or oblong-lanceolate or ovate-lanceolate. The flowers are numerous, brilliant red in dense axillary, paniculate-cymose clusters (Figure 1: a,b,c,d.).

When in flower the bush appears twiggy and formless but entirely swathed in red (Figure 3). This is because the small flowers grow singly or in groups all the way along the branches and side twigs, and it is at this time that the leaves fall. Each flower, borne on a tiny stem, is a slender tube, slightly curved, the greenish base of which is the sepal. Swelling slightly, the tube divides into narrow, pointed lobes and from within emerges a bunch of long stamens. The whole length, including the stamens, is not more than 2 cm.1,3 The capsules are ellipsoid, and membranous. The seeds are brown, minute, smooth and obovate. A much-branched, beautiful shrub, with fluted stems and long, spreading branches, 1-3 m. high, rarely up to 7 m., commonly occurring throughout North India, ascending to an altitude of c. 1,500 m. in the Himalayas, but rather scarce in South India. It is sometimes cultivated in gardens for its flowers, which are borne during the summer months. Bark reddish brown, peeling off in thin, fibrous strips; leaves lanceolate, oblong-lanceolate or ovate-lanceolate; flowers numerous, brilliant red in dense axillary paniculate-cymose clusters; capsules ellipsoid, membranous; seeds brown, minute, smooth obovate.

Figure 1: [a,b,c,d] Brilliant red in dense axillary paniculate-cymose clustered flowers
The fruit is a small, oblong capsule, covered by the withered sepals. The narrow, pointed leaves grow straight from the branches, either opposite or in whorls of three. They are harsh and dull, dark green in colour, but paler underneath. Sometimes they are dotted beneath with small, black glands. From the flowers, which contain much tannin, a red dye is obtained which is used to dye silks. The leaves also contain a large proportion of tannin and make the commonest tan in India.

2. Therapeutic Applicability
A comprehensive account of the chemical constituents and the biological activities is presented and a critical appraisal of the ethnopharmacological issues is included in view of the many recent findings of importance on this plant. Woodfordia is a accepted source of ayurvedic drugs throughout India. The flowers are acrid, astringent, styptic, depurative, uterine sedative, constipating, antibacterial, corrective of urinary pigments, febrifuge and alextetic. They are useful in the conditions of kapha and pitta, leprous, burning sensation, skin diseases, diarrhoea, dysentery, fever, headache, hemorrhoids, herpes, internal hemorrhage, leukorrhea, liver disorders, menorrhagia, ulcers, wounds. Juice of leaves are used in bilious sickness. They are also valued as a stimulant in pregnancy. Dried flower powder (Figure 4) is used in ulcers and wounds to reduce the discharge and promote granulation. The juice of its fresh flowers applied on the forehead, reduces the headache.

The extracts of Woodfordia fruticosa flowers showed the presence of carbohydrates, gums, flavonoids, sterols and phenolic compounds/tannins. Extracts and metabolites of this plant, particularly those from flowers and leaves, possess useful pharmacological activities. A comprehensive account of the chemical constituents and the biological activities is presented and a critical appraisal of the ethnopharmacological issues is included in view of the many recent findings of importance on this plant.

There is no adverse effect on usage of this plant. A wide range of chemical compounds including tannins (especially those of the macrocyclic hydrolysable class), flavonoids, anthraquinone glycosides and polyphenols are found in the plant, which renders Fire Flame Blush its pharmacological properties. The astringent properties of the herb are effective in treating skin disorders, superficial wounds and cuts. As a nervous central nervous system stimulant, Fire Flame Bush relieves depression and lethargy. This is bush is largely used in native medicine. This enters into the composition of many preparations, decoctions, churnas and ghritas for various diseases, but chiefly dysentery and diarrhoea by reason of its being highly astringent.
3. Investigatory Measures

The Ayurvedic Pharmacopoeia of India recommends the use of the plant’s flower in acute diarrhea, hemorrhages, ulcerations and erysipelas (skin infection). The dried flowers, powdered and sprinkled over ulcers and wounds, help in their healing. In small doses, the plant stimulates the central nervous system, while in large doses it depresses the central nervous system.

Plant pacifies initiated kapha, pitta, skin diseases, burning sensation, hemorrhage, anemia, leukemia, menorrhagia, diarrhea, dysentery, ulcers, diabetes, oligosperma, urinary tract infections and jaundice. It find use in imparting natural color to a ayurvedic preparations. Oenothein B (Figure 6) a unique macrocyclic ellagitannin dimer that has been found in Woodfordia fruticosa L. with diverse biological activities. Immunological effects of oenothein B, on dendritic cells has been determined.

Woodfruticosin (woodfordin C), a cyclic dimeric hydrolyzable tannin having an inhibitory activity toward DNA topoisomerase II, has been isolated from the leaves of Woodfordia fruticosa along with 3 known flavonol glycosides and three known flavonolglycoside gallates. The structure of woodfruticosin (woodfordin C) was determined by the use of 2-D NMR spectroscopy including HMOC & HMBC techniques. Detailed analyses of the proton and carbon-13 NMR (1H- and 13C-NMR) spectra of six knownflavonoids were performed. The antibacterial activity of the crude methanol extract of Woodfordia fruticosa L. flower was evaluated at two different concentrations by the agar well diffusion method. The methanol extract of the flower exhibited antibacterial activity at varied levels except against Bacillus subtilis and Micrococcus flavus. The methanol extract was most active against Pseudomonas pseudoalcaligenes. The extract was more active against Gram–negative bacteria as compared to Gram–positive.

The inhibitory effect of the extract was compared with standard antibiotics, amoxicillin and ciprofloxacin. The study aims at preliminary phytochemical investigation and antifertility activity of dried flowers of Woodfordia fruticosa L.. The dried flowers were extracted successively with various solvents and individually with water and aqueous alcohol (50:50). The extracts were evaluated for phytochemical studies, including qualitative tests and HPTLC analysis. Antifertility activity of successive alcoholic, individual aqueous and individual hydroalcoholic extracts was studied in female albino rats.

The results revealed that the alcoholic extract showed significant abortifacient activity, whereas aqueous and hydroalcoholic extracts showed moderate activity as compared to the control. Thus, the successive alcoholic extract showed promising abortifacient activity at 100 mg/kg body weight. The FRSA and TPC were found more in extract prepared in methanol from bark of this plant in than prepared in ethanol and water as compared to extract of leaf and flower. The methanolic extract of bark, leaf (Figure 6a,b) and flower showed higher tannic acid content while TBARS assay of ethanolic extract of flowers showed maximum protection (27-65).

Ayurveda Measures

Dashaprasamana - decreasing burning sensation.
Jwaraghna - anti pyretic
Krumighna - destroys Parasites
Kushthaghna - skin conditions
Muttravrajaniya - normalises colour of urine

Rakta Pitta Shamaka - pacify rakta pitta disorders
Rakta sstambhana - stops bleeding
Sandhaniya - bone fractures
Stambhana - prevents expulsion of fluids
Swedajanana - promotes sweating
Vranaropana - wound healing properties
4. Abbreviations

TBARS (Thiobarbutric Acid Reactive Substances); RPHPLC (Reverse Phase High Performance Liquid Chromatography) TPC (Total Phenolic Content); DPPH (2,2 diphenyl-1 Picrazylhydrazyl); FRSA (Free Raducal Scavenging Activity); HPTLC (High Performance Thin Layer Chromatography); DN (deoxyribose Nucleic Acid); HMQC (Heteronuclear Multiple Quantum Coherence (HMQC); HMBC (Heteronuclear Multiple Bond Connectivity); 2-D NMR (2-Dimensional Nuclear Magnetic Resonance Spectroscopy)

5. Conclusion

The plant is a well-known non forest produce that has ong been in regular demand amongst practitioners of traditional medicines in different South East Asian countries. Althpugh all parts of this plant possesses valuable medicinal merits, there is a profound demand for the flowers, both in domestic and international corporate sectors specialized in the manufacturing herbal medicines. The flowers are acrid, astringent, styptic, depurative, utreine sadative, constipating, antibacterial, corrective of urinary pigments, febrifuge and alexeteric. They are useful in the conditions of kapha and pitta, leprosy, burning sensation, skin diseases, diarrhoea, dysentery, fever, headache, hemorrhoids, herpes, internal hemorrhage, leukorhoea, liver disorders, menorrhagia, ulcers, wounds. Juice of leaves are used in bilious sickness. They are also valued as a stimulant in pregnancy. A wide range of chemical compounds including tannins (especially those of macrocyclic hydrolysable class), flavonoids, anthraquinone glycosides, and poly phenols have been isolated from this species in recent times. Extracts and metabolites of this plant, particularly those from flowers and leaves, possess useful pharmacological activities.

6. References

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