AMERICAN JOURNAL OF PHARMTECH RESEARCH
Journal home page: http://www.ajptr.com/

Anti-Inflammatory Activity of Vateria Indica

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ABSTRACT

Vateria indica Linn (sarja) is one of the plant species that cultivated near the Western Ghats, On critically analyzing the status of Vateria indica Linn. It have carminative and digestant activity. It is used as the oral medicament for treatment of various disease but it was found to be over exploited & highly felled for the purpose of making plywood. The current study was performed for anti-inflammatory activity of the Vateria indica leaves . Extraction of dried materials were performed with the help of successive solvents extraction(SSE) with the help of soxhlet apparatus. The anti-inflammatory of Vateria indica leaves were performed according to the guideline of World Health Organization (WHO). The anti-inflammatory activity of the Vateria indica extracts showed may be due to presence alkaloids, carbohydrates, steroids and glycosides. [3]

Keywords- Extraction, Anti-inflammatory activity, Vateria indica Linn

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Received 21 June 2017, Accepted 30 June 2017

Please cite this article as: Vijay P *et al*., Anti-Inflammatory Activity of Vateria Indica. American Journal of PharmTech Research 2017.

INTRODUCTION

Herbal is a part of science that regulates the fact of the different parts of vegetable and plant origin all have medicinal properties which can be used to treat and cure diseases. In plant, the medicinal elements of all which materials have been documented by herbal researchers of the all over world from centuries. Herbal plants have some valuable properties that have been used to treat disease and provide power to maintain the health. Herbal medicines are generally made from medicinal plants which are used either single or combination with other medicament or additives. Many types of metals obtained from plant origin. It all depends on the method of extraction procedure of herb and minerals. If any medicinal ingredients are to be used in herbal, they should all purified by individual processes to make the herbal medicine safe to for health.[2]

Plant Profile

Figure 1: *Vateria indica*

Synonyms:- Vateria malabarica

Family: Diterocarpaceae

Species: Vateria acumirata

English: White Dammar Tree,

Sanskrit: Sarja,

Hindi: Safed dammar

MORPHOLOGY:

Bark: Rough, white to grey

Fruits: Capsules, 7 to 10 cm long, and 3.6 to 6 cm in Diameter. 1 seed, red white, filled with fat and carbohydrate. Ripens during june to july.

Leaves: Curvaceous,

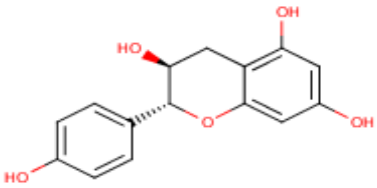
Flowers: White, fragrance

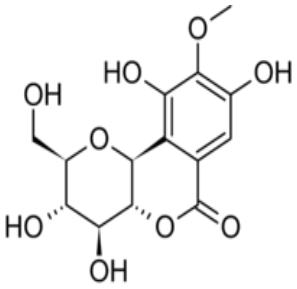
Profile of *Vateria indica:*

Vateria indica Linn, medicinal plant species to peninsular India, highly appreciated for its characteristics resin, Timber, Tallow etc., is at threat in its own land. Delineated as one of the critically naturally endangered species of plant in the red list of International Union for Conservation of Nature (IUCN Red list – August 2010), needs an urgent attention for Conservation. Sarja as it is termed in Ayurveda, Unani, in systems of medicines, is highly preferred and essential in Local healing traditions for curing many type of diseases in body. Age old Astrological sciences in India, have considered this medicinal plant to be sacred, which finds a Niche for itself in 'Nakshatra' (group of specific plant to birth stars) and accredited as the medicinal plant to be worshiped for Moola Nakshatra. Down the ages people have been exploiting this medicinal plant for various purposes in drug preparation, which have an led to a heavy loss of its Habitat especially. The onslaught of Plywood industries has proven to be continuously destructive in pushing this plant to the endangered list. Since times immemorial, the aromatic resin is utilized for the preparation of ayurveda Medicines & Incense, which seem not to have caused a threat to its survival. The resin is as such of a low quality & cost when compared to the high quality resins extracted from another plant Canarium strictum (Black Dammar), utilized for the same purpose for uses. Although the Economic value of *Vateria indica* Linn finds no short comes, as it yields one of the best timbers also. Hence, an attempt has been made to bring such drugs under the lime lights, of which *Vateria indica* Linn marks the first step, which needs high concern. Let us see the vateria indica linn with further more details.

Phytochemistry of vateria indica:

The bark is reported to be containing afzelechin and bergenin. The leaves and roots contain bergenin and afzelechin. The seeds also contain bergenin. The fruit shell contains 25% tannins. High-performance liquid chromatography analysis showed that the extract contains bergenin, hopeaphenol, vaticanol B, vaticanol C, and ε-viniferin.[4]





Afzelechin bergenin

MATERIALS AND METHOD

Extraction

Air dried leaves of the Vateria indica was coarsely powder and was allowed for successive solvent extraction with the help of Soxhlet apparatus for 6 to 8 hrs by using petroleum ether, ethanol and aqueous as menstrum.

ANTI-INFLAMMATORY ACTIVITY TEST

Anti-inflammatory activity was evaluated using the carrageenan induced rat paw oedema method. Rats wcrc caps for fasting around 16 hrs and then they divided into six groups each contain six animals. Group 1 served as control group received 1 m1/100 g of 0.5% w/v carboxy methyl cellulose, orally. Group 2 and 3 animals received ethanol and Group 4 and 5 animals received water extract respectively, at a dose of 200 mg/kg and 400mg/kg as a fine suspension in 0.5% w/v carboxy methyl cellulose, orally. Group 6 received 15mg/kg Diclofenac sodium as a standard drug, orally. After 30 min administration of extracts, oedema was induced in animals by administered 0.1 ml of 1% w/v carrageenan in normal saline into right hind paw. The change in the volume of rats paw due to the edema was measured by Plethysmometer. The paw volume of both legs and control and diclofenac sodium treated rats at 15, 30, 60 and 120 min after carrageenan. Calculate the percent difference in the right and left paw volumes of each animal of control and diclofenac sodium treated group. Compared the mean percent change in paw volume in control and drug treated animals and express as percent oedema inhibition by the drug [23].

The dose of drugs and extracts for rats and mice were calculated by the formula given below

Dose = (std. / 1000) x b. w

Where

Std. = standard dose of drug.

b•w. = body weight of animals.

Percentage of inhibition = 100

Where.

Vc = edema volume in control and

Vt = edema volume in test/standard compound. (Patil, e. al., 2011)

Table 1 Detail work plan for anti-inflammatory activity:

Groups	Treatment	(Dose orally)
Test, group 1	Control	1ml/100 g
Test, group 2	Ethanol	200/mg/kg
Test, group 3	Ethanol	400mg/kg
Test, group 4	Aqueous	200 mg/kg
Test, group 5	Aqueous	400 mg/kg
Test, group 6	Diclofenac sodium	15 mg/kg

RESULTS AND DISSCUSSION

Extraction

Successive solvent extraction of plant materials was performed by using ethanol and aqueous solvents. The extracts were air dried and stored in amber color air tight bottle at a temperature of 45 to 50 °C. These extracts were used to carry out the qualitative tests, TLC and screening for the anti-inflammatory pharmacological activities.

Table 3: Effects of different extracts of Vateria indica on carrageenan induced rats hind paw oedema.

S.No	Treatment	Dose (mg/kg)	Mean Differences in paw volume (ml) ± S.E.M			
			30 min	60 min	90 min	120 min
1.	**Control**		0.59±0.08	0.83±0.02	0.94±1.05	1.05±0.03
2.	**Standard**	15	0.37±0.07**	0.53±0.05**	0.61±0.08*	0.69±0.04*
3.	**AEFG**	200	0.43±0.07*	0.61±0.08*	0.72±0.05**	0.83±0.08*
4.	**AEFG**	400	0.35±0.04*	0.56±0.06*	0.64±0.03**	0.75±0.03*
5.	**EEFG**	200	0.42±0.06**	0.60±0.07**	0.71±0.03**	0.82±0.06*
6.	**EEFG**	400	0.31±0.08**	0.54±0.05**	0.63±0.02**	0.71±0.05**

Value expressed as mean ± SEM, *p<0.05, **p<0.01, compared with control (one way ANOVA followed by Dunnett's' test)

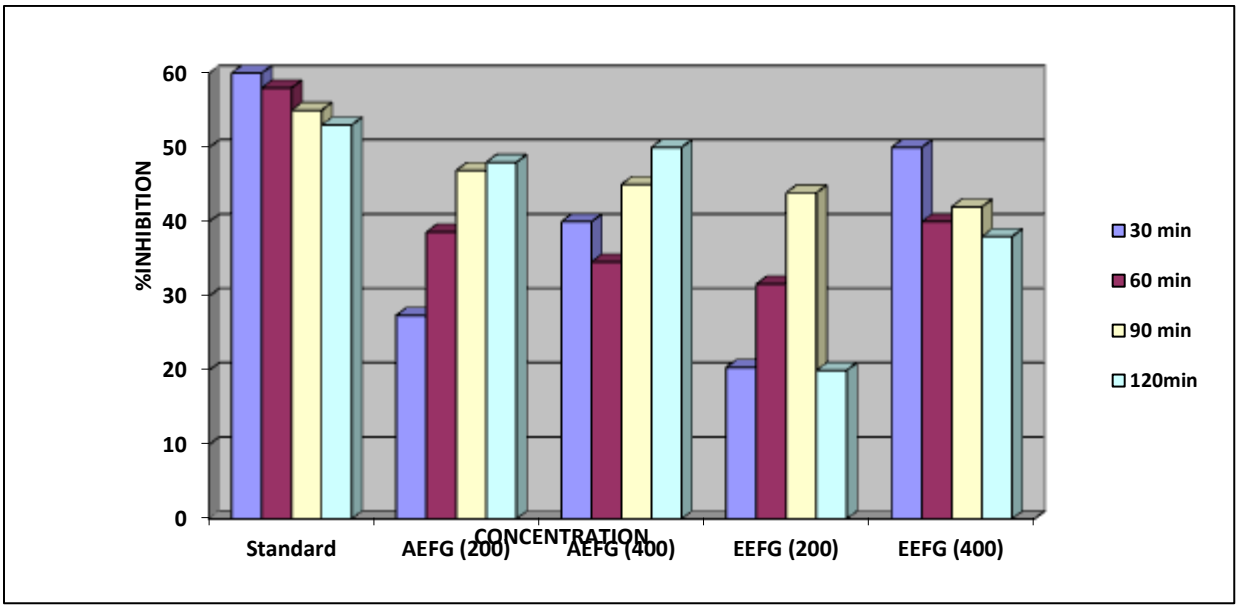


Figure 2: Graphical representation of inhibition for anti-inflammatory activity

Anti-inflammatory activity was carried out for ethanol and aqueous extracts of Vateria indica. The ethanol extracts showed maximum % inhibition i.e. 40.67%, 32.53%, 31.9% and 28.57% respectively.

RESULTS AND DISCUSSION

The ethanolic extract (400 mg/kg,) showed maximum % inhibition i.e. 47.45 after 30 min while water extracts showed maximum % inhibition i.e. 40.67%, 32.53%,31.9% and 28.57% respectively but standard drug Diclofenac sodium (15 mg/kg) showed 59.45%. From the above result we can conclude that ethanolic extract (400 mg/kg) showed highest anti-inflammatory effect which was more similar to standard drug (Diclofenac sodium) as compare to aqueous extracts.

CONCLUSION

The herb Vateria indica plays an important role in herbal medicine. It is a herb belonging to family Dipterocarpaceae. The various chemical constituents present in the plant are alkaloids, carbohydrates. glycosides, steroids, phenols, tannins, flavonoids, fixed oils and proteins. The literature reported various pharmacological activities like hypolipidemic activity. Renal anti carcinogenic, antioxidant. hepatoprotective, antifungal, antidiarrhoeal, antidiuretic, antibacterial, hypoglycemic activity etc. on different parts of vateria indica, however literature is silent on its detailed macroscopic. microscopic, anti-inflammatory studies of leaves parts of plants. The current study was performed for chemical screening of the leaves of Vateria indica and study its anti-inflammatory activity. Air dried materials were coarsely powdered and was subjected to successive

solvents extraction with the help of soxhlet apparatus. The chemical screening of leaves of Vateria indica were performed as per the guideline of World Health Organization (WHO). The Anti-inflammatory activity screening of the various extracts showed the presence alkaloids, carbohydrates. steroids and glycocides. Anti-inflammatory activity was performed using the carrageenan induced rat paw oedema method. The ethanolic extract (400 mg/kg, p.o.) showed 36.9% inhibition and compared to the standard drug Diclofenac sodium which showed 55.6 % inhibition. Conclusively. the result revealed that Vateria indica leaves has anti-inflammatory activities which may be due to the presence of alkaloids, steroids and glycosides.

ACKNOWLEDGEMENTS

All my efforts have born fruit with the grace and blessings of the almighty God with raised hands and prayers I accord my thanks to God in granting me the strength and wisdom for timely and successful completion of my review article. I express my sincere and heartiest gratitude to Prof. (Dr.) Abhishek Kumar Saxena Department of Pharmacology, Brahmanand Group of Institutions, Bulandshahr and Associate Professor Brijesh Duvbey Department of Pharmacology, Brahmanand Group of Institutions, Bulandshahr who provided me all the facilities and support to complete my research work. I owe special thanks towards my co-supervisor Mrs. Yogita Department of Pharmacognosy, Brahmanand Group of Institutions, Bulandshahr who has provided me with the requisite facilities in the department and he always stood by me throughout the duration of the project. His innovative ideas, expert guidance & timely support have helped me tremendously in the accomplishment of this goal. I wish to express my sincere thanks, with a deep sense of gratitude to Mrs. Yogita Department of Pharmacognosy, Brahmanand Group of Institutions, and all other faculty members of Department of Pharmacognosy, Brahmanand Group of Institutions, Bulandshahr for their meticulous support. At last my best friend Yatendra Sharma Research Associate at Ministry of Youth Affairs and Sports India who encourage me . All that I have achieved so far in life would not have been possible without the guidance & support of my parents. I owe my deepest sense of gratitude and respect for Mother, Father& Brother.

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