

Amherstia Nobilis: An Approach to In-Vitro Antiinflammatory Activity

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ABSTRACT

Herbal plant compounds were used in the inhibition of inflammation from traditional period and its main benefit is the less side effects. The aim of this study is to determine the anti-inflammatory potential of *Amherstia nobilis* by albumin denaturation method. The leaves of the plant were collected, dried and powdered. The egg albumin, phosphate buffer and different concentrations of the plant extracts were incubated at 37°C for 15 minutes and heated at 70°C for 5 minutes. The rate of inhibition of protein denaturation is calculated. The result verified the anti-inflammatory potential of *Amherstia nobilis* and its prospective use in alleviating inflammation as a natural remedy.

Key words: *Amherstia nobilis*, Anti-inflammatory activity, Albumin denaturation, Ethanolic extract

INTRODUCTION

Inflammation is the part of our body's defense mechanism to the harmful stimuli like exogenous and endogenous foreign particles, injury, allergens and on the other hand, inflammatory reaction may recognize as the causes of several conditions such as metabolic syndrome, diabetes, cancer, cardio vascular diseases, cancer[1]. Conventional drugs such as NSAIDs are broadly used in association with inflammation and many adverse effects arises due to those drugs[2]. Apart from NSAIDS other drugs such as immunosuppressant drugs and steroids are also used in inflammatory conditions and as a result several adverse effects are being reported like ulceration, gastric irritation, hematochezia, angioedema, hepatic failure, headache, hemolytic anemia, hyperglycemia, osteoporosis, immunodeficiency-related problems, and others.

Considering these issues, the herbal remedial methods with low adverse effects may have significant role in medical field. *Curcuma longa*, *Zingiber officinale*, *Rosmarinus officinalis*, *Borago officinalis*, evening primrose, and Devil's claw and several other plants are showing effectiveness in improvising inflammatory response with less side effects[3].

Amherstia nobilis is a rare and beautiful plant that is found in certain regions of the world. It is also called as Pride of Burma, because it is native to Myanmar. It is known for its vibrant purple flowers and unique, twisting stems that give it a distinct appearance. *Amherstia nobilis* has been used in traditional medicine for centuries to treat a variety of ailments, including fever, arthritis and digestive issues. Its leaves and

stems rich in antioxidants and anti-inflammatory compounds that have been shown to have a positive effect on the body immune system and overall health.



Figure 1: *Amherstia nobilis* leaves



Figure 1: *Amherstia nobilis* flowers, leaves, tree and habit

Despite its many benefits, *Amherstia nobilis* is still relatively unknown and underutilized in modern medicine. However, recent research has shown that this plant may have even more potential health benefits and it becoming those seeking natural remedies for their concerns. One of the main active compounds found in *Amherstia nobilis* is quercetin, which is a flavonoid known for its anti-inflammatory and antioxidant properties. Quercetin has been shown to have positive effect on cardiovascular health, including reducing blood pressure and improving blood flow. *Amherstia nobilis* is also used in aroma therapy. Few researches evaluated the antibacterial and antioxidant activities of this plant[4].

Albumin denaturation lead to the structural changes in the protein by means of external heat, organic solvents or strong acid or strong base[11]. Natural medicine proved to be major remedy in indigenous system of medicine. The present study was carried out to determine the potential of *Amherstia nobilis* to be utilized as a natural remedy for inflammatory response

MATERIALS AND METHODS

Collection of specimen

The plant specimens (leaves) for the proposed study were collected from plants located at Mannuthy, Thrissur district. Leaves were collected from plant. The collected plants were carefully examined and authenticated by Dr.V.B.Sreekumar, Scientist, Botany department, Kerala Forest Research Institute, Thrissur.

Preparation of sample

The leaves of *Amherstia nobilis* W was collected and dried under shade. These dried materials were mechanically powdered, sieved using 80 meshes and stored in an air tight container. These powdered materials were used for further physiochemical and fluorescent analysis.

In vitro Anti-inflammatory Activity

The inflammatory response in disease condition involves a complex array of enzyme activation, mediator release, cell migration, tissues breakdown and repair. Inflammatory mediators are released by the rupture of lysosomal membrane. Stabilization of lysosomal membrane is important in limiting inflammatory response.

Inhibition of albumin denaturation

The following procedure was followed by Saleem et al. for evaluating the percentage of inhibition of protein denaturation:-

Control solution (50ml)

2ml of egg albumin, 28ml of phosphate buffer (pH 6.4) and 20ml distilled water.

Standard drug (50ml)

2ml of egg albumin, 28ml of phosphate buffer and various concentration of plant extract (*Amherstia nobilis* ethanolic leaves extract) concentration of 100, 200, 400, 800, and 1000µg/ml. All of the above solutions were adjusted to pH using a small amount of 1N HCl. The samples were incubated at 37°C for 15 minutes and heated at 70°C for 5 minutes. After cooling the absorbance (at 230nm) of the above solutions percentage inhibition of protein denaturation was calculated using the following formula

Calculation

$$\text{Percentage inhibition} = \left(\frac{V_t}{V_c} - 1 \right) \times 100$$

Where,

V_t = Absorbance of test sample

V_c = Absorbance of control

Statistical analysis

Statistical analysis was done by using one way ANOVA followed by Dunnett's test. P values lesser than 0.01 were considered as significant.

RESULT AND DISCUSSION

Inhibition of Albumin Denaturation

Table: 1 Absorbance and percentage inhibition of standard Aspirin and Ethanolic extract of leaves of *Amherstia nobilis* W

Sl No.	Sample	Concentration µg/ml	Mean Absorbance	Percentage Inhibition
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1	Control	-	0.0814±0.0002**	-
2	Standard Aspirin	100	0.1580±0.0001**	94.13
		200	0.2371±0.0002**	191.27
		400	0.2785±0.0003**	242.13
		800	0.3179±0.0001**	290.54
		1000	0.3927±0.0002**	382.43
3	Ethanollic extract	100	0.1398±0.0002**	71.74
		200	0.2109±0.0003**	159.09
		400	0.2573±0.0001**	216.09
			0.3398±0.0004**	317.44
			0.4530±0.0002**	456.51

Values are expressed in mean ±SEM, (N=5)

All values were significant at **P< 0.01 when compared with the control group by One way ANOVA followed by Dunnett’s Multiple Comparison Test.1

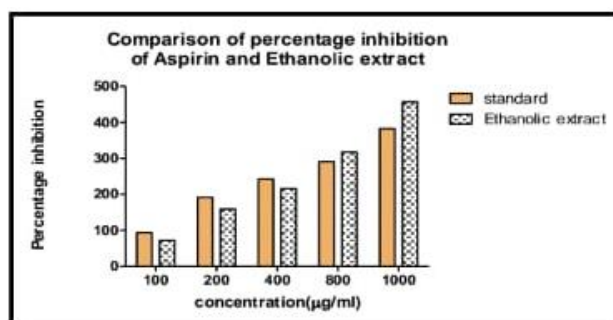


Figure 2: Comparison of percentage inhibition of ethanolic extract of leaves of *Amherstia nobilis* W with standard Aspirin by Inhibition of Albumin denaturation method.

CONCLUSION

The anti-inflammatory activity is essential for wound-healing procedure. A wide variety of phytochemical like flavonoids, alkaloids, terpenoids etc. possess anti-inflammatory activity. The present study was carried out to evaluate the in-vitro anti-inflammatory activity of *Amherstia nobilis*. From the investigation the bioactive potential of this plant in aid of inflammation was found out. Comparison of percentage inhibition of ethanolic extract of leaves of *Amherstia nobilis* W with standard Aspirin by inhibition of Albumin denaturation method revealed that it has potent Anti-inflammatory activity. Further *In vivo* study may pave a pathway for a potent Anti-inflammatory drug.

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