



Anti-arthritic Activity of *Abutilon indicum* Aerial Parts

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ABSTRACT

The aim of the study is to investigate the *in vitro* anti-arthritic activity of *Abutilon indicum* aerial parts. Inflammation is a vital part of the body's immune response. It is the body's attempt to heal itself after an injury; defend itself against foreign invaders, such as viruses and bacteria; and repair damaged tissue. Arthritis can cause permanent joint changes. Inflammation is often characterized by redness, swelling, warmth, and sometimes pain and some immobility. Arthritis refers to joint pain or joint disease. The *Abutilon indicum* is a small shrub in the malvacea native to tropical and subtropical regions and can be cultivated as ornamental. It is often used as medicinal plant. Protein Denaturation method is used to demonstrate the Antiarthritic activity. The present study targets the potential use of *Abutilon indicum* which could be an alternative approach for many chronic diseases such as arthritis.

Keywords: Anti-arthritic, Inflammation, Protein Denaturation, *Abutilon indicum*.

INTRODUCTION

Rheumatic arthritis is a systemic autoimmune disorder characterized by poly articular symmetrical arthritis. Various inflammatory mediators produce joint inflammation with pain function loss, joint destruction andj permanent deformity after certain time if left untreated¹. According to WHO, 0.3-1% of the world population is affected from rheumatic fever and among the females are three times more prone to the disease as compared to males². The exact etiology is unknown but several hypothesis said that it is triggered by the combination of genetic predisposition and exposure to environmental factors like viruses. Many herbs and herbal medicines have been used since time immemorial to cure many diseases, including arthritis³. However, the scientific basis for such uses is not completely established. Therefore it is necessary to screen various herbs and natural products for their pharmacological properties⁴. In India, many ayurvedic practitioners are using various indigenous plants for the treatment of different types of arthritic conditions⁵. Although the application of these medications has a sound tradition and a traditional background according to the Indian system of medicine, perhaps it is essential to investigate the rationality of their use in modern scientific terms⁶. *Abutilon indicum* has been used extensively as a home remedy in traditional Indian and Chinese form of medicine⁷. The leaves are used as a demulcent, laxative, diuretic, aphrodisiac and sedative⁸. The seeds are considered to be laxative, demulcent and expectorant. The bark is diuretic and astringent. The whole root is uprooted dried and made into powder to be used as a laxative and tonic⁹. The roots are prescribed in urethritis and fever. It is also used in leprosy. The plant is very much used in Siddha medicines¹⁰. In fact the root, leaves,

flowers, bark and seeds are allowing used for medicinal properties¹¹.

MATERIALS AND METHODS

Plant material

Abutilon indicum aerial parts extract is obtained from Green chem. Herbal extractions and formulations.

Chemicals

Diclofenac sodium is obtained from sigma Aldrich (USA), All the chemicals used were of analytical grade.

Anti-arthritic activity

Inhibition of Protein Denaturation method: Concentration of test substance: 1000 to 200µg/ml

Standard: Diclofenac sodium

Chemicals Required: Bovine serum albumin, 1N HCl, Phosphate buffer (pH 6.3) Instrument: Incubator, Spectrophotometer - 660nm

The following 4 solutions is used

Test solution (0.5ml) consists of 0.45ml of bovine serum albumin (5%w/v aqueous solution) and 0.05ml of test solution.

1. Test control solution (0.5ml) consists of 0.45ml of bovine serum albumin (5%w/v aqueous solution) and 0.05ml of distilled water.
2. Product control (0.5ml) consists of 0.45ml of distilled water and 0.05ml of test solution
3. Standard solution (0.5ml) consists of 0.45ml of bovine serum albumin (5%w/v aqueous solution) and 0.05ml Of Diclofenac sodium (200µg/ml).



All of the above solutions were adjusted to pH 6.3 using a small amount of 1N HCl. The samples were incubated at 37°C for 20 minutes and heated at 57°C for 3 minutes. After cooling, add 2.5ml of phosphate buffer to the

above solutions. The absorbance of the solutions was measured using UV-Visible spectrophotometer at 416nm. The percentage inhibition of protein denaturation was calculated using the formula.

The percentage inhibition of Protein denaturation will be calculated as follows.

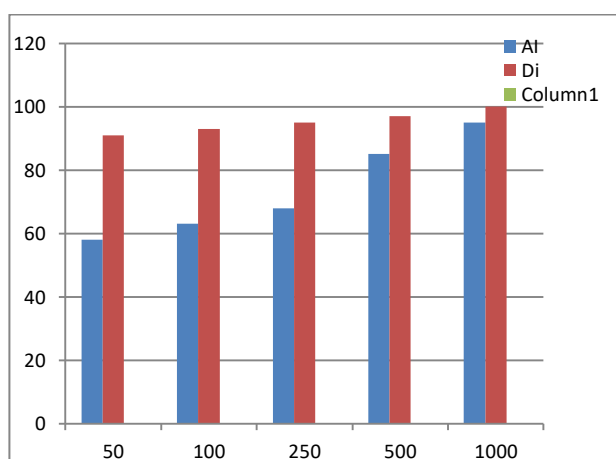
$$\text{Percent Inhibition} = 100 - \frac{\text{OD of test solution} - \text{OD of product control}}{\text{OD of test control}} \times 100$$

The control represents 100% protein denaturation. The result is compared with Diclofenac sodium treated sample.

RESULT AND DISCUSSION

Arthritis refers to joint pain or joint disease. Common symptoms of arthritis are pain, swelling, stiffness and decreased range of motion¹². Arthritis can cause permanent joint changes. These changes may be visible, such as knobby finger joints, but mostly the damage can only be seen on X-ray¹³. *Abutilon indicum* had been broadly used for its reported biological activities in indigenous system of medicine. The phytochemical constituents present in extracts may be responsible for the anti-inflammatory and analgesic activities of the plant *Abutilon indicum* and the actions may be mediated through CNS and peripheral mechanisms¹⁴.

From the present study, it was clearly evident that *Abutilon indicum* when tested at different concentrations showed dose dependent increase in the inhibitory rate in protein denaturation assay. At a concentration of 50mcg it shows 54% inhibition and at a concentration of 100,250 Mcg it shows 57.21, 62.25 and at 500, 1000 Mcg it shows 82.62, 93.26 respectively.



CONCLUSION

From the present study we come to know that aerial parts of *Abutilon indicum* can be used as an *in vitro* anti-arthritis agent. Hence *Abutilon indicum* should be used as an anti-arthritis agent since it has medicinal effects.

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