



EVALUATION OF ANTI HISTAMINIC ACTIVITY OF LEAVES OF ACALYPHA CANESCANA IN ISOLATED ILEUM OF RABBIT

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ABSTRACT

Antihistaminic activity was studied in rabbit ileum using histamine induced bronchospasm in isolated models. The ethanolic extract of *Acalypha canescana* (100µg/ml) shows greater affinity to reduce the histamine induced contraction in asthma. A contact time of 30 seconds were followed up to 3 minutes time cycle for recording the responses. The studies reveal that antihistaminic activity of ethanolic extract of *Acalypha canescana* may be due to their effect on H1 receptor and competitively antagonizing the action of histamine.

Key words: Bronchospasm, ethanolic extract, competitively antagonizing.

INTRODUCTION

Allergy is one of the common diseases that affect mankind with diverse manifestations. The prevalence of allergy and asthma has risen in the recent years despite an improvement in the general health of the population¹. Allergic diseases are responsible for significant morbidity and have severe economic impact². Some of the postulated reasons for upper and lower respiratory tract allergic diseases are increasing environmental pollution³ and increased predisposition of individuals producing excessive IgE through a major change in gene pool, changing life styles, and an increasing awareness of the disorders. Intensive research during last several decades has highlighted the role of lymphocytes, immunoglobulins, mast cells and various autacoids in the etiopathogenesis of allergic conditions.

In spite of voluminous literature available on the subject, the treatment of allergic disorder continues to be far from satisfactory. The available treatment options for upper and lower respiratory tract allergic diseases have major limitations owing to low efficacy, associated adverse effects and compliance issues⁵.

Ayurveda, An Indian system of medicine has described several drugs from indigenous plant sources for use in the treatment of bronchial asthma and allergic disorders. The traditional uses of turmeric in folk medicine are multiple, and some based are on their antioxidant, anti-inflammatory and antiallergic properties which have been confirmed by various experimental studies⁶. *Piper longum* has been shown to reduce the passive cutaneous anaphylaxis in rats and protect guinea pigs against antigen-induced bronchospasm⁷. *Adhotoda vasica* is documented for its potent anti inflammatory⁸, antiallergic and antitussive activities⁹. *Emblca officinalis* was found to exhibit anti-inflammatory, antitussive and antioxidant activities¹⁰. *Ocimum sanctum* has been demonstrated to protect against histamine, as well as pollen-induced bronchospasm in guinea pigs and inhibited antigen-induced histamine release from sensitized mast cells¹¹. *Terminalia bellerica* demonstrated potent antiperoxidative activity and inhibited lipid peroxide formation by scavenging hydroxyl and superoxide radicals *in vitro*¹². *Zingiber officinale* has been found to exert anti-inflammatory activity and is reported to be a potent inhibitor of inflammatory mediators such as prostaglandins and leukotrienes¹³.

Acalypha canescana, belongs to family *Euphorbiaceae*, and is found in all parts of the tropical regions. *Acalypha canescana*, is a common annual shrub in Indian gardens, backyards of houses and waste place throughout the plains of India. This herb is found in fields and wastes places throughout the hotter parts of the world. In the Malay

Peninsula it occurs in the more settled parts¹⁴. Traditionally the plant is used as expectorant and as a substitute for Senega. Its leaves, root, stalks (young shoots) and flowers are used in medicine. It has cathartic, anthelmintic, expectorant, emetic, anodyne and hypnotic properties. It also has many uses as diuretic action, useful for bronchitis, asthma, pneumonia, rheumatism, purgative, antiparasiticide, antibacterial and antihelmintic¹⁵. It is reported that *Acalypha canescana* possesses activity against *Staphylococcus aureus*, *Bacillus cereus*, *Escherichia coli* and *Candida albicans* (yeast)^{16, 17}. *Acalypha canescana* leaves contain acallyphine, cynogenic glycoside, inositol methylether, resin, triacetomamine and volatile oils, phytosterols such as β - sitosterol and lanosterol. Quercetin, and salts of acetic acids, malic acids, citronic acids, and tartaric acids as well as caffeic acids, chlorogenic acids, ferulic acids and coumaric acids have also been reported¹⁸.

Traditionally various uses of different parts of plant *Acalypha canescana* in different system of medicine like Ayurveda, Siddha and Homeopathy has been reported in the literature. Based on traditional claims of showing antihistaminic and anticholinergic activity, we have tested the plant extract for antihistaminic activity.

EXPERIMENTAL WORK

Procurement of Plant and its authentication

The plant material was obtained from road sides of Trichy, Tamil Nadu, and India and authenticated by an acknowledged botanist and the voucher specimen was deposited at Bharathidasan University, Trichy, Tamil Nadu, India. Further studies were done as follows.

Phytochemical Investigation

The powdered leaves are extracted with ethanol by continuous hot extraction using soxhlet apparatus for 16 hrs separately. The extract was concentrated to remove the solvent and dried in desiccators.

Chemicals and reagents used

Ringer's solution (NaCl 154.0; KCl 5.4; CaCl₂ 2.4; NaHCO₃ 6.0 and dextrose 11.0 mM/l), Atropine sulphate (E. Merck), Pheniramine maleate (E. Merck), Histamine (BDH).

Evaluation of antihistaminic activity

The antihistaminic testing was carried out as per the method described by Magnus¹⁹ (1904) in the isolated ileum of guinea pig. The rabbit was sacrificed by a blow on ahead and carotid bleeding was done. The abdomen was cut open. A few cm long of the ileum was cut out and removed. It was immediately placed in a watch glass containing the ringer solution. The ileum was cut in to pieces of 2-3

cm long. One piece of ileum was taken and tied with a thread in the top and bottom ends without closing the lumen. The tissue was mounted with organ bath containing ringer solution maintained at 37 ° C and bubbled with air. A tension of 0.5 gms was applied on the tissue. The tissue was allowed to stabilize for 30 minutes after placing the organ bath. The response to histamine and *Acalypha canescana* were recorded. The effect of Pheniramine maleate (1µg/ml) and Atropine (1µg/ml) on the rhythmic contraction induced by Histamine were studied. A contact time of 30 seconds were followed up to 3 minutes time cycle for recording the responses. The experimental protocol data are shown in Table 1.

Table 1: Antihistaminic activity protocol for *Acalypha canescana*

S. No.	Method	Magnus (1904)
1.	Test Solution	Concentration of the test solution
	Histamine	10 µg / ml
	Atropine sulphate	1 µg / ml
	Pheniramine maleate	1 µg / ml
	<i>Acalypha canescana</i>	100 µg / ml
2.	Contact time	30 Seconds
3.	Time cycle	3 Minutes
4.	Bath volume	30 ml
5.	Temperature of bath	37 degree centigrade
6.	Physiological solution	Ringer's solution
7.	Drum speed	0.12 mm / sec

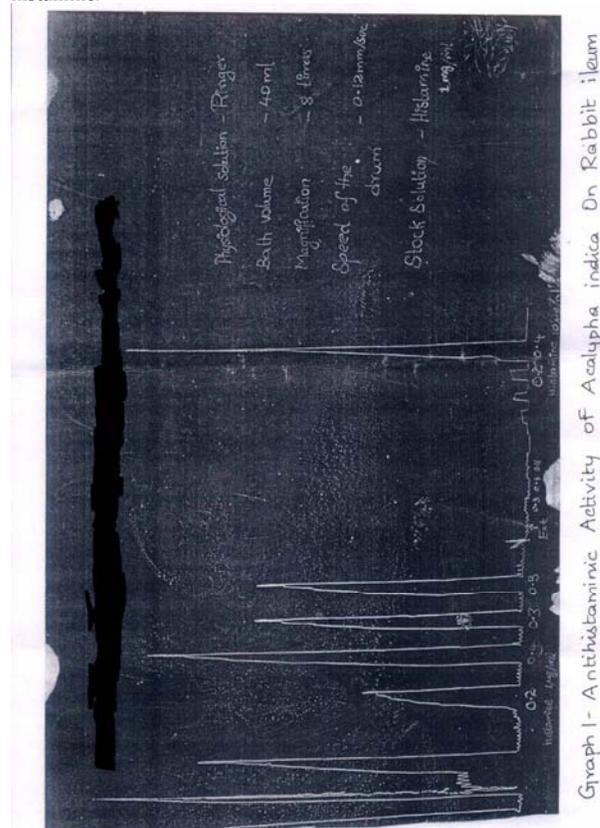
RESULTS AND DISCUSSION

The antihistaminic effect of ethanolic extract of *Acalypha canescana* were carried out using histamine induced contraction in guinea pig ileum. The anti-asthmatic effect of *Acalypha canescana* was analyzed in rabbit ileum along with the standards and the results were very well understood from the graph 1. Histamine produced dose dependent increase in the rhythmic contraction in ileum which was significantly inhibited by ethanolic extract of the *Acalypha canescana*. It was also observed that the rhythmic contractions were neither blocked by pheniramine nor by atropine indicating that it has a direct bronchodilatory action²¹. Histamine administration caused bronchoconstriction (H1 receptor action) in guinea pig isolated ileum²⁰. This constricted ileum was further treated with standard drugs atropine sulphate, pheniramine maleate and ethanolic extract of *Acalypha canescana* individually. Significant antihistaminic activity was observed at 100 µg / ml dose of ethanolic

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extract of *Acalypha canescana*. The graph 1 indicates that the ethanolic extract of *Acalypha canescana* (100 µg / ml) shows the greater affinity to reduce the histamine induced contraction in asthma. Ethanolic extract of the *Acalypha canescana* may be acting on H1 receptor and competitively antagonizing the action of histamine.



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