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EVALUATION OF IN VITRO ANTIASTHMATIC ACTIVITY OF METHANOLIC EXTRACT OF LEAVES OF *AILANTHUS EXCELSA* (ROXB.)

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ABSTRACT

The main objective of the work was to evaluate the use of *Ailanthus excelsa* (Roxb.) (AE) leaves for safety and efficacy in the treatment of asthma. The anti-asthmatic activity of the extract by using methanolic extract was evaluated in isolated goat tracheal chain preparations by using histamine. The similar concentration-effect curve was taken in presence of standard drug Chlorpheniramine Maleate (1 µg/ml). In the present study, histamine produced dose dependent contraction of goat tracheal chain preparation, as number of papers with antiasthmatic activity are reported with use of guinea pig ileum, tracheal chain preparation but yet antiasthmatic activity was not carried out using tracheal chain hence present study was designed using goat tracheal chain preparation. The modified physiological salt solution containing methanolic extract of *Ailanthus excelsa* significantly inhibited the contractile effect of histamine thus produces significant bronchodilation. It is concluded that *Ailanthus Excelsa* showed potent antiasthmatic activity due to bronchodilator activity.

KEYWORDS: Antiasthmatic, *Ailanthus excelsa* (Roxb), Histamine, Goat Tracheal Chain.

INTRODUCTION

Asthma is a disease of the lung's airways. It affects 155 million individuals in the world.

Its Prevalence and severity among children have increased significantly in the world over the past 40 year. It varies from 5–30 percent in different population.[1,2] It has affected 14–15 million people in the United States, including estimated 4.8 million children. It is the most

common chronic disease of childhood. It accounts for about 11 million hospital visits annually and the sixth most frequent reason for visits in ambulatory setting. About 4, 70,000 patients are hospitalized and more than 5,000 patients die annually due to asthma.[3] Asthma is a global problem, many synthetic drugs are used to treat acute symptoms of asthma, but they are not completely safe for long term use. Hence search has been started once again to look back to traditional medicine which can be used to treat asthma. Ayurveda and other Indian literature mention the use of plants treatment for various human ailments.[4]

Ailanthus excelsa (Roxb.) is a tree belonging to family Simaroubaceae, indigenous to Central and Southern India. Commonly it is known as plant of Heaven.[5]

The traditional claims, phytochemical investigations and pharmacological evaluation and some ayurvedic formulations provide the backbone to make this tree as a plant of Heaven.

MATERIALS AND METHODS

Tissue Preparation: Isolated adult goat trachea and chicken tissue was obtained from slaughter house. Trachea was collected in the ice cold oxygenated Krebs' solution.

Plant Material: Leaves of *Ailanthus excelsa* were collected in the Month of August from the agricultural fields of Tirunelveli district, Tamilnadu. The plant was identified and leaves of *Ailanthus excelsa* were authenticated and confirmed from Dr.V.Chelladurai, Research Officer, Botany, C.C.R.A.S. (Retired), Govt. Of India by compairing morphological features (leaf and stem arrangement, flower /inflorescence arrangement, fruit and seed morphology etc.). The collected plant material was shade dried to retain its vital phytoconstituents and then subjected to size reduction for further extraction process.

Preparation of Methanolic extract by Cold maceration (at room temperature) Method

Cold Maceration Extraction Method: In this process, the coarsely powdered plant material of *Ailanthus excelsa* leaves is extracted by placing the powder in a stoppered container with the solvent methanol and allowed to stand at room temperature for a different period of time (6h, 12h, 24h, 48h) with frequent agitation until the soluble matter has dissolved. The mixture then is strained, the marc (the damp solid material) is pressed, and the combined liquid is clarified by filtration or decantation after standing. All the extract was evaporated to dryness, weighed and stored for future use.

The Methanolic extract of *Ailanthus excelsa* (MAE) leaves was subjected to the following investigation,

1. Antiasthmatic activity using Goat Tracheal Chain Preparation.

Isolated Goat Tracheal Chain Preparation

Goat trachea was brought from slaughter house was cut into individual ring and tied together in series to form chain. It was suspended in bath containing Krebs's solution maintained at 37±1^{0}C stream of CO2 in O2 was bubbled through the organ tube. One end was tied to aerator tube and other attached to isotonic frontal lever to Kymograph paper on Sherrington rotating drum. The tissue was allowed to equilibrate for 45 min under a load of 1g. The contractile responses of tracheal strip to histamine (100 µg/ml) with doses of 0.1ml, 0.2ml, 0.4ml, 0.8ml and 1.6ml were recorded in absence and presence of methanolic extract of Ailanthus excelsa (Roxb.) MAE) by using Sherrington' Recording Drum with a frontal writing lever. Similar concentration effect curve was taken in presence of standard drug Chlorpheniramine Maleate (1 µg/ml). The height of response curve was measured to express percentage inhibition.[6,7,8]

Statistical Analysis: The results of various studies were expressed as mean ± SEM and analyzed statistically using one way ANOVA followed Dunnett's test to find out the level of significance. Data were considered statistically significant at minimum level of $p < 0.01$.

RESULTS AND DISCUSSION

Table 1: Effect of Methanolic Extract of Leaves of *Ailanthus excelsa* (Roxb.) on Histamine Induced Contraction of Isolated Goat Tracheal Chain Preparation.

Dose of Histamine (ml)	Height of DRC (mm)		
	Histamine	CPM + Histamine	MAE + Histamine
0.1	8	4	6
0.2	11	6	7
0.4	15	9	11
0.8	19	11	15
1.6	24	12	17

In the present study, histamine showed maximum contraction while Ailanthus excelsa (Roxb.) significantly inhibited the histamine induced contraction of isolated goat tracheal chain preparation as compared to standard drug Chlorpheniramine Maleate The parallel shift of graph towards right side in histamine concentration-response curves in the presence of increasing concentrations of *Ailanthus excelsa* indicating that there was competitive

antagonism between histamine and *Ailanthus excelsa* for H1 receptors present on the smooth muscle. This contraction of tracheal or bronchial smooth muscle in vitro has often been utilized for the study of contractile /dilator responses of agonists as well as antagonists.[9] This effect may be due to its antihistaminic activity.

CONCLUSION

It can be concluded from present study that the methanolic extract of *Ailanthus excelsa* (Roxb.) leaves possesses significant antihistaminic activity that may be attributed due to H1 antagonistic action. This may be later useful in treatment of allergic disorders like asthma.

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