Anti-histamine Activity of Roots of
*Tephrosia purpurea* L. and *Tephrosia villosa* Pers.

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Objective

*Tephrosia purpurea* L. and *Tephrosia villosa* Pers. (Fabaceae) root extracts have been evaluated for their anti-histamine activity on H1 receptor antagonist on isolated superfused guinea pig ileum by *in vitro* techniques.

Keywords: Anti-histamine, Fabaceae, Antagonist, *In vitro*.

Introduction

Plant of *Tephrosia purpurea* is given as tonic, laxative and anthelmintic to children to purify the blood and as cordial, decoction is given as tonic. Root is bitter chewed to cure colic pain, used in asthma. Juice is mixed with molasses and given for stomach pain, applied on skin eruptions. Powder is smoked for cough, asthma and respiratory diseases, as a paste it is applied on belly to cure dyspepsia. Powdered and boiled in milk is applied on leprosy and wounds (Maheshwari, 2000).

The present study was undertaken to compare the anti-histamine activity of root of *T. purpurea* and *T. villosa*. Histamine is a biogenic amine involved in local immune responses as well as regulating physiological function in the gut and acting as a neurotransmitter (Passani *et al.*, 2004). It is found virtually in all animal body cells. New evidence also indicates that histamine plays an important role in chemotaxis of white blood cells. Histamine is an important mediator of airway smooth muscle contraction, which is mediated via H1 receptors (Chand and Sofia, 1995).

Materials and Methods

Plant Materials

*Tephrosia purpurea* and *Tephrosia villosa* roots were collected in and around Thanjavur and authenticated with the help of local floras. A voucher specimen was deposited at Tamil University Herbarium numbered TUH 277, 278. Roots were collected, dried in shade and used for further studies.

Preparation of Extracts

60 mg portion of both the extracts (50% alcoholic extract of *T. purpurea* and *T. villosa*) were scraped off from the bottom of the container and placed in a mortar and pestle. To this, added 2 ml of distilled water and triturated well. This mixture was then made up with 6 ml of distilled water. This process gave a stock solution of 10 mg/ml. This solution was tested against the guinea pig ileum preparation.
Preparation of Histamine

A stock solution of 5 µg/ml was made with tyrode solution. This concentration was added to the bath and used as a standard drug.

Preparation of Animals

Animals were uniquely identified and kept in their cages for five days prior to dosing for acclimatized to the laboratory conditions. During acclimatization the animals were observed for any ill-health factors for ill-health.

Perfusion Apparatus

In this system the tissues were suspended in a 2 × 20 cm (internal dimensions) water-jacketed chamber with a coarse sintered glass filter disk sealed into the lower portion. A mixture of moisture O$_2$:CO$_2$ (95:5) was delivered by small diameter tubing to the lower portion of the chamber by the aerator (Morgan et al., 1961).

Method

For the preparation of tissues, adult male guinea pigs (460 g; Hartley strain) were killed by a blow to the head and exanguinated. The abdomen region was opened and identified ileo-cecal junction. The lumen of ileum was removed, the intact tissues and rubbed preparations in which the blood had been removed by vigorously rubbing the luminal surface with filter paper. A piece of ileum was excised (approximately 3-4 cm) by using surgical suturing needle tied a thread at each end. One end of the thread was tied to the hook of the aeration tube and the other to frontal writing lever. The ileum was mounted in 30 ml organ bath under a load of 500 mg. The tissues were allowed to equilibrate for 90 min in Tyrode solution (composition in mM): NaCl 139.2, KCl 2.7, CaCl$_2$ 1.8, and MgCl$_2$ 0.49, NaHCO$_3$ 11.9, NaH$_2$PO$_4$ 0.4, glucose 5.5, pH 7.4 and gassed with 5 percent CO$_2$ and 95 percent O$_2$ at 37ºC. During the equilibration period the bath fluid was exchanged every 10 min with fresh Tyrode solution. All protocols were applied to both intact and rubbed preparations (Braunstein et al., 1988).

Results

Histamine Concentration Effect

After the equilibration period, the tissues were contracted with histamine at the dose of 500 ng, when the response reached a plateau, the bath fluid was exchanged for 3 times at 5 min intervals until the preparations returned passively to their initial resting tone of 1, 2 and 4 µg respectively. The tissues were contracted in a dose dependent manner and then the tissue was again washed with tyrode solution when the basal tone was re-established, histamine concentrations were added to the tissue baths in a dose dependent manner. The data presented in Fig. 1 show that the preparation exhibited an increased maximum concentration.

From the extract preparation, 1 mg of extract was added into inner organ bath and allowed it to act for 2 minutes. Then 500 ng of histamine was given into inner organ bath and repeated the procedure by increasing the concentration of the extract from 2 to 8 mg followed by histamine at the dose of 500 ng.

Effect of Root Extracts of T. purpurea and T. villosa

The effect of root extracts of T. purpurea and T. villosa on histamine induced isolated guinea pig ileum is given in Table 1 and Fig. 1. Root extract of T. purpurea showed inhibitory effect in all the doses (viz. 2 mg, 4 mg and 8 mg). However, there is no dose dependent inhibitory effect. Root extract of T. villosa also showed significant inhibitory effect at all the doses used. And it gave dose dependent inhibitory effect. T. villosa root extract at 8 mg concentration gave maximum response.
Fig. 1
Effect of 50% EtOH of roots of *T. purpurea* and *T. villosa* against histamine on isolated ileum
Discussion

The results from pharmacological experiments with 50% alcoholic extracts of roots of *T. purpurea* and *T. villosa* failed to produce maximum response to this contractile agent, histamine. However, this investigation reveals that the samples with partially antagonist activity is an agent which serves to inhibit the release or action of histamine. The 50% alcoholic extract of *T. purpurea* and *T. villosa* can be used to describe any histamine antagonist activity. In guinea pig isolated ileum, preparations have been made by a number of investigations for anti-histamine activity (Goldie et al., 1986 and Farmer et al., 1986). In present study, this investigation reveals that *T. purpurea* and *T. villosa* can be used to describe any histamine antagonist activity.

<table>
<thead>
<tr>
<th>Drug and treatment</th>
<th>Height of the concentration response curve (cm)</th>
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<tbody>
<tr>
<td></td>
<td><em>T. purpurea</em></td>
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<tr>
<td>Histamine (500 ng)</td>
<td>1.3 (repeated 2.6)</td>
</tr>
<tr>
<td>Histamine (1 µg)</td>
<td>2.2</td>
</tr>
<tr>
<td>Histamine (2 µg)</td>
<td>4.4</td>
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<tr>
<td>Histamine (4 µg)</td>
<td>6.1</td>
</tr>
<tr>
<td>Sample (2 mg) + Histamine (500 ng)</td>
<td>1.2</td>
</tr>
<tr>
<td>Sample (4 mg) + Histamine (500 ng)</td>
<td>1.5</td>
</tr>
<tr>
<td>Sample (8 mg) + Histamine (500 ng)</td>
<td>1.4</td>
</tr>
</tbody>
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REFERENCES