A STUDY ON THE LOCAL ANAESTHETIC ACTIVITY OF THE ACETONE EXTRACT OF LYCOPERSICON ESCULENTUM LEAVES

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Shipochliev (1) demonstrated that aqueous extracts of Lycopersicon esculentum (tomato) leaves produce diarrhea in rabbits, guinea pigs and rats on oral administration. He also reported that on intravenous administration the extract produced lethal action on rats. We have already shown (2) that the acetone extract of L. esculentum leaves produced a prolonged fall in dog's blood pressure and completely reversed the heart failure produced by pentobarbitone sodium in dog's heart lung preparation. While working on the isolated gastrocnemius sciatic nerve preparation of frog we observed that when the extract came in contact with the nerve there was progressive fall in the amplitude of muscle contraction induced by the sciatic nerve stimulation. Hence it was thought worthwhile to study the local anaesthetic activity of this extract in detail.

Nerve block: The effect of the extract was studied on the isolated gastrocnemius sciatic nerve preparation of frog. The nerve was stimulated through an induction coil and single muscle twitches were obtained every two minutes. A cotton swab soaked in 100% w/v of the acetone extract of dry leaves was placed on the nerve and effect on muscle contraction noted. This was compared with the effect obtained with 2% solution of procaine.

Infiltration anaesthesia: The activity of the extract was determined by intradermal wheal method of Bulbring and Wajda (3) on guinea pigs. 0.25 ml of different concentrations was injected intradermally in two areas each on back and front. These areas of 4-5 cm were shaved 24 hours earlier. Each dose was injected in four different areas of three guinea pigs. 0.25 ml of saline was injected in the fifth area which served as
control. Reaction to pin pricks was taken as criterion for the presence of sensations. Six pricks were applied at an interval of 2-3 seconds every five minutes. The total number of pricks to which guinea pigs did not respond were counted and the percentage protection found out and ED-50 was calculated.

Surface anaesthesia: At neutral pH different concentrations of the extract were instilled in the conjunctival sac of the right eye of the rabbit and the left served as control. Each concentration was tested in three rabbits. Every 5 minutes the cornea was touched with a cotton wick and absence of winking reflex was taken as the criterion for the surface anaesthetic activity. All these negative responses over a period of 30 minutes were added, percent protection noted and ED-50 of the extract was calculated. This was compared with the ED-50 of the standard surface anaesthetic, cocaine.

### Table I. Local anaesthetic activity of the acetone extract of *Lycopersicon esculentum* leaves.

<table>
<thead>
<tr>
<th>Drugs</th>
<th>Infiltration anaesthesia (Guinea pig)</th>
<th>Surface anaesthesia (Rabbit's cornea)</th>
<th>Time to produce 80% block (min)</th>
<th>Time of recovery (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ED-50 ± S.E. % solution</td>
<td>Recovery (min)</td>
<td>ED-50 ± S.E. % solution</td>
<td>Recovery (min)</td>
</tr>
<tr>
<td>Extract</td>
<td>52.0 ± 11*</td>
<td>60-90</td>
<td>60.0 ± 13*</td>
<td>30-40</td>
</tr>
<tr>
<td>Procaine</td>
<td>0.49 ± 0.14</td>
<td>60-90</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Cocaine</td>
<td>–</td>
<td>–</td>
<td>0.3 ± 0.09</td>
<td>30-60</td>
</tr>
</tbody>
</table>

*In terms of the weight of dry leaves.

As shown in Table 1 the acetone extract of *L. esculentum* leaves has been found to possess potent local anaesthetic activity in all the three types of anaesthetic tests compared to the standard local anaesthetic agents procaine and cocaine.

In the present study the acetone extract of the leaves of *L. esculentum* was found to possess marked local anaesthetic activity. This was found to possess nerve block, infiltration and surface anaesthetic activity as tested on frog's gastrocnemius sciatic nerve preparation, intradermal wheal method on guinea pig and on rabbit's cornea. The active principle of tomato leaves has been identified to be alkaloid tomatine (1). Local anaesthetic activity, however, does not seem to be due to tomatine as tomatine is not soluble in acetone. In our previous studies (3) we have separated seven fractions from the acetone extract by descending paper chromatography and only the fraction R6 with RF value of 0.52 was found to be pharmacologically active. This fraction again should not contain tomatine as tomatine can not be separated by descending paper chromatography.

### REFERENCES