to isolate and identify the hypoglycemic principles and to elucidate their exact mechanism of action.

HYPOGLYCAEMIC ACTIVITY OF AQUEOUS ROOT EXTRACT OF
GLOCHIDION ZEYLANICUM (Gaertn)

8.1 INTRODUCTION
The plant *Glochidion Zeylanicum* (Euphorbiaceae) commonly named as Neerummamidi in Telugu, commonly grown in slopes and altitudes of forests in all over Chittoor District, A.P., India, and abundant in kapalitheertham area (Tirumala). It plays an important role in curing diseases like stomachic, anticancer, refrigerant Dr K Madhavachetty et al, 2008. Although there are reports on the medicinal uses of this plant, there is no report found on its antidiabetic activity on roots.

Therefore, it was thought worthwhile to evaluate its antidiabetic activity.

8.2 EXPERIMENTAL

The roots of *Glochidion Zeylanicum* were collected in the month of July, 2008 from kapalitheertham forest, A.P., India. The plant was identified by Dr. K. Madhavachetty, Asst. Professor, Botany Department, Sri Venkateswara University, Tirupati, A.P., India.

The roots were dried for a period of thirty days. It was powdered with mechanical grinder and then 100gm of the powder was macerated in 300ml of distilled water in a conical flask for 72hr. The liquid filtrate was concentrated in *vacuo* at 40°C. The yield was 3%. The dried extract was formulated as suspension in distilled water using 2% Tween 80 as suspending agent. The extract was chemically tested for the presence of different chemical constituents using standard methods Trease GE, Evans WC et al, 1983.

Adult albino Wistor rats (150 – 180gm) of either sex were selected for present study. The animals were grouped and housed in polyacrylic cages with not more than six animals per cage and maintained under standard
laboratory conditions. They were allowed access to standard drug pellet diet and water *ad libitum*. Approval for animal studies were obtained from the ethical committee.

**Effect of the Glochidion Zeylanicum extract on normal blood glucose level in rats (n=6):**

To evaluate hypoglycaemic activity in normal blood glucose level, the rats were divided into four groups of six each. I group of rats served as control and received (10 ml/kg) of 2% Tween 80 p.o aqueous solution. II and III group of rats received 200 and 400 mg/kg p.o of extract of *Glochidion Zeylanicum* respectively. IV group of rats received a standard drug Glybenclamide (10mg/kg) for assessing comparative pharmacological significance. The animals were fasted for 18 hours prior to the experiment. The blood samples were collected by tail tipping method after treatments at 0hr, 1hr, 3hr, 6hr and 12hr. The blood glucose level (BGL) was determined by glucometer Yanarday R, et al, 1998 and results were analyzed by applying statistical method.

**Effect of the Glochidion Zeylanicum extract on alloxan – induced diabetic rats:**

To evaluate antidiabetic activity of *Glochidion Zeylanicum* extract in diabetic rats. They were made diabetic by injecting alloxan monohydrate 150
mg/kg body weight dissolved in normal saline and injected intraperitoneally (WHO, 1980). After 1 hr of alloxan administration the animals were fed on standard pellets and water *ad libitum*. The experimental animals were fasted 18 hr before alloxan administration. After 72 hr of alloxan treatments, the rats showing BGL above 200 mg/dl were selected for the study and divided into 4 groups of six rats each. I group of rats served as control and received (10 ml/kg) of 2% tween 80 aqueous solution. II and III group rats received 200 mg and 400 mg/kg p.o of *Glochidion Zeylanicum* extract respectively. IV group of rats received a standard drug Glybenclamide (10 mg/kg) for assessing comparative pharmacological significance. The blood samples were collected by tail tipping method after treatments at 0 hr, 1 hr, 3 hr, 6 hr and 12 hr. Blood glucose level (BGL) was monitored by glucometer and the results were analyzed by applying statistical method.

**Statistical Analysis:**

Results are expressed as mean ± SD and the results were analyzed by Dunnett multiple comparisons test *versus* control, *P* < 0.05 implies significant (Woodson et al, 1987) and were given in Table I5 and Table 16.

### 8.3 RESULTS

**Effect on normal blood glucose level:**

The blood glucose lowering efficacy of the extract was noticed in normal rats for 24 hr after oral treatment of all the dose levels (200 and 400 mg/kg).
The extract reduced the blood glucose level significantly ($P < 0.05$) after 1.5hr of oral administration when compared to control group. It was also noted that the blood glucose lowering capacity persisted upto 24hr after treatment by showing more significant activity ($P < 0.01$). The effect was comparable to that of the effect produced by the standard drug Glibenclamide 10mg. / Kg.

**Table 15:**

The effect of *Glochidion Zeylanicum* extract on normal blood glucose level in rats ($n=6$).
<table>
<thead>
<tr>
<th>Time Interval (in hrs)</th>
<th>Control (I Group)</th>
<th>Dose (II Group)</th>
<th>Dose (III Group)</th>
<th>Standard (IV Group)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10ml/Kg.</td>
<td>200mg/Kg.</td>
<td>400mg/Kg.</td>
<td>10mg/Kg.</td>
</tr>
<tr>
<td>0</td>
<td>106.82 ± 4.2</td>
<td>111 ± 5.2</td>
<td>112 ± 5.0</td>
<td>109 ± 4.0</td>
</tr>
<tr>
<td>1</td>
<td>107.97 ± 3.9</td>
<td>99.16 ± 4.0</td>
<td>102.33 ± 4.2</td>
<td>96.00 ± 4.7*</td>
</tr>
<tr>
<td>3</td>
<td>115.60 ± 3.7</td>
<td>97.33 ± 5.0*</td>
<td>87.50 ± 6.2*</td>
<td>85.20 ± 6.7**</td>
</tr>
<tr>
<td>6</td>
<td>113.40 ± 4.4</td>
<td>85.83 ± 4.8*</td>
<td>76.33 ± 5.3**</td>
<td>75.16 ± 4.3**</td>
</tr>
<tr>
<td>12</td>
<td>112.26 ± 3.8</td>
<td>78.33 ± 4.2***</td>
<td>74.50 ± 4.9***</td>
<td>70.20 ± 4.4***</td>
</tr>
</tbody>
</table>

* P < 0.05 Vs control, n = 6 in each group.

** P < 0.01 Vs control, n = 6 in each group.

*** P< .001 Vs control, n = 6 in each group.

Standard : Glybenclamide

Control : 2% Aqueous Tween 80 solution.

**Effect on alloxan induced diabetic rats:**

The extract demonstrated significant hypoglycaemic effect on alloxan induced diabetic rats after 3hr of drug administration and the activity also prolonged upto 12hr. The extract 200mg / Kg., 400mg / Kg doses produced significant activity (P < 0.01) when compared with the control group. The hypoglycemic efficacy was compared to that of standard antidiabetic agent Glybenclamide.

**Table 16:**
The effect of *Glochidion Zeylanicum* extract on blood glucose levels of alloxan induced diabetic rats (n=6).

<table>
<thead>
<tr>
<th>Time Interval (in hrs)</th>
<th>Blood sugar level in mg / dl (mean ± SEM)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control (I Group)</td>
</tr>
<tr>
<td></td>
<td>10ml/Kg.</td>
</tr>
<tr>
<td>0</td>
<td>300.33 ± 3.9</td>
</tr>
<tr>
<td>1</td>
<td>289.50 ± 7.4</td>
</tr>
<tr>
<td>3</td>
<td>219.2 ± 20.5</td>
</tr>
<tr>
<td>6</td>
<td>289.33 ± 4.7</td>
</tr>
<tr>
<td>12</td>
<td>296.67 ± 4.9</td>
</tr>
</tbody>
</table>

* P < 0.01 Vs control, n = 6 in each group
** P < 0.001 Vs control, n = 6 in each group

Standard : Glybenclamide
Control : 2% Aqueous Tween 80 solution

**8.4 DISCUSSION**

The glucose lowering potential exhibited by the extract was more significant and the action is also similar fashion like the standard drug Glybenclamide. The
observation confirms the use of this plant in ethnomedical practice for diabetes management. This study warrants the investigation to isolate and identify the hypoglycaemic principles and to elucidate their exact mechanism of action.