Changes in the Blood Lipid Profile After Administration of Murraya Koenigii Spreng (Curry Leaf) Extracts in the Normal Sprague Dawley Rats

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Abstract
Aqueous and methanol leaf extract of Murraya koenigii were investigated for hypolipidemic effects on male Sprague Dawley rats. The rats were divided into three groups of six animals each. The first group (I) received vehicle alone to serve as control. The second (II) and third (III) groups received aqueous extract (600 mg/kg b.w.) and methanol extract (200 mg/kg b.w.) respectively daily orally for a period of eight weeks. There were no significant changes in lipid profile in group I rats. In groups II and III plasma cholesterol, triglycerides and phospholipids levels were significantly decreased when compared to group I. The decrease in the lipid profile may be due to the constituents present in the leaf which are found to stimulate insulin secretion. The present study therefore suggests that these extracts exert hypolipidemic activities in treated rats.

Introduction
The genus Murraya is a group of aromatic plants, distributed mainly in the tropical and subtropical regions of the world. The species Murraya koenigii is considered to be highly medicinal and finds its place in extensive application in the indigenous system of medicine in many Asian countries (Chopra et al., 1956; Pruthi, 1979). Physiological and pharmacological studies carried out by various workers during the last few decades indicated antidiysenteric, antihelminthic (Duny, 1978), antioxidant (Khan et al., 1997) and antidiabetic (Khan et al., 1995; Senthakumari et al., 1987) properties of this plant.

In the present study, the effect of Murraya koenigii leaves extracts on plasma total cholesterol, triglyceride, phospholipids and total lipid has been studied in normal healthy male Sprague Dawley rats.

Material and Method
Healthy, five month old male rats of Sprague Dawley strain weighing 200-250 gm were used after taking approval from the institutional animal ethics committee. Fresh curry leaves were collected, cleaned, dried and finely powdered. The aqueous and methanol extracts from the powdered leaf were obtained as per the standard procedure (Rupashree, 1999). The rats were divided into three groups (I, II and III) of six each. The group I animals received saline and constituted control group, whereas group II and III animals received aqueous extract (600 mg/kg b.w./day) and methanol extract (200 mg/kg b.w./day) of M. koenigii respectively. The rats were provided basal diet comprising commercial rat chow and water ad lib. for eight weeks. After overnight fasting the blood samples from groups I, II and III were drawn from the retro-orbital venous plexus on days 0, 14, 28, 43 and 58 and analysed for plasma total cholesterol, triglyceride (Footsati and Prencipe et al., 1982), phospholipids (Ackermann and Toro, 1963) and total lipid (Levinson, 1969). The changes in the lipid

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levels of each group were statistically analysed by applying analysis of variance with level of significance as P<0.05 (Snedecor and Cochran, 1976).

RESULTS AND DISCUSSION

There was no significant changes in the lipid profile of group I rats. In groups II and III, plasma total cholesterol, triglyceride, phospholipids and total lipid levels were significantly reduced when compared to group I. No significant difference was noticed in these parameters when compared with Group I and II rats (Table 1).

Murraya koenigii leaves have been reported to contain tryptophan, vitamin C, lysine and arginine as water soluble constituents and essential oils as well as β-carotene as methanol soluble constituents and niacin that is soluble both in water and methanol (Pruthi, 1979; Kumar et al., 1999). It is probable that M. koenigii extracts feeding may have a direct impact on insulin secretion as the components are known to stimulate its secretion (Berne and Levy, 1988; Bhat, 1995; Satyanarayana, 1999). Insulin is found to cause an increase in storage and decrease in release of lipids into circulation (Zammit, 1996).

Plasma cholesterol, triglycerides and total lipid showed a tendency to decrease on day 28, while phospholipids on day 43 in groups II and III.

A decrease in the plasma total cholesterol due to feeding of M. koenigii extracts is in accordance with the previous study (Khan et al., 1998). The possible ways in which a substance can exert cholesterol lowering effect are (a) inhibitory effect on cellular cholesterol biosynthesis (b) increase in the excretion of faecal bile acids and (c) depletion of cholesterol stores in liver.

The decrease in triglycerides concentration upon feeding of M. koenigii extracts can be related to suppressed production of hepatic lipogenesis or due to early clearance of plasma triglycerides in peripheral tissues by lipase on account of increased peripheral action.

Table 1. Plasma lipid mean values (± S.E.) in rats given saline, aqueous and methanol extracts of Murraya koenigii leaves

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group</th>
<th>Levels of different plasma lipid components (mg/dl) on day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>I</td>
<td>69.40±1.78</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>67.00±1.45</td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>73.20±3.89</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>I</td>
<td>74.40±2.11</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>66.80±4.99</td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>69.60±6.59</td>
</tr>
<tr>
<td>Phospholipids</td>
<td>I</td>
<td>72.80±6.02</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>73.00±4.47</td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>75.00±4.00</td>
</tr>
<tr>
<td>Total lipid</td>
<td>I</td>
<td>218.60±2.12</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>206.80±2.03</td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>219.80±2.40</td>
</tr>
</tbody>
</table>

Group I - Rats (Sprague Dawley) received only saline orally along with basal diet;
Group II and III - Rats orally supplemented with aqueous and methanol extracts of M. koenigii leaves respectively;
*Significant (P<0.05) as compared with control group I.
Following the pattern the total lipids, phospholipids levels was also decreased significantly proving its strong hypolipidemic action.

In conclusion it is evident from the above study that M. koenigii extracts exert hypcholesterolemic, hypotriglyceridemic and hypophospholipidemic effects in the normal Sprague Dawley rats. The hypolipidemic effect thus produced by the extracts of M. koenigii leaves may be due to insulin secretogogue effect of various constituents present in the extract. Hence, further research on this direction is desirable for identifying individual effects of the constituents of M. koenigii leaves.

REFERENCES