ABSTRACT
The effect of ethanolic extract of fruits of Terminalia chebula, given orally at doses 500 mg/kg (Dose-A) & 250 mg/kg (Dose-B) for 30 days. Extract showed significant reduction of serum level of cholesterol and triglycerides in hyperlipidemic rats.

Keywords: Cholesterol, Terminalia chebula, Hypocholesterolemia, Tri Glyceride.

1. INTRODUCTION
Increased plasma lipid level, mainly total cholesterol (TC), triglycerides (TG) and low density lipoproteins (LDL) along with decrease in high density lipoproteins (HDL) are known to cause hyperlipidemia which is core in initiation and progression of atherosclerosis impasse. Therefore, prime consideration in therapy for hyperlipidemia and arteriosclerosis is to enervate the elevated plasma levels of TC, TG and LDL along with increase in HDL lipids levels\(^1\).

*Terminalia chebula* Retz. belonging to the family- Combretaceae, commonly known as harde, is a deciduous tree found throughout the Indian forests and plains. The tree is about 15-25 m. in height and 1.5-2.5 m. in girth. Harde is drupe, brown in color. It is ovate longitudinally wrinkled, 2 to 3.5 cm. Long and 1.3 to 2.5 cm. Broad. Fruit has 5 to 6 ribs. Fruit is astringent, antiseptic, rejuvenative, tonic, anthelmintic and laxative. It is used in chronic ulcer wound, piles and stomatitis\(^2\).

Fruit contains about 30-32% of tannin, free tannic acid, gallic acid and ellagic acid, glucose and sorbitol\(^3\).

2. EXPERIMENTAL
2.1 Plant material
Fruit of *Terminalia chebula* obtained from Yucca enterprises, Mumbai, were authenticated and identified by Dr. A.B. Sheerwani. (Retd. Prof. and Head), Deptt. of Botany, Holkar Science College, Indore. A voucher specimen has been deposited in our laboratory for further reference.

2.2 Preparation of extract
Powdered fruit were soxhlet-extracted with 90% ethanol. The ethanolic extract was evaporated in vacuo and residue (yield: 21.5% w/w). Preliminary phytochemical analysis shows the presence of glycosides, tannins, phenolic compounds and flavonoids\(^4\).

2.3 Chemicals
The concentrate was weighed and the two doses were prepared, *dose A* 500 gm/kg of body weight and *dose B* 250 gm/kg of body weight were prepared. Cholesterol, triglyceride kits were purchased from the authorized dealer. A strip of Stanlip (references standard) was also purchased from the authorized pharmacy.

2.4 Preparation of normal and high fat diet
Along with this normal diet two high fat diets were prepared namely *Diet A* and *Diet B*. *Diet A* contains powdered soybeans chunks, milk powder, egg albumin and salt. *Diet B* contains powdered soybean chunks, milk powder, cheese, vanaspati and salt. The final percentage of each component in the diets was as follows: Carbohydrate 65%, Proteins 15%, Fat (diet A) 18%, (diet B) 22%, salt 2%, fiber 2%\(^5\).
2.5 Animals
Foster rats (150-250g) were obtained from the experimental animal house, School of Life Science, Devi Ahilya University, Indore. They were maintained under standard housing condition (Room temperature 25±2°C and 45-55% RH with 10:14h, L:D cycles). The animals were given standard laboratory feed and water ad libitum. The study was cleared by Animal ethics committee (School of Life Science, Devi Ahilya University, Indore). All the animals received humane care according to criteria outlined in the guide for the care and use of laboratory animals prepared by the national academy of the sciences and published by national institute of health.

Animals were divided into 9 groups of 6 animals each. 1) Control. 2) Diet A. 3) Diet B. 4) Diet A+ std drug, 5) Diet B + std drug, 6) Diet A + extract dose A, 7) Diet A + ext dose B. 8) Diet B + extract dose A. 9) Diet B + extract dose B. Forced oral feeding of the high fat diet that induced hypercholesterolaemia was treated for 30 days. At the end of this period blood samples were collected after fasting overnight. The animals were anesthetized by ether and blood samples were collected with the help of disposable syringe by cardiac puncture.

2.6 Studied activity
Total serum cholesterol estimation
Total serum cholesterol was determined using Cholesterol PAP kit form Beacon Diagnostic Pvt Ltd Navsari

Triglyceride estimation
Triglyceride estimation was done by triglyceride kit using GPO/PAP method, from Crest biosystems, a division of Coral Clinical systems, Goa.

2.7 Statistical analysis
The data expressed as mean ± S.E.M. were analyzed by students t-test. A value of P<0.01 was chosen as the criteria of statistical significance.

3. RESULTS
Reported in Table I.

4. DISCUSSION
In the present study we have investigated the antihyperlipidemic effect of *Terminalia chebula* extract in high fat fed rat. The ethanolic extract of *Terminalia chebula* showed significant hypocholesterolemic activity when orally administered in rats.

Tannins have been reported to increase faecal bile acid excretion, thereby leading to reduction in cholesterol levels. Secondary plant metabolites such as alkaloids and tannins from the extract may be responsible for the antihyperlipidemic activity. The decrease in plasma cholesterol level could be due to inhibition of cholesterol biosynthesis, decreased absorption of dietary cholesterol, reduced level of serum cholesterol and to increased faecal bile acid excretion. It is evident from the results that feeding *Terminalia chebula* extract along with fatty diet for 30 days resulted in less marked cholesterol and triglycerides as compared to the control group i.e. the group maintained on fatty diet (Diet A and B) alone. These results offer pharmacological evidence on the folkloric uses of *Terminalia chebula* fruits for hypocholesterolemia. Thus on the basis of results of the present study, it can be concluded that *Terminalia chebula* have a definite potential as hypocholesterolemic activity. Further research on the fractionation of extract, isolation, purification and characterization of active constituents responsible for the hypocholesterolemic activity and their mechanisms are in progress.

<table>
<thead>
<tr>
<th>Group</th>
<th>Treatment</th>
<th>Cholesterol* in mg/dL</th>
<th>Triglyceride* in mg/dL</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Control</td>
<td>215.1 ± 2.8</td>
<td>117.1 ± 2.5</td>
</tr>
<tr>
<td>II</td>
<td>Diet A</td>
<td>224.4 ± 3.9</td>
<td>148.2 ± 4.1</td>
</tr>
<tr>
<td>III</td>
<td>Diet B</td>
<td>227.8 ± 4.1</td>
<td>151.5 ± 4.6</td>
</tr>
<tr>
<td>IV</td>
<td>Diet A + Std drug</td>
<td>208.4 ± 1.9</td>
<td>113.2 ± 2.1</td>
</tr>
<tr>
<td>V</td>
<td>Diet B + Std drug</td>
<td>209.1 ± 2.2</td>
<td>115.6 ± 2.3</td>
</tr>
<tr>
<td>VI</td>
<td>Diet A + Extract dose A</td>
<td>212.9 ± 2.8</td>
<td>116.5 ± 3.6</td>
</tr>
<tr>
<td>VII</td>
<td>Diet A + Extract dose B</td>
<td>216.2 ± 2.2</td>
<td>114.8 ± 2.5</td>
</tr>
<tr>
<td>VIII</td>
<td>Diet B + Extract dose A</td>
<td>212.6 ± 2.6</td>
<td>120.5 ± 3.1</td>
</tr>
<tr>
<td>IX</td>
<td>Diet B + Extract dose B</td>
<td>219.4 ± 3.7</td>
<td>122.6 ± 3.6</td>
</tr>
</tbody>
</table>

Absorbance at 517nm (shimadzu 1700)

*Values are mean ± S.E.M. of 6 determinations, student t-test.
REFERENCES


