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Long-term consumption effect of Eurycoma longifolia on Histopathological changes in the vital organs

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Medicinal plants have been used since the time immemorial for medical purposes with respect to benefit mankind.

_Eurycoma longifolia Jack (ELJ)_ is one of the medicinal plant that is well known among various ethnic groups in Asia including Malaysia for enhancing health.\(^1\)

It has been claimed that _ELJ_ improves men’s power during sexual activities.\(^2\)

In the present the _ELJ_ water extracts has a better market value as beverage.\(^3\)

There is a lack of scientific evidence or published data on the efficacy of long-term consumption of _ELJ_ as beverage among men for its vitality energy incited us to evaluate its effect on the safety of body organs.\(^4\)
From nature to consumers
THE OBJECTIVE OF THIS STUDY

The present study is aimed to determine if long term consumption of *Eurycoma longifolia* as beverage could have any deleterious effects on the liver, Pancreas and Kidney tissues in rats.
Materials and methods

✓ The study was conducted after an approval No. IIUM / IACUC Approval / 2014/(3) (16).

✓ Aqueous extract of Eurycoma longifolia Jack (ELJ) was purchased from MKI (M) Sdn. Bhd. No 469700V.

✓ Thirty two Sprague-Dawley male rats were purchased from University Putra Malaysia breeding lab.

✓ Rats are divided into three test groups and control.

✓ Water extract of *ELJ* was given orally and daily for 5 weeks

✓ Rats are sacrificed and full tissue of liver, Pancreas and Kidney tissue obtained for histology assessment.( H & E)
The experiment is designed as shown in the table below.

<table>
<thead>
<tr>
<th>Gp</th>
<th>Rat</th>
<th>Treatment for</th>
<th>Doses intake</th>
<th>Doses duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>8</td>
<td>E. longifolia water extract at 250 mg/kg bw</td>
<td>Orally</td>
<td>Daily for 5 weeks</td>
</tr>
<tr>
<td>II</td>
<td>8</td>
<td>E. longifolia water extract at 500 mg/kg bw</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>8</td>
<td>E. longifolia water extract at 1000 mg/kg bw</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>8</td>
<td>Distilled water (control)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Results
Clinical observations

There was no evidence of infection or mortality among rats was observed in any of the rats before and during the experiment.
Effect of *E. longifolia* on Pancreatic tissue
Fig. 1 Microscopic analysis by H & E (1A, 1B, 1C and 1D) staining of rat pancreatic tissue 5-week post oral administration of *ELJ* water extract. The rats were administrated with low dose (250 mg/kg bw) exhibited normal texture of pancreatic tissue (1A). The medium and high doses (500 mg & 1000 mg/kg, bw) treated groups showing no evidence of defect as well (1B & 1C). The pancreatic tissue structure in all groups appeared as normal as control (1D). There was no sign of degeneration, haemorrhage or fatty changes in all test groups. PD – Pancreatic duct BV-blood vessel IL-islet of Langerhans. Original magnification×20.
Effect of *E. longifolia* On Liver tissue
Fig. 2 Microscopic analysis by H & E (1A, 1B, 1C and 1D) staining of rat liver tissue 5-week post oral administration of ELJ water extract. The rats were administrated with low and medium doses (250 mg & 500 mg / kg bw) exhibited mild fatty changes and haemorrhage and mono nuclear infiltration (1A & 1B). High doses (1000 mg/kg, bw) treated groups showing severe degeneration of hepatocytes and fatty changes, hepatocytes haemorrhage. (1C), compared to control group (1D). Distilled water gavages group (control) showing normal structure of liver tissue. Original magnification × 20. In- inflammation, CV-central vein, PA-portal area, FC-fatty changes and BiD- Bile duct.
Effect of *E. longifolia* On Kidney tissue
Fig. 3  Microscopic analysis by H & E (3A, 3B, 3C and 3D) staining of rat Hepatic tissue 5-week post oral administration of ELJ water extract. The rats were administrated with low and medium doses (250 & 500 mg/kg bw) respectively exhibited normal kidney tissue (3A & 3B). The high doses (1000 mg, bw) ELJ treated groups showing moderate hemorrhage and degeneration of some glomeruli (3D) with comparison to control (3D). Control group was given distilled water shows normal kidney tissue. Original magnification×20.

**Bc**- Bowman’s capsule, **Glom**- Glomerulus **Dt** - Destal tube, **Ct** Collecting tube.
Discussion

✓ The levels of safety for the use of herbal drugs have become the center of attention now.

✓ Various herbal drugs in the market are prescribed for various infirmities *without including* any toxicity profile.

✓ Such prescriptions may cause serious or fatal problems for the patients who are dependent on such traditional medications.

✓ To our knowledge at present there are no available data in the literature on the safety and on the side effects or any deleterious effects of long term use of the products prepared from the ELJ plant.

✓ The study of long-term consumption of ELJ as daily beverage and its potential efficacy on the safety of some vital organs such as liver, Pancreas and Kidney are not fully studied yet.
Conclusion

- In this study we found that use of *Eurycoma longifolia* Jack (ELJ) as beverage or capsules at low doses did not appear to cause any toxic effect on the liver, pancreas and kidney in rats model.

- The long-term daily consumption of *ELJ* when taken in large quantity either as beverage or capsules may cause fatty changes, haemorrhage and hepatocytes degeneration in vital organs in rats model.

- Further studies are recommended to prove the effect of long-term consumption in different animal models.
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Publications


References


QUESTIONS