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

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# INTRODUCTION

- ✓ 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<sup>1</sup>.
- ✓ It has been claimed that **ELJ** improves men's power during sexual activities<sup>2</sup>.
- ✓ In the present the **ELJ** water extracts has a better market value as beverage<sup>3</sup>.
- ✓ 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<sup>4</sup>

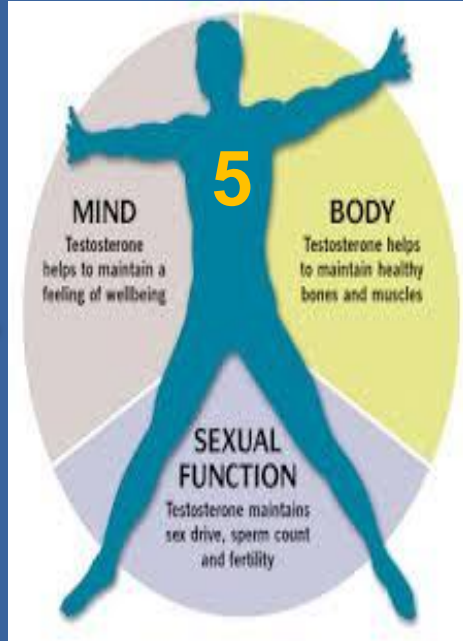
# From nature to consumers

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# 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

Gp	Rat	Treatment for	Doses intake	Doses duration
I	8	E. longifolia water extract at 250 mg/kg bw	Orally	Daily for 5 weeks
II	8	E. longifolia water extract at 500 mg/kg bw	-----	-----
III	8	E. longifolia water extract at 1000 mg/kg bw	-----	-----
IV	8	Distilled water ( control)	-----	-----



# 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*

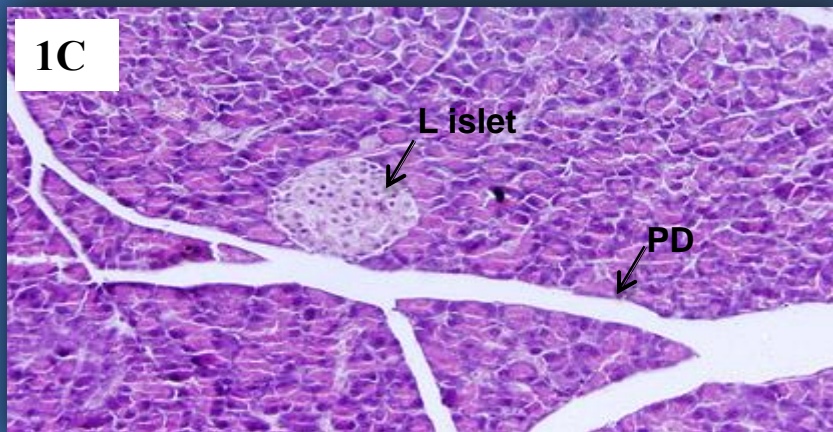
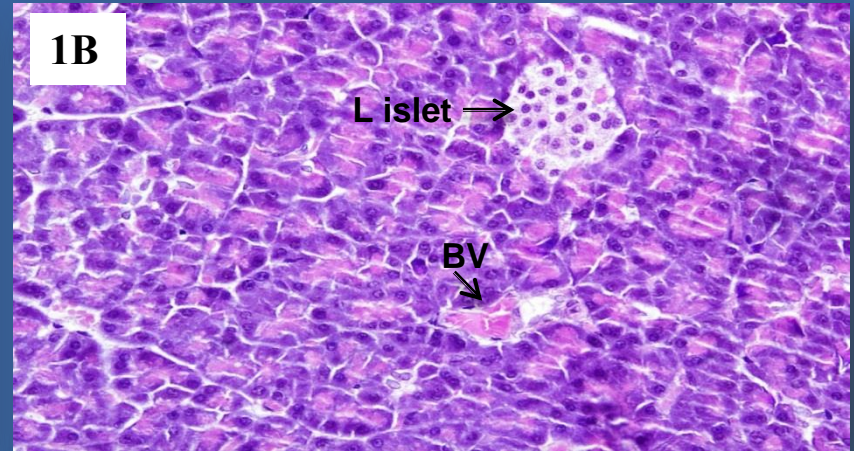
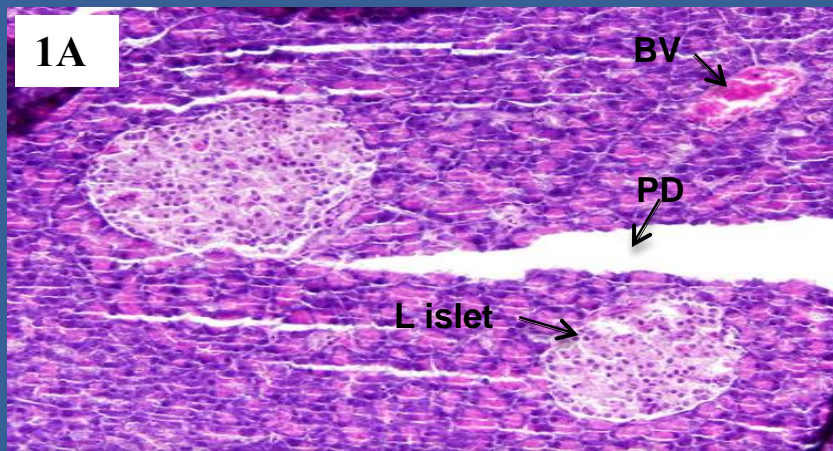


Fig. 1 Microscopic analysis by H & E (1A, 1B, 1C and 1D) staining of rat pancreatic tissue 5-week post oral administration of *ELJ* water extract. The rats were administered with low dose (250 mg/kg bw) exhibited normal texture of pancreatic tissue (1A). The medium and high doses (500 mg & 1000 mg/kg, 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*

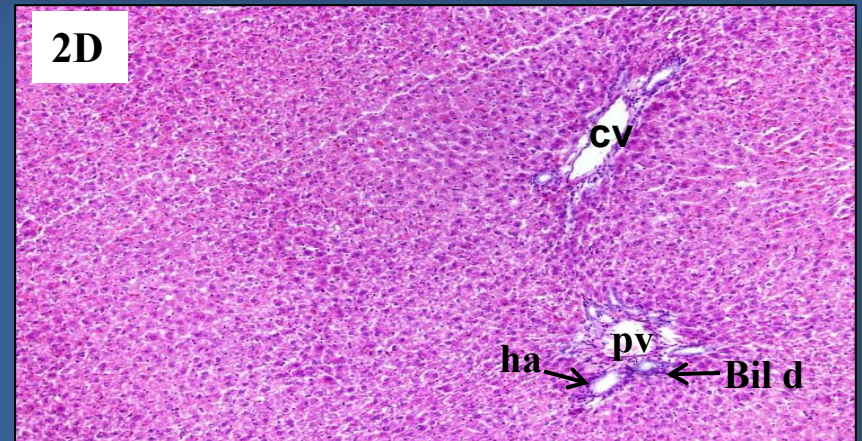
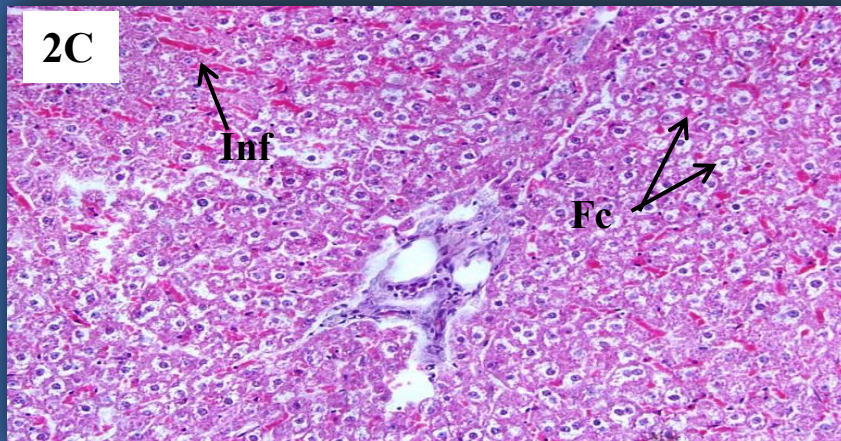
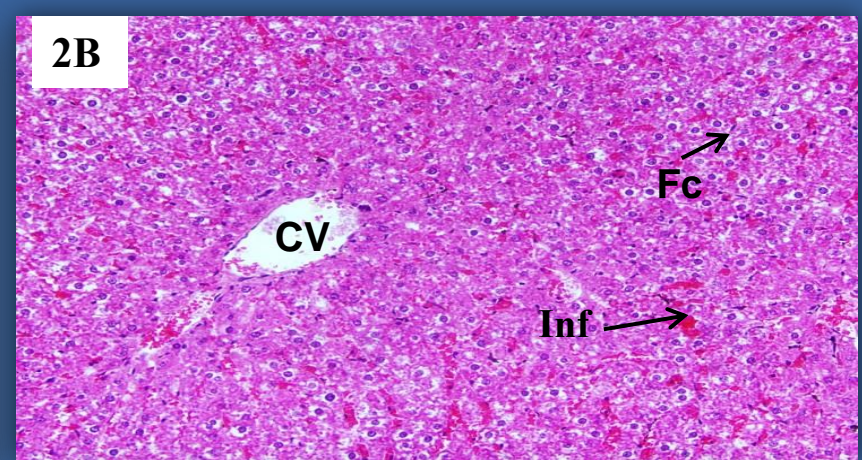
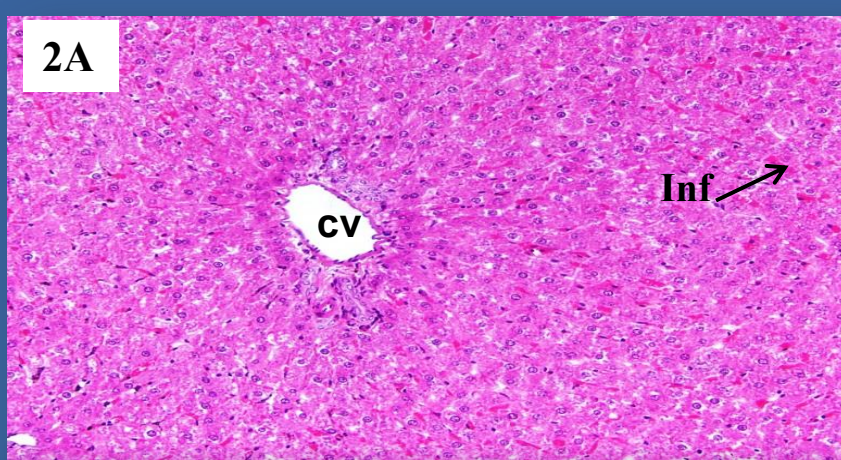


Fig.2 Microscopic analysis by H & E (1A, 1B, 1C and 1D) staining of rat liver tissue 5-week post oral administration of ELJ water extract. The rats were administrated with low and medium doses (250 mg & 500 mg / kg bw) exhibited mild fatty changes and haemorrhage and mono nuclear infiltration (1A & 1B). 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  $\times 20$ . In- inflammation, CV-central vein, PA-portal area, FC-fatty changes and BiD- Bile duct

*Effect of E. longifolia*

*On*

*Kidney tissue*

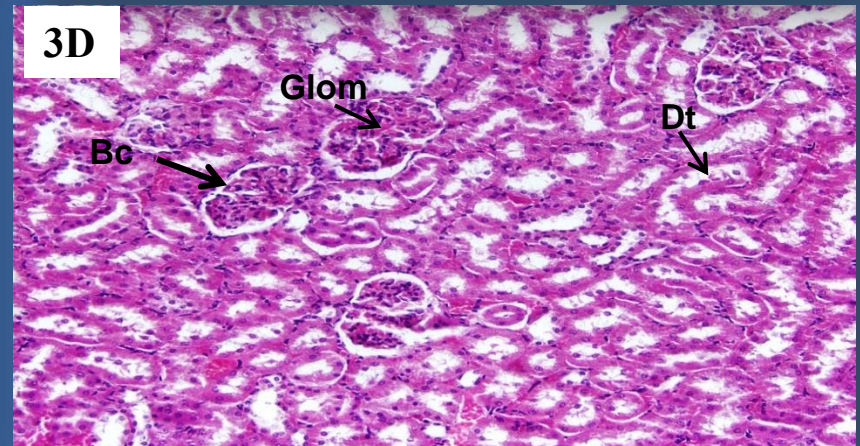
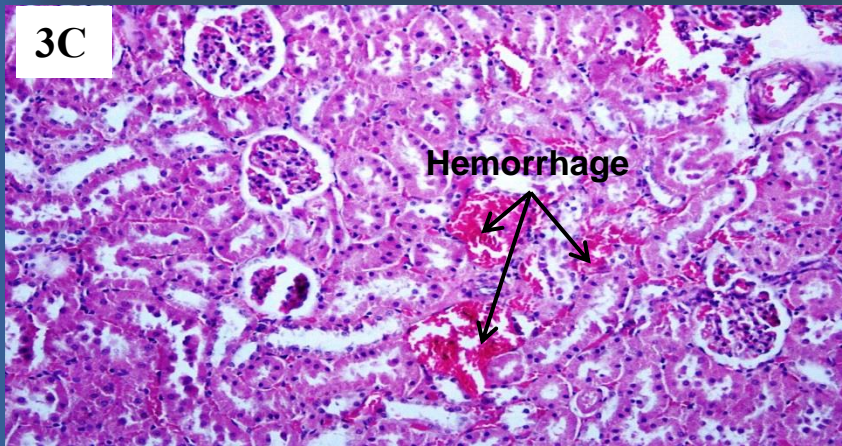
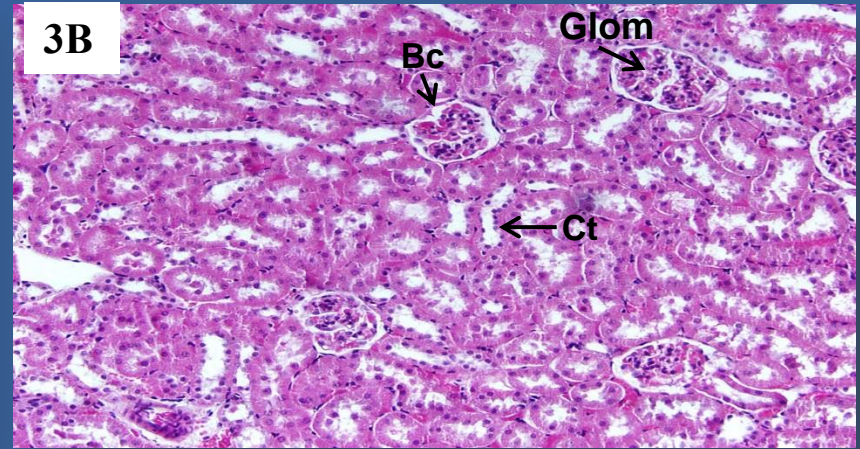
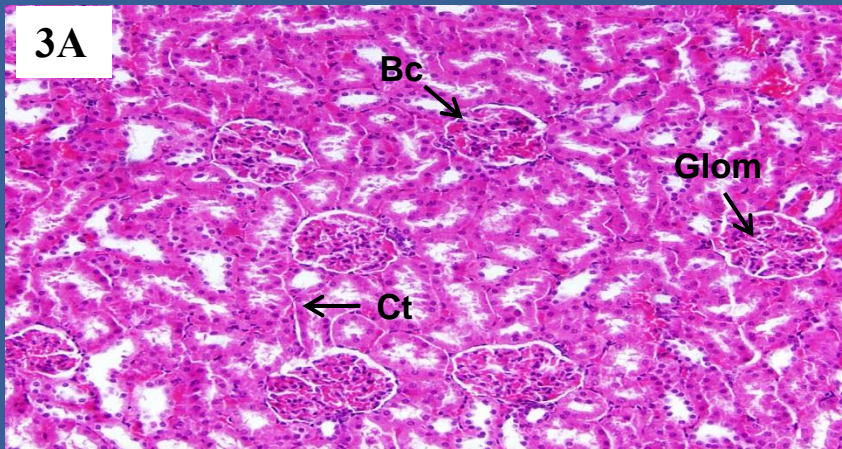


Fig. 3 Microscopic analysis by H & E (3A, 3B, 3C and 3D) staining of rat Hepatic tissue 5-week post oral administration of ELJ water extract. The rats were administrated with low and medium doses (250 & 500 mg/kg bw) respectively exhibited normal kidney tissue (3A & 3B). The high doses (1000 mg, bw) 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  $\times 20$ .

**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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Thank must be given to brother .....

# Publications

- ✓ **Hamoud Hussein Alfaqeh** and Qamar Uddin Ahmad **2013**. Effect of long-term use of Eurycoma Longifolia Jack on the pancreas in rats: Histological assessment. Journal of Regenerative Research 2(2), 22-25.
- ✓ **Hamoud Al Faqeh**, Bin Mohamad Yahya Nor Hamdan, Hui Cheng Chen, Bin Saim Aminuddin, Bt Hj Idrus Ruszymah. **2012**. The potential of intra-articular injection of chondrogenic-induced bone marrow stemcells to retard the progression of osteoarthritis in a sheep model. Journal of Experimental Gerontology 47, 458–464.
- ✓ **Hamoud Hussein Al-Faqeh** et al **2011**. The effect of eurycoma longifolia jack (tongkat ali) on carbon tetrachloride -induced liver damage in rats. Malay J Pharm Sci, Vol. 8, No. 2.
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1. Kuo PC, Shi LS, Damu AG, Su CR, Huang CH, Ke CH, *et al.* Cytotoxic and antimalarial  $\beta$ -carboline alkaloids from the roots of *Eurycoma longifolia*. *J Nat Prod.* 2003; 66: 1324-7.
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# QUESTIONS

**THANK YOU FOR LISTENING**

