



# Toxicological Effects of Aqueous Root Extracts of *Jatropha curcas* (Jc) and *Jatropha gossypifolia* (Jg) in Alloxan-Induced Diabetic rats Liver



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## INTRODUCTION

→ A previous study has demonstrated the anti-diabetic properties of *Jatropha curcas* and *Jatropha gossypifolia* [1] but there is need to guarantee safety on their use.

→ Reports on investigations carried out on medicinal plants show that they could cause damage to vital organs of the body even when considered safe for consumption[2].

→ In the present study, investigation was carried out on the effects of administration of concentrated aqueous extract of Jc, Jg and mixture on the histology of the liver and some biochemical indices of hepatic function.



Images of leaves of Jc and Jg

Images of roots of Jc and Jg

## MATERIALS AND METHODS

Preparation of the extract using by Yakubu *et al.* (2005)

% yield = 10.50%

Dosage administered: 450mg/kg body weight

**Grouping and Treatment of Animals**  
After 24 hours of alloxan injection, when diabetes has set in, animals in the various groups were treated as follows:- **Group1**:- Non-diabetic rats

on sterile distilled water (Control);

**Group2**:- Diabetic rats on 450 mg/kg b.wt. aqueous extract of root of *J. curcas* (Jc450); **Group3**:- Diabetic rats on 450 mg/kg b.wt. aqueous extract of root of *J. gossypifolia* (Jg450); **Group4**:- Diabetic rats on 450 mg/kg b.wt. aqueous extracts of mixture of *J. curcas* and *J. gossypifolia* (M450).

Table 1 : Various Biochemical Analysis Carried out

|    | ANALYSIS                                                   | METHOD/ REFERENCE                                     |
|----|------------------------------------------------------------|-------------------------------------------------------|
| 1. | Total Protein                                              | Biuret reaction method (Gornall <i>et al.</i> , 1949) |
| 2. | Serum Albumin                                              | Doumas <i>et al.</i> , 1971                           |
| 3. | Globulin                                                   |                                                       |
| 4. | Gamma glutamyl tranferase (GGT) activity (serum and liver) | Method of Szasz (1969)                                |
| 5. | Alkaline phosphatase (ALP) activity (serum and liver)      | Wright <i>et al.</i> , 1972                           |
| 6. | Alanine amino transferase (ALT) (serum and liver)          | Reitman and Frankel, 1957                             |
| 7. | Aspsrtate amino transferase (AST) (serum and liver)        | Reitman and Frankel, 1957                             |
| 8. | Histological studies                                       | Krause, 2001                                          |

## RESULTS

Table 2: Effects of 450mg/kg body weight aqueous extracts of roots of Jc, Jg and mixture on serum protein profiles in alloxan-induced diabetic rats

| Group  | Total Protein (mg/dl)    | Albumin (mg/dl)         | Globulin (mg/dl)        |
|--------|--------------------------|-------------------------|-------------------------|
| NDDW   | 101.20±1.86 <sup>a</sup> | 39.20±1.04 <sup>a</sup> | 62.00±1.58 <sup>a</sup> |
| DJc450 | 75.00±2.31 <sup>b</sup>  | 32.90±0.56 <sup>b</sup> | 43.00±1.61 <sup>b</sup> |
| DJg450 | 85.60±0.71 <sup>c</sup>  | 35.50±0.72 <sup>c</sup> | 50.10±1.58 <sup>c</sup> |
| DM450  | 78.50±1.81 <sup>b</sup>  | 37.00±0.56 <sup>d</sup> | 41.50±1.80 <sup>a</sup> |

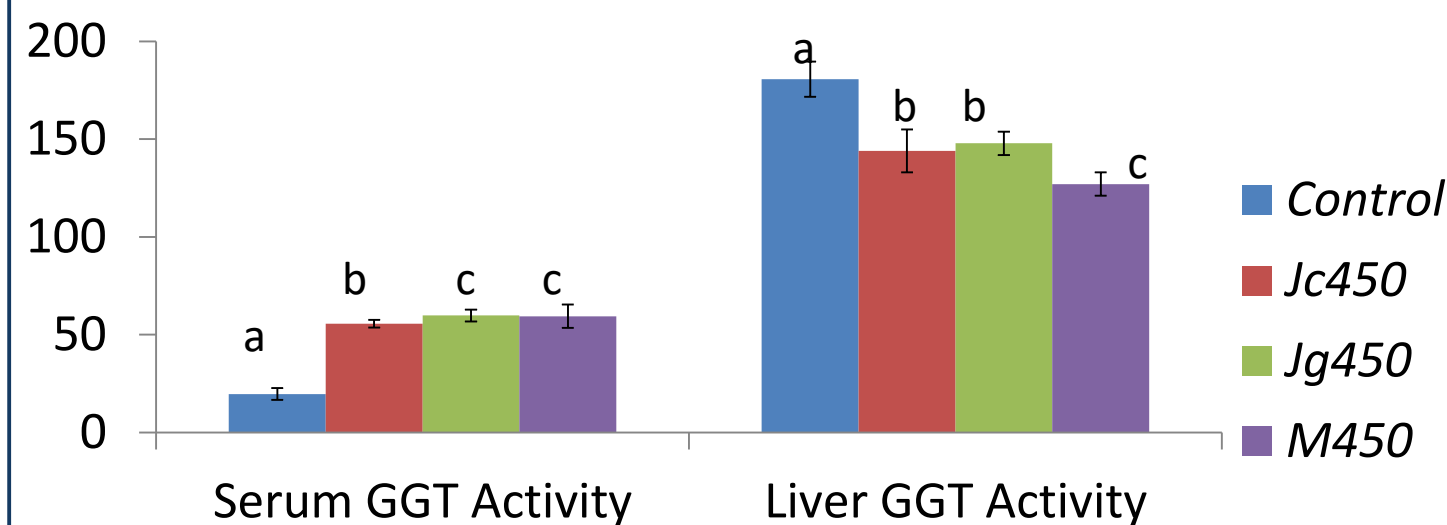


Fig 1: Effects of Jc, Jg and Mixture on serum and liver gamma glutamyl tranferase activities of alloxan-induced diabetic rats

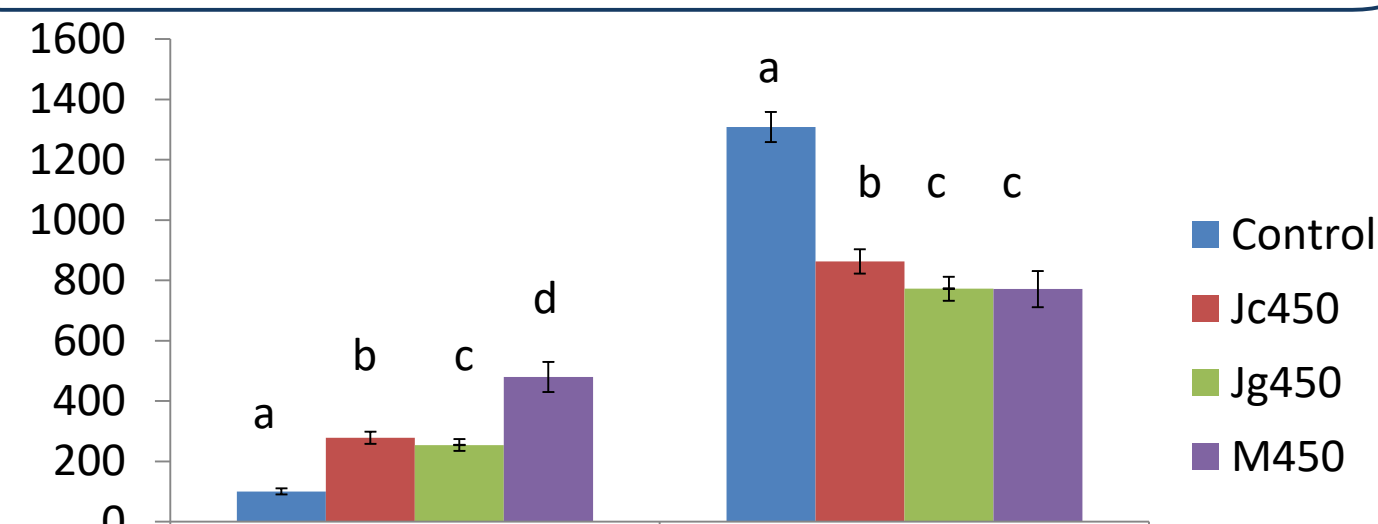


Fig 2: Effects of Jc, Jg and their mixture on alkaline phosphatase activity in the serum and liver of alloxan-induced diabetic rats

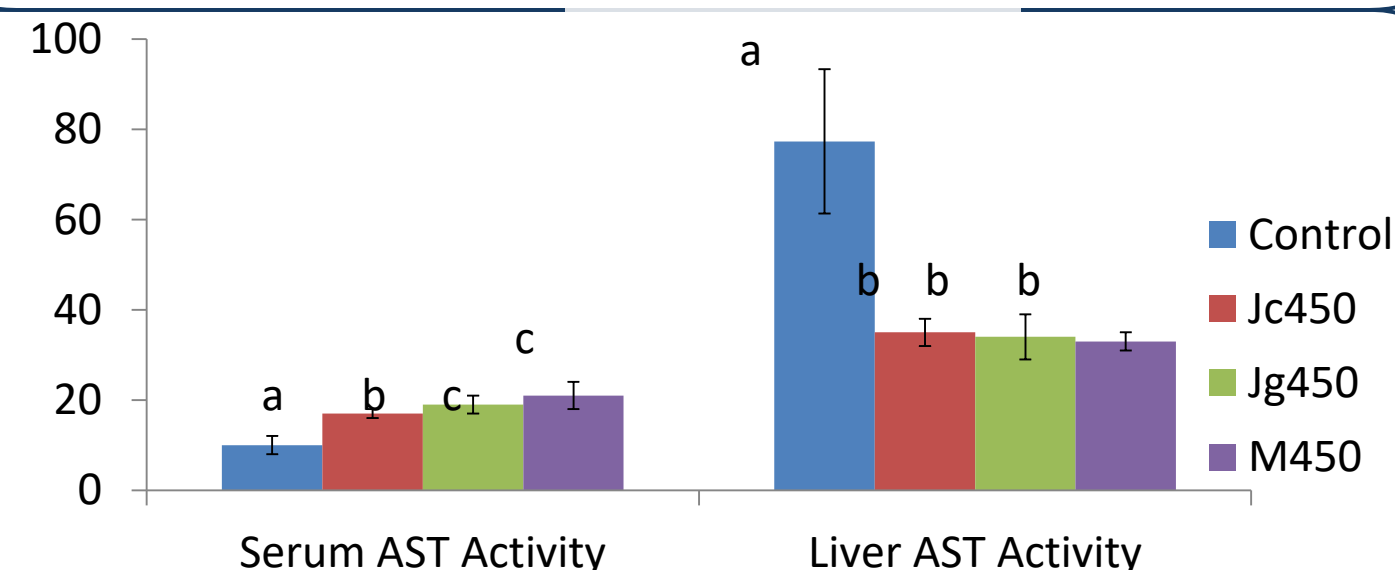


Fig 3: Effects of Jc, Jg and mixture on aspartate aminotransferase activity in the serum and liver of alloxan-induced diabetic rats

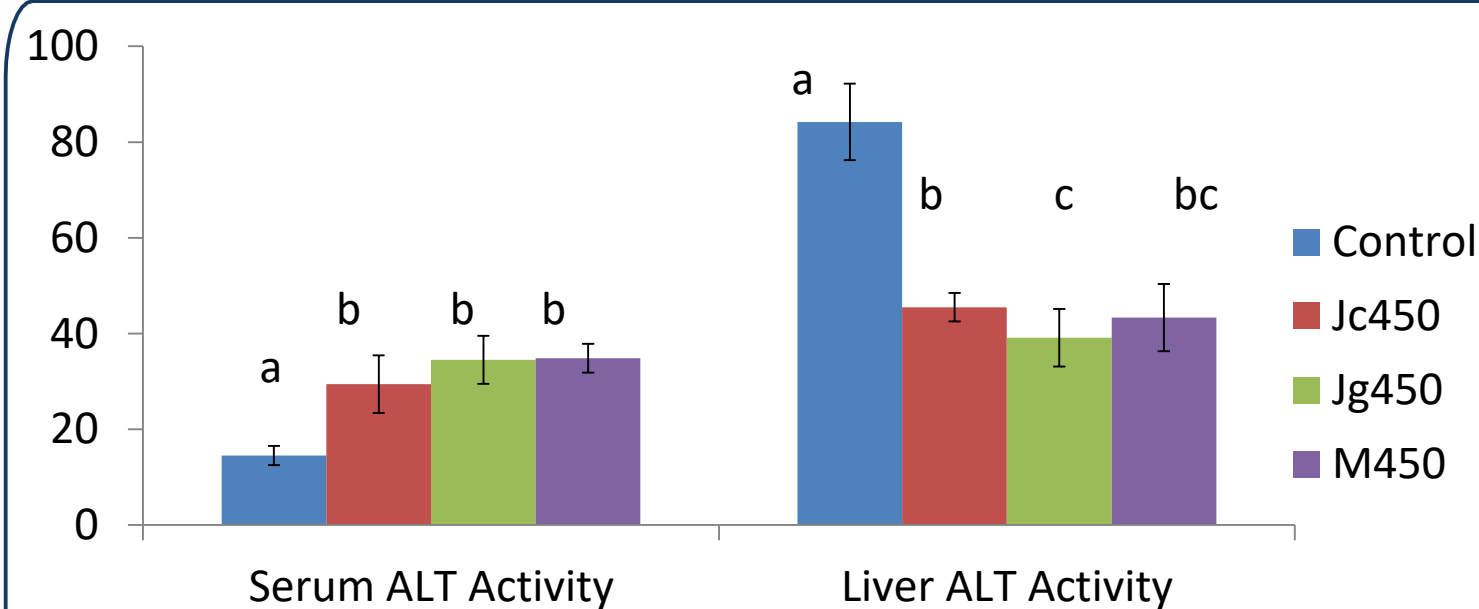


Fig 4: Effects of Jc, Jg and mixture on alanine aminotransferase activity in serum and liver of Alloxan-induced diabetic rats



Photomicrograph of the liver with (a) (NDDW) normal architecture (b) (Jc450) slight degeneration (c) (Jg450) slight degeneration and hyperchromic (d) (M450) severe degeneration at cellular level

## DISCUSSION

• Levels of the enzymes not maintained in the liver in all groups → administered extract has membrane labilizing effect on the hepatocyte [3].

## CONCLUSION

The present work suggest that concentrated aqueous extracts of *Jatropha curcas*, *Jatropha gossypifolia* and their mixture may affect normal liver function in rats. Thus the extracts should be taken with caution.

1. Aladodo *et al.*, 2017. Iranian Journal of Tox. 11 (1) pp 11;

2. Ukoha U. U., Mbagwu S. I., Ndukwe G. U. and Obiagboso C. (2015). <http://dx.doi.org/10.1155/2015/486510>;

3. Adesokan *et al.*, 2010. Sierra Leone Journal of Biomedical Research Vol. 1 (1) pp. 33-37, July, 2009.