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Evaluation Of Hepatoprotective Activity Of Alcoholic And Aqueous Extracts Of Bassia Latifolia Roxb Bark In Rats.

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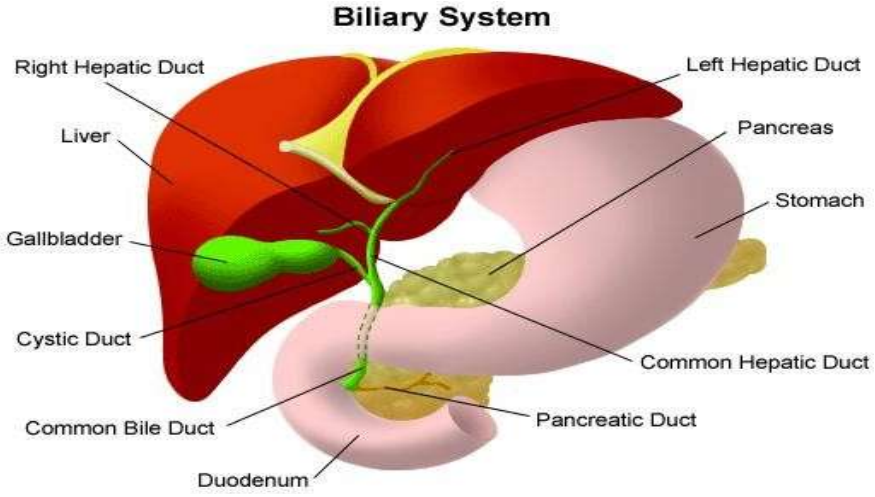
I. INTRODUCTION

- The liver is a vital organ in the body and is primarily responsible for the metabolism of endogenous and exogenous agents.
- It plays an important role in drug elimination and detoxification and liver may be damaged by xenobiotic, alcohol consumption, malnutrition, infection, etc.
- Hepatotoxicity is defined as injury to the liver that is associated with impaired liver function caused by exposure to a drug or another non-infectious agent.

HISTOLOGY OF LIVER



LIVER DAMAGES

LIVER DISEASES

- HEPATIC FAILURE
- CIRRHOSIS
- PORTAL HYPERTENSION
- JAUNDICE
- CHOLESTATIS

PLANT DETAILS

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Botanical Synonyms
Maduraindica,
Ban mahuva,
Kansan,
Mahuda,
Jangli moha,
doddippe.

Common name: Butter Tree, Mahua, Indian Butter Tree.

BASSIA LATIFOLIA

Taxonomical classification
Kingdom Plantae
PlantsSubkingdom Tracheobionta
VascularplantsSuperdivision Spermatophyta

Seed plantsDivision Magnoliophyta
Flowering plantsClass Magnoliopsida
DicotyledonsSubclass Dilleniidae
Order Ebenales
Family Sapotaceae
Sapodilla familyGenus Madhuca Buch.-Ham. ex J.F. Gmel.
Madhuca Species Madhuca longifolia (J. Konig) J.F. Macbr.

Chemical constituents

Part	Chemical
Bark	Triterpenoids
Leaves	Glucosidic saponin
Flowers	Sugar, cellulose, aluminous substance, ash, water Enzymes and yeast
Seeds	Fat, tannin, extractive matter, saponin, albumen, gum, starch, mucilage and ash 50-55 % fatty oil
Juice	Coutchouc, tannin, starch, calcium oxalate, resin, formic acid, acetic acid and ash
Plant	Ethyl cinnamate, mowrin
Ash	Silicic phosphoric acid, sulphuric acid, lime, iron, potash and traces of soda

Uses
- To cure biliousness, congestion of liver, ulcers, and fractures
- An aphrodisiacand used in ear complaints
- In bronchitis
- For expelling worms from the body,
- cures orchitis

Aim and objective
- The main objectives of the proposed work are to evaluate hepatoprotective activity of B.

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latifolia in different models of experimental animals, rats.

- The present work was planned with the following objectives:
- To prepare alcoholic AEBBL and aqueous AQEBBL extracts with bark powder of B. latifolia
- To assess the acute toxicity of bark extracts AEBBL and AQEBBL of B. latifoliausing mice by following Up and Down method of OECD Guidelines No.425.
- To assess the hepatoprotective activity of AEBBL and AQEBBL against Paracetamol (PCM), Ethanol (ALC) and ranitidine (RTD) induced hepatotoxicity in rats.

II. MATERIALS AND METHODS

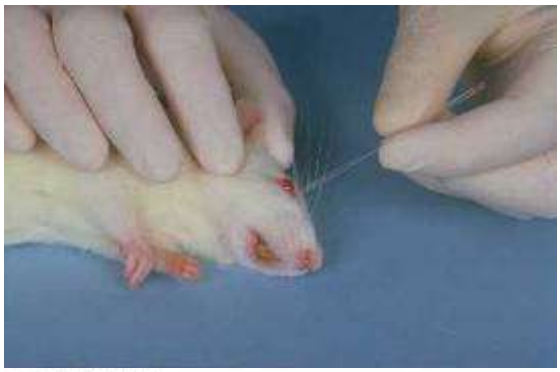
Chemicals:

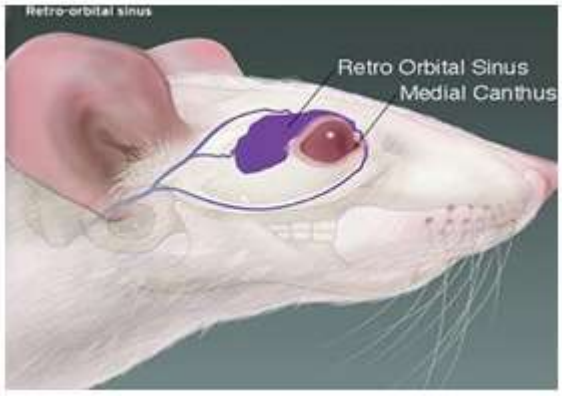
- All the chemicals and reagents used for this study were of analytical grade.
- Silymarin was procured from Micro labs (Solem, India).
- Biochemical estimation kits for SGOT, SGPT, ALP, Total bilirubin and Total Protein, (AUTOSPAN, India).

Animals:

- Albino rats (Wistar strain) of either sex weighing between 150-200 g and Albino mice of either sex (16-20 g) were procured from National Centre for Laboratory Animal Sciences, C/0 Sri Venkateswara Enterprises, Bengaluru for experimental purpose. All the animals were acclimatized for 7 days under standard husbandry condition. i.e;
- Room temperature - 26 ± 2^0
- Relative humidity - 45-55%
- Light/ dark cycle - 12:12 h

Blood collection technique
Retro Orbital collection





Experimental Grouping:
Hepatoprotective activity:
Paracetamol induced hepatotoxicity(preventive aspect)
In the CCl_4 induced liver toxicity model, CCl_4 (0.5 ml/kg i.p.) will be administered daily for 14 days to all animals except group 1.

Group	Treatment
Group-A	Normal control (vehicle treated, p.o) for 03 days
Group-B	Toxicant Paracetamol 2 gm/Kgdaily, p.o for 03 days
Group-C	Standard Silymarin 100 mg/ kg and after 30 min Paracetamol 2 g/kg both administered p.o once daily for 03 days.
Group-D	AEBBL Low dose (100 mg/Kg) and after 30 min Paracetamol

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	2 g/kg both administered p.o once daily for 03 days
Group-E	AEBBL Medium dose (200 mg/Kg) and after 30 min Paracetamol 2 g/kg both administered p.o once daily for 03 days.
Group-F	AEBBL Higher dose (400 mg/Kg) and after 30 min Paracetamol 2 g/kg both administered p.o once daily for 03 days.
Group-G	AQEBBL Low dose (100 mg/Kg) and after 30 min Paracetamol 2 g/kg both administered p.o once daily for 03 days.
Group-H	AQEBBL Medium dose (200mg/Kg) and after 30 min Paracetamol 2 g/kg both administered p.o once daily for 03 days.

Method 2: Alcohol induced hepatotoxicity(Preventive aspect)
Albino rats weighing between 150-200 g each group containing 6 animals was divided into 9 groups.

Group	Treatment
Group-A	Normal control (vehicle treated p.o) for 25 days
Group-B	Toxicant (alcohol 3.76 g/Kg daily, p.o for 25 day)
Group-C	Standard Silymarin 100 mg/ Kg, and after 30 min alcohol 3.76 g/Kgin Equal volume (half in the morning and half in the evening) once daily, p.o for 25 days.
Group-D	AEBBL Low dose (100 mg/Kg) and after 30 min alcohol 3.76 g/Kg in equal volume (half in the morning and half in the evening) once daily, p.o for 25 days.
Group-E	AEBBL Medium dose (200 mg/Kg) and after 30 min alcohol 3.76 g/Kg in equal volume (half in the morning and half in the evening)once daily, p.o for 25 days.
Group-E	AEBBL Higher dose (4000 mg/Kg) and after 30 min alcohol3.76 g/Kg in equal volume (half in the morning and half in the evening) once daily, p.o for 25 days.

Method 3:Ranitidine induced hepatotoxicity

Group A	-	Normal control (vehicle treated p.o)
Group B	-	Toxicant (Ranitidine 50 mg/Kg daily, i.m)
Group C	-	Standard (Silymarin 100 mg/ Kg, p.o)
Group D	-	AEBBL (Low dose 100 mg/Kg p.o)
Group E	-	AEBBL (Medium dose 200 mg/Kg p.o)
Group F	-	AEBBL (Higher dose 400 mg/Kg p.o)
Group G	-	AQEBBL (low dose 100 mg/Kg p.o)
GroupH	-	AQEBBL (medium dose 200 mg/Kg p.o)
Group I	-	AQEBBL (Higher dose 400 mg/Kg p.o)

Albino rats weighing between 150-200 g each group containing 6 animals was divided into 9 groups

III. RESULTS

- Preliminary phytochemical studies with AEBBL and AQEBBL revealed the presence of phytoconstituents like glycosides, tannins, saponins, triterpenoids and flavonoids in both the
- studies none of them produced abnormal behavior or mortality even at the dose level of 2000 mg/Kg body weight in mice. Three different doses like low 1/20th (100 mg/Kg), medium

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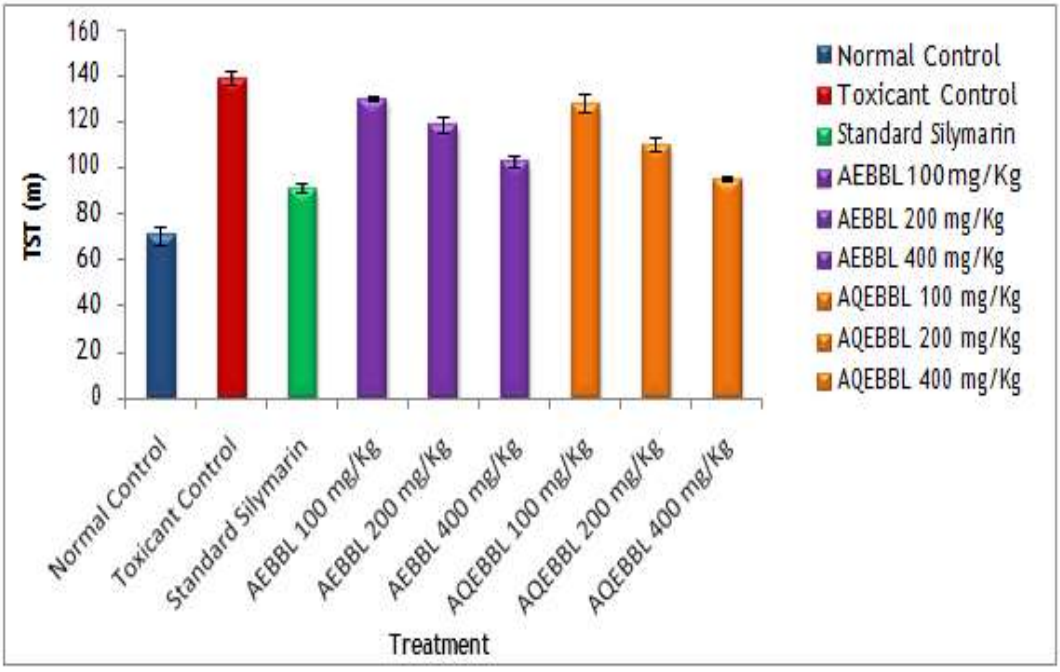
- 1/10th (200 mg/Kg) and high 1/5th (400 mg/Kg) doses from the maximum dose tested for LD_{50} were selected for the present study.
- Silymarin, AEBBL and AQEBBL treated groups when compared to PCM (preventive and curative aspect), ALC (preventive and curative aspect) and RTD induced hepatotoxic rats the increased TST, wet liver weight and wet liver volume, ALT, AST, ALP, BILD, BILT, CHO and TG levels were significantly reduced and ALB and PRO levels were significantly increased. The histopathological changes i.e. fatty changes (steatosis), necrosis etc were partly or fully prevented.

Preliminary phytochemical constituents

Phytoconstituents	AEBBL	AQEBBL
Carbohydrates	Absent	Absent
Proteins	Absent	Absent
Flavonoids	Present	Present
Tannins	Present	Present
Saponins	Present	Present
Fixed oils and fats	Absent	Absent
Alkaloids	Present	Absent
Glycosides	Present	Present
Sterols	Absent	Absent

Hepatoprotective effect of different extracts of B. latifoliaon paracetamol induced hepatotoxicity in rats (Preventive aspect)

Effect of AEBBL and AQEBBL on thiopentone induced sleeping time (TST) in Paracetamol induced hepatotoxic rats (Preventive aspect)



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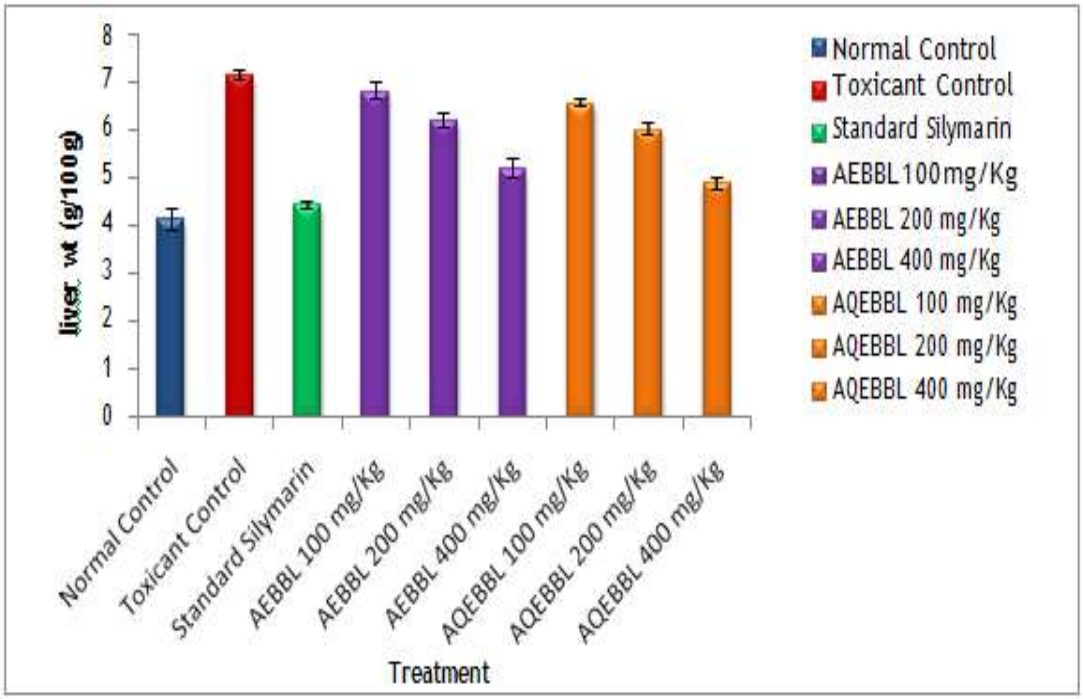
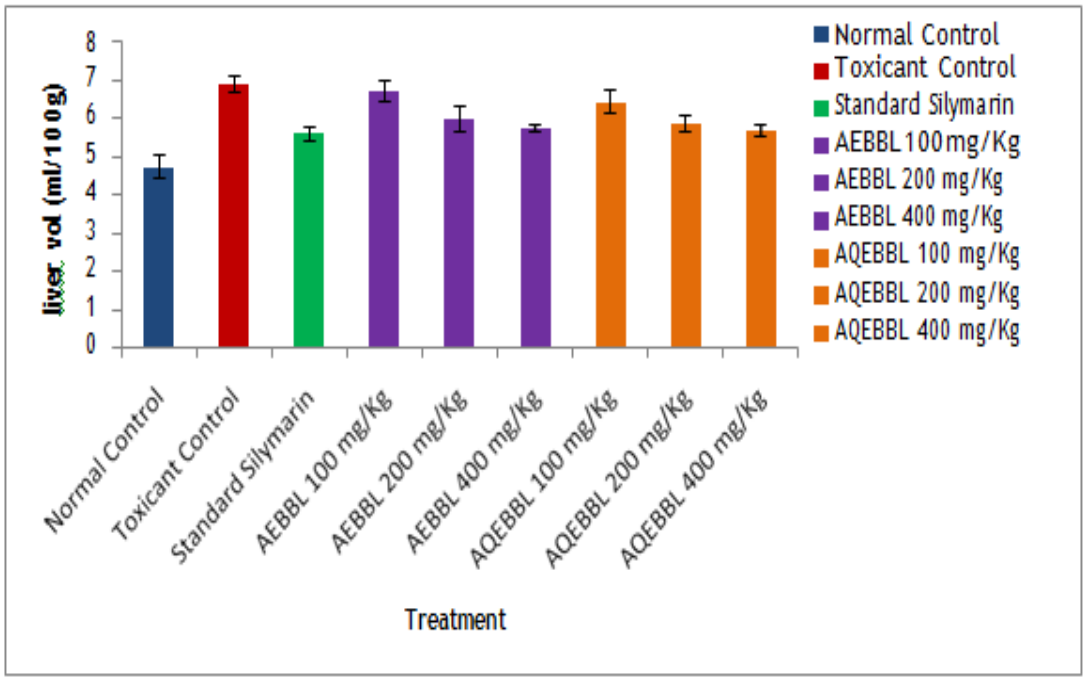
Effect of AEBBL and AQEBBL on wet liver weight in Paracetamol induced hepatotoxic rats (Preventive aspect)



Effect of AEBBL and AQEBBL on wet liver volume in Paracetamol induced hepatotoxic rats (Preventive aspect)



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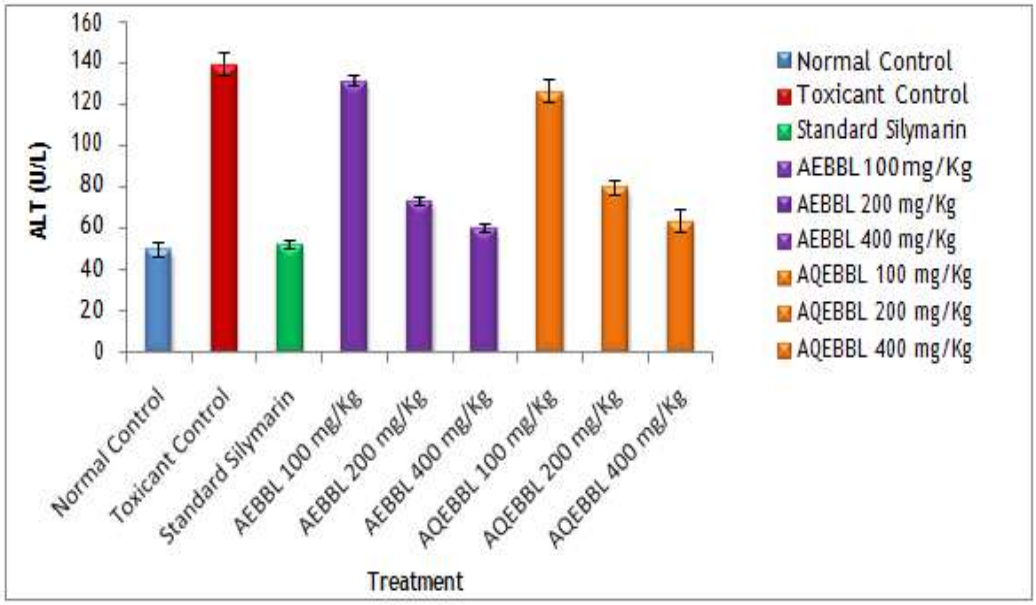
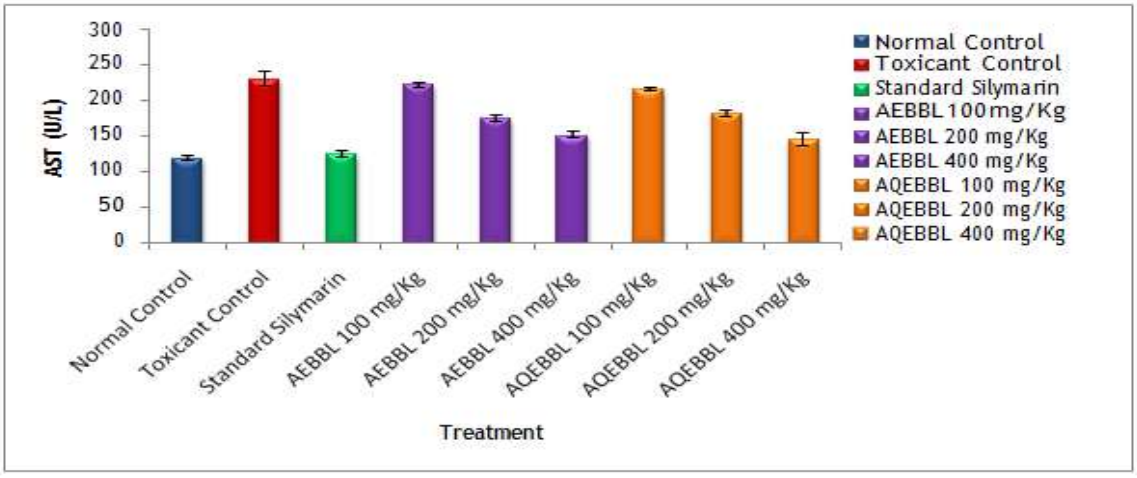
Effect of AEBBL and AQEBBL on serum ALT levels in Paracetamol induced hepatotoxic rats (Preventive aspect)



Effect of ALCOHOLIC AND AQUEOUS extracts of BASSIA LATIFOLIA on biochemical parameters in Paracetamol induced hepatotoxic rats:

- Rats treated with Paracetamol developed a significant hepatic damage observed as elevated serum levels of hepatic specific enzymes like ALT, AST, ALP and TB when compared to normal control.
- Pretreatment with Silymarin, Alcoholic and Aqueous Extracts had showed good protection against paracetamol induced toxicity to liver. Test indicates a significant reduction in elevated serum enzyme levels with extract treated animals compared to toxic control animals which are evident in table 2 and figure 6,7,8,9.
- Paracetamol treatment has considerably reduced serum total protein levels. Pretreatment with Silymarin and Alcoholic and Aqueous Extracts of Bassia Latifolia showed a significant increase in total protein levels as compared with toxicant group. This is evident by table no.2 and figure 10.

- **Effect of AEBBL and AQEBBL on serum AST levels in Paracetamol induced hepatotoxic rats (Preventive aspect)**



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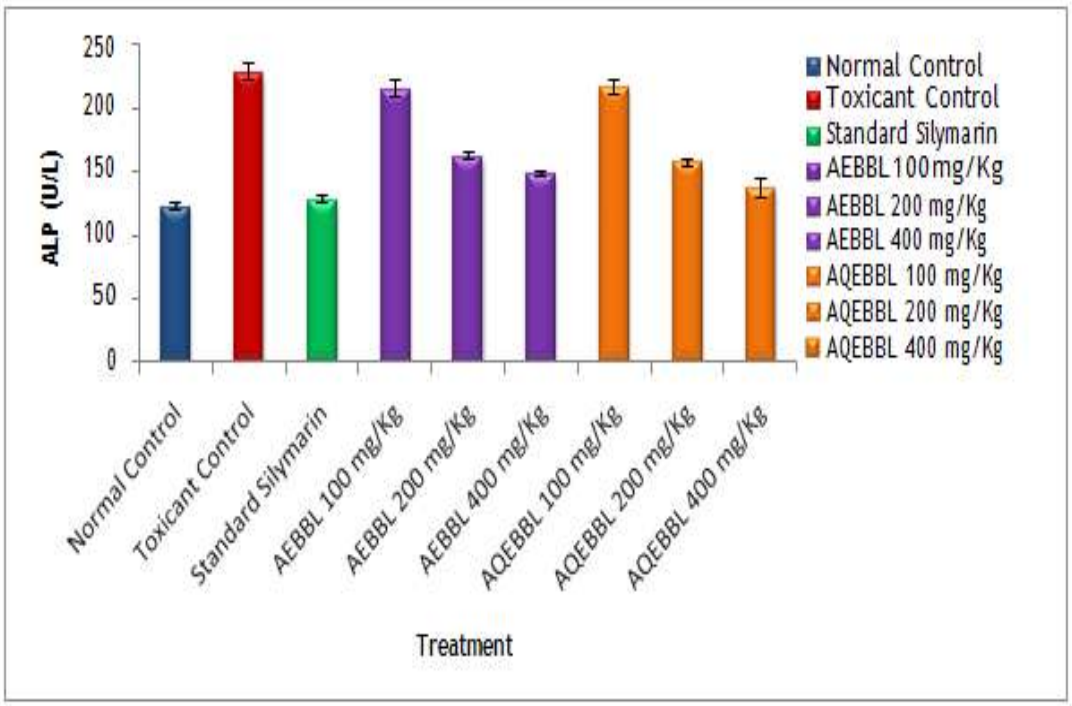
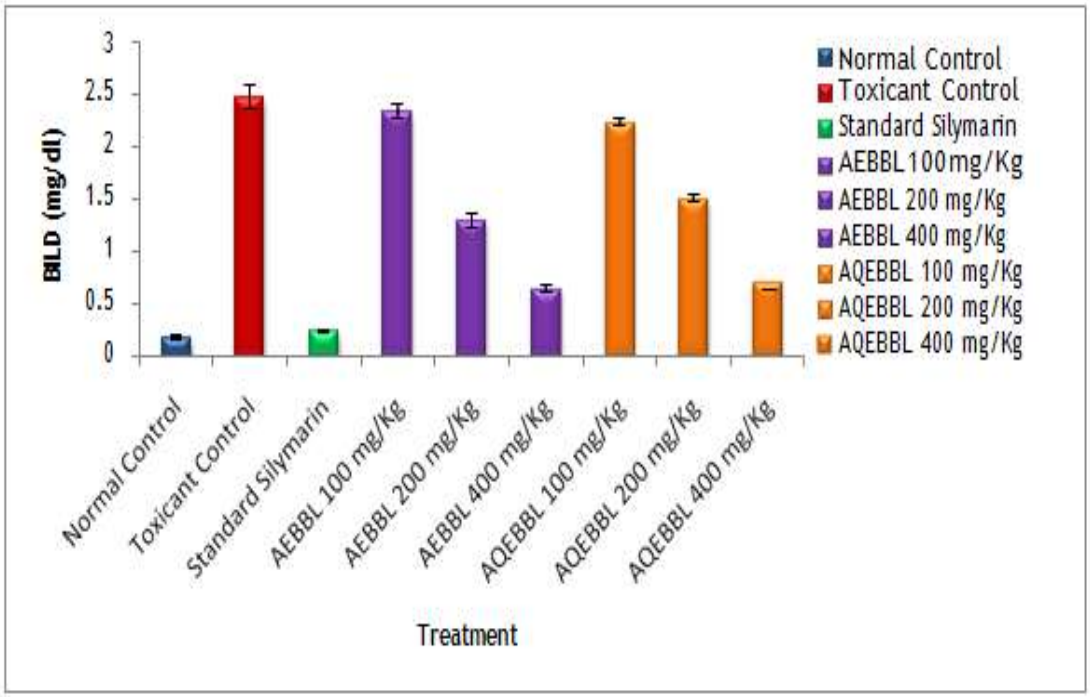
Effect of AEBBL and AQEBBL on serum ALP levels in Paracetamol induced hepatotoxic rats (Preventive aspect)



Effect of AEBBL and AQEBBL on serum BILD levels in Paracetamol induced hepatotoxic rats (Preventive aspect)



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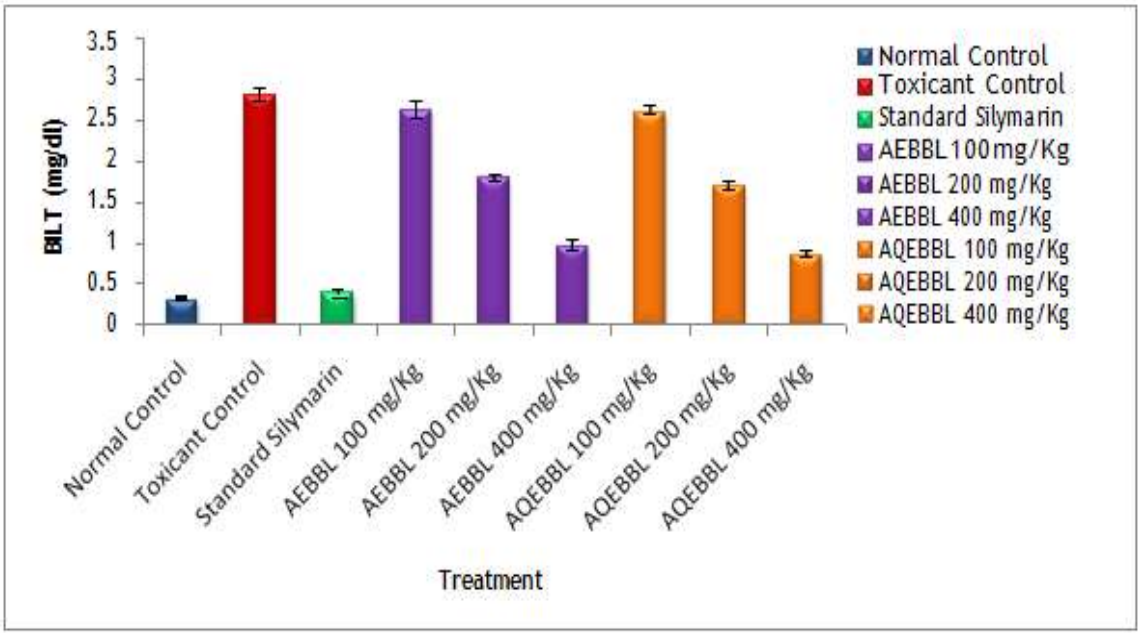
Effect of AEBBL and AQEBBL on serum BILT levels in Paracetamol induced hepatotoxic rats (Preventive aspect)



IV. CONCLUSION

From the above studies it can be concluded that AEBBL and AQEBBL showed a significant hepatoprotective effect against PCM (preventive and curative aspect), ALC (preventive and curative aspect), and RTD induced hepatic damage as depicted by its protective activity on functional, physical, biochemical and histological changes in liver.

REFERENCES

[1]. Handa SS, Sharma A, Chakraborty KK. Natural products and plants as liver protecting drugs. Fitoterapia. 1986, 57: 307-351.

[2]. Dienstag J L, Isselbacher K J, "Toxic and drug-induced hepatitis", Chapter 296 In Harrison's Principles of internal medicine. Braun Wald E., et al., 15th Edn, The McGraw-Hill Companies, Inc., 2001, Vol.2, 1737-1742pp.

[3]. Piper D.W. et al. "Gastrointestinal and Hepatic Diseases", Chapter 22 in Avery's Drug treatment. Speight T M, Helford N H G, 4th Edn, Addis International Limited, New Zealand: 1997, 937pp.

[4]. Bhanwra S., Singh J., Khosla P. "Effect of Azadirachta indica leaf aqueous extract on paracetamol-induced liver damage in rats", J PhysioPharmacology. 2000; 44(1): 64-68.

[5]. Doss EE, Shah KK. "Paracetamol and conventional antimalarial drugs induced hepatotoxicity and its protection by methionine in rats", Indian J. Exp. Biol. 2000 1138-1142.