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ASSESSMENT OF HEPATOPROTECTIVE ACTIVITY BY *LYCOPERSICON ESCULENTUM*

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Keywords:

Lycopersicon esculentum, Hepatoprotective activity, Biochemical analysis, Serum analysis

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ABSTRACT: Liver manage different critical metabolic functions. The point of this review is to think about hepatoprotective movement of lycopene and non lycopene containing part of tomato concentrate to investigate the likelihood that a few constituents other than lycopene may be in charge of hepatoprotective action. Writing uncovered that plant containing Carotenoids, Lycopene, Carotene, Xanthophylls, Xanthophylls Ester mixes were in charge of hepatoprotective action and they chose plant additionally having these constituent so it was conjectured that it might likewise have the capacity to ensure the liver. Keeping this view exhibit study is meant to arrange the work for the impact of hepatoprotective action of *Lycopersicon esculentum*. Paracetamol-initiated liver rot was repressed essentially by methanolic-I extricate (Non-lycopene fractionate) of *Lycopersicon esculentum*. The outcomes reasoned that the Methanolic-I (Non-lycopene division) was more compelling than the Methanolic-II (Non-lycopene part) extricate. The CCl_4-III (Lycopene division) was observed to be not powerful in the treatment of the hepatotoxicity. In this manner it can be derived from this examination that *Lycopersicon esculentum* showed hepatoprotective action and this might be because of its rich substance of flavonoids. Hepatoprotective movement of flavonoids is very much recorded before. At long last, it is inferred that, the plant *Lycopersicon esculentum* might be investigated as a strong hepatoprotective because of nearness of Flavonoid.

INTRODUCTION: The Indian customary solutions can be categorized into two gatherings. In first gathering are the restorative arrangements which are for the most part of plants, minerals, or creature birthplace or blends of a few of them and have well set down system for their arrangements. While the people meds have a place with the second gathering, which are home grown house hold cures and have no precise approach for preparing crude materials and are generally utilized as family conventions [1, 2].

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The WHO shows that around 80% of the total populace living in the creating nations depends only on customary prescription for the essential medicinal services needs [4]. The therapeutic plants assume a noteworthy part and the constituent the foundation of the conventional solution. India materica medica incorporates around 2000 medications of common birthplace all of which are gotten from various conventional framework and fables rehearses.

The accentuation of advancement of new organically dynamic particles has been slowly supplanted by utilization of aggregate herbs as medication and nourishment supplement now natural based items have great present and future prospects in International market [3, 5]. Liver manage different essential metabolic capacities.

Its assumes a noteworthy part in detoxification and discharge of numerous endogenous and exogenous mixes, and damage to it or weakness of its capacities may prompt to numerous ramifications on one's wellbeing. Liver channels unsafe substances from the blood, directs hormones and in addition vitamins and sugar. Regardless of the gigantic advances made in allopathic drugs, no successful hepatoprotective solution is accessible. Phytoconstituents are known to assume key part in the administration of liver sickness [6, 7].

The point of this review is to look at hepatoprotective movement of lycopene and non lycopene containing segment of tomato concentrate to investigate the likelihood that a few constituents other than lycopene may be in charge of hepatoprotective action. Writing uncovered that plant containing Carotenoids, Lycopene, Carotene, Xanthophylls, Xanthophylls Ester mixes were in charge of hepatoprotective action and plant likewise having these constituent so it was theorized that it might likewise have the capacity to ensure the liver. Keeping this view exhibit study is expected to arrange the work for the impact of hepatoprotective action of *Lycopersicon esculentum*.

Experimental:

Plant Material: Plants materials *Lycopersicon esculentum* were collected from the local market of Bhopal, (M.P.) during the month of May –July, 2014. The specimens were identified and authenticated by Dr. Zia ul Hassan, Assistant professor, Department of Botany, Saifia College of Science and Education, Bhopal and their herbarium was deposited. These collected specimens were chosen for the extraction process and assessment of hepatoprotective activity.

Extraction: Canned tomato glue, 50g, in a 3L wide mouthed jug is got dried out by including 65mL methanol. The blend is instantly shaken overwhelmingly to keep the arrangement of hard knots. A little example of the suspension is tried by hands; on the off chance that it has glutinous consistency; more methanol is added to the principle segment to keep away from the conceivable stopping up of channels. The blend is permit remaining for 1-2 hr and is then shaken energetically. The thick suspension is sifted on a Buchner channel (distance across 20-25cm). The yellow filterate is disposed of the dim red cake is come back to the container and shaken with a blend of 65mL methanol and 65mL carbon tetra chloride. The plug of a container must fit well and ought to be lifted for a minute after the blending, to discharge any development weight. Brief shaking took after by opening of the container is rehashed until not any more abundance weight is taken note. The suspension is shaken for 10-15 min and isolated by filteration on a huge Buchner channel. The filterate comprises of a lower, exceptionally dull red, CCl_4 stage, and an orange watery methanolic layer [8-10].

Phytochemical Analysis: Screening was carried out on all the extracts of Fruit of *Lycopersicon esculentum* to determine the active principles or secondary plant constituents. The screening was carried out in the Pharmacognosy lab of the V.N.S Institute of Pharmacy, Bhopal (M. P.). Different substance tests keeping in mind the end goal to decide the optional plant constituent's exhibits by utilizing the utilization of different strategies as takes after [11-12]. With a specific end goal to identify the different constituents introduce in the distinctive concentrates of *Lycopersicon esculentum* these were subjected to the tests according to strategies depicted by Ansari, and khandelwal.

***In vivo* Experimental Design:**

Animals for Experiment: Swiss albino rats were obtained from animal house VNS institute of Pharmacy with due permission from Institutional animal ethical committee (Registration Number. 778/03/c/cpcsa). Acute toxicity studies were conducted by using albino mice of either sex weighing between 20 and 25gms and healthy adult male albino rats weighing between 150 and 200 gms were selected for the Hepatoproctetive screening. The animals were acclimatized to standard laboratory conditions (temperature: 25 ± 20 °C) and maintained on 12-hr light: 12-dark cycle. They were provided with regular rat chow (Lipton India Ltd., Mumbai, India) and drinking water *ad libitum*.

Acute Toxicity: A safe oral dose was determined through the acute oral toxic test in rats as described by the Organization of Economic Co-Operation and

Development (OECD) as per 423 guidelines (OECD Guidelines for the Testing of Chemicals, 2010). The extract, at different doses up to 3000 mg/kg, was prepared by dissolving the extract in distilled water and the concentration was adjusted in such a way that it did not exceed 1mL/100g of the rat. The extract was then administered (p.o.) and animals were observed for behavioural changes, any toxicity and mortality up to 48 hr. Doses (1/10 or 1/5 mg/kg, p.o) of extract were later chosen for this study based on the acute toxicity testing [13-14].

Preparation of Extract: Dosage form was prepared in the Tween 80. 1g of extract were taken in the mortar and pestle and triturated with 10ml Tween 80 continuously to get homogenous suspension beings concentration of 100mg/ml of drug in each case. Suspensions were stored in airtight bottles in a cool place. Silymarin suspension (silybon) was also take-up for study.

Preparation of Toxin Solution: 3g of paracetamol suspended in to 100mL of distilled water and administered orally [40].

Pharmacological Screening:

Biological Activity: Assurance of hepatoprotective action in (corrective perspective). Paracetamol initiated hepatotoxicity [15]. At the point when taken in ordinary helpful measurements, paracetamol has been appeared to be sheltered. Taking after remedial measurements, it is for the most part changed over to nontoxic metabolites by means of Phase II digestion by conjugation with sulfate and glucuronide, with a little segment being oxidized through the cytochrome P450 compound framework. Cytochrome P450 2E1 and 3A4 change over around 5% of paracetamol to a very receptive delegate metabolite, N-acetyl-p-benzoquinone-imine (NAPQI). Under ordinary conditions, NAPQI is detoxified by conjugation with glutathione to frame cystine and mercapturic corrosive conjugates [16-18].

In instances of paracetamol overdose, the sulfate and glucuronide pathways get to be distinctly immersed, and more paracetamol is shunted to the cytochrome P450 framework to deliver NAPQI. Accordingly, hepatocellular supplies of glutathione get to be distinctly drained, as the interest for glutathione is higher than its recovery. NAPQI subsequently stays in its poisonous frame in the liver and responds with cell layer atoms, bringing about across the board hepatocytedamage and demise, prompting to intense hepatic putrefaction. In creature ponders, hepatic glutathione must be exhausted to under 70% of ordinary levels before hepatotoxicity happens [19-20].

Paracetamol Toxicity:

Experimental Procedure: Hepatoprotective study will carry out as described by Ashish *et al.*, 2010. Swiss albino mice of either sex (20-50g) select and divide into 6 groups of six animals each. The animals treat with paracetamol (500mg/kg) for seven days except normal control group which will treat with vehicle. In order to assess hepatoprotective action of *Lycopersicon esculentum* extract in albino rats, the rats were divided into the following groups each containing 4 mice (n = 3-6) [47].

Group 1: Control mice: which were fed normal diet and water (*ad-libitum* condition).

Group 2: Paracetamol treated mice: paracetamol 300mg/kg body weight p.o. on daily basis for 7 days.

Group 3: Reference rats: treated with Silymarin 100mg/kg and paracetamol 300mg/kg body weight p.o. on daily basis for 7 days.

Group 4: Extract treated rats: received Methanolic-I extract of *Lycopersicon esculentum* on daily basis for 7 days.

Group 5: Extract treated rats: treated with Methanolic-II extract of *Lycopersicon esculentum*.

Group 6: Extract treated rats: treated with CCl_4 extract of *Lycopersicon esculentum*.

Biochemical Assays: Serum marker enzymes of liver function: Serum will separate by centrifugation at 3000 rpm at 4 °C for 10 min and used for measurement of various biochemical markers like SGOT, Total bilirubin, AST, alkaline phosphatase (ALP) activity.

Serum Analysis:

Aspartate Aminotransferase (AST):

Method: 2, 4-DNPH (Retiman and Frankel Method).

Assay Principle: Aspartate aminotransferase (AST) catalyses the transamination of L-Aspartate and α-Ketoglutrate to form oxaloacetate and L-Glutamate. Oxaloacetate so formed is coupled with 2, 4-dinitrophenyl hydrazine (2, 4-DNPH) to form a corresponding hydrazone, a brown colored complex in alkaline medium and this can be measured calorimetrically [21-23].

TABLE 1: PROCEDURE OF ASPARTATE AMINOTRANSFERASES (AST)

Pipette into tube marked	Blank	Standard	Test	Control
	Volume in mL			
Reagent 1	0.25	0.25	0.25	0.25
Serum	-	-	0.05	-
Standard	-	0.05	-	-
Mixed well and Incubate at 37 °C for 60 minute				
Reagent 2	0.25	0.25	0.25	0.25
Deionised water	0.05	-	-	-
Serum	-	-	-	0.05
Mix well and allow to stand for 20 minutes at room temperature (15-30 °C)				
Solution I	2.5	2.5	2.5	2.5

Mix well and read the OD against water in a colorimeter using green filter or on photometer at 505 nm, within 15 minutes.

Calculation:

$$\text{AST (GOT) Activity} = \frac{\text{Abs. of Test} - \text{Abs. of Control}}{\text{Abs. of Standard} - \text{Abs. of Blank}} \times \text{Conc. Of Standard}$$

Alanine aminotransferases (ALT) / (GPT):

Method: 2, 4 DNPH (Retiman and Frankal method)

Assay Principle: Alanine aminotransferases (ALT) catalyses the transamination of L-Alanine and α-Ketoglutarate to form pyruvate and L- glutamate. Pyruvate so formed is coupled with 2, 4-dinitrophenylhydrazine (2, 4 DNPH) to form a corresponding hydrazone, a brown colour complex in alkaline medium and this can be measured colorimetrically [21-23].

α-KG + L-Alanine = pyruvate + L-glutamate

pyruvate + 2,4- DNPH = corresponding hydrazine (brown colour).

TABLE 2: PROCEDURE OF ALANINE AMINOTRANSFERASES (ALT)/ (SGPT)

Pipette into tube marked	Blank	Standard	Test	Control
	Volume in mL			
Reagent 1	0.25	0.25	0.25	0.25
Serum	-	-	0.05	-
Standard	-	0.05	-	-
Mixed well and Incubate at 37 °C for 30 minute				
Reagent 2	0.25	0.25	0.25	0.25
Deionised water	0.05	-	-	-
Serum	-	-	-	0.05
Mix well and allow to stand for 20 minutes at room temperature(15-30 °C)				
Solution I	2.5	2.5	2.5	2.5

Mix well and read the O.D. against Purified water in a colorimeter using green filter or on photometer at 505 nm, within 15 minutes.

Alkaline Phosphate (ALP):

Method: Kind and King's Method.

Principle: Alkaline phosphatase from serum converts phenyl phosphate to inorganic phosphate and phenol at ph 10.0. Phenyl so formed reacts in alkaline medium with 4-aminoantipyrine I presence of the oxidizing agent Potassium ferricyanide and forms an orange red colored complex, which can be measured calorimetrically. The colour intensity is proportional to the enzyme activity [24-25].

Calculation:

$$\text{ALP Activity} = \frac{\text{Abs. of Test} - \text{Abs. of Control}}{\text{Abs. of Standard} - \text{Abs. of Blank}} \times 10$$

TABLE 3: PROCEDURE OF ALKALINE PHOSPHATE (ALP)

Pipette into tube marked	Blank	Standard	Test	Control
		Volume in mL		
Working Buffer	0.5	0.5	0.5	0.5
Deionised water	1.5	1.5	1.5	1.5
		Mixed well and incubate at 37 °C for 30 minutes		
Serum	-	-	0.05	-
Reagent 3	-	0.05	-	-
		Mixed well and incubated at 37 °C for 15 minutes		
Reagent 2	1.0	1.0	1.0	1.0
Serum	-	-	-	0.05

Mixed well after addition of each reagent and measure the Abs. of the Blank (B), Standard (S), Control (C), and Test (T) against purified water using green filter at 510 nm.

Bilirubin:

Method: Melloy and Evelyn method.

Principle:

Direct (Conjugated): Bilirubin couples with diazotized sulfanilic acid, forming Azobilirubin, a red-purple colored product in acidic medium.

Indirect (Unconjugated): Bilirubin is diazotized only in the presence of its dissolving solvent (Methanol). Thus the red-purple colored azobilirubin produced in the presence of methanol originates from both Direct and indirect fractions and thus represents Total Bilirubin concentration. The difference of Total and Direct Bilirubin gives Indirect Bilirubin. The intensity of red-purple color so developed above is measured colorimetrically and it is proportional to the concentration of the appropriate fraction of bilirubin [25-32]. The reaction can be represented as:

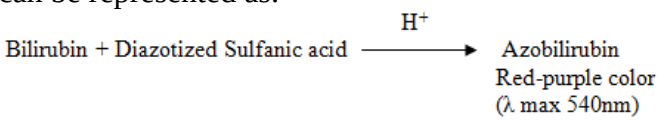

TABLE 4: PROCEDURE OF BILIRUBIN

For UV	T1	T2	D1	D2
	Volume in mL			
Serum/Plasma	0.1	0.1	0.1	0.1
Distilled water	0.9	0.9	0.9	0.9
Reagent 3: Diazo	-	0.25	-	0.25
Blank				
Distilled water	-	-	1.25	1.25
Reagent 4 Methanol	1.25	1.25	-	-

Histopathological Studies: After collecting blood samples, the animals from all groups were sacrificed by cervical dislocation and liver was removed liver was then cut into small pieces and fixed in 10% neutral formalin solution for 2 days, followed by dehydration through graded alcohol and xylene. The portions were then embedded in paraffin wax following the standard micro technique. Section were made at multiple levels and stained routinely with hematoxylin and eosin. Mounted slides were examined for Histopathological changes in liver and their micrographs were taken.

Histopathological Analysis: In rats of control group, the liver architecture was normal and the cells were arranged radially (**Fig. 2**). The liver dissected from Paracetamol treated rats with dose of 500mg/kg body weight p.o., showed vacuole formation and fatty degeneration. Some of the cells found to have damaged cell walls (**Fig. 3**). The normal texture and cell arrangement were observed in the liver section of rats treated with Silymarin with dose of 100mg/kg body weight p.o. (**Fig. 4**). In rats treated with dose of Methanolic- I extract *i.e.* 500mg/kg body weight p.o., the liver appeared normal. Similar texture and cell arrangement were observed in the liver section of rats treated with Silymarin (**Fig. 5**).

In mice treated with the dose of Methanolic- II extract *i.e.* 500mg/kg body weight p.o. along with paracetamol, the damage was less marked and vacuole formation was observed. The liver cells were observed to be well organized around the central vein along with fat depositions (**Fig. 6**). In mice treated with the dose of CCl_4-III extract *i.e.* 500mg/kg found to have damaged cell walls (**Fig. 7**). These changes in the liver architecture were coincided with the corresponding changes in the enzyme levels and hence hepatoprotective effect of *Lycopersicon esculentum* was confirmed.

Statistical Analysis: Statistical evaluation of the data was done by Student's *t* test. (Graph PAD Instat software, Kyplot). A value of $p < 0.05$ was considered to be significant.

Observations:

TABLE 5: EFFECT OF METHANOLIC-I (NON-LYCOPENE FRACTIONATE) EXTRACT OF *LYCOPERSICON ESCULENTUM* ON BIOCHEMICAL PARAMETERS (ON 8TH DAY)

Group	Mean ± SEM			
	SGOT	SGPT	ALP	Total Bilirubin
Normal control	24.74±0.21	95.93±0.14	102.95±0.2	0.35±0.012
PCM control(500mg/kg)	138.527±0.208[a]	172.56±0.29[a]	155.73±0.20[a]	8.256±0.117[a]
PCM+ Silymarin(100mg/kg)	89.032±0.32*	121.02±0.27*	94.93±0.091*	0.977±0.0213*
PCM+Methanolic-I (Non-Lycopene Fractionate)	96.31±0.34*	136.29±0.34*	114.15±0.27*	1.136±0.018**

N = 6 Swiss albino mice per group, tabular value represents mean ± SEM.
*p<0.05 (Comparison of Group II with I)
**p<0.05: (Comparison of group III and IV with II)

TABLE 6: EFFECT OF METHANOLIC-II (NON-LYCOPENE FRACTIONATE) EXTRACT OF *LYCOPERSICON ESCULENTUM* ON BIOCHEMICAL PARAMETERS (ON 8TH DAY)

Group	Mean ± SEM			
	SGOT	SGPT	ALP	Total Bilirubin
Normal control	24.74±0.21	95.93±0.14	102.95±0.2	0.35±0.012
PCM control(500mg/kg)	138.527±0.20[a]	172.56±0.29[a]	155.73±0.203[a]	8.256±0.117[a]
PCM+ Silymarin(100mg/kg)	89.032±0.32*	121.023±0.27*	94.93±0.091*	0.977±0.0213*
PCM+Methanolic-II (Non-Lycopene Fractionate)	107.016±0.16*	150.81±0.147*	129.91±0.158*	1.29±0.0125*

N = 6 Swiss albino mice per group, tabular value represents mean ± SEM.
*p<0.05 (Comparison of Group II with I)
**p<0.05: (Comparison of group III and IV with II)

TABLE 7: EFFECT OF CCL_4-III (LYCOPENE FRACTIONATE) EXTRACT OF *LYCOPERSICON ESCULENTUM* ON BIOCHEMICAL PARAMETERS (ON 8TH DAY)

Group	Mean ± SEM			
	SGOT	SGPT	ALP	Total Bilirubin
Normal control	24.74±0.21	95.93±0.14	102.95±0.2	0.35±0.012
PCM control (500mg/kg)	138.527±0.20[a]	172.56±0.29[a]	155.73±0.203[a]	8.256±0.117[a]
PCM+ Silymarin (100mg/kg)	89.032±0.32*	121.023±0.27*	94.93±0.091*	0.977±0.021*
PCM+CCl_4-III (Lycopene Fractionate)	124.73±0.20*	165.99±0.161*	155.67±0.151*	8.75±0.421*

N= 6 Swiss albino mice per group, tabular value represents mean ± SEM.
*p<0.05 (Comparison of Group II with I)
**p<0.05: (Comparison of group III and IV with II)

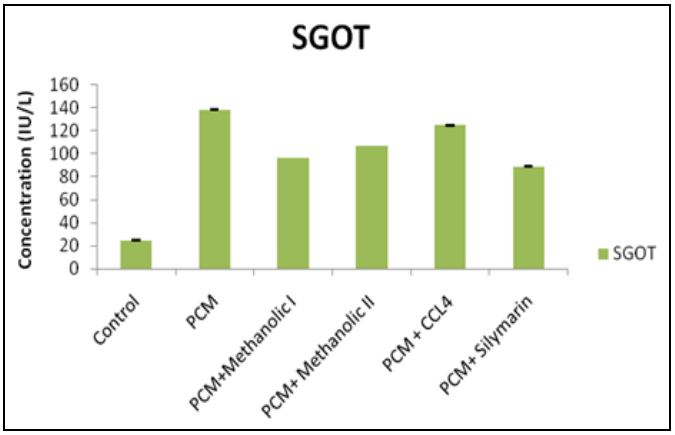

FIG. 1: SREUM SGOT (SERUM GLUTAMIC OXALOACETIC TRANSAMINASE) PARAMETERS OF DIFFERENT GROUP

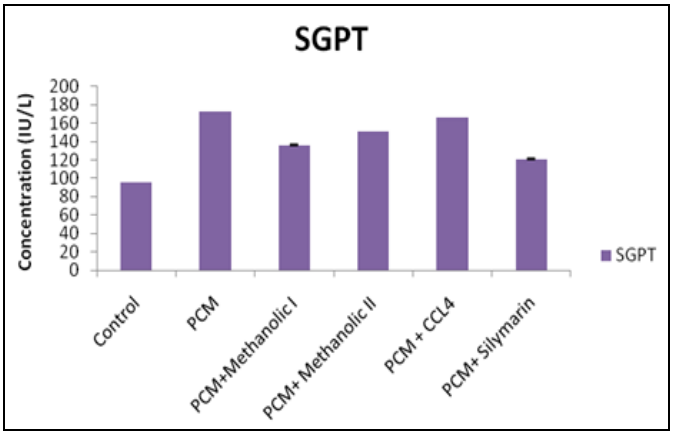

FIG. 2: SREUM SGPT (SERUM GLUTAMIC PYRUVATE TRANSAMINASE) PARAMETERS OF DIFFERENT GROUP

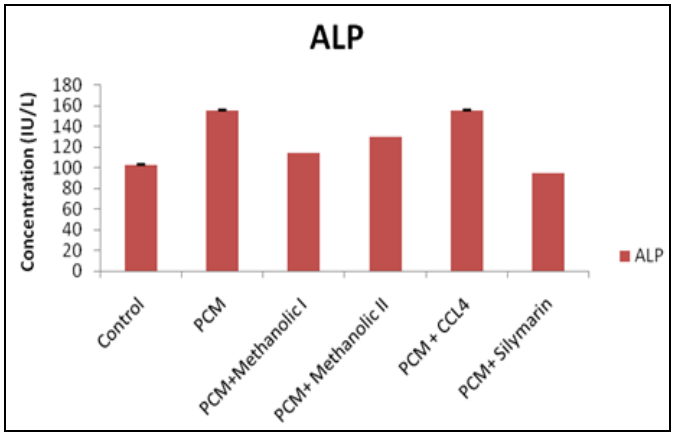

FIG. 3: SREUM ALP (ALANINE TRANSAPYRUVATE) PARAMETERS OF DIFFERENT GROUP

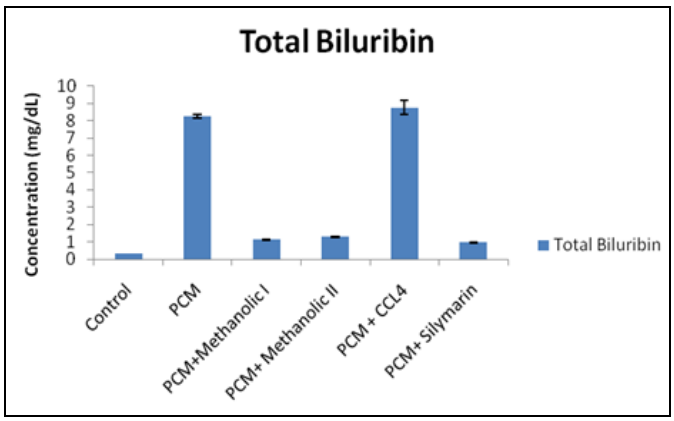

FIG. 4: SERUM TBIL (TOTAL BILIRUBIN) PARAMETERS OF DIFFERENT GROUP

RESULTS AND DISCUSSION: Fruit of *Lycopersicon esculentum* was selected for the assessment of the hepatoprotective activity and is used as culinary and medicinal purpose and is most popular in indigenous system of medicine. The tomato contains higher amount of lycopene, carotene, flavonoids, Carotenoids, Xanthophylls.

Effect of Paracetamol on Liver Function Tests Parameters and Histopathological Changes in Mice: Administration of Paracetamol to mice caused severe damage to liver, as evident by both significantly ($p < 0.01$) altered serum biochemical parameters and changes in the hepatic tissues observed during histopathology examination. There was a significant (approx 2-5) times increase in the average levels of SGOT, SGPT, ALP and Total bilirubin from 162, 204, 188 and 13.13 resp. in paracetamol treated animals (group II), reflecting severe hepatic injury (**Table 4**, **Fig. 4**).

Histopathological examination of liver section in Paracetamol treated control (Group II) revealed the area of hydropic changes and degeneration of hepatocytes and congestion of the sinusoids, necrosis of central veins (**Fig. 4**), which were absent in the section from untreated normal control group (I). Section from normal untreated control group showed healthy liver structure with normal central vein and sinusoids as well as healthy hepatocytes exhibiting regular under surface without any evidence of necrosis.

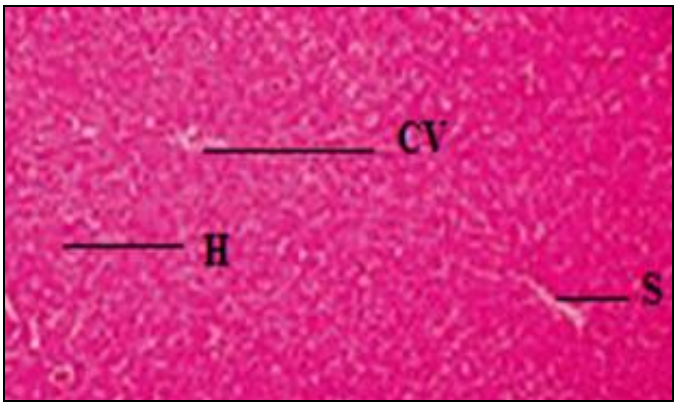

FIG. 5: PHOTOMICROGRAPH OF LIVER SECTION OF CONTROL GROUP OF MICE STAINED WITH HAEMOTAXYLINE AND EOSIN

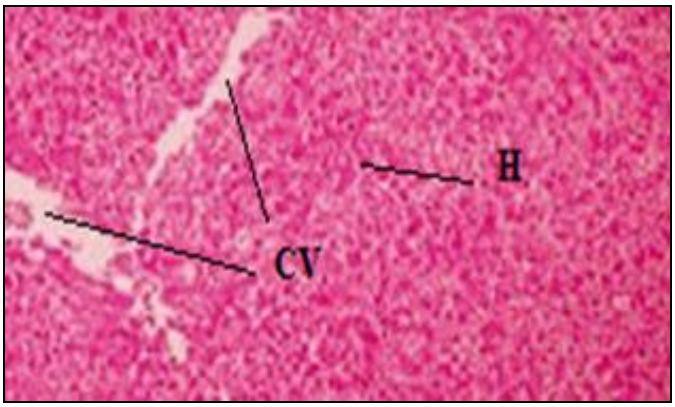

FIG. 6: PHOTOMICROGRAPH OF LIVER SECTION OF PARACETAMOL GROUP OF MICE SHOWING AREA OF HYDROPIC CHANGES AND DEGENERATION OF HEPATOCYTES AND CONGESTION OF THE SINUSOIDS, NECROSIS OF CENTRAL VEIN. SECTION WAS STAINED WITH HEAMOTAXYLINE AND EOSIN

Effect of Silymarin Liver Function Tests Parameters and Histopathological Changes in Mice: The administration of Silymarin to mice studies on Paracetamol group showed significant ($p < 0.01$) increase in liver enzyme parameter as compared to control animal (group I). Comparison of group II with silymarin treated mice (Group III) reveals that there was significant decreased in liver enzyme paracetamol from 87.28, 122.6, 96.82, 0.98

respectively as a result of Silymarin treatment. Histopathological examination of liver section in Silymarin treated control (Group III) revealed the recovery of hepatocytes cell and reduced necrosis identified cells as compare to Paracetamol treated group.

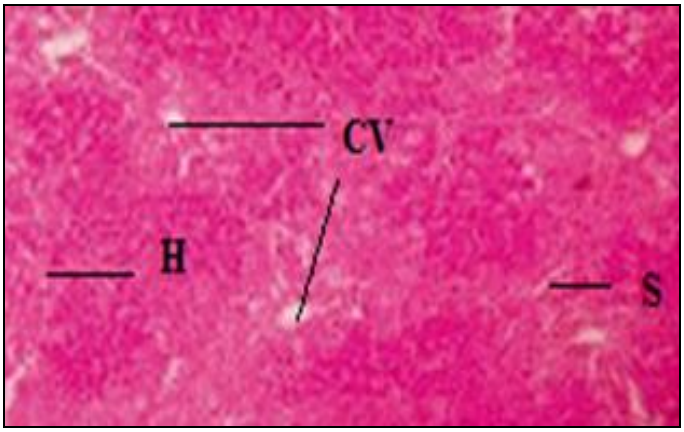

FIG. 7: PHOTOMICROGRAPHS OF LIVER SECTION OF STANDARD GROUP OF MICE TREATED WITH SILYMARIN SHOWING RECOVERY OF HEPATOCYTES, REDUCED NECROSIS. SECTION WAS STAINED WITH HEAMOTAXYLINE AND EOSIN

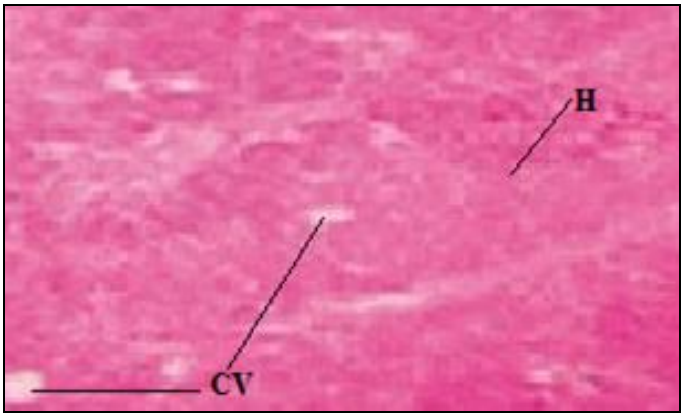

FIG. 8: PHOTOMICROGRAPHS OF LIVER SECTION OF METHANOLIC-I (NON-LYCOPENE FRACTION-ATE) OF MICE SHOWING RECOVERY OF HEPATOCYTES, REDUCED NECROSIS. SECTION WAS STAINED WITH HEAMOTAXYLINE AND EOSIN

Effect of Methanolic-I Extract on Liver Function Tests Parameters and Histopatho-logical Changes in Mice: Organization of concentrate of CCl_4-III to mice brought about extreme harm to liver, as clear by both altogether ($p < 0.01$) adjusted serum biochemical parameters and changes in the hepatic tissues saw amid histopathology examination. There was a huge increment in the normal levels of SGOT, SGPT, ALP and Total bilirubin from 167.01, 202.23, 186.37, and 11.13 resp. in CCl_4-III treated creatures (aggregate VI), reflecting serious hepatic harm. Histopathological examination of liver area of this gathering uncovered the degeneration of hepatocytes, blockage of sinusoids and putrefaction of focal veins.

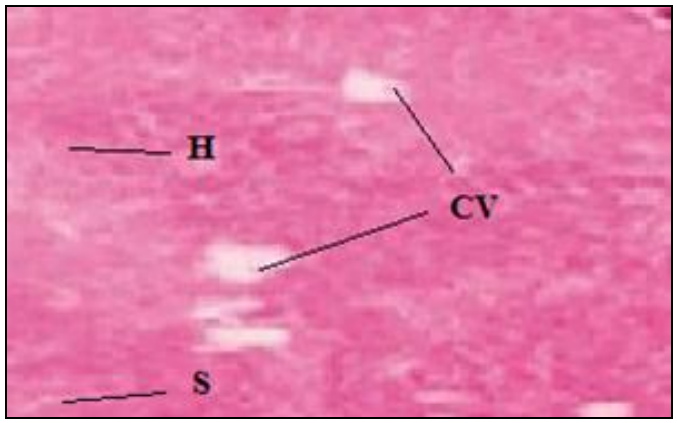

FIG. 9: PHOTOMICROGRAPHS OF LIVER SECTION OF METHANOLIC-II (NON-LYCOPENE FRACTION-ATE) GROUP OF MICE SHOWING CONSIDERABLE RECOVERY OF HEPATOCYTES, SOME AREA ARE SHOWING RECOVERY NECROSIS. SECTION WAS STAINED WITH HEAMOTAXYLINE AND EOSIN

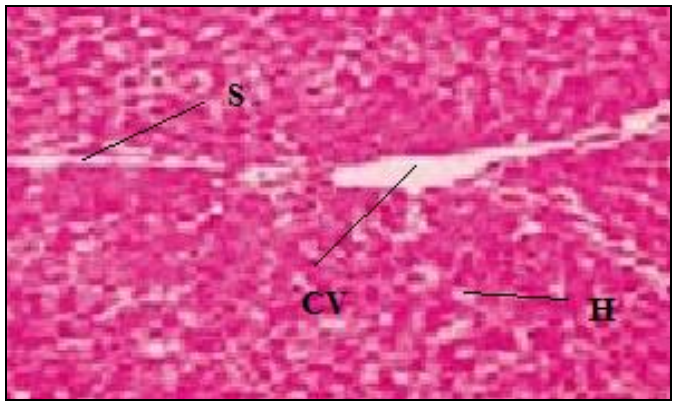

FIG. 10: PHOTOMICROGRAPHS OF LIVER SECTION OF CCl_4-III EXTRACT (LYCOPENE FRACTIONATE) OF MICE SHOWING AN AREA OF HYDROPIC CHANGES AND DEGENERATION OF HEPATOCYTES, CONGESTION OF THE SINUSOIDS, CENTRAL VEINS AND INFLAMMATORY CELLS

Abbreviations: H= hepatocytes, S= sinusoids and CV= central vein.

The hepatotoxicity incited by Paracetamol overdose because of its sulfate and glucuronide pathways gets to be distinctly soaked, and more paracetamol is shunted to the cytochrome P_{450} framework to create NAPQI. Thus, hepatocellular supplies of glutathione get to be distinctly exhausted, as the interest for glutathione is higher

than its recovery. NAPQI consequently stays in its dangerous frame in the liver and responds with cell layer particles, bringing about across the board hepatocyte damage and passing, prompting to intense hepatic corruption. In creature examines, hepatic glutathione must be drained to under 70% of ordinary levels before hepatotoxicity happens. SGOT, SGPT, ALP, TBIL have been accounted for to be touchy markers of liver damage and decrease level of these compounds related with hepatotoxicity is an unequivocal sign of hepatoprotective activity of the medication.

No lethal impacts for the concentrate utilized as a part of the treatment were seen in the present review. The outcomes inferred that the Methanolic-I (Non-lycopene division) was more successful than the Methanolic-II (Non-lycopene part) extricate. The CCl_4-III (Lycopene division) was observed to be not compelling in the treatment of the hepatotoxicity. The recuperation of the liver capacities from paracetamol instigated hepatotoxicity may be because of the nearness of Phenolic mixes and flavonoids in non-lycopene portion of methanolic-I and methanolic-II separate.

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