

PHARMACOLOGICAL EVALUATION OF STEM OF CARISSA CARANDAS FOR HEPATOPROTECTIVE ACTIVITY

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ABSTRACT:

Liver disease is a significant global health issue, particularly prevalent in developing countries. They are primarily caused by chemicals and are drugs when taken at very high doses. Despite the advances in modern medicine, there is no effective drug that can stimulate liver function, protect liver protection from damage, or help regenerate liver cells. Therefore, it is urgently necessary to replace/complete effective medications with current use. The plant Kingdom is undoubtedly a valuable source of new remedies. The present work constitutes a review of the literature on plant extracts and chemically defined molecules of natural origin with hepatoprotective activity. *Carissa carandas* (caraunda) is a broadly beneficial food and medicinal plant of India. Plant-based drugs play a crucial function in all cultures and have been fundamental in retaining health and fighting illnesses. The *Carissa carandas* plant is popularly used as a traditional medicinal plant over heaps of years inside the Ayurvedic, Unani, and Homoeopathic machines of medicine. The fundamental bioactive factors, which impart the medicinal worth of herbs, are alkaloids, flavonoids, saponins, and big quantities of cardiac glycosides, triterpenoids, phenolic compounds, and tannins. Traditionally, the entire plant and its elements were used within the treatment of numerous illnesses. It consists of several phytochemical materials

belonging to the terpenoid class. the basis is attributed to sour, stomachic, antidiarrheal, vermifuge, etc.

KEYWORDS: Liver, Liver Disease, Hepatoprotective Activity, Carissa Carandas Plant.

INTRODUCTION: The liver aids in metabolism and rids the body of harmful substances. Drugs, alcohol, toxins, and microbial contaminations are just a few of the many operators that might harm it.[1] If left untreated, hepatic damage can progress to chronic liver diseases such as fibrosis and hepatic cellular carcinoma. There is a pressing need to research new hepatoprotective chemicals that are safe and efficient due to the limited viability and possible adverse effects of existing restorative operators.[2] Hepatoprotective specialists are drugs that either prevent liver damage or improve liver healing and restoration. For many years, restorative professionals have used common things, especially those made from medicinal plants, to treat liver diseases. Various phytochemicals, including flavonoids, alkaloids, terpenoids, and phenolic compounds, have been detailed to have noteworthy hepatoprotective action through instruments such as antioxidant defenceness, hindrance of lipid peroxidation, tweak of fiery pathways, and stabilization of hepatic cell layers. [3,4] A liver illness could be defined as the liver damage, maladies, & contaminations that influence cells, tissues, or the function of the liver. The liver harm that foremost general factor is a sedate that pulled back to advertise. Sorts of hepatic maladies incorporate rot, cirrhosis, hepatitis, hepatic disappointment, sedate-initiated poisonous quality, and liver clutter due to metabolic work (jaundice, lipolysis). [5,6] Medication-induced acute liver harm and hepatotoxicity too legitimize disappointment for a number of compounds, and they highlight the need for more measures for screening of sedatives for case stem cell-derived hepatocytes like cells, which have the capability to identify opportune hepatotoxicity within the sedative improvement forms.[7] Chemical

compounds frequently cause subclinical damage to the liver, which builds up, as it were, as anomalous liver protein tests. Worldwide, absorption or inhalation of liver toxins increases the number of cases of liver damage, and standard medications for the treatment of this type of liver damage are usually insufficient and have adverse side effects; more than 50% of acute liver damage is caused by medication.[8] An overdose of paracetamol leads to drug-induced liver damage, which causes approximately 13% of hospital stays. The present study was undertaken for evaluation of the hepatoprotective activity of stem extract of the *Carissa carandas* plant with pharmacological standard drugs such as silymarin flavonolignan acquired seeds, given that historical instances appreciably used it for super hepatoprotective ability. Numerous research studies proved that silymarin is effective in the remedy of both chronic and acute hepatitis. Administration of silymarin diminished the increased ALT, AST, and serum bilirubin and also shortened the treatment time in cases of acute viral hepatitis. In sufferers with acute hepatitis who had been given either silymarin (one hundred forty mg) or a placebo three times each day for three weeks.[9]

In the end, hepatotoxicity is one of the major hassles globally. Various synthetic and natural-based treatment options are to be had for the remedy of hepatotoxicity; however, there may nevertheless be a want of a stronger, low-dose remedy for hepatoprotection activity and uses. *Carissa carandas* that prove the effect of herbal treatment for hepatoprotective.[10]

MATERIAL AND METHODS:

Extraction and phytochemical test:

1. Grind of plant stem of *carissa carandas* into a fine powder.
2. The stem powder are kept in the thimble within the Soxhlet apparatus.

3.Added ethanol in round bottom flask 100 ml and attach flask to Soxhlet extractor.

4.Then use the heating mantle to heat round bottom flask at temperature 75-85oc for 6 to 8 hrs.

5.This process are repeated until the thimble is exhausted.

6.Then filter and evaporate the ethanol through the water bath.

The ethanol extract is primary phytochemical showing for detection of occurrence and/ or absenteeism of alkaloids, flavonoids, tannins, terpenoids, saponin, carbohydrates.



Figure no.1: Performing phytochemical test.

Table no. 1: phytochemical screening test.

Phytochemical	Test name	Appearance	Inference
Alkaloids	Mayer's	Creamy white ppt.	+
	Wagner's	Deep chocolate ppt.	+
	Hager's	Yellow crystalline ppt	+
Flavonoids	Shinoda	Pink colour	+

	Specific Lead acetate	Orange to red Yellow coloured	+ +
Tannins	Gelatine	Blue or green colour	+
Terpenoids	Salkowski's test	Golden yellow layer	+
Saponin	Foam test	Develop stable foam	+
Carbohydrates	Molisch's Fehling's	Ring interface of two liquid Reddish -brown ppt.	- -

Collection and authentication of plant:

The Carissa carandas plant stem is pickup in month December 2024 through the R. K. PHARMACY COLLEGE, AZAMGARH, U.P. The plant authentication was done through the Prof. Nawal Kishor Dubey, in botany department, BHU, UTTAR PRADESH. The voucher specimen no. CCDS/Car/2025/02 is kept in the BHU Varanasi of the future reference.

Paracetamol induce model test:

Wistar albino rats weighing 150-200 g are deprived of food 24 hours previous to the experimentation but permitted only water. Allocated into five groups of all animals. Each group consists of 6 animals. Distilled water was given to Groups I and II. Paracetamol (2 gm per kg body weight, orally) and silymarin were delivered to the III group (50 mg/kg orally). EECC (200 & 400 mg/kg b.w.) was delivered to the IV and V groups. A total of 14 days (once a day) administered orally for all pretreatments. One hour later, treatment for hepatotoxicity induced through paracetamol (2 gm/kg) body weight administered as a single oral dose on the final experiment day (day 14) was given to all groups of animals other

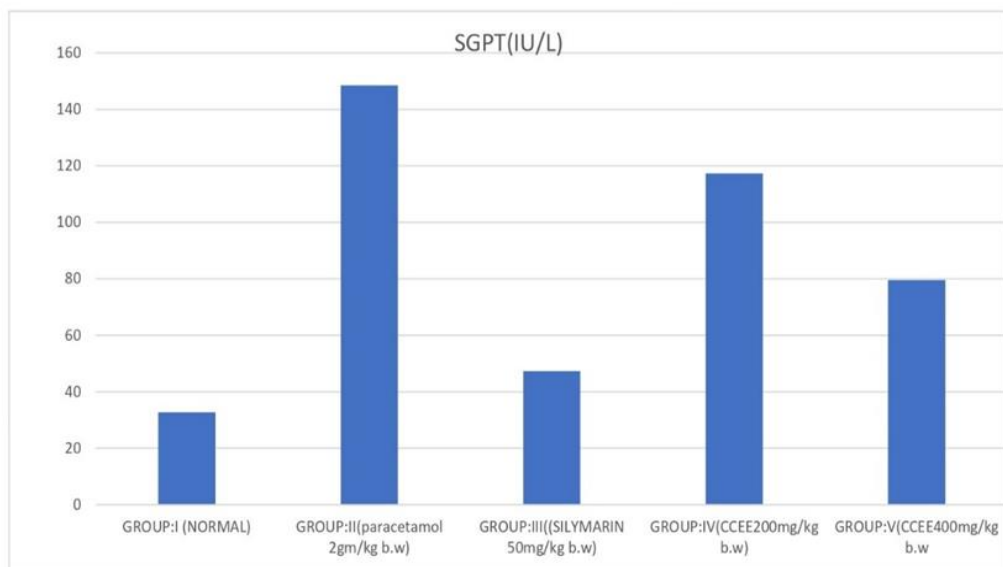
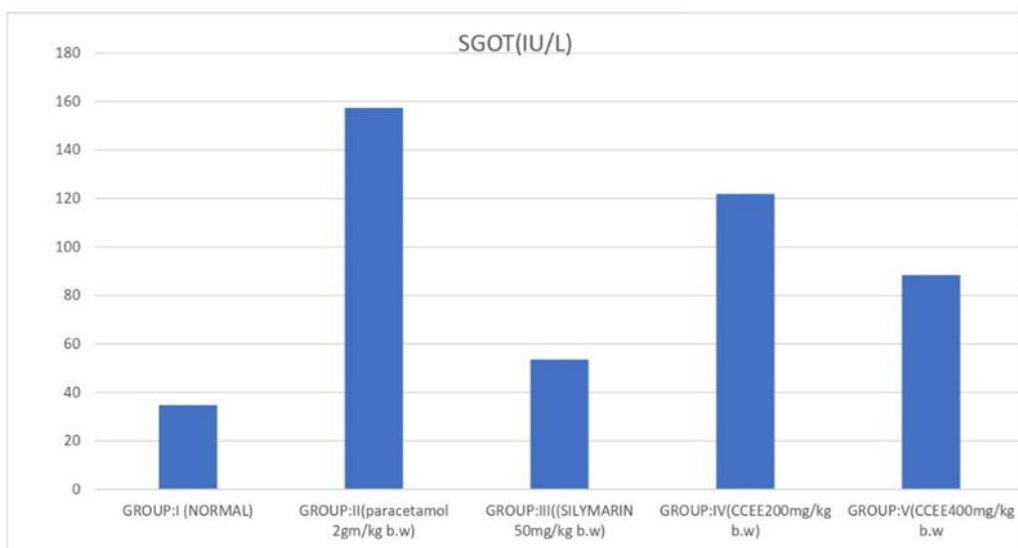
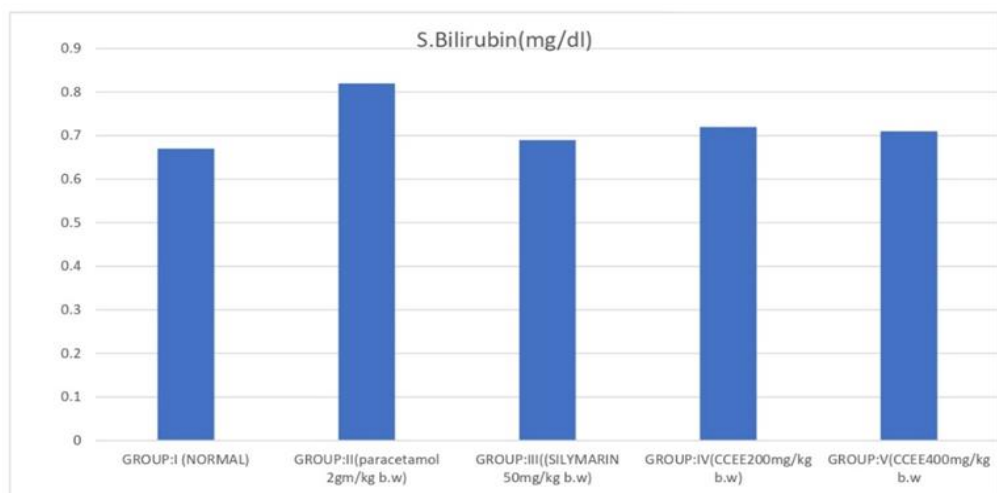
than the normal group. Coprophagia was prevented by using specially constructed cages. On the 14th day, blood samples were collected from all animals by puncturing the retro-orbital plexus after they were given anaesthesia, and later the animals were sacrificed & their livers collected.

Table no. 2 Experimental animal groups:

Animal group	Treatment
Group I	Normal control
Group II	Negative (paracetamol 2gm /kg b.w)
Group III	Standard (Silymarin 50mg /kg b.w)
Group IV	EECC 200 mg/kg b.w
Group V	EECC 400 mg /kg b.w

Table no.3 The serum parameter result of paracetamol, silymarin, EECC in rats.

Biochemical marker	GROUP: I Normal	GROUP: II paracetamol 2gm/kg (negative)	GROUP: III Silymarin 50mg/kg (standard)	GROUP: IV (200mg /Kg. b.w)	GROUP: V (400mg /Kg b.w)
S. Bilirubin (mg/dl)	0.67	0.82	0.69	0.72	0.71
SGOT (IU/L)	34.74± 0.1	157.36±0.3	53.63± 0.3	121.82±0.6	88.43±0.3
SGPT (IU/L)	32.71± 0.6	148.52±0.4	47.35± 0.2	117.37±0.5	79.56±0.3
ALP (IU/L)	158.48± 0.4	261.56±0.3	167.68± 0.4	224.53±0.3	193.53±0.3



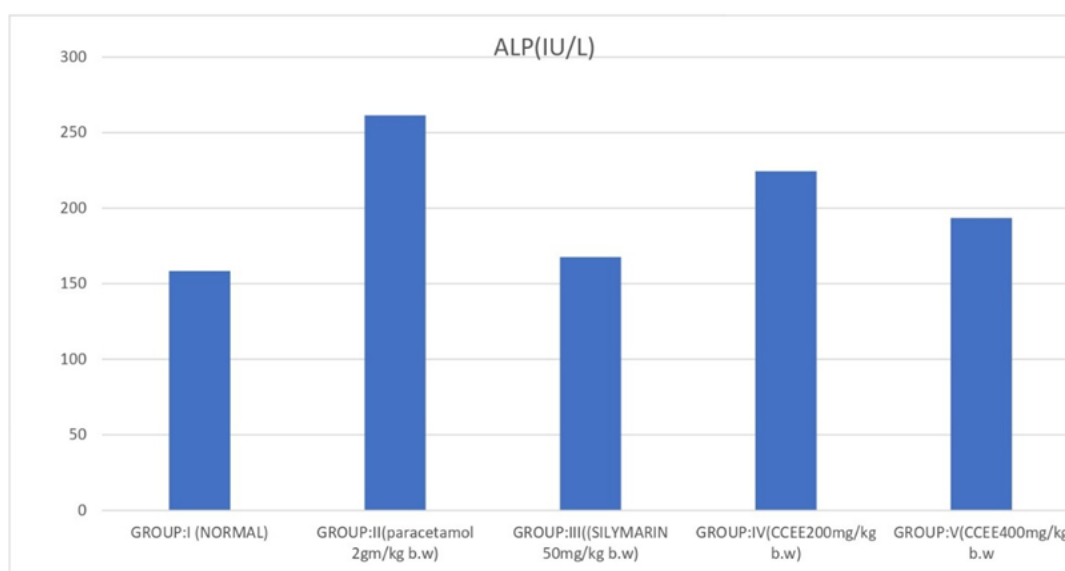


Figure no.2: Upper all graphic image is showing the effect of drugs.

RESULT AND DISCUSSION:

The current study discusses that *Carissa carandas* demonstrates hepatoprotective protective capabilities. In an PCM – induced toxicity model. *Carissa carandas* stem extract decreased the hepatotoxic index, thereby demonstrating antihepatotoxic efficacy.

Orally treatment with ethanolic extract of the stem of *Carissa carandas* (200mg/kg. b.w and 400mg/kg. b.w p.o) give a significance of hepatoprotective effect on against PCM- induce toxicity by decreasing the activities of serum marker enzymes, bilirubin, SGOT, SGPT and ALP these are confirmed by the decrease the function of the liver and histopathological examination. These are probably leads to the promising hepatoprotective activities of extract of *Carissa carandas* stem. These findings therefore supported the traditional belief on hepatoprotective effect of the stem of *Carissa carandas*.

CONCLUSION:

In order to identify potential alternative medications with hepatoprotective effects, a comprehensive literature review was undertaken. Since there is a lack of sufficient scientific evidence to back up its traditional use in these activities, *Carissa carandas* was chosen for this study. If we want to learn more about the traditional applications of this herbal medicine and create safer, more effective treatments, we need to screen it for various pharmacological actions.

The present study is distinct in that the ethanolic extraction of the *Carissa carandas* stem has hepatoprotective capabilities. In a PCM-induced toxicity model. The ethanolic extract of *Carissa carandas* stem decreased the hepatotoxic index, thereby demonstrating antihepatotoxic efficacy. Oral treatment with ethanolic extraction of the stem of *Carissa carandas* (200 mg/kg b.w. & 400 mg/kg b.w. p.o.) gives the valuable effect opposite to PCM-induced toxicity in albino rats.

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