Hepatoprotective Activity of Alcoholic Extract of Actinidia Deliciosa (Kiwi Fruit) Against Carbon tetrachloride Induced Liver Damage in Albino Rats

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Abstract

In the early 20th century, herbal medicine was a prominent health care system because there were no antibiotics or pain relievers. With the development of systems of allopath medicine, herbal medicine gradually lost its popularity among humans, and it was based on the therapeutic effect of synthetic drugs. Almost a century has passed bad we have seen the limitations of the allopathic system. Herbal medicine has been gained momentum recently and this is evident in the fact that some herbal medicines have reached heights on par with systemic drugs. It can be concluded that knowledge of alternative and complementary medicine systems such as Ayurveda, botany, pharmacology and photochemistry, biochemistry, ethnology and toxicology is an integral part, treatment option for common liver diseases such as cirrhosis, fatty liver diseases and chronic hepatitis are problematic. The effectiveness of treatment such as interferon, colchicine, penicillamine and corticosteroids is very low and the incidence of side effects is very high. Too often, the treatment worsens the disease. Conservative's doctors often many of their patients to wait cautiously, infact waiting for the time when the disease has progressed to point where heroic measures need to be taken. Physicians and patients needs effective therapeutic agents with low rates of side effects. Plants are capable of forming such group. For the past 5000 years, humans have relied on natural products as their primary source of medicine. However, the past 2 centuries have brought about an explosion in understanding how natural products are made and how they interact with other organisms. The world health organization (WHO) estimates that 80% of the world healthy population currently uses herbal medicines for some aspects of primary health care (kokanee ck et al; 2011)

Key words:

Hepatoprotective, kiwi fruit (Actinidia deliciosa), ccl4

Introduction:

The normal human liver weighs 1.441.66 kg (3.23.7 lb).) and is about 15 cm wide. It is the he aviest internal organ and the second largest gland in the human body. It is then located in the right upper quadrant of the abdominal cavity, it lies just below the diaphragm to the right of t he stomach andcovers the gallbladder. Red- brown wedge S shaped organ with four lobes of unequal shape and size. The functional units of the liver are the lobules and it consist of hepatocytes which are the basal metabolic cells. The hepatic artery and the portal vein are the two principal blood arteries that supply the liver and arteries), ducts and nerves through the hepatic portal, the entire surface of the liver is covered with a serous layer of peritoneal origin and this layer has an inner fibrous layer to fix it and hold on to it. The fibrous layer is polar tissue and follows vessels and ducts to support them. The liver performs more than 500 different functions, including fighting infections, neutralizing toxins, making proteins and hormones, controlling blood sugar and clottig blood. The liver is the largest and most metabollically complex internal organ in humans. The liver is the only organ capable of self regeneration, allowing a person to donate part of his or her liver to another person. When a liver part is transplanted, the donar liver regenerates back to its original size while the transplanted part grows to a size suitable for the recipient. The liver has a great job in maintaining metabollic heamostasis in the body. This includes processing amino acids, carbohydreates, lipids and vitamins in the diet. Serum protein synthesis; and detoxify and excrete in bile endogenous waste and contaminating xenobiotics. Liver disorders have farreaching consequences, due to the important depedence of the other organs on the metabolic function of the liver. Liver damage and associated symptoms frequently exhibit recognizable patterns. In some cases, the disease process is primary in the livers. In others, liver damage is secondary, often due to some of the most common human diseases, such as cardiac decompensation, alcoholism, and extrahepatic nfections with diffuse disease progression or circulatory disruption. Comb or flow of bile.anatomy: degeneration, cell death, fibrosis, cirrhosis.Causes of liver disease:

There are numerous potential causes of liver disease.

Among the causes are

- Congenital birth problems, such as faulty liver function at birth.
- Metabolic disorders, or defects in basic body processes.
- Viral or bacterial infections.
- Alcohol or poisoning by toxins.
- Several drugs can be harmful to the liver.
- Nutritional deficiencies.
- Trauma, or injury

Plant Introduction:

Actinidia deliciosa:

Actinidia deliciosa (kiwi fruit)L. (Actinidiaceae), commonly known as Indian or malbar spinach belongs to family actinidiaceae, is an oval, ovoid or oblong fruit is up to 2-1/2 inches long, with russest-brown skin densely covered with short, stiff brown hairs. The flesh is shiny, solid untill fully mature, brilliant green or occasionally yellow, brownish, or off-white, with the exception of the white, juicy center from which many fine, pale lines radiate. Small dark-purple or almost- black seeds are strewn between these lines; they are undetectable when eaten. The flavor is sweet/tart to acidic, resembling gooseberries with hints of strawberry.

Chemical composition:

Kiwi is said to be extremely nutritious, an excellent source of vitamin C and a very good source of potassium and folic acid. Kiwi fruit also contains vitamin E and variety of polyphenols and carotenoids, which are essential for good health. Kiwi is a fruit with a low glycemic index, so it is very beneficial for people with diabetes.

Medicinal uses:

Actinidia deliciosa has long been used to treat many diseases such as dysentery, diarrhea, anemia and cancer. The plant has been reported for antifungal, antconvulsant, analgesics, anti - inflammatory and androgenic activities. Traditionally, the fruit is used in ayurvedic medicine to induce sleep when applied to the head. The root paste is applied to the swelling and is also used as massage agent. Fruit decoction is used for its mild laxative effect. (shruthi et al; 2014). For snake bites, crushed herbs are applied to the site of bite. The fruit juice is used to relive constipation in pregnant women and decoction is used to relive labor pain. This also helpful in gonorrhea and balanitis. (anupama; 2015). Antimicrobial activity: this study revealed the presence of secondary metabolites such as steroids, triterpenoids in the fruit and stem of Actinidia deliciosa. He further confirmed that the leaf exract could be used to treat infections caused but microorganisms E.coli, Pseudomonas aeruginosa, Bacillus subtilis and Aspergillus flavus. (Krishna priya et al; 2015).

3. Materials and Methodology:

Materials

Experimental plants are the fruit of Actinidia deliciosa. Collect and identify test plants Actinidia deliciosa. Actinidia deliciosa (kiwi) purchased in December 2020 from trees growing in South India from Kerala and dried at room temperature. Actinidia deliciosa (kiwi) seeds collected from local source, Tamil Nadu (Chennai) in March.

Actinidia deliciosa Extract Preparation:

Extraction consists of separating the biologically active portion of plant tissue from the inactive components using a selective solvent in a standard extraction procedure. Fruit powder (500g) was extracted with acetone by sequential extraction using petroleum ether, chloroform and acetone in a Soxhlet apparatus. While the raw meal fraction of each plant of known weight was extracted continuously with chloroform. (the residue obtained was stored in a clean, dry bottle until use (Harborne, 1973).

Preliminary PHYTOCHEMICAL STUDY:

The various Actinidia deliciosa (kiwi) extracts obtained were qualitatively analyzed to examine the presence of different solvents, ethanol (98%) using a Soxhlet extractor. The chloroform extract was set aside and the etanol extract was filtered, evaporated, dried using a rota autoclave (under reduced preeure), and the yield obtained plant phytochemical components such as alkaloids, carbohydrates, glycosides, flavonoids and other phytochemicals, steroids, terpenoids, phenols, proteins and tannins etc.

1. Alkaloid test:

a) **Mayer's test** Take a pinch of dry extract and add 2 ml of dilute hydrochloric acid, mix well, filter. The filtrates added with one or two drops of Mayer reagent alkaloids can be detected by the yellow precipitate that forms when they are present.

b) **Dragendorff test** Take a pinch of the dry extract, treat with 2 ml of 2% acetic acid, mix and filter. The filtrate is added to 2 drops of Dragendorff reagent. The formation of an orange- brown precipitate indicates the presence of an alkaloid.

c) **Hager test** A pinch of dry extract was taken and treated with drops of Hager's reagent. The formation of a yellow precipitate indicates the presence of alkaloids.

d) **Wagner test** A pinch of the dry extract is taken and treated with drops of Wagner's reagent. The formation of a brown precipitate indicates the presence of alkaloids

2. Sugar and Carbohydrate Test:

Molish test

A small amount of the extract was dissolved separately in 4 ml of distilled water and filtered. The filtrate is treated with 2-3 drops of 1% alcohol α napthol solution and 2ml of concentrated sulfuric acid is added through the wall of the test tube. A brown ring at the junction of two liquids indicates the presence of carbohydrates.

3. Glycosides Test:

a) Anthrone Test

Place a pinch of extract in a watch glass and add 2 drops of alcohol to the extract. An equal amount of anthrone was added and thoroughly mixed and dried. A drop of concentrated sulfuric acid is then added, which is separated into a thin film by a glass rod in the watch glass. And heated in a bain-marie. The dark green formation indicates the presence of glycosides.

Test for anthraquinone glycosides:

b) Borntrager test

Boil a pinch of the extract with dilute sulfuric acid, filter hot, and the filtrate extracted with a solvent such as benzene. It is shaken well and the organic layer is separated and the corresponding amount of dilute ammonia is added. The pink color in the ammonia layer indicates the presence of anthraquinone glycosides.

c) Cardiac glycoside test Legal test

Extracts are hydrolyzed for several hours in a water bath. The hydrolyzate was added to 2 ml of pyridine, sodium nitropruside solution and alkylated with sodium hydroxide solution. Orange indicates
the presence of cardiac glycosides.

4. Test for Protein:

Dissolve a small amount of extract in several ml of water and perform the following test: BiuretTest add a few drops of biuret reagent (1% cuSo4 and 10% NaOH) to the solution. Extract), add 1drop of copper sulfate solution and 10 drops of sodium hydroxide solution. Purple or purple colour indicates the presence of protein.

Million's Test:

A few drops of Million's Reagent were added to the extraction solution. The reddish-brown Colour indicates the presence of protein.

5. Amino acid Test:

Ninhydrin Assay:

A few drops of ninhydrin reagent were added to the extract. Purple indicates the presence of amino acids.

6. Test for Saponin:

Foam test:

Take 1 ml of carbon tetrachloride extraction solution from the graduated cylinder. To this, 20 ml of distilled water was added and shaken well.

Haemolysis test:

The carbon tetrachloride extract of the plant was applied to a glass slide to form a thin film, on which a drop of human blood was placed and the extract was applied. After 30 minutes, the slidewas examined under a microscope for changes in the structure and shape of the red blood cells. Always maintain monitoring to see structural changes of red blood cells for hemolysis.

7. Glycosides Test:

A small amount of extract is treated with distilled water and tested for Molish. The extracts were hydrolyzed with dilute hydrochloric acid and subjected to Lieberman Buchara, Legal and Borntrager assays for the presence of various glycosides.

8. Sugar Reduction Test:

Dissolve a small portion of the extract in water and treat with Fehling and Benedict's reagent to detect the presence of sugar.

9. Phyo Serols Test:

The extract is heated with an alcohol solution of potassium hydroxide until completelysaponified. It was then diluted with distilledwater and extracted with ether. The ethereal extract was evaporated and the residue (unsaponifiable substance) was subjected to the Liebermannand Lieberman Burchara test.

10.Phenolic Composition Test:

Ferric Chloride Solution Test

The extract was taken in water and heated; 2 ml of this ferric chloride solution was added. The formation of green color is due to the presence of phenolic compounds. The lead acetate solution. Add lead acetate separately to the extract (2ml). the precipitate formation indicates the presence of phenolic compounds.

11. Tannin Test:

Dissolve a pinch of the dry extract in carbon tetrachloride, mix well and filter. The filtrate is checked for the presence of tannin by the following test;

a]Iron chloride

Iron chloride solution is added to the diluted filtrate. The formation of a green precipitate is due to the presence of tannins.

b]Lead acetate

Lead acetate solution (10%). The formation of a white precipitate is due to the presence of tannins.

c]Gelatin solution

A 1% gelatin solution containing 10% sodium chloride was added to the filtrate. The formation of a white precipitate is due to the presence of tannins.

12.Test Of Terpenoids:

Noller's test or Salkowshi's test

Take a pinch of the dry extract in a test tube and add a little tin and 0.5 ml of thionyl chloride. It is gently heated. The pink formation is due to the presence of terpenoids.

13. FIXED DOSAGE OF OIL AND FATS:

In situ test

A small amount of different extracts is pressed separately between two filter papers. Oil stains on the filter paper indicate the presence of fixed oil.

14. Steroids Test:

Liebermann's Burchard test

The extract was dissolved in 2 ml of chloroform and 10 drops of acetic anhydride, adding 2 drops of concentrated sulfuric acid. The formation of green color due to the presence of phytosterols.

Ash Value: (Peter S et al; 2001)This parameter can be used to determine inorganic substances such as carbonates, silicates, oxalates and phosphates. Heating loses organic matter in the form of carbon dioxide leaving inorganic components. The ash value is an important property of the drug and with the help ofthis parameter we can detect the degree of contamination and establish the quality and

purity of the drug. There is considerable variation in the ash value of different drugs, but most of thetime this difference varies within narrow limits in the case of the same drug. Acid insoluble ash

consists mainly of silica and highly acid insoluble ash, thus indicating contamination by soil material. Ash dissolved in water is used to estimate the amount of inorganic elements.

Determination of Total Ash:

Accurately weigh approximately 2 g of the airdried crude drug into a platinum or silica tar capsule and ash at not more than 450 °C until no carbon remains. Then cool and weigh. The calculated ash percentage is related to the air-dried drug.

Determination of ash dissolved in water:

All ash was boiled for 5 min. with 25ml of water. Insoluble material was collected in ashless filter paper. It is washed in hot water and calcined for 15 minutes, at atemperature not exceeding 450 °C. The weight of the insoluble material is subtracted from theweight of the ash. The difference in ash weight represents the ash dissolved in water. Thepercentage of ash dissolved in water is calculated based on the drug being dried in the air.

Determination of acid-insoluble ash:

Ash was boiled with 25 ml of 2M HCl acid for 15 min. Insoluble material was collected in ashless filter paper. He was washed in hot water and burned. Then cool in a desiccator and weigh. The percentage of acid-insoluble ash is calculated based on the airdried drug substance.

Extract Values:

The amount of extract a drug produces in a particular solvent is usually an approximate measure of the amount of a given ingredient the drug contains. Drugs must be extracted with differentsolvents in order of their increasing polarity to obtain accurate and reliable values. In general, petroleum ether, alcohol and water extracts are considered to establish the standard of a drug. Petroleum ether extracts contain immobilized oil. Resin and volatile substances, but when the extract is heated at 105℃ until constant weight, the volatile substances are volatized only resin, colorings matter and fixed oil. Although practically all chemicals can be dissolved by alcohol, this material is typically employed to calculate the extractive index for medications that contain glycosides, resins, alkaloids, etc. For medications that primarily consist of water-soluble ingredients, water is employed.

- Water soluble extractive
- Alcohol soluble extractive

Determination of water-soluble extractive:

5gm of the powder was macerated with 100ml water in a closed flask for 24 hours, shaking frequently for 6 hours and allowing standing for 18 hoursAfter filtering, 25ml of the filtrate was collected, dried at 105°C, and weighed. The water-soluble extract ratio was calculated based onthe drug substance being air-dried.

Determination of alcohol-soluble extracts:

5 g of powder was soaked with 100 ml of alcohol in a sealed bottle for 24 h, shaken frequently for 6 hr and allowed to stand for 18 h. It was quickly filtered using precautions against alcohol loss and loss and 25ml of the filtrate was evaporated to dryness at 105℃ and weighed. The calculated alcohol-soluble extract ratio is related to the air-drying drug.

Determination of loss on drying:

This parameter is used to determine moisture content. Loss on drying is the mass loss in % w/v determined by the following procedure.

Procedure:

A weighed glass stopper bottle has been dried for 30 min for a period of time. same conditions wereused for the determination. The sample is placed in the bottle and the contents areweighed accurately. The simple is evenly distributed to a depth not exceeding 10mm. The loaded bottle is placed in the drying chamber (drying oven) and the cap is removed. Sample was dried to constant weight at 110°C in a hot air oven. The percentage loss on drying is calculated based on the drug substance being dried in the air.

Swelling index:

1 g bud was soaked in water for 24 h and weighed again. Swelling index is calculated according to the formula.

$$\text{Swelling index} = \frac{\text{Weight after soaking}}{\text{Weight before soaking}}$$

Instruments and chemicals:

Various instruments and chemicals were used in this study as follows:

Instruments:

• Soxhlet Quick FIT instrument, EX5/83. ENGLAND

• Bain-marie BUCHI 461 SWITZERLAND

• Sensitive scale HF-300G A&D COMPANY, Limited

• Blood pressure monitor Hawksley, ENGLAND. Chloroform (Centre drug house pvt ltd) New Delhi

Mechanism of action of Silymarin

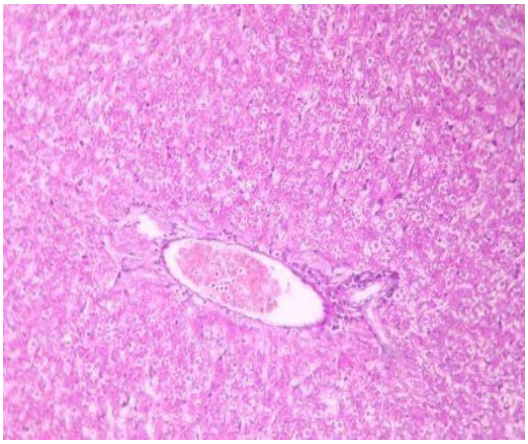
The mechanisms that provide silymarin's hepatoprotective effects are many and varied, including antioxidant, antilipid peroxidation, enhanced detoxification, and protection against glutathione depletion. (Halim AB et al; 1997)Stimulation of liver regeneration:One of the mechanisms explaining silymarin's ability to stimulate liver tissue regeneration is anincrease in protein synthesis in the damaged liver. In both in vivo and in vitro experiments, asignificant increase in ribosome formation and DNA synthesis was measured along with an increase in protein synthesis. Interestingly, the increase in protein synthesis was measured only in the damaged liver (partial resection), not in the control group. on polymerase, thereby stimulating ribosome formation. (Schopen RD et al.; 1969)The ability of silymarin to stimulate protein synthesis has been investigated in malignant liver tissue, and no increase in protein synthesis, ribosome formation, or DNA synthesis was found as demonstrated. found in malignant cell lines. (Sonnenbichler J et al.; 1986).

Chemicals:

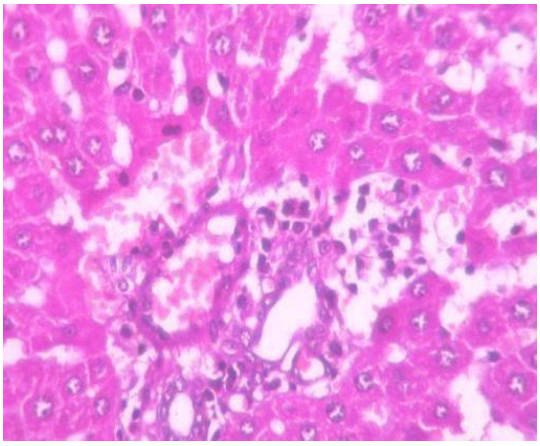
The solvent and chemicals were all of analytical grade. Silymarin was purchased from micro labs in Indian silybon. ALP, SGOT and SGPT Standard kits, etc were obtained from span diagnostics ltd.,India. Male albino rats weighing between 150-200g used in the experiment were kept in animal house under standard environmental conditions and had free access to feed and water. The animals were fasted for 16hr before experiment but allowed free access to water. The were divided into five groups each containing four rats.

Group 1	Control	Received water (5ml/kg. p.o) for 21 days once daily, and served as normal control
Group 2	Negative control	Received water (5 ml/kg. p.o) for 21 days once daily and 40% Carbontetrachloride v/v (2.0ml/l00g body wt, p.o.) for 21 days.
Group 3	Standard	Received 40% Carbontetrachloride v/v (2.0ml/l00g body wt, p.o.) for 21 days and standard drug silymarin (25 mg/kg. p.o.) for 21 days once daily
Group 4	High dose	Received 40% Carbon tetrachloride v/v (2.0ml/l00g body wt, p.o.) for 21 days and Received Ethanolic extract of Actinidia deliciosa(Kiwi Fruit)(400 mg/kg) 21 days once daily

a) Normal Control group, showing normal
b) Carbon tetrachloride treated animal group shows that hepatic cell damage and congestion of the liver
c) Hepatocytes in group treated with Standard (Silymarin 200 mg/kg)
d) **EEAD** of 400 mg/kg shows that few regenerative hepatocytes, sinusoidal congestion and scattered mononuclear inflammatory cells



(a)



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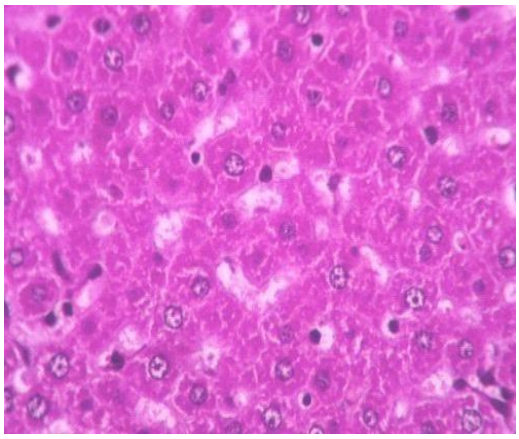

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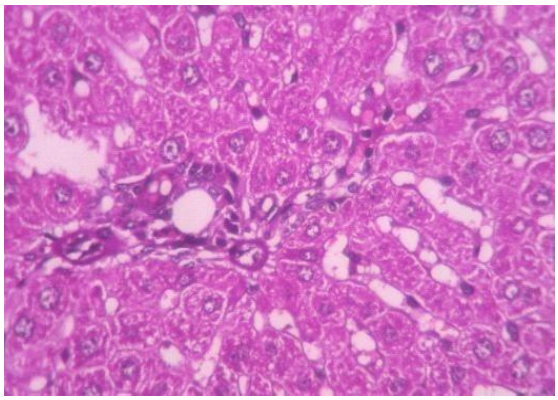


(c)

4. Results& Discussion

Nature phytoconstituents present in the Actinidia deliciosa of

1	**Test**	**Result**
2	Carbohydrates	+
3	Alkaloids	-
4	Gums And Mucilages	+
5	Saponins	+
6	FIXED OILS AND FATS	-
7	TANNINS	-
8	STARCH	+
9	PROTEINS AND AMINO ACIDS	+
10	PHYTOSTEROLS	-
11	PHENOLS	+
12	GLYCOSIDES	-
13	Reducing Sugar	+

(+) = indicates the presence of constituents,(-) = indicates the absence of constituents

TLC of Carbontetrachloride extract of Actinidia deliciosa (Kiwi Fruit) Fruit.

$$\text{Rf value} = \frac{\text{Distance travelled by the solute}}{\text{Distance travelled by the solvent}}$$

$$= 5.6/10$$
$$= 0.56$$

Rf values of Ethanolic extracts of Actinidia deliciosa (Kiwi Fruit) Fruit

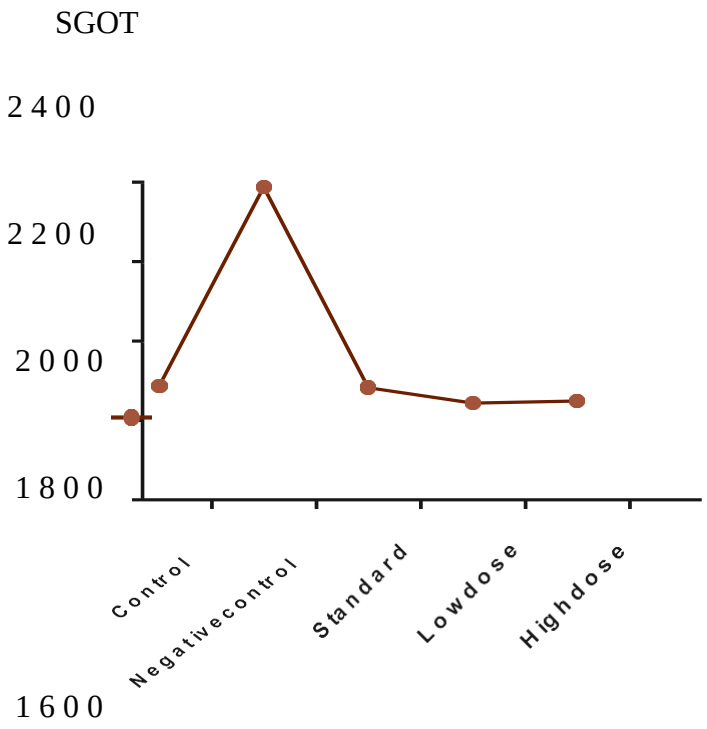
Sl. No	Extract	Rf value
1	EEAD	0.56

Effect of extracts of Ethanolic extract Actinidia deliciosa(Kiwi Fruit)Fruit on SGOT

GROUP	SGOT level mean ± SEM
Control	1760±1.02
Negative Control	2097.90± 2.468**a
Standard	1759.53±2.33**b
EEAD 200mg/kg	1735.64±1.73 *b
EEAD 400mg/kg	1750.26±1.99 ***b

Effect of EEAD on SGOT levels

Groups: Graphical representation of Effect of EEAD on SGOT



Effect of Eead on Total Bilirubin

There was significant ($p<0.01$) increase in Bilirubin level in Carbon tetrachloride induced group when compared to control group. There was significant ($p<0.01$) decrease in Bilirubin in Silymarin treated group when compared to control group. There was significant ($p<0.05$) decrease in Bilirubin in EEAD treated group at a dose of 200mg/kg/po when compared to control group. There was significant ($p<0.001$) decrease in Bilirubin in EEAD treated group at a dose of 400mg/kg/p.o when compared to control group. There was a significant ($p<0.01$) decrease in Bilirubin in Silymarin treated rats when compared Carbon tetrachloride treated. The EEAD at a dose of 200mg/kg/p.o showed a significant ($p<0.05$) decrease in serum bilirubin when compared to Carbon tetrachloride induced group. The EEAD at a dose of 400 mg/kg/p.o showed a significant ($p<0.001$) decrease in Bilirubin when compared to Carbon tetrachloride induced group. Results were shown in the Table no5. and Graph no.4.

Effect of Eead on Alp :

There was significant ($p<0.01$) increase in ALP in Carbon tetrachloride induced group when compared to control group. There was significant ($p<0.01$) decrease in ALP in Silymarin treated group when compared to control group. There was significant ($p<0.05$) decrease in ALP in EEAD treated group at a dose of 200mg/kg/p.0 when compared to control group. There was significant ($p<0.001$) decrease in Alp in EEAD treated group at a dose of 400mg/kg/p.o when compared to control group. There was a significant ($p<0.05$) decrease in ALP in Silymarin treated rats when compared Carbon tetrachloride treated. The EEAD at a dose of 200mg/kg/p.o showed a significant ($p<0.001$) decrease in ALP when compared to Carbon tetrachloride induced group. The EEAD at a dose of 400 mg/kg/p.o showed a significant ($p<0.05$) decrease in ALP when compared to Carbon tetrachloride induced group.

Discussion:

Many factors cause damage or damage to the liver such as chemical and medicational and medications. In the present study , caebon tetrachloride was used to induce hepatotoxicity because of its clinical relevance. Carbon tetra chloride produces arange of dose related adverse effects in the liver (Leo et al., 1982). The majority of carbon tetrachloride is metabolized in the liver, and people who abuse alcohol by regularly drinking 50-60 g (about 4-5 glasses of carbon tetrachloride per day are at increased risk of alcoholic liver disease (Zakhari et al., 2007). In addition, acute and chronic administration of carbon tetrachloride increases the formation of cytokinesespecially TNF alpha, by hepatic kupffer cells, which play an important role in liver injury (Zhou et al. 2003; Thurman et al., 1998; Tsukamoto et al., 2001). Besides the development of fatty liver disease (steatosis), another early sign of consuming too much carbon tetrachloride is an enlarged liver and protein buildup, two common phenomena in alcoholics and heavy drinkers. (Baraona et al,1975; Baraona et al.,1977).Actinidia deliciosa (Kiwi) is commonly used in indigenous systems of medicine.Different parts of the plant such as the fruit and the roots are very important medicinally.

To investigate the medicinal use of Actinidia deliciosa (kiwi) in hepatoprotection, weevaluated the crude extract for its hepatoprotective activity using various in vitro assayand a In vivo imaging of hepatoprotective activity in micePreliminary phytochemical analysis of the ethanol extract of Actinidia deliciosa (Kiwifruit) revealed the presence of phytochemicals such as alkaloids, flavonoids, tannins, saponins and cardiac glycosides. Flavonoids and alkaloids are widely distributed in the plant with healing properties and hepatoprotective activity. It is for that reason that the factory chose to carry out this study. This suggests that EEAD may contain substances that inhibit liver damage and thus block an important step in liver detoxification. 2006). In the present study, AAEAC and AQEAC at 500 mg/kg, p.o. induced significant inhibition of SGOT and SGPT levels to the respective normal ranges, which is also indicative of plasma membrane stability. such as repairing liver tissue damage caused by carbon tetrachloride. On the other hand, inhibition of elevated ALP activities together with concomitant depletion of elevated bilirubin and increased total plasma protein suggestsstabilization of rat hepatic biliary dysfunction during liver injury. toxic liver injury (Mukherjee et al., 2002). These results indicate that AAEAC and AQEAC preserve the structural integrity of hepatocyte membranes and architecture of carbon tetrachlorideinjured hepatocytes, which was confirmed by histopathological examination. learn.When testing the liver function tests of animals induced by carbon tetrachloride, SGOT, SGPT, ALP, total bilirubin increased significantly After treatment with ethanol extract of Actinidia deliciosa (Kiwi) 200 mg/kg and 400 mg/kg) significantly reduced excretion of SGOT, SGPT, ALP, total bilirubin Although low dose was more potent than high dose compared with silymarintreated group, this was a criterion.Ethanol extract of Actinidia deliciosa (Kiwi) shows promising in vitro effect on hepatoprotective activity, we observed an increase in absorbance indicating inhibition of oxalate nucleation and synthesis. calcium in in vitro studies.For the in vivo hepatoprotective activity of EEAD, a carbon tetrachlorideinduced hepatotoxicity model in mice was used. Because the treatment causes liver damage, carbon tetrachloride, is taken orally, so the extract is taken orally. to block any potential interactions of carbon tetrachloride with plant components within the gut, impeding absorption of either substance. Administration of carbon tetrachloride resulted in increased toxicity, possibly due to hepatotoxicity, as evidenced by increased SGOT, SG [T, ALP compared with normal.

Summary:

The present study aimed to evaluate the hepatoprotective and diuretic activities of the carbontetrachloridic and ethanolic extracts of Actinidia deliciosa (kiwi fruit). Studies on LD50 were performed in albino rats with actinidia deliciosa (kiwifruit) extract in water and ethanol according to OECD guideline 425 and were found to be safe at a dose of 4 g/kg confirming the properties. its non-toxic substance.Hepatoprotective activity has been studied in an animal model of carbon tetrachloride-induced hepatotoxicity. Physical parameters wet liver weight, biochemical parameters such as serum SGPT, SGOT and total bilirubin concentrations, and histopathology of the liver were considered as the main study parameters.Carbon tetrachloride induced hepatotoxicity was significantly prevented by pretreatment of Ethanol fruit extract.

Reduction of liver wet weight, high concentration of biochemical parameters such as serum SGPT, SGOT and total bilirubin, after treatment with ethanolic Actinidia deliciosa (Kiwi) extract, confirmed the hepatoprotective effect. of the extract is being studied. In rat liver injury models, recovery of hepatocytes with minor changes in lipid profile and no necrosis was observed after extract treatment, suggestinghepatoprotective potential qualified.Based on the improvement of serum marker enzyme levels, physical parameters and histopathological studies, it was concluded that the carbon tetrachloride extract of Actinidia deliciosa (Kiwifruit) has significant hepatoprotective activity. mentioned in the doseused.Hepatoprotective activity has been studied in an animal model of carbon tetrachloride induced hepatotoxicity. Physical parameters of liver wet weight, biochemical parameters such as serum SGPT, SGOT and total bilirubin concentration, and liver histopathology were considered as key parameters.

Conclusion of Hepatoprotective protective activities of Liver:

The hepatoprotective effect of the ethanolic Actinidia deliciosa (kiwi) extract was confirmed by the following measurements: Liver was isolated from animals treated with toxins (carbon tetrachloride) showed an increase in the wet weight of the liver. Indeed,extracttreated animals showed a decrease in the values of the above physical parameters as a marker of hepatoprotection. Serum markers such as SGPT, SGOT and total bilirubin were markedly increased. The same is seen in liver disease in clinical practice and is therefore of diagnostic importance in the assessment of liver function. In the present study, the mCarbontetrachlorideic extract and aqueous solution of Actinidia deliciosa (Kiwi) Fruit significantly reduced the elevated serum marker enzyme levels mentioned above. Therefore, at this stage, it was concluded that the carbontetrachloridic and aqueous extracts of Actinidia deliciosa (kiwi) fruit have hepatoprotective activity.In support of this study, histopathological results also showed significant plant activity. In animals treated with poison, there are serious disturbances in the cellular structure of the liver. The same goes for people with severe liver disorders. But in the Carbontetrachlorideic and aqueous extract of Actinidia deliciosa (Kiwifruit), the animals in the treated group showed few liver disorders and the intact cellular structure of the liver was maintained. In addition, hepatocyte regeneration was also observed, indicating hepatoprotective activity.Finally, based on the improvement of serum marker enzyme levels, physical parameters, functional parameters and histopathological studies, it was concluded that the Ethanolic Extract of Actinidia deliciosa (Kiwi) Fruit has hepatoprotective activity and thus support the traditional application of the analog in light of modern science.

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