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PHYTOCHEMICAL SCREENING OF PHYLLANTHUS EMBLICA LEAVES

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ABSTRACT: Phytochemical analysis conducted on the phyllanthusEblica and bark extracts revealed the presence of constituents which are known to exhibit medicinal as well as physiological activities. The phytochemical screening of the leaves of phyllanthusEblica done with acetone, chloroform, Petroleum ether and n-hexane .Among the four extracts show presence of carbohydrate in bark as evidenced by positive Molish test. All the four extracts of bark showed positive Molish test for carbohydrate . The phenols and tannins were detected only in chloroform and petroleum ether extracts but not in acetone extracts. All the four solvent extracts of bark showed negative ;' reagent test which indicated the absence of flavonoids. Saponin was detected in chlororform petroleum ether and n-hexane extracts of leaves as evidenced by positive froth foam test. Glycosides were not detected in any of the four solvent extracts of leaves in Libermann's test, but in Salkowski and Killer- Kilani tests all the four solvent extracts showed the presence of glycosides. Phenolic compounds were detected in all extracts. The extracts. Fehling's test was positive in only ethanol. Benedict's test was positive in acetone and ethanol extract. Similarly, Iodine test for carbohydrates was positive in only ethanol extract. Phenols and tannins were detected in all except ethanolic extracts. Flavonoid was not detected in all and saponinsin all except acetone extracts. Ethanolic extract showed negative results for the presence of glycosides inLibermann's, and Killer- Kilani. Phenolic compounds and steroids were detected in acetone andethanolicextracts of leaves.

KEYWORDS: Extraction, Isolation, Incubation, Medicine, Therapeutic effect.

INTRODUCTION: To encourage a disease free healthy life Mother Nature has gifted mankind medicinal plants. Numerous medicinal plants are present in a collection of herbal preparations of the Indian traditional health care system (Ayurveda) named Rasayana, recommended for their interesting antioxidant activities. *Phyllanthusemblica* Linn. (syn. *Emblicaofficinalis*), commonly known as Indian gooseberry or Amla, family Euphorbiaceae, is a main herbal drug utilized in unani (Graceo-arab) and ayurvedic systems of medicine. It is used equally as a medicine and as a tonic to build up lost energy and vigor. *E. officinalis* is extremely nutritious and might be a chief dietary source of vitamin C, amino acids, and minerals. Entire parts of the plant are used for medicinal purposes, particularly the fruit, which has been used in Ayurveda as a powerful rasayana and in customary medicine for the treatment of diarrhea, jaundice, and inflammation. The fruit is used either alone or in combination with other plants to treat many ailments such as common cold and fever; as a diuretic, laxative, liver tonic, refrigerant, stomachic, restorative, alterative, antipyretic, anti-inflammatory, hair tonic; to prevent peptic ulcer and dyspepsia, and as a digestive. Moreover, plant parts show antidiabetic, hypolipidemic, antibacterial, antioxidant, antiulcerogenic, hepatoprotective, gastroprotective, and chemopreventive properties. Beginning with the Ayurvedic treatment, and spreading to the Chinese, European as well as other systems of traditional medicines. These phytochemicals cannot only be isolated but also be developed as single-ingredient drugs, with quality and standards of modern medicine. Pharmacological validation of each hepatoprotective plant should include efficacy evaluation against liver diseases induced by various agents. Inflammation and oxidative stress contribute to liver injury. *E. officinalis* which is rich in vitamin C, gallic acid, flavonoids, and tannins, protects against hepatotoxicity-induced liver injury. *E. officinalis* supplementation offsets N-nitrosodiethylamine (NDEA) -induced liver injury via its antioxidant, anti-inflammation, anti-apoptosis, and anti-The utilization of natural remedies for the treatment of liver diseases has a long history autophagy properties. A profound pathological protection to liver cell as described by univacuolated hepatocytes was exhibited by the pretreatment of *E. officinalis* for seven consecutive days. Pretreatment with *E. officinalis* prior to CCl₄ (Carbon tetrachloride) intoxication exhibited major decrease in the levels of serum glutamic oxaloacetic transaminase, serum glutamic pyruvic transaminase, lactate dehydrogenase (LDH), GSH-S-transferase, lipid peroxidation (LPO) and DNA synthesis. There was also enhanced levels of reduced GSH, GSH peroxidase and GSH reductase. The results suggest that *E. officinalis* inhibits hepatic toxicity in Wistar rats. Tasduq et al., demonstrated the hepatoprotective property of a 50% hydroalcoholic extract of the fruits of *E. officinalis* (fruit) (EO-50) against anti-tuberculosis drugs-induced hepatic injury. The hepatoprotective activity of EO-50 was found to be due to its membrane stabilizing, antioxidative and Cytochrome (CYP) 2E1 inhibitory effects. Oxidative stress and ROS-mediated toxicity are considered two of the vital fundamental mechanisms responsible for alcohol-induced liver injury and mitochondrial dysfunction. The effect of *E. officinalis* fruit extract (EFE) against alcohol-induced hepatic damage in rats was explored. EFE possesses antioxidant as well nitric oxide (NO) scavenging activity as per in vitro studies. In vivo administration of EFE to alcoholic rats significantly brought the plasma enzymes towards near normal level

and also significantly reduced the levels of lipid peroxidation, protein carbonyls besides restoring both the enzymatic as well as non-enzymatic antioxidants level. This observation was supported by histopathological examination in liver. Thus, this data suggests that the tannoid, flavonoid and NO scavenging compounds present in EFE may offer protection against free radical mediated oxidative stress in rat hepatocytes of animals with alcohol-induced liver injury. Chronic treatment of CCl₄ and thioacetamide revealed abnormal histopathology suggestive of pre-fibrogenic events. EO reversed such modifications with substantial regenerative changes indicative of its preventive role in pre-fibrogenesis of liver. The reversal of pre-fibrogenic events could probably be due to its favorable antioxidative activity. Arsenic, a significant human toxin, is naturally present in groundwater.

MATERIALS AND METHODS:

Family	Phyllathaceae
Common name	INDIAN gooseberry
Division	Flowering Plant
Class	Magnoliposida
Genus	Phyllanthus



METHODS:

Isolation and Extraction of leaves

Isolation and Extraction

Leaves of *Phyllanthusemblica* were collected in the month of January 2023 from the NRI CAMPUS BHOPAL. The collected plant materials were brought to the laboratory on the same day. Plant samples were washed with water and air-dried at room temperature for 7 days, oven-dried at 40 °C to remove the residual moisture. The dried leaves were powdered using a mixer grinder and stored in air-tight containers for future use. Three different solvents such as Ethanol, and Distilled water were used for extraction. About 5 gm of the plant samples were added respectively into the test tubes containing 200 ml solvents, and were extracted at room temperature. The extracts in all the three solvents of leaves were tested for the presence of biological compounds following standard methods.



Fig 2: Isolation and Extraction

PHYTOCHEMICAL SCREENING

Phytochemical Screening

Qualitative estimation of Phytochemicals:

Qualitative analysis of phytochemicals was done for carbohydrates, phenols, tannins, flavonoids, saponins, glycosides, cardiac glycosides and alkaloids.

1. Test for Carbohydrates:

1.1 Fehling's test:

Equal volume of Fehling A and Fehling B reagents were mixed together and 2ml of it was added to crude extract and gently boiled. A brick red precipitate appeared at the bottom of the test tube indicated the presence of reducing sugars.

1.2 Benedict's test:

Crude extract when mixed with 2ml of Benedict's reagent and boiled, a reddish brown precipitate formed which indicated the presence of the carbohydrates.

1.3 Iodine test:

Crude extract was mixed with 2ml of iodine solution. A dark blue or purple coloration indicated the presence of the carbohydrate.

2. Test for Phenols and Tannins:

Crude extracts were mixed with 2ml of 2% solution of FeCl_3 . A blue-green or black coloration indicated the presence of phenols and tannins.

3. Test for Flavonoid:

3.1 Alkaline reagent test:

Crude extracts were mixed with 2ml of 2% solution of NaOH . An intense yellow color was formed which turned colorless on addition of few drops of diluted acid which indicated the presence of flavonoids.

4. Test for Saponins (Frothing test):

Crude extracts were mixed with 5ml of distilled water in a test tube and it was shaken vigorously. The formation of stable foam was taken as an indication for the presence of saponin.

5. Alkaloids:

Alkaloids content was measured by method suggested by Harborne. A suspension was prepared by dispersing 5 gm of the dried leaves in 10% acetic acid solution in ethanol and kept at 280°C for 4hrs which was further filtered through Whatman No. 42.

6. Determination of Tannins:

The finely powdered leaves and barks of *Saracaindica* were kept separately in a beaker containing 20 ml of 50% methanol covered with parafilm and then heated at 80°C in a water bath for 1 hr with continuous stirring.

7. Determination of Saponins:

100 ml Isobutyl alcohol was added to 1 gm of the finely powdered sample and stirred for 5 hrs. 20 ml of 40% saturated solution of Magnesium carbonate was added to the mixture and filtered.

8. Determination of total phenols:

Five gms of the powdered leaves were boiled with 50 ml of ether for 15 mins and distributed in the ratio 1:2 (extract: distilled water)..



Fig 3: Phytochemical Screening in Different Solvents

RESULT AND DISCUSSION:

The present study revealed that the various phytochemical components such as carbohydrates, flavonoids, saponins, phenols, tannins, glycosides and steroids, are present in the leaves of *Phyllanthusemblica*, have many medicinal uses and is a nontoxic traditional medicinal plant.

Table 1: Qualitative phytochemical analysis of Saracaasoca bark sample.

Sr. No.	Constituents	Test/Reagent	Chloroform	Petroleum ether	Acetone	n-hexane
1	Carbohydrate	Molish's Test Barfoeds Test	- -	- -	+ -	+ -
2	Tannins	Ferric chloride Test Potassium Dichromate test	+ +	+ -	- -	+ -
3	Flavonoids	Shinoda Test	-	-	+	-
4	Saponins	Foam Test	+	+	-	+
5	Alkaloids	Dragendroffs Reagent Mayers Reagent	- -	- -	- -	- -

6	Protein	Biuret test	-	-	-	-
7	Steroids	Liebermann Burchard Test	+	+	-	-

CONCLUSION: Phytochemical analysis conducted on the phyllanthusEblica and bark extracts revealed the presence of constituents which are known to exhibit medicinal as well as physiological activities. The phytochemical screening of the leaves of phyllanthusEblica done with acetone, chloroform, Petroleum ether and n-hexane .Among the four extracts show presence of carbohydrate in bark as evidenced by positive Molish test. All the four extracts of bark showed positive Molish test for carbohydrate . The phenols and tannins were detected only in chloroform and petroleum ether extracts but not in acetone extracts. All the four solvent extracts of bark showed negative ;' reagent test which indicated the absence of flavonoids. Saponin was detected in chlororform petroleum ether and n-hexane extracts of leaves as evidenced by positive froth foam test.

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