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# EVALUATION OF ANTI-MICROBIAL ACTIVITY AND SPECTRAL ANALYSIS (IR) AN ETHANOLIC EXTRACTION OF EUPHORBIA HIRTA.

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**Abctract :** The green plants are found to be an effective reservoir for bioactive compounds. The phytochemical test for ethanolic extract that shows bioactive compounds Alkaloid, Tannins, Terpenoids, Carbohydrates, Flavonoids, Saponins. IR spectrum of the extraction sample that functional groups are present alcohol, acid, amine groups are present. It can provide some anti-microbial agents. Anti-microbial activity of ethanol solvent extracts of *Euphorbia hirta* plant (except root). It shows an antibacterial activity and antifungal activity.

**Key words:** Euphorbia hirta, ethanol extracts, phytochemicals, IR spectrum, antimicrobial activity.

**Introduction**: In India the medicinal plants are consider as a backbone of traditional medicines. In recent times the humans are explored the plants are rich in bioactive compounds. It shows that 70-80% of human population in India developing traditional medicines. This plant use traditional medicines are cure disease in all over the world. *Euphorbia hirta* is a pantropical weed, originating from the tropical region of Americas. It is the hairy herb that grows in open grasslands, roadsides. It is widely used in traditional herbal medicines. In ancient days the *Euphorbia hirta* plant is

commonly called as asthma plant. *Euphorbia* is the genus of plant it belongs to the family of *Euphorbiaceae.* It is a very popular herb widely used as decoction for folk fever in Philippines particularly for dengue and malaria. This herb is also used for asthma, dysentery, intestinal parasites, diarrhoea, peptic ulcer, hay fever, heartburn, vomiting, skin problems and wound healing. *Euphorbia hirta* is often used traditionally for female disorders, worm infections in children, pimples, digestion problem and tumours. The *Euphorbia hirta* contain a milky white latex are slightly toxic. It is a stemmed, annual hairy plant with many branches from top to bottom. It grows up to 60 cm height with greenish or purplish color.

The leaves are present opposite elliptic - oblong to oblong - elliptic, the fruits are three celled hairy capsules 1-2 mm in diameter. It contains a four sided, angular and wrinkled seeds. The flowers are small unisexual greenish assembled in the same involucres which is cupshaped, four-toothed at the top, the teeth altering with minute glands. The seeds are red-brown, 1mm long, slightly transversally ribbed or wrinkled when dry. It is reproducing from the seeds. This plant has been containing the phytochemicals like Alkaloids, Flavonoids, Terpenoids, Tannins, Saponins, Steroids and Carbohydrates. These phytochemicals are natural and non-nutritive bioactive compounds produced by plants that act as protective agents against environmental stress and pathogenic attack.

**Figure 1: euphorbia hirta plant**

**Materials and method:**

**Preparation of extracts:** The *Euphorbia hirta* plants are collected from the local grass land then the plants are rinsed in running water and the roots are removed from the plant then this are placed on dry towel or newspaper. And the plants are dried for ten days in normal room temperature. The dried and grinded powdered sample was weighed 50gm taken into a filter bag and kept inside the soxhlet apparatus. Then 250ml of ethanol is taken into a round bottom flask. The condenser is placed upon the soxhlet apparatus with the help of wax. The heating mantle placed bellow round bottom flask. The temperature is maintained at 50°C for 24 hrs. The extracts were evaporated using rotary evaporated using rotary evaporated and the percentage yield was thus recorded. Dried

extracts were stored in airtight containers for further studies. Concentrated extracts were subjected to various chemical tests in order to detect the various phytoconstitutents.

**Phytochemical screening:**

The concentrated extraction sample of a *euphorbia hirta* plant was subjected to different chemical test for detection of phytoconstitutions using some standard procedures.

**Test for alkaloids:**

Crude extract of *euphorbia hirta* was dissolved with 2ml of 1% HCL and heated gently. Wagners and Mayer reagent were added to the mixture. Turbidity of the resulting precipitate. Conformation for the presence of alkaloids.

**Test for flavonoids:**

Curde extract of *euphorbia hirta* plant when mixed with 10ml distilled water, 5ml of dilute ammonia solution were added to a portion of the aqueous filtrate solution then added 1ml concentrated sulphuric acid. Indicate yellow color shows the presence of flavonoids.

**Test for tannins:**

Crude extract of *euphorbia hirta* plant was mixed with small amount of water and heated on water bath. The mixture was filtered and ferric chloride was added drop by drop to the filtrate. A dark green color appear which indicates the presence of tannins.

**Test for saponins:**

Crude extract of *euphorbia hirta* plant when mixed with 5ml distilled water in a test tube then it was shaken briskly. The formation of stable foam which that indicate the presence of saponins.

**Test for carbohydrates:**

Both Felling A and Felling B solution were mixed in equal volume. These reagents are added in crude extract of *euphorbia hirta* plant and smoothly boiled. A brick red color is appeared at the bottom of the test tube. That indicate the presence of reducing sugar.

**Test for steroids:**

The crude extracts of *euphorbia hirta* plant was dissolved in 0.5ml dichloromethane to prepare a dilute solution and then 0.5ml of acetic anhydride was added and add four drop of concentrated sulphuric acid. A blue-green color is appeared. That indicate the presence of steroids.

| PHYTOCHEMICAL COMPOUNDS | ETHANOLIC EXTRACT |
|---|---|
| Alkaloids | + |
| Flavanoids | + |

| | |
|---|---|
| Terpenoids | + |
| Tannins | + |
| Saponins | + |
| Carbohydrate | + |

**Table1 :phytochemical analysis**

## Spectral analysis:

The IR spectrum analysis was done in Sri Vinayaka Mission College of Pharmacy Salem. In IR spectrum there is a peak that are obtained. The peaks are measured by wavenumber $cm^{-1}$. The that shows a compounds like alcohol, acid, amine, aldehyde…etc.,

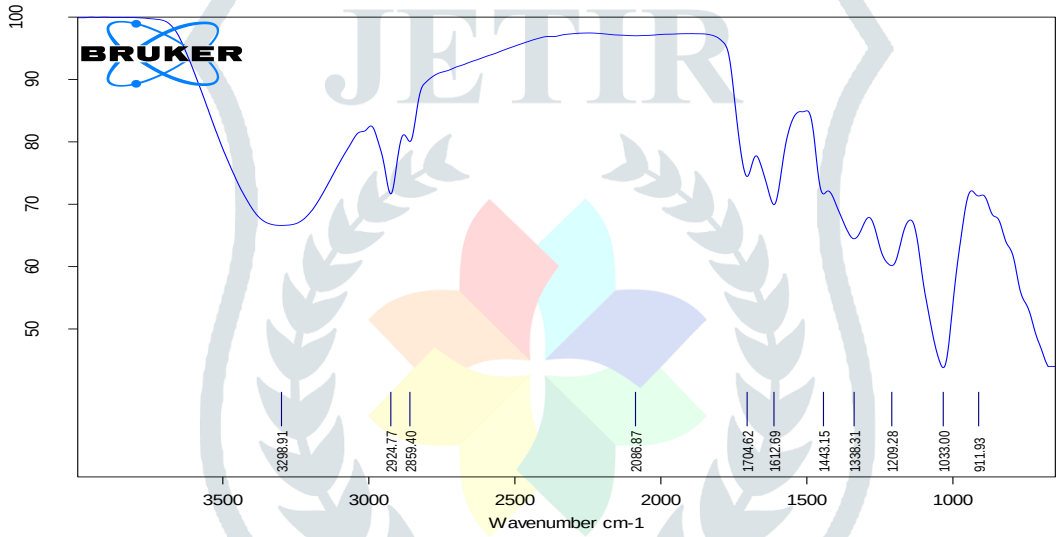


**Figure 2: Spectral analysis (IR)of euphorbia hirta plant.**

## Anti-microbial activity

## Bacterial culture

The human bacteria such as Streptococcus mutans, Streptococcus aureus, Clostridium absonum, and Escherichia coli were maintained in Nutrient agar at 4$^{o}$C for experiment studies. The different fungus strains such as Arthogrophis cuboida, Aspergillius fumigates and Aspergillius nigar were isolated from potato dextrose agar.

## Preparation of standard culture media of test organism

The colonies of different bacteria and strains of different fungus were inoculated in the 20ml nutrient broth and incubated for 24- 72hours.

**Assay of anti-bacterial activity**

Assay of anti-bacterial activity extraction of *Euphorbia hirta* plant (except root) was done by Disc Diffusion method. In this method 20ml of sterilized Mueller Hinton Agar was poured into sterile petri plates, after solidification, 120µl of bacterial culture poured on the plates and the culture was spread on plates using spreader. Then, the Whatmans filter paper discs (6mm in diameter) were kept over the agar plates using sterile forceps at various concentrations. Concentrated solvent was used as negative control. The anti-bacterial assay plates were kept incubator, where all the plates were incubated at 37ºc for 24hours. The diameter of inhibition zone was recorded.

**Assay of anti-fungal activity**

Assay of anti-fungal activity extract of *Euphorbia hirta* plant (except root) was done by Disc Diffusion method. In this method 20ml of sterilized Mueller Hinton Agar was poured into sterile petri plates, after solidification, 120µl of fungus culture poured on the plates and the culture was spread on plates using spreader. Then, the Whatmans filter paper discs (6mm in diameter) were kept over the agar plates using sterile forceps at various concentrations. Concentrated solvent was used as negative control. The anti-fungus assay plates were kept incubator, where all the plates were incubated at 37ºc for 24hours. The diameter of inhibition zone was recorded.

**Conclusion:**

Phytochemical analysis, spectral analysis, and antimicrobial study of selected *euphorbia hirta* plant species is a very significant way to establish that the selected plant species may be use as potent drugs. In our present study we select commonly found plant *Euphorbia hirta* which is easily available in our campus. It is a wellknown medicine for inflammation of respiratory tract and for asthma as it has a special reputation for causing bronchial relaxation. It can also be used as diuretic and purgative action. The above points clearly illustrate that the plants studied here can be seen as a potential source of useful bioactive compounds. In this study, we found that the plant extract(except root) of the plant contain alkaloids, flavonoids, terpenoids, saponins, tannins and carbohydrate. The IR spectral analysis that shows a compounds like alcohol, amine, aldehyde, aldehyde. The plant can be used as an important source of phytochemical and antimicrobial activity. On the basis of our antimicrobial study we find that our selected plant shows significant antibacterial activity against selected gram-positive strains. In addition to antibacterial study we also perform antifungal activity against selected fungal strains but unfortunately isolated extracts of selected plant extracts does not show any significant activity against selected fungal strains. So the study our results clearly indicate that we may use our plants as potent antibacterial drugs of natural origin. Further work will give emphasis to the isolation and characterization of active principles responsible for bio-efficacy and bioactivity.

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