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Review Article

Overview of Euphorbia Hita

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ABSTRACT

Medicinal herbs are the local heritage with global importance. Medicinal herbs have curative properties due to presence of various complex chemical substance of different composition, which are found as secondary plant metabolites in one or more parts of these plants. These plant metabolites according to their composition are grouped as alkaloids, glycosides, corticosteroids, essential oils etc. Euphorbia hirta, (family Euphorbiaceae) is an herb found in many parts of the world. In Sanskrit it means "Dugadhika" According to the Doctrine of Signatures, the plant has a reputation for increasing milk flow in women, because of its milky latex, and is used for other female complaints as well as diseases of the respiratory tract. The plant has been reported as increase in urine output, antidiarrheal, antispasmodic, antiinflammatory etc.

INTRODUCTION

The plant Euphorbia hirta, a small annual hairy plant of family Euphorbiaceae is popularly known by the name Dudhe Jhar in Nepal. The plant is erect or ascending herb growing up to the height of 50 cm, stem is slender and often reddish or purplish in colour, covered with yellowish bristly hairs especially in younger parts. The plant bears small numerous clustered flowers on leaf nodes. From each leaf node there protrudes out a pair of opposite, elliptical, oblong or oblong-lanceolate leaf having serrated edge. Fruits are yellow, three celled, hairy and keeled capsules having the

diameter of 1-2 mm that contain three brown, four sided. angular wrinkled seed. The plant is distributed throughout the hotter part of Nepal, India and most of the tropical and sub-tropical countries mostly grow in open grasslands. Euphorbia hirta is a well-known herb amongst the users of conventional medicines. It is used as the folk medicine against several skin disease, wounds, warts, gonorrhoea, migraines and intestinal parasites throughout the world. The plant is popularly known as asthma plant because it provides a good cure for asthma disease and other respiratory problems. The plant is also widely used against diarrhoea, and dysentery. There are many

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testimonies that prove the effectiveness of *E. hirta* against dengue too, traditionally it is also used in the treatment of kidney stone, diabetes, and in conjunctivitis. It also exhibit anxiolytic and sedative (4), analgesic, antipyretic, antiinflammatory, antimicrobial (16), anti-allergy (7), anti-oxidant (1, anti-tumour 19, anthelmintic 1001, anti-cancer and diuretic activities 2 The current study was purposed to determine the bioactive compounds from the methanol extract of *E. hirta* plant, evaluate the pharmacological potential and characterize them by GC-MS chromatographic technique.

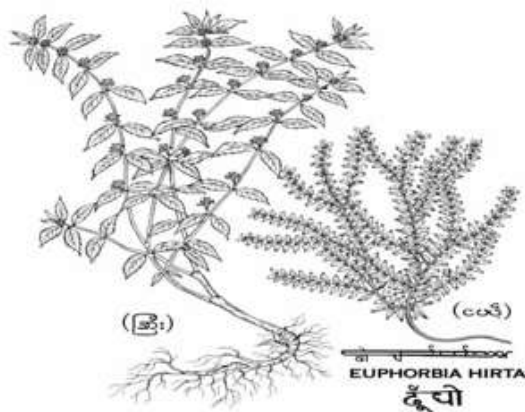
DESCRIPTION

Euphorbia Hirta L

Family: (Euphorbiaceae)

Vernacular names: dudhani, dudhi

English name: snake weed Morphology:



1) Selection of Herbal Drugs

Herbal drug was selected based on its long history of traditional use. The plant is widely available and has been commonly used in medicine to treat various health problems. Selection of herbal drug involves choosing the correct plant with proper botanical identification. The medicinally active part of the plant should be collected at the

appropriate stage of growth. The selected herbal drug must contain the required phytochemical constituents and be free from adulteration and contamination. The selection of plant material is essential to ensure the safety, effectiveness, and quality of herbal formulation.

- Selection of plant: *Euphorbia hirta*
- Family: Euphorbiaceae

The plant is used in the treatment of asthma, cough, diarrhoea, dysentery, wounds, skin infections, inflammation, and warts. *Euphorbia hirta* is rich in bioactive phytoconstituents such as flavonoids, phenolic compounds, tannins, alkaloids, saponins, and terpenoids. It possesses antioxidant, antimicrobial, anti-inflammatory, antidiabetic, and anti-asthmatic activities.

Botanical Identity

Kingdom : Plantae

Division : Spermatophyta

Class : Dicotyledonae

Order : Euphorbiales

Family : Euphorbiaceae

Genus : *Euphorbia*

Species : *Hirta*

2) Literature Review of *Euphorbia hirta*

Medicinal plants have been widely used since ancient times for the treatment and prevention of various diseases. According to the World Health Organization (WHO), about 80% of the world's population depends on traditional medicine for primary healthcare. Among the various medicinal plants, *Euphorbia hirta* L. has gained considerable



attention due to its diverse pharmacological activities. *Euphorbia hirta* belongs to the family Euphorbiaceae and is commonly known as asthma weed, garden spurge, or tawa-tawa. The plant is widely distributed in tropical and subtropical regions including India, Africa, Australia, and Southeast Asia. Traditionally, it has been used in herbal medicine for the treatment of asthma, diarrhoea, dysentery, cough, bronchitis, and skin infections. Recent scientific studies have focused on the phytochemical composition and biological activities of *Euphorbia hirta*. Various research reports have confirmed that the plant possesses antimicrobial, antioxidant, anti-inflammatory, antidiarrheal, and anticancer properties. Because of these therapeutic potentials, the plant has become an important subject of pharmacological and phytochemical research.

3) Collection and Authentication of Plant Material

The whole plant of *Euphorbia hirta* was collected from Chautara, Sangachowkgadhi, Nepal, in the month of June 2016. The plant was collected from natural habitats where it grows abundantly in open fields and roadside areas. The collection was carried out carefully to ensure that healthy and disease-free plant samples were obtained for the study. After collection, the plant material was thoroughly washed with clean water to remove soil, dust, and other impurities. The washed plant material was then subjected to shade drying at room temperature for about 15 days. Shade drying was preferred to preserve the phytochemical constituents present in the plant and to avoid degradation caused by direct sunlight. Once the plant material was completely dried, it was crushed and ground into a fine powder using a mechanical grinder. The powdered plant material was then stored in a clean, airtight container to protect it from moisture, contamination, and

microbial growth. The container was kept in a cool and dry place until further analysis and experimental procedures were carried out. The collected plant material was authenticated by examining its morphological and physical characteristics. The identification process involved comparing the observed features of the plant with standard botanical references and herbarium records. Important morphological characteristics such as the structure of the leaves, stem, flowers, and fruits were carefully observed during the identification process. *Euphorbia hirta* is characterized by small yellow flowers that appear in clusters at the leaf axils. The plant produces hairy, three-lobed capsules that contain wrinkled and triangular seeds. The leaves are opposite, elliptical in shape, and possess serrated margins, while the stem is covered with fine hairs. Based on these morphological characteristics and comparison with standard botanical descriptions, the plant material was confirmed to be *Euphorbia hirta*. These features verified and authenticated the identity of the collected plant sample used in the present study.

4) Preparation of Extract (Detailed)

The collected plant materials such as leaves and flowers of *Euphorbia hirta* were thoroughly washed with distilled water to remove dust and other contaminants. The cleaned plant materials were then shade-dried at room temperature for about 7–10 days to prevent the degradation of thermolabile phytoconstituents. After complete drying, the plant materials were cut into small pieces and ground using a mortar and pestle or mechanical grinder to obtain a coarse powder. The powdered material was passed through a sieve (40–60 mesh size) to obtain uniform particle size. The powdered plant material was then stored in airtight containers in a cool and dry place until further use. For extraction, the powdered plant



material was subjected to Soxhlet extraction method. Approximately 50–100 g of the powdered plant material was placed in a thimble made of filter paper and loaded into the Soxhlet extractor. The extraction was carried out using solvents of increasing polarity, such as hexane, chloroform, and methanol. Initially, hexane was used to remove non-polar compounds such as fats and oils. After completion of hexane extraction, the same plant material was dried and further extracted with chloroform to obtain moderately polar compounds. Finally, extraction was carried out using methanol, which can extract highly polar phytochemical constituents. The extraction process was continued for 6–8 hours until the solvent in the siphon tube of the Soxhlet apparatus became colourless, indicating complete extraction of phytoconstituents. After extraction, the solvents were removed by evaporation using a rotary evaporator under reduced pressure at controlled temperature (40–50°C). This resulted in the formation of semi-solid crude extracts. The

extracts obtained from each solvent were carefully collected, weighed, and the percentage yield of the extract was calculated using the following formula:

$$\text{Percentage Yield} = \frac{\text{Weight of Dried Extract}}{\text{Weight of Powdered Plant Material}} \times 100$$

The dried extracts were then stored in sterile airtight containers and kept in a refrigerator at 4°C until further use. These extracts were subsequently used for phytochemical screening, biological activity studies, and other analytical evaluations to identify the presence of active constituents such as alkaloids, flavonoids, tannins, phenolic compounds, saponins, steroids, and glycosides.

5) Preliminary Phytochemical Tests:

Preliminary test for alkaloids, saponins, tannins, steroids, flavonoids, anthraquinones, cardiac glycosides and reducing sugar.

EXPERIMENT	OBSERVATION	INFERENCE
i) Test for Alkaloids One ml of the extract solution was taken and a few drops of Dragendorff's reagent were added.	Orange-coloured precipitate formed	Presence of alkaloids.
ii) Test for Coumarins One ml of extract was mixed with 10% NaOH solution.	Yellow colour developed	Presence of coumarins
iii) Test for Tannins A small amount of powdered sample was treated with 10% alcoholic ferric chloride solution.	Appearance of dark blue or greenish-black colour	Presence of tannins
iv) Test for Flavonoids Few drops of NaOH solution were added to the extract	Formation of intense yellow colour which becomes colourless on addition of dilute acid.	Presence of flavonoids
v) Test for Phenols The extract solution was treated with 3–4 drops of ferric chloride solution.	Bluish-black coloration	Presence of phenolic compounds
vi) Test for Volatile Oils Two ml of extract solution was mixed with dilute HCl	Formation of white precipitate	Presence of volatile oil
vii) Test for Quinones 1 ml of extract and few drops of concentrated HCl were added	Development of red colour	Presence of quinones



<p>viii) Test for Sugars One ml of extract was treated with Fehling's solution</p>	Formation of red coloured precipitate	Presence of sugar
<p>ix) Test for Carbohydrates a) Molisch's Test Sample was treated with two drops of alcoholic αnaphthol solution b) Benedict's Test Sample was mixed with Benedict's reagent and gently heated c) Fehling's Test Sample was hydrolysed using dilute H_2SO_4, neutralized with alkali and heated with Fehling's A and B solutions</p>	<p>Formation of a violet ring at the junction of the two layers</p> <p>Formation of orange-red precipitate</p> <p>Formation of a red precipitate</p>	<p>Presence of carbohydrates</p> <p>Presence of reducing sugar</p> <p>Presence of reducing sugar</p>

6) Physiochemical Evaluation

Physicochemical Evaluation of *Euphorbia hirta* is an important step in pharmacognosy to determine the purity, quality, and identity of the crude drug. These parameters help in detecting adulteration, contamination, and standardization of the herbal drug.

6.1 Moisture Content (Loss on Drying)

- Moisture content determines the amount of water present in the plant material.

Procedure:

- Accurately weigh about 2–5 g of powdered *Euphorbia hirta*.
- Place it in a dry Petri dish.
- Dry in a hot air oven at $105^\circ C$ until constant weight is obtained.
- Calculate the percentage loss in weight.

Importance:

- Prevents microbial growth
- Avoids decomposition of active constituents

6.2 Ash Values

- Ash values indicate the inorganic content present in the drug.

a) Total Ash

- Represents total inorganic residues such as physiological ash and non-physiological ash.

Procedure:

- Weigh about 2 g of air-dried powdered drug.
- Incinerate in a silica crucible at $450\text{--}600^\circ C$ until carbon free ash is obtained.
- Cool and weigh.

b) Acid Insoluble Ash

- Measures silica and earthy materials like sand.

Procedure:

- Boil the total ash with dilute hydrochloric acid.
- Filter and ignite the residue.
- Weigh the remaining ash.



c) Water Soluble Ash

- Indicates water soluble inorganic salts.

Procedure:

- Boil total ash with distilled water.
- Filter and ignite the insoluble portion.
- Subtract from total ash.

6.3 Extractive Values

- Extractive values determine the amount of active constituents extracted with solvents.

a) Alcohol Soluble Extractive Value

- Macerate 5 g powdered drug with 100 ml alcohol for 24 hours.
- Filter and evaporate 25 ml filtrate to dryness.
- Dry and weigh the residue.

b) Water Soluble Extractive Value

- Same procedure as alcohol extractive value using distilled water.

Importance:

- Indicates the presence of polar compounds such as glycosides, tannins, and flavonoids.

6.4 pH Determination

- pH indicates the acidic or basic nature of the plant extract.

Procedure:

- Prepare 1% or 10% aqueous solution of the powdered drug.
- Measure using a pH meter.

6.5 Foreign Organic Matter

- Determines impurities such as other plant parts, dust, insects, or soil.

Procedure:

- Spread the sample on a clean surface.
- Separate and weigh foreign matter.
- Express as percentage w/w.

6.6 Fluorescence Analysis

- Some plant constituents show fluorescence under UV light.

Procedure:

- Treat powdered drug with reagents such as:

1. NaOH

2. HCl

3. H₂SO₄

4. Methanol

- Observe the colour under visible light and UV light (254 nm & 366 nm).

Importance:

- Helps in authentication of crude drug

7) Chromatographic Analysis

7.1 FTIR Analysis

Fourier Transform Infrared (FTIR) analysis was carried out to identify the functional groups present in the different fractions of *Euphorbia hirta*. The chloroform, butanol, ethyl acetate fractions, and methanol extract were analysed using an FTIR spectrophotometer (Shimadzu IR



Prestige). The samples were scanned in the infrared region of 5000–400 cm^{-1} . The obtained spectra were used to identify the characteristic functional groups present in the extracts based on their absorption peaks. FTIR analysis helps in determining the presence of important phytochemical constituents such as alcohols, phenols, alkanes, aldehydes, ketones, and carboxylic acids.

7.2 GC–MS Analysis

Gas Chromatography–Mass Spectrometry (GC–MS) analysis was performed to identify the chemical constituents present in the methanol extract of *Euphorbia hirta*. The analysis was carried out using a GC–MS QP 2010 Ultra instrument equipped with an RTX-5MS capillary column (30 m \times 0.25 mm \times 0.25 μm).

Operating Conditions:

- **Carrier gas:** Helium
- **Flow rate:** 1 ml/min
- **Injector temperature:** 280°C
- **Column type:** RTX-5MS capillary column
- **Oven temperature program:** 250–280°C

During the analysis, the sample components were separated based on their volatility and interaction with the stationary phase of the column. The separated compounds were then detected by the mass spectrometer, which produced characteristic mass spectra for each compound. The identification of compounds was carried out by comparing the obtained mass spectra with the standard spectra available in the NIST (National Institute of Standards and Technology) library database. This analysis helps in identifying bioactive compounds present in the plant extract,

which may be responsible for the pharmacological activities of *Euphorbia hirta*.

8) Quantitative Analysis of *Euphorbia hirta*

Quantitative phytochemical analysis is carried out to determine the amount of major bioactive compounds present in the plant extract. These compounds are responsible for the medicinal properties of the plant. In *Euphorbia hirta*, important phytochemicals such as alkaloids, flavonoids, phenols, tannins, and saponins are quantitatively estimated.

8.1 Determination of Total Alkaloid Content

- Alkaloids are nitrogen-containing compounds that exhibit various pharmacological activities.

Procedure:

- Take 5 g of powdered plant material in a conical flask.
- Add 200 ml of 10% acetic acid in ethanol and allow it to stand for 4 hours.
- Filter the extract and concentrate it to one-fourth of the original volume.
- Add concentrated ammonium hydroxide dropwise until precipitation occurs.
- Collect the precipitate by filtration, wash with dilute ammonium hydroxide, and dry it.
- Weigh the dried residue.

Calculation:

Total Alkaloid (%) =

$$\frac{\text{weight of alkaloid residue} \times 100}{\text{weight of sample}}$$



8.2 Determination of Total Flavonoid Content

- Flavonoids are important antioxidant compounds present in many medicinal plants.

Procedure:

- Weigh 10 g of plant powder and extract with 80% methanol.
- Filter the solution and evaporate to dryness.
- Weigh the residue obtained.

Calculation:

Flavonoid Content (%) =

$$\frac{\text{Weight of flavonoid extract} \times 100}{\text{Weight of sample}}$$

8.3 Determination of Total Phenolic Content

- Phenolic compounds possess strong antioxidant and antimicrobial properties.

Procedure:

- Prepare plant extract using methanol.
- Add Folin–Ciocalteu reagent to the extract.
- Add sodium carbonate solution and mix well.
- Incubate the mixture for 30 minutes.
- Measure absorbance using a UV–Visible spectrophotometer at 765 nm.
- The phenolic content is expressed as Gallic Acid Equivalents (GAE).

8.4 Determination of Tannin Content

- Tannins are polyphenolic compounds with astringent and antimicrobial properties.

Procedure:

- Take plant extract and add Folin–Denis’s reagent.
- Add sodium carbonate solution and mix thoroughly.
- Incubate for 30 minutes.
- Measure absorbance at 700 nm using a spectrophotometer.

8.5 Determination of Saponin Content

- Saponins have antimicrobial, anti-inflammatory, and immune-boosting activities.

Procedure:

- Take 20 g of powdered plant material.
- Extract with 20% ethanol by heating at 55°C for 4 hours.
- Filter and concentrate the extract.
- Add diethyl ether and separate the aqueous layer.
- Add n-butanol, wash with sodium chloride solution, and evaporate to dryness.
- Weigh the remaining residue.

Calculation:

Saponin content (%) =

$$\frac{\text{Weight of saponin residue} \times 100}{\text{Weight of sample}}$$

9) Biological Activities of Euphorbia hirta

Euphorbia hirta (commonly called Asthma weed or Snake weed) is a medicinal plant widely used in traditional medicine. Different parts of the plant such as leaves, stems, flowers, and roots contain phytochemicals like flavonoids, tannins, alkaloids, phenols, and terpenoids which are responsible for its various biological activities.

1. Antimicrobial Activity

Euphorbia hirta shows strong antimicrobial activity against several bacteria and fungi. Extracts of the plant inhibit the growth of microorganisms such as *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa*, and *Candida albicans*. This activity is mainly due to the presence of flavonoids, tannins, and phenolic compounds.

2. Anti-inflammatory Activity

The plant possesses significant anti-inflammatory properties. The extracts reduce inflammation by inhibiting inflammatory mediators such as prostaglandins and cytokines. Because of this property, it is traditionally used to treat asthma, bronchitis, and skin inflammation.

3. Antioxidant Activity

Euphorbia hirta contains natural antioxidants such as quercetin, gallic acid, and other phenolic compounds. These compounds help neutralize free radicals, protecting cells from oxidative stress and preventing damage to tissues.

4. Antidiarrheal Activity

The plant is widely used in traditional medicine for treating diarrhoea and dysentery. Studies have shown that extracts of *Euphorbia hirta* can reduce intestinal motility and fluid secretion, helping control diarrhoea.

5. Antidiabetic Activity

Research has indicated that *Euphorbia hirta* may help in reducing blood glucose levels. The plant extracts improve glucose metabolism and may enhance insulin activity, making it useful in managing diabetes.

6. Anticancer Activity

Some studies suggest that the plant exhibits cytotoxic effects against certain cancer cell lines. The presence of flavonoids and triterpenoids contributes to its potential anticancer properties by inhibiting tumour cell growth.

7. Antimalarial Activity

Extracts of *Euphorbia hirta* have shown activity against *Plasmodium* species, the parasite responsible for malaria. This supports its traditional use in treating fever and malaria.

8. Respiratory Activity

The plant is popularly known as Asthma plant because it helps in relieving asthma, cough, and bronchial disorders. It acts as a bronchodilator and expectorant, helping clear mucus from the respiratory tract.

10) Formulation of *Euphorbia hirta*

Euphorbia hirta is widely used in herbal medicine and can be formulated into different dosage forms such as tablets, capsules, syrups, ointments, and herbal teas. The formulation depends on the intended therapeutic use such as antidiarrheal, antimicrobial, anti-inflammatory, or respiratory treatment.

1. Herbal Syrup Formulation

- This formulation is commonly used for cough, asthma, and respiratory disorders.

Ingredients:

- Euphorbia hirta extract – 10–20%
- Sucrose or sugar syrup – 60–70%
- Glycerine – 5%
- Sodium benzoate – 0.1% (preservative)
- Flavouring agent – q.s.
- Distilled water – q.s.

Procedure:

- Prepare the extract of Euphorbia hirta using solvent extraction (usually methanol or ethanol).
- Filter and concentrate the extract.
- Prepare sugar syrup by dissolving sucrose in distilled water.
- Add glycerin and preservative to the syrup.
- Mix the concentrated plant extract into the syrup.
- Add flavouring agents and adjust the volume with distilled water.
- Filter and store in airtight bottles.

2. Herbal Capsule Formulation

- Used for antidiarrheal, antimicrobial, and antidiabetic effects.

Ingredients:

- Dried Euphorbia hirta extract – 250–500 mg
- Lactose – diluent
- Magnesium stearate – lubricant
- Talc – glidant

Procedure:

- Dry and powder the plant material.
- Prepare extract and evaporate the solvent.
- Mix the dried extract with excipients (lactose, talc).
- Add magnesium stearate as lubricant.
- Fill the mixture into hard gelatin capsules using a capsule filling machine.

3. Topical Ointment Formulation

- Used for skin infections, wounds, and inflammation.

Ingredients:

- Euphorbia hirta extract – 5–10%
- Petroleum jelly or ointment base – 80–90%
- Beeswax – 5%
- Preservative – q.s.

Procedure:

- Melt the ointment base and beeswax using a water bath.
- Add the plant extract slowly with continuous stirring.
- Mix until a uniform consistency is obtained.
- Allow it to cool.
- Fill into ointment tubes or containers.

4. Herbal Tea / Decoction

- Used for digestive disorders and diarrhoea.



Preparation:

- Take dried *Euphorbia hirta* leaves (5–10 g).
- Boil in 100–200 ml of water for 10–15 minutes.
- Filter the decoction.
- Drink warm 1–2 times daily

11) Data Analysis of *Euphorbia hirta*

Data analysis in the study of *Euphorbia hirta* is performed to interpret the results obtained from physicochemical evaluation, phytochemical screening, extraction yield, and biological activity tests. The collected experimental data are analysed statistically to determine the significance and reliability of the results.

1. Physicochemical Data Analysis

Physicochemical parameters such as moisture content, ash values, and extractive values are analysed to determine the quality and purity of the plant material.

Parameters commonly analysed:

- Total ash value
- Acid insoluble ash
- Water soluble ash
- Moisture content

- Alcohol soluble extractive value
- Water soluble extractive value

The results are expressed as mean \pm standard deviation (SD) after performing experiments in triplicate.

2. Phytochemical Screening Analysis

Qualitative phytochemical tests are conducted to detect the presence of bioactive compounds.

Compounds analysed:

- Alkaloids
- Flavonoids
- Tannins
- Saponins
- Glycosides
- Phenols
- Terpenoids

The results are usually represented in tabular form showing presence (+) or absence (–) of phytochemicals in different solvent extracts (hexane, chloroform, methanol, etc.).

Example table:

Phytochemical	Hexane Extract	Chloroform Extract	Methanol Extract
Alkaloids	-	+	+
Flavonoids	-	+	+
Tannins	-	-	+
Saponins	-	-	+

3. Extraction Yield Analysis

The percentage yield of extracts obtained from different solvents is calculated using the formula:

Percentage Yield =

$$\frac{\text{Weight of Extract}}{\text{Weight of Plant Material}} \times 100$$

This helps determine which solvent provides the maximum extraction of phytochemicals.

4. Biological Activity Data Analysis

Biological activities such as antimicrobial, antioxidant, and antidiarrheal activities are analysed by comparing experimental results with control samples.

For example:

Antimicrobial activity:

Measured by zone of inhibition (mm) against microorganisms.

Microorganism	Extract	Zone of Inhibition (mm)
E. coli	Methanol extract	15mm
S. aureus	Methanol extract	18mm

5. Statistical Analysis

Statistical methods are used to validate the experimental results.

Common methods include:

- Mean \pm Standard Deviation (SD)
- Student's t-test
- Analysis of Variance (ANOVA)

These analyses help determine whether the results are statistically significant ($p < 0.05$).

RESULT & DISCUSSION

The results obtained from the study of *Euphorbia hirta* include physicochemical evaluation, phytochemical screening, extraction yield, and biological activity tests. These results help to confirm the medicinal value and pharmacological potential of the plant.

1. Physicochemical Evaluation Results

The physicochemical parameters were determined to assess the quality and purity of the plant material.

Parameter	Result (%)
Moisture content	6.5 %
Total ash	8.2 %
Acid insoluble ash	2.1 %
Water soluble ash	3.8 %
Alcohol soluble extractive value	12.4 %
Water soluble extractive value	15.6 %

Discussion:

The moisture content was within acceptable limits, indicating proper drying of the plant material. The ash values reflect the presence of inorganic substances and confirm the purity of the sample. Higher water-soluble extractive value indicates the presence of polar phytoconstituents such as flavonoids and tannins.

2. Phytochemical Screening Results

Preliminary phytochemical analysis revealed the presence of various bioactive compounds.

Phytochemical	Result
Alkaloids	Present (+)
Flavonoids	Present (+)



Tannin	Present (+)
Saponins	Present (+)
Glycosides	Present (+)
Phenols	Present (+)
Terpenoids	Present (+)

Discussion:

The presence of these phytochemicals suggests that *Euphorbia hirta* has significant medicinal properties. Flavonoids and phenols contribute to antioxidant activity, while tannins and saponins may be responsible for antimicrobial and anti-inflammatory effects.

3. Extraction Yield Results

Solvent	Yield (%)
Hexane	4.5 %
Chloroform	6.8 %
Methanol	12.3 %

CONCLUSION

The present study on *Euphorbia hirta* demonstrates that the plant possesses significant medicinal and pharmacological properties. The physicochemical evaluation confirmed the purity and quality of the plant material. Preliminary phytochemical screening revealed the presence of important bioactive constituents such as alkaloids, flavonoids, tannins, saponins, phenols, glycosides, and terpenoids.

The extraction process showed that methanol extract produced a higher yield, indicating that polar solvents are more effective in extracting phytochemicals from the plant. The biological

activity studies, particularly antimicrobial tests, indicated that *Euphorbia hirta* exhibits effective inhibitory activity against various bacterial and fungal strains. These results support the traditional use of *Euphorbia hirta* in the treatment of respiratory disorders, diarrhoea, inflammation, and infections. The presence of various bioactive compounds suggests that the plant can serve as a potential source for the development of herbal medicines and pharmaceutical formulations. Therefore, *Euphorbia hirta* can be considered a valuable medicinal plant with promising therapeutic potential, and further studies such as isolation of active compounds, toxicity studies, and clinical trials are recommended to explore its full medicinal benefits.

REFERENCES

1. Ping G. Herbal therapy in respiratory diseases. Australian family physician. 2001; 30(8):775779.
2. Khurshid R. Saleen M. Karim S. Mir M. Antipyretic, antiviral, antithrombotic properties of *Euphorbia hirta* against Dengue fever. *Pharmacia*. 2013; 60(3):8.
3. Withernam KM, Soemarrdji AA, Wirasutisna KR, Kardonol BS. Anti-diabetes mellitus activity in vivo of ethanolic extract and ethyl acetate fraction of *Euphorbia hirta* L herb international. *J Pharmacol*. 2010; 6(3):231-240
4. Khan S, Ahmed B, Khalilullah H, Masoodi MH. Neuro pharmacological activity of *Euphorbia hirta* and its isolated compound. *J Pharmacog. Phytochem*. 2014; 3(2):138-146.
5. Lanhers MC, Fleurentin J, Dorfman P, Mortier F, Pelt JM. Analgesics, antipyretic and antiinflammatory properties of *Euphorbia hirta*. *Planta Med*. 1991; 57(1):225-233.
6. Rajch MAB, Zuraini Z, Sasidharan S, Latha LY, Amutha S. Assessment of *Euphorbia hirta* L. leaf, flower, stem and root extracts for their antibacterial and antifungal activity and brine shrimp lethality. *Molecules*. 2010; 15(1):6008-6018.

7. Youssouf MS, Kaiser P, Tahir M. Anti-anaphylactic effect of *Euphorbia hirta*. *Fitotherapia*. 2007; 78(7-8):535-539.
8. Aasha S, Thirunavukkarasu V, Magendra M, Mohamad sadiq A. Antioxidant activity of *Euphorbia hirta* Linn leaves extracts. *Eur. J Med. Plant*. 2016; 14(1):1-14.
9. Sandeep BP, Chandrakant SM. Phytochemical Investigation and antitumor activity of *Euphorbia hirta* Linn. *Eur. J Exp. Biol*. 2011; 1(1):51-56,
10. Hore SK, Ahuja V, Mehta G, Kumar P, Pandey SK, Ahmad AH. Effect of aqueous *Euphorbia hirta* leaf extract on gastrointestinal motility. *Fitotherapia*. 2006; 77(1):35-38.
11. Anitha P, Geegi PG, Yogeswari J, Anthoni Sami A. In Vitro Anticancer activity of Ethanolic extract of *Euphorbia hirta* (L.). *Sci. Technol. Arts Res. J*. 2014; 3(1):8-13.
12. Johnson BP, Abdurahman M, Tiam EA, Abdu-Aguye I, Hussaini IM. *Euphorbia hirta* leaf extracts increase urine output and electrolytes in rats. *J Ethnopharmacology*. 1999, 65(1).

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