

Pharmacognostic, Phytochemical And Ethnomedicinal Assessment Review on *Corallocarpus Epigaeus* Plant.

Bhavana Shinde^{*1}, Maitreyee Pachpor^{*2}, Dipti Kavtkar^{*3}, Om Iche^{*4}, Prof. Dipali Doifode^{*5}

^{1,2,3,4}. Student At Vidyaniketan Collage Of Pharmacy, Takarkheda More Road, Anjangaon Surji.

⁵Department of Pharmaceutical Quality Assurance, Vidyaniketan Collage Of Pharmacy, Takarkheda More Road, Anjangaon Surji.

**Address for Correspondence:
Bhavana Shinde***

ABSTRACT :

Corallocarpus epigaeus is a medicinal climbing plant valued in traditional practices. It belongs to the Cucurbitaceae family and is widely found in India and Southeast Asia. The tuber, which is the main part used for healing, has been utilized in Ayurveda, Siddha, and folk medicine for treating fever, inflammation, parasitic infections, skin issues, digestive problems, and respiratory conditions. Despite its long history of use, detailed pharmacognostic standardization of the tuber is still lacking. This review collects and assesses the pharmacognostic, physicochemical, phytochemical, and ethnomedicinal aspects of the *C. epigaeus* tuber. This work aims to establish reliable identification and quality control standards. Macroscopic and microscopic studies revealed unique diagnostic features. These include a tuber that is subglobose to irregularly ovoid, with creamy-white starchy parenchyma, scattered vascular bundles, plenty of starch grains, and specific lignified fibers. Powder microscopy confirmed the presence of both simple and compound starch granules, calcium oxalate crystals, and xylem vessels; these are important markers for identification. Physicochemical analysis, such as measurements of ash values, extractive values, and moisture content, provided standards that are critical for determining purity and spotting adulteration. Initial phytochemical screenings showed a variety of bioactive compounds, including alkaloids, flavonoids, saponins, tannins, glycosides, terpenoids, and sterols. These compounds are linked to various pharmacological effects, such as antioxidant, anti-inflammatory, hepatoprotective, anthelmintic, antimicrobial, antidiabetic, anticancer, and anti-venom properties. Overall, this work brings together traditional knowledge and scientific research. It provides foundational data for standardizing the *Corallocarpus epigaeus* tuber. The established standards can help ensure safe use in herbal products, support future pharmacological research, and aid in creating official documents for quality assurance in the herbal medicine industry.

KEYWORD : *Corallocarpus epigaeus*, Pharmacognostic standardization, Phytochemical screening, Ethnomedicinal uses, Physicochemical evaluation, Cucurbitacins, Antioxidant and anti-inflammatory activity.

INTRODUCTION :

The medicinally important climbing herb *Corallocarpus Epigaeus* belongs to the family Cucurbitaceae and is distributed across dry deciduous forests of parts of Southeast Asia, India, Sri Lanka, and Myanmar. ^[1] Traditionally valued for its tuber, which is considered to be the primary therapeutically active part of this plant, the plant is also known in various regional dialects as Jangli Aalu, Creeping Cucumber, or Mala Nirpi. ^[2] According to ethnomedical records, it is used to treat parasite infections, fevers, inflammatory diseases, skin conditions, digestive

disorders, and respiratory problems. The C. tuber contain Alkaloids, flavonoids, saponins, glycosides, terpenoids, phenols, and steroids are among the bioactive substances found in epigaeus that contribute to its pharmacological actions such as anti-inflammatory, analgesic, antipyretic, antibacterial, antioxidant, and wound-healing properties [4,5] Pharmacognostic evaluation includes macroscopic and microscopic analysis, physicochemical standards, powder properties, extraction methods, and first phytochemical screening. [6] Thus, the present study undertakes a detailed effort to achieve a pharmacognostic standardized profile of *Corallocarpus epigaeus tuber*. [7] This encompasses in-depth macroscopic and microscopic studies, powder microscopy, determination of physicochemical constant, extraction studies in different alcoholic and aqueous solvent, and preliminary phytochemical studies. [8] Such standardization will enhance its applications in the herbal medicinal industries, facilitate future pharmacological studies, and help in the establishment of monographs. The plant has been used to a great extent by Ayurveda, Siddha, and traditional folk medicine for fever, pain, inflammation, skin diseases, digestive, and respiratory issues. The tuber, which is the most sought-after part, is valued for its antibacterial, anthelmintic, antipyretic, analgesic, anti-inflammatory, and wound-healing properties. Despite its ethnomedical importance, it lacks comprehensive pharmacognostic standardization. The current study focuses on creating a thorough pharmacognostic standardized profile for the tuber because of its extensive use in Ayurveda, Siddha, and traditional folk medicine. This is an essential step to guarantee the quality, purity, and identity of the crude drug and to support its future applications in pharmacological research and the herbal medicinal industries. [9]

MACROSCOPIC EXAMINATION :

Macroscopic Study (Morphological) Prior to microscopic and chemical investigation, a thorough macroscopic assessment of the *Corallocarpus epigaeus tuber* gives the major diagnostic traits required for authenticating the crude medicine. A complete morphological characterisation is crucial because the tuber is the most commonly utilized medicinal element.

A) Organoleptic Characteristics

- **Color:** The inside parenchymatous tissue of fresh tubers appears creamy white, while the outside is pale yellow to light brown. The dried tubers have uneven spots and a dark brown color.
- **Odour:** Non-aromatic, earthy, and slightly distinctive.
- **Taste:** Slightly acidic and bitter; as it dries, the bitterness intensifies.
- **Texture:** Fleshy and wet while new; hard, fibrous, and compact when dry.
- **Shape:** Depending on the depth of the soil, it might be subglobose, spherical, or irregularly ovoid.
- **Size:** 3–10 cm in diameter; huge, fully grown tubers can grow up to 12–15 cm in diameter. [19]
- **Surface:** Thin, brittle exterior corky layer with shallow longitudinal creases and sporadic root scars.
- **Fracture:** Short and fibrous, revealing interior starchy tissues as it breaks with an uneven surface.
- **Consistency:** Heavy and solid, suggesting that fresh samples contain a lot of moisture and starch.



Figure 1. Tuber of *Corallocarpus Epigaeus* plant

B) Internal Morphology

When the tuber is sliced transversely or vertically:

- **Cortex:** A thin layer of cork on a narrow, light brown exterior.
- **Stele:** A sizable center area made up of starch-rich, soft, white parenchymatous cells.
- **Vascular Bundles:** Small, dispersed, collateral kind; they show up in the parenchyma as tiny, yellowish spots.
- **Latex:** A tiny quantity of watery exudate may show up on fresh cuts.
- **Fibers:** They contribute to the slightly fibrous fracture by appearing randomly.

These characteristics aid in identifying the authentic tuber and setting it apart from adulterants:

C) Macroscopic Diagnostic Features

- Large storage tuber that is subglobose to irregularly ovoid.
- The surface is pale brown and has tiny wrinkles.
- Starchy inner parenchyma that is creamy-white.
- Fibrous fracture that is hard and dry.
- Harsh taste and a slight earthy smell.
- On the sliced surface, dispersed yellowish vascular bundles are evident.^[21]



Figure 2. *Corallocarpus epigaeus*- A-Habit, B- Male flower, C- Fruit

MICROSCOPIC STUDIES :

Corallocarpus epigaeus tubers can be examined under a microscope to reveal crucial diagnostic characteristics that facilitate precise identification and guard against adulteration. The tuber's transverse section (T.S.) reveals a large core parenchymatous region with dispersed vascular bundles, as well as a clearly delineated cork and cortex.

A) Transverse Section (T.S.) of the Tuber

1.Cork

Four to ten layers of rectangular cells stacked tangentially make up the outermost layer. The cells are compactly packed, brownish, and have significantly thicker walls. Serves as a layer of defence.

2.Cortex

Cortex found beneath the cork and is made up of parenchymatous cells with thin walls. Polygonal to oval in shape, cells have a modest amount of intercellular space. Stone cells could occasionally be found. Includes trace amounts of starch granules.

3.Endodermis

Endodermis usually blurry, it seems like a layer that has been slightly compressed. Creates a line separating the central stele from the cortex.

4.Stele (Parenchymatous Central Region)

This makes up the majority of the tuber. Composed of big, spherical, thin-walled parenchyma composed of big, spherical, thin-walled parenchyma. There are a lot of simple and complex starch grains in cells. The gaps between cells are moderate.

5.Vascular bundles

The stele is filled with numerous, tiny, dispersed collateral vascular bundles. Each bundle displays: Xylem: pitted, lignified vessels with sparse tracheids. Phloem: little groups containing companion cells and sieve tubes. In T.S., the bundles show up as yellowish spots, a crucial diagnostic characteristic.

6.Fibers

Strands vascular bundles are surrounded by a few lignified fibers. Small lumen with thick walls.

7.Parenchyma Medullar

Parenchyma medullar big parenchymatous cells having a dense starch grain dispersion in a wide zone. The diffuse vascular system prevents true pith.

8.Starch Grain

Simple grains: 5–20 μm diameter, circular or oval. Two to five-celled clusters are compound grains. Hilum is either rather eccentric or centered. A significant microscopic diagnostic feature.

9.Calcium Oxalate Crystals

In the cortex and stele, a few prismatic crystals and cluster crystals (druses) are dispersed. Present but not plentiful.

B| Powder microscopy

When macroscopic characteristics are lost, powder microscopy is crucial for recognizing powdered drug samples and detecting adulteration. The following important microscopic features can be seen in the light brown, fine to moderately coarse *Corallocarpus epigaeus tuber* powder.

• Elements of Diagnosis Found in Powder: -

Starch Grains (Major Identifier: Extremely Plenty)

1.**Shape:** Oval, round, and occasionally pear-shaped in shape.

2.**Size:** Simple grains are 5–20 μm in size; compound grains are up to 30–40 μm .

Types :

- **Simple grains:** Simple grains are distinct, solitary, and smooth.
 - **Compound grains:** Compound grains are groups of two to six grains.
3. **Hilum:** Point-like or slit-like, central or somewhat eccentric.
 4. **Striations:** Under polarized light, striations clear concentric rings are seen.
 5. **Very abundant:** Extremely plentiful high starch content is a defining characteristic.
 6. **Fiber:** A fiber lengthy ends that taper. Narrow lumen, thick walls, and lignified. Periodically septate. Occur alone or in little groups.
 7. **Vessels in Xylem highly diagnostic:** Kinds of thickening a pit Scalar-like Helical brilliant under stain; lignified. The range of diameter is 40–70 μm .
 8. **Parenchyma Cells:** Cells in parenchyma polygonal with thin walls. Brimming with starch. Some have a reddish-brown hue.
 9. **Crystals of Ca Oxalate:** A little number druses and crystals with prisms. 10–25 μm in size.
 10. **Stone Cells (Sclereids):** Occasionally there lignified, thick-walled, and extremely reflective. Add more diagnostic information. ^[17]

PHYSICO-CHEMICAL CONSTANTS:

A drug's ash values provide information about its earthy content, inorganic makeup, and other contaminants. According to Indian Pharmacopoeia the percentage of total ash, acid-insoluble ash, water-soluble ash, and sulphated ash values of the tuberous root powder were calculated. ^[23]

Table no.1: Quantitative measurements of *C. epigaeus* (ash values)

Parameter	Ash values (% w/w)
Part Used	Roots tuber
Total ash	3.66
Water soluble Ash	1.66
Acid insoluble ash	1.00
Sulphated Ash	8.00

Table no.2: Quantitative measurements of *C. epigaeus* (extractive values)

Parameters	Extractive values (% w/w)
Ether soluble	0.74
Alcohol soluble	3.02
Water soluble	5.92

A) Extractive values:

Using petroleum ether, chloroform, ethanol, and water as solvents, the tuberous root powder was extracted using the method described by Kokate and Harborne. The extractive values percentages were computed using the air-dried medication as a reference, and the results are shown in Table.

Table no.3: Physical properties of extracts from tuberous roots

Physical properties of extract from tuberous roots				
S. No.	Extract	Nature	Colour	% yield (w/w) g
1	Alcoholic	Thick paste	Brown	3.02
2	Aqueous	Sticky	Dark brown	5.92
3	Chloroform	Sticky paste	Red brown	0.57
4	Petroleum Ether	Waxy	Yellow	0.74

B) Physicochemical Characteristics

To determine the identification, purity, and quality of *Corallocarpus epigaeus tubers*, a physicochemical analysis is crucial. These metrics aid in the detection of contamination, adulteration, and variances brought on by environmental or geographic causes.

1]Moisture Content/Loss on Drying (LOD): determines how much moisture is in the crude medication. Elevated moisture influences stability and encourages microbial growth. Anticipated Range: 4–10% w/w (depending on drying conditions and collecting season).

Importance: Prevents microbiological deterioration and guarantees stability.

2]Total Value of Ash: shows how much inorganic stuff there is overall. Comprises both non physiological ash (contaminants as sand, dirt) and physiological ash (plant tissue minerals). 5– 15% w/w for tubers is the expected range.

Significance: Adulteration or contamination is suggested by a high ash value.

3]Acid Insoluble Ash: Percentage of total ash that is not soluble in diluted HCl. Represents impurities such as earthy materials, sand, dirt, and silicates. Range Expected: <2% w/w.

Significance: Shows contamination of the soil or silica during harvesting.

4]Water Soluble Ash: How much ash is soluble in water. Shows the existence of inorganic salts that are soluble in water. Range Expected: 1-3% w/w. Significance: Aids in determining the water-soluble components' purity.

Table no.4: Physicochemical evaluation of *C. epigaeus* leaf, stem, and tuber powder

S. No.	Parameter	Values reported as a % (w/w)		
		Leaf	Stem	Tuber
1	Loss On Drying	86	83	82
2	Total Ash	2.6	3.2	3.6
3	Acid Insoluble Ash	0.4	0.3	0.4
4	Water Soluble Ash	1.0	0.9	0.8
5	Solubility			
	Alcohol	49	44	48
	Water	86	79	80

PRELIMINARY PHYTOCHEMICAL SCREENING:

Detailed Procedures, Findings, and Interpretation Preliminary phytochemical screening is aimed at the detection of major groups of secondary metabolites present in the tuber. Perform tests on the crude powdered drug (aqueous suspension) and each extract obtained from successive extraction (n-hexane, chloroform, ethyl acetate, methanol, and aqueous). Always perform a negative control (solvent blank) along with a positive control (known standard that contains the class).^[24]

1] Preparation of the Extracts

A) Aqueous Extract

To 100 mL of distilled water, add 5 g of powdered tuber. Heat for 30 minutes in a water bath; filter. The filtrate shall be used for the following tests: protein, tannin, saponin, glycoside, and carbohydrate.^[25]

B) Alcoholic extract (70% ethanolic)

100 mL ethanol and 5 g powder. Filter, reflux 30 to 45 minutes. Use in phenolic, terpenoid, steroid, alkaloid, and flavonoid assays.

2] Investigations on various parts of the plant including root, rhizome, tuber, leaf, and stem, have revealed the presence of the following compounds:

• Active Compounds and Mechanisms of Action

Major compounds identified include:

- **Cucurbitacins:** Bitter triterpenoids (notably cucurbitacin B and E) thought to inhibit inflammatory pathways, possibly downregulating COX-2 expression as seen in in vitro studies.
- **Saponins:** Natural detergents that may contribute to mild expectorant and anti-edema actions.
- **Flavonoids:** Kaempferol and quercetin derivatives provide antioxidant ability, scavenging free radicals in cellular experiments.
- **Sterols:** β -sitosterol and campesterol, associated to lipid-lowering and immune-modulatory actions.
- **Polysaccharides:** Water-soluble fiber components that could enhance gut health and moderate blood glucose reactions.

3] Identification Testes :

A) Test for Alkaloids

For the determination of alkaloids, two to three drops of Dragendroff's reagent should be added to one milliliter of extract. The solution thus obtained will be pale yellow, indicating the presence of alkaloids.

B) Test for Flavonoids

Flavonoids are also characterized by distinct colour changes during alkalization and reduction of metals. To test for flavonoids, add 1% ammonia solution to 1 milliliter of extract. A yellow coloration indicates the presence of flavonoids.

C) Test for Tannins

Tannins form characteristic precipitates or colour changes with ferric ions and gelatin. Testing for tannins for the black precipitate that shows the presence of tannins, 0.1% FeCl₃ was added to 1 ml of extract and well stirred.

D) Test for Saponins

To test for the saponins, mix one milliliter of aqueous extract with one milliliter of distilled water, then shake it well. The appearance of the foam shows the saponins.

E) Test for Glycosides

General tests that reveal the nature of the aglycone moieties, cardiac anthraquinone, etc. will determine the presence of glycosides.

The violet to blue to green precipitate that forms when to milliliters of extract, two milliliters of chloroform and two milliliters of acetic acid are added shows the presence of glycosides.

F) Test for Triterpenoids & Steroids

Three milliliters of chloroform and two milliliters of extract are mixed together. To this mixture, a few drops of concentrated H₂SO₄ are added to produce a rich red coloration that shows the presence of terpenoid.

G) Test for volatile Oils and Terpenoids

The Salkowski test gives colour changes often with terpenoids, volatile oils are usually identified by means of GC analysis and odour.

H) Test for coumarins

Coumarins are fluorescent under UV light after alkaline treatment. To extract and observe under UV 366 nm, add 5% NaOH. Coumarins reveal themselves through blue or green fluorescence.

I) Cholesterol test

Reducing sugars produce a brick-red precipitate upon heating. Since tubers contain a large amount of starch, Molisch + Fehling may work well with aqueous extracts.

Table no.5: Phytochemical screening Methanolic leaf extract of (Redfruit creeper) *Corallocarpus epigaeus*.

S.no.	Phytochemicals	Test Reaction name	Reaction is characterized by
1	Alkaloid	Dragendroff test	Pale yellow colour
2	Flavonoids	Lead acetate test	Formation of yellow colour
3	Phenol	FeCl ₃ test	Precipitates of green/blue/violet
4	Saponin	Foam test	Froth formation
5	Terpenoids	Salowski's test	Reddish Brown precipitate
6	Cardiac Glycoside	Keller-Killiani test	Formation of a brown ring
7	Reducing Sugars	Fehling's or Benedict's test	Brick-red precipitate at the bottom

8	Steroids	LiebermanBurc hard test	Greenish precipitate
9	Tannins	Ferric chloride test	Black precipitate
10	Coumarin	NaOH test	Appearance of a fluoresce colour

EXTRACTION METHODOLOGY: (ALCOHOLIC AND AQUEOUS)

A] Prior to Extraction Preparing Samples

1. Voucher & Authentication: Verify the botanical identity and note the location, date, collector, and voucher number.
2. Cleaning: Clear away dirt and debris, give it a quick rinse with distilled water, and then let it dry in the shade.
3. Drying: Until the weight remains consistent, shade-dry at room temperature or in an oven at 40 to 45 degrees Celsius.
4. Powdering: To get a consistent powder, pulverize the dried tuber and run it through a screen no. 40 sieve.
5. Storage: Until extraction, keep the powdered sample at room temperature in airtight amber containers with silica gel.
6. Moisture Check: To provide dry weight basis, calculate loss on drying (LOD) prior to extraction.

B] Sequential Extraction (Soxhlet):

Suggested Sequence Hexane comes first, followed by optional chloroform, ethyl acetate, methanol, and water. The Soxhlet Method (per solvent):

1. Fill a Soxhlet thimble with 50 g of defatted powder.
2. Fill the flask with 300-500 mL of solvent.
3. Allow extraction for 6 to 8 hours after heating the solvent to reflux (or until the siphon is clear and the solvent in it appears colorless).
4. Following extraction, concentrate the solvent extract under low pressure on a rotary evaporator at the proper temperature (for example, 40–45 °C for methanol/ethanol).
5. Weigh the extractive yield after drying the residue in a vacuum oven or lyophilizer.
6. Keep dried extracts at 4°C in amber jars.

C] Hydroalcoholic 70% reflux:

1. Fill a round-bottom flask with 500 mL of 70% ethanol and 50 g of powdered substance.
2. Reflux at a low boil for 1-2 hours.
3. Cool, filter, concentrate, and dry.

D] Aqueous Decoction (Traditional Method):

1. Pour 500 mL of distilled water into 50 g of powder.

2. Boil slowly for 20 to 30 minutes, decreasing to 1/3 volume.
3. Cool, filter, lyophilize, or concentrate under low pressure to produce an aqueous extract.

E] Aqueous extraction :

a) Hot water extraction (decoction): Hot water extraction, or decoction, involves boiling the plant material in water to extract water-soluble active constituents such as tannins, saponins, and mucilage. The plant powder is boiled for a specific time, cooled, filtered, and the extract is collected.

b) Cold Water Maceration (Infusion): For 24 hours at 4–8 °C, soak 50 g of powder in 500 mL of distilled water while stirring occasionally. After filtering, focus.

c) Lyophilization: Freeze filtrate and lyophilize to obtain dry powder, this method is preferred for aqueous extracts to protect heat-sensitive ingredients.

F] Hydroalcoholic Extraction (Ethanol: Water 70:30 or 50:50): - A wide range of polar and moderately polar chemicals are extracted by hydroalcoholic combinations. The ideal balance is to use reflux or maceration with 70% ethanol (v/v).

Table no.6: Extractive value (in %) of *C. Epigaeus* leaf, stem, and tuber

Method of Extraction	Solvent used	Yeild in (percentage)		
		Leaf	Stem	Tuber
Solvent Extraction	Water	11.1%	12.1%	12.2%
	Chloroform	4.2%	5.2%	6.8%
	Ethanol	6.2%	8.6%	10.4%
	Methanol	6.8%	9.3%	9.6%
	Acetone	6.4%	4.6%	6.8%
	Benzene	4.2%	4.8%	6.8%
	Petroleum Ether	5.8%	5.7%	6%

G] Concentration as well as drying

1. Use a rotary evaporator at less than 45 °C and lower pressure to concentrate filtrates.
2. Freeze and lyophilize aqueous concentrations to prevent deterioration.
3. If a lyophilizer is not available, dry extracts to a consistent weight in a vacuum oven at 40–45 °C.
4. Keep track of weights and use the dry weight basis to compute yield percentage.

• **Extract Storage:** Dried extracts should be refrigerated at 4 °C with desiccant in amber vials labeled with the solvent, date, batch, yield, and yield percentage. Store at -20 °C for extended periods of time.

ASSAYS FOR QUANTITATIVE AND CONFIRMATORY ANALYSIS OF EXTRACTS

1. Folin-Ciocalteu's total phenolic content (TPC)

Sample preparation: Dissolve 1 mg/mL of extract in methanol/water. Combine 0.5 mL of the sample with 2.5 mL of diluted 10% Folin-Ciocalteu reagent and 2.0 mL of 7.5% Na₂CO₃. RT in the dark for 30 minutes. Measure at 765 nm. Gallic acid is the standard (calibration 0–200 µg/mL).

Report as gallic acid equivalents (mg GAE/g extract).^[27]

2. The AlCl₃ technique for total flavonoid content (TFC)

Sample: solution of 1 mg/mL.

Method: Combine 0.5 mL of sample, 0.1 mL of 10% AlCl₃, 0.1 mL of 1M CH₃COOK, and 4.3 mL of methanol. Give it a half-hour. At 415 nm, read.

Standard: Calibration of quercetin, Report as: extract/mg QE.^[28]

3. DPPH Radical Scavenging (Antioxidant)

Method: Combine 3.9 mL of 0.1 mM DPPH in methanol with 100 µL of sample (different concs). Incubate in the dark for 30 minutes. Read at 517 nm.

Report: IC₅₀ (µg/mL) and percentage inhibition.^[29]

4. GC-MS/LC-MS (confirmatory): To detect non-volatile components, use LC-MS (reverse phase C18 column; gradient water: CAN + 0.1% formic acid). Use GC-MS for essential oils or volatile fractions.^[30]

5. FTIR analysis: Phytochemicals including phenols and carboxylic acid with spherical-shaped nanoparticles were detected by FTIR analysis and SEM assessment.^[31]

6. Heavy metals and microbial load: pathogen-free microbial limit test according pharmacopeia (TAMC, TYMC). Report mg/kg or ppm for Pb, As, Cd, and Hg using ICP-MS or AAS.

GUIDELINES FOR INTERPRETING AQUEOUS VERSUS ETHANOLIC DATA

- **Aqueous extracts:** Higher yields, more carbohydrates, saponins, tannins, mucilage, glycosides, and certain polar phenolics are to be expected from aqueous extracts. Excellent for screening for saponins and tannins and for conventional decoction-type applications.
- **Ethanol (70%) extracts:** A wider range of polarity is frequently extracted by ethanolic (70%) extracts, including polar phenolics and medium polarity flavonoids, alkaloids, and certain terpenoids. TPC/TFC, antioxidant assays, and bioactivity screens utilized in pharmaceutical research are often superior.^[32]
- **Concordance:** Semi-quantitative data (TFC, TLC densitometry) will provide relative enrichment if a constituent class (such as flavonoids) is present in both extracts.^[33]

ETHNOMEDICINAL AND TRADITIONAL USES OF *C. EPIGAEUS* :

1) Antioxidant and anti-inflammatory activity: The DPPH test demonstrated the compound's capacity to scavenge free radicals. This characteristic has been widely utilized to assess how well natural antioxidants scavenge free radicals. *C. epigaeus* has an anti-inflammatory action against paw edema caused by carrageenan.^[34]

2) Anthelmintic activity: Anthelmintic action using piperazine citrate as the reference standard, the anthelmintic activity of the alcoholic and aqueous extracts of the roots and rhizomes of *C. epigaeus* was assessed on adult earthworms *Lampito marutii*, *Eudrillus eugine*, and *Eisenla foetida*. At every tested dose level, the extracts paralyzed the worms before killing them.^[35]

3) Hepatoprotective activity: When compared to the control group, the results clearly showed that CCL₄ intoxication in normal rats increased the serum levels of SGOT, SGPT, ALKP, TBL, and CHL while dramatically lowering the levels of TPTN, ALP, and ALB. When compared to methanolic extracts, the ethyl acetate extract provided a substantial percentage of inhibition while the crude extract from the chosen plant produced strong hepatoprotective action.

- 4)Antibacterial Activity:** Both gram positive and gram-negative bacteria showed notable antibacterial activity. The plant extracts were totally ineffective against *K. pneumoniae*.
- 5)Anticancer activity:** MAPK signal transducers are clearly involved in controlling Cu-B Mediated anti melanoma activity since cucurbitacin B suppresses MEK $\frac{1}{2}$ as well as constitutive and EGF-mediated ERK $\frac{1}{2}$ Activation.
- 6)Haemopoietic Activity:** *C. epigaeus* rhizome Choornam improved hemoglobin concentration in a somewhat substantial way. Exertional fatigue, palpitations, paleness, and tachycardia are among the signs and symptoms of Pandu Rogam that Choornam effectively relieves.
- 7)Antidiabetic properties:** *Corallocarpus epigaeus* rhizome ethanolic extract has antidiabetic properties. Has an antidiabetic effect that is comparable to that of the commonly used medication glibenclamide.^[36]
- 8)Management of urticaria:** The current study clearly demonstrates that all four bioactive compounds screened in-silico have a propensity to bind with the most important active site amino acid residues found in the Histamine 1 receptor, Prostaglandin H2 synthases, and Cyclooxygenase I. It was also noted that none of the compounds have bound with Cyclooxygenase 2. The phototherapeutics found in the herb *Corallocarpus epigaeus*.^[37] will be useful in the treatment of urticaria, according to the findings of the current study.
- 9)Anti-ophidian activity:** Poisonous bites are treated with this stem decoction. Root paste is used to snake bites. The deadly effects of Russell's viper venom were investigated in vivo in mice at a dose level of 500 mg/kg by administering methanolic and aqueous extract *Corallocarpus epigaeus*. When used to treat Russell's viper snake bites, *Corallocarpus epigaeus* exhibits strong anti- venom action.^[38]

FUTURE PROSPECTIVE :

- Compare different extraction techniques, such as Soxhlet, reflux, maceration, decoction, ultrasound-assisted, and microwave-assisted extraction, to establish the best method according to efficiency.
- Optimization of extraction solvents-aqueous, ethanol, methanol, and hydroalcoholic-to maximize the yield of the major bioactive compounds.
- Determine the extraction efficiency of fresh versus dried tubers to understand how drying conditions influence phytochemical yield.
- Optimise solvent systems for the ideal recovery of specified key phytochemicals, in relation to regional chemical variation.

CONCLUSION :

The assessment confirms the historical justification for the tuber's therapeutic usage by describing its traditional use in treating conditions like fevers, inflammatory diseases, digestive disorders, and parasite infections. Additionally, a wide range of bioactive compounds, such as alkaloids, flavonoids, saponins, glycosides, and terpenoids, were identified by the review's methodical characterization of the phytochemical composition. These compounds collectively provide the chemical foundation for the reported pharmacological activities, including anti-inflammatory, analgesic, and wound-healing qualities. The thorough explanation of macroscopic and microscopic diagnostic traits that are crucial for the botanical verification of the *C. epigaeus tuber* serves as the foundation for this definitive standardization. Macroscopically, the review found that the tuber is usually subglobose to irregularly ovoid, with an exterior surface that is pale brown and has shallow longitudinal creases. The inside parenchyma is a characteristic creamy-white and very starchy. In the field or during procurement, these observable characteristics offer quick and accurate identification. The internal cellular structure was further verified under a microscope, with the presence of scattered yellowish vascular bundles and a large number of starch granules serving as clear internal indicators. In conclusion, the review has produced primary data points—the standardized parameters that transform the conventional understanding of *Corallocarpus epigaeus* into a therapeutic agent that is both scientifically verifiable and quality-controlled, preparing it for dependable use and additional pharmacological research.

REFERENCES :

1. T.Sivkumar, K.Kannan and R.Manavalan. Pharmacognostical Investigation of *Corallocarpus Epigaeus* (Rottler) C.B Clark. (n.d.). *Rasayanjournal*, Vol.2, No.1, (2009) 159–166.
2. Dhanraj T.S. & Nalini V. Phytochemical Screening and Anticancer Activity of *Corallocarpus Epigaeus* Rhizome in Benzo A Pyrene Induced Lung Cancer. *Shodhganga : A Reservoir of Indian Theses*, 242 (2017).
3. Nakum, K. H., Vaja, V. B., Ishnava, K. B., JMPS, & Nakum, K. H. Ethnobotany and phytochemistry of *Corallocarpus epigaeus* CL-A candidate of potentials medicinal plant. *Journal of Medicinal Plants Studies*, (2025) 382–385.
4. Vasantha, K Priyavardhini, S. Efficacy of Phytochemical and Antibacterial activity of *Corallocarpus epigaeus* Hook.f. *International Journal of PharmTech Research*, Vol.4, No.1, (2012) 35–43.
5. Saranya U. & Sivakanesan R. and Varnakulendran N. Evaluation of Haemopoietic Activity of the Rhizome of *Corallocarpus epigaeus* Benth. Ex Hook-A Pilot Study. *Cloud Publications International Journal of Advanced Ayurvedic and Herbal Medicine*, Volume 3(Issue 1), (2017) 18–25.
6. Kothawade, K. A., & Siddiqui, A. Proximate Phytochemical analysis of *Corallocarpus epigaeus* (Arn.) Cl rhizomes and *Vernonia anthelmintica* willd seeds. *Journal of Drug Delivery and Therapeutics*, 9(4-s) (2019) 1203–1206.
7. Ravi Shankar Lankalapalli, Sreekumar Usha Devi Aiswarya. Cucurbitacin B, Purified and Characterized from the Rhizome of *Corallocarpus epigaeus* Exhibits Anti-Melanoma Potential. *Frontiers in Oncology*, Volume 12, Article 903832 (2022).
8. Umadevi U., Kamalam M. Pharmacognostical, phytochemical and heavy metal studies on an ethno medicinal plant-*corallocarpus epigaeus* (rottl. & wild.) Clarke. *International Journal of Pharmacognosy and Phytochemical Research*, (2012) 117–121.
9. Tamizharasi S. Pharmacological evaluation of tubers of *corallocarpus epigaeus* rottl willd Clarke with special reference to its antiarthritic antioxidant and immunomodulatory activities in rats. *Shodhganga : A Reservoir of Indian Theses* (2003).
10. Priya Murugan. Phytochemical analysis and biological activities of methanolic extract of Redfruit creeper, *Corallocarpus epigaeus*. *Reserch Square* (2025).
11. Hema G, Sivasubramanian P, Dhanusu Raman N, Gas Chromatography-Mass Spectrometry Analysis for the Identification of the Bioactive Metabolites in Hydroalcoholic Extract of *Corallocarpus Epigaeus* Rhizome. *International Journal of Research in Pharmacology & Pharmacotherapeutics (IJRPP)*, Vol.14, (2025) 596–607.
12. R. Sarojini, S. Selvakumar, N. Chidambaranathan. Preclinical Evaluation of Hydro alcoholic extract of Coral. *International Journal of Research in Pharmacology & Pharmacotherapies' (IJRPP)*, Vol.13, (2024) 176–202.
13. B. Arirudran, K. Anbarasu, S. Kannan. Gas Chromatography-Mass Spectrometry (GC-MS) Determination of Bioactive Components from *Corallocarpus epigaeus* L Rhizome. *Asian Journal of Medicine and Biomedicine* (2023).
14. Kalpesh B. Ishnava and Priya S. Konar. In vitro anthelmintic activity and phytochemical characterization of *Corallocarpus epigaeus* (Rottler) Hook. F. tuber from ethyl acetate extracts. *Ishnava and Konar Bulletin of the National Research Centre* (2020).
15. Vinod Kamble, Battu Ganga Rao. Effect of Roots of *Corallocarpus epigaeus* in Methanolic and Ethyl Acetate Extracts on Ccl4 – induced Hepatotoxicity in Rat. *International Journal of Pharmaceutical Sciences Review and Research*, Article No. 02 (2018).
16. Poonam Sethi. Micro morphological Studies on Rhizome of *Corallocarpus Epigaeus* Benth. Ex Hook. F. 9(12), (2017) 71–73.
17. J. Venkata Suresh, G. Nagarjuna Reddy, V. Ramanarayana Reddy. Pharmacognostical Evaluation of Tuberos Roots of *Corallocarpus Epigaeus* (n.d.). *Asian Journal of Phytomedicine and Clinical Research*, 5(4) (2017) 150–160.
18. V. Nalini and T.S. Dhanaraj. Determination of Phytocomponents in *Corallocarpus Epigaeus* rhizome Using GC-MS. *International Journal of Institutional Pharmacy and Life Science*, (2016) 6(4).

19. C. Nisha Shri, J. Balaji, S. Venkatramanan. Pharmacognostical and preliminary phytochemical screening of the root and rhizome of *Corallocarpus epigaeus*. *International Journal of Pharmaceutical and Biomedical Research*, 1, (2010) 24–27.
20. Tuber of *Corallocarpus epigaeus* (Arn.) Cl | Download Scientific . . . (n.d.-b).
21. World Health Organization. Quality control methods for medicinal plant materials. Geneva: WHO; 1998.
22. *Corallocarpus epigaeus*. -A: Habit. -B: Male flowers. -C: Fruits . . . (n.d.).
23. World Health Organization Quality control methods for herbal materials. World Health Organization (2011)
24. Harborne JB. *Phytochemical Methods: A Guide to Modern Techniques of Plant Analysis*. 3rd ed. London: Chapman & Hall; 1998.
25. Kokate CK. *Practical Pharmacognosy*. 4th ed. Delhi: Vallabh Prakashan; 1994.
26. Soundravalli V. and Kalaiarasi Kalamegam. Biogenic Synthesis of ZnO Nanoparticles from *Corollocarpus epigaeus*: Phytochemical Characterization and Antimicrobial Applications. *Research Journal of Biotechnology*, Vol. 20 (7) (2025).
27. Singleton VL, Rossi JA. Colorimetry of total phenolics with phosphomolybdc phosphotungstic acid reagents. *Am J Enol Vitic* 1965; 16 (3):144-158.
28. Chang C, Yang M, Wen H, Chern J. Estimation of total flavonoid content in propolis by two complementary colorimetric methods. *J Food Drug Anal*. 2002; 10 (3):178-182.
29. Brand-Williams W, Duvalier ME, Berset C. Use of a free radical method to evaluate antioxidant activity. *Lebensm Wiss Technol*. 1995; 28 (1):25-30.
30. Sharma A, Cannoo DS. Phytochemical profiling of plant extracts using LC-MS and GC-MS: An overview. *J Drug Deliv Ther*. 2013; 3 (2):210-218.
31. Stuart B. *Infrared Spectroscopy: Fundamentals and Applications*. John Wiley & Sons; 2004.
32. Do QD, Angkawijaya AE, Tran-Nguyen PL, Huynh LH, Soetaredjo FE, Ismadji S, Ju YH. Effect of extraction solvent on total phenolic content, total flavonoid content, and antioxidant activity of *Limnophila aromatica*. *J Food Drug Anal*. 2014; 22(3):296–302.
33. Wagner H, Bladt S. *Plant Drug Analysis: A Thin Layer Chromatography Atlas*. 2nd ed. Springer; 1996.
34. M. Jayaseelan, T. Arumugam, N. Thangaraj Evaluation of antioxidant and anti-inflammatory activities of *Corallocarpus epigaeus* (Hook.F.) rhizomes. *International Journal of Pharmaceutical and Biomedical Reserch*, 5(1), (2014) 18–24.
35. T. Shri Vijaya Kirubha, R. Senthamarai, K. Vasuki, Anthelmintic activity of roots and rhizomes of *Corallocarpus Epigaeus*. *Scholars Research Library*, 1 (1), (2011) 81–84.
36. Kattamanchi Gnananath, Kontham Ramakanth Reddy, Gudur Pavan Kumar. Evaluation of antidiabetic activity in *Corallocarpus epigaeus* rhizomes. *International Current Pharmaceutical Journal*, 2(3), (2013) 53–56.
37. V.M. Karthic, B.Poongodi, P.Shanmugapriya, D.Sivaraman. In-Silico Molecular Docking Analysis of Potential Phototherapeutics from the Medicinal Herb *Corallocarpus Epigaeus* for Treating Urticaria. *Int J Trans Res Ind Med*, 1(2), (2019) 05–12.
38. S.Manonmani, R.Madhavan, P.Shanmugapriya. A Review of beneficial effects of Siddha medicinal herbs on Snake bite. *International Journal of Current Research in Biology and Medicine*, 1(7), (2016) 27–35.

Copyright & License:

Authors retain the copyright of this article. This work is published under the Creative Commons Attribution 4.0 International License (CC BY 4.0), permitting unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.