



**Screening of phytochemicals with comparative studies on different parts of Leea macrophylla Roxb. ex Hornem.**

**(Hastikarna Palasa)**

**Riya<sup>1</sup> Dr. Arun Kumar<sup>2</sup>**

1Ph.D. Research Scholar, University Department of Botany, Ranchi University, Ranchi

**Orcid Number:** 0000-0002-4837-9561

<sup>2</sup>Associate Professor, Head, University Department of Botany and Dean, Faculty of Science, Ranchi University, Ranchi

**Corresponding Author: Ms. Riya**

**Email:** [sheenriyas@gmail.com](mailto:sheenriyas@gmail.com)

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**Abstract:**

Medicinal plants are the backbone of living beings and it is absolutely in demand as food and good health of all living beings. Plants naturally produces metabolites that is primary and secondary metabolites which are also termed as phytochemicals or bioactive compounds. The objective of this write up is to bring medicinal values of Leea macrophylla Roxb. ex Hornem. (Hastikarna Palasa).

The wild ethnomedicinal plant Leea macrophylla Roxb. ex Hornem. (Hastikarna Palasa) comes to the Vitaceae family, and is blessed with several ethnomedicinal importance and also this plant is known to have many therapeutic properties due to the numerous chemical compounds present in it. Qualitative phytochemical screening was concluded to show the presence of various phytoconstituents. Ethanolic extracts of tuberous root, stems and leaves of this plant namely Leea macrophylla Roxb. ex Hornem. (Hastikarna Palasa) were used to conclude the examines. After the screening of phytochemicals, it has shown that the plant contains a rich number of bioactive compounds. From which we can use it as potential novel drug in future to treat several ailments.

**Keywords:** Bioactive, Hastikarna Palasa, Therapeutic properties.

**Introduction:**

Traditionally used plants with their products are widely appraise for pharmacological properties which have been increased throughout the world today. Plant derived phytoconstituents imparts a leading role in boosting health and treating several ailments in preventive and cytotoxic effects<sup>1</sup>.

The epithet Hastikarna Palasa as a name of plant, being expressive of this name bearing plant. Perhaps the plant Leea macrophylla bears very huge size of leaf which often looks like a hand fan or similar to the ear of an elephant<sup>1</sup> (*Figure1*). Leea macrophylla to which local common names Hathikana, Hatkana, Hatikana, are used by tribal and forest area<sup>2,3</sup>, has botanically identified as Leea macrophylla Roxb. ex Hornem. (Family Vitaceae)<sup>2</sup>. The use of medicinal plants is always useful to the mankind from decades.

Medicinal plants received a great deal of attention for its safest uses and cost consideration. It is believed that the drug of natural origin plays a vital role in healthcare without any side effects<sup>3</sup>. The medicinal plants engaged major place in pharmaceutical companies; herbal medicines are remaining the most important source of health care for the population of world<sup>4</sup>. These Medicinal plants typically comprise mixtures of various chemical

compounds that may act independently, additively or in synergy to improve health<sup>4</sup>.

**Habit of Leea macrophylla Roxb. ex Hornem.:**

Leea macrophylla commonly called as Hastikarnapalasa widely distributed to Western Ghats and Sub-Himalayan region identified under Indian habitat growing up at altitude of 2000-2500 m relatively hotter parts of India. It is an erect herbaceous shrub attains the height about 1ft. – 3 ft. with tuberous roots and elephant ear shaped leaves<sup>5</sup>.

**Description of Leea macrophylla Roxb. ex Hornem.:**

Leea macrophylla is an erect herbaceous shrub broadly found at an altitude of 2000-2500m throughout India. This ethnomedicinal plant grows up to the height of 1-3ft, perennial, many branches with tuberous roots found in warm region. The leaves are simple, broad, oval shaped with cordate base, apex is acute or acuminate with serrate margin attains up to size of 20-60 cm long. The upper surface is dark green glabrous while the lower surface is light green fibrous surface. Leaves are oppositely arranged with 6-8 pairs. Flowers are greenish white with large corymbs with white petioles, branched, corymbose, terminal inflorescence. Its berries are spherical, 5-6 diameter;

green in colour, branched on ripening becomes purple or black<sup>6</sup> (Figure 2).

#### **Material and Methods:**

*Leea macrophylla* Roxb. ex Hornem. were collected from ICAR, Garhkhatanga, Ring Road Ranchi during the month of September to November 2023. Firstly, the plant was self-identified with the help of Flora- "The Botany of Bihar and Orissa" Vol. I & II-page number 207-208<sup>7</sup>. Then it was identified by Prof. Dr. (Mrs.) Kunul Kandir, Former Head, University Department of Botany and Dean, Faculty of Science, Ranchi University, Ranchi. Further the herbarium (Figure 3) was made and sent to Botanical Survey of India (BSI), Hyderabad, Telangana, India, for authenticated identification.

After all this, the fresh plant was again collected for lab work. From the whole fresh plant, tuberous root, stems and leaves were separated and washed two to three times to remove all soil contaminations. After being washed, all these were chopped into small pieces and kept aside in a clean cool area to get dried. After dried properly tuberous root, stems and leaves were grinded into powder and kept in an air tight glass container (Figure 4).

Phytochemicals have two categories, which includes Primary & Secondary metabolites. It has very great commercial value like the production of new drugs for curing of several diseases. For qualitative phytochemical screening the extracts were soaked into ethanol in the ratio of 1:10 and kept for about 48 to 72 hours. Later it was filtered with the help of Whatman filter paper number 1, then kept for evaporation and after evaporation it was again resuspended with ethanol to make the extracts of tuberous root, stems and leaves.

Ethanolic extracts of tuberous root, stems and leaves were subjected to preliminary phytochemical screening for the presence of different 11 phytoconstituents with the help of using various qualitative reagents as per the standard procedures<sup>8</sup>. Qualitative screening of **alkaloids, amino acids, carbohydrates, flavonoids, glycosides, reducing sugar, proteins, phenols, steroids, tannins, terpenoids** were done. The methods are as given below:

#### **For Alkaloids:**

Extract was treated with Dragendorff's reagents. A reddish-brown precipitate shows the presence of alkaloids.

#### **For Amino acid:**

Extract was treated with few drops of Ninhydrin reagent, and then heated in water bath. A purple or pink coloured solution indicates the presence of amino acids.

#### **For Carbohydrates:**

Extract was treated with 2ml of Molisch's reagent and mixture was shaken. 2ml of conc sulfuric acid was poured carefully. Formation of brick red or dull violet colour shows the presence of carbohydrates.

#### **For Flavonoids:**

Extract was treated with few drops of lead acetate solution. Formation of yellow colour precipitate shows presence of flavonoids. And Treated with few drops of 10% ferric chloride solution. A green colour precipitate indicates presence of flavonoids.

#### **For Glycosides:**

Extract was treated with glacial acetic acid, 5% ferric chloride, Conc. Sulfuric acid. Formation of brown ring indicates the presence of Glycosides.

#### **For Reducing sugar/Glucose:**

Extract was mixed with Fehling's solution A & b and boiled in water bath. A red colour precipitate indicates the presence of Reducing sugar. Extract was treated with 0.5ml Benedict's reagent then boiled for 2minutes. Formation of green, yellow, red colour shows the presence of Reducing sugar.

#### **For Proteins:**

Extract was treated Millon's reagent, white precipitate indicates presence of protein.

#### **For Phenols:**

Extract was treated with few drops of 5% ferric chloride solution. A dark green or bluish black colour precipitate indicates presence of phenols.

#### **For Steroids:**

Extract was treated with 2ml of chloroform and 3ml of conc. Sulfuric acid. Reddish brown colour formed at the interface indicates the presence of steroids.

#### **For Tannins:**

Extract was treated with 3ml distilled water and 3drops of 10% ferric chloride solution. Blue green colour shows the presence of tannins.

#### **For Terpenoids:**

Extract was mixed with 2ml of chloroform and 3ml of conc sulfuric acid carefully. Indication of reddish brown colour indicated the presences of terpenoids.



Figure.1: Morphology of Leea macrophylla Roxb. ex Hornem. (Hastikarna Palasa)



Figure.2: Flowers and Berries of Leea macrophylla Roxb. ex Hornem. (Hastikarna Palasa)



Figure.3: Herbarium of Leea macrophylla Roxb. ex Hornem. (Hastikarna Palasa)



Figure.4: Fresh cutting and powdered samples of Leea macrophylla Roxb. ex Hornem. (Hastikarna Palasa)

#### Result and Conclusion:

In the present study, the qualitative phytochemicals screening tests was done for the test

of alkaloids, amino acids, carbohydrates, flavonoids, glycosides, glucose, proteins, phenols, steroids, tannins and terpenoids from ethanolic extracts of

tuberous root, stems and leaves of Leea macrophylla Roxb. ex Hornem. (Hastikarna Palasa). All of these phytoconstituents were present and showed the positive results as shown in Figure 5 (a) Tuberous root (b) stems and (c) leaves with Table 1.

It is of prime importance to exhibit the use of drug Leea macrophylla Roxb. ex Hornem. (Hastikarna Palasa) in front of the society. Furthermore, many phytochemicals acting as primary and secondary metabolites which is present in the different parts of this plant are shown to exhibit pharmacological activities justify the use of

Leea macrophylla as traditional medicine. The data available in the present research work may help to check potency as well as efficacy of the drug. This research will be accommodating for further studies on this plant. Henceforth, there are huge scopes for additional scientific investigation to establish Leea macrophylla Roxb. ex Hornem. (Hastikarna Palasa) as a potential source of novel drugs. Further research is mandatory for the advantageous for commerce and trade of the drug Leea macrophylla Roxb. ex Hornem. (Hastikarna Palasa).

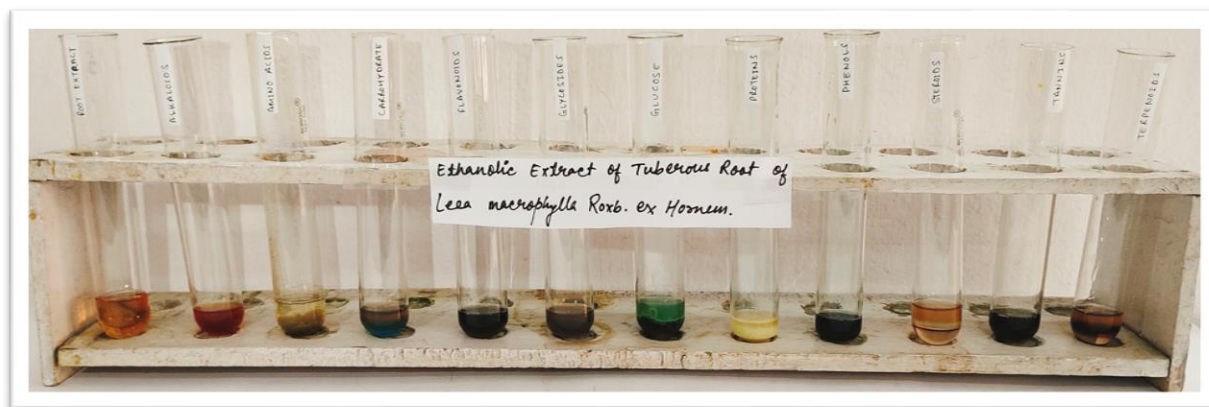


Figure.5: (a) Ethanolic extract of tuberous root of Leea macrophylla Roxb. ex Hornem. (Hastikarna Palasa) for qualitative phytochemicals screening.



Figure.5: (b) Ethanolic extract of stems of Leea macrophylla Roxb. ex Hornem. (Hastikarna Palasa) for qualitative phytochemicals screening.



Figure.5: (c) Ethanolic extract of leaves of Leea macrophylla Roxb. ex Hornem. (Hastikarna Palasa) for qualitative phytochemicals screening.

Sl. No.	Compound names	Tuberous root	Stems	Leaves	Colour Observations
1	Alkaloids	++	++	++	Orange, red, brownish red
2	Amino acids	++	++	++	Reddish orange, dull bluish purple
3	Carbohydrates	++	++	++	Bluish green, reddish brown
4	Flavonoids	++	++	++	Orange, brownish red, dull greenish
5	Glycosides	++	++	++	Violet or blue to green, pale yellow
6	Glucose	++	++	++	Intense orange red, yellowish or reddish brown, brick red
7	Proteins	++	++	--	Creamish white
8	Phenols	++	++	++	Orangish brown, deep blue-black, blue-green
9	Steroids	++	++	++	Reddish brown ring at the interface
10	Tannins	++	++	++	Green-black to blue black, brownish green
11	Terpenoids	++	--	++	Reddish brown or green

**Table.1: Qualitative phytochemicals screening of ethanolic extracts of Tuberous root, stems and Leaves of *Leea macrophylla* Roxb. ex Hornem. (Hastikarna Palasa) for qualitative phytochemicals screening.**

#### Conflicts of interest:

The authors declared that they have no completing conflicts of interest to publish under the current issue of the journal.

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