Phytochemical Screening of *Millingtonia hortensis* (L.) Flower

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ABSTRACT

*Millingtonia hortensis* is one of the folkloric medicinal plant belonging to the family Bignoniaceae. It is used as antipyretic, sinusitis, cholagogue and tonic in folklore medicine. The present study provides information about *Millingtonia hortensis* phytochemical analysis. Maceration extract method was carried out using polarity solvent Acetone (AC) were chemically screened. The main aim of the present study was to evaluate the phytochemical properties of *Millingtonia hortensis* flower to treat various diseases. The Qualitative Phytochemical Analysis of flower revealed the presence of fatty acids and carbohydrates.

**Keywords:** *Millingtonia hortensis*, folkloric plant, phytochemical, polarity solvent, flowers.

1. INTRODUCTION

Medicinal plants play an important role in curing various diseases in allopathic, ayurvedic and traditional medicine. For the past thousands of years medicinal plants have been used to treat health disorders and to add flavor to food. *Millingtonia hortensis* L. commonly known as cork tree are found throughout Southern Asia. It is well known for its fragrant flowers and it belongs to the family Bignoniaceae. This tree is grown as ornamental plant in gardens and avenue. The plant parts are used as antipyretic, sinusitis, cholagogue and tonic in folklore medicine [1]. It is also rich in flavonoids, tannin, alkaloids and essential oil [2]. Stem bark of plant is mainly used to cure lung diseases, antiasthmatic and antimicrobial [3]. *Millingtonia hortensis*, Tree Jasmine or Indian Cork tree, the sole species in the genus *Millingtonia* is a tree native to South-East Asia [5]. The name *Millingtonia* comes from Thomas Millington, an English botanist while *hortensis* means “grown in gardens” [6]. Tall deciduous tree - mostly found in tropical forests low altitude slopes 500-1200m [7]. The flowers are also used in rituals and have good antimicrobial properties [8]. The main focus of this study is to determine the phytochemical components present in the flower.

2. MATERIALS AND METHODS

2.1 Herbarium

All the ethnomedicinally important plants were collected as per information given by the local population and numbers were given accordingly. Herbarium specimens were prepared according to the method described earlier [9]. The flowers of *Millingtonia hortensis* flower were identified with the help of Flora of Presidency of Madras [10] and confirmed with the authentic herbarium of Government of India, Botanical Survey of India (Southern Circle) Coimbatore. All the prepared herbarium specimens were deposited in the
Department of Vivekananda College of Arts and Sciences for Women (Autonomous) Campus, Elayampalayam, Thiruchengode, Tamil Nadu, India.

2.2. Collection and storage of plant material

The fresh flowers were collected from the plant species of *Millingtonia hortensis* (Bignoniaceae). It was ensured that the plant was healthy and uninfected, then cleaned it up. The particular amount of flowers were dried under shadow at room temperature. The dried samples were powdered in a Wiley Mill (Scientific Equipment’s Works, New Delhi, India) to be 60 mesh in size. Care was taken to clean the Wiley Mill thoroughly after powdering sample and before starting to powder a new sample to avoid mixing up of samples. The powder samples were stored in polythene containers at room temperature. The flower samples were chemically screened to detect the presence of certain biologically active compound(s).

2.3. Identification of certain biologically active compounds using preliminary qualitative test

The plant species *Millingtonia hortensis* (Flower) were chemically screened to find out the presence or absence of certain bioactive compound(s). The method of extraction is common for all the aforesaid plants and respective test procedures are given below. For each experiment triplicates were maintained.

2.4.1. Test for alkaloids

Two ml aliquot of the extract was treated with the following reagents to test the presence or absence of alkaloids. Mayer’s reagent - white precipitate or turbidity will be observed.

2.4.2. Test for steroids and sterols

*Salkowski’s test:*

The extract were dissolved in 1 or 2 ml of chloroform and equal volume of concentrated sulphuric acid was added by the sides of the test tube. The upper layer turns red revealing the presence of steroid and sterol compounds in the extract.

*Libermann-Burchard*’ test:

The extracts were in 2 ml of chloroform and 10 drops of acetic anhydride and 5 drops of concentrated sulphuric acid were added and mixed. The change of red colour through blue to green indicates the presence of steroids.

2.4.3. Test for Triterpenoids

*Hirshorn test:*

The extracts were dissolved in 2 ml of chloroform and heated for 10 min. after the addition of 2 ml of trichloro acetic acid. Appearance of yellow colour to red indicates the presence of triterpenoids.

*Libermann-Burchard*’ test:

The extracts were in 2 ml of chloroform and 10 drops of acetic anhydride and 5 drops of concentrated sulphuric acid were added. Appearance of red to violet colour indicates the presence of triterpenoids.

2.4.4. Test for Proteins and Amino acids

*Biuret test:*

One ml of extract, 1 ml of 40 per cent sodium hydroxide solution and 2 drops of 1 per cent copper sulphate solution were added. The appearance of violet colour indicates the presence of proteins/amino acids.

*Ninhydrin test:*

One ml of the extract, 2 drops of freshly prepared 0.2 per cent ninhydrin reagent was added and heated. The appearance of blue colour indicates the presence of proteins, peptides or amino acids.

2.4.5. Test for Carbohydrates

*Benedict’s test:*

Five ml of Benedict’s solution was added to the extract and boiled in water bath. The appearance of red yellow or green precipitate indicates the presence of reducing sugars.

2.4.6. Tests for volatile oils

Two -ml aliquot of extract was evaporated on a porcelain crucible. If the residue has an aromatic smell, it indicates the presence of volatile oils.

2.4.7. Test for fatty acids

The extracts were evaporated on a filter paper. A translucent spot indicates the presence of fatty acids.

3. RESULTS AND DISCUSSION

*Phytochemical Screening*

In the present study the results of phytochemical screening of the potential medicinal plant such as *Millingtonia hortensis* are shown in Table. 1.
All the five samples of the investigated five plant species were extracted with solvents of increasing polarity such as benzene, acetone, chloroform, methanol and qualitatively analyzed for certain bioactive compounds such as alkaloids, steroids, triterpenoids, protein, amino acids, carbohydrates, volatile oils and fatty acids. The floral sample of Millingtonia hortensis was extracted by using acetone. Flower extract of Millingtonia hortensis (flower) showed for the presence of alkaloids, steroids, triterpenoids, protein, amino acids, carbohydrates, volatile oils and fatty acids.

Figure 1. Phytochemical Screening of Millingtonia hortensis flower. A-Habitat, B-Extraction (Maceration), C- Phytochemical screening tests, D-Fatty acids, E-Volatile oils.

Table 1. Phytochemical screening of Millingtonia hortensis flower

<table>
<thead>
<tr>
<th>Extract Name</th>
<th>Chemical Constituents</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanol</td>
<td>Alkaloids</td>
<td>++</td>
</tr>
<tr>
<td></td>
<td>Steroids</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Triterpenoids</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Protein</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Amino Acids</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Carbohydrates</td>
<td>+++</td>
</tr>
<tr>
<td></td>
<td>Volatile Oils</td>
<td>+++</td>
</tr>
<tr>
<td></td>
<td>Fatty Acids</td>
<td>+++</td>
</tr>
</tbody>
</table>

4. CONCLUSION

Nowadays scientists from divergent fields are investigating plants with a view to decipher antimicrobial usefulness and they found hundreds of phytochemicals which have inhibitory effects on all types of microorganism in vitro. In the present study chemical composition relevant to the disease for which they are used. The secondary metabolites Millingtonia hortensis (Flower) are reported for the first time in our laboratory. The optimal effectiveness of medicinal plants many not be due to one main bioactive constituent, but in fact to the combined action of different secondary metabolites originally present in the plant.

Conflicts of Interest

There are no conflicts of interest.

References

