Phytochemical analysis of Mentha piperita (Peppermint)

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Mentha piperita (Lamiaceae family) is one of the most popular herbs in the world and has a long history of safe usage in medical preparations. Its leaf is used as a treatment for conditions including the common cold, liver inflammation, mouth, throat, and pharynx inflammation, as well as gastrointestinal problems like cramps, nausea, vomiting, diarrhoea, and more. In this work, the analysis of photochemical processes of Mentha piperita was attempted which includes test for phenol and tannins, glycosides, Flavonoids, carbohydrates, glycosides and alkaloids. This plant is certainly rich in significant phytochemicals that can be employed as medications, according to the evidence.

Keywords: Mentha piperita, Phytochemical investigation, Medicinal plants, alkaloids

INTRODUCTION

A hybrid mint created by crossing spearmint and watermint is called Mentha piperita. It is a perennial herbaceous rhizomatous plant. It is derived from Mentha piperita, a member of the Lamiaceae family. One of the most popular plants in the world, Mentha piperita (family Lamiaceae), has a long history of safe usage in medical compositions. Its leaf is used as a treatment for conditions like the common cold, liver inflammation, mouth, throat, and pharynx inflammation, as well as gastrointestinal problems like cramps, nausea, vomiting, diarrhoea, and dyspepsia. Due to its therapeutic effects like antinociceptive, antiinflammatory, antibacterial, and antioxidant characteristics, it is also of significant interest to medicine. Flavonoids including eriocitrin, narirutin, hesperidin, luteolin-7-O-rutinoside, isorhoifolin, diosmin, and 5, 7-
dihydroxycromone-7-O-rutinoside have anti-allergic properties. Mentha piperita is used medicinally, according to many researchers [1-4]. It appears to have antibacterial properties, according to some research [5-7]. In this work, an analysis of Mentha piperita's photochemical processes was attempted.

**METEOLOGY**

**Sample collection and drying**
The vivid green leaves of Mentha piperita were purchased at a neighbouring market. The leaves were then dried in the shade for two weeks after being cleaned in water to remove any epiphytic hosts that would ordinarily be on the surface. Powder was created by physically pulverising these dried leaves. After that, it was kept at a low temperature.

**Extraction of plant materials**
90 grammes of crushed, dried leaves were employed. The Soxhlet method and methanol were then used to extract the 50 grammes of powdered Mentha piperita leaves. 250 cc of methanol were used as the solvent. The apparatus was heated continually by a heating mantle. The sample was contained in an extraction thimble, which was then dipped into a boiling solvent. A rotary evaporator was used to concentrate the Soxhlet extraction solvent after it had been put through multiple cycles over the period of around 6-7 hours, all while keeping the temperature below the boiling point of the methanol that was used as the extraction solvent. The extracts were stored in the repulsive tubes and at a very low temperature.

**Phytochemical analysis**
This method necessitates repeated, selective phytochemical extraction. investigation of the main class of naturally occurring compounds in the plant. To extract, a variety of special reagents were applied. Chemical experiments were conducted according to standard techniques to find bioactive compounds that had pharmacological importance. Phytochemicals such tannins, alkaloids, saponins, flavonoids, terpenoids, phenols, etc., according to qualitative analysis.

**Test for phenol and tannins:**
2 ml of a 2% solution of FeCl3 were combined with 2 drops of crude extract. When something is black, phenols and tannins are present.

**Test for glycosides (Keller Kilianin Test):**
Two millilitres of extract were treated with glacial acetic acid, two millilitres of ferric chloride solution, and one millilitre of strong sulfuric acid. The development of a brown ring at the contact proves the existence of glycosides.
Test for Flavonoids (Shinoda’s test):
The extract was combined with two to three pieces of magnesium ribbon before 4 drops of concentrated HCl were added. The extract's red colouring shows the presence of flavonoids.

Test for carbohydrates:
To 1ml of Benedict's reagent, 1ml of each extract was added. After 2 minutes of heating on a boiling water bath, the mixture became green, indicating the presence of reducing sugar.

Test of alkaloids:
2ml of 2% HCl was added to the crude extract. After being heated over a boiling water bath, the mixture was cooled, filtered, and separated into two tubes.

Test of terpenoids and steroids:
2 ml of chloroform were combined with crude extract. After it had been completely evaporated, 2 ml of concentrated H 2 SO4 was added, and it was heated for about two minutes. In contrast to the red colour created in the lower chloroform, which showed the presence of steroids, the reddish-brown colouring or greyish tint indicates the presence of terpenoids.

Test for saponins:
A test tube containing crude extract and 5ml of distilled water was forcefully shaken. It was thought that the development of stable foam was a sign that saponins were present.

Mayer’s Reagent:
Mayer's reagent was diluted and a few drops were added to the first tube's solution. Alkaloids are present when precipitation appears yellow or there is turbidity.

Dragendroff’s Reagent:
Dragendroff's reagent was diluted with three drops and added to the second tube's solution. Alkaloids are present when there is white precipitation.

RESULTS AND DISCUSSION

The colour reaction with several reagents allowed researchers to distinguish between the various phytochemical components that were present in the extract. Identification of the various chemical groups contained in the plant extract was the primary goal of the phytochemical screening process. Following is a summary of the phytochemical screening results:
**Table 1:** Phytochemical screening of extract of leaves of Mentha piperita.

<table>
<thead>
<tr>
<th>S.N</th>
<th>Phytochemicals</th>
<th>Methanol Extract</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Tannins</td>
<td>+</td>
</tr>
<tr>
<td>2.</td>
<td>Steroids</td>
<td>-</td>
</tr>
<tr>
<td>3.</td>
<td>Glycosides</td>
<td>+</td>
</tr>
<tr>
<td>4.</td>
<td>Flavonoids</td>
<td>+</td>
</tr>
<tr>
<td>5.</td>
<td>Anthraquinone</td>
<td>-</td>
</tr>
<tr>
<td>6.</td>
<td>Alkaloids</td>
<td>+</td>
</tr>
<tr>
<td>7.</td>
<td>Carbohydrates</td>
<td>+</td>
</tr>
<tr>
<td>8.</td>
<td>Phenols</td>
<td>+</td>
</tr>
<tr>
<td>9.</td>
<td>Saponins</td>
<td>-</td>
</tr>
</tbody>
</table>

(+) = presence & (-) = absence
CONCLUSION

A phytochemical analysis of the peppermint leaf extract revealed the presence of several bioactive compounds in methanol, including phenols and tannins, flavonoids, carbohydrates, glycosides, and alkaloids. This plant is certainly rich in significant phytochemicals that can be employed as medications, according to the evidence.

REFERENCES