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Research Article

PHYTOCHEMICAL ANALYSIS OF *MAJORANA HORTENSIS* LEAVES

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ABSTRACT

Today there is growing interest in understanding the composition of several plants due to the rich bioactive compounds present. Medicinal plants are considered as chemical factories since it produces several vital compounds needed for mankind. Traditional medicines have gained a place in medicine due to the immediate remedies it can bring without any side effects. These components play crucial roles as they have curative properties for several disorders. Majorana hortensis (M.hortensis) leaves were subjected to phytochemical screening. A comparison was made between the tender and mature leaves. The aqueous extract of the leaves was used for the study. It was observed that both the samples were rich in alkaloids, phenols, flavonoids, steroids, saponins and tannins. Hence, the present study proved that the leaves are a rich source of phytochemicals and can be used as a cure for several disorders irrespective of the stage of growth of the leaves.

KEYWORDS: *Alkaloids, Flavonoids, Phenols, Phytochemicals, M.hortensis.*

INTRODUCTION

India has one of the oldest, richest and most diverse cultural traditions associated with the use of medicinal plants [1]. The shortcomings of the drugs available today propel the discovery of new pharmacotherapeutic agents from medicinal plant research [2]. Two thirds of the world's plant species have medicinal value, in particular, great antioxidant potential that can reduce the oxidative stress in cells and also useful in the treatment of many human diseases [3]. In this regard, thousands of plants and plant parts have been screened to comprehend its property and its uses to mankind. *M.hortensis* leaves used in the present study belongs to lamiaceae family and is a perinneal herb [4]. The phytochemicals are the plant chemicals that are naturally present in the plants which play active role in curing diseases without any side effects. Therefore, phytochemicals are called as man friendly medicines [5]. The aqueous extract of the *M. hortensis* leaves were screened for the presence of alkaloids, phenols, flavonoids, saponins and tannins which are commonly present in the medicinal plants which attribute to the medicinal values of the same.

MATERIALS AND METHODS

Collection of leaves:

The plants were pot grown in the campus and the leaves were collected for the study. The fresh leaves were washed thoroughly under running tap water twice and then washed with distilled water. Both tender and mature leaves were collected and processed separately for the study. After washing it was blotted dry on the blotting paper and then shade dried for a day after which it was weighed and extract was prepared.

Preparation of extract:

A 10% homogenous mixture was made with fresh distilled water using a mortar and pestle and then centrifuged to collect the supernatant. The supernatant was used as the source of the leaf sample which was freshly prepared just before the start of the experiment. Same procedure was followed for both tender and mature leaves.

Qualitative Test for Phytochemical Analysis:

The aqueous extract of the leaves of *M. hortensis* was screened for the presence of phytochemicals according to the method of Khandelwal [6].

1. Detection of Alkaloids:

a) Mayer's Test: A fraction of the extract was treated with Mayer's reagent (1.36 g of mercuric chlorate and 5 g of potassium iodide in 100 mL distilled water) and noted for a cream coloured precipitate.

b) **Dragendroff's test:** A fraction of the extract was treated with Dragendroff's reagent and observed for the formation of reddish orange precipitate.

c) **Wagner's Test:** A fraction of the extract was treated with Wagner's reagent (1.27 g of iodine and 2 g of potassium iodide in 100 mL of distilled water) and observed for the formation of reddish brown precipitate.

2. Detection of Phenolic Compounds:

a) Ferric chloride Test: A fraction of the extract was treated with 5% FeCl3 solution and observed for the formation of deep blue colour.

b) Lead acetate test: A fraction of the extract was treated with 10% lead acetate solution and observed for the formation of white precipitate.

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3. Detection of Flavonoids:

a) Aqueous NaOH test: To a fraction of the extract, 1 N aqueous NaOH was added and observed for the formation of yellow orange colour.

b) Concentrated H2SO4 test: To a small fraction of the extract, concentrated H2SO4 was added and observed for the formation of orange colour.

c) Shinodo's test: To a small fraction of the extract, a piece of magnesium turning was added, followed by concentrated HCl and then heated slightly and the formation of dark pink colour was observed.

4. Detection of Saponins:

a) Foam Test: A fraction of the extract was vigorously shaken with water and observed for persistent foam.

b) Haemolyti test: A fraction of the extract was added with a drop of blood placed on a glass side and observed for the hemolytic zone.

5. Test for Steroids:

a) Liebermann Buchard Test: To the ethanolic extract, 2 mL of chloroform followed by 10 drops of acetic anhydride and 2 drops of concentrated sulphuric acid were added. The appearance of rose red colour, which quickly changes from blue to green, indicated the presence of sterol.

b) Salkowski Test: The ethanolic extract was dissolved in chloroform and shaken well with an equal volume of concentrated sulphuric acid. The appearance of red colour, in the chloroform layer and green fluorescence in the acid layer indicated the presence of sterol.

6. Test for tannins:

a) Braemer's Test: To 10 mL of water 0.5 methanolic/ethanolic extract was brought to a boil, then filtered. To the filtrate, a few drops of 10% ferric chloride was added. A dark green, blue or brown color was observed, indicating the presence of tannins.

RESULTS AND DISCUSSION

The tender and mature leaves were exposed to all the phytochemical screening where both the samples showed the presence of all the 6 classes of phytochemicals namely, alkaloids, phenols, flavonoids, saponins, steroids and tannins as shown in Table 1. This indicates that the *M. hortensis* leaves are an abundant source of the above phytochemicals irrespective of the stage of growth of the leaves. Only difference was observed in the case of steroids and tannins. In the tender leaves the steroids was comparatively lesser than that of the mature leaves. Similarly, the tannin content also was less in the tender leaves. All the rest of the components were found in both the tender and mature leaves. Sometimes the difference could be due to the leaves grown in a different temperature, altitude or geographic condition [7]. The presence of all the above 6 phytochemical components serves as a good medical remedy with special reference to flavonoids which is reported to have protection against allergies, inflammation, free radicals, platelet aggregation, microbes, ulcers, hepatotoxin, viruses and tumors [8]. Similar types of studies have been carried out by different groups with different medicinal plants keeping in mind the major biodiversity of India [9]. In view of increasing development of resistant to diseases it has become a major challenge to continuously offer new compounds with potential activities which is under study [10].

Table No. 1: Comparison of Phytochemical Screening of *M. hortensis* leaves

S.No.	COMPONENT	Tender leaves	Mature leaves
1.	**ALKALOIDS:** Meyer's Test Dragondroff's Test Wagner's Test	+++	+++
2.	**PHENOLS:** Ferric Chloride Test Lead acetate Test	+++	+++
3.	**FLAVONOIDS:** Aqueous NaOH Test Con. Sulphuric acid Test Schinado's Test	+++	+++
4.	**STEROIDS:** Leibermann-Buchard Test Salkowski Test	+	++
5.	**SAPONINS:** Froth test Hemolytic test	++	++
6.	**TANINS:** Braemer's Test	++	+++

+ Present – Not detected

CONCLUSION

The pharmacological potential of *M.hortensis* is evident from the above results which can persuade the researchers to take this study forward in order to isolate the components which attribute the rich phytochemical properties. M.hortensis has rich anticancer and antioxidant properties which has already been proved [11, 12].

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