

Comparative Phytochemical Studies Of *Ocimum Sanctum* and *Mentha Arvensis* Ethanolic Leaf Extract

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Abstract: Ethanolic extract of *Ocimum sanctum* and *Mentha arvensis* was studied for their phytochemical investigation. Ethanolic extract was prepared using soxhlet extraction method. Phytochemical analysis of active extracts demonstrated the presence of common phyto-constituents like tannins, glycosides, flavonoids, steroids and alkaloids. These phytochemicals established a good support to the use of this plant in herbal medicine and as a base for the development of new and more potent drugs of natural origin.

Keywords: *Ocimum sanctum*, *mentha arvensis*, soxhlet extraction, phytochemical.

1. Introduction

Since, the medicinal value of plants has been known centuries. The plant as a whole, their juices and extracts are used for various diseases among human beings by many systems of medicines. This has led many researchers to investigate the various activities of traditional plants¹. A variety of drugs could be obtained from medicinal plants. About 80 % individuals from developing countries rely on plant based preparations used in their traditional medicinal system and as the basic needs for human primary health care². Plants produce a diverse range of bioactive molecules, making them rich sources of different types of medicine³. In recent years, drug resistance to human pathogenic bacteria has been commonly and widely reported in literature⁴⁻⁶. Because of the side effects and the resistance that pathogenic microorganism build against antibiotics, many scientists have recently paid attention to herbal extracts and biologically active compounds isolated from plant species used in herbal medicines⁷. Natural products can be selected for biological screening based on ethno-medicinal use of plants, because many infectious diseases are known to have been treated with herbal remedies throughout the history of mankind. Even today, plant materials continue to play a major role in primary early care as therapeutic remedies in many developing countries^{8,9}. Tulsi is a Sanskrit word which means "the incomparable one" and has a very special place in the Hindu culture. Several medicinal properties have been attributed to the Tulsi plant not only in Ayurveda and Siddha but also in Greek, Roman and Unani systems of medicine¹⁰. *Mentha arvensis* belonging to the family Labiatae is a common edible and aromatic perennial herb which is cultivated throughout India. The aromatic leaves are used widely for flavoring foods and beverages¹¹.

The predominant cause of global mortality and morbidity is lifestyle related diseases which can be addressed through Ayurveda with its focus on healthy life style practices and regular consumption of adaptogenic herb¹². Medicinal plant would be the best source to obtain a variety of drug about 80% of individuals from developed countries use traditional medicine which has compounds derived from medicinal plants therefore such plants should be investigated to better understand their properties, safety and efficiency¹³.

Phytochemical constituents such as steroids, alkaloids, flavonoids, tannins, phenol and several other aromatic compounds are secondary metabolites of plants that serve as a defense mechanism against predation by many microorganisms, insects and other herbivores¹⁴. These secondary metabolites exert antimicrobial activity through different mechanisms¹⁵. The basil is cultivated all over India as culinary herbs and also as medicinal plants; these are highly aromatic, carminative, diuretic and stimulant. Flowers are present and the seeds are mucilaginous and are given in infusion to cure gonorrhoea, dysentery and chronic diarrhoea. Juice of leaves is used in cataract and bronchitis in order to stop ear ache; it drops in the ears. Leaf infusions are useful in gastric and liver disorders¹⁶. Phytochemicals have antioxidant or hormone-like effects which help in fighting against many diseases including cancer, heart disease, diabetes, high blood pressure and preventing the formation of carcinogens on their target tissues¹⁷. Extracts of *ocimum* are believed to decrease lipid peroxidation and increase the activity of superoxide dismutase¹⁸. The difference in antimicrobial potency of different tulsi species depends on season, botanical source, storage condition, harvesting and processing but mainly due to its chemical constituents that may have biological activity including saponins, flavonoids, triterpenoids and tannins¹⁹. Scientifically, tulsi is known as *ocimum sanctum* is a time-tested premier medicinal herb of Indian origin²⁰.

2 MATERIALS AND METHODS

2.1 Selection of studied plant species: In the present investigation, *Ocimum sanctum* & *Mentha arvensis*. Plant will be collected from the different areas of Indore city (M.P).

2.2 Extraction of plant material: The extraction of *Ocimum sanctum* & *Mentha arvensis* Ethanolic Leaf Extract using soxhlet extraction method.

2.3 Phytochemicals studies : The Phytochemical studies methods described by Harborne were used to test for the presence of the active ingredients in the test sample.

2.4 Test for Phlobatannins : The powder sample was mixed with distill water in a test tube and shaken well after that it was filtered to take plant extract. Then to each plant extract, 1% aqueous hydrochloric acid was added and each plant sample was then boiled with the help of hot plate stirrer. Formation of red colored precipitate confirmed a positive result.

2.5 Test for reducing sugar: 0.50 g of selected plant sample was added in 5 ml of distilled water. Then 1 ml of ethanol mixed in the plant extract. After that we took 1ml of fehling solution A and 1ml of fehling solution B in test tube, heated in to boiling and then poured it in the aqueous ethanol extract. When color reaction was observed, it showed positive result.

2.6 Test for terpenoids: 0.8 g of selected plant sample was taken in a test tube, than 10 ml of methanol was poued it, it was shaken well and filtered to take 5 ml extract of plant sample. than 2ml of chloroform were mixed in. extract of selected plant sample and 3 ml of sulphuric acid were added in selected sample extract. Formation of reddish brown color indicated the presence of terpenoids in the selected plant.

2.7 Test for flavonoids: For the confirmation of flavonoid in the selected plant, 0.5 g of each selected plant powder were added in a test tube and 10 ml of distill water, 5 ml of dilute ammonia solution were added to a portion of the aqueous filtrate of each plant extract followed by addition of 1ml concentrated H₂SO₄ indication of yellow color shows the presence of flavonoid in each extract.

2.8 Test for Alkaloids: For the purpose of phytochemical analysis of the selected plant, 0.2 g of the selected plant samples were added in each test tube and 3 ml of hexane were mixed in it ,shaken well and filtered. Than took 5ml of 2 % HCl and poured in a test tube having the mixture of plant extract and hexane. Heated the test tube having the mixture, filtered it and poured few drops of picric acid in a mixture. Formation of yellow color precipitate indicates the presence of alkaloids.

Table – 1. Phytochemical analysis of Ethanol extract of *Ocimum santum* leaves.

S.no	Phytochemical	Ethanol extract
1.	Saponins	-
2.	Flavonoids	+
3.	Steroids	-
4.	Alkaloids	+
5.	Tannins	+
6.	Phenol	-
7.	Cardiac glycoside	-

Table – 2.

analysis of Ethanol extract of *Mentha arvensis* leaves.

Phytochemical

S.no	Phytochemical	Ethanol extract
1.	saponins	+
2.	Flavonoids	+
3.	Steroides	+
4.	Cardiac glycoside	+
5.	Alkaloids	+
6.	Phenols	+
7.	Tannins	+

(+) represent the presence of compounds and (-) represent the absence of compounds

3 RESULTS AND DISCUSSION

The recent work deals with the phytochemical investigation of the leaves extract of *Ocimum sanctum* and *Mentha arvensis*. In this study saponins, flavonoid, steroides, cardiac glycoside, alkaloids, phenols, tannins are investigated in presence of ethanol extract. Foam test performed In ethanol extract (*Ocimum sanctum*). The result shows the presence of saponins. For alkaloids using Mayers reagent cream precipitate was observed, this indicate presence of alkaloids. In ethanol extract steroides, cardiac glycoside, tannins showed positive result. This indicate the presence of steroides, cardiac glycoside tannins.

Phytochemical investigation of *Mentha arvensis* in ethanol extract give negative result for saponins and steroides. While lead acetate test in ethanol extract is positive for presence of flavonoid. Presence of alkaloids and tannins have also been confirmed in the same extract

CONCLUSION

Herbs have been used by humankind in the form of medicine since their origin. Modern medicine showed several side effects at the cost of its fast relief. This medicine has several shortcomings as per as treatment toward AIDS, cancer, diabetes etc. Hence, world is seeing with new hope toward folk medicine. *Ocimum sanctum* and *Mentha arvensis* leaves were investigated for their phytochemicals, saponins, flavonoids, steroids, cardiac glycoside, alkaloids, phenols and tannins. Some of the phytochemicals showed positive results and some showed negative results. The presence of tannins suggests the ability of this plant to play a major role as an anti-diarrhoeic, presence of saponins revealed anti-hypercholesterolemia. Tannins have traditionally been considered antinutritional but they may be employed medicinally in anti-diarrheal, hemostatic and anti-hemorrhoidal compounds.

In conclusion, it is suggested that *Ocimum sanctum* and *Mentha arvensis* plant leaves may be recommended as useful sources to prepare natural bioactive products from which we can develop new drugs which will be cost-effective because the plants are freely available. It is hoped that this study would lead to the establishment of some compound that could be used to formulate new and more potent drugs of natural origin.

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