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Phytochemical analysis some medicinal plants

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Abstract
For this study, Five medicinal plants such as *Ocimum sanctum, Syzygium samarangense Syzygium aqueum, Murraya koenigii, Zingiber officinale, Mentha* were selected. This present study reports the solvent extract and aqueous prepared from five Indian plants belonging to different families collected from home town.The aim of the present study was to investigate the presence of phytochemicals and to determine the total phenolic and flavonoid contents of the selected medicinal plants. Solvents used were ethanol or methanol. proteins, carbohydrates, flavonoids, phenols were detected in all of the plants tested. These tested plants (*Ocimum sanctum, Syzygium samarangense or Syzygium aqueum, Murraya koenigii, Zingiber officinal Mentha)* contain medicinally important bioactive compounds and it justifies their use in the traditional medicines for the treatment of different diseases. It was concluded that the plants studied were rich in phytochemicals with significant pharmacological and medicinal applications.

Keywords: Phytochemical analysis, medicinal plants, tests etc

Introduction

Phytochemicals generally originated from the plant source are nothing but the bioactive compounds also known as secondary metabolites. There are two types of metabolites produced in plants *viz*. Primary metabolites and Secondary metabolites. Primary metabolites are important for the plants regular metabolism such as growth and development. Secondary metabolites produced by plants may have little need for them. Medicinal plants contain some organic compounds which provide definite physiological action on the human body and these bioactive substances include tannins, alkaloids, carbohydrates, terpenoids, steroids and flavonoids. These compounds are synthesized by primary or rather secondary metabolism of living organisms. Secondary metabolites are chemically and taxonomically extremely diverse compounds with obscure function.

The potential of the phytochemicals have large scale pharmacological and biological activities such as antioxidant constituents (hydrolysable tannins, phenolic acid and flavonoids etc.) of the plant materials for the care of health and protection from coronary heart diseases, cancer, anti-carcinogenic and anti-mutagenic effects.

In the present work, the phytochemical analysis were carried out in five plants *Ocimum sanctum, Syzygium samarangense or Syzygium aqueum, Murraya koenigii, Zingiber officinale, Mentha.*

Materials and methods

Collection of plants material

Fresh parts of five medicinal plants *Ocimum sanctum(leaves), Syzygium samarangense or Syzygium aqueum(leaves), Murraya koenigii (leaves), Zingiber officinale(leaves), Mentha (leaves)* were collected from different regions of Nashik district. The plant materials were taxonomically identified and authenticated by The Department of botany, Pune University, Pimpalgaon (B), India. The plant materials were shade dried until all the water molecules evaporated and plants became well dried for grinding. After drying, the plant materials were ground well using mechanical blender into fine powder and transferred into airtight containers with proper labeling for future use.

Preparation of plants extract

Hot water extraction

5 gm of dried finely powdered plant material was taken in a beaker and 200ml of distilled water was added. The mixture was heated on a hot plate with continuous stirring at 30º-40ºC for 20 minutes. Then the water extract was filtered through filter paper and the filtrate was used for the phytochemical analysis.

Solvent extraction

Plant extract was prepared by Soxhlet extraction method. About 20gm of powdered plant material was uniformly packed into a thimble and extracted with 250ml of different solvents separately. Solvents used were methanol, ethanol, and acetone. The process of extraction continues for 24 hours or till the solvent in siphon tube of an extractor become colorless. After that the extract was taken in a beaker and kept on hot plate and heated at 30-40ºC till all the solvent got evaporated. Dried extract was kept in refrigerator at 4ºC for their future use in phytochemical analysis.

Primary metabolites

The extract was tested for the presence of bioactive compounds by using following standard methods.

Test for protein

Ninhydrin test

Extract when boiled with 2ml of 0.2% solution of Ninhydrin, violet colour appeared suggesting the presence of amino acids and proteins.

Test for carbohydrates

Benedict's test

Extract when mixed with 2ml of Benedict's reagent and boiled, redish brown precipitate formed which indicates the presence of carbohydrates.

Iodine test
Extract was mixed with 2ml of iodine solution. A dark blue or purple colouration indicated the presence of carbohydrates.

Molish's test
Extract was mixed with 2ml of Molisch's reagent and mixture was shaken properly. After that 2ml conc. H_2SO_4 was poured carefully along the side of the test tube. Appearance of a violet ring at the interphase indicated the presence of carbohydrates.

Test for phenols
Extract was mixed with 2ml of 2% solution of $FeCl_3$. A blue-green or black coloration indicated the presence of phenols.

Test for starch
2ml iodine solution with potassium iodine were added to 2 mL of test extract, and the appearance of a blue colour indicated that presence of starch.

Secondary metabolites
The extract was tested for the presence of bioactive compounds by using following standard methods.

Test for flavonoids
Shinoda test
Extract was mixed with few fragments of magnesium ribbon and conc. HCL was added drop wise. Pink scarlet colour appeared after few minutes which indicates the presence of flavonoids.

Test for alkaloids
Dragendroff's test
By adding 1 mL of Dragendorff's reagent to 2 mL of extract, an orange red precipitate was formed, indicating the presence of alkaloids.

Mayer's test
Few drops of Mayer's reagent were added to 1 mL of extract. A yellowish or white precipitate was formed, indicating the presence of alkaloids.

Test for steroids
Salkowski's test
Extract was mixed with 2ml chloroform and Shake it properly. Add few drops of conc. Sulfuric acid. A golden yellow colour appeared which indicates the presence of steroids.
Extract was mixed with 2ml of chloroform and concentrated H_2SO_4 was added sidewise. A red colour produced in the lower chloroform layer indicated the presence of steroids. Another test was performed by mixing crude extract with 2ml of chloroform. Then 2ml of each of concentrated H_2SO_4 and acetic acid were poured into the mixture. The development of a greenish coloration indicated the presence of steroids.

Test for tannin
Extract was mixed with 2ml of 2% solution of $FeCl_3$. A blue-green or black coloration indicated the presence of tannins.

Table 1: Ethenobotanical information of selected medicinal plants species for phytochemicals analysis in Nashik District.

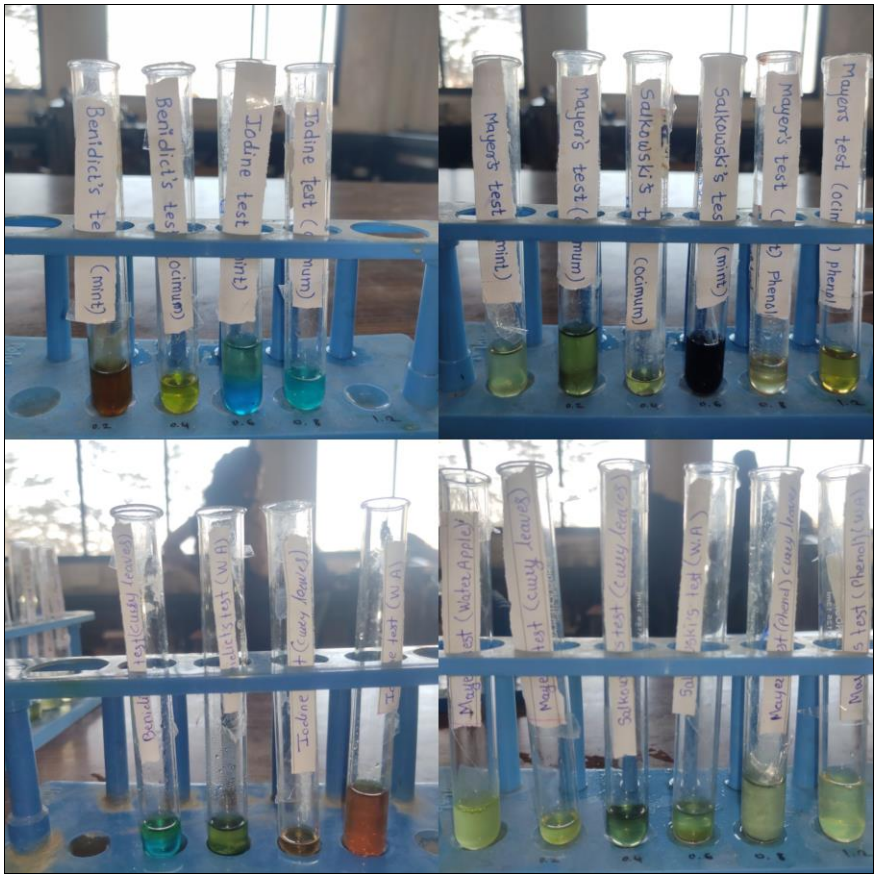
Sr.no	Plant species	Local name	Part used
1.	*Ocimum sanctum*	Tulsi	Leaves
2.	*Syzygium samarangense*	Water apple	Leaves
3.	*Murraya koenigii*	Curry leaves	Leaves
4.	*Zingiber officinale*	Ginger	Leaves
5.	*Mentha*	Mint	Leaves

Table 2: Phytochemical constituents of five medicinal plants studied.

Sr.no	Plants	Proteins	Carbohydrate	Phenols	Starch	Flavonoids	Alkaloids	Steroid	Tannins
1.	*Ocimum sanctum*	+	+	+	+	+	+	–	+
2.	*Syzygium samarangense*	–	–	+	+	+	–	+	+
3.	*Murraya koenigii*	–	–	+	–	–	+	+	+
4.	*Zingiber officinale*	+	+	+		+		–	+
5.	*Mentha*	+	+	+	–	–	+	+	+

Discussion
Phytochemicals analysis conducted on the plants extracts revealed the present of constituents which are known to exhibit medicinal as well as physiological activities. Analysis of the plants extracts revealed the presence of phytochemicals such as protein, carbohydrates, phenols, steroids, alkaloids, flavonoids and tannins. The results obtained in this study thus suggest the identified phytochemical compounds may be the bioactive constituents and these plants are proving to be an increasingly valuable reservoir of bioactive compounds of substantial medicinal merit.

Conclusion
Conclusion, the phytochemical study revealed the presence of proteins, carbohydrates, alkaloids, tannins, phenols, steroids and flavonoids which are compounds capable of causing varied physiochemical and pharmacological effects. Their presence therefore seems to support the traditional use of the plant in the management of various diseases.
Also additional work is encouraged to elucidate the possible mechanism of action of these extract.



Tests

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