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Phytochemical Analysis of Medicinal Plants Occurring in Local Area of Maregaon Tahsil, Dist. Yavatmal Maharashtra, India

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Abstract:

Medicinal plants have bioactive compounds that are used for curing various human diseases and also play an important role in healing. The present study involves ten different medicinal plants Derodendron infortunatu, Urginea indica, Soyamida febrifuga, Tinospra cordifolia, Andrographis paniculata, Benica hispida, Mucuna pruriens, Cissus quadrangularis, Combratum ovalifolium, and Butea monosperma. Locally available in the Maregaon tahsil region of Maharashtra. The main objective of the research work was to check the presence or absence of the phytochemical constituents in all the selected medicinal plants. The results of the phytochemical analysis of these medicinal plants showed that terpenoids, phlobatannins, reducing sugar, flavonoids, and alkaloids were found to be present in the aforementioned medicinal plants.

Keywords: Medicinal Plants, Phytochemicals etc.

Introduction:

Medicinal plants are useful for healing as well as for curing human diseases because of the presence of phytochemical constituents [1]. Phytochemicals are naturally occurring in medicinal plants, leaves, vegetables, and roots that have defense mechanisms and protect from various diseases. Phytochemicals are primary and secondary compounds. Chlorophyll, proteins, and common sugars are included in primary constituents and secondary compounds have terpenoids, alkaloids and phenolic compounds [2]. Terpenoids exhibit various important pharmacological activities i.e., anti-inflammatory, anticancer, anti-malarial, inhibition of cholesterol synthesis, and anti-viral and anti-bacterial activities [3]. Terpenoids are very important in attracting useful mites and consuming herbivorous insects [4]. Alkaloids are used as anesthetic agents and are found in medicinal plants [5]. The *Benica hispida* belongs to the Cucurbitaceae family and it has common names such as bitter Sherni. More than a thousand herbal products are used for the treatment of diabetic patients and are also helpful in lowering glucose levels in the blood [. The bioactive constituents present in *Benica hispida* that is charantosides, momordin, and goya glycosides. It also includes terpenoid constituents such as momordicinin, momordenol, momordicin-28, momordicilin, and momordol [7-11Caeya Soyamida is the botanical name of the Rohini and it belongs to the family Meliaceae. Rohini has shown various biological properties such as anti-inflammatory activities. Jungle Kanda is the common name of the *Urginea indica* and it belongs to the family Aspargiacae. Its phytochemical study shows that its extracts have more than twenty compounds [13,14].

Combretum ovalifolium belongs to the Combretaceae family. It is used as a medicinal plant in African countries and this medicinal plant has shown strong anti-fungal activities [15]. Pomegranate is the common name of the *Punica granatum* (PG) and belongs to the family Lythraceae. It has much medical significance and used as medicine for centuries. Recent studies have investigated that pomegranates are used for the treatment of several diseases e.g., diabetes, dysentery, diarrhea, cough, asthma, bleeding disorders, bronchitis, fever, AIDS, inflammation, ulcers, malaria, prostate cancer, hypertension, atherosclerosis, hyperlipidemia, male infertility, infant brain ischemia and obesity. *Cissus quadrangularis* (Vitaceae) is one of the plants that are locally used in Maharashtra as a cure for snake bites. *Acacia nilotica*, it is a member of the Leguminosae family. The subfamily of the *Acacia nilotica* is Mimosoideae. *Luffa cylindrica* is the botanical name of the sponge gourds and belongs to the Cucurbitaceae family. The fruits of this plant have flat seeds and black which is enclosed by a group of fibers. Medicinal and nutritional properties are the characteristics of *Luffa cylindrica* and seeds of this plant are used for curing asthma, fever, and sinusitis. *Butea monosperma* is included in the Fabaceae family. Their leaves and fruits are used for curing prematurely grey hair. Its root bark is used by humans for more than 4 thousand years. *Mucuna pruriens* is included in the family of Fabaceae and is used as a dry vegetable. It is a herbaceous perennial plant. Its leaves have hypotensive actions. The main objective of our research work was to analyze the presence or absence of different phytochemicals in the selected ten medicinal plants from the Maregaon Tahsil region (Maharashtra) used for healing and curing various diseases.

Materials and Methods:

Plant materials- Leaves of the selected plants:

The present study included plant species which were *Derodendron Infortunatu, Urginea indica, Tinospra cordifolia, Soyamida febrifuga Andrographis paniculate, Benica hispida, Mucuna pruriens, Cissus quadrangularis Combratum ovalifolium, and Butea monospema*.

Chemicals:

Fehling solution A and Fehling solution B, ethanol, distilled water, aqueous HCl, methanol, chloroform, concentrated sulphuric acid, Ammonia solution, picric acid, and Hexane.

Sample Collection:

Ten medicinal plants were collected locally from the farmlands of the Maregaon Tahsil area (Maharashtra). The plants were used for their phytochemical analysis. The plants collected were identified botanically in the department of Botany Lokmanya Tilak Mahavidyalaya, Wani. Fresh and tender leaves of selected plants were used for phytochemical analysis. Plant species selected during the present investigation are given in Table 1.

Preparation of Plant Extract:

The leaves of the selected plants were removed from the plants and then washed under running tap water to remove dust. The plant samples were then air-dried for a few days and the leaves were crushed into powder and stored in polythene bags for use. The plant powder was taken in a test tube and distilled water was added to it such that plant powder soaked in it and shaken well. The solution was then filtered with the help of filter paper and filtered extract of the selected plant samples was taken and used for further phytochemical analysis.

Table No.1: List of Plants Used for Phytochemical Analysis

Sr. No.	Plant Species	Local Name	Part Used
1	*Clerodendron Infortunatum*	Bhat	Leaves
2	*Urginea indica*	Jangali Kanda	Leaves
3	*Soyamida febrifuga*	Rohini	Leaves
4	*Tinospra cordifolia*	Gulwel	Leaves
5	*Andrographis paniculate*	Bhunimb	Leaves
6	*Benicia hispida*	Shirni	Leaves
7	*Mucuna pruriens*	Khaj Khujali	Leaves
8	*Cissus quadrangulars*	Haddijod	Leaves
9	*Combreatum ovalifolium*	Piwar wel	Leaves
10	*Butea monospema*	Palas	Leaves

Test for Phlobatannins:

The plant powder sample was mixed with distilled water in a test tube, then shaken it well, and 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 a Hot plate stirrer. The formation of a red-colored precipitate confirmed a positive result. Test for reducing Sugar An amount of 0.50 g of the selected plant sample was added to 5 ml of distilled water. Then 1 ml of ethanol was mixed in the plant extract. After that, we took 1 ml of Fehling solution A and 1 ml of Fehling solution B in a test tube, heated it to boiling, and then poured it into the aqueous ethanol extract. When the color reaction was observed, it showed a positive result.

Test for Terpenoids:

An amount of 0.8 g of the selected plant sample was taken in a test tube, then 10 ml of methanol in it, shaken well, and filtered to take 5 ml extract of the plant sample. Then 2 ml of chloroform was mixed in the extract of the selected plant sample and 3 ml of sulphuric acid was added in the selected sample extract. The formation of a reddish-brown color indicates the presence of terpenoids in the selected plants.

Test for Flavonoids:

For the confirmation of flavonoid in the selected plants, 0.5 g of each selected plant extract was added in a test tube and 10 ml of distilled water, and 5 ml of dilute ammonia solution were added to a portion of the aqueous filtrate of each plant extract followed by addition of 1 ml concentrated H2 S04. The indication of yellow color shows the presence of flavonoids in each extract.

Test for Alkaloids:

For phytochemical analysis of the selected plants, 0.2 g of the selected plant samples were added to each test tube and 3 ml of hexane was mixed in it, shaken well, and filtered. Then took 5 ml of 2% HCl and poured it into a test tube having a mixture of plant extract and hexane. Heated the test tube having the mixture, filtered it, and poured a few drops of picric acid into a mixture. The formation of a yellow color precipitate indicates the presence of alkaloids.

Table No. 2: Preliminary phytochemical analysis of screened medicinal plant species.

Sr. No	Plant species	Phlobatannins	Reducing Sugar	Terpenoid	Flavonoids	Alkaloids
1	*Derodendron infortunatum*	-	-	-	+	+
2	*Urginea indica*	+	+	+	+	+++
3	*Soyamida febrifuga*	-	-	-	-	++
4	*Tinospra cordifolia*	-	-	-	+	-
5	*Andrographis paniculata*	-	-	-	+	-
6	*Benica hispida*	+	-	-	-	-
7	*Mucuna pruriens*	+			+	+
8	*Cissus quadrangulars*	-	-	++	+++	-
9	*Combreatum ovalifolium*	+	-	-	-	++
10	*Butea monospema*	-	--	-	++	+

+ = indicates the presence of phytochemicals and
- = indicates the absence of phytochemicals.
+++++ = shows high concentration.
+++ = shows moderate concentration.

Results:

This study has revealed the presence of phytochemicals considered active medicinal chemical constituents. Important medicinal phytochemicals such as terpenoids, reducing sugar, flavonoids, alkaloids, and phlobatannins were present in the samples. The result of the phytochemical analysis shows that the ten plants are rich in at least one of the alkaloids, flavonoids, terpenoids, reducing sugars, and phlobatannins. Plant *Urgina indica* has all these phytochemicals. The phytochemical screening and qualitative estimation of 10 medicinal plants studied showed that the leaves were rich in phlobatannins, terpenoids, flavonoids, alkaloids, and reducing sugar (Table 2). Phlobatannins are present in *Urgina indica, Benica hispida, Mucuna pruriens* and *Combratum ovalifolium*. Phlobatannins have been reported for their wound healing properties, these are anti-inflammatory analgesic, and antioxidant. Reducing sugars are present only in one plant out of 10 plants i.e., *Urgina indica*. Terpenoids are present in *Urgina indica* and *Cissus quadrangulars*. Terpenoids are reported to have anti-inflammatory, anti-viral, anti-malarial, inhibition of cholesterol synthesis, and anti-bacterial. Flavonoids are found in *Derodendron Infortunatu. Urginea indica, Tinospra cordifolia, Andrographis paniculate, Mucuna pruriens, Cissus quadrangularis and Butea monospema*. Epidemiologic studies recommend that coronary heart disease is opposed by dietary flavonoids. Alkaloids are present in *Derodendron Infortunatu. Urginea indica, Soyamida febrifuga, Mucuna pruriens,*

Cissus quadrangularis Combratum ovalifolium and Butea monospema. as shown in Table 2. Plants having alkaloids are used in medicines for reducing headaches and fever. These are attributed to antibacterial and analgesic properties.

Discussion:

The research work was carried out on the ten selected medicinal previous studies it is confirmed that flavonoids and reducing sugars were present in the methanolic extract of, *Cissus quadrangularis* while terpenoids were present in the n-hexane extract of the *Cissus quadrangularis* critical and in our recent research studies, it is investigated that flavonoids and terpenoids were found to be present in this plant. In our research studies, alkaloids were found to be present in *Combrtum ovalifolium* while the previous studies showed that flavonoids were present in this plant.

Conclusion:

The selected ten medicinal plants are the source of the secondary metabolites i.e., alkaloids, flavonoids, terpenoids, phlorotannins, and reducing sugars. Medicinal plants play a vital role in preventing various diseases. The antidiuretic, anti-inflammatory, anti-analgesic, anti-cancer, anti-viral, anti-malarial, anti-bacterial, and anti-fungal activities of the medicinal plants are due to the presence of the above-mentioned secondary metabolites. Medicinal plants are used for discovering and screening phytochemical constituents which are very helpful for the manufacturing of new drugs. The previous phytochemical analysis and present study show nearly similar results due to the presence of the phytochemical constituents. The phytochemical analysis of medicinal plants is also important and has a commercial interest in both research institutes and pharmaceutical companies for the manufacturing of new drugs for the treatment of various diseases. Thus, we hope that the important phytochemical properties identified by our study in the local plant will help cope with different diseases of this particular region.

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