Preliminary phytochemical screening of medicinal plants used in traditional medicine

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Abstract
Medicinal plants have bioactive compounds which are used for curing of various human diseases and also play an important role in healing. Phytochemicals have two categories i.e., primary and secondary constituents. Primary constituents have chlorophyll, proteins sugar and amino acids. Secondary constituents contain terpenoids and alkaloids. Medicinal plants have antifungal, antibacterial and anti-inflammation activities. The present study involves ten different medicinal plants *Acacia nilotica*, *Raphanus* sativus, Momordica charantia and *Ficus religiosa* locally available in Akola region of Maharashtra. The leaves of the selected medicinal plants were washed, air dried and then powdered. The aqueous extract of leaf samples were used for the phytochemical analysis to find out the phytochemical constituents in the plants. 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 the terpenoids, phlobatannins, reducing sugar, flavonoids and alkaloids were found to be present in afore mentioned medicinal plants. The phytochemical analysis of the plants is very important commercially and has great interest in pharmaceutical companies for the production of the new drugs for curing of various diseases. It is expected that the important phytochemical properties recognized by our study in the indigenous medicinal plants of Akola will be very useful in the curing of various diseases of this region.

Keywords: Medicinal plants, Phytochemicals, Anti-fungal, Anti-bacterial, Anti-inflammation activities

1. Introduction
Traditional knowledge of medicine has long been used since ages for curing various human ailments. About 60-80% of world populations still rely on plant based medicines [1]. Though the traditional Indian system of medicine has a long history of use, yet they lack adequate scientific documentation, particularly in light of modern scientific knowledge [2] Globally, about 85% of the traditional medicines used by different ethnic groups inhabiting various terrains for primary healthcare are derived from plants, especially in India; medicinal plants are widely used by all sections of the population with an estimated 7500 species of plants used by several ethnic communities [3].
Medicinal plants besides therapeutic agents are also a big source of information for a wide variety of chemical constituents which could be developed as drugs with precise selectivity. These are the reservoirs of potentially useful chemical compounds which could serve as newer leads and clues for modern drug design [4]. Phytochemicals are naturally occurring in the medicinal plants, leaves, vegetables and roots that have defence mechanism 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 terpenoid, alkaloids and phenolic compounds [5]. Terpenoids exhibit various important pharmacological activities i.e., anti-inflammatory, anti-cancer, anti-malarial, inhibition of cholesterol synthesis, anti-viral and anti-bacterial activities [6]. Terpenoids are very important in attracting useful mites and consume the herbivorous insects [7]. Alkaloids are used as anaesthetic agents and are found in medicinal plants [8]. Thus, the present study deals with the screening based on phytochemical tests of six medicinal plants viz. *Acacia nilotica*, *Raphanus* sativus, *Momordica charantia* and *Ficus religiosa* for identifying their chemical constituents. All these plants possess different bioactivities which were later correlated with the presence of some specific phyto-constituent.

2. Materials and Methods
The fresh, mature healthy leaves of *Acacia nilotica*, *Raphanus* sativus, Momordica charantia and *Ficus religiosa* from Akola and its surrounding areas. The plant samples were shade dried and ground into fine powder with the help of mixer grinder. About 50g of powdered material was extracted in Soxhlet apparatus with 200 ml of each of the following solvents; aqueous, petroleum ether, acetone, ethanol and chloroform. The extracts obtained with each solvent were filtered through Whatman filter paper No. 1 and the filtrate was used for phytochemical analysis as per the standard prescribed methods [9].

2.1 Preparation of extracts
The collected leaves *Acacia nilotica*, *Raphanus* sativus, Momordica charantia and *Ficus religiosa* were removed from the plants and then washed under running tap water to remove dust. The plant samples were then air dried for 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 then filtered with the help of filter paper and filtered extract of the selected plant samples were taken and used for further phytochemical analysis.

2.2 Test for reducing Sugar
An amount of 0.50 g of selected plant sample was added in 5 ml of distilled water. Then 1 ml of ethanol mixed in 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 in the aqueous ethanol extract. When colour reaction was observed, it shows a positive result.

2.3 Test for phlobatannins
Plant powder sample was mixed with distiled water in a test tube, then shacked 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 Hot plate stirrer. Presence of a red precipitate in *R. sativus* root juice only was taken as an evidence for the presence of phlobatannins in this.

2.4 Test for terpenoids
An amount of 0.8 g of selected plant sample was taken in a test tube, then poured 10 ml of methanol in it, shaken well and filtered to take 5 ml extract of plant sample. Then 2 ml 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 colour indicates the presence of terpenoids in the selected plants.

2.5 Test for flavonoids
For the confirmation of flavonoid in the selected plants, 0.5 g of each selected plant extract were added in a test tube and 10 ml of distilled water, 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 H_2S0_4. Indication of yellow colour shows the presence of flavonoid in each extract.

2.6 Test for alkaloids
For the purpose of phytochemical analysis of the selected plants, 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. Then took 5 ml 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: Results of phytochemical analyses of the selected medicinal plants

Variable	Acacia nilotica,	Raphanus sativus	Momordica charantia	Ficus religiosa
Reducing Sugar	+	-	-	-
Terpenoids	+	-	-	+
Flavonoids	+	-	-	+
Alkaloids	-	-	-	+
Phlobatannins	-	+	+	-

(+) Present (-) Absent

3. Results and Discussion
These secondary metabolites contribute significantly towards the biological activities of medicinal plants such as hypoglycemic, antidiabetic, antioxidant, antimicrobial, antiinflammatory, anticarcinogenic, antimalarial, anticholinergic, antileprosy activities etc. [10]. This study has revealed the presence of phytochemicals considered as 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 alkaloids, flavonoids, terpenoids, reducing sugars and phlobatannins. The phytochemical screening and qualitative estimation of 4 medicinal plants studied showed that rich in phlobatannins, terpenoid, flavonoids, alkaloids and reducing sugar (Table1).Phlobatannins are present in Momordica charantia and *Raphanus* sativus. Phlobatannins have been reported for its wound healing properties, these are anti-inflammatory and analgesic [11] and antioxidant [12]. Reducing sugars are present only in one plants out of 4 plants i.e. Acacia nilotica. Terpenoids are present in Acacia nilotica and *Ficus religiosa*. Terpenoids are reported to have anti-inflammatory, anti-viral anti-malarial, inhibition of cholesterol synthesis and anti-bacterial [13]. Flavonoids are found in *Ficus religiosa* and Acacia nilotica. Epidemiologic studies recommend that coronary heart disease is opposed by dietary flavonoids. Alkaloids are present in surprisingly, this time *Ficus. religiosa* were also devoid of alkoloid shown in Table 1. Plants having alkaloids are used in medicines for reducing headache and fever. These are attributed for antibacterial and analgesic properties [14].

4. Conclusion
The selected medicinal plants are the source of the secondary metabolites i.e. alkaloids, flavonoids, terpenoids, phlobatannins and reducing sugars. Medicinal plants play a vital role in preventing various diseases. The antidiuretic, anti-inflammatory, antianalgesic, 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 of the phytochemical constituents which are very helpful for the manufacturing of new drugs. The previous phytochemical analysis and present studied show nearly the similar results due to the presence of the phytochemical constituents. The phytochemical analysis of the medicinal plants are also important and have commercial interest in both research institutes and pharmaceuticals companies for the manufacturing of the new drugs for treatment of various diseases. Thus we hope that the important phytochemical properties identified by our study will be helpful in the copping different diseases of this particular region. The quantitative analyses of these phyto-compounds will be an interesting area for further study. Efforts should be geared up to exploit the biomedical applications of these screened plants due to the presence of certain class of phyto-compounds for their full utilization

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6. References

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