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PHYTOCHEMICAL SCREENING OF SELECTED MEDICINAL PLANTS AND THEIR ANTIBACTERIAL ACTIVITIES AGAINST *PSEUDOMONAS AEROGINOSA* AND *SALMONELLA TYPHI*

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Abstract:
Secondary metabolites present in the plants are having medicinal values. These chemicals possess lot of potential to cure number of diseases. Hence in the present study phytochemical screening of some important medicinal plants was carried out. Qualitative phytochemical analysis of these plants confirms the presence of various phytochemical like alkaloids, terpenoids, saponins, steroids, anthocyanin and tannins. The results suggest that the phytochemical with medicinal properties can be used for curing various ailments and possess potential antioxidant and leads to the isolation of new and novel compounds. Antibacterial activity of selected plants against Pseudomonas aeroginosa and Salmonella typhi was carried out.

Key words: *Phytochemicals, Medicinal plants, Secondary metabolites, Antibacterial activity*

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INTRODUCTION:

Humans, since ancient times, have been exploiting the nature, particularly plants in search of new drugs. This has resulting in the use of large number of medicinal plants with curative properties to treat various diseases. Nearly 80% of the world's population relies on traditional medicines for primary health care, most of which involve the use of plant extracts. In India, almost 95% of the prescriptions are plant based in the traditional systems of Unani, Ayurveda, Homeopathy and Siddha. The study of plants continues principally for the discovery of novel secondary metabolites. Around 80% of products are of plant origin.

Plant products have been part of phytomedicines since time immemorial. These can be derived from any part of the plant like bark, leaves, flowers, seeds, roots etc. which contains active components. Knowledge of the chemical constituents of plants is desirable because such information will be of value for the synthesis of complex chemical substances. Such phytochemical screening of various plants is reported by many workers. In the present work, qualitative phytochemical analysis of 8 medicinal plants.

MATERIALS AND METHODS:

1. Collection of plant materials: The plant material were collected from Harishchandragad, (Located $19^0$31'45"N to $73^0$45'5"E) Maharashtra during Jan 2017. The fresh plant material was collected and washed under running tap water, air dried and then homogenized for fine powder and stored in airtight bottles. The plants materials were identified with the help standard literature.

2. Extraction: The leaves were washed thoroughly 2-3 times with running tap water, then air dried under shade and the plant material was grinded in mixer. The powder was kept in small plastic bags with paper labeling. The grinded leaf material of 5gm was weighed using an electronic balance and were crushed in 25 ml of distilled water and kept on shaker for overnight and was filtered through Whatman No.1 filter paper. The filtrate was stored at room temperature.

3. Phytochemical Screening:

Qualitative phytochemical screening was carried out with the following:

- **Alkaloids**: 2 ml of extract was mixed with 3ml of Dilute HCL and placed in steam bath for 5 min. Then add 1 ml of Dragendoff's reagent.
- **Saponins:** 5 ml of extract was mixed with 20 ml of distilled water and then agitated in a graduated cylinder for 15 minutes.
- **Tannins:** 2 ml of extract was added to few drops of 10% ferric chloride.
- **Flavanoids:** 3 ml of 1 % aluminium chloride solution was added to 5 ml of extract.
- **Terpenoids:** 2 ml of extract was added to 2 ml of acetic anhydride and concentration of H_2SO_4.
- **Quinone:** 1 ml of extract was mixed with 1 ml of concentrated sulphuric acid.
- **Glycosides:** 2 ml of extract was mixed with 3 ml of chloroform and 1 ml 10 % ammonia solution was added.
- **Steroids:** 1 ml of the extract was dissolved in 10 ml of chloroform and equal volume of concentrated sulphuric acid was added to the test tube.
- **Phlobatannin:** 1 ml of extract was boiled in 2ml of 1% aq. HCL.

4. Testing for Antibacterial properties of plant extracts:

Agar Well Diffusion Method was used for testing the antibacterial properties of selected medicinal plants. Nutrient agar plates were inoculated with 100 µl of inoculums. Wells were created using cork borer with 6 mm diameter and filled with 100 µl of plant extracts. Plates seeded with bacteria were allowed to incubate at 37°C. Zones of inhibition were measured after 24 hours of incubation (J. Parekh *et al*, 2006).

Sr. No.	Bacteria used	Grown on media	Gram stain
1.	*Pseudomonas aeroginosa*	Nutrient agar	G -ve
2.	*Salmonella typhi*	Nutrient agar	G -ve

RESULTS AND DISCUSSIONS:

- **Phytochemical Screening of Methanol Extract of Plants**

Sr. No	Name of plants	Alkaloids	Saponin	Tannin	Flavon-oids	Terpenoid	Quinone	Glyco-side	Steroid	Phloba-tannin
1.	*Clematis gauriana*	-	+	+	+	+	+	-	+	-
2.	*Mimosa pudica*	+	-	+	+	+	+	-	+	-
3.	*Phyllanthus fraternus*	+	-	-	-	+	+	-	+	-
4.	*Plumbago zeylanica*	-	-	+	+	+	+	-	+	-
5.	*Acacia catechu*	+	+	+	+	+	+	+	+	-
6.	*Terminalia bellerica*	-	-	+	+	+	+	+	+	-
7.	*Saraca indica*	-	+	+	+	+	+	+	+	-
8.	*Butea monosperma*	-	-	-	-	+	+	+	+	-

* '+' indicates the presence of Phytochemical

- **Testing for Antibacterial (Gram negative) properties of plant extracts:**

Antibiotic-ampicillin which was used as a standard. The plants like *Clematis gauriana, Mimosa pudica, Phyllanthus fraternus, Butea monosperma, Acacia catechu* showed the highest zone of inhibition against *Pseudomonas aeroginosa* gram negative bacteria.

The plants like *Terminalia bellerica, Saraca indica, Plumbago zeylanica, Acacia catechu* showed the highest zone of inhibition against *Salmonella typhi* gram negative bacteria.

Sr. No.	Name of plant species (Methanol extract)	Zone of Inhibition (MM)	
		Pseudomonas aeroginosa	*Salmonella typhi*
1.	*Clematis gauriana*	6	8
2.	*Mimosa pudica*	10	7
3.	*Phyllanthus fraternus*	8	5
4.	*Plumbago zeylanica*	10	12
5.	*Acacia catechu*	13	18
6.	*Terminalia bellerica*	14	10
7.	*Saraca indica*	12	13
8.	*Butea monosperma*	9	10

+ indicates presence and – indicates absence of phytochemical.

CONCLUSION:

Phytochemical screening of medicinal plants:- Phytochemical screening of medicinal plant was done in distilled water. The results indicated that all the phytochemicals except Phlobatannin are soluble in water. Results reveal that *Acacia catechu* has more than 7 phytochemicals. Also *Butea monospermous, Saraca indica, Terminalia bellerica* contain high amount of alkaloids, terpenoid, saponin, glycosides and tannins.

Acacia catechu,Terminalia bellerica, and *Saraca indica* were found to be best in inhibiting the growth of both the bacteria's.Concluded that the above mentioned medicinal plants can be used in antimicrobial drugs in future.

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