



ORIGINAL RESEARCH PAPER

Microbiology

STUDY OF ANTIBACTERIAL ACTIVITY OF SELECTED INDIAN PLANTS

KEY WORDS: antimicrobial activity, Phytochemical testing

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ABSTRACT medicinal plants were traditionally used for the treating various diseases. Keeping this in mind the number of plants were explored for antibacterial activity analysis . Plants are rich in a variety of phytochemicals including tannins, terpenoids, alkaloids, and flavonoids which have been found in vitro to have antimicrobial properties. The six plants were selected under this research and two mediums i.e ethanol and methanol were explored for their antimicrobial activity

Introduction




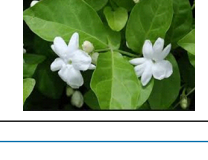
Plants are the good sources of medicines from last many decades. Keeping this in mind the various plants were explored for their antimicrobial finish ability. In the current scenario of environmental consciousness, the new quality requirement also emphasize production process that is environment-friendly they not only focus on the intrinsic functionality and long service life of a product. Therefore research on environment-friendly antimicrobial agents based on natural products is gaining worldwide interest for textile application..Increasing awareness towards the health and hygiene demand for antimicrobial textiles among the consumers.


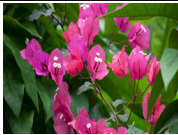
Methodology

6 plants were explored for the research for their antimicrobial activity. These were as follows:

1. Rose
2. Marigold
3. Jasmine
4. Mogra
5. Hibiscus
6. Bougainvillea

Phytochemical testing was done in all the three mediums i.e aqueous, ethanol and methanol.

S.no.	Common Name	Botanical Name	Part used	Picture
1.	Rose	Rosa centifolia	flower	
2.	Marigold	Calendula officinalis	leaves	
3.	Jasmine	Jasminum	leaves	
4.	Mogra	Jasminum sambac	leaves	

5.	Hibiscus	Hibiscus rosa-sinensis	leaves	
6.	Bougainvillea	Bougainvillea glabra	leaves	

1. Rose (*Rosa centifolia*)- It is the most beautiful and attractive flower in the world. It is not only famous for its beauty and fragrance but also for its medical use. It can be used in any of form that is dried, preserved, juices, distilled or as powder or tincture.

It is very useful in heart disease improve blood pressure. It provides quick healing when applied over the wounds, useful in eye problems, it reduces pain due to its analgesic property. It possesses strong antibacterial and antiseptic properties. It helps in reducing blood sugar levels and increasing bile production.

Leaves of Rose plants are used in treating wounds, ophthalmia hepatopathy and hemorrhoids. While roots of rose are useful in intestinal ulcers hemorrhages, rickets and diarrhoea.

2. Marigold (*Calendula officinalis*) - It is very popular due to its beautiful flowers with yellow and orange petals. These flowers are used for medicinal purpose; it possesses bitter and pungent taste. It is mainly used for treating sore throat and mouth, menstrual cramps, cancer, stomach and duodenal ulcer. Sometimes also used for treating measles, smallpox.

The various parts of this plant are used for medicinal purpose such as flowers, roots, leaves and seeds. These parts are having many properties like antimicrobial, antioxidant, antifungal, antiseptic, anti-inflammatory, antiviral and claiming comma decongestant etc.

3. Jasmine (*Jasminum*)- Its Hindi name is Chameli. The main parts used in treatment are leave, flower and root. As a medicinal plant, jasmine has traditionally been considered an aphrodisiac and calmative. The roots and leaves of some jasmine species have been used in folk medicine as an anthelmintic, active against ringworm and tapeworm .The plant has been employed against cancer. Leaves are used in the treatment of swollen spongy gums, ulcers, and loose teeth, tooth-ache, skin diseases, pain in ear, pus in ear, ulcer, painful periods, and wound. Flowers are used in eye diseases, ulcers, skin diseases, itching, diseases of teeth, etc. Jasmine oil has anti-depressant, anti-inflammatory, antiseptic, aphrodisiac, and sedative properties and used in the treatment of

Depression, nervous exhaustion, stress related conditions and in child birth. It is used during labour to strengthen the contraction. Due to the presence of alkaloids, glycoside, flavonoids, resins and salicylic acid The plant has antimicrobial and antibacterial activity.

4. Mogra (*Jasminum sambac*)- It is incompatible with any other flower, it's 5 white Petals are a tiny box of fragrance, the floor is very durable enough and remain fresh for a long time, even in hot climates. It is well known for its medical properties and arrow. It is one of the famous flowers used for Aroma therapist for its healing and coming influence. The roots and leaves are used in decorations for relieving sore Eyes. Flour is used for removing intestinal worms and is also used for Jaundice and general diseases. The flower buds are used in treating ulcers, vesicles, boil, skin diseases and disorders. The leaves extract against breast tumors. The leaves are antiseptic and are useful for women's in Acne. Regular drinking of jasmine tea helps in curing cancer also.

5. Hibiscus (*Hibiscus rosa-sinensis*)- A common name for Hibiscus in Ayurvedic texts is *Japa*. Hibiscus is widely known for its attractive flowers which lack fragrance. It is an evergreen plant which is approximately 150-270 cm in height. The plant contains the cyclopropanoids, methyl sterulate, methyl-2-hydroxysterulate, 2-hydroxysterulate and betasitosterol. The major antho cyanin in the flower is cyaniding 3-sophoroside. Red hibiscus flowers are very common and widely used for medicinal purposes. The bark, leaves and flowers are known to possess medicinal properties. Usually the root of hibiscus is used for coughs, colds and other infectious diseases. The leaves are emollient and aperients. They soften inflammation and are gently laxative. The flowers are also used for soothing internal and external wounds and sores. The petals of the flowers soothe and protect the alimentary tract and relieve inflammation and also lower body heat. In fevers, the infusion of the flower helps to reduce temperature. Flower paste with milk helps in controlling heavy bleeding during menstruation.

6. Bougainvillea (*Bougainvillea glabra*)- commonly referred to as Great *Bougainvillea* or Paper Flower, is one of the traditional medicinal plants with potential antifertility activity. The aqueous extract and decoction of this plant have been used as fertility control among the tribal people in many countries. Furthermore, it has been shown to possess anticancer, antidiabetic, antihepatotoxic, anti-inflammatory, antihyperlipidemic, antimicrobial, antioxidant, and antiulcer properties. Its phytoconstituents such as alkaloids, essential oils, flavonoids, glycosides, oxalates, phenolics, phlobotannins, quinones, saponins, tannins, and terpenoids were reported as the basis of its efficacious therapeutic properties. The other important constituents which contribute to the remedial properties are bougainvinones, pinitol, quercetagenin, quercetin, and terpinolene.

Phytochemical screening

Chemical tests for the screening and identification of bioactive chemical constituents of the medicinal plants under the study were carried out for extracts using the standard procedures. Phytochemical analysis of different selected plant leaves was done on three different mediums i.e aqueous, methanol and ethanol. The screening of Alkaloids, Flavonoids, Glycosides, Steroides, Cardiac glycosides, Saponins, Phenols, Terpenoids and Quinone were observed. Out of 6 sources the best results were observed in Rose and Hibiscus. These two sources were showing maximum affinity towards antimicrobial activity as compared to other sources.

Rose- The presence of flavonoids and glycosides were found in all the three mediums that is aqueous, ethanol and methanol while Saponins, Terpenoides, and Quinone were observed in methanol and ethanol medium.

Hibiscus- Cardiac glycosides and Phenols were found in all the mediums while Glycosides, Saponins, Terpenoides, and Quinone were found in methanol and ethanol medium.

This shows that both these sources i.e rose and hibiscus possess good antimicrobial activity.

CONCLUSION

The six different medicinal plants were explored to know about their antimicrobial activity these were Rose, Marigold, Jasmine, Mogra, Hibiscus and Bougainvillea. Out of 6 sources the best results were observed in Rose and Hibiscus. These two sources were showing maximum affinity towards antimicrobial activity as compared to other sources.

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