



# INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X  
Impact Factor: 6.078

(Volume 7, Issue 5 - V7I5-1235)  
Available online at: <https://www.ijariit.com>

## Study of medicinal plant species diversity: A scenario of Bhor Taluka, Pune district

Dr. Govind Santoba Dhulgande  
[drgovind2012@gmail.com](mailto:drgovind2012@gmail.com)  
Sir Parashurambhau College,  
Pune, Maharashtra  
Anuja Kante  
[anujakante17@gmail.com](mailto:anujakante17@gmail.com)  
Sir Parashurambhau College,  
Pune, Maharashtra

Dr. M. W. Patale  
[mwpatale@gmail.com](mailto:mwpatale@gmail.com)  
Sir Parashurambhau College, Pune,  
Maharashtra  
Dr. Deepak Shelke  
[dpk.shelke1@gmail.com](mailto:dpk.shelke1@gmail.com)  
Amruteshwar Arts, Commerce and Science College,  
Velhe, Maharashtra

### ABSTRACT

*The present study focuses the current state of detailed information about some medicinally important plant species that have been used traditionally. It goes over the general information regarding their traditional uses. Also trying to enhance their sustainable development and conservation. This research will undoubtedly help to guide others who are interested in this field.*

**Keywords**— Medicinal plant species, traditional use, sustainable development, conservation, etc.

### 1. INTRODUCTION

In ancient history, every civilization in the world used plants or their derivatives for treatment or prevention of various diseases. From ancient times to the present, Ayurvedic medicines were documented in Atharva-veda, Rig-veda and Sushruta. Medicinal plants have been used by most of the world's population for thousands of years in the treatment of different infectious diseases.

India is a country of rich biological diversity, having the world's largest biodiversity hotspots like the Western Ghats. The Bhor taluka of Pune district is an important and floristically rich area of Maharashtra state, located on the Western Ghats of India. Bhor taluka covers an area of 892, of which 122 is covered by forest. The surrounding area of Bhor has many well-known high peaks, such as Rajgad towards the east and Shivaganga towards the north-south. There are two major dams; Bhatghar on the Velvandi River and Nira-Devghar on the Nira River. Bhor taluka is surrounded by Khandala and Purandhar. In Bhor Taluka, Kolawadi is a small village and shows a great diversity of medicinal plants. Due to the Gunjawani River, Kolawadi village has a year-round continuous water supply. The Gunjawani River is a natural boon for greenery and the diversity of plants throughout Kolawadi village.

### 2. MATERIAL AND METHODS

The present study was a biological screening program of some medicinally important plant species. About 42 plant species belonging to 26 plant families have been recorded from Bhor taluka of Pune district in Maharashtra state part of the Western Ghats, a rich biodiversity hotspot. All the recorded plant families have been arranged according to the Bentham and Hookers system of classification. Each plant species has its own correct botanical names, family, and plant parts used for medicinal purposes. Also, photo plates are given for better understanding.

**Table: 1. Observed plant species**

Sr. No.	Family	Plant Species	Medicinal uses
1	Annonaceae	<i>Annona squamosa</i> L.	Used as effective vermifugal and insecticidal, acts as an anti-tumor, anti-diabetic, anti-oxidant, and anti-inflammatory agent. It contains acetogenin has anti-cancer activity.

2	Papavaraceae	<i>Argemone maxicana</i> L.	Used in Virechana Panchakarma as natural purgative. Root juice is used as blood detoxification. Root paste is applied on scorpion and insect bite. Seed paste is applied over joints to cure arthritis pain.
3	Portulacaceae	<i>Portulaca oleracea</i> L.	Used as a purgative, cardiac tonic, emollient, muscle relaxant, and anti-inflammatory and diuretic agent. Also used in the treatment of osteoporosis and psoriasis.
4	Malvaceae	<i>Abutilon theophrasti</i> Medik	Used in the treatment of dysentery. Remedy for ulcers. Bark is used to reduce flow of bodily fluids.
		<i>Malvaviscus arboreus</i> Cav.	To treat inflammation of the digestive tract and as a menstrual aid.
		<i>Urena lobata</i> L.	The juice of the leaves and roots are widely used for bowel complaints, especially colic, stomach-ache, diarrhoea and dysentery and to treat gonorrhoea and persistent fever from malaria.
5	Rutaceae	<i>Citrus medica</i> L.	The fresh shoots, leaves, flowers, fruits and seeds of citron are used for the treatment of asthma, arthritis, headache, stomach-ache, intestinal parasites. The fruits are used in the treatment of malaria, coughs and colds.
6	Meliaceae	<i>Azadirachta indica</i> L.	Used against a wide variety of diseases which include heat-rash, boils, wounds, jaundice, leprosy, skin disorders, stomach ulcers, chicken pox, etc. Leaves are beneficial for eye disorders and insect poisons. It is anti-leprotic. Its fruits are bitter, purgative, anti-haemorrhoids and anthelmintic.
7	Rhamnaceae	<i>Ziziphus lotus</i> L.	Used as ant diabetes, sedative, bronchitis, and antidiarrheal by local populations. It is known for its high content in polyphenols exhibiting antioxidant and antimicrobial, immune modulatory properties.
8	Sapindaceae	<i>Cardiospermum halicacabum</i> L.	It possesses anti-inflammatory, antidiarrheal, ant parasitic, antipyretic, ant filarial, anxiolytic and adulticidal activities.
		<i>Sapindus mukorossi</i> Gaertn.	To remove tan and freckles from the skin. It is used to clean the skin of oily secretion and is even used as a cleanser for washing hair as it forms a rich, natural lather.
9	Anacardiaceae	<i>Mangifera indica</i> L.	Plant is used as a dentifrice, antiseptic, astringent, diaphoretic, stomachic, vermifuge, tonic, laxative and diuretic and to treat diarrhoea, dysentery, anaemia, asthma, bronchitis, cough, hypertension, insomnia, rheumatism, toothache, leucorrhoea, haemorrhage and piles.
10	Fabaceae	<i>Clitoria ternatea</i> L.	Used as anti-stress, anti-depressant, anticonvulsant and tranquilizing agent. And has sedative property.
		<i>Crotalaria retusa</i> L.	The roots are used against coughing up blood. The plant is used as a treatment for complaints such as cough, dyspepsia, fever, cardiac disorders, stomatitis, diarrhoea, scabies and impetigo.
		<i>Delonix regia</i> (Boj) Raf.	Used as a medicinal agent to treat some disorders, such as constipation, inflammation, rheumatoid arthritis, diabetes, pneumonia, and malaria
		<i>Cassia tora</i> L. or <i>Senna tora</i> L.	The leaves and seeds are used as laxative, anthelmintic, ophthalmic, liver tonic, cardio tonic and expectorant. The leaves and seeds are useful in leprosy, ringworm, flatulence, colic, dyspepsia, constipation, cough, bronchitis and cardiac disorders.
		<i>Tamarindus indica</i> L.	In traditional medicine, it is used in wound healing, abdominal pain, diarrhoea, dysentery, parasitic infestation, fever, malaria and respiratory problems. It can be used traditionally in snake bite, abdominal pain, colds, inflammations, diarrhoea, helminthic infections, and fever. It also shows antimicrobial and ant diabetic activity.
11	Myrtaceae	<i>Psidium guajava</i> L.	Effective in diarrhoea, dysentery, gastroenteritis, hypertension, diabetes, caries, pain relief, cough, oral ulcers and to improve locomotors coordination and liver damage inflammation.
		<i>Syzygium cumini</i> L.	Traditionally used in herbal medicines due to its properties against cardiometabolic disorders, which include: antihyperglycemic, hypolipemiant, anti-inflammatory, cardio protective, and antioxidant activities. It is also a good blood purifier.
12	Lythraceae	<i>Woodfordia fruticosa</i> L. (Kurz)	It is used to cure dysentery, diarrhoea, bleeding disorder, infection, worm infestation and skin diseases.
13	Carricaceae	<i>Carica papaya</i> L.	Used for preventing and treating gastrointestinal tract disorders, intestinal parasite infections and as a sedative and diuretic.

14	Rubiaceae	<i>Tamilnadia uliginosa</i> (Retz)	Used to treat diarrhoea, cholera, dysentery, migraine, pimples, boils etc. Ripe fruits are sweet in taste, coolant and diuretic in nature. Decoction of leaves is used to cure urination problems.
15	Asteraceae	<i>Baccharoides anthelmintica</i> L.	Used as an herbal medicine with the common name of “Kaliziri” for the treatment of diabetes mellitus, leukoderma, skin diseases, fever, worm infection and kidney disorders.
		<i>Chromolaena odorata</i> L.	Use to treat wounds, burns and skin infections. It has anti-cancer, anti-diabetic, anti-hepatotoxic, anti-inflammatory, anti-microbial and anti-oxidant property.
		<i>Erigeron bonariensis</i> L.	The whole plant is administered in the form of herbal tea as diuretic, haemostatic and antidiarrheal. It is also recommended for the treatment of gout, the excessive bleeding during menstruation, haemorrhoids, haematuria, haemoptysis, dysentery, diarrhoea, bronchitis, cough and fever.
		<i>Guizotia abyssinica</i> L.	Beneficial for rheumatism, cough, burn, syphilis and other associated microbial diseases. Seed oil has anti-parasitic and antioxidant property. Also seed oil is used for birth control and for the treatment of syphilis.
		<i>Sonchus oleraceus</i> L.	Used as anti-depressant, anti-oxidant, anti-microbial, Antitumor, Antimalarial, blood purifier, hepatic, sedative, febrifuge, tonic, anti-inflammatory, anti-cancer etc. It is also used as Galactagogue, febrifuge, sedative, vermifuge, and in the treatment of liver disorder.
		<i>Tridax procumbens</i> L.	Used for wound healing and as an anticoagulant, antifungal, and insect repellent. The juice extracted from the leaves is directly applied on wounds. Its leaf extracts were used for infectious skin diseases in folk medicines.
16	Phyllanthaceae	<i>Bridelia retusa</i> L.	Leaf, stem, bark and root used to prevent pregnancy, malaria, AIDS/HIV, anaemia, asthma, cancer, colic, cough, diabetes, diarrhoea, enlarged spleen, gonorrhoea, hernia, joint pain, menstruation that is abnormal or painful, stomach-aches and other stomach problems.
		<i>Phyllanthus emblica</i> L.	All parts of the plants are used for medicinal purposes, especially the fruit, which has been used in Ayurveda as a potent rasayana and in traditional medicine for the treatment of diarrhoea, jaundice, and inflammation. Rich source of Vitamin-C.
17	Oleaceae	<i>Nyctanthes arbor-tristis</i> L.	Anti-malarial properties and cures Fever. Good for arthritis, treats dry cough. It also reduces asthma. Treats liver ailments and worms in the stomach. Natural laxative. Work As Anti-aging agent.
18	Apocynaceae	<i>Asclepias curassavica</i> L.	Milkweed sap for wart removal and chewed its roots to treat dysentery. It was also used in salves and infusions to treat swelling, rashes, coughs, fevers and asthma.
		<i>Calotropis gigantea</i> L.	Effective in treating skin diseases, digestive, respiratory, circulatory and neurological disorders and was used to treat fevers, elephantiasis, nausea, vomiting, and diarrhoea. The milky juice was used against arthritis, cancer, and as an antidote for snake bite.
		<i>Carissa carandus</i> L.	To treat acidity, indigestion, fresh and infected wounds, skin diseases, urinary disorders and diabetic ulcer, also used to cure joint pain, stomach pain, constipation and anaemia.
19	Gentianaceae	<i>Zeltnera beyrichii</i> (Torr. and A. Gray) G. Mans.	Reduce fever.
20	Solanaceae	<i>Solanum anguivi</i> (Lam.)	The roots are carminative and expectorant useful in coughs, catarrhal affections and dysuria. Used as an ingredients of dashamula. Also used to cure asthma, toothache, cardiac disorder, worm complaints, spinal guard disorder, nervous disorder and fever.
21	Verbenaceae	<i>Lantana camara</i> L.	The stem, root and leaves contain many of the bioactive compounds responsible for various therapeutic applications such as cancers, chicken pox, measles, asthma, ulcers, swellings, eczema, tumours, high blood pressure, bilious fevers, catarrhal infections, tetanus, rheumatism and malaria. Used as antiseptic.
22	Lamiaceae	<i>Ocimum sanctum</i> L.	Leaves, stem, flower, root, seeds and even whole plant have been recommended for the treatment of bronchitis, bronchial asthma, malaria, diarrhoea, dysentery and skin diseases.



		<i>Tectona grandis</i> L.	According to Ayurveda, wood is acrid, cooling, laxative, sedative to gravid uterus and useful in treatment of piles, leucoderma and dysentery.
23	Asparagaceae	<i>Asparagus racemosus</i> Willd.	Used in various reproductive and hormonal issues in women's. It is also used in cases of gastric ulcers and indigestion.
24	Asphodelaceae	<i>Aloe barbadensis</i> Miller	The plant is used in Ayurveda, Homoeopathy and Allopathy for food and medicine. The plant leaves contains numerous vitamins, minerals, enzymes, amino acids, natural sugars and other bioactive compounds. It is purgative. It shows anti-microbial, anti-inflammatory, antioxidant, aphrodisiac, anti-helminthic, antifungal, antiseptic activity. Also used in cosmetics.
25	Thymelaeaceae	<i>Gunidia glauca</i> (FRESEN) GILG.	It is used for treatment of abdominal pain, cancers, wounds, snake bites, sore throat and burns. It is also well known for its piscicidal, insecticidal, molluscicidal and even homicidal activity.
26	Euphorbiaceae	<i>Euphorbia hirta</i> L.	Used in the treatment of cancer, diarrhoea, dysentery, intestinal, asthma, bronchitis, fever, cough, asthma, bronchial infections, bowel complaints, helminthic infestations, wounds, kidney stones and abscesses.
27	Moraceae	<i>Ficus benghalensis</i> L.	The bark is useful in burning sensation, ulcers and painful skin diseases. It is also used in inflammation and toothache.
		<i>Ficus racemosa</i> L.	<u>Bark of the plant cures dysentery, spongy gums, ulcers, diabetes, asthma, leucorrhoea and urinary problems.</u>
		<i>Ficus religiosa</i> L.	Used for Asthma. The bark and ripened fruits are helpful for treating asthma, poor appetite, stomach pain, eczema and itching.
28	Arecaceae	<i>Phoenix sylvestris</i> L.	The fruit serves as a tonic and restorative and is also used as an analgesic to mitigate pain from backache and in the buttocks. Dried dates improve cardiovascular health by soaking out all the cholesterol from the arteries.

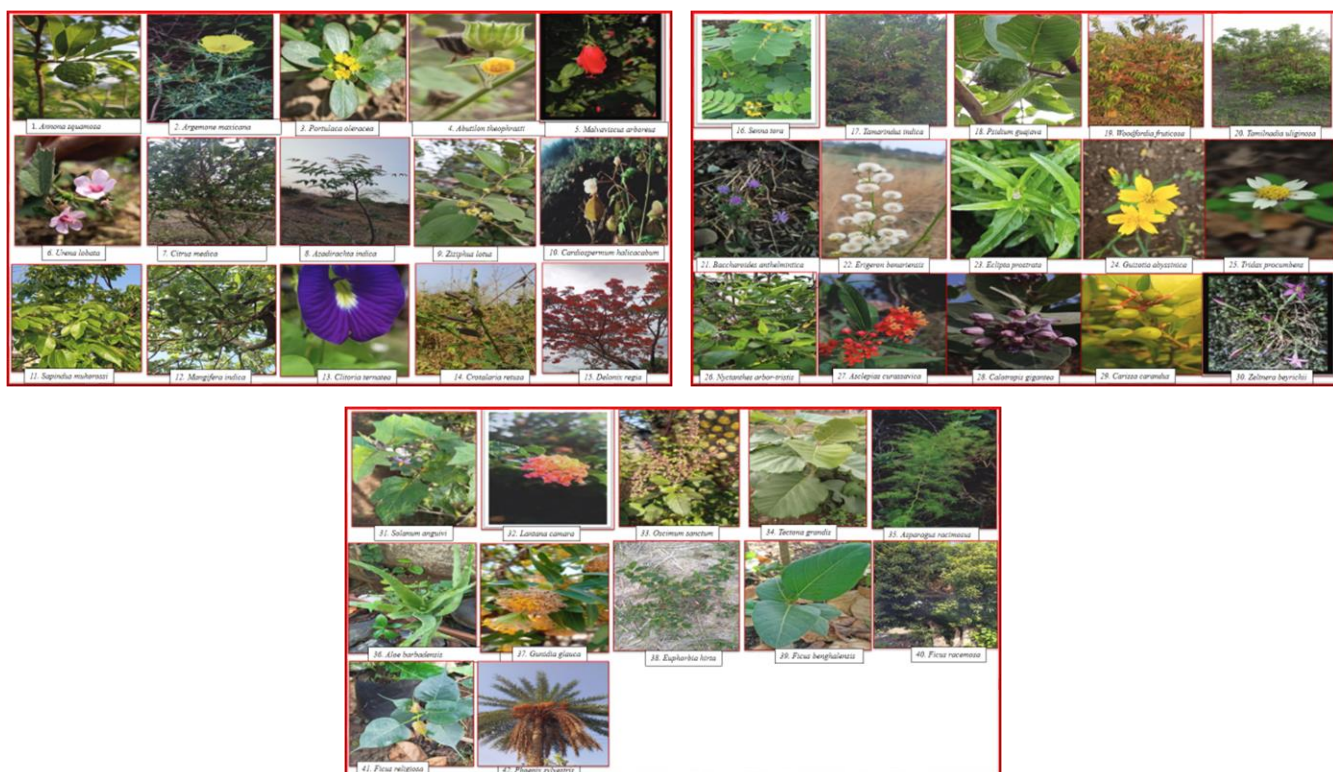


Fig. Photographs of observed plant species

### 3. DISCUSSION

All the plant species studied have been confirmed for their medicinal property. Since ancient times, these plant species have been used continuously by local people. From ancient times, most of the Indian peoples followed the Ayurveda, Siddha, and Unani systems for care and cure of various infectious diseases. Due to pollution, deforestation, industrial development, popularization, use of fertilizers, change in lifestyle, etc., major and minor diseases are increasing day by day, so the pharmaceutical industry plays an important role in India. (Anuradha Upadhye and Vinaya Ghate, 2018).

Similar studies were carried out in different small parts of Ethiopia. The Ormo group of people of Ethiopia do socioeconomic practice, farming, and are distributed in different parts of Ethiopia. They are well known for their treatment of diseases on the basis of traditional use of ethno botanical plants. (H. Yineger, D. Yewhalaw, and D. Teketay, 2008). Throughout the world, many

developed and developing countries like India, China, Japan, Thailand, Pakistan, Sri Lanka, and Korea show traditional use of medicinal plants. Overall production of medicine is around 40% in China. In Ethiopia, 80% of herbal medicines are used by humans and 90% are used for livestock. (Jima and Megersa, 2018).

In India, the Kupwara district is rich in plant diversity. Some wild plants are used for medicinal purposes, not only to cure diseases but also as a source of vitamins, proteins, and minerals. (Mudasir Yousuf Mir, 2020). Medicinal plants are considered as a rich source of ingredients which can be used in drug development. They are also called medicinal herbs and are used in traditional medicine. Plants such as ginger, garlic, barberry, and others are extremely beneficial to humans for medicinal purposes. Some plants show antioxidant, anti-diabetic, and anti-cancerous properties which play an important role in curing diseases. (M. Rafieian and Kopaei, 2012).

The tribal people of Kupwara district used medicinal plants for skin diseases. In their survey, they found 36 plant species belonging to 25 families. Herbal remedies have been used for primary disease treatment. 134 species of locally available plants have been used for treatment of disease. (Mudasir Yousuf Mir, 2014). Due to the climatic conditions and medicinal properties of many species, they are useful in various alignments. (Zakir Hussain Khanday and Sumer Singh, 2017).

It is already mentioned that the Western Ghats are one of the richest biodiversity hotspots in the world. It includes various plant species, few of which are medicinally important. Hence, there is a scope to collect the right information through the study. Also, to explore them on the basis of their medicinal property will be helpful for many people who believe this.

Along with such studies while exploring these plant species, everyone should always be serious about the biodiversity of such an area, which should not be disturbed. Therefore, it is advisable to collect very few plant parts from nature for use. Conserve and cultivate in other suitable places by using various techniques under the guidance of specialised people.

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