

Species Diversity and Germplasm Collection of Medicinal Plants from Western Ghats of Maharashtra

DN Mokot and BB Jadhav

Department of Agricultural Botany, Dr Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli-415 712, Dist. Ratnagiri, (Maharashtra)

Extensive explorations were undertaken for the collection of medicinal plant germplasms from 11 districts of Western Ghats of Maharashtra. Total 25 exploration tours were undertaken during the period from February 2000 to January 2002 for the collection of biodiversity of medicinal plants from Western Ghats of Maharashtra. During the exploration the passport data related to frequency, sample type, habitat, common name, source and important characteristics and use of each accession were noted. Total 552 accessions were collected. The collected seeds, vegetative materials and live materials were sent for conservation comprising of seed/fruits-261, vegetative materials-12, wild relative of crop material-15, economic plants-15, oil yielding plants-15, aromatic plants-10, live plants-284.

Key words: Germplasm, Medicinal Plants, Biodiversity

Considering the depletion in plant biodiversity at a fast rate, a need for immediate and massive efforts for collection and conservation of national genetic wealth was felt strongly. About 600 plant species belonging to 108 families are on the verge of extinction to varying degrees in India (Nayar and Sastry, 1987, 1988, 1990). On an average, 155 landraces are lost every year, globally. Whereas large area of country still remains unexplored several locations need to be revisited for intensive collections. Agro biodiversity is an important component of total biological diversity and therefore the component of collection and conservation of germplasm is an important aspect in the maintaining the present status of existing biodiversity in country.

Plants with curative properties were known to humans since ancient times. In India, out of 17,500 species of flowering plants, about 17 per cent are commercially exploited, resulting in depletion of natural populations, an urgent need to collect and conserve the diversity in the medicinal plants before it is wiped out from nature.

The vegetation of the region is interesting since all types of forests from scrub semi-evergreen to sholas, occur. Broadly, the vegetation can be categorized into semi-evergreen, evergreen, moist deciduous and dry deciduous.

Bringing more land under cultivation due to biotic pressures, commercialization of agriculture for increased production of improved cultivars and thrust on socio-economic development has led to severe loss of genetic diversity. Therefore, considering all these factors, collection and conservation of this germplasm, which evolved and

adapted over a long period of time, assumes great significance. Keeping in view the background information and contribution to the resources in Western ghats of Maharashtra, a survey was undertaken during February 2000 to October 2002 in forest area of Western Ghats of Maharashtra. This study was conducted under NATP project on Sustainable Management of Plant Biodiversity with following objectives:

1. Survey and collection of medicinal and other economic plant germplasm.
2. Germplasm characterization, maintenance and regeneration.
3. Conservation of Plant Biodiversity.
4. Documentation and information management.
5. Need based human resource development (HRD).

Materials and Methods

The area surveyed during this work includes 11 districts of Maharashtra. Out of these, five constitute Konkan along the western side like Sindhudurga, Ratnagiri, Raigad, Bombay and Thane while remaining from the Deccan plateau such as Kolhapur, Sangli, Satara, Pune, Ahmadnagar and Nashik. The area of Western ghats of Maharashtra known as 'Sahyadris' lies between 15°60' to 20°75' and 72°61' to 74°60' E, covering an area of about 1,06,790 square kilometers. The average rainfall varies from 250-440 cms. Red basalt soils are frequently encountered in the area the range of soil types includes red loam, red sandy loam and red soil with clay base etc. Rice, ragi are major food crops; mango, cashew nut, jackfruit are the major fruit crops; vegetables are

cultivated wherever irrigation facilities are available, coconut, areca nut, mango, nutmeg, cashew, etc. are grown in alluvial soils.

The overall collection methods and logistics were taken into consideration. The general strategy adapted for collection of medicinal and agri-horticultural plant germplasm was based on the theory suggested by Bothmer and Seberg (1995) and Human *et al.* (1995). About 500 seeds of wild plants and 2000 seeds of cultivated plant species were collected, dried and cleaned. Total 25 explorations were conducted for collection of medicinal and other economic plant germplasm and for gathering the vital information. Remote places such as sacred grooves, sanctuaries, reserved forest, remote villages were tribal population as well as local medicine men available were selected for the explorations. The collected plant material was identified by using local flora. After identification the herbariums were sent to NBPGR, New Delhi and also maintained in Department of Agril. Botany. Data were recorded on plant parts used, its collection, processing, mode of administration,

habitat, frequency, local names etc. For authentication of information and future reference, voucher specimens are collected. For the medicinal and edible use of plants earlier literature was used as reference (Satyavati *et al.* 1976).

Results and Discussion

Information collected during the exploration is presented in Table 1. As most of the collections are seed, live plants, vegetatively propagated and wild material, the sampling sites and intervals depended on the variation in the environmental and edaphic factors and the frequency of occurrence and importance of the species. Nayar and Sastry (1987, 1988, and 1990) documented the medicinal and useful plant species under various threatened categories from this region.

During the explorations, medicinal, aromatic, dye yielding, other agri-horticultural crops and their wild relatives were collected from 11 districts of Western Ghats of Maharashtra. During the time of exploration a total of 552 accessions of various germplasm were

Table 1. List of medicinal plants germplasm collected from Western Ghats of Maharashtra from February, 2000 to October, 2002

Botanical Name	Family	Frequency	Uses
<i>Abelmoschus moschatus</i> (L.) Medic.	Malvaceae	Occasional	Seeds are used as stimulant, antispasmodic, stomachic, tonic, carminative and aphrodisiac (medicinal, aromatic)
<i>Abrus precatorius</i> L.	Fabaceae	Frequent	Decoction of leaves and roots used for cold and coughs (medicinal)
<i>Abutilon indicum</i> (L.) Sweet.	Malvaceae	Frequent	Leaves and seeds are rich in mucilage and are used as demulcent, and laxative (medicinal)
<i>Acacia catechu</i> (L.f.) Willd.	Mimosaceae	Abundant	Bark used as astringent, digestive and useful for cough and diarrhea. The bark powder is sprinkled on the wound morning and evening (medicinal, dye, fuel)
<i>Acacia farnesiana</i> (L.) Willd.	Mimosaceae	Frequent	Bark is used as astringent and demulcent. (medicinal, fuel)
<i>Acacia nilotica</i> (L.) Willd.	Mimosaceae	Frequent	Used extensively in sweetmeats and also in medicine for its demulcent effect (medicinal, dye, fodder, timber, fuel)
<i>Acatinodaphne hookeri</i> Meissn.	Lauraceae	Frequent	Infusion of leaves is used in urinary disorders and in diabetes (medicinal)
<i>Achyranthes aspera</i> L.	Amaranthaceae	Abundant	Useful in epilepsy, mental disorders, and wounds, colds, dog bite and conjunctivitis etc (medicinal)
<i>Acorus calamus</i> L.	Araceae	Occasional	Relieves flatulence, increases appetite, promotes flow of bronchial secretions and useful in asthma (medicinal)
<i>Adhatoda vasica</i> Nees.	Acanthaceae	Frequent	For quick relief in bronchitis (medicinal, fence)
<i>Aegle marmelos</i> (L.) Corr.	Rutaceae	Occasional	Used as an antidote for poison and in dysentery (medicinal, ornamental)
<i>Ageratum conyzoides</i> L.	Asteraceae	Abundant	Leaves are used for to cure skin diseases (medicinal)
<i>Aloe bardadensis</i> Mill.	Liliaceae	Frequent	Leaves are source of resinous drug, which is used mainly as purgative (medicinal)
<i>Alpinia galanga</i> (L.) Sw.	Zingiberaceae	Rare	Used in rheumatism, diarrhea and vomiting. (medicinal)
<i>Andrographis paniculata</i> (Burm.F) Wall. Ex. Ness.	Acanthaceae	Rare	Used as liver tonic (medicinal)
<i>Argemone mexicana</i> L.	Papaveraceae	Abundant	Roots are useful in chronic skin diseases, seed as laxative, expectorant and demulcent: juice of plant for jaundice and cutaneous affections. 2 to 3 inches long root is ground fine and given to drink with 1 cup of water for curing prolonged menstruation. Latex is mixed with equal quantity of coconut oil. The mixture is applied once a day for 3 days to cure scabies (medicinal)

Botanical Name	Family	Frequency	Uses
<i>Argyrea hookeri</i> Clarke	Convolvulaceae	Frequent	Used in gleans, gonorrhoea and chronic ulcers (medicinal)
<i>Aristolochia indica</i> L.	Aristolochiaceae	Occasional	Antidote for epilepsy and in tumor healing (medicinal)
<i>Aristolochia bracteolata</i> Lamk.	Aristolochiaceae	Occasional	Decoction of roots is used for expelling roundworms (medicinal)
<i>Asparagus racemosus</i> Wild.	Asparagaceae	Abundant	Used for vigor and treatment of venereal diseases. One cup of juice of tuberous root with one tea spoonful of sugar is taken in the morning for three days for increasing breast milk (medicinal)
<i>Atylosia scarabaeoides</i> (L.) Benth	Fabaceae	Frequent	Used in rheumatism (medicinal)
<i>Avicennia officinalis</i> L.	Avicenniaceae	Frequent	Bark is astringent and roots aphrodisiac. Unripe seeds are used as poultice for boils (medicinal)
<i>Azadirachta indica</i> A. Juss.	Meliaceae	Frequent	Effective in treatment leprosy and skin diseases (medicinal)
<i>Bacopa monnieri</i> (L.) Pennell.	Scrophulariaceae	Rare	Entire plant constitutes drug which is used in insanity, epilepsy and as potent diuretic cardiostimulant and nerve tonic (medicinal)
<i>Bambusa arundinacea</i> (Retz.) Roxb.	Poaceae	Occasional	Useful for to cure wound, Regulation of M.C., Rheumatism etc. (medicinal)
<i>Barleria prionitis</i> L.	Acanthaceae	Frequent	Fruits applied to aphthae of mouth (medicinal)
<i>Begonia crenata</i> Dry and	Begoniaceae	Occasional	Leaves are administered for active kidney function (medicinal)
<i>Bixa orellana</i> L.	Bixaceae	Frequent	Seeds yield a dye, which is used in colouring foodstuffs (medicinal)
<i>Calophyllum inophyllum</i> L.	Guttiferae	Frequent	Used in rheumatism and for skin diseases (medicinal)
<i>Calotropis gigantea</i> Ait.	Asclepiadaceae	Abundant	Root bark is used in dysentery, acts as substitute for ipecacuanha, diaphoretic, expectorant, emetic, and is valuable remedy in skin diseases. Tincture of leaves is used in intermittent fevers, and powdered flowers in cold, cough and asthma (medicinal)
<i>Calycopteris floribunda</i> (Roxb.) Poir	Combretaceae	Frequent	Leaves are laxative, astringent and used in ulcers (medicinal)
<i>Canavalia virosa</i> (Roxb.) Wright & Arn.	Fabaceae	Occasional	Fruit - abortive property (medicinal)
<i>Capparis decidua</i> (Forsk.) Edgew	Capparidaceae	Rare	Top shoots and young leaves are used as plaster for boils and swellings, in powder from to relieve toothache. Bark is considered useful for cough and asthma. Root bark is given in intermittent fevers (medicinal)
<i>Cassia fistula</i> L.	Caesalpiniaceae	Abundant	Fruit pulp is used as purgative (medicinal)
<i>Cassia tora</i> L.	Caesalpiniaceae	Abundant	Leaves are used in ringworm and other skin diseases (medicinal)
<i>Celastrus paniculata</i> Willd.	Celastraceae	Occasional	Seeds are laxative, stimulant, and aphrodisiac and used in leprosy, gout and rheumatism (medicinal)
<i>Celosia argentea</i> L.	Amaranthaceae	Abundant	Seeds are useful in blood diseases and mouth sores, and for diseases of eye (medicinal)
<i>Centella asiatica</i> (L.) Urb	Apiaceae	Frequent	Used in anti-diarrhoeal preparations, promotes memory and useful in skin diseases (medicinal)
<i>Cinnamomum zeylanicum</i> Blume	Lauraceae	Abundant	It is used as astringent, stimulant and carminative, and also for checking nausea and vomiting (medicinal)
<i>Cissampelos pereira</i> L.	Menispermaceae	Frequent	Root decoction in combination with other herbs is useful in all types of fevers and body pains (medicinal)
<i>Clitoria ternatea</i> L.	Papilionaceae	Frequent	Seeds are used as purgative and roots as cathartic, diuretic and purgative. One-cup decoction is taken morning and evening to cure fever and joint pains (medicinal)
<i>Cocculus hirsutus</i> (L.) Diels	Menispermaceae	Abundant	Used in chronic rheumatism and venereal diseases. Extract of stems and roots is sedative, hypertensive, cardio tonic and spasmolytic (medicinal)
<i>Costus speciosus</i> (Koen. ex Retz.) Sm.	Costaceae	Rare	Precursor of steroids including sex hormones and oral contraceptives (medicinal)
<i>Cymbopogon citratus</i>	Poaceae	Frequent	Yields aromatic oil called lemon-grass oil. Leaves are taken as a substitute for tea, as a refreshing beverage (medicinal)
<i>Datura metel</i> L.	Solanaceae	Frequent	Used as stimulant for central nervous system and expectorant, antispasmodic, demulcent (medicinal)
<i>Dichrostachys cinerea</i> (L.) Wt. & Arn.	Mimosaceae	Rare	Root used in rheumatism and renal troubles (medicinal)
<i>Eclipta prostrata</i> L.	Asteraceae	Abundant	Plant juice in combination with aromatics is administered for catarrhal jaundice. Also used in hair oils (medicinal)
<i>Embelia ribes</i> Burm.	Myrsinaceae	Rare	Fruits are used as an anthelmintic, and astringent (medicinal)
<i>Embelia tsjeriam-cottom</i> A.DC.	Myrsinaceae	Frequent	Its fruits are used as an antispasmodic and anthelmintic (medicinal)
<i>Euphorbia hirta</i> L.	Euphorbiaceae	Abundant	Used in bronchial affections, cough, asthma, and in removing worms in children and in bowel complaints. Latex of plant is applied on warts (medicinal)
<i>Gloriosa superba</i> L.	Liliaceae	Rare	Used as an anthelmintic, and leaf juice is reported to kill lice in hair (medicinal)

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<i>Gymnema sylvestre</i> (Roxb.) Br.	Asclepiadaceae	Rare	Leaf powder is used for reducing blood sugar and root paste for eye inflammations (medicinal)
<i>Helicteres isora</i> L.	Sterculiaceae	Frequent	Bark is employed for diarrhoea, dysentery and biliousness (medicinal)
<i>Hemidesmus indicus</i> (L.) R.Br.	Asclepiadaceae	Frequent	Roots are used for rheumatism, skin diseases, and syphilis (medicinal)
<i>Holarrhina antidysenterica</i> (Roth) Wall.	Apocynaceae	Abundant	Decoction made of stem bark mixed with Bael fruit is used for dysentery, leaf juice for joint pains and piles (medicinal)
<i>Hygrophila auriculata</i> (Schum.) Heine	Acanthaceae	Frequent	Leaves seeds and roots are used as diuretic, and also for jaundice, dropsy, rheumatism and diseases of urino-genital tract (medicinal)
<i>Hyptis suaveolens</i> (L.) Poit	Lamiaceae	Abundant	Used for eye troubles (medicinal)
<i>Ipomea pes-caprae</i> (L.) Sweet.	Convolvaceae	Occasional	Whole plant, alterative, astringent, diuretic, laxative, Stomachic and tonic (medicinal)
<i>Ixora coccinea</i> L.	Rubiaceae	Abundant	Roots are sedative, stomachic and used in diarrhoea and dysentery. Flowers are used for treating dysentery, leucorrhoea and catarrhal bronchitis (medicinal)
<i>Madhuca longifolia</i> (L.) Macb.	Sapotaceae	Frequent	Flowers are used in manufacture of alcohol and in treatment of coughs, colds and bronchitis. Bark is used for rheumatism, ulcers, itches, bleeding and spongy gums, and tonsillitis. Roots are applied to ulcers (medicinal, oil yielding, industrial etc.)
<i>Mallotus philippinensis</i> (Lamk) Muell. Arg.	Euphorbiaceae	Frequent	Fruit yields a dye called kamala, used for colouring foodstuff and silk. fruit powder is used as anthelmintic and fruit paste is used along with gently oil against leprosy (medicinal, dye)
<i>Marsdenia volubilis</i> (L.F.) Cooke	Asclepiadaceae	Rare	Use for controlling skin disease (medicinal, fuel)
<i>Memicylon umbellatum</i> Burn.	Melastomataceae	Frequent	Leaf extract used for controlling skin diseases. (medicinal, fuel)
<i>Mimosa pudica</i> L.	Mimosaceae	Abundant	Leaves and roots are used for diabetes, filariasis, whooping cough and sterilization in women (medicinal)
<i>Mimusops elengi</i> L.	Sapotaceae	Frequent	Bark of stem & fruit used for teeth and gum problem. (medicinal)
<i>Momordica charantia</i> L.	Cucurbitaceae	Frequent	Leaves and fruits are used in diabetes, diarrhoea, fevers, and high blood pressure (medicinal)
<i>Mucuna pruriens</i> (L.) DC.	Leguminosae	Rare	Roots and seeds are used for elephantiasis, spermatorrhoea and paralysis (medicinal)
<i>Murraya koenigii</i> (L.) Spreng.	Rutaceae	Frequent	Essential oil extracted from plant parts is used in perfumes and soaps. Leaves are used for diarrhoea and dysentery. Root juice is given for renal pain (medicinal, spice)
<i>Nerium indicum</i> Mill.	Apocynaceae	Frequent	Dried leaves are an effective cardiac stimulant. Root is externally applied as a paste against ringworm's (medicinal)
<i>Ocimum americanum</i> L.	Lamiaceae	Frequent	Seeds are diuretic and tonic and also used in the preparation of a cooling drink (medicinal)
<i>Ocimum basilicum</i> L.	Lamiaceae	Frequent	Seeds are used in dysentery and chronic diarrhoea. (medicinal)
<i>Ocimum sanctum</i> L.	Lamiaceae	Abundant	The juice or infusion of the leaves is useful in bronchitis, catarrh, digestive complaints: applied locally on ringworm and other skin diseases (medicinal)
<i>Oroxylum indicum</i> (L.) Vent.	Bigonaceae	Rare	Roots are used for controlling body temperature, piles and tonic (medicinal)
<i>Osmunda regalis</i> L.	Osmundaceae	Rare	The plant is used as a tonic and styptic; used for rickets.(medicinal)
<i>Oxalis corniculata</i> L.	Oxalidaceae	Abundant	Fresh juice of the plant cures dyspepsia, piles, anemia and tympanitis. An infusion of the leaves is used to remove opacity of the cornea. Plant having astringent and antiseptic property (medicinal)
<i>Jatropha curcas</i> L.	Euphorbiaceae	Frequent	Used as purgative, tender twigs are reported to be used for cleaning teeth (medicinal)
<i>Jatropha gossypifolia</i> L.	Euphorbiaceae	Rare	An ether extract of shoots is reported to have antibiotic activity against <i>E. coli</i> (medicinal)
<i>Lantana camara</i> L.	Verbenaceae	Abundant	Bark is astringent and used as lotion in impetiginous eruptions, leprosy ulcers and obstinate ulcers. Leaves are boiled and applied for swelling and pains of body (medicinal)
<i>Lasiosiphon eriocephalus</i> Decne	Thymelaeaceae	Frequent	Leaves are applied to swelling and contusions.(medicinal)
<i>Leea macrophylla</i> Roxb. ex Hornem	Leeaceae	Abundant	Roots are used as remedy for ringworm, and in cure of guineaworm (medicinal)
<i>Limonia acidissima</i> L.	Rutaceae	Occasional	Fruits are used in fever and roots as purgative (medicinal)
<i>Pandanus odoratissimus</i> L.F.	Pandanaceae	Occasional	Used in leprosy, smallpox, scabies and diseases of heart and brain (medicinal)
<i>Peperomia pelluciada</i> (L.) .B. & HK.	Piperaceae	Occasional	Crushed leaves are used for headache and fever; also for abdominal pain (medicinal)

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<i>Phyllanthus emblica</i> L.	Euphorbiaceae	Frequent	Used as urine purifier, for control of white discharge, Hypertension, Blood pressure, Brain tonic etc. (medicinal)
<i>Phyllanthus fraternus</i> Webster	Euporbiaceae	Anundant	Plant is used of stomachache, diarrhoea, dysentery and urinogenital disorders. Fresh roots are used for jaundice (medicinal)
<i>Phyllanthus reticulatus</i> Poir.	Euporbiaceae	Abundant	Used as diuretic and cooling. Decoction of root is given to children for cough and catarrh (medicinal)
<i>Physalis minima</i> L.	Solanaceae	Abundant	Used for to cure gonorrhea (medicinal)
<i>Piper longum</i> L.	Piperaceae	Abundant	Used as carminative, diuretic, analgesic, and stomachic and in rheumatism (medicinal)
<i>Piper nigrum</i> L.	Piperaceae	Abundant	Used as stimulant, carminative and stomachic (medicinal)
<i>Plumbago zeylanica</i> L.	Plumbaginaceae	Frequent	Root is an appetizer, used in skin diseases, diarrhoea, and piles. Milky juice is used as application in scabies and unhealthy ulcers (medicinal)
<i>Pongamia pinnata</i> (L.) Pierre	Fabaceae	Abundant	The oil extracted from the seeds are used by local people as a good remedy on scabies (medicinal)
<i>Portulaca oleracea</i> L.	Portulacaceae	Abundant	Plant is used for scurvy, liver diseases, spleen, kidney, bladder, cardio-vascular diseases, and dysentery and as blood purifier (medicinal)
<i>Pterocarpus marsupium</i> Roxb.	Papilionaceae	Frequent	Stem is used in diarrhoea and for toothache. Bruised leaves are applied on sores and boils (medicinal)
<i>Randia dumetorum</i> Lamk.	Rubiaceae	Frequent	Pulp of fruit is given in dysentery (medicinal, insecticidal)
<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz.	Apocynaceae	Rare	Root extracts are employed for relief from nervous disorders, intestinal troubles, easing delivery and in hypertension (medicinal)
<i>Rauvolfia tetraphylla</i> L.	Apocynaceae	Frequent	An extract of plant mixed with castor oil is prescribed for chronic skin diseases (medicinal)
<i>Remusatia vivipara</i> (Roxb.) Schott.	Araceae	Rare	Used against itching (medicinal)
<i>Ricinus communis</i> L.	Euphorbiaceae	Frequent	Applied in sores, boils and rheumatic swellings (medicinal, fodder, oil yielding)
<i>Rubia cordifolia</i> L.	Rubiaceae	Frequent	Decoction of leaves and stems used as vermifuge (medicinal)
<i>Ruta graveolens</i> L.	Rutaceae	Occasional	Used as anathematic, antispasmodic and antiepileptic. Herb is used in hysteria; extract is useful for earache and toothache (medicinal)
<i>Santalum album</i> L.	Santalaceae	Frequent	Wood paste is use of diabetes wounds, menorrhagia, headaches and contraception (medicinal, oil yielding)
<i>Sapindus emarginatus</i> Vahl.	Sapindaceae	Abundant	Used for treating colic due to indigestion, diarrhoea, and paralysis of the limbs and lumbago. Roots and bark are used as mild expectorant and demulcent (medicinal)
<i>Sarca asoca</i> (Roxb.) de Wilde	Caesalpiniaceae	Rare	Stem bark is used as an astringent in excessive menstruation and as a uterine sedative (medicinal)
<i>Scilla indica</i> Roxb.	Liliaceae	Abundant	Employed in dropsy, rheumatism and skin troubles also used as expectorant, stimulant and cardio-tonic in small doses. Squill is used chiefly in chronic bronchitis and asthma (medicinal)
<i>Securingea leucophyrus</i> (Willd.) Muell.	Euphorbiaceae	Frequent	Paste of leaves combined with tobacco, is used to destroy worms in sores (medicinal, leaf used in fishing)
<i>Semecarpus anacardium</i> L.F.	Anacardiaceae	Abundant	Oil from seed used for Rheumatism, cough.(medicinal,oil yielding)
<i>Solanum indicum</i> L.	Solanaceae	Occasional	Roots are carminative and expectorant. Fruits laxative and digestive (medicinal)
<i>Solanum nigrum</i> L.	Solanaceae	Frequent	Leaves are used for constipation, jaundice, piles, uncers and fissures in the mouth and root powder for whooping cough (medicinal)
<i>Sphaeranthus indicus</i> L.	Asteraceae	Occasional	Plant powder is used to hasten labour pains and fruits for chicken pox and mumps (medicinal)
<i>Sterculia urens</i> Roxb.	Sterculiaceae	Frequent	Bark powder given to women to facilitate delivery (medicinal, oil yielding)
<i>Strychnos nux-vomica</i> L.	Loganiaceae	Rare	Stem bark used for menorrhagia, leprosy and snakebite, seed paste for corne and hair fall and juice of fresh wood is used for cholera, fevers and dysentery (medicinal)
<i>Tamarindus indica</i> L.	Caesalpinac	Frequent	An infusion of leaves is reported to be cooling and useful in bilious fever. A poultice of fresh leaves is useful in swelling and boils, and for relieving pain (medicinal)
<i>Tephrosia purpurea</i> (L.) Pers.	Papilionaceae	Frequent	Powdered leaves are smoked for relief from asthma and cough (medicinal)

Botanical Name	Family	Frequency	Uses
<i>Terminalia arjuna</i> (Roxb.) Wight & Arn.	Combretaceae	Occasional	Powdered bark is reported to relieve hypertension, and also has diuretic and tonic effect in cirrhosis of liver (medicinal, timber)
<i>Terminalia bellerica</i> (Gaertn.) Roxb.	Combretaceae	Abundant	Fruits are used for indigestion and contraception (medicinal, timber)
<i>Terminalia chebula</i> Retz.	Combretaceae	Abundant	Fruits are used for conjunctivitis, diarrhoea, dysentery and piles (medicinal, timber, fuel)
<i>Tinospora cordifolia</i> (Wild). Miers	Menispermaceae	Frequent	Stems are used for cough and cold, cuts and wounds, diabetes, fevers, paralysis, snake bite, obesity and to prevent old age. Stem decoction as hair tonic brain tonic and vaginal cleaning (medicinal)
<i>Trichosanthes bracteata</i> (Lamk.) Voigt	Curcubitaceae	Occasional	Fruit powder used on sores (medicinal)
<i>Tylophora indica</i> (Brum.f.) Merr.	Asclepiadaceae	Frequent	Root are used in asthma, bronchitis whooping cough, dysentery, diarrhoea and rheumatism (medicinal)
<i>Uraria picta</i> (Jacq.) Desv. ex DC	Papilionaceae	Occasional	Decoction of roots is given in colds and fevers. Leaves are antiseptic and used in gonorrhoea. Roots and pods are used for prolapse of anus in children (medicinal)
<i>Urena lobata</i> L.	Malvaceae	Abundant	A root is used as diuretic (medicinal)
<i>Vanda tassellata</i> (Roxb.) Hook ex G. Don	Orchidaceae	Frequent	Roots are used for curing rheumatism and bronchitis. Leaves are used for fever, juice of leaves is also used for ear troubles (medicinal)
<i>Vernonia cinerea</i> (L.) Less.	Asteraceae	Abundant	An infusion of plant with quinine is used for malaria and ringworm. Decoction of root is given in diarrhoea and stomachache. Flowers are used for rheumatism (medicinal)
<i>Vetiveria zizanioides</i>	Poaceae	Occasional	Roots yield essential oil called vetiver oil, which is used in cosmetics and perfumes. Oil is used in colic, flatulence, vomiting, rheumatism and sprains (medicinal, oil yielding)
<i>Viscum album</i> L.	Viscaceae	Frequent	Used against hypertension, hysteria, epilepsy and ear diseases (medicinal)
<i>Vitex negundo</i> L.	Verbenaceae	Abundant	Leaves are used as tonic, also smoked for headaches, and applied to rheumatic swelling of joints (medicinal, oil yielding)
<i>Molluva spicata</i> Dalz.	Caesalpinaceae	Frequent	Roots are used for pneumonia, bark for skin trouble (medicinal)
<i>Withania somnifera</i> Dun.	Solanaceae	Rare	Roots seeds and fruits are used in arthritis, asthma, bronchitis, cancer, leucorrhoea, spermatorrhoea and impotency (medicinal)
<i>Woodfordia fruticosa</i> (L.) Kurz.	Lythraceae	Frequent	Dried flower acts as astringent and stimulant (medicinal, dye yielding)
<i>Wrightia tinctoria</i> R.Br.	Apocynaceae	Rare	Bark and seeds are used in flatulence, cough and bilious troubles (medicinal, dye yielding)

collected comprising 261 seed/fruits accessions, 12 vegetative materials, 15 wild relatives of crop plants, 15 economic plants, 15 oil yielding plants, 10 aromatic plants and 284 live plants. These were sent for conservation to National Gene Bank (NBPG), New Delhi. All these accessions were identified by using local floras (Cooke, 1958; Kulkarni, 1988; Lakshminarsimhan and Sharma 1991; Singh and Karthikeyan 2000; Sharma *et al.* 1996). Large diversity was found among species such as *Carisa carandus*, *Holarrhena antidysenterica*, *Semecarpus anacardium*, *Terminalia chebula*, *Syzygium cumini*, *Mimosops elengi* etc. The information about medicinal uses, method of consumption and local name was also documented. Vegetative and live materials available were also collected. The 21 species characterized on the basis of days for germination and morphological characters. The seedlings of important medicinal plants were collected

and maintained in the university campus during this period.

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