

Ethnobotanical Euphorbian plants of North Maharashtra Region

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Abstract: Euphorbiaceae is among the large flowering plant families consisting of a wide variety of vegetative forms. Some of which plants are of great importance, It is need to explore traditional medicinal knowledge of plant materials belonging to various genera of Euphorbiaceae available in North Maharashtra State. Plants have always been the source of food, medicine and other necessities of life since the origin of human being. Plant containing ethnomedicinal properties have been known and used in some forms or other tribal communities of Satpuda region. These tribal have their own system of Ethnomedicine for the treatment of different ailments. In the course of survey useful Euphorbian plants of Satpuda, 34 medicinal plants belonging to 18 genus is documented. This article reports their botanical identity, family name, local language name part used preparations and doses, if any. It is observed that tribes of this region uses various Euphorbian plant in the form of decoction, infusion, extract, paste, powder etc. Thus the knowledge area of this region with respect to ethnomedicine would be useful for botanist, pharmacologist and phytochemist for further explorations. It is concluded that the family is a good starting point for the search for plant-based medicines.

Keywords: Ethnomedicine, Tribals, Satpuda region, Euphorbian medicinal plant.

I. Introduction

The family Euphorbiaceae is one of the largest families of flowering plants it composed of over 300 genera and 8,000 species. The family is very diverse in range, composed of all sorts of plants ranging from large woody trees through climbing habit to simple weed that grows prostrate to the ground. The member of Euphorbiaceae are widely distributed all around the world, many family members are inhabitants of tropical climates surviving hot dry desert condition while other are rainforest trees and herbs. The family consists of species of great economic importance like *Ricinus communis* (Castor oil plant) *Manihot esculenta* and *Hevea brasiliensis*. Euphorbiaceae is complex family with a lot of research potential¹.

Complexity in habitat range and variability in morphology and genetics has made Euphorbiaceae classification difficult. Homogenous families have their classification based on simple, unique characteristics that cut across the family, eg. monocotyledony and parallel venation for family poaceae. In the case of Euphorbiaceae, there appears to be no particular and easily observable feature that can be used for its classification. The enumeration of several anatomic features like wood structure, laticifer type, trichomes and nature of stomata as being important for family classification, while other like pollen nuclear, exine structures, type of pollination and inflorescence types are important for classifying genera, tribes and subfamilies².

Ethnobotany deals with studies among the tribals and rural people for recording their unique knowledge about plant wealth and for search of new sources of herbal drugs edible plants and other aspect of plants. Plants medicines are regarded as highly important in the lives of our ancestors plants the basis for life on earth have been widely used as a source of medicine by man since ancient times³. Most of the people depending on traditional medicine live in developing countries and they rely mainly on traditional herbal medicine to meet their primary health care needs. The science of ethnobotany is concerned with the relationship between man and vegetation involving man's dependence upon vegetation as well as tremendous influence man has had on vegetatin. Recently, Tripathi and Srivastava (2010) reported important of ethnomedicinal flora use in dermatological problem where they mentioned 7 genera with 11 species of Euphorbiaceae family⁴.

The species of Euphorbiaceae have been used by local population of many part of countries in folk medicines as remedies against several diseases and complaints such as cancer, diabetes, diarrhoea, heart diseases, hemorrhages, hepatitis, Jaundice, malaria, ophthalmic diseases, rheumatism and scabies etc. In India following genera of Euphorbiaceae are reported as medicinal plants. *Acalypha*, *Bridelia*, *Chrozophora*, *Jatropha*, *Mallotus*, *Phyllanthus*, *Baliospermum*, *Cicca acida*, *Euphorbia nerifolia*, *Euphorbia thymifolia*, *Jatropha gossypifolia*, *Ricinus communis*.⁵ A part from these many of Euphorbiaceae members have been used in traditional folk medicines such as *Acalypha indica* for rheumatic arthritis, *Phyllanthus fratarnus* for treatment of leprosy. The present study is the attempt to prepare the survey, documentation and enumeration of Euphorbian medicinal plants in the study area.⁶

II. Materials and Methods

Plant materials belonging to various genera of the Euphorbiaceae, readily available in North Maharashtra region were collected from Dhule, Nandurbar and Jalgaon districts. Specimens were satisfactorily identified and confirmed with the help of the herbarium at Department of Botany. S.S.V.P.S. Dr. P.R. Ghogrey Science College Dhule. The survey was conducted according to the method evolved and adopted by different ethnobotanists. The methodology used by various investigators is based on the emphasis of the nature of information sought.

Location and study area

Geographically Maharashtra is located in the center of North and South side of India and it is the 3rd largest state with a geographical area 307690 Sq. kms and lies between 16^o40' to 22^o10' N latitude and 72^o56' to 80^o09' E longitude. Western border of it is linked with Arabian sea having 825 sq. kms length. 750 sq. kms long Eastern side is connected to Madhya Pradesh (MP), 1875 sq. kms long southern border it attached to Andhra Pradesh and Karnataka and 1725 sq. kms long Northern border is linked with Gujrat an Madhya Pradesh. Maharashtra is distributed in to 35 districts ad 303 tahsils. There are four different region of Maharashtra Viz, Khandesh, Marathwada, Vidharbha and Kokan, Khandesh region of Maharashtra was divided into two parts since 1906 i.e. West Khandesh and East Khandesh which were, later on renamed after the district headquarters as Dhule and Jalgaon district respectively. (Mahajan and Badgujar 2008) Later on Dhule was divided into two districts i.e. Nandurbar and Dhule, on 01 Jul 1998. Nandurbar district is bounded by Dhule in South, Gujrat and Madhya Pradesh in West and North Madhya Pradesh and Dhule in Eastern.¹⁶

Methods

An ethnomedicinal survey was conducted in surrounding areas of Satpuda M.S. This area is inhabited by Bhills, Gavits, Kokanis, Padvīs, Tadvis, Valvis, Pawaras etc. Regular visits were made during the period 2008-2010. The information was collected from local traditional healers and aboriginal people of Satpuda, considering two different types of observation viz ethnobotanical and household survey related to quantification of plant products consumed or gathered. Criteria adopted for present study include i) Interview, ii) inventory. Former includes asking questions about ethanobotanical application of Euphorbian plant for different purposes such as medicine, food, fuel, folder etc. Simultaneously recording the common names of plant, forest visits with ethnobotanical knowledge provider tribe or informants for identification of specific plant was also made. The latter involves collection of plant specimen, making herbarium and interviewing the informants for names and uses of corresponding plant specimen. Above both approaches were repeated with knowledgeable tribal heads, traditional healers, elders, bhagats, buwas etc. in to the forest and information was verified in different seasons and surrounding area of visited villages of particular district. The collected data has been compared with recent literatures The fresh specimen of the plants were collected and identified taxonomically by the experts matching with authentic herbarium books on flora (Kirtikar and Basu 1995) and photographs.⁸

Species enumeration

The plants are arranged alphabetically as per their botanical names. These are followed by the family names and then by their local names and plant part used along with the method of application described.

Table 1 : Medicinally important Euphorbiaceae plants belonging to Northern region of Maharashtra

Sr. No.	Botanical Name (Voucher specimen)	Common name	Life form	Period of Fl and Fr	Habitat	Part used	Uses
01	<i>Acalypha ciliate</i> Forsk (EP1)	Kuppi; Khajoti	Herb	July-December	Occasional in hill forest, along gullies or stream banks in shade of bushes.	WP	Whole plant is used as laxative and vermifuge 16
02	<i>Acalypha hispida</i> Burm. F(EP2).	Red Hot Cat-Tail, Chenille Plant	Shrub	August-April	Cultivated in the gardens for ornamental purposes.	WP, FR, LE	Flowers are used in diarrhea; leaf is used in ulcer, burn, ringworm, scabies, skin diseases wound; decotion of whole plant is used in cough and haemoptysis. ⁸
03	<i>Acalypha indica</i> L(EP3).	Kuppu; khokali	Herb	July-December	Common in wastelands under shade of trees, on old walls etc.	LF, RT SD	Powder of dry leaves is used in bad sores; Uniform mixture of leaf juice and garlic they is used as Anthelmintic 12

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04	<i>Acalypha wilkesiana</i> Muell.-rg.(EP4)	Copper leaf	Shrub	Throughout year	Grow in gardens for its highly ornamental leaves.	WP LF	The expressed juice or boiled decoction is used for the treatment of gastrointestinal disorders and fungal skin infections. The leaves of this plant are eaten as vegetables in the management of hypertension. 16
05	<i>Baliospermum raziana</i> Keshav (EP5)	Dathi, Lepkyo	Shrub	September-December	In shady habitats, and cleared forest areas along the roads and the bank of nallas etc.	LT, RT	Latex is applied externally on skin diseases; root is used in constipation (1-2 gm roots are crushed and soaked in water-this water is administered as a single does against constipation) 17
06	<i>Bridelia airyshawii</i> P.T.Li (EP6)	Asan, Ahani, Agan, Ahan	Tree	July-December	Frequently found on hill slopes	FT, SB	Ripe fruits are edible; bark powder is used diabetic and a powerful tonic for reducing the body weight. 1
07	<i>Chrozophora prostrate</i> Dalz. (EP7)	Betha, Okharad, Unhali	Herb	Almost Throughout year	In moist rocky and sandy beds of nallas, also a weed in cultivated fields	RT, SD	Decoction of roots is given in cough to children (10 years old), Seed: Purgative, the ash of root is given early in the morning daily with warm cow milk in asthma. 6
08	<i>Chrozophora rotleri</i> (Geis.) A. Juss.(EP8)	Unhali	Herb	December - February	Weed in cultivated fields, also in wastelands, river sides etc.	WP	Plant has emetic, drastic and corrosive properties, seeds are used as a cathartic. 8
09	<i>Cicca acida</i> (L.) Merr.(EP9)	Rai-awala	Tree	October - March	Cultivated in the gardens	FT	Remove dandruff, cure night blindness, anti vomiting 10
10	<i>Cleidion spiciflorum</i> (Burm.f.)Merr (EP10)	Mahadi	Shrub	April-June	Occasional in hilly forest area	SD, LE	Aerial part is edible, sweet; decoction of the leaves will produce abortion 15
11	<i>Codiaeum variegatum</i> (L.) Juss.(EP11)	Croton	Shrub	Almost Throughout year	Cultivated in the gardens for ornamental purpose	LE	Decoction of crushed leaves for diarrhoea. Sap of leaves mixed with coconut milk used for sphyritic lesions. Leaves, for antibacterial uses. 16
12	<i>Croton bonplandianum</i> Baill(EP12)	Putri	Herb	Almost Throughout year	Naturalized in wastelands along roadside, river banks, railway lines etc.	WP	Control scabies, catarrh, bronchitis & asthma 17
13	<i>Emblica officinalis</i> Gaertn(EP13)	Awala, Amala, Borbhajia wala	Tree	February-August	Occasional in hilly forest area and also planted	FT	Fruits are edible 1
14	<i>Euphorbia clarkeana</i> Hook.f. (EP14)		Herb	August-November	Occasional in open forest among grasses	WP	It is used to cure spermatorrhoea and mouth blister 6
15	<i>Euphorbia cyathophora</i> Murr.(EP15)	Dudhali	Herb	September-March	Mostly ornamental and naturalized	WP	Useful as galactagogue 8
16.	<i>Euphorbia hirta</i> L.(EP16)	Dudhi	Herb	Almost throughout year	Common weed in different habitats	WP	Urinary disorders, itches, gonorrhoea Remove warts Cure scabies (Skin diseases), burns, antiseptic, antidyentric, antidiarrhoea Plant juice is used colic trouble, dysentery, urinogenital diseases 15
17.	<i>Euphorbia indica</i> Lamk. (EP17)		Herb	August-December	Common in waste places and as a weed in cultivated fields	WP	Whole plant is used as Ringworm disease 16

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18.	<i>Euphorbia milii</i> <i>Desmoul.</i> (EP18)	Christ plant	Shrub	Usually March, May, sometimes Throughout year	Cultivated in the gardens	LX	Latex is applied to treat sprain 1
19.	<i>Euphorbia</i> <i>nerifolia</i> L. (EP19)	Sabar, Sabari, Sabar-Kand	Shrub	March-June	Wild in hilly open forest	RT	A succus compounded of equal parts of the juice and simple syrup is said to be used for giving relief in asthma 4
20.	<i>Euphorbia</i> <i>nivulia</i> Buch. - <i>Ham</i> (EP20).	Sabar	Shrub	March-June	Wild on dry and rocky regions	RT	Used in dropsy 17
21.	<i>Euphorbia</i> <i>pulcherrima</i> <i>Willd.</i> (EP21)	Lal-patta	Shrub	November- February	Panted in gardens for ornamental floral-leaves	LE	Cure rheumatic pain 8
22.	<i>Euphorbia</i> <i>thymifolia</i> L (EP22).	Dudhi	Herb	Usually Throughout year	Weed in cultivated fields	RT, LX, WP	Relieve joint pains, antiinflammotory agent, applied on bone dislocation of animals Antidote for snake bie, astringent, antihelmatic, against ring worm Laxative for children 5
23.	<i>Euphorbia</i> <i>tirucalli</i> L (EP23)	Thor, Thorya, Sher	Tree	Very rarely flowers, fruits not seen	As a hedge plant	LX, SB	Latex applied externally on warts. Stem bark is used for gastralgia 8
24.	<i>Jatropha</i> <i>curcas</i> L(EP24).	Mogali erand, Ratanda	Shrub	Almost Throughout year	Planted in hedges and also naturalized in wastelands near villages	LX, SB	Bark is Used as a fish poison, Latex Strongly inhibits the watermelon mosaic virus Latex is applied to treat boils and pimples. 10
25.	<i>Jatropha</i> <i>gossypifolia</i> L (EP25)	Chandrajyot, Chandre	Shrub	Almost Throughout year	Naturalized in wastelands near villages, along nallas, rivers, railway lines etc.	SD, SB	Seed oil is externally applied in rheumatism, whereas decoction of root is taken orally for abdominal inflammation. A decoction of the bark is used as an emmenagogue. Seed oil is used in skin diseases, Seeds are drastic purgative and emetic, Regular brushing with the twigs keeps the teeth and gum disease free and cures tooth-ache 16
26.	<i>Kirganelia</i> <i>reticulate</i> (Poir.) Baill. (EP26)	Kali- kumhuni, pichrundi	Shrub	August- December	On the edges of fields and in wastelands	FT	Ripe fruits are edible and cure skin diseases. 12
27.	<i>Mallotus</i> <i>philippensis</i> (Lamk.) Muell.- Arg.(27)	Madari, Shendrya, Hendra	Tree	December- March	Frequently in hilly forest tracts	FT	Hair of fruits used for the treatment of tapeworm infestation, in scabies, ringworm, herpes etc. 16
28.	<i>Micrococca</i> <i>mercurialis</i> (L) <i>Benth.</i> (EP28)	Garari	Herb	August- October	Rare, in moist shady habitats on gravelly hilly slopes	WP	The plant is used to treat children with fever and the plant-sap is instilled into the nose, eyes or ears to treat headache, filariasis of the eye or otitis, respectively 17
29.	<i>Pedilanthus</i> <i>tithymaloides</i> (L.) <i>Poit.</i> (EP29))	Vilayatisher, Vilayatithor	Shrub	March-May	Planted as hedge in garden and around bungalows	RT, LX	Root along with the bark of <i>Moringa oleifera</i> is pounded together and administered after menstruation to develop permanent sterility in female. Root is also a powerful emetic. The latex has emetic, irritant and caustic properties; used in venereal troubles, also applied to warts and leucoderma patches 16

30.	<i>Phyllanthus amarus</i> Schumacher & Thonn (EP30).	Bhui awala	Herb	August-December	Common in wet localities and cultivated fields	WP	It is good galactagogue for goats and sheep 1
31.	<i>Phyllanthus maderaspatensis</i> L.(EP31)	Ranavati	Herb	August-November	Common in wet localities and cultivated fields	LE	An infusion of leaves is used in headache 6
32.	<i>Phyllanthus urinaria</i> L. (EP32)	Erandi, Erand, Diwali, Diwegi	Tree	Almost Throughout year	Common in open fields and in rock places	RT, LX	Used as a single drop in the treatment of jaundice 15
33.	<i>Ricinus communis</i> L. (EP33)	Erandi, Erand, Diwali, Diwegi	Tree	Almost Throughout year	Cultivated in the fields for oil production.	SD	Seed oil is used in dermatosis and eczema. 16
34.	<i>Synadenium grantii</i> Hook. f.(EP34)	Eronda	Shrub	March-May	Planted along fences	LX	Latex is applied for wound healing 17

Part Used - FT : Fruit, WP : Whole plant, SB : Stem Bark, LX : Latex, SD: Seed, LE : Leaves, EP:Euphorbiaceae

III. Results and Discussion

The results of this study survey are presented in [Table:1](#) and the scientific names of the plant are arranged in alphabet order. The present investigation comprises 34 members of Euphorbiaceae. For each member scientific name, family, local name, part used, method of preparation, administration and aliment treatment has been provided. Tribal communities are using these plants to cure various diseases like diarrhoea, cough, skin disorder, astrointestinal disorder, asthma, night blindness, scabies, tooth decay, dysentery, snake and scorpion bite, ringworm, headache, jaundice, burn, Gonorrhoea, antiseptic, urinogenital disorder, Bronchitis, Dabetes, Antihelminthic, Wound healing, Ringworm Vermifuge and Laxative. Figure2 illustrates genus wise distribution of Euphorbiaceae member the order of Euphorbian genus are *Euphorbia Acalypha*, *Chrozophora*, *Jatropha*, *Baliospermum*, *Bridellia*, *Cicca*, *Cleidion*, *Codiaeum*, *Croton*, *Embilica*, *Kirganelia*, *Mallotus*, *Micrcoocca* and *Pedilanthus*. During survey, one common thing was observed that a single plant was used for more than one diseases. For example *Acalypha hispida*, Brume (Haemoptysis, Gastro-intestinal) Respiratory affections, fractures. Toothache and Earache, severe cough associated with bleeding from lung and Diarrhoea) *Baliospermum mouthanum* (wild) muell-Arg. (Anasarca, dropsy, flatulence, constipation, jaundice, hemorrhoids leprosy, skin diseases, strangury, vesical cacculi, wounds, splenomegaly, anaemi leucoderma, fever and vitiated condition of vata, asthma, bronchitis, vat inflammations, flatulence) and *Euphorbia hirta*. (Urinary disorder, itches, gonorrhoea Remove warts cure scabies. The leaf of *Croton bonplandianum* is applied in the treatment of typhoid fever by tribal people of North Maharashtra region and our observations are in accordance with earlier antimicrobial activity report made by Jeeshna *et al.*, 2011 against *Escherichia coli*, *Salmonella typhi*, *Staphylococcus aureus* and *Bacillus Subtilis*. Bark of *Jatropha crucus* was used by aborigines of investigated part as toxic ingredients and this confirms earlier claim made by Rug and Ruppel, 2000. The whole plant extract of *Euphorbia hirta* is used as an anti diarrhoeal agent and this confirms earlier report¹⁴ given by Galves *et al*, 1993. Fruit of *Emblica officinalis*, *Kirganelia reticulate* and *Bridelia airyshawii* are used as a food material because of its nutritious value and its content of hydrolytic enzyme and many more macro and micro nutrients. The content of these fruits is confirmed by experiments conducted in our laboratory under standard conditions. Information recorded from tribals of North Maharashtra region is more or less parallel to earlier observations about all the plants compiled by us. The most commonly utilized part of plant was WP(G%) followed by root and leaf(D&A%) respectively, latex(E%) ,Bark(F%) ,Stem and Seed(B&C%) in [figer.3](#).The information generated from the present study about Euphorbian plants used by traditional people needs to be evaluated for proper biochemical analysis with respect to their enzymatic assay, level of toxicity, phytochemical investigations including alkaloid extraction and isolation of along with few clinical trials. Phytochemical examination of these plants may lead to development of potential bio- product in the treatment of eye disorders ,for healing of wound skin diseases toothache and many other human ailments. This could help in mass awareness of conservation of such plants to promote ethano medico botany knowledge within the region beside contributing to preservation of such medicinally important species before they are lost forever

Conclusion

From the above observation it is evident that Euphorbiaceae family play a significant role in ethnomedicinal and ethnoveterinary system present in this area by contributing 34 plant species .It is also evident that a particular plant used by one aboriginal group to treat a particular disease. Ethanobotany is an ever growing field and form the mainstay in establishing the therapeutic potential and medicinal use of herbs growing in the interior area of India ,where as tribal people use plants of that region as medicine. Therefore ,the plants require a thorough investigation of their bio-active compounds for the efficiency reported in different literature.

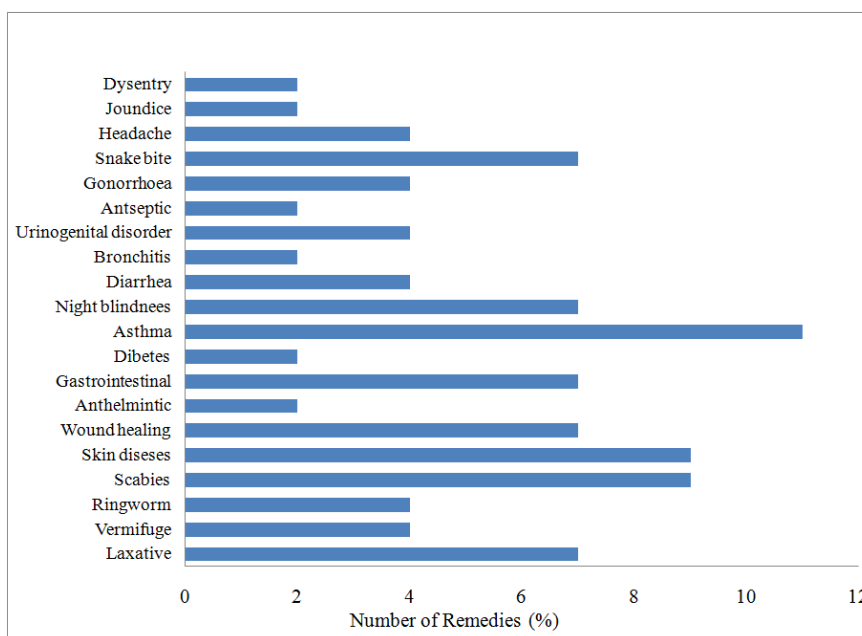
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Figure 1:
Distribution of household remedies (%) used for various ailments



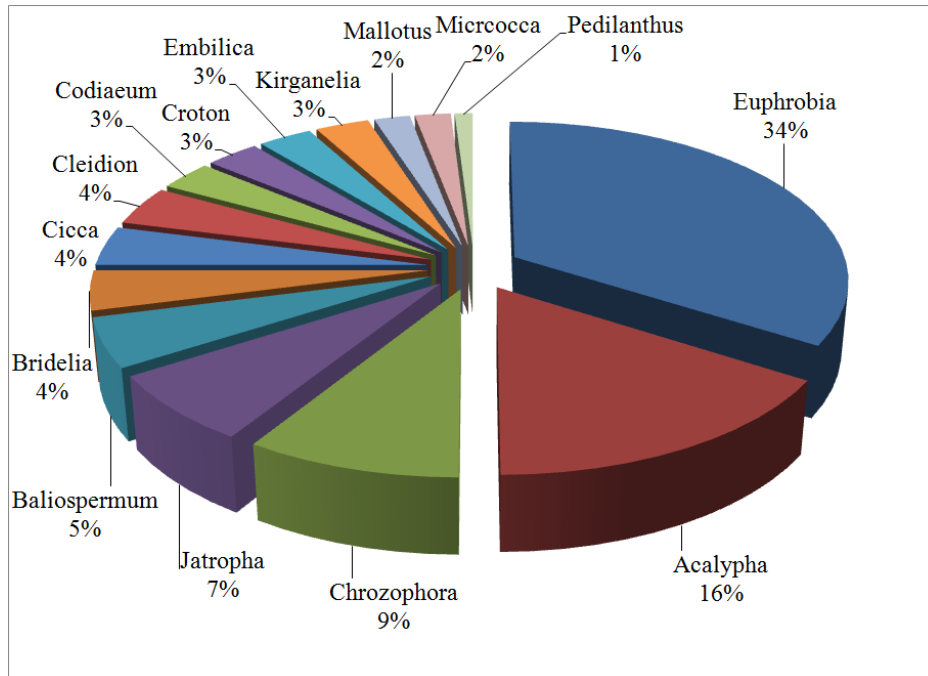


Figure 2: Genus wise distribution of Euphorbian plants occurred in North Maharashtra region of Maharashtra

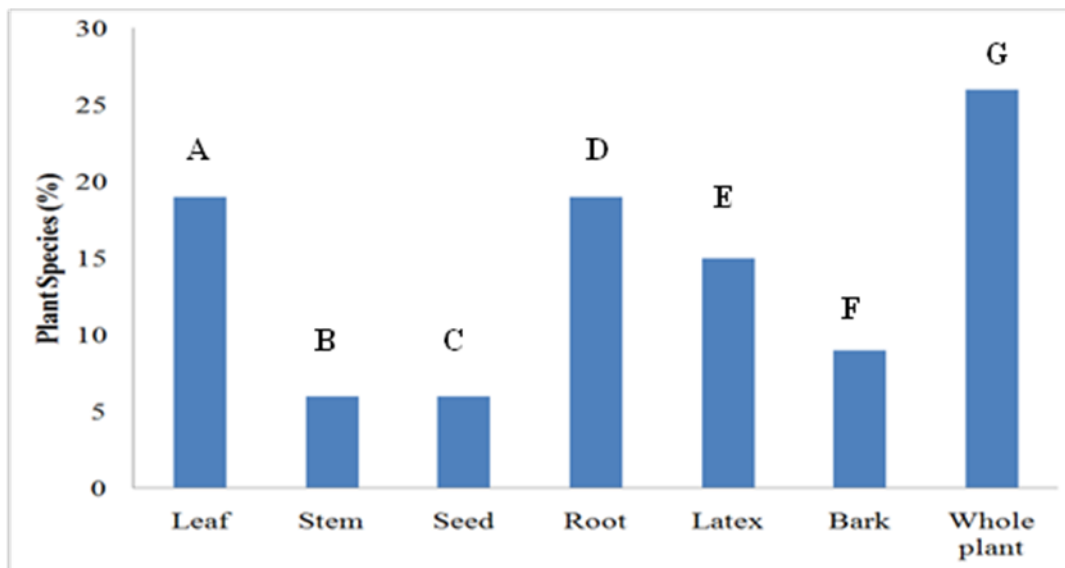


Figure 3: Frequency of plant parts used for preparation of remedies