



REGULAR ARTICLE

# ETHNOBOTANY OF BULDHANA DISTRICT (MAHARASHTRA: INDIA): PLANTS USED IN VETERINARY MEDICINE

D.A.Patil\*, P.S.Patil, Y.A.Ahirrao, U.P.Aher, Y.A.Dushing

Post-Graduate Department of Botany, S.S.V.P.S's L.K. Dr.P.R.Ghogrey Science College, Dhule-424005, (M.S.), India

## SUMMARY

The present paper deals with plants used in veterinary medicine in Buldhana district, which is situated in the northern part of Maharashtra (India). The folk knowledge about medicinal plants is still prevalent in the region. The increasing force of acculturation in the area indicated urgency in recording such data. A field study was carried out during 2006-2009. It was aimed at documentation, analysis and assessment of ethnobotanical knowledge in the study area. We performed structural interviews as well as open discussions with about 5-8 informants (with age between 50-65). It is compared with literature available to date. Eighty plant species belonging to 44 families have been reported as employed by the rural folks and tribals. A list of a plant species along with their family, local name, plant part/s used, medicinal recipe and mode of administration for effective control of different ailments. These remedies are mostly extended for cows, calves, bullocks, buffaloes, goats and sheeps. The main ailments treated are wounds, bone fractures, stomach and gynecological complaints. In few cases, the use of these remedies is also consistent with their use in human medicine. These are also discussed from the standpoint of 'doctrine of signatures'. Buldhana district has a rich repository of medicinal plants and this reinforces the need for concomitant evaluation of their chemical contents and biological activity as a basis for developing future medicines.

**Key words:** Ethnobotany; Buldhana district; Maharashtra; Ethnoveterinary; Traditional knowledge

D.A.Patil edited. Ethnobotany of Buldhana District (Maharashtra: India): Plants Used in Veterinary Medicine. J Phytol 2/12 (2010) 22-34.

\*Corresponding Author, Email: dapatil\_10aug@yahoo.com

## 1. Introduction

Traditions of collecting, processing and applying plant-based medications are maintained by indigenous societies for long and carefully. They have been handed down by word of mouth from generation to generation. The significance of ethnomedicine and ethnopharmacology is now increasingly recognized in modern medicine (*cf.* Maydell, 1990) and these are enjoying a respectable position today, where modern healthcare services are limited. These remedies have gained popularity amongst the people of developing countries, being safe, effective and inexpensive.

Even before pre-historic period, domestic animals have started to act under the direction of man. Sheeps and goats were perhaps domesticated probably around 9000 years ago, cattle 6000 years, buffaloes and

horses 4000 years. Since domestication was first unnatural work of mankind, therefore, the domestical animals subjected to various ailments. In due course of this struggle between man and nature, early men developed various skills in the treatment of their pets by plants through life-long trials and error and continued from prehistoric age to modern cybernetic age through various phases of history.

Buldhana district extends between 19°51' and 21°17' north latitude and 75°57' and 76°59' east longitude with an area of 9745 sq km. in the northern part of Maharashtra State. It is a land of small holdings and 70 per cent of population practice subsistence agriculture, but the most peasants are not self-sufficient. They have to rear domestic animals such as oxen, cows, buffaloes, goats

and sheeps. Apart from agricultural work and utility, these domestic animals provide milk, milk products and meat. In most localities, no organized veterinary medicinal aid is available; therefore, they depend mainly on the local herbal medicines. The animals are treated with plant remedies on the basis of empiric knowledge.

In India, enough attention has not been paid to the traditional veterinary remedies. Even the 'Rigveda', 'Atharveda' and eight divisions of 'Ayurveda', the pioneer documents with curative properties of plants have not provided much information on veterinary remedies (Pal, 1991), except few such Hasthyapuran, Ashwapuran, Garudpuran and Matsyapuran which deal with domestication, diet, healthcare and use of animals (Jain, 2003), Recently, A Dictionary of Ethnoveterinary Plants of India have been brought out (Jain and Srivastava, 1999) which contains brief accounts of only 836 plant species. As far as state of Maharashtra is concerned, very few publications are on reward on this line (Patil and Patil, 2001; Naser and Vaikos, 2002; Mokat and Deokule, 2004; Patil and Merat, 2003). The district of Buldhana is fairly rich from the point of biodiversity (Diwakar and Sharma, 2000), agrobiodiversity and diversity of human culture (Anonymous, 1976). The people belong to 15 scheduled castes, some artisan castes e.g. Sutar, Lohar, Beldar, Kumbhar, Panchal, Ghisadis, Pathratas, Rangari, etc., apart from forward caste people. They inhabit rural and tribal hilly areas. Majority of them are well conversant with the state language Marathi, besides their own dialects (Anonymous, 1976). All of them are particularly appropriate for ethnobotanical and ethnopharmacological studies. Few reports from Buldhana district are published (Patil et al., 2007; Ahirrao et al., 2009). The area was practically untapped ethnobotanically before our attempts. We obtained 80 species belonging to 44 families useful for human healthcare. The present paper is aimed at projecting veterinarian uses gathered during our ethnobotanical projecting.

## 2. Area studied and Methodology

The district of Buldhana, a part of the Northern Maharashtra State (India) is located between 19°51' and 21°17' north latitude and 75°57' and 56°59' east longitude comprising 9745 sq km (Map-I). Marathi is the state official language known to the people and also they have their own local dialects. The rainfall ranges from 515.1 to 1019.4 mm / year and mean temperatures oscillate between the lowest 15°C in December-January to 47°C in April-May with the highest. Angiospermic flora is fairly rich, with around 563 taxa (Diwakar and Sharma, 2000). The vegetation basically belongs to the teak (*Tectona grandis* L.) forest, with fair presence of Babul [*Acacia nilotica* (L.) Del.], Salai (*Baswellia serrata* Roxb.ex Coleb.) mixed with others such as Kuda [*Holarrhena pubescens* (Buch.-Ham.) Wall. ex. G.Don.], Anjan (*Hardwickia binata* Roxb.), Dudhkudi (*Wrightia tinctoria* R.Br.), etc. The district being basically agrarian, people inhabit villages and hamlets (locally called khedegav and pada respectively). These localities are connected to the tehsil and district headquarters by road. Agriculture is the main occupation and industrial activity is low and mainly linked to agricultural products e.g. milling, dehusking, processing, spinning, ginning, etc., besides few cottage industries for making bidi, brooms, wooden furniture, etc. Livestock raising is also important occupation on the sidelines of agricultural activities and part of rural and tribal life in the district. Their management is interesting in ethnoveterinary terms.



The various villages and hamlets were first visited in view of knowing the geography, people, language, occupation, forest cover, seasons, etc. Knowledgeable informants were particularly noted such as elder (50-65 years of age), healers, medicine men/women, farmers and farm labourers in the study area. The data presented are based on ethnobotanical interviews with the abovesaid informants, who are native to the region. We used a questionnaire specially prepared for the purpose. We also tried to orient the open conversation so as not to forget any relevant subject without coercing the informants. We always bore in mind the information we wanted to tap. Thus methodology adopted is a combination of structural and non-structural interviews. We also participated, on some occasions, in group discussions involving the informants. As far as possible, various information (usually 5 to 8 in number), were allowed to express their views and experience in their mother tongue, Data were jotted down in field. On another frequent visits, the data accrued were verified. Plant vouchers were collected, mostly when accompanied with the informants. Sometimes, they were shown to them and confirmed.

They are identified using the state, regional and district floras by Cooke (1958), Naik (1998), Patil (2003), Kshirsagar and Patil (2008), Patel (1968), Sharma, Karthikeyan and

Singh (1996), Singh and Karthikeyan (2000a, 2000b), Diwakar and Sharma (2000), etc. The specimens have been housed in the Post-graduate Department of Botany, L.K.Dr.P.R.Ghogrey Science College, Dhule (M.S.) India. We compared the results to assess the degree of novelty of the uses. They were compared with the published literature (Jain and Srivastava, 1999; Maheshwari, 1996, 2000; Joshi 1995; Singh and Pandey, 1998; Rawat and Chaudhury, 1998 and Sinha 1998).

### 3. Results and Discussion

We documented plant species belonging to 90 families ethnobotanically useful for various purposes such as food, fodder, timber, seed, medicinal and some for miscellaneous ones. Of these, only 80 species from 44 families are applied as veterinary medicine by the people of Buldhana district. Interestingly, 29 species (marked as \* in Table-1) are used exclusively for ethnoveterinary purpose, whereas only five species are employed medicinally for both animals and human-beings (marked as \*\* in Table-1). About 46 plant species are used for veterinary medicine and also for other purposes. Total plant species administered in ethnoveterinary medicine in Buldhana district and arranged alphabetically in the Table-1.

Table-I : Medicinal plants and their traditional utilities in Buldhana District

	Scientific Name, Family & Voucher Specimen	Local Indian Name	Part used and preparation	Disease Treated & Administration
*\$	<i>Abelmoschus manihot</i> (L.) Medik. Malvaceae PSP-438	Jangli bhendi	Fruit, Mixed with fodder	Dysentery, Oral
*	<i>Abutilon indicum</i> (L.) Sweet Malvaceae AUP-120	Dabba	Leaf	Lal-Khurguti (Foot and mouth disease), oral
	<i>Acalypha indica</i> L. Euphorbiaceae AYA-411	Tankhalan	Leaf, Extract	Wounds, Topical

Scientific Name, Family & Voucher Specimen	Local Indian Name	Part used and preparation	Disease Treated & Administration
<i>Acanthospermum hispidum</i> DC. Asteraceae PSP-195	Bokharu	Leaf, Ash	Worms in wounds, Topical
<i>Achyranthes aspera</i> L. Amaranthaceae DYA-227, AYA-408	Aghada, Zinzoda	(i) Root, Paste (ii) Root, Extract	(i) To increase milk, Oral (ii) Dysentery, Oral
<i>Aegle marmelos</i> (L.) Corr. Rutaceae AUP-272	Bel	Leaf	Worms in wounds, Oral
<i>Aerva lanata</i> (L.) Juss. Amaranthaceae PSP-331	Safed-phuli	Leaf, extract	Fever, Oral
<i>Ailanthus excelsa</i> Roxb. Simaroubaceae AYA-186	Mahapurush, Waghat	Leaf, Extract	Worms near horns, Topical
<i>Amaranthus spinosus</i> L. Amaranthaceae AUP-246	Kathymath	Entire plant, Extract	Stomach-ache, Oral
*\$ <i>Amaranthus blitum</i> L. Amaranthaceae AUP-112	Pokla	Entire Plant	To increase milk, Oral
* <i>Ampelocissus latifolia</i> (Roxb.) Planch. Vitaceae AUP-85	Randraksha	Powder	Flatulence, Oral
** <i>Annona squamosa</i> L. Annonaceae PSP-222	Sitaphal	Leaf, Powder	Worms in injuries, Topical
<i>Aristolochia bracteolata</i> Lamk. Aristolochiaceae PSP-106	Gidiyan	Leaf, Extract	Worms in wounds, Topical
* <i>Asparagus racemosus</i> Willd. Liliaceae PSP-113	Shatavari	Roots, Powder	To increase milk, Oral
<i>Balanites aegyptiaca</i> (L.) Del. Balanitaceae (syn.B.roxburghii) Planch. AUP-284, AYA-368	Higanbet, Petri	i) Seed, with betel leaf ii) Seed, Paste	i) Flatulence, Oral ii) White in eyes, Topical
* <i>Bambax ceiba</i> L. Bombacaceae AUP-30	Kathsawar	Stem bark, Powder	Dysentery, Oral
<i>Basella alba</i> L. Basellaceae PSP-346	Vavding	Seed, Powder	Worms in wounds, Topical
* <i>Biophytum sensitivum</i> (L.) DC. Oxalidaceae AYA-209	Lajalu	Leaf, Paste	Wounds, Topical

Scientific Name, Family & Voucher Specimen	Local Indian Name	Part used and preparation	Disease Treated & Administration
** <i>Butea monosperma</i> (Lamk.) Taub. Fabaceae AYA-248	Palas	Flower, Paste	Stomach-ache, Topical
<i>Caccinia grandis</i> (L.) Voight Cucurbitaceae AYA-441	Tondali	Raw Fruit	Dizziness, Oral
<i>Cajanus cajan</i> (L.) Millsp. Fabaceae AYA-435	Tur	Pulse, Cooked	Diarrhoea, Oral
<i>Calotropis gigantea</i> (L.) R.Br. Asclepiadaceae PSP-248, DYA-315, AYA-287	Rui	Latex with groundnut oil and red lead	Poor vision, Topical. Worms in wounds, Topical.
<i>Calotropis procera</i> (Ait.) R.Br. Asclepiadaceae PSP-228, DYA-178	Rui	i) Latex ii) Leaf iii) Directly fed, Leaf iv) Indirectly fed	i) Bone fracture, Topical ii) Twisting of leg, Topical iii) Colic, Oral iv) Flatulence, Oral
*\$ <i>Capparis zeylanica</i> L. Capparidaceae PSP-466	Fulya-yel	Flower, Paste	Germes in wounds, Topical
* <i>Cardiospermum halicacabum</i> L. Sapindaceae AUP-48, AYA-	Fatakdi	Leaf, Extract	Stomach ache, Oral
<i>Careya arborea</i> Roxb. Lecythidaceae AYA-423	Khumbai	Fruit, Extract	Stomach-ache, Oral
\$ <i>Cassia obtusifolia</i> L. Caesalpiniaceae AUV-320	Deo-tarota	Leaf	Lal-khurguti Disease, Oral
* <i>Cassia occidentalis</i> L. Caesalpiniaceae PSP-187	Dav-tarota	Leaf, Extract	Worm in wounds, Topical
\$ <i>Cassine albernus</i> (Retz.) Kostem. Celastraceae AVP-63	Bhutkes	Leaf, Decoction	To increase milk, Oral
<i>Celosia argentea</i> L. Amaranthaceae PSP-178	Killu, Karadu	Root, Extract in coconut oil	Emergence of placenta after delivery, Oral
<i>Cicer arietinum</i> L. Fabaceae PSP-316	Harbhar	Pulse, with jaggery and Sago	To expel foetus early, Oral
<i>Cissus quadrangula</i> L. Vitaceae PSP-227	Kandyawel	Stem, Paste	Bone fracture, Topical

Scientific Name, Family & Voucher Specimen	Local Indian Name	Part used and preparation	Disease Treated & Administration
** <i>Citrus aurantifolia</i> (Christm.) Sw. Rutaceae PSP-329	Limbu	Fruit, Juice	Flatulence in calf, Oral
* <i>Cleome gynandra</i> L. Capparidaceae AVP-301	Ghanfod	Leaf, Extract	Fever, Oral
\$ <i>Clitoria biflora</i> L. Fabaceae AUP-274	Jangli-wal	Entire Plant (Stem)	Worms in ears, Topical
*\$ <i>Commelina forskalaei</i> Vahl Commelinaceae PSP-443	Keri	Entire plant, Paste with turmeric	Cough in goat, Oral
*\$ <i>Comolvolulus arvensis</i> L. Colvolvulaceae PSP-449	Sadhi-vasan	Leaf, Extract	To avoid worms in injury, Topical
*\$ <i>Cordia gharaf</i> (Forsk.) Eherenb. & Asch. Boraginaceae DYA-448	Gondhan	Stem bark, Flakes	Bone fracture, Topical
* <i>Coriandrum sativum</i> L. Apiaceae PSP-357	Kothambir, Kothmer	Entire plant, Extract	Lal-Khurguti (Foot & Mouth disease)
\$ <i>Cryptolepis buchanani</i> R. & S. Asclepiadaceae AYA-73	Karala	Entire plant, Wrapped around neck	Lal-Khurguti (Foot & Mouth disease), Topical
**\$ <i>Cucumis callosus</i> (Rottl.) Cogn. Cucurbitaceae PSP-143	Dendolya	Leaf, Extract	Wound, Healing, Topical
*\$ <i>Cucurbita moschata</i> (Duch. ex Lamk.) Poir. Cucurbitaceae PSP-190	Gangaphal	Fruit, Decoction	To promote milching, Oral
\$ <i>Cucurbita pepo</i> L. Cucurbitaceae AYA-401	Bhopla	Fruit, Paste, with lime	Intestinal swelling, Topical
 <i>Cucurma longa</i> L. Zingiberaceae PSP-4, AUP-218	Haland	Rhizome, Powder	Dysentery, Oral
 <i>Cucurma longa</i> L. Zingiberaceae PSP-4, AUP-218	Haland	Rhizome, Powder	Wound, Topical
* <i>Cullen corylifolia</i> (L.) Medic. (syn. <i>Psoralea coryfolia</i> L.) Fabaceae PSP-445	Fulore	Leaf, Extract	Worms in Wounds, Topical
 <i>Cuscuta chinensis</i> Lamk. Cuscutaceae AUP-351	Amarwel	Leaf, Decoction	To increase milk, Oral

Scientific Name, Family & Voucher Specimen	Local Indian Name	Part used and preparation	Disease Treated & Administration
\$ <i>Cymbopogon martinii</i> (Roxb.) Wats. Poaceae AUP-167	Rohis		Diarrhoea, Oral
* <i>Eclipta prostrata</i> (L.) L. Asteraceae DYA-131	Maka	Root pieces	Injury, Oral
<i>Euphorbia tirucalli</i> L. Euphorbiaceae PSP-442	Kshar	Young branch, Paste with soil of ant-hill	Bone fracture, Topical
* <i>Ficus bengalensis</i> L. Moraceae PSP-273, DY A-303	Wad	i) Leaf, oil applied on leaf and warmed ii) Leaf, Paste	i) Bone Fracture, Topical ii) Leg swelling, Oral
* <i>Hardwickia binata</i> Roxb. Caesalpiaceae AYA-95	Anjan	Leaf	To increase milk, Oral
<i>Helicteres isora</i> L. Sterculiaceae AYA-387	Bahalsheng, Mural	Fruits, Paste in lemon juice	Dysentery, Oral
** <i>Holarrhena pubescens</i> (Buch.-Ham.) Wall. ex G. Don Apocynaceae AUP-309	Dudhkanda	Green pods, with bread	To increase milk, Oral
* <i>Hordeum vulgare</i> L. Poaceae AVP-340	Jawar	Seed, Paste	Tumour, Topical
<i>Ipomoea carnea</i> Jacq. ssp. <i>fistulosa</i> (Mart. ex Choisy) Austin Convolvulaceae PSP-359	Nilwarni	Leaf, Paste	Cuts, Topical
\$ <i>Kedrostis rostrata</i> (Rottl.) Cogn. Cucurbitaceae DYA-18	Mirchi-kand	Root, Paste	To increase fodder consumption, Oral
<i>Lagerstroemia parviflora</i> Roxb. Lythraceae AUP-358	Bondara, Landga	Leaf, Paste with ant-hill soil	Bone fracture, Topical
* <i>Manilkara zapota</i> (L.) P. van Royen Sapotaceae PSP-360	Chiku	Leaf, Seed, Paste with soil of ant-hill	Bone fracture, Topical
<i>Momordica dioica</i> Roxb. ex Willd. Cucurbitaceae PSP-154, AYA-311	Katirle	i) Root, Pieces in fodder ii) Leaf, Extract	i) Flatulence, Oral ii) Post-delivery bleeding, Oral
* <i>Morinda pubescens</i> J.E.Sm. Rubiaceae DYA-468	Jangli-ramphal	Leaf	Colic, Oral

Scientific Name, Family & Voucher Specimen	Local Indian Name	Part used and preparation	Disease Treated & Administration
*\$ <i>Musa paradisiaca</i> L. Musaceae DYA-409	Keli	Pericarp of unripe fruit, Paste	Worms in wound, Topical
<i>Nerium indicum</i> Mill. Apocynaceae AUP-303	Kanher	Leaf, Decoction	Fever, Oral
<i>Nicotiana tabacum</i> L. Solanaceae DYA-165	Tambakhu	Leaf, Paste with sugar and camphor	To avoid worms in injury, Paste
<i>Ocimum basilicum</i> L. Lamiaceae PSP-202	Sabja	Leaf, Extract	To prevent pus formation in ears, Topical
<i>Ocimum tenuiflorum</i> L. Lamiaceae PSP-291	Tulsi	Leaf, Paste in whey	Bone fracture, Topical
<i>Pergularia daemia</i> (Forsk.) Chiov. Asclepiadaceae DYA-2006, AYA-296	Utaran	Root, Pieces	Flatulence, Oral
* <i>Physalis minima</i> L. Solanaceae AUP-129	Doke-Phodi	Leaf, Decoction	Flatulence, Oral
<i>Ricinus communis</i> L. Euphorbiaceae PSP-186	Erandi	Leaf, paste in whey	Bone fracture, Topical
\$ <i>Salvadora persica</i> L. Salvadoraceae PSP-195, AYA-323	Pilu-kathar, Pillu-pala	i) Leaf, Paste ii) Leaf, Extract	i) Bone fracture, Topical ii) Flatulence, Oral
<i>Semecarpus anacordium</i> L. f. Anacardiaceae PSP-271, DY A-303, AYA-145	Biba, Bhilava	i) Seed, Oil ii) Seed, Paste with camphor iii) Seed, Paste in butter iv) Seed, Paste	i) Mouth ulcer, Topical ii) Eye complaint, Topical iii) Lal-khurguti, (Foot & Mouth Disease), Oral iv) Throat swelling, Topical
<i>Solanum virginianum</i> L. Solanaceae AYA-422	Bhui-ringni	Fruit, Extract	To improve vision, Topical
* <i>Spermadictyon suaveolens</i> Roxb. Rubiaceae AYA-147	Padri	Root, Extract	Blood dysentery, Oral
*\$ <i>Tabernaemontana divaricata</i> L. Apocynaceae PSP-463	Chandani	Leaf, Paste with lead	Shoulder injury due to yoke, Topical
* <i>Tamarindus indica</i> L. Caesalpiniaceae PSP-26, DY A-278, AYA-129	Chinch	i) Leaf, Paste ii) Leaf, boiled with soil of ant-hill iii) Leaf, boiled one young leaf	i) Bone fracture, Topical ii) Cramp iii) Worms in wounds, Topical



Scientific Name, Family & Voucher Specimen	Local Indian Name	Part used and preparation	Disease Treated & Administration
<i>Tectona grandia</i> L.f. Verbenaceae DYA-458	Sag	Seed, Paste	Scant urination, Topical
<i>Terminalia arjuna</i> (Roxb.) Wight & Arn. Combretaceae DYA-271	Arjuna sadada	Leaf	Dysentery, Oral
<i>Terminalia bellirica</i> (Gaertn.) Roxb. Combretaceae AUP-357	Behda	Seed, Powder	Intestinal worms, Oral
<i>Thespesia populnea</i> (L.) Soland. ex Corr. Malvaceae AYA-63	Paras-pimpal	Fruit, Paste, with jaggery	To arouse sex, Oral
\$ <i>Tribulus lanuginosus</i> L. Zygophyllaceae AUP-370	Gokharu	Leaf, Extract	Worms in ears, Topical
<i>Ventilago denticulata</i> Willd. Rhamnaceae AYA-392	Sakhal-wel	Leaf, Extract	Dysentery, Oral
*\$ <i>Vernonia cinerea</i> (L.) Less. Asteraceae PSP-447	Buddhi	Young Leaf, Extract	Cough, Oral

### Species most often reported and with the most varied uses

Of the 411 plant species indigenously used for different purposes, considerable number of them have multipurpose uses/applications in daily life of the residents of the area studied. Some species useful for animal medicine are also useful multipurposely e.g. *Annona squamosa*, *Calotropis gigantea*, *C.procera*, *Ocimum tenuiflorum*, *Ricinus communis*, *Tamarindus indica*, *Butea monosperma* and *Hardwickia binata*. Of these, *A.squamosa* and *T.indica* occur wild as well as planted, *O.tenuiflorum* and *R.communis* are although under cultivation, also run wild as escapes.

### Botanical analysis and comparison with reference to Indian literature

Out of 44 families of ethnoveterinarian plants, 39 families belong to the dicotyledons and the rest others (05) to the monocotyledons. The former are represented by 75 species belonging to 70

genera. The number of these species (given in parenthesis) for each families are : Cucurbitaceae (06), Caesalpiniaceae, Fabaceae (Papilionaceae) and Amaranthaceae (05 each), Asclepiadaceae (04), Malvaceae, Asteraceae, Euphorbiaceae, Apocynaceae and Solanaceae (03 each), the remaining eight families by two and 26 families by a single species. The monocotyledons are represented by only five species belonging to equal number of genera and families viz., Liliaceae, Commelinaceae, Musaceae, Zingiberaceae and Poaceae. Jain (2003) made a botanical analysis of the ethnoveterinary recipes in India. He pointed out total 836 plant species useful for ethnoveterinary purpose. Of these, 58 species belonging to 55 genera and 38 families (33 dicotyledonous and 05 monocotyledonous) are also recorded by the present authors from Buldhana district. The dicotyledons are represented by 53 species, whereas the monocotyledons by only 05 species. Jain (*loc.cit.*) also reported 21 largest

families (each with more than 10 species), of which 05 families viz., Araceae, Ranunculaceae, Acanthaceae, Rosaceae and Polygonaceae are not recorded in Buldhana district flora due to their paucity or absence in this area, except Acanthaceae.

#### **Plant parts and medicinal recipes used in the composition of veterinary medicine**

The most frequently used parts are the aerial ones (92%), whereas underground parts constitute minimum composition (8%). Of the former, leaves are used of 39 species, stem 02 species, entire plant 05 species, young branch 01 species, fruits 10 species, seeds 09 species and latex of 02 species. The medicinal recipes vary depending upon the kind of disease and method of administration. They are employed in the form of (number in parenthesis indicates number of applications) extract (23), juice (01), decoction (04), paste (22), powder (06), latex (02), ash (01), oil (01) and few others as raw or even cooked. The data suggest that extract and paste are more commonly used recipes in the area.

#### **Afflictions treated and number of species used**

We documented about 92 use-reports for 80 species employed in veterinary medicine. The diseases/disorders treated are (number in parenthesis suggest use-reports) : injury (02), Tumour (01), wounds (15), bone fracture (09), shoulder injury due to yoke (01), leg twisting (01), cuts (01), flatulence (08), cramp (01), dysentery (07), blood dysentery (01), diarrhoea (02), stomach-ache (04), intestinal worms (01), mouth ulcer (01), throat swelling (01), colic (02), intestinal swelling (01), bleeding after delivery (01), placental emergence after delivery (01), to expel foetus early (01), scant urination (01), fever (03), cough (02), lal-khurguti (05), pus formation in ears (01), eye vision (02), eye complaints (02), worms in ears (01), worms near horns (01), dizziness (01), to arouse sex (01), to enhance milk production (07) and to increase fodder consumption (01).

#### **Analysis of treatments**

Although 80 species are in vogue as veterinary medicine, few species have more applications in the area studied : (1) *Calotropis procera* cures four ailments viz., bone fracture, twisting of leg, colic and flatulence, (ii) *Semecarpus anacardium* useful against four complaints e.g. mouth ulcer, eye-complaints, lal-khurguti and throat swelling, (iii) *Tamarindus indica* is beneficial against three ailments e.g. bone fracture, cramp and as vermicide for wounds. Few species are useful to combat two diseases e.g. *Curcuma longa*, *Ficus bengalensis*. *Momordica dioica*, *Calotropis gigantea*, *Salvadora persica*, *Achyranthes aspera* and *Balanites aegyptiaca*. Majority of species (70 species) have a single use-report in the area.

#### **Injuries, wounds, bone fracture, etc.**

Injuries are usually caused during agricultural works. Only two use-reports for this purpose clearly suggest that this ailment is generally neglected by the cattle owners/farmers. It neglected for many days, these injuries are turned into wounds, which are usually infected by worms or germs. About 15 use-reports to treat wounds is the highest number for one kind of complaint. This is also indicative of a fact that at initial stages of injuries, they are mostly overlooked and the animals do not receive proper attention in due time. Bone fracture is another such complaint met with during agricultural work. As many as 08 use-reports for this complaint suggest its severity in the area. Twisting and swelling of legs, cramp are also mostly remain unattended.

#### **Diseases of digestive system**

Diseases of digestive system are more frequent in Buldhana district e.g. dysentery, blood dysentery, diarrhoea, flatulence, intestinal worms, unwillingness to consume fodder, etc. These diseases many times are coupled by other diseases such as 'lal-khurguti' which causes excessive saliva secretion and pains near hoofs. The local disease name 'lal-khurgudi' means saliva and hoofs. The local phytomedicines work better and animals are cured in time. Other diseases e.g. worms in ears, near horns, eye complaints are rather less frequent.

### Complaints about genital organs

Placental emergence outside the genital organs especially after delivery, to promote early foetal expulsion and excessive bleeding after delivery are, however, more frequent. Local remedies satisfactorily combat them in time.

### Salutiferous medicines

Salutiferous remedies are similar to the use of adaptogenic drugs e.g. ginseng, 'chyaanparash', 'safed-musali' (Indian medicines), etc. used to better human health although the human advised is not sufferer of any particular ailment or disorder. They are administered for specific aspect of health or for the general purpose of enhancing health. There are some such use-reports from Buldhana district especially for animals e.g. taxa like *Asparagus racemosus*, *Achyranthes aspera*, *Amaranthus blitum*, *Cassine alberns*, *Cucurbita moschata*, *Cuscuta chinensis* and *Hardwickia binata*. There are fed especially to milching animals to enhance milk production. Patil and Patil (2001) recorded such taxa from Nasik district to increase milk yield e.g. *Agave veracruz*, *Asparatus racemosa* and *Ficus arnottiana*. Patil (2004) documented some laticiferous taxa (especially with white latex) useful to increase milk in human-beings e.g. *Calotropis gigantea*, *Euphorbia fusiformis* Ham. E.hirta L. *Hemidesmus indicus* (L.) R.Br. He further noted similarly for milching goats e.g. *Holostemma ada-kodien* Schultes. He explained these use-reports lending support to the 'doctrine of signature'. According to this doctrine, many medicinal herbs are stamped, as if were, with some clear indication of their uses. Reddy *et al.* (1998) also noted laticiferous plants e.g. *Gymnema sylvestre* (Retz.) R.Br. and *Hemidesmus indicus* (L.) R.Br. beneficial as galactogogue. These use-reports also reiterate the said doctrine.

### New or little reported veterinarian uses of plants and comparative study

The veterinarian 20 use-reports did not find place in previous Indian literature (marked as \$ in Table-1). Our information is compared with the literature mentioned under methodology. Amongst these, plants with remedies for combating shoulder injury

caused due to yoke, unwillingness to consume fodder, to increase lactation, 'lal-khurguti' (foot and mouth disease caused due to microbial organisms) and intestinal swelling are notable. Some of these species are substitute for treating the same diseases in the area studied and also in other Indian regions.

A particular use is conceived reliable when it is reported by at least three independent informants (*cf.* Le Grand and Wondergem, 1987; Johns *et al.*, 1990). In our study (as stated under methodology) we considered minimum five independent informants for each use/application. Regarding veterinarian uses in Buldhana district all species/use-reports meet this condition.

### 4. Concluding Remarks

The present inventory showed that 80 plant species are relevant in veterinarian medicine. The treatments are mostly for milching animals (cows, buffaloes, goats) and livestock employed for agricultural works (mostly bullocks). A considerable number (20) of the uses found are new or little known to date. Agriculture and livestock raising in the principal and relevant human activities in Buldhana district. It is, therefore, clear that these traditional medicines are necessary for the people and animals in the area. However, the forces of acculturation are putting long strides, and hence this treasure-house is likely to disappear from the scene. Discoveries of new drugs from such traditional/ethnomedicinal claims have proved a fascinating area. Many official drugs from such leads have been put on record. These drugs, although crude, have established credibility over centuries /generations. After satisfying with its toxicity tests, the drugs can be officially prescribed. The state of knowledge on Indian ethnoveterinary medicine, the richness of Indian flora and huge number of live-stock suggest that still enough attention has not yet been given to the traditional veterinary herbal remedies. This is corroborated by the limited publications on the subject matter.

## Acknowledgements

We tender our sincere thanks to our informants, who shared their experience and knowledge with us. We are grateful to the authorities of S.S.V.P.Sanstha for library and laboratory facilities to conduct and complete this work.

## References

- Maydell Hans. J., 1990. Arbres et Arbustes du Sahel : leurs caracteristiques et leurs utilisations. GT2.
- Pal, D.C., 1991. Plants used in treatment of cattle and birds among tribals of eastern India. In : Contributions to Indian Ethnobotany, (ed. S.K.Jain), pp.585-297. Scientific Publishers, Jodhpur, India.
- Jain, S.K., 2003. Ethnoveterinary recipes in India : A botanical analysis. Ethnobotany 15,23-33.
- Jain, S.K., Srivastava, Sumitra. 1999. Dictionary of Ethnoveterinary. Plants of India. Deep Publications, New Delhi, India.
- Patil, S.H., Merat, M.M., 2003. Ethnoveterinary practices in Satpudas of Nandurbar District of Maharashtra. Ethnobotany, 15,103-106.
- Mokat, D.N., Deokule, S.S., 2004. Plants used as veterinary medicine in Ratnagiri district of Maharashtra. Ethnobotany 16,131-135.
- Patil, M.V., Patil D.A., 2001. Ethnoveterinary herbal medicines from Nasik district (Maharashtra). Journal of Non-timber Forest Products. 8(1-2),19-24.
- Naser, Rafiuddin, Vaikos, N.P., 2002. Plants used in ethnoveterinary practices in Aurangabad district, Maharashtra, In Proceeding of plant resource development, (eds. A.M.Mangikar and A.S.Bhutkar, pp.202-210. Dr.B.A.Marathwada University, Aurangabad (M.S.), India.
- Patil, P.S., Dushing, Y.A., Patil, D.A., 2007. Observations on plantlore in Buldhana district of Maharashtra. Ancient Science of Life. 17(1),43-49.
- Diwakar, P.G., Sharma, B.D., 2000. Flora of Buldhana district, Maharashtra. India. B.S.I., Calcutta, India.
- Anonymous, 1976. Gazetteer of India, Maharashtra State gazetteer, Buldhana district, Gazetteers Department, Government of Maharashtra, India.
- Jain, S.K., 2003. Ethnoveterinary recipes in India :A botanical analysis. Ethnobotany 15,23-33.
- Reddy, K.N., Bhanja, M.R., Vatsawaya S. Raju, (1958) Plants used in ethnoveterinary practices in Warangal District, Andhra Pradesh, India Ethnobotany 10,75-84.
- Le Grand, A., Wandergaon, P.A., 1987. Les Phytotherapies anti-infectieuses de la foret-savane, Senegal. Afrique Occidentale. Un inventaire, Journal of Ethnopharmacology 21,109-125.
- Johns, T., Kakwaro, J.O., Kimannani, E.K., 1990. Herbal remedies of the Luo of Saiya District, Kenya : Establishing quantitative criteria for consensus. Economic Botany 44,369-381.
- Patil, M.V., Patil, D.A., 2001. Ethnoveterinary herbal medicines from Nasik District (Maharashtra). Journal of Non-timber Forest Products 8(1-2), 19-24.
- Patil, D.A., 2004. Origin of medicines vis-à-vis Doctrine of medicines viz-a-vis. Doctrine of Signatures. Ethnobotany 16,52-58.
- Ahirrao, Y.A., Patil, P.S., Aher, U.P., Dushing, Y.A., Patil, D.A., 2009. Traditional herbal remedies in Buldhana district (Maharashtra, India). Ancient Science of Life 28(4),38-41.
- Maheshwari, J.K. (Ed.), 1996. Ethnobotany in South Asia. Scientific Publishers, Jodhpur, Rajasthan, India.
- Maheshwari, J.K. (Ed.), 2000. Ethnobotany and medicinal plants of Indian subcontinent. Scientific Publishers, Jodhpur, Rajasthan, India.
- Joshi, Prabhakar, 1995. Ethnobotany of the primitive tribes in Rajasthan. Printwell, Jaipur, Rajasthan, India.
- Singh, V., Pandey, R.P., 1998. Ethnobotany of Rajasthan, India. Scientific Publishers, Jodhpur, Rajasthan, India.
- Rawat, M.S., Chowdhuri, S., 1988. Ethno-medico botany of Arunachal Pradesh (Nishi. & Apatani Tribes). Bishen Sing

Mahendra Pal Singh, Dehra Dun, U.P.  
India.  
Sinha, Rajiv. K., 1998. Ethnobotany : The  
Renaissance of Traditional Herbal

Medicine. Shree Publishers, Jodhpur,  
Rajasthan,India.