

Ethno-veterinary Practices for Animal Health and the Associated Medicinal Plants from 24 Locations in 10 States of India

Balakrishnan Nair MN*, Punniamurthy N and Kumar SK

TransDisciplinary University, School of Health Sciences, Veterinary Ayurveda group, Bangalore-560106, Karnataka, India

Research Article

Received date: 03/05/2017
Accepted date: 13/06/2017
Published date: 19/06/2017

*For Correspondence

Balakrishnan Nair MN, TransDisciplinary University, School of Health Sciences, Veterinary Ayurveda Group, 74/2 Jarakabandekaval, Attur Post, Yelahanka, Bangalore, Karnataka, India.

E-mail: nair.mnb@tdu.edu.in; nairunni2003@yahoo.co.uk

Keywords: Ethno-veterinary, Natural/herbal remedies, Livestock health, medicinal plants, antibiotic residue, antibiotic resistance

ABSTRACT

Introduction: The objectives of this study were to collect the ethno-veterinary practices for prevention and cure of animal health conditions and associated flora from healers and knowledgeable dairy farmers and to rapidly assess these practices for their safety and efficacy.

Methods: Participatory rural appraisal and matrix ranking are used for prioritization of the animal health conditions. The documented formulations were rapidly assessed for their safety and efficacy using rapid assessment methodology.

Results: Local people used 248 species of plants belonging to 80 families for prevention and cure of animal health conditions. Out of 441 formulations using various plants, 353 are safe and efficacious. The majority of these medicinal plants belong to Leguminosae (27 species with 20 genera), Apiaceae (nine species), Cucurbitaceae (8 species), Euphorbiaceae (11 species) and Poaceae (14 species). Leaves are commonly used (34.42 %) followed by roots, (11%), fruits (9.74%), seeds (8.76%), barks (8.76%, whole plant (3.57%) stem (3.25%) and rhizome (2.6%). Average expenditure incurred for animal health care by a household was Indian Rupees 726.00 with western veterinary treatment and Indian Rupees 42.4 with ethno-veterinary practices, saving Indian Rupees 684 per episode.

Conclusion: There is large amount of cost effective traditional knowledge and resources for animal health available in the community. Ethno-veterinary practices are effective alternative to antibiotics and other chemicals drugs in livestock management.

INTRODUCTION

High cost and indiscriminate use of antibiotics and other veterinary drugs and their residues in the milk and other animal products are serious problems of present veterinary services in India. The presence of drug residues results in development of drug resistant microorganisms that are difficult to treat^[1,2] and the world is looking for safer herbal alternatives. The objectives of this study were to collect the ethno-veterinary practices for prevention and cure of animal health conditions and associated flora from healers (healers are local community based traditional health practitioners who have acquired their ecosystem and ethnic community specific traditional health knowledge through intergenerational learning. They practice healing within the respective communities based on the social legitimacy and status within their societies) and knowledgeable dairy farmers and to rapidly assess these practices for their safety and efficacy. The present paper reports the documentation and rapid assessment of the ethno-veterinary practices from 24 locations in 10 states of India.

MATERIALS AND METHODS

The Details of the Project Area

The study area involved 27 blocks, 51 Grama Panchayat having 71 villages/wards with 12,114 households and 70,449 people (**Figure 1**). **Table 1a** and **Table 1b** show the names of the states, districts, blocks, villages and the household covered.

Research & Reviews: Journal of Veterinary Sciences

Participatory Rural Appraisal (PRA) and matrix ranking is used for prioritization of the animal health conditions. Documentation and rapid assessment to find the safety and efficacy of documented formulations were conducted using the methodology suggested earlier^[3,4].

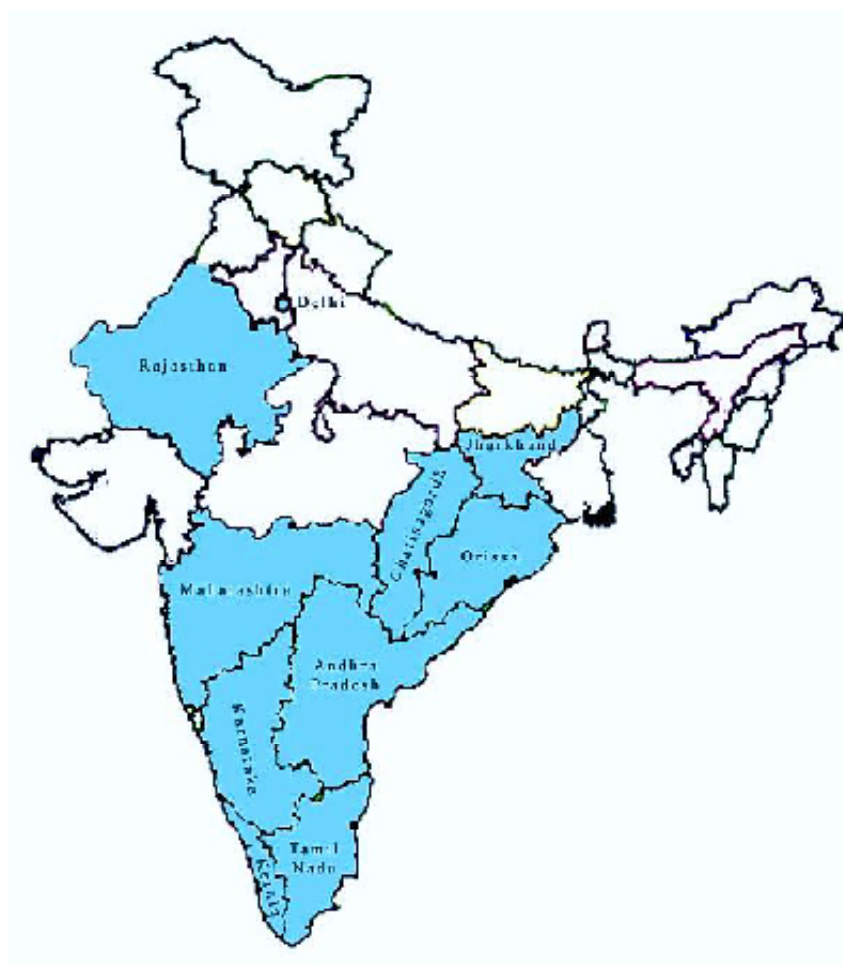


Figure 1. Location map of 10 states where the study is undertaken.

RESULTS

Four hundred and forty one Ethno-veterinary practices were documented for 52 prioritized conditions out of which 353 practices were assessed as safe and efficacious. Two hundred and forty eight plant species belonging to 80 families were used in 441 formulations. **Table 2** shows the botanical names of the documented plant species arranged in alphabetic order with parts used for the animal health practices. Majority of these medicinal plants belong to Leguminosae (27 species with 20 genera), Apiaceae (9 species), Cucurbitaceae (8 species), Euphorbiaceae (11 species) and Poaceae (14 species). The parts used are leaves (34.42 %) roots, (11%), fruits (9.74%), seeds (8.76%), barks (8.76%, whole plant (3.57%), stem (3.25%) and rhizome (2.6%) (**Figure 2**).

DISCUSSION

The veterinary diseases such as mastitis, foot and mouth disease (FMD), bloat, diarrhoea, ephemeral fever, indigestion and parasitic infection substantially affect the farmer's income. Ethno-veterinary practices have great potential to address these as EVP has decentralized local resource-based applications that are safe, efficacious and cost effective. It also can lead to reduction of use of antibiotics and other chemical drugs and associated residues in the animal products and microbial resistance.

The local communities have the traditional medicinal knowledge and they have their own unique way of identifying medicinal plants, developing formulations and using them to treat a particular disease. They were developed in a culture and perception that is different from that of Western science. In the indigenous knowledge systems the evaluation is 'systemic', whereas in Western system it is 'atomic' or cellular^[1,2]. Presently there are no correlations or poorly established correlations between these medical systems. The logic of folk knowledge lacks the theoretical rigor of Ayurveda or western medicine but there is an inherent relationship between classical textual knowledge and folk knowledge and therefore they (Ayurveda/Mrugayurveda) are used as a tool for assessment of safety and efficacy of the documented ethno-veterinary practices^[1,2].

The urgent need of documentation and revival of these traditional veterinary practices is highlighted in the light of the benefits they provide.

Research & Reviews: Journal of Veterinary Sciences

Table 1a. Details of the area, number of household selected and the population of the area covered during the study.

S. No.	Name of the Organization	State	District	Block	Gram panchayat selected	Ward/village selected	No. of House holds	Population covered
1	AAAS	Maharastra	Kurkheda	Gewardha- Gowardhan	2	2	50	1690
2	ARM	Orissa	Keonijhar	Bauripada, Nulung	2	3	46	1986
3	BIRDS	Karnataka	Belgaum	Gokak	1	1	10	1012
4	CRIED	Tamil Nadu	Madurai	Sedapatty	1	1	49	2500
5	GRM SW	Orissa	Mayurbhanj	Baripada	3	3	50	3389
6	IIT-DELHI	Delhi	-	-	4	6	53	4346
7	JASS	Andhra Pradesh	Chttor	Kuppam	5	9	49	4190
8	JJVS	Rajasthan	-	Girwa	4	6	32	761
9	KCT	Kerala	Kottayam	Lalam	1	2	90	7100
10	LEAD	Tamil Nadu	Parambalur	Alathur	1	2	23	3182
11	MACFAST	Kerala	Pathanamthitta	Ranni	1	2	58	2400
12	NEEDS	Tamil Nadu	Virudhunagar	Srivilliputtur	3	4	59	2975
13	PETS	Tamil Nadu	Mdurai	Alanganallur	4	2	51	3688
14	PLANT	Tamil Nadu	Tiruvallur	Minjur	1	2	50	2296
15	REACH	Tamil Nadu	Vellore	Tirupattur	3	3	30	4120
16	SAMBAND	Orissa	Myurbhanj	Thakurmunda	3	6	61	3293
17	SAWARD	Kerala	Kozhikode	Kunnamkulam	1	2	94	4918
18	SESA	Jharkhand	Palamu	Patan	1	1	50	2280
19	SHIDA	Tamil Nadu	Theni	Chinnavulapuram	1	4	45	186
20	SLT	Tamil Nadu	Dharmapuri	Morapur	4	4	40	2056
21	TPSVMS	Tamil Nadu	Theni	Chinnamanur	1	1	53	3476
22	VM	Chatisgarh	Bastar	Kondagaon	2	2	45	2135
23	VOICE	Tamil nadu	Thoothukudi	Pudur	1	2	46	870
24	WSSS	Kerala	Wayanad	Manathavadi	1	1	50	5600
		10	21	25	51	71	1184	70,449

Table 1b. Organizations that helped in the study.

No.	Name and address of the Organizations
1	Alternative Rural Movement (ARM), Chandan Hajuri Road, In front of S.C.S College, Puri, Dist-Puri (Orissa), Pin-752001, E-mail: arm_badapanda@yahoo.com
2	Amhi Amachya Arogya Sathi (AAAS), At post Taluka Kurkheda, Dist. Gadchiroli-444209, Maharashtra, E-Mail: arogyasathi@rediffmail.com
3	Belgaum Integrated Rural Development Society (BIRDS), Tukkanatti-591224 Gokak, Dist.Belgaum, Karnataka, E-mail: birds@naganur.com
4	Peoples Education And Training Society, Greenland, k.C. Patty, Erampatty P.O. Alangallur Via, Madurai Dt- 625 501 Tamil Nadu, E-mail: petsociety@rediffmail.com
5	Scheduled Tribes and Hill Dwellers Development Association Trust (SHIDA) Chinnavulapuram, Chinnamanur (Via), Uthamapalyam (Tk), Theni District, Thamilnadu-625515, E-mail:scheduled_tribes@rediffmail.com
6	Gram Swaraj, Ward No.16, Kamala Nehru Girls School Road, Baripada Dist, Mayurbhanj, Orissa - 757001, deepak_gramswaraj@hotmail.com
7	Indian Institute of Technology (IIT), Centre for Rural Development & Technology, IIT, Hauz Khas, New Delhi-110016, E-Mail: Vetgopi97@gmail.com
8	Integrated Development through Environmental Awakening (IDEA) *#4C, Maharaja Towers, R.K.Mission Road, Vishakapatnam-530003, AP. E-Mail: gowtham_shankar@hotmail.com
9	Jagranjan Vikas Samithi (JJVS), Sapita Road, Bedla, Udaipur-313011, Rajasthan, E-mail: jagranjan@datainfosys.net
10	Jana Abhyudaya Seva Sangham, Paipalyam Village, Kuppam Mandal, Chittoor Dist., Andhra Pradesh, E-mail: jassshivraj@gmail.com
11	Kaimal Charitable Trust, Chakkampuzha P.O, Via Arunapuram, 686 574, E-Mail: pknkaimal@yahoo.com
12	League for Education And Development (LEAD) 8/40, First Street, Sri Ramapuram, Srirangam, Tiruchirapalli-620006, Tamil Nadu, E-Mail: radha_lead@rediffmail.com
13	Mar Athanasios College for Advanced Studies & Bodhana Department of Phytomedicine and Technology & Sciences, Thiruvalla, Kerala, E-Mail: mulamoottil@hotmail.com
14	Needs 12A Mudukku Street, Srivilliputtur- 626 125, Virudhunagar District, Tamil Nadu, E-Mail: Needs_raja@yahoo.co.in
15	PLANT, No 22/10, Kumaran Street, Vijayalakshimpuram, Ambatoor, Chennai 600 053, E-Mail:plant_suresh@yahoo.com
16	Rural Education and Community Health Society (REACH), 203 Jai Beem Nagar, Pachal Post, Tirupattur-63602, Vellore District, Tamil Nadu, E-Mail: Jeynirmala83@gmail.com
17	Samband, No.2926/5198, Jayadev Nagar Road, (Behind CRAC computer), Bhubaneswar-751002, Orissa, SAWARD, Poovathuparampu, P.O.Calicut 673008, E-Mail: swardteam@gmail.com

18	SAWARD, Poovathuparampu, P.O.Calicut 673008, E-Mail: swardteam@gmail.com
19	SESA, ITO Road, Redma, Daltonganj, Palamau, Jharkand-822101, E-Mail: Sesa_environment@yahoo.co.in
20	Sustainable Life Trust (SLT), 3/645, Kaliappa chetty Street, 3rd Cross, Pidamaneri, Dharmapuri -636 703, Tamil Nadu, E-mail: sustain_trust@yahoo.co.in
21	Tamil Nadu Parampariya Sidha Vaidya Maha Sangha Madurai Dist, Tamil Nadu, E-Mail: Poorveegam07@gmail.com
22	Vikas Mitra, Samaja Sevi Sanstha, Thasila para, Millan Chowk, Kondagaon, Bastar, Chattisgarh-494226,
23	VOICE, 5/106, Indiranagar colony, Vempoor, P.O. thuthukudi Didt. Tamil Nadu, E-Mail: Zgnanasundariram@yahoo.co.in
24	Wayanad Social Service Society, Post Box No. 16, Mananthavady, Wayanad-670645 Kerala State, E-Mail: wsss@satyam.net.in

Table 2. Shows the botanical name, family which it belongs, parts used and the disease conditions for which it is used.

S. No.	Plant name	Family	Parts used	Disease conditions for which it is used
1.	<i>Abelmoschus esculentus</i> (L.) Moench	Malvaceae	Leaves	Retention of placenta (ROP)
2.	<i>Abrus precatorius</i> L.	Fabaceae	Leaves	Foot and Mouth Disease (FMD)
3.	<i>Abutilon indicum</i> (Link) Sweet.	Malvaceae	Leaves	Diarrhoea, Dysentery
4.	<i>Acacia</i> sp.	Fabaceae	Bark	Snake bites, poisoning
5.	<i>Acacia caesia</i> (L.) Willd.	Fabaceae	Leaves	Bloat
6.	<i>Acacia catechu</i> Willd.	Fabaceae	Wood	Foot and Mouth Disease
7.	<i>Acacia nilotica</i> (L.) Delile	Fabaceae	Bark	Foot and Mouth Disease
8.	<i>Acalypha indica</i> L.	Euphorbiaceae	Leaves	Poisonous bite, Foot disease, Mastitis, Endoparasites, Snoring
9.	<i>Achyranthes aspera</i> L.	Amaranthaceae	Whole Plants	Fever, Poisonous bite, Dermatitis
10.	<i>Acorus calamus</i> L.	Acoraceae	Rhizome	Intestinal parasites, Dysentery, Hemorrhagic Gastroenteritis, Wheezing, Ranikhet disease, indigestion, Bloat, Retention of placenta, Calf scour
11.	<i>Justicia adhatoda</i> (L.) Nees	Acanthaceae	Leaves	Fever, Pest, Cough/cold
12.	<i>Aegle marmelos</i> (L.) Corrêa	Rutaceae	Leaves	Foot rot, Diarrhoea,
13.	<i>Aerva lanata</i> (L.) Juss.ex Schult.	Amaranthaceae	Leaves	Eye Infection
14.	<i>Albizia chinensis</i> (Osbeck) Merr.	Fabaceae	Bark	Foot and Mouth Disease
15.	<i>Allium cepa</i> L.	Amaryllidaceae	Bulbs	Jaundice, Bronchitis, Indigestion, ROP, Diarrhoea, Infertility, Snoring, Mastitis
16.	<i>Allium sativum</i> L.	Amaryllidaceae	Bulbs	External parasite, Fever, Ephemeral fever, Haemorrhagic septicaemia (as blood poisoning), Helminthiasis, Bloat, Foot and Mouth Disease , Fowl Pox, Ranikhet disease
17.	<i>Aloe vera</i> (L.) Burm.f.	Asphodelaceae	Leaves	Mastitis, Poisonous bite, Bites, Dysentery Foot disease, Hemorrhagic Gastroenteritis, Intestinal worms
18.	<i>Alstonia venenata</i> R. Br	Apocynaceae	Leaves	Mastitis
19.	<i>Alternanthera sessilis</i> (L.) R.Br.ex DC	Amaranthaceae	Root	Cough, Infection, Maggot wounds
20.	<i>Amaranthus viridis</i> L.	Amaranthaceae	Root	Diarrhoea
21.	<i>Amorphophallus paeoniifolius</i> (Roxb.) Blume ex Decne	Araceae	Rhizome	Fowl Pox
22.	<i>Anacardium occidentale</i> L.	Anacardiaceae	Fruit	Ranikhet disease
23.	<i>Andrographis paniculata</i> (Burm.f.) Wall. ex Nees	Acanthaceae	Whole Plants	Intestinal worms, Poisonous bite Diarrhoea, Indigestion, Cough, infection, Fever, Foot and Mouth Disease, Dermatitis
24.	<i>Anethum graveolens</i> L.	Apiaceae		Mastitis, disease
25.	<i>Anisomeles malabarica</i> (L.) R.Br. ex Sims	Lamiaceae	Root	Worm infestation, (Helminthiasis)
26.	<i>Annona reticulate</i> L.	Annonaceae	Leaves	Maggot wounds
27.	<i>Annona squamosa</i> L.	Annonaceae	Leaves	Maggot wounds, Worm infestation, (Helminthiasis), Foot and Mouth Disease, Ephemeral fever viral, Tick infestation, Ranikhet disease
28.	<i>Anogeissus latifolia</i> (Roxb.ex DC.) Wall. ex Guill. & Perr.	Combretaceae	Gum	Maggot wounds
29.	<i>Aphanamixis polystachya</i> (Wall.) R.N. Parker	Meliaceae	Bark	Fracture
30.	<i>Arachis hypogaea</i> L.	Fabaceae	Oil	Bloat
31.	<i>Areca catechu</i> L	Arecaceae	Nut	Intestinal worms

Research & Reviews: Journal of Veterinary Sciences

32.	<i>Aristolochia bracteolata</i> Lam.	Aristolochiaceae	Stem and Leaves	Intestinal parasites, Poisonous bite, Infertility,
33.	<i>Aristolochia indica</i> L.	Aristolochiaceae	Root, Whole, Plant	Fever, Mastitis, Intestinal worms, Dysentery, Diarrhoea, Neutralizing poison
34.	<i>Aristolochia tagala</i> CHAM	Aristolochiaceae	Root	Hydrocyanic acid poisoning
35.	<i>Artemisia vulgaris</i> L.	Asteraceae	Leaves	External parasite
36.	<i>Artocarpus heterophyllus</i> Lam.	Moraceae	Leaves, Petiole	Bloat, indigestion
37.	<i>Artocarpus hirsutus</i> Lam	Moraceae	Leaves, Petiole, Inflorescence ash	Indigestion, Bloat, Maggot wounds
38.	<i>Asparagus racemosus</i> Willd	Liliaceae	Root and Leaves	Mastitis
39.	<i>Azadirachta indica</i> A.Juss.	Meliaceae	Leaves, Oil	Maggot wounds, Ulcers/wounds, Mastitis, Foot and Mouth Disease, Fowl Pox, leg wound, Ephemeral fever viral, Poisonous bite, Dermatitis, Infertility, Pox
40.	<i>Balanites roxburghii</i> Planch.	Balanitaceae	Tubers	Siluria
41.	<i>Bambusa bambos</i> (L.) Voss	Bambusaceae	Splinters for Bandage, Leaves	Fracture, Diarrhoea
42.	<i>Bambusa vulgaris</i> Schrad.ex J.C.Wendl	Poaceae	Leaves	Diarrhoea, Indigestion
43.	<i>Barringtonia acutangula</i> (L.) Gaertn.	Barringtoniaceae	Fruit	Mastitis
44.	<i>Bassialongifolia</i>	Sapotaceae		
45.	<i>Bauhinia acuminata</i> L.	Caesalpiniaceae	Bark	Injury
46.	<i>Bauhinia racemosa</i> Lam.	Caesalpiniaceae	Leaves	Eye disorders
47.	<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Roots & Leaves	Fever, Ephemeral fever, Haemorrhagic septicaemia, Prolapse of uterus
48.	<i>Bombax ceiba</i> L.	Bombacaceae	Seeds	Diarrhoea
49.	<i>Borassus flabellifer</i> L	Arecaceae	Jaggery	ROP, Bloat
50.	<i>Boswellia serrate</i> Triana& Planch.	Burseraceae	Gum Resin (Jhuna)	
51.	<i>Brassica nigra</i> L.	Brassicaceae	Seeds	Calf scour, Ranikhet disease, Bloat, Indigestion
52.	<i>Brassica compestris</i> L.	Brassicaceae	Seeds	
53.	<i>Bridelia retusa</i> (L.) A.Juss.	Euphorbiaceae	Bark, Roots	Repeat breeding
54.	<i>Bridelia scandens</i> (Roxb.) Willd.	Euphorbiaceae	Bark	Fowl Pox
55.	<i>Bryonia epigaea</i> Rottl.	Cucurbitaceae	Root	Poisoning
56.	<i>Bryophyllum pinnatum</i> (Lam.) Oken	Crassulaceae	Leaves	Bloat,
57.	<i>Butea monosperma</i> (Lam.) Taub	Fabaceae	Stem, Seed	Calf scour, Worm infestation
58.	<i>Calotropis gigantean</i> (L.) W.T.Aiton	Asclepiadaceae	Bark , Latex	Horn fracture, Foot disease
59.	<i>Cannabis sativa</i> L	Cannabinaceae	Leaves	Uterus prolapse, Ranikhet disease, Dyspepsia
60.	<i>Canthium parviflorum</i> Lam.	Rubiaceae	Root Bark	Dysentery
61.	<i>Capsicum annuum</i> L.	Solanaceae	Fruits	FMD, Mastitis, Bloat
62.	<i>Capsicum minimum</i> L.	Solanaceae	Fruit	Fever, Ephemeral fever, Haemorrhagic septicaemia
63.	<i>Cardiospermum halicacabum</i> L.	Sapindaceae	Leaves	Fever
64.	<i>Careya arborea</i> Roxb.	Lecythidaceae	Bark	Diarrhoea, Indigestion Bloat, Fracture
65.	<i>Carica papaya</i> L.	Passifloraceae	Seeds, Latex, Fruit	Helminthiasis, Ranikhet disease, Diarrhoea
66.	<i>Carum carvi</i> L.	Apiaceae	Seeds	Dyspepsia, Neo-natal diarrhoea
67.	<i>Cassia fistula</i> L.	Caesalpiniaceae	Bark, Fruits	FMD, Haemorrhagic septicaemia, Fever, Ephemeral fever, Bloat, Jaundice, Arthritis
68.	<i>Cassia obtuse</i> Roxb.	Caesalpiniaceae	Leaves	Endo-parasites
69.	<i>Cassia</i> sp (<i>Cassia sophera</i> L)	Caesalpiniaceae	Bark	Snake bite, Poisoning
70.	<i>Cassia auriculata</i> L.	Caesalpiniaceae	Leaves	Fracture, Calf scour, Diarrhoea, Wounds
71.	<i>Centella asiatica</i> (L.) Urban.	Apiaceae	Whole Plants	Fowl Pox
72.	<i>Centratherum anthelminticum</i> (L.) Kuntze	Asteraceae	Seeds	Fowl Pox, FMD, Indigestion, Bloat
73.	<i>Cinnamomum camphora</i> (L.) J.Pres.	Lauraceae	Resins	Mastitis, Maggot wounds, FMD, Ulcers/wounds
74.	<i>Cinnamomum verum</i> J.Pres.	Lauraceae	Bark	FMD
75.	<i>Cissampelos pareira</i> L.	Menispermaceae	Root	Diarrhoea, wounds, FMD
76.	<i>Cissus quadrangularis</i> L.	Vitaceae	Whole Plant	Bloat, Wounds, Fracture
77.	<i>Citrullus colocynthis</i> (L.) Schrader	Cucurbitaceae	Leaves, fruits	Poisonous bite
78.	<i>Citrus limon</i> (L.) Burm.f	Rutaceae	Leaves, Fruit, Stem	Fever, Helminthiasis, Mastitis, Pox
79.	<i>Citrus aurantiifolia</i> (Christm.) Swingle	Rutaceae	Whole Plant,	Mastitis, Dermatitis
80.	<i>Citrus reticulate</i> Blanco	Rutaceae	Stem	Diarrhoea, indigestion
81.	<i>Clausena excavate</i> Burm.f.	Rutaceae	Root	Diarrhoea
82.	<i>Cleome gynandra</i> L.	Cleomaceae	Leaves	Mastitis
83.	<i>Clerodendrum inerme</i> (L.) Gaertn.	Verbenaceae	Leaves	Ticks/Lice

Research & Reviews: Journal of Veterinary Sciences

84.	<i>Coccinia grandis</i> (L.) Voigt.	Cucurbitaceae	Leaves	Mastitis, Loss of appetite
85.	<i>Cocculus hirsutus</i> L.	Menispermaceae	Leaves	Diarrhoea, Hydrocyanic acid poisoning, Indigestion, Dermatitis, Ulcers/wounds, Maggot wounds, Mastitis, Bloat, Diarrhoea, ROP
86.	<i>Cocos nucifera</i> L.	Arecaceae	Husk, Skull, Tender Coconut, Milk, Oil	Hydrocyanic acid poisoning, indigestion, Dermatitis, Wounds, Ulcer, Diarrhoea, Ranikhet disease, Repeat breeding, Bloat
87.	<i>Coleus forskohlii</i> (Willd.) Briq.	Lamiaceae	Leaves	Bloat, diarrhoea
88.	<i>Coleus barbatus</i> (Andrews) Benth.	Lamiaceae	Leaves	Bloat
89.	<i>Commiphora wightii</i> (Arn.) Bhandar	Burseraceae	Gum Resin	Fowl Pox
90.	<i>Corallocarpus epigaeus</i> (Rottl.) C.B.Clark	Cucurbitaceae	Root	Dysentery
91.	<i>Corallocarpus epigaeus</i> (Rottler) Hook.f	Cucurbitaceae		Neutralizing poison, Pest
92.	<i>Coriandrum sativum</i> L.	Apiaceae	Seeds, Leaves	Fever, Ranikhet disease, Diarrhoea
93.	<i>Costus speciosus</i> Koen ex. Retz.	Costaceae	Rhizome	Ranikhet disease, Diarrhoea
94.	<i>Cucumis sativus</i> L.	Cucurbitaceae	Leaves, Tender Fruits, Flower,	Conception
95.	<i>Cuminum cyminum</i> L.	Apiaceae	Seeds	Diarrhoea, Bloat, Indigestion, Dysentery, Jaundice, Infertility, ROP, Fowl Pox
96.	<i>Curcuma angustifolia</i> Roxb.	Zingiberaceae	Root	Diarrhoea
97.	<i>Curcuma aromatica</i> Salisb.	Zingiberaceae	Rhizome	Thrift
98.	<i>Curcuma longa</i> L.	Zingiberaceae	Rhizome	Mastitis, Diarrhoea, Ephemeral fever, Indigestion, Haemorrhagic septicaemia, Bloat, Mastitis, Hydrocyanic acid poisoning, Foot rot, Ranikhet disease, Maggot wounds, FMD, Constipation, Foot disease, Fowl Pox, Ranikhet disease, ROP, III-Thrift
99.	<i>Cuscuta reflexa</i> Roxb.	Convolvulaceae	Branches	Diarrhoea, Indigestion
100.	<i>Cyclea peltata</i> Hook. f.&Thoms	Menispermaceae	Roots, Leaves	Helminthiasis, snake poison
101.	<i>Cymbopogon citratus</i> (DC.) Stapf.	Poaceae	Leaves	Diarrhoea, Indigestion
102.	<i>Cymbopogon flexuosus</i> (Nees ex Steud.) W.Watson	Poaceae	Root	Indigestion
103.	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Leaves	Poisonous bite
104.	<i>Cyperus rotundus</i> L	Cyperaceae	Rhizome	Worm infestation (Helminthiasis)
105.	<i>Daturametel</i> L.	Solanaceae	Leaves, Un Ripened Fruit, Bark	Fever Dysentery (or)Hemorrhagic enteritis, (or) Hemorrhagic enteritis, Wounds Ulcers
106.	<i>Delonix elata</i> (L) Gamble.	Caesalpiaceae	Leaves	wounds
107.	<i>Desmostachya bipinnata</i> (L.) Stapf.	Poaceae	Leaves	Prolapse of uterus
108.	<i>Dichrostachys cinerea</i> Wight et Arn.	Mimosaceae	Stem Bark	Calf scour
109.	<i>Diospyros chloroxylon</i> Roxb.	Ebenaceae	Root, Bark	Diarrhoea, Dog bite
110.	<i>Dolichos biflorus</i> L.	Fabaceae	Seeds	Diarrhoea, Indigestion, Retention of Placenta (R OP), Infertility
111.	<i>Eclipta prostrate</i> (L.) L.	Asteraceae	Leaves	Diarrhoea
112.	<i>Elephantopus scaber</i> L,	Asteraceae	Leaves	Haemorrhagic septicaemia, Maggot wounds
113.	<i>Eleusine coracana</i> Gaertn.	Poaceae	Seeds	FMD
114.	<i>Elytraria acaulis</i> (L.f.) Lindau	Acanthaceae	Leaves	Foot disease
115.	<i>Embelia ribes</i> Burm.f.	Myrsinaceae	Seeds	Worm infestation (Helminthiasis)
116.	<i>Enicostemma axillare</i> Lam. Raynal	Gentianaceae	Leaves, Whole Plant	Mastitis, Bloat, Intestinal worms
117.	<i>Enicostemma hyssopifolium</i> (Willd.) Verd.	Gentianaceae	Leaves	Thrift
118.	<i>Enicostemma littorale</i> Blume	Gentianaceae	Stem &Leaves	Neutralizing poison
119.	<i>Erythrina indica</i> Lam.	Fabaceae	Seeds	Worm infestation(Helminthiasis)
120.	<i>Erythrina variegata</i> L.	Fabaceae	Leaves, Bark	FMD, Diarrhoea
121.	<i>Eucalyptus</i>	Myrtaceae	Leaves, Oil	Ranikhet disease, Diarrhoea
122.	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Root	Mastitis
123.	<i>Euphorbia neriifolia</i> L.	Euphorbiaceae	Latex	Haemorrhagic septicaemia,
124.	<i>Euphorbia pilulifera</i> , L.	Euphorbiaceae	Leaves	Diarrhoea
125.	<i>Ferula alliacea</i> Boiss	Apiaceae	Resin	Indigestion, Thrift
126.	<i>Ferula assa-foetida</i> L.	Apiaceae	Resin	Prolapse of uterus, Bloat, Wheezing, indigestion
127.	<i>Ficus bengalensis</i> L.	Moraceae	Leaves	ROP
128.	<i>Ficus hispida</i> L.	Moraceae	Unripe Fruits, Exudate	Diarrhoea, Maggot wounds

Research & Reviews: Journal of Veterinary Sciences

129.	<i>Ficus tinctoria</i> G.Forst.	Moraceae	Fruit	Dysentery\Hemorrhagic Gastroenteritis
130.	<i>Flueggea virosa</i> (Roxb. ex Willd.) Voigt	Euphorbiaceae	Husk	Diarrhoea
131.	<i>Foeniculum vulgare</i> Mill.	Apiaceae	Seeds	Diarrhoea
132.	<i>Garcinia gummi-gutta</i> (L.) Roxb.	Clusiaceae	Dried Fruits	Bloat, Indigestion, Fever
133.	<i>Glycosmis mauritiana</i> (Lam.) Tanaka	Rutaceae	Root	Ranikhet disease
134.	<i>Gossypium hirsutum</i> L.	Malvaceae	Seeds	ROP
135.	<i>Gymnema sylvestre</i> R. Br.	Asclepiadaceae	Leaves	Pest, Endo-parasites
136.	<i>Hemidesmus indicus</i> (L.) R.Br.	Asclepiadaceae	Root	Diarrhoea
137.	<i>Hemionitis arifolia</i> (Burm. f.) T. Moore	Polypodiaceae	Root	Worm infestation (Helminthiasis)
138.	<i>Holarrhenaantidysenterica</i> (L) Wall.	Apocynaceae	Leaves	Diarrhoea
139.	<i>Holoptelea integrifolia</i> (Roxb.) Planch	Ulmaceae	Leaves	Thrift
140.	<i>Centella asiatica</i> (L.) Urban	Apiaceae	Leaves	Mastitis
141.	<i>Hypolytrum nemorum</i> (Vahl) Spreng	Cyperaceae	Root	Worm infestation(Helminthiasis)
142.	<i>Hyptis suaveolens</i> (L.) Poit.	Lamiaceae	Leaves	Conjunctivitis
143.	<i>Imperata cylindrical</i> (L.) P. Beauv.	Poaceae	Whole Plant	Prolapse of uterus
144.	<i>Indigofera aspalathoides</i> DC.	Fabaceae	Leaves	Thrift
145.	<i>Ipomoea mauritiana</i> Jacq.	Convolvulaceae	Tuber	Worm infestation (Helminthiasis)
146.	<i>Jatropha glandulifera</i> Roxb.	Euphorbiaceae	Leaves	Plant poisoning
147.	<i>Justicia adhatoda</i> L.	Acanthaceae	Leaves	Poisonous bite
148.	<i>Kaempferia galanga</i> L.	Zingiberaceae	Rhizome	Indigestion, Worm infestation, Helminthiasis, Ranikhet disease
149.	<i>Lawsonia inermis</i> L.	Lythraceae	Leaves	Calf scour, Mastitis, Diarrhoea
150.	<i>Leea asiatica</i> (L.) Ridsdale	Leeaceae	Root	Fracture
151.	<i>Lepidium sativum</i> L.	Brassicaceae	Seed	Mastitis
152.	<i>Leucas aspera</i> (Willd.) L.	Lamiaceae	Root, Whole Plant, Leaves	Helminthiasis, Bloat, FMD, Ulcers/wounds, Jaundice, Repeat breeding Poisonous bite, Ticks/Lice, Pest, thrift, Fever
153.	<i>Limnophila heterophylla</i> Benth.	Scrophulariaceae	Twigs	Diarrhoea, Indigestion
154.	<i>Linum usitatissimum</i> L.	Linaceae	Oil	Eye infection
155.	<i>Litsea glutinosa</i> (Lour.) C. B. Rob	Lauraceae	Leaves	Diarrhoea, Indigestion
156.	<i>Luffa acutangula</i> (L.) Roxb.	Cucurbitaceae	Leaves	Mastitis
157.	<i>Luffa amara</i> Roxb.	Cucurbitaceae	Leaves	Mastitis
158.	<i>Madhuca indica</i> J. F. Gmel.	Sapotaceae	Bark	Fracture, Siluria, Indigestion, Diarrhoea, Dysentery, Bloat
159.	<i>Madhuca longifolia</i> (J.Konig) J.F.Macbr	Sapotaceae	Tender Leaves	Dysentery
160.	<i>Mangifera indica</i> L.	Anacardiaceae	Stem, Bark, Leaves,	Siluria
161.	<i>Melia azedarach</i> L.	Meliaceae	Leaves	Uterus prolapse, Repeat breeding
162.	<i>Mesua ferrea</i> L.	Clusiaceae	Root	Diarrhoea, Indigestion
163.	<i>Momordica charantia</i> L.	Cucurbitaceae	Young Fruits & Roots	Diarrhoea, Worm infestation, (Helminthiasis)
164.	<i>Morinda tinctoria</i> Roxb.	Rubiaceae	Leaves And Bark	Fever
165.	<i>Moringa oleifera</i> Lam.	Moringaceae	Bark, Seed, Root, Fruit, Leaves.	Indigestion, Dog bite, Helminthiasis, Diarrhoea, Thrift,
166.	<i>Murraya koenigii</i> (L.) Sprengel	Rutaceae	Leaves	Repeat breeding,
167.	<i>Musa paradisiaca</i> L.	Musaceae	Flower, Fruits	Mastitis, Constipation, Diarrhoea, FMD; leg wound, Dysentery
168.	<i>Myristica malabarica</i> Lam.	Myristicaceae	Fruits	Black quarter
169.	<i>Naregamia alata</i> Wight & Arn.	Meliaceae	Whole Plant	Mastitis
170.	<i>Nicotiana tabacum</i> L.	Solanaceae	Leaves/Dry Leaves	Bloat, Maggot wounds, Foot rot, Ulcers/wounds, Foot rot, Ulcers/wounds,
171.	<i>Nigella sativa</i> L.	Ranunculaceae	Seeds	Thrift
172.	<i>Nyctanthes arbor-tristis</i> L.	Oleaceae	Leaves	Ephemeral fever
173.	<i>Ocimum basilicum</i> L.	Lamiaceae	Leaves	Mastitis, FMD
174.	<i>Ocimum canum</i> Sims.	Lamiaceae	Leaves	Maggots wound, Bloat
175.	<i>Ocimum sanctum</i> L.	Lamiaceae	Leaves	Fowl Pox, Mastitis, Ranikhet disease, Fever, Thrift Poisonous bite, Bloat Ulcers/wounds, Wheezing, Helminthiasis
176.	<i>Olea dioica</i> Roxb.	Oleaceae	Tender Leaves	Foot rot
177.	<i>Operculina turpethum</i> (L.) Silva Mans	Convolvulaceae	Root	Worm infestation(Helminthiasis)

Research & Reviews: Journal of Veterinary Sciences

178.	<i>Oryza sativa</i> L.	Poaceae	Grains	Diarrhoea, Fowl Pox, Ranikhet disease, Dysentery (or) Hemorrhagic enteritis, ROP
179.	<i>Paspalum scrobiculatum</i> L.	Poaceae	Dried Grass	Ephemeral fever
180.	<i>Pavoniae panda</i> (Roxb. ex Sm.) Spreng.	Malvaceae	Root	Fracture
181.	<i>Pedaliium murex</i> L.	Pedaliaceae	Leaves	Repeat breeding, ROP
182.	<i>Pennisetum americanum</i> (L.) Leeke	Poaceae	Tender Leaves	Malakundhu (A Fever type)
183.	<i>Pergularia daemia</i> (Forssk.) Chiov.	Asclepiadaceae	Leaves	FMD, Mastitis, Intestinal parasites, Wounds, Fowl Pox
184.	<i>Peumus boldus</i> Molina	Monimiaceae	Leaves	Neonatal diarrhoea
185.	<i>Phyllanthus amarus</i> Schum. &Thonn.	Euphorbiaceae	Leaves, Whole Plant	Fowl Pox, Jaundice, Eye infection, Indigestion
186.	<i>Phyllanthus emblica</i> L.	Euphorbiaceae	Fruits	Indigestion
187.	<i>Piper betle</i> L.	Piperaceae	Leaves	Helminthiasis, Bloat, Wheezing
188.	<i>Piper chaba</i> Trel. &Yunck.	Piperaceae	Fruits	Indigestion
189.	<i>Piper longum</i> L.	Piperaceae	Fruits	FMD, Fever, Ephemeral fever, Tuberculosis, Fowl Pox, indigestion
190.	<i>Piper mullesua</i> Buch.-Ham. ex D.Don	Piperaceae	Fruits	Indigestion, Prolapse of uterus
191.	<i>Piper nigrum</i> L.	Piperaceae	Fruits	Fever, Ephemeral fever, Haemorrhagic septicaemia, Indigestion, Helminthiasis, Ranikhet disease, Dermatitis, Fowl Pox, Tuberculosis, Eye infection, Cough/cold, Snoring
192.	<i>Plumbago indica</i> L.	Plumbaginaceae	Root	Worm infestation(Helminthiasis)
193.	<i>Plumbago zeylanica</i> L.	Plumbaginaceae	Swollen Roots	Fever, Ephemeral fever, Haemorrhagic septicaemia, Maggot wounds
194.	<i>Polygala arvensis</i> Willd.	Polygalaceae	Leaves	Neutralizing poison, Pest
195.	<i>Pongamia pinnata</i> (L.)Pierre	Fabaceae	Seed , Oil	Helminthiasis, FMD, Black quarter
196.	<i>Psidium guajava</i> L.	Myrtaceae	Unripe Fruits	Diarrhoea, Hydrocyanic acid poisoning, Calf scour
197.	<i>Psoralea corylifolia</i> L.	Fabaceae	Seeds	Diarrhoea, Worm infestation, Timpanists (Bloat)
198.	<i>Pterospermum acerifolium</i> (L.) Willd.	Sterculiaceae	Bark	Mastitis
199.	<i>Punica granatum</i> L.	Punicaceae	Young Leaves, Rind of Fruit	Diarrhoea
200.	<i>Quercus infectoria</i> Oliv.	Fagaceae	Galls	Foot disease, FMD, Black quarter
201.	<i>Randia dumetorum</i> Lam.	Rubiaceae	Rhizome	Poisonous bite
202.	<i>Randiaspinosa</i> (THUNB.) POIR.	Rubiaceae	Fruits, Seeds	Fever, Haemorrhagic septicaemia
203.	<i>Raphanussativus</i> L.	Brassicaceae	Tuber	ROP
204.	<i>Rhaphidophora pertusa</i> (Roxb.) Schott	Araceae	Stem	Dermatitis
205.	<i>Rhynchosia minima</i> (L.) DC.	Fabaceae	Whole Plant	Calf scour
206.	<i>Ricinus communis</i> L.	Euphorbiaceae	Seeds, Fruit, Oil	Mastitis, Bloat, Difficult birth, Intestinal worms, Fracture, Arthritis
207.	<i>Saccharum officinarum</i> L.	Poaceae	Jaggery	Indigestion, ROP
208.	<i>Santalum album</i> L.	Santalaceae	Leaves	ROP
209.	<i>Schleichera oleosa</i> (Lour.) Merr.	Sapindaceae	Oil	Haemorrhagic septicaemia, infected ear, FMD, Magot wounds Ephemeral fever
210.	<i>Semecarpus anacardium</i> L.	Anacardiaceae	Leaves	Cold, Ephemeral fever, Haemorrhagic septicaemia, FMD, Maggot wounds; Bloat, Repeat breeding, Mastitis, ROP, Foot disease
211.	<i>Senna alata</i> (L.) Roxb.		Leaves	Dermatitis
212.	<i>Senna auriculata</i> (L.) Roxb.		Leaves	Fracture, Calf scour, Diarrhoea, Wounds
213.	<i>Senna hirsuta</i> (L.) H.S.Irwin & Barneby		Leaves	Restlessness
214.	<i>Senna occidentalis</i> (L.) Link.		Leaves	Eye infection
215.	<i>Sesamum indicum</i> L.	Pedaliaceae	Seeds, Leaves, Oil	ROP, mastitis, FMD, Bloat, infertility
216.	<i>Sesamum orientale</i> L.	Pedaliaceae	Seeds	ROP, FMD
217.	<i>Shorea robusta</i> Roth	Dipterocarpaceae	Resins, Seeds	Diarrhoea, Indigestion, Mastitis, Ephemeral fever
218.	<i>Sidaacuta</i> Burm. f.	Malvaceae	Leaves	Diarrhoea, ROP, Dysentery, Intestinal worms
219.	<i>Solanum melongena</i> L.	Solanaceae	Root	Infection
220.	<i>Solanum surattense</i> Burm. f.	Solanaceae	Unripe Fruit	Cough, infection
221.	<i>Solanum virginianum</i> L.,	Solanaceae	Root	Arthritis
222.	<i>Sorghum vulgare</i> Pers.	Poaceae	Grains	Diarrhoea
223.	<i>Soymida febrifuga</i> (Roxb.) A. Juss.	Meliaceae	Bark	Fracture
224.	<i>Sphaeranthus indicus</i> L.	Asteraceae	Areal Parts	Worm infestation
225.	<i>Spondias pinnata</i> (L. f.) Kurz	Anacardiaceae	Bark	Mastitis
226.	<i>Sterculia urens</i> Roxb.	Sterculiaceae	Leaves	ROP

227.	<i>Strychnos nux-vomica</i> L.	Loganiaceae	Fruits	FMD
228.	<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	Fruits, Tender Leaves	Dysentery
229.	<i>Tamarindus indica</i> L.	Caesalpiniaceae	Fruits	FMD, Constipation, Bloat, Constipation, Jaundice
230.	<i>Tephrosia purpurea</i> (L.) Pers.	Fabaceae	Leaves	Bloat
231.	<i>Terminalia arjuna</i> (Roxb.) Wight & Arn.	Combretaceae	Stem \ Bark	Horn fracture, Fracture
232.	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Combretaceae	Leaves	Loss of appetite, Black quarter
233.	<i>Terminalia chebula</i> Retz	Combretaceae	Fruits	Constipation, Bloat, FMD, Black quarter, Bloat
234.	<i>Thottea siliquosa</i> (Lam.) Ding Hou	Aristolochiaceae	Root	Fever
235.	<i>Tinospora cordifolia</i> (Thunb.) Miers	Menispermaceae	Leaves, Stem, Root	Bloat, FMD, Mastitis
236.	<i>Trachyspermum ammi</i> Sprague	Apiaceae	Seeds	ephemeral fever
237.	<i>Tribulus terrestris</i> L.	Zygophyllaceae	Seeds	Mastitis
238.	<i>Tridax procumbens</i> L.	Asteraceae	Leaves	Eye Infection, Horn fracture
239.	<i>Triticum aestivum</i> L.	Poaceae	Grains	Diarrhoea
240.	<i>Urginea indica</i> Kunth	Liliaceae	Bulbs & Tubers	Foot rot
241.	<i>Vernonia cinerea</i> Less.	Asteraceae	Leaves	Fowl Pox
242.	<i>Vigna mungo</i> (L.) Hepp	Fabaceae	Germinate d Seeds, Leaves	Repeat breeding, Fracture
243.	<i>Vigna unguiculata</i> (L.) Walp.	Fabaceae	Leaves	Repeat breeding, Mastitis
244.	<i>Vitex negundo</i> L.	Verbenaceae	Leaves	Bronchitis, Cold, Mastitis, Fever, FMD, Poisonous bite
245.	<i>Withania somnifera</i> (L.) Dunal	Solanaceae	Root	Repeat breeding, Fever
246.	<i>Wrightia tinctoria</i> (Roxb.) R.Br.	Apocynaceae	Bark And Leaves	Ephemeral Fever, Fever
247.	<i>Zingiber officinale</i> Roscoe	Zingiberaceae	Rhizome	Fever, Haemorrhagic septicaemia, Indigestion, Helminthiasis Indigestion, Bloat, Calf scour, Wheezing, Tuberculosis, Ephemeral fever
248.	<i>Ziziphus mauritiana</i> Lam.	Rhamnaceae	Dry Stem	Ephemeral Fever

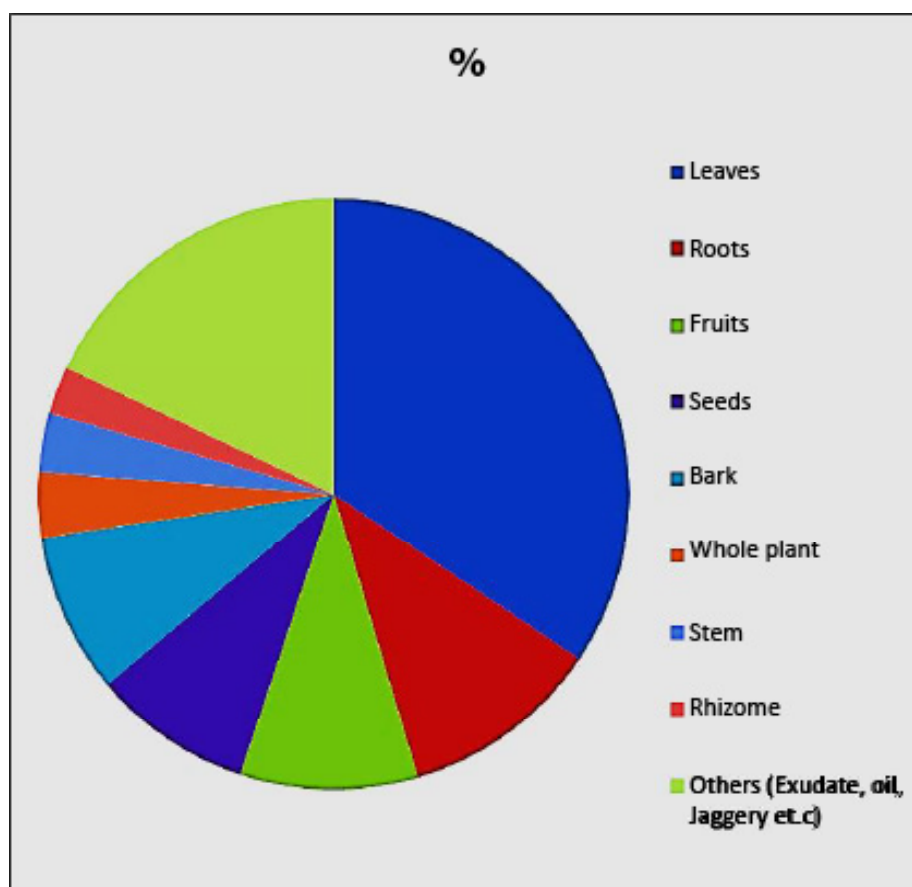


Figure 2. Shows the percent of plant parts used.

CONCLUSION

There is large amount of cost effective traditional knowledge and resources for animal health available in the community and communities use these practices regularly. EVP can be an effective alternative to antibiotics and other synthetic chemicals in livestock management.

ACKNOWLEDGEMENT

The authors thank Department of science and Technology, Government of India for financial support during this work. We wish to thank the local healers and farmers who have shared their valuable knowledge. We also acknowledge all 24 organizations for their cooperation and contribution and all our colleagues for the support during this work.

COMPETING INTERESTS

The authors declare that they have no competing interest.

REFERENCES

1. Global Antibiotic Resistance Partnership (GARP). Rationalizing antibiotic use to limit antibiotic resistance in India. *Indian J Med Res.* 2011;143;281-294.
2. Nisha AR. Antibiotic residues-A global health hazard. *Vet World.* 2008;1:375-377.
3. Nair MNB, Unnikrishnan PM. Revitalizing ethno-veterinary Medical tradition: A perspective from India (Chapter 5). In: Katerere DR, Luseba D (eds.) *Ethno-veterinary Botanical Medicine-Herbal Medicine for Animal Health.* CRC-Press, Taylor & Francis group, USA. 2010.
4. Raneesh S, Abdul H, Hariramamurthi BA, et al. Documentation and participatory rapid assessment of ethnoveterinary practices. *Indian J Tradit Knowl* 2008;7:360-364.