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Full length Research paper

Traditional knowledge on medicinal plants used for the treatment of domestic cattle in Dhikura village of Arghakhanchi district, Nepal

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Present study was carried out to document ethno-veterinay information for the treatment of livestock diseases in Dhikura village of Arghakhanchi district. Information on the use of plants was collected from October to November, 2014 by interviewing key informants using a semi-structured open-ended questionnaire. The ethno-veterinary surveys of the study area revealed veterinary uses of 54 angiosperms (herbs-22, shrubs-7, trees-20 & climbers-5) used for the treatment of different diseases of domestic cattle. Among life forms studied, herbs was found to be highly medicinal followed by trees; and most medicinal plants of study area was represented by the families- Leguminosae and Moraceae. Besides, it was also found that leaf to be highly medicinal followed by stem/bark for livestock diseases.

Key words: ethno-veterinary, indigenous knowledge, documentation, livestock

INTRODUCTION

Since the very beginning of human civilization, human beings have been dependent on plants for the treatment of their as well as animals' ailments and diseases. In addition to food, clothing and shelter, the green plants have manifold use providing all the medicaments to man and his domestic animals for thousands of years (Akhtar, 1992). Traditional medicinal practice deals with the use of plants having medicinal property to cure diseases of mankind, livestock including plants, since some plants are used to cure diseases of crop plants in the form of botanical extracts (i.e. biopesticide). Medicinal plants that are regarded as a free commodity to be collected from nature are the major source of traditional medicine and also include all goods of biological origin (Subedi, 1997). It is probable that the discovery of uses of ethnoveterinar -y medicinal plants must have occurred in a number of ways: by the principle of trial and error mechanism, watch -ing animals eating and rubbing themselves with special plants when ill and subsequent adoption of the same remedies, the results being passed from one generation to the next, communicating and interacting with other traditional ethno-veterinary medicinal practioners, etc. (Galav *et al.*, 2013). This practice of curing diseases through herbal plant is still used by many veterinarians, medical officers, Ayurvedic physicians and local *vaidyas*. It is a well known fact that some modern medicines have been formulated from the herbal plants through an ethnobotanical approach (Rajbhandari, 2001).

Nepal is predominantly an agrarian country where more than 90% of the people living in rural areas own livestock as a part and parcel of their livelihood (Bhandary and Shrestha, 1999). Livestock rearing is an integral part of agricultural production system accounts second major economic activity and the backbone of rural economy in Nepal which contributes about 36-47% of household cash, 18% and 27% in Gross Domestic Production (GDP) (excluding processing industry such as hides/skin,

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carpets, etc.) and Agriculture Domestic Production (AgDP) respectively (MoAC, 2010)

Availability and access to modern veterinary service is one of the limiting factors to get optimum production and profit from livestock economy in rural community (Jha, 2012). In most of the remote rural areas, where veterinary service is not available, traditional medicinal practice is a suitable way for the treatment of domestic cattles (Chaudhary, 1994). Indigenous knowledge of local healers associating with the usage of plants plays a key role in primary health care. This indigenous knowledge have been transmitted from generation to generation in the form of inherited culture and such practices have been handed down verbally/orally and only few of information were documented in books and in many other religious scripts (Raut and Shrestha, 2010). They communicate their knowledge to limited members of their periphery if they show interest (Acharya and Acharya, 2010). Ethno-veterinary information is in danger of extinction because of current rapid change in communities all over the world (Kubkomawa *et al.*, 2013). Such knowledge of rural people with the traditional healing practices using plant resources is now gradually disappearing due to tendency of younger generations to discard their traditional life style (Galav *et al.,* 2012) and poor recognition of the traditional healers and availability of modern health facilities. Because of which, we are in a danger of losing the traditional knowledge forever (Manandhar, 2002). However, Burlakoti and Kunwar (2008) had reported that the traditional herbal medicine possesses great significance in Nepal and the interest in herbal medicine has gradually increased over recent years and various other literature related to ethnobotanical study have showed their more popularity in the remote rural areas. So, the priority should be given to the documentation of such precious traditional knowledge and practices which may facilitate to perform further research work for the scientific validation of the folklore claims since tradition and beliefs are only the basis of use of the herbal medicines. Documenting the indigenous knowledge through ethnobotanical studies is important for the conservation and utilization of biological resources (Singh and Hamal, 2013).Therefore, importance for documentation and proper conservation of such dwindling indigenous knowledge was felt since the information available on herbal veterinary medicines in different regions of Nepal so far includes some sporadic work of Manandhar (1989, 2001), Bhattarai (1992), Chaudhary (1994), Alam and Thapaliya (2009), Acharya and Acharya (2010), Raut and Shrestha (2010) and Rana (2014). No comprehensive work on documenting ethno-veterinary use of plants by the tribal people of Dhikura village has been done so far. In this context, present study was carried out in Dhikura village of Arghakhanchi district to identify, collect and document the ethno-veterinary medicinal plants used by people of this area and their traditional knowledge on the use of plants to treat livestock diseases.

MATERIALS AND METHOD

Study area

Dhikura village is located in Arghakhanchi district, is one of the hilly district of Lumbini zone in Nepal's Western Development Region. It has unique physiography due to Churia and Mahabharat range which are not running in a parallel fashion. Sixty eight percent of the district is in the mountainous Mahabharat range and the rest is in the Siwalik hills. It is situated between 27° 45'–28° 26' N latitude and 84° 45'–83°23' E longitude, and covers an area of 1,193 sq. km. It is bounded by Palpa district to the east, Pyuthan and Dang to the west, Gulmi to the north and by Terai districts Kapilvastu and Rupandehi to the south. The elevation of the district varies from 305 to 2,575 m asl and about 40% of the total area is forested (Bhusal *et al*., 2013). Climate of the study area is tropical to subtropical type with cool and humid climate. The average maximum temperature is 28°C and minimum 4.5°C and it receives average annual rainfall of about 850 mm (recorded at Khanchikot (27°56' N, 83°09' E, alt. 1,760 m asl) Arghakhanchi in 2005 (Source: Department of Hydrology and Meteorology/GoN). The total population of Dhikura Village Development committee, VDC (or Dhikura village having 9 wards) is about 4,199 accounting 1,009 household (HH) (CBS, 2012). Majority of people of this village is Brahman-Hill followed by *Chhetree, Magar,* and a number of other ethnic groups like *Kumal, Gurung, Kami, Damai, Sarki, Thakuri, Sanyasi, Newar, Badi* and others. On the basis of preinformation regarding household having maximum number of domestic cattle (i.e. domestic cattle owner), the selected ward for interview was ward no. 3, 4 & 5 (lower and upper Sursing village, alt. 1,030–1,100 m asl) of Dhikura village and people of this region depend on community forest for fulfillment of their subsistence daily requirements of fuelwood, fodder, grasses, leaf litter, etc. The forest is mainly dominated by *Pinus roxburghii* with its associated species like *Schima wallichii, Shorea robusta, Castanopsis indica, Diospyros lancifolia, Wendlandia puberulla, Woodfordia fruticosa,* etc.

Field study

The study area was surveyed in October, 2014. Ethno-veterinary information of plants for the treatment of livestock diseases was collected in October-November

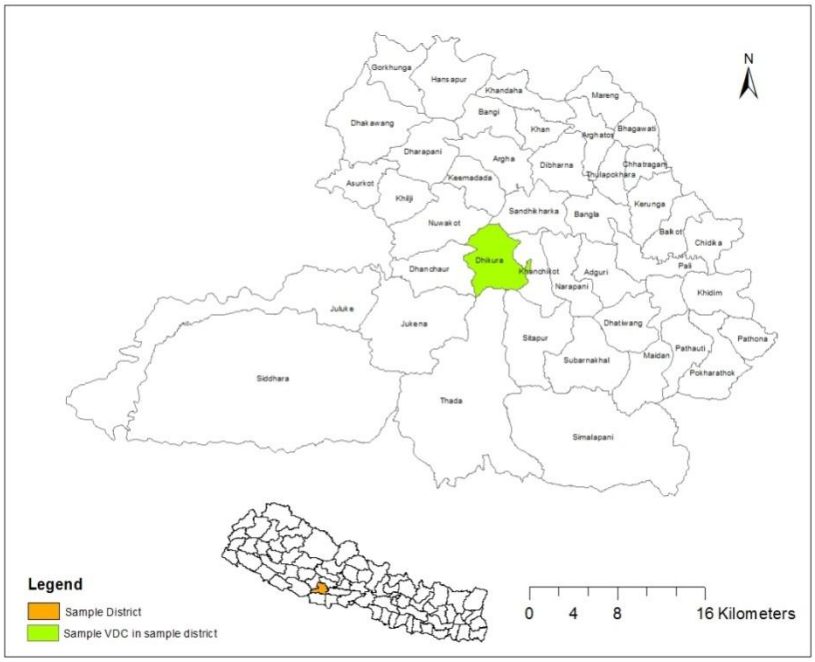

Figure 1: Map of the study area

2014, by direct field observation as well as making interview with 57 key informants and local healers. Key - informants were identified after preliminary discussion with local people. Focal group discussion during the meeting of forest user's group was also carried out two times. Information on ethnobotanical usage of the plants was collected by interviewing key informants (viz. cattle herder, farmers, village headman, housewives, senior citizen, community leader and people on the trail) of the community using a semi-structured open ended questionnaire in local language. The data were considered worth mentioning only when more than five informants gave similar information for the same plant. Moreover, information for particular ailments was cross checked through various means, including repeated queries with the local healers of different wards of the study area. The local healers were consulted for the medicinal uses of plants, showing the samples of plants collected from this area (forest, scrubland, marginal land and cultivated field). The local healers accompanied during the collection of plant species for making herbarium. Some of the collected specimens were identified in the field, whereas others were identified with the help of standard literature (Rao, 1957; Polunin and Stainton, 1984; Stainton, 1997) and with cross checking the specimens deposited at National Herbarium and Plant Laboratories (KATH), Godawari, Lalitpur while some of them were identified with the help of experts of taxonomy.

The nomenclature of identified plant species and their family names follows Press *et al.* (2000).

RESULTS AND DISCUSSION

A total of 54 different medicinal plant species (including both wild and cultivated: 10 monocots & 44 dicots) belonging to 53 genera and 39 families were studied. List of medicinal plants with their scientific name, family, collection number, local name, life form, parts used and uses are presented in Annex 1. Out of the total species used for medicinal value, majority were herbs followed by trees, shrubs and climbers (Figure 2). The maximum use of herbaceous species in life forms may be due to its higher abundance, easy to collect, store and transport. Similar result was reported by Raut and Shrestha (2010) on 37 medicinal angiospermic plants studied from seven VDCs of Morang district where majority of the species were herbs (54%) followed by trees (24%), shrubs (19%) and climbers, the least (3%). But in contrast, out of 18 angiosperms studied by Acharya and Acharya (2010) in Sardikhola VDC of Kaski district for medicinal values, majority were climbers (39%) followed by trees (28%), herbs (22%) and shrubs (11%). Similarly, Chaudhary (1994) has reported 52 medicinal plant species from different VDCs of Rauthat, Bara, Parsa, Makwanpur and Chitwan districts where majority of the species were trees (38%) followed by herbs (35%), shrubs (23%) and

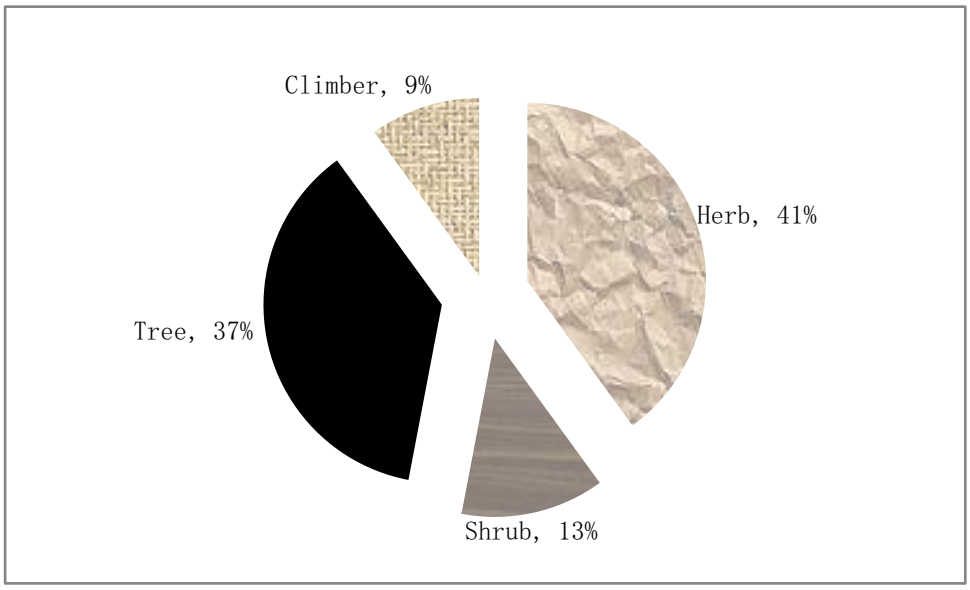

Figure 2: Different life forms of medicinal plants collected

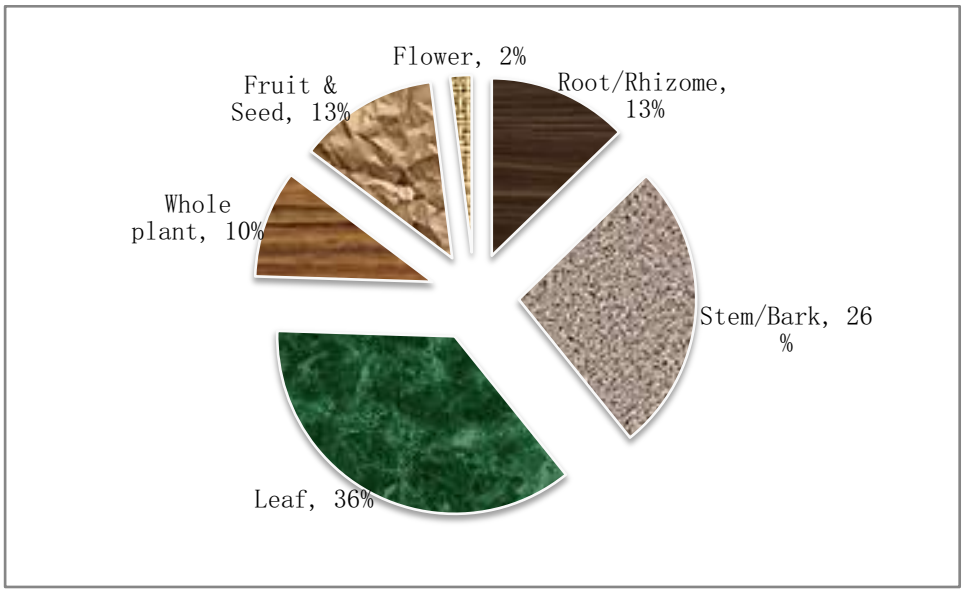

Figure 3: Graph showing whole plant and its used parts for medicinal purposes

climbers (4%).

Leguminosae and Moraceae, both families, are represented by the highest number of species (4 sp. each) followed by Gramineae (3 sp.), Anacardiaceae, Compositae, Labiatae, Liliaceae, Meliaceae, Rosaceae and Rutaceae (2 sp. each) and rest of the 29 families each includes only single plant species (Annex 1). Similar result was reported by Chaudhary (1994) who found Leguminosae (7 sp.) to be the largest family in terms of medicinal plants used followed by Moraceae (3 sp.). In contrast, Raut and Shrestha (2010) had reported Solanaceae (7 sp.) to be the largest family followed by Liliaceae (4 sp.) and Moraceae (3 sp.); and Acharya and Acharya (2010) had reported Cucurbitaceae (2 sp.) family as the largest one. A number of raw plants reported to have medicinal values in the present study are also more

or less supported by the findings of other researchers in Nepal like Manandhar (1989) from different parts of Nepal, Bhattarai (1992) from 11 districts of central Nepal, Chaudhary (1994) in Rautahat, Parsa, Makwanpur and Chitwan districts, Alam and Thapaliya (2009) in Chitwan district, Acharya and Acharya (2010) and Rana (2014) in Kaski district and Raut & Shrestha (2010) in Morang district and India (Salam *et al*., 2013; Galav *et al.*, 2013, 2013a and Yadav *et al*., 2014). Out of the 54 plant species documented for medicinal use in this study, 11 species are reported by Chaudhary (1994), 4 species by Acharya & Acharya (2010), 9 species by Raut and Shrestha (2010) and 6 species by Rana (2014) in their study as well. Altogether 26 medicinal plant species (indicated by asterisk in Annex 1) reported in this study have not been reported in above mentioned references in Nepal and are new findings of this research work.

Generally freshly collected plants or plant parts of the most of the commonly found plants collected by local people and herbal healers from various habitats such as forest, scrubland, marginal land, grassland and cultivated fields and used in crude form traditionally were considered in this research. The plant parts widely used for medicinal purposes include leaf followed by stem/bark, followed equally by root/rhizome and fruit & seed; whole plant and flower (Figure 3). Nearly similar result was reported by Chaudhary (1994) in his study area where the plant parts used for medicinal purposes include leaf (33%) followed by stem/bark (30%), fruit/seed (15%), root (12%), whole plant (8%) and flower, the least (2%). The maximum use of leaf and stem/bark indicates that these parts may have strong medicinal properties. In contrast, Acharya and Acharya (2010) had reported maximum ethno-veterinary use of whole plant (31%) followed by bulb/root (21%), fruit and leaf (each with 16%), bark (12%) and milky juice (5%) whereas Raut and Shrestha (2010) had reported maximum use of fruit & seed (33%) followed by leaves (23%), stem/bark (16%), bulb, root & whole plant (each with 6.9%), rhizome (5%) and tuber, the least (2%). The practice of using plant/ plant parts to cure different diseases of domestic animals may vary according to ethnic variation in the society. Moreover, it may differ according to the tradition/culture, geography, vegetation, etc. of the place (Rajbhandari, 2001). In certain cases, using of plant parts of the same species of medicinal plant to cure livestock diseases was also found to vary according to ethnic communities. For example: Raut and Shrestha (2010) had reported juice extracted from the stem of *Tinospora cordifolia* is given orally to cattle to cure appetite loss whereas we reported crushed tuberous root and dried bark of the stem is used to cure sterility. Likewise, Chaudhary (1994) had reported paste of tender shoots of *Vitex negundo* is applied to get relief from scorpion bite which is antagonistic to our finding where boiled extractof the leaf of that plant is applied on scabies and other skin infections in domestic animals. Ethno-veterinary information of study area revealed that single plant is used to treat some diseases as well as combination of two or more plants is also used to treat many other diseases.

Regarding different disease categories, the majority of plants are related to anthelmintic, mastitis, stomach disorder, killing external parasites in the body, dermatological problems, facilitating smooth delivery, sterility, bone/horn fracture whereas plants used to cure urinary disorder, snake bite and ophthalmic diseases are very less in comparison with all uses (Annex 1). According to village members, placenta retention, helminth disease and mastitis is a very common problem in present study area and except in serious cases, they had used different parts of the plant traditionally to treat those diseases. People of this region specifically use many plants for increasing the milk quantity of their cattle. They had shown keen desire to improve livestock productivity and profits. This result indicated that people of study area have retained good knowledge on medicinal value of plants. In contrary, Rana (2014) further reported that many diseases of cattle are cured after grazing with or without knowing by farmers. Generally, the local healers identify various diseases of animals by their behavior, stool, urine, hotness of ear/body, color of eyes, appetite loss and unusual sound produced by them (Raut and Shrestha, 2010). For the purpose of treating livestock diseases, various forms of preparations are formulated in juice form which is extracted from different parts of plant followed by paste, fresh plants, powder and decoction (Annex 1). In some cases, the healers perform certain religious rituals using plants and its parts. From this research work, it was found that plant parts either mixing with different plant species or without mixing has curative properties against different types of diseases and even a single disease can be cured by different species of medicinal plants. Some plants like *Artemisia indica, Inula cappa, Leucas cephalotes*, *Schima wallichii,* etc. were found to be used for treating more than one disease. It was found that plant parts taken from single plant species to cure a single disease was more in number with that of plant parts mixing with different plant species to cure single or more than one diseases (35 and 19 spp. respectively). Some plants and their young shoot/ coppice or particular part may be highly, moderately or fairly poisonous for cattle (Bhandari and Shrestha, 1999). In some cases, plants or its parts when used in optimum quantities may be useful whereas in large quantities as reported in case of *Cannabis sativa, Tinospora cordifolia* and *Daphne papyracea* in the study area, they may be ha -rmful (may cause physiological disorder) so precaution

should be taken before administering the plants/plant parts for health care.

During the study period, it was observed that farmers, cattle herder, village headman, other community leaders, senior citizen and local healers (*jhankris* and *dhamies*) have greater knowledge about traditional medicines than younger persons (Acharya and Acharya, 2010; Raut and Shrestha, 2010). We also found that the knowledge of traditional healers to be very secret, usually kept within themselves and they were not comfortable in sharing their knowledge to other people thinking their importance in the society will decrease if everybody knows such knowledge. Moreover, they can not fulfill their needs without other alternative income as they help the farmers by treating their domestic cattle in their leisure time generally without taking any money. When we interacted with younger generation of the society, they showed less interest in traditional practices due to tendency of poor recognition of traditional healers, lack of successor of faith healers, people's attraction towards the use of modern allopathic medicine to acquire quick remedy to their domestic cattle and availability of modern health facilities. Therefore, the knowledge of traditional healers (pioneer of ethnomedicine) is on the verge of extinction. So, attempts should continue to promote the documentation of information hidden among the tribes about the indigenous uses, traditional knowledge and practices. Moreover, many constraints such as lack of nutrition, poor modern veterinary services and inadequate breed improvement remain to be solved before full livestock potential is realized in our country.

CONCLUSION

It was found that herbs to be highly medicinal among the different life forms. Besides, plants belonging to both families– Leguminosae and Moraceae were found to be highly used for ethno-veterinary purpose in the study area. Furthermore, it was also concluded that leaf to be highly medicinal than other parts of the plants such as roots, fruits, etc. People of the study area were still found to rely on traditional medicinal practices for the treatment of their domestic cattle. The ethnic communities have developed own medical formulation using traditional knowledge for the treatment of their domestic cattle except in serious cases. Therefore, this knowledge can be the valuable assets for future generation and economic development of the community by improving income and quality of life of the household owing livestock.

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Annex 1: List of medicinal plant with their scientific name, family and collection number with their local name, life form, parts used and usage

SN	Plant species, Family and Voucher number	Local name	Life form	Parts used	Usage
1.	*Achyranthes aspera* L. Amaranthaceae RA 732	Datiwan/ Apamarga	H	Root	If the placenta of an animal is not expelled for a long time, root cut into small pieces and tied with a string to form bead and tied externally circling the neck. It is believed that after this, the placenta is expelled and tied root on a string should be removed as soon as the placenta is expelled.
2.	**Agave cantula* Roxb. Agavaceae RA 709	Ketuki	H	Leaf	Juice extracted from boiled leaf of *Agave cantula*, grinded flour of roasted seed of *Trigonela foenumgracium*, jelly like substsnce extracted from fruit of *Aegle marmelos* and bulbils of teuno (*Dioscorea kamoonensis*) is mixed and given orally to cattle to treat fever.
3.	**Albizia procera* (Roxb.) Benth. Leguminosae RA 726	Jumgret	T	Bark	Paste made from the bark of *Albizia procera,* lahare githi *(Gonostegia hirta*)*, Marsdenia tenacissima,* bark of puwanle (*Ilex doniana*), latex of siudi (*Euphorbia royleana)* is applied on the fractured or sprain part either separately (any of the mentioned each plant part can be used) or by mixing to cure sprain or bone fracture.
4.	*Allium sativum* L. Liliaceae RA 701	Lahsun	H	Bulb	After pounding bulb of *Allium sativum* and *gundruk* (locally prepared dried vegetable) and mixing it with butter milk and making gravy like is fed to animal with the help of bamboo cylinder or bottle to treat fever.
5.	**Ampelocissus divaricata* (Wall. ex M.A. Lawson) Planch. Violaceae RA 722	Pureni	C	Stem	About one and half feet long cut fresh stem is brought near by the eye and from one end of the stem, with the help of mouth is forced, water oozing out from other end of stem enters into the eye and help to cure keratitis (inflammation on cornea) locally called *phulo pareko.*
6.	*Artemisia indica* L. Compositae RA 720	Titepati	H	Leaf	Leaf juice obtained from green leaves is externally applied over body to remove lice, other external parasite and insect. Leaves are fed to cattle during stomach disorder and it is believed to increase the appetite.
7.	*Artocarpus heterophyllus* Lam. Moraceae RA 745	Rukh Katahar	T	Fruit	The paste of inner part of fruit is applied to the infected part to cure mastitis.
8.	*Asparagus racemosus* Willd. Liliaceae RA 737	Kurilo	S	Root	Tuberous root of *Asparagus racemosus,* pod of kauchho (*Mucuna pruriens*) and locally called *marcha* (*marcha* is made by mixing various substances which is used to make alcohol) is given orally to cattle to cure sterility.
9.	*Azadirachta indica* A. Juss. Meliaceae RA 705	Neem	T	Leaf	Paste of leaves along with mustard oil is applied over fractured horns and externally tied with human or other animal's hairs to heal the injury.
10.	*Boenninghausenia albiflora* (Hook.) Rchb. ex Meissn Rutaceaae	Upiya jhar	H	Leaf	Juice of the plant is applied over body to remove flea, bug, lice, other external parasites and insects.

	RA 720				
11.	**Boerhavia diffusa* L. Nyctaginaceae RA 749	Punarnava	H	Whole plant	Whole plant is fed to cattle and paste made from fruit of chichindo *(Trichosanthes anguina*) is applied over the bitten area of snake to get relief from snake bite.
12.	*Bombax ceiba* L. Bombacaceae RA 706	Simal	T	Stem, Seed	Decoction of stem bark mixed with powder of pepper and ginger is given orally to cattle to cure dysentery. The seed fiber mixed with mustard oil is applied to treat the wounds of cattle.
13.	*Cannabis sativa* L. Cannabaceae RA 716	Ganja	H	Flower/Seed	Mixture of roasted seed/inflorescence of female *Cannabis sativa,* powder prepared from the fruit of siltimur (*Lindera neesiana*), grinded fruit of jaiphal *(Myricaria germanica*) and finally vinegar is mixed and is given orally to cattle in case of indigestion and swelling of stomach.
14.	**Carica papaya* L. Caricaceae RA 757	Mewa	H	Seed	Matured seeds are crushed with the help of mortar and pestle to form powder and mixed with little amount of water to form a like a paste of about 100 g is given orally to cattle once a day upto six days against internal parasites in the body.
15.	**Cassia fistula* L. Leguminosae RA 738	Rajbrichya	T	Fruit/Seed	Grinded seed of *Cassia fistula*, along with extract made from the root of *Ficus benghalensis*, *Thysanolaena maxima* is given to cattle for treating urinary disorder. Furthermore, flour of barley is put in water; strongly shaked and is given orally to cattle to cure the problem of urinary disorder.
16.	*Centella asiatica* (L.) Urb. Umbelliferae RA 746	Ghodtapre	H	Whole plant	Whole plant is fed to animals to treat urinary disorder.
17.	**Chenopodium album* L. Chenopodiaceae RA 736	Bethe	H	Whole plant	Whole plant is crushed and about half liter of juice is given orally to cattle 3-4 times a day at an interval of 4-5 hours for about 3-4 days to cure dysentery.
18.	**Citrus medica* L. Rutaceae RA 753	Bimiro/Beora	T	Root	Juice obtained by pounding root with the help of mortar and pestle is given orally to cattle against ascariasis.
19.	*Colebrookea oppositifolia* Sm. Labiatae RA 752	Dhurselo	S	Leaf	Juice obtained by pounding young leaves is used as anthelmintic.

20.	*Commelina benghalensis* L. Commelinaceae RA 710	Kane jhar	H	Leaf	Leaves juice is applied locally on fresh cuts in animals as antiseptic.
21.	**Crateva unilocularis* Buch.-Ham. Capparaceae RA 754	Siplikan	T	Leaf	Paste of fresh leaf is applied over the body of cattle to treat scabies and to remove lice, teak and leech.
22.	**Curculigo orchioides* Gaertn. Hypoxidaceae RA 731	Musligandh	H	Root	Root tuber of *Curculigo orchioides*, fruit of citrus, fruit of *Musa paradisica* and locally called *khuwa* (milk product) of cow is given to the buffalo and ox to minimize sexual incapability.
23.	*Curcuma aromatica* Salisb. Zingiberaceae RA 744	Besar	H	Rhizome	Powder of rhizome, black powder deposited generally at the ceiling wood of raw house after burning wood in molten hearth, locally called *dhaiso,* mustard oil, paste of *Allium sativum* and cooked flour of millet is applied over the broken horn and externally tied with hairs to cure broken horn in cattle. Furthermore powdered turmeric is mixed with crushed bulb of garlic & mustard oil and paste such made is applied to cure cut wound.
24.	*Cuscuta reflexa* Roxb. Cuscutaceae RA 724	Aakashebeli	C	Stem	Juice extracted from the stem of the plant, local fruit of tomato, ghee, butter and curd is placed in copper or bronze vessel over a night and curd color changed into green color, which is locally called *uwal*, is given orally to cattle against ascariasis.
25.	**Daphne papyracea* Wall. ex Steud. Thymeliaceae RA 755	Seto baruwa	S	Stem bark	Bark juice of the plant in optimum amount is given orally to cattle according to their age to cure dysentery.
26.	**Erythrina stricta* Roxb. Leguminosae RA 734	Phaledo	T	Bark	Juice obtained from the bark of the plant is applied over the body to treat scabies (locally called *khairo*).
27.	**Eulaliopsis binnata* **(**Retz.) C.E. Hubb. Gramineae RA 743	Babiyo khar	H	Leaf	Grass of *Eulaliopsis binnata*, *Dendrocalamus hamiltoni* and cooked flour of millet is given to cattle to cure weakness. Beside, ripe or unripe fruit of *Aegle marmelos* is crushed with the help of mortar and pestle and is cooked with water which is given orally to cattle to cure weakness.
28.	**Ficus benjamina* L. Moraceae RA 740	Swami	T	Bark	Bark of *Ficus benjamina* is fed to cattle by wrapping over the grass which like most by cattle, inflorescence of *Musa paradisica* and dry seed of *Oryza sativa* is given orally to cattle to minimize the problem of abortion i.e. embryo cannot fully developed to reach upto birth stage.
29.	*Ficus semicordata* Buch.-Ham. ex. Sm. Moraceae RA 748	Khanyu	T	Leaf	Leaves as a fodder is given to cattle which is highly nutritive and makes child birth easy to cattle, so it is given as before and after the child birth.
30.	**Imperata cylindrica* (L.) P. Beauv. Gramineae RA 715	Siru	H	Root	Root juice in optimum amount is given to cattle with the help of drenching tube or bamboo cylinder to cure ascariasis (anthelmintic).
31.	*Inula cappa* (Buch.-Ham. ex D. Don) DC. Compositae RA 725	Gaitihare	S	Whole plant	Whole plant is cut into pieces and mix with flour and is cooked which is given orally to cattle to cure sterility, drowsy, diarrhea and appetite & appetite loss.
32.	**Leucas cephalotes* L.	Dronapuspi	H	Whole plant	Paste of whole plant is applied on the affected

	Labiatae RA 723				area to cure foot and mouth diseases. Furthermore, fresh plant is given to cattle to feed as fodder to cure fever.
33.	**Mallotus phillippensis* (Lam.) Muller. Arg. Euphorbiaceae RA 742	Sindure	T	Fruit	Ripe fruit of *Mallotus phillippensis* & seed of *Thespesia lampas* is grinded with the help of mortar and pestle or stone slab and paste formed by this process is accumulated and is made in tablet form which is given orally to cattle to cure gastritis (*gano gayama*).
34.	**Mangifera indica* L. Anacardiaceae RA 703	Aap	T	Stem/Bark	Decoction of stem bark is given to animal through drenching tube or bamboo cylinder twice in a day for three days to cure dairrhea.
35.	*Marsdenia tenacissima* (Roxb.) Moon Asclepiadaceae RA 712	Bilajor	C	Root bark	Root bark of *Marsdenia tenacissima* and *Gonostegia hirta*, latex of *Eurphorbia royleana* is mixed and applied on affected part to treat sprain and bone fracture as well.
36.	*Melia azedarach* L. Meliaceae RA 735	Bakaino	T	Seed, Leaf	Paste prepared from dried seed is applied over the body to kill louse and tick. Leaf juice can be applied to treat skin diseases.
37.	*Morus australis* Poir. Moraceaee RA 713	Kimmu	T	Root	Extract of root is given orally to cattle to treat intestinal worms.
38.	*Musa paradisica* L. Musaceae RA 708	Malbok kera	H	Fruit	Ripen fruit of *Musa paradisica*, powder of pepper (*Piper nigrum*), ghee of *Aesandra butyracea,* flour of barley (*Hordeum vulgare*), *Phagopyrum esculentum* is given orally in case of mastitis. Beside this, paste made from the stalk of jackfruit, honey bee can be applied on the nipple and nipples should be dipped in vessel containing hot water that helps to cure mastitis.
39.	**Nicotiana tabaccum* L. Solanaceae RA 36	Surti	H	Leaf	Powder prepared from one kg dried leaf of *Nicotiana tabaccum* and 500g leaf of *Azadirachta indica* is soaked in half litre water for 3-4 hrs and then applied over the body skin to kill louse and tick.
40.	*Oxalis corniculata* L. Oxalidaceae RA 750	Chariamilo	H	Leaf	Juice obtained by pounding fresh leaves is dropped into the eyes with the help of sprayer or with hand twice daily for 7 days to cure conjunctivitis.
41.	**Plumeria acutifolia* Poir. Apocynaceae RA 749	Golechi	T	Leaf	Tender shoots of *Prunus persica* and corm of *Arisaema tortuosum* are pounded into paste and mixed with latex obtained from the leaf of *Plumeria acutifolia* and applied in infected area for eradicating worms from wounded areas.
42.	**Prunus cerasoides* D. Don Rosaceae RA 704	Paiyu	T	Bark	The paste obtained after boiling the bark of *Prunus cerasoides* is mixed with the paste obtained from the same process from the bark of *Garuja pinnata* is externally applied over the sprain or fractured part of leg and tied with *katro* (small stick made from the stem of bamboo are placed near to each other and is tied with the help of thread/string).
43.	**Rhus javanica* L. Anacardiaceae RA 730	Bhakkimlo	T	Fruit	Ripe fruits are soaked in water & such formed acidic water is given orally twice a day to animal to cure diarrhea and dysentery.
44.	**Rubus ellipticus* Sm. Rosaceae RA 729	Aiselu	S	Leaf	Tender shoot are pounded into paste and applied in infected area for eradicating worms from wounded areas.
45.	**Rumex hastatus* D. Don Polygonaceae	Kapo	H	Whole plant	Extract of juice is applied over the body to treat scabies.

	RA 728				
46.	*Schima wallichii* (DC.) Korth. Theaceae RA 741	Chilaune	T	Leaf/ Bark	Juice obtained by pounding the leaves and bark of the tree is made powder and given with flour orally to the cattle suffering from taeniasis.
47.	*Solena heterophylla* Lour. Cucurbitaceae RA 747	Golkankri	C	Root	The paste prepared from root is applied to the infected part to cure mastitis.
48.	*Staphylea* sp. Staphyleaceae RA 733	Kayan	T	Bark	Bark of the plant is cooked with chappatte and is given orally to cattle if uterus expel out during delivery.
49.	*Terminalia bellirica* (Gaertn.) Roxb. Combretaceae RA 718	Barro	T	Fruit	Pulp of about one kg fresh fruit or about half kg of dried fruit powder is given to animal orally twice a day for at least 7 days to get relief from diarrhea.
50.	**Thysanolaena maxima* (Roxb.) Kuntz Gramineae RA 702	Amriso	S	Leaf	Along with the leafy shoot of *Thysanolaena maxima,* leafy shoot of *Saccharum officinarum*, immature leaf of middle part of stem of *Musa paradisica*, fodder of *Dendrocalamus hamiltoni* and *Arundinaria falcata* is given to cattle for easy removal of placenta after delivery.
51.	*Tinospora cordifolia (*Willd.) Miers Menispermaceae RA 719	Kalo ganegurjo	C	Root/Bark	Crushed tuberous root of about 100 g and dried bark of the stem is given orally once up to three days to cattle to cure sterility.
52.	*Trigonella foenumgracium* L. Leguminosae RA 737	Methi	H	Seed	Soaked seed of *Trigonella foenumgracium*, tuberous root of *Asparagus racemosus*, powder of jwano *(Apium graveolens*) and sugarcane is mixed together and cooked with crushed seed of maize (flour) and is given orally to cattle to increase lactation.
53.	**Urtica dioica* L. Urticaceae RA 721	Sisno	H	Leaf	Paste of leaf is applied on the fracture part of bone externally and tied with locally called *katro* (small stick made from the stem of bamboo and are placed near to each other and is tied with the help of thread/ string).
54.	*Vitex negundo* L. Verbenaceae RA 727	Simali	S	Leaf	Boiled extract of the leaf is applied on scabies and other skin infections in animals.

Note: Life forms- H: Herb, S: Shrub, T: Tree, C: Climber; *Not reported in previous literature