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Ethno-Veterinary Health Care Plants in Jagalur Taluk of Davangere District, South India

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Abstract: ***People living in rural areas are having traditional health care practices which are valuable knowledge for maintain human health and animal health, hence present investigation has been made to document the Traditional veterinary health care knowledge of local communities in Jagalur Taluk of Davangere district, Karnataka. The present study revealed that, a total of 121 medicinal plant species belongs to 117 genera and 54 families used for animal health care. The 40 different ailment types were documented as veterinary health problems in study area. The major and most widespread diseases according to the informants include 14 plant species were used for the treatment of bloat disease, 14 plants for fever, 12 plants for dysentery, 10 plants for lack of appetite and 9 plants for foot and mouth disease, 7 species for bone fracture and dislocation of bones. Of the 121 recorded plant species frequently applied plant species against veterinary ailments. Proper documentation of this type of indigenous knowledge about the plants could be supportive in achievement of sustainable threatened of endangered medicinal herbs and conservation aspect with future research.***

Keywords: Ethno-veterinary, Medicinal plants, Jagalur taluk, South India

1. Introduction

India has a rich culture of medicinal herbs and spices, which includes about more than 2000 species and has a vast geographical area with high potential abilities for Ayurvedic, Unani, Siddha traditional medicinal systems only few medicinal herbs have been studied chemically and pharmacologically for their potential medicinal value (Gupta *et al.*, 2005; Sandhu and Heinrich, 2005). Human beings have used plants for the treatment of different health problems for thousands of years (Sofowara, 1982; Hill, 1989). According to the World Health Organization, most populations still rely on traditional medicines for their psychological and physical health requirements (Rabe and Van Stoden, 2000). Rural areas of many developing countries still rely on traditional medicine for their primary health care needs. These natural medicines are relatively safer and cheaper than synthetic or modern medicine (Iwu *et al.*, 1999; Idu *et al.*, 2007; Ammara *et al.*, 2009). People living in rural areas from their personal experience know that these traditional remedies are valuable source of natural products to maintain human health and animal healthcare. However, they may not understand the interaction between these medicines and human body. Moreover, knew that certain medicinal herbs are highly effective only when used at specific therapeutic doses (Maheshwari *et al.*, 1986; Van Wyk *et al.*, 2000).

For certain common diseases and more chronic conditions such as colds, skin diseases, worms, wounds, reproductive disorders, nutritional deficiencies, and mild diarrhoea, ethnoveterinary medicine has much to offer and can be a cheap and readily available alternative to costly imported drugs. For some diseases, a combination of modern and local remedies and management practices might be preferable. The search for alternatives is especially important. Some reports should therefore explore whether local treatments are available, and should validate practices that are promising. Hence present investigation has been made to document the Traditional veterinary health care knowledge about plants wealth in Jagalur Taluk of Davangere district, Karnataka.

2. Materials and Methods

Study area

Jagalur taluk in Davangere district is bounded by Bellary district, in the north, Chitradurga district in the east and south. Davangere and Harapanahalli taluk in the west. Jagalur taluk is having 3 hobblies 170 villages. The taluk lies between north latitude 30° 75"and east longitude 45° 13" to 50° 14'. The temperature is minimum (18° C) during November and December, maximum (43° C) during May. The average rainfall has been 556mm. The total population of the is 158883, among them male is 80954 and female is 77929 (2011, census). The cattle population of the taluk is 39288. The study area possesses forest area of 12688 hectors. This is about 13.28% of the total geographical area. The main occupation of the taluk is agriculture and maize, jower, ragi, groundnut, sunflower, and sugarcane are the main crops. There is no river in this taluk. Main irrigation is by tanks and borewells. Local residents in the study area belonged to different castes such as Kurubas, Bhovis, Madigas and Muslims.

Data collection and Field survey

An ethnomedical study was undertaken in 15 randomly selected villages of Jagalur taluk. The survey was carried out during the year 2014. There were 18 rural herbal practitioners aged between 45-70 years of age who were interviewed, among them 17 were male and 1 female. Most herbal healers have 15-35 years of experience in the treatment of diseases of domestic animals. The ethnoveterinary data was collected through interviews and discussion. In interview a list of questions and information

on the plant species used to treat veterinary ailments. Their local name, parts of plant, method of drug preparation and mode of use was collected. Plants were identified taxonomically using the standard floras, flora of presidency of Madras, flora of Chikmagalur district, flora of Shimoga district, flora of Davangere district (Gamble, 1995; Yoganarasimhal *et al*., 1982; Ramswamy *et al*., 2001).

3. Results and Discussion

Ethnobotany is perhaps most important method to study natural resources and their management by indigenous people it enables us to work with local people to explore knowledge based on experiences of age. The traditional knowledge system in India is fast disappearing. So there is an urgent need for inventorying and recording all ethnobotanical information among the diverse ethnic communities. The present work revealed that on ethnobotanical uses of plant belonging to Jagalur taluk been documented for their interesting therapeutic properties for various ailments of animals. Various plants have dual significance as food and certain medicinal plants can have some active constituent for future pharmaceutical analysis.

Medicinal Plants and their Medical Application

In the present study, a total of 121 medicinal plant species belongs to 117 genera and 54 families used for animal health care purpose. Forty different ailment types were documented as veterinary health problems in Jagalur taluk (Table.1). The major and most widespread diseases according to the informants include 14 plant species were used for the treatment of bloat disease, 14 plants for fever, 12 plants for dysentery, 10 plants for lack of appetite and 9 plants for foot and mouth disease, 7 species for bone fracture and dislocation of bones. Of the 121 recorded plant species frequently applied plant species against veterinary ailments included *Adhatoda zeylanica* (Medikus.), *Wrightia tinctoria* R.Br, *Leucas apera* (Willd.) Link, *Withania somnifera* (L.) Dunal, *Azadirachta indica* (A.Juss)

Table 1: Medicinal plants used in the treatment of veterinary disease by local communities in Jagalur Taluk.

Sl No	*Ailments/Animal Diseases*	*Botonical Name, Family*	*Dosage*
1.	Bloat	*Cissus quadrangularis* L. [vitaceae] *Withania somnifera* (L.) Dunal [Solanaceae] *Toddalia asiatica* (L.) Lam. [Rutaceae] *Holoptelea integrifolia* (Roxb.) [Ulmaceae]	One handful of leaves of *C.quadrangularis, T.asiatica* root of *W.somnifera* ground with the bark of *H.integrifolia* are made into paste, this paste is given orally in cow's butter milk thrice daily for 2 days.
		Jatropa curcas L. [Euphorbiaceae]	Bark of *J.curcas* ground with water and given orally once daily for 3 days.
		Leucas aspera (Willd.) Link [Lamiaceae]	Handful of leaves of *L.aspera* ground with 7 fruits of pepper, 5 cloves of garlic, are given orally twice daily for 3 days.
		Moringa oleifera auct.non Lam. [Moringaceae]	Leaves of *M.oleifera* ground into paste mixed with cow's butter milk and given orally until the cure
		Acorus calamus L. [Araceae] *Trachyspermum ammi* (L.) Sprague [Apiaceae]	1 inch stem of *A.calamus* and 2 tea spoon full of *T.ammi* are ground and given orally with warm water until the cure.
		Aegle marmelos (L.) Correa [Rutaceae] *Trachyspermum ammi* (L.)Sprague [Apiaceae] *Allium cepa* L. [Liliaceae]	Leaves of *A.marmelos* ground with 1 tea spoon of seeds of *T.ammi*, pepper and 1 bulb each of *A.cepa*, Garlic given orally then ground nut oil is made to drink once daily for 2 days.
		Adhatoda zeylanica (Medikus.) [Acanthaceae]	Leaf juice is given orally until the cure.
		Coccinia grandis (L.) Voigt [Cucurbitaceae]	Leaves of *C. grandis* ground with 7 cloves of garlic and 7 fruits of pepper into paste given orally with water once daily for 5 days.
		Sapindus laurifolia Vahl. [Sapindaceae]	Fruits of *S. laurifolia* is crushed and given with water until the cure.
2.	Common fever	*Leucas apera* (Willd.) Link [Laminaceae] *Momordica charantia* L. [Cucurbitaceae] *Andrographis paniculata* (N.Burman) [Acanthaceae]	One handful of each of the leaves of *L. apera, M. charantia, A. paniculata* are ground in 2 glass of butter milk given orally twice daily for 2 days.
		Azadirachta indica (A.juss) [Miliaceae]	The bark of *A. indica* ground in water and the juice is given twice daily for 3 days.
		Withania somnifera (L.) Dunal (Solanaceae) *Cassia fistula* L. (Caesalpiniaceae) *Limonia acidissima* L. (Rutaceae) *Curcuma longa* auct.non L. [Zingiberaceae] *Zingeber officinale* Roscae . [Zingeberaceae] *Balanites roxburghii* (Phanchon) [Simarovbaceae]	Bark of *W. somnifera, C. fistula, L.acidissima* crushed with *C.longa* Pepper, garlic, *Z.officinale* boiled in 2 liters of water and reduced to ½ liter decoction, this decoction given orally, after this fruit of *B.roxburghii* taken once daily for 2 days.
		Zingeber officinale Roscoe [Zizgeberaceae] *Citrus aurantifolia* (Christm) [Rutaceae]	These are crushed and boiled in 1 liter of water and reduced to ¼ liter, this decoction is given orally once daily for 3 days.
		Wrightia tinctoria R.Br [Apocynaceae] *Holoptelea integrifolia* (Roxb.) [Ulmaceae] *Adhatoda zeylanica* (Medikus.) [Acanthaceae] *Leucas* apera (Willd.)Link [Laminaceae]	The leaves of *W. tinctoria, H. integrifolia, A. zeylanica, L. apera*, are ground with pepper, garlic, and the juice is given twice daily for 2 days.

		Adhatoda zeylanica (Medikus.) [Acanthaceae] *Wrightia tinctoria* R.Br [Apocynaceae] *Leucas* apera (Willd.) Link [Laminaceae] *Achyranthus apera* L. [Amaranthaceae] *Withania somnifera (*L.) Dunal [Solanaceae] *Argemone Mexicana* L. [Papaveraceae]	These plant leaves are ground with water and the juice is given orally once daily for 3days.
		Wrightia tinctoria R.Br [Apocynaceae] *Thespesia lampas* (cav.) [Malvaceae]	The leaves of these plants ground and the juice is given orally twice daily for 2 days.
3.	Cough	*Wrightia tinctoria* R.Br [Apocynaceae]	Bark of *W. tinctoria,* ground with 6 to 7 Pepper , 1 blub of garlic into paste given orally with butter milk thrice daily for 2 days.
		Adhatoda zeylanica (Medikus.) [Acanthaceae] *Leucas* apera (Willd.) Link [Laminaceae] *Celtis timorensis* span. [Ulmaceae]	Leaves of these plants are ground into paste given orally with water for 3 days.
		Celtis timorensis span. [Ulmaceae] *Curcuma longa* auct.non L. [Zingiberaceae]	The bark of *C. timorensis* is ground with Pepper Garlic, *C.longa*, into paste given orally with water for 3 days.
		Aegle marmelos (L.) Correa [Rutaceae] *Balanites roxburghii* (Phanchon) [Simarovbaceae] *Ocimum sanctum* L. [Lamiaceae] *Tinospora cordifolia* (Willd.) [Menispermaceae]	Leaves of *A.marmelos, O. sanctum, T.cardifolia*, are ground into paste. Paste is mixed with the fruit juice of *B.roxburghii* given orally twice daily for 2 days.
		Adhtoda vesica Nees [Acanthaceae]	Leaves of *A.vesica,* are ground with fruits of pepper into paste given orally with water twice daily until the cure.
4.	Diarrohoea	*Cymbopogan caesius* (Hook.and Arn.) [Poaceae] *Maytenus emarginta* (Willd) [Celastraceae] *Ziziphus jujube* Lam. [Rhamnaceae]	The leaves of these plants are ground into paste, mixed with fresh cow's milk and given orally twice daily for 3 days.
		Punica granatum L. [Punicaceae] *Pedalium murex* L. [Pedaliaceae] *Ailanthus excels* Roxb. [Simaroubaceae]	Fruit of *P.granatum*, leaves of *P.murex*, and the bark of *A.excels* ground into paste, given with cow's butter milk twice daily for 2 days.
		Aegle marmelos (L.) Correa [Rutaceae]	Fruit flesh is given orally.
		Cajanus cajana (L.) [Fabaceae]	Seeds of *C. cajana* ground into paste and given orally with fresh cow's milk twice daily for 3 days.
		Thespesia lampas (cav.) [Malvaceae]	The leaf juice of this plant is mixed with fresh cow's milk given orally thrice daily for 2 days [equal amount of milk and leaf juice is given]
		Limonea acidissima L. [Rutaceae] *Carum curvi* G.Koch [Apiaceae]	2 fruits of *L. acidissima* ground with 25 gram of *C. curvi* in butter milk given thrice daily for 3 days.
5.	Intestinal worms	*Azadiracta indica* (A.Juss) [Meliaceae]	6 leaves of *A.indica* are boiled in 2 glass of water and reduced to ½ glass decoction. From this 2 spoons are given in empty stomach for 2 days.
		Emblica ribes N.Burman [Myrsinaceae] *Butea monosperma* (Lam.) [Fabaceae]	25 of seeds of *E.ribes* and 3 seeds of *B.monosperma* are ground with jaggery into paste given orally with food for 2 days.
6.	Foot and mouth disease	*Semecarpus anacardium* L.f [Anacardiaceae] *Piper betle* L. [Piperaceae]	2 seeds of *S. anacardium,* 3 leaves of *P. betle,* 1 bulb of onion are ground into paste and mixed with 200gram of coriander powder, this mixture is given orally in water twice daily for 2 days.
		Azadiracta indica (A.Juss) [Meliaceae] *Ailanthus excels* (Roxb) [Simaroubaaceae] *Toddalia asiatica* L. [Rutaceae] *Anacardium occidentale* L. [Anacardiaceae] *Ferula assafoetida* L. [Apiaceae]	The bark of *A. indica, A. excels* and seeds of *T. asiatica A. occidental* are ground with a bulb of *onion* into paste. This is mixed with *F. assafoetida* given orally in water for 3 days.
		Anacardium occidentale L. [Anacardiaceae] *Musa paradisiaca* L. [Musaceae]	1 seed of *A. occidentale* is crushed and given orally with *M. paradisiaca* once daily for 4 days.
		Blepharis repens (Vahl) [Acanthaceae]	The leaves of *B.repens* ground with Pepper into paste given orally in water twice daily for 3 days.
7.	Lack of appetite	*Adhatoda zeylanica* (Medikus.) [Acanthaceae] *Datura metal* L. [Solanaceae] Aegle marmelos (L.) Correa [Rutaceae] *Brassica nigra* L. [Brassicaceae]	One handful of each of the leaves of *A. zeylanica, D. metal, A. marmelos*, ground with ground with 1 bulb of Garlic, 10 to 15 fruits of Pepper and 2 spoons of *B.nigra* into paste. This paste is given orally twice daily along with ragi balls for 4 days.
		Cissus quadrangularis L. [vitaceae]	Whole plant is given orally only once.
		Argemone Mexicana L. [Papaveraceae]	Stem of *A.mexicana* is given orally only once.
		Withania somnifera (L.) Dunal [Solanaceae] *Cinnamomum wightii* (Meissner) [Lauraceae] *Elettaria cardamomum* (L.) *Papaver somniferum* L. [Pepaveraceae]	All these are boiled in 2 liters of water and reduced to 1 liter this decoction is given orally once daily for 2 days.

8.	Ephemeral fever	*Argemone Mexicana* L. [Papaveraceae] *Alangium salvifolium* (L.f) [Alangiaceae] *Commiphora myrrha* (Nees) [Burseraceae]	Root of *A. Mexicana* leaves of *A. salvifolium* and *C. myrrha* are ground with garlic into paste given orally with warm water twice daily for 3 days.
		Withania somnifera (L.) Dunal [Solanaceae] *Pergularia daemia* (forsskal) [Asclepiadaceae]	Paste of both roots is given orally twice daily for 3 days.
		Plumbago zeylanica L. [Plumbaginaceae] *Moringa oleifera* auct . [Moringaceae] *Azadirachta indica* (A.juss) [Meliaceae] *Piper betle* L. [Piperaceae]	Root of *P. zeylanica* leaves of *M.oleifera* , *A.indica* are ground with 2 leaves of *P.betle* into paste. Paste given orally in goat milk twice daily for 2 days
		Coccinia grandis (L.) Voigt [Cucurbitaceae]	Leaves of *C. grandis*is ground with 7 cloves of garlic, 7fruits of pepper into paste. This paste given orally in cheese twice daily for 3 days.
		Capparis zeylanica L. [Capparaceae] *Piper betle* L. [Piperaceae]	Leaf juice is given orally twice daily for 3 days.
		Diospyros melanoxylon Roxb. [Ebenaceae]	Leaves of *D. melanoxylon* is ground with 1 bulb of each of garlic, onion, into paste. This paste is mixed with 2 tea spoon of coriander powder and given orally in water twice daily for 2 days.
		Oroxylum indicum L. [Bignoniaceae] *Trachyspermum ammi* (L.) Sprague [Apiaceae] *Carum curvi* G.Koch [Apiaceae]	Bark of *O.indicum* is crushed with 5 to 6 pieces of Zinger, 4 spoon of *C. curvi T. ammi* and garlic are boiled in water, that 1glass of decoction is given orally thrice daily for 2 days.
		Terminalia chebula Retz. [Combretaceae]	Bark is crushed and boiled in water, that decoction is given twice daily for 8days.
9.	Skin disease	*Solanum xanthocarpum* Schrader andWendl. [Solanaceae] *Sorghum vulgare* L. [Poaceae]	fruit of *S. xanthocarpum* and is ground with *S. vulgare* into paste, paste is applied topically on the infected part until the cure.
		Pongamia pinnata L. [Fabaceae] *Azadirachta indica* (A.juss) [Meliaceae]	The oil of *P. pinnata* or *A. indica* is applied topically on the infected part, until the cure.
10.	Inflammatory swelling	*Aloe vera* (L.) N [Liliaceae]	2-3 leaves of *A.vera* ground with 50gm of lime paste, this kept for 2-3 days in closed vessel and applied topically on the swelled part once daily for 5 days.
		Ailanthus excels (Roxb) [Simaroubaceae] *Ficus religiosa* L. [Moraceae]	Leaves are ground into paste given orally in water twice daily for 4 days.
		Tylophora indica (N.Burman) [Asclepiadaceae] *Leucas* apera (Willd.) Link [Laminaceae] *Erythrina indica* Lam. [Fabaceae]	Leaves of *T.indica, L.aspera*, bark of *E.indica*, are ground with 10-15 Pepper and 1 bulb of Garlic are given orally twice daily for 2 days.
11.	Maggot wound	*Tagetes erecta* L. [Astraceae]	Leaf juice is squeezed on the wound part until the cure.
		Nicotiana tabacum L. [Solanaceae]	Leaves are ground into paste mixed with lime paste, this mixture applied topically on the wound part.
12.	Inferility	*Solanum melongena* L. [Solanaceae]	1kg ripen fruit of *S.melongena* is given orally once daily for week.
		Cocos nucifera L. [Arecaceae]	Inflorescence of *C.nucifera* is crushed and given orally with tender coconut once daily for 4 days.
		Ficus benghalensis L. [Moraceae]	Leaves are given.
13.	Repeat breeding problem	*Mimosa pudica* L. [Mimosaceae]	200 gram of *M. pudica* crushed and boiled in 1 liter of water. This decoction given orally once daily for 2-3 days.
		Butea monosperma L. [Fabaceae]	Bark and leaves are crushed and boiled in water. This decoction is given orally once daily for a week.
		Murraya koenigii (L.) [Rutaceae]	Leaves are given orally once daily for 5 days.
		Lawsonia inermis L. [Lythraceae]	½ kg leaves are ground and the juice is given orally once daily for 5 days.
14.	Poor milk production	*Withania somnifera* (L.) Dunal [Solanaceae] *Leptadenia reticulate* (Retz.) [Asclepiadaceae]	Root of *W. somnifera*is ground and given orally in cow's butter milk once daily for 2 days, with this a handful of leaves of L. reticulate is given orally for a week.
		Asparagus racemosus (Willd) [Liliaceae]	Tubers are boiled in 3 glass of water and reduced to 1 glass decoction given orally twice daily for 2 days.
		Sida rhombifolia L. [Malvaceae]	2-3 handful of leaves are given orally once daily for 3-4 days.
15.	Retention of placenta	*Mimosa pudica* L. [Mimosaceae]	50 gm of whole plant is ground in water. Juice is given orally twice daily.
		Ablemoschus esculentus [Malvaceae]	Leaves are given orally once.
		Bambusa arundinaceae (Retz.) [Poaceae]	Leaves are given orally once.

16.	Problem of milk let down	*Asparagus racemosus* (Willd) [Liliaceae]	2 tubers of *A. racemosus* ground in water and the juice is given orally twice daily for 4 days.
		Datura metal L. [Solanaceae]	3-4 fruits of *D.metal* is given orally with rice bran once daily for 3 days.
17.	Fever with respiratory symptoms	*Datura stramonium* L.[Solanaceae]	Leaves of *D. stramonium* ground with 7 fruitsof pepper 7 cloves of garlic is given orally twice daily for 3 days.
		Moringa oleifera auct . [Moringaceae] *Adhatoda zeylanica* (Medikus.) [Acanthaceae] *Argemone Mexicana* L. [Papaveraceae] *Toddalia asiatica* L. [Rutaceae] *Leucas* apera (Willd.)Link [Laminaceae] *Wrightia tinctoria* R.Br [Apocynaceae] *Leucas* apera (Willd.)Link [Laminaceae]	Bark of *M. oleifera* leaves of *A. zeylanica, A. Mexicana,* are ground with pepper, garlic given orally once daily for 3 days. Each of the leaves of *T. asiatica, L.aspera W. tinctoria* ground with pepper and garlic given orally in warm water once daily for 2 days.
		Ailanthus excels Roxb. [Simaroubaceae] *Capparis zeylanica* L. [Capparaceae]	Bark of *A. excels,* Leaves of *C. zeylanica* ground with Pepper given orally with warm water twice daily for 3 days.
		Adhatoda zeylanica (Medikus.) [Acanthaceae] *Acacia polycantha* Willd. [Mimosaceae]	Leaf juice is given orally twice daily for 3 days.
		Ocimum basilicum L. [Lamiaceae] *Ocimum tenuiflorum* L. [Lamiaceae] *Holoptela integrifolia* (Roxb.) [Ulmaceae] *Aristolochia indica* L. [Aristolochiaceae]	Leaves of *O. basilicum , O. tenuiflorum, H. integrifolia, A. indica* are ground with garlic, pepper into juice, juice is dropped into nose thrice daily for 3 days.
18.	Dysentery	*Bambusa arundinaceae* (Retz.) [Poaceae]	Leaves are given orally with jaggery twice daily, for 3 days.
		Tinospora cardifolia (Willd) [Menispermaceae]	Leaf juice is given orally with fresh cow's milk twice daily, for 2 days.
		Thespesia lampus (Cav.) [Malvaceae] *Vigna angularis* (L.) [Fabaceae]	Leaves are ground with 25gram of *Vigna angularis* paste is given orally.
		Aegle marmelos (L.) Correa [Rutaceae] *Ficus racemosa* L. [Moraceae]	Pulp of these fruits are given orally twice daily for 2 days.
		Aloe vera (L.) [Liliaceae] *Antidesma ocidum* Retz. [Euphorbeaceae]	Leaves are crushed and boiled in 2 glass of water with sugar and the decoction is given orally twice daily for 2 days.
		Breynia vitis idaea (N.Burman) [Euphorbiaceae]	Leaf juice is given orally with curd twice daily for 3 days.
		Argyreia cuneata (Willd.) [Convolvulaceae] *Setaria italika* (L.) [Poaceae]	Leaves are ground with navane into paste given orally twice daily, for 3 days.
		Acacia eburnean [Mimosaceae] *Thespesia lampus* (Cav.) [Malvaceae] *Argyreia cuneata* (Willd.) [Convolvulaceae] *Zizipus jujuba* Lam. [Rhamnaceae]	Leaves are ground into paste and given orally twice daily, for 2 days.
19.	Blood in urine	*Cajanus cajana* (L.) [Fabaceae]	Seeds are boiled in water with sugar, decoction is given orally twice daily for 2 days.
20.	Nose ulcer	*Leucas aspera* (Willd.)Link [Lamiaceae]	Leaves are ground with pepper and garlic into paste, this is rubbed externally over nostrils of nose by fingers twice daily until the cure.
		Solanum xanthocarpum Schrader andwendl. [Solanaceae]	Root is ground with fresh cow's milk and the juice is dropped topically into nose for every 15min until the cure.
21.	Horn ulcer	*Ocimum sanctum* L. [Lamiaceae]	Leaf juice is mixed with old ghee and is applied topically on the infected part until the cure.
22.	Seizure	*Cymbopogon caesius* (Hook,and Arn.) [Poaceae] *Dichrostachys cinera* L. [Mimosaceae]	Flowers of *C.caesius,* leaves of *D.cinera* are ground with pepper and garlic into paste, given orally once daily for 3 days.
23.	Snake bite	*Adhatoda zeylanica* (Medicus.) [Acanthaceae] *Wrightia tinctoria* R.Br [Apocynaceae]	Leaves are ground with pepper and garlic in water and the juice is given orally only twice.
		Wrightia tinctoria R.Br [Apocynaceae]	Leaves are ground with 7 fruits of pepper and garlic into juice, given orally only twice.
24.	Hair loss	*Anacardium occidentale* L. [Anacardaceae]	Seeds are ground with jaggery into paste, mixed with small amount of refined oil and is applied externally over the infected part until the cure.
25.	Stomach problem	*Jatropa curcas* L. [Euphorbiaceae] *Agave cantula* (Roxb) [Agavaceae]	Leaves are given orally once.
		Adhatoda zeylanica (Medicus.) [Acanthaceae]	Leaves are tied around the neck of cattle.
		Lycopersicon lycopersicum (L.) [Solanaceae] *Tamarindus indica* L. [Caesalpinaceae] *Agave cantula* (Roxb) [Agavaceae]	Leaves are ground with fruit of *T. indica* into paste given orally only once.
25.	Corneal opacity	*Neerium olender* L. [Apocynaceae]	2-3 drops of latex is dropped topically on the affected eye twice daily, for 7 days.

		Breynia vitis idasa (N.Burman) [Euphorbiaceae]	Latex is dropped topically on the affected eye until the cure.
		Rhaphanus sativus L. [Brassicaceae]	Leaves are ground with butter milk into juice, 2-3 drops dropped topically on the affected eye, twice daily for 10 days.
		Pergularia daemia (Forssk.) Chiov. [Asclepiadaceae]	Leaf juice dropped topically on the affected eye, twice daily for a week.
		Citrus aurantifolia (Christm.) [Rutaceae]	Fruit juice mixed with a pinch of salt, and dropped topically on the affected eye twice daily for 3 days.
26.	Insect bite	*Adhatoda zeylanica* (Medicus.) [Acanthaceae] *Wrightia tinctoria* R.Br [Apocynaceae] *Caesalpinia bonduc* L. [Caesalpinaceae] *Capsicum annum* L. [Solanaceae]	Each of the leaves of *A. zeylanica*, *W. tinctoria*, and *C. bonduc* are ground with stalk of *C.annum* into paste, given orally twice daily.
		Securinega virosa (Willd.) [Euphorbiaceae]	Leaves are ground with 7 fruits of pepper and 7 cloves of garlic into paste given orally twice daily.
		Adhatoda zeylanica (Medicus.) [Acanthaceae] *Securinega virosa* (Willd.) [Euphorbiaceae] *Tinospora cardifolia* (Willd) [Menispermaceae]	Leaf juice mixed with cow's butter milk given orally twice daily.
		Wrightia tinctoria R.Br [Apocynaceae] *Holoptelia integrifolia* (Roxb) [ulmaceae] *Trewia nudiflora* L. [Euphorbiaceae]	Leaf juice is given orally twice daily.
27.	Pain abdomen	*Cassia mimosoides* L. [[Caesalpinaceae] *Gossypium herbaceum* L. [Malvaceae] *Syzygium cumini* (L.) [Myrtaceae]	Leaves of *C. mimosoides*, bark of *G.herbaceum* and *S. cumini* are ground into paste, given orally with fresh cow's milk twice daily for 3 days.
28.	Vein rupture	*Ximenia americana* L. [Olacaceae] *Blepharis repens* (Vahl) [Acanthaceae] *Tinospora cardifolia* (Willd) [Menispermaceae]	Bark of *X. Americana*, *B. repens*, stem of *T. cardifolia* are ground with goat or cow's milk and paste bandaged with cloth around the rupture part once daily for 5 days.
29.	Bone Fracture	*Malva rotundifolia* L. [Malvaceae] *Blepharis repens* (Vahl) [Acanthaceae]	Leaves are ground into paste with cow's milk, applied topically on the fractured part for 15 days.
		Ximenia americana L. [Olacaceae]	Bark is ground with cow's milk into paste, bandaged with cloth around the fracture part for 12 days.
		Agave cantula (Roxb) [Agavaceae] *Eleusine coracana* (L.) [Poaceae]	Leaves of *A. cantula* ground with seeds of *E. coracana* into paste, applied topically on the fractured part for 15 days.
		Euphorbia tortilis Rottler ex [Euphorbiaceae] *Dodonaea viscose* (L.) [Sapindaceae]	Latex of *E. tortilis* applied by joining the fractured bones over this, leaf paste of *D. viscose* and egg is applied topically on the fractured bones.
30.	Neck swelling	*Calotropis gigantea* L. [Asclepiadaceae]	Latex is mixed with refined oil, applied externally on swelled part until the cure.
31.	Epistachsis	*Allium cepa* L. [Liliaeceae]	Bulb juice is dropped into nose once.
32.	Mastitis	*Aloe vera* (L.) [Liliaceae]	2-3 leaves are crushed and mixed with 50gm of lime paste, mixture is applied externally on the infected area.
		Andrographis serpyllifolia (Vahl) [Acanthaceae]	This is crushed and boiled with 3 fruits of pepper, 3 bulbs of garlic, decoction given orally twice daily for 8 days and the remaining decoction smeared on the infected region.
33.	Abortion	*Diospyros montana Roxb.* [Ebenaceae]	Two handful of leaves are ground and given orally with butter milk once daily for 3 days.
		Asparagus racemosus (Willd) [Liliaceae]	¼ kg of *A. racemosus* is crushed and given with food once daily for 4 days.
34.	Metritis	*Tinospora cardifolia* (Willd) [Menispermaceae]	Plant is ground with rice soaked water into paste, given orally once daily for a week.
		Aegle marmelos (L.) Correa [Rutaceae]	300gm of leaves are crushed and given orally with akki ganji once daily for 3 days.
35.	Ticks and mites [Ectoparasites]	*Achyranthus apera* L. [Amaranthaceae]	Leaf juice applied externally over the body of cattle once daily for 3-4 days and washed.
		Annona squamosa L. [Annonaceae] *Azadiracta indica* (A.juss) [Meliaceae]	Seeds of *A. squamosa* are ground with leaves of *A. indica* into paste, applied externally over the body of cattle in morning and washed in evening for 4-5 days.
36.	Yoke gall	*Tinospora cardifolia* (Willd) [Menispermaceae]	Leaf juice is applied externally on the infected part twice daily for 7 days.
		Tridax procumbens L. [Astraceae]	Leaves are ground with rhizome of turmeric into paste and applied externally on the infected part twice daily for 10 days.
37.	Fever (Neer jwara)	*Adhatoda zeylanica* (Medikus.) [Acanthaceae] *Argemone mexicana* L. [Papaveraceae]	Leaves of *A. zeylanica* and root of *A. mexicana* are ground into paste given orally with water twice daily for 3 days.

38.	Urine problem	*Colocasia esculenta* (L.) Schott [Araceae]	Stem is ground into paste, given orally with water thrice daily for 2 days.
39.	Intermited fever	*Tinospora cardifolia* (Willd) [Menispermaceae] *Centratherum anthelminticum* (L.) [Asteraceae]	Leaves are ground into paste given orally twice daily for 3 days.
40.	Anthrax	*Withania somnifera* (L.) Dunal [Solanaceae] *Asparagus racemosus* (Willd) [Liliaceae]	Corm paste is given orally with water twice daily for 3 days.

4. Plant Families

The family Acanthaceae was represented by the highest number of species (18 species). This was followed by Solanaceae (16 species), Rutaceae (14 species), Lamiaceae (13 species), Apocynaceae (12 species) and Malvaceae (9 species). Poaceae, Fabaceae were represented 8 species. Apiaceae, Ulmaceae, Papaveraceae and Mimosaceae with 6 species each, while Cucurbitaceae, and Asclepiadaceae with 5 species each (Fig. 1).

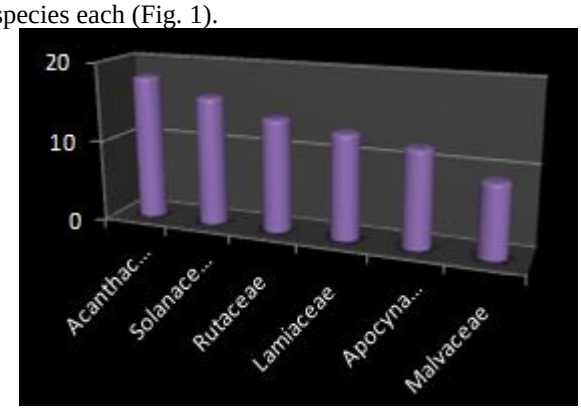

Figure 1: Most dominantly used represented families of Ethnoveterinary knowledge of Jagalur Taluk.

Life forms of Medicinal Plants

In Jagalur taluk, most of the traditional practitioners used locally available plants to cure veterinary diseases. Habit-wise analysis of medicinal plants indicated that tree species were preferred most of the herbal drug preparations represented with 48 species followed by herbs (30 species), shrubs (28 species) and climbers (15 species). Large number of healers preferred wild plants as compared to cultivated species for the preparation of herbal formulation (Fig.2).

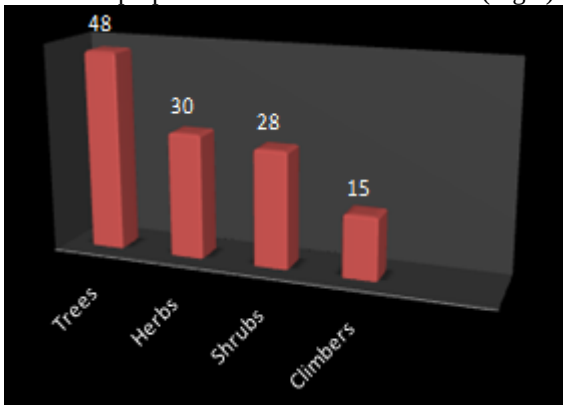

Figure 2: Life form of medicinal plants used in Study area

Plant Parts used and Herbal Preparation

The most commonly used plant part to prepare the herbal remedies was leaf and bark followed by seed, fruit, latex, rhizome, tubers whole plant and flower . In many case, more than one part of the same plant species is used in the treatment of different ailments. The use of plant material can also depend on its availability. The leaves and bark are always available and most of the healers prefer these parts for preparing herbal formulation. The less prefer parts of the plants were flower and fruits because they have short time of availability. The percentage of plant parts included in veterinary applications are, leaves (67%) followed by bark (13%), root (3%) seeds(7%), fruits (5%), latex (5%), Rhizome (2%), Flower (1%), whole plant (2%) (Fig.3). Amongst all the plant parts, leaf is most commonly used in the preparation of different remedies in the study area. This is in agreement with most other ethnobotanical studies in the world (Macia *et al*., 2005; Srithi *et al*., 2009).

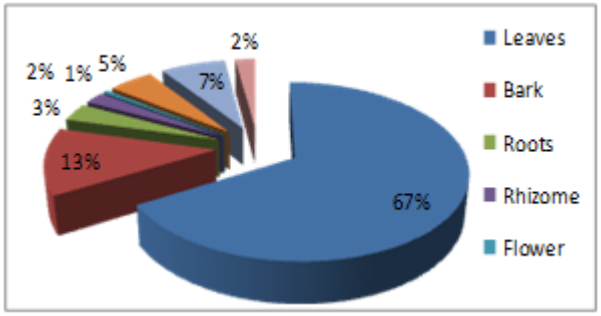

Figure 3: Plant parts used in herbal preparation in Jagalur taluk.

Drug Preparation and Additives

The medicinal plants have various methods of preparation and application for different types of ailments. The majority of herbal remedies are prepared in the form of paste (58 remedies) and juice (36 remedies) followed by decoction (12 remedies), raw (12 remedies) and latex (6 remedies) form (Fig. 4). The rural folk healers prepared remedies in single and in multiple preparations in different ways. The mode of preparation are grounding, crushing, boiling, and chewing or eating fresh part. The crushed parts are used to prepare juices or paste to be taken orally or applied topically.

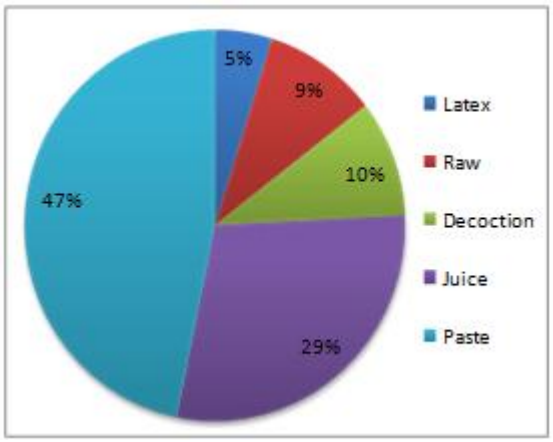

Figure 4: Preparation of herbal drug formulation in study area.

Traditional healers use different mixtures or additives or solvents for the preparation of herbal formulation. In most cases, water was the solvent employed in preparation of the remedy. Besides plants and water, some other materials were also incorporated in the preparations; buttermilk (37%), freshmilk (33%), oil (4%), ghee (2%), sugar (4%), salt (2%), lime paste (7%), coriender powder (4%) and egg (2%).

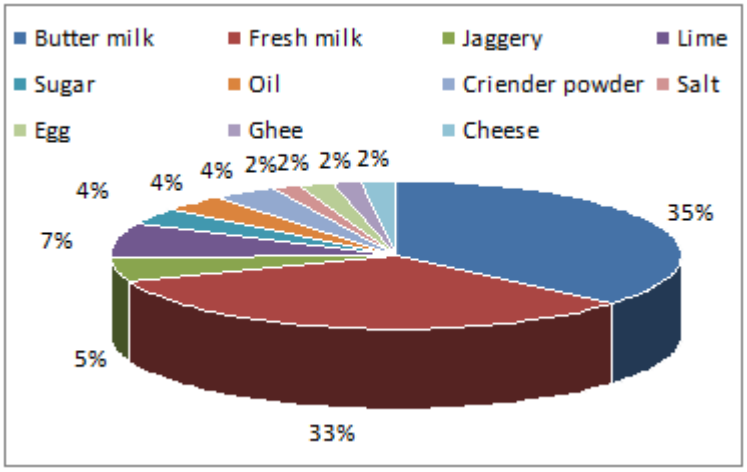

Figure 5: Additives used in herbal formulation in the study area

The majority of the formlations were prepared using a combination of plants. For example, fruit of *Punica granatum* in combination with the leaves of *Pedalium murex* and the bark of *Ailanthus excels* for diarrohoea. Flower of *Cymbopogon caesius* in combination with the leaves of *Dichrostachys cinera*, fruits of *Piper nigrum* and bulb of *Allium sativum* for seizure. And leaves of *Cissus quadrangularis*, *Withania somnifera*, *Toddalia asiatica* in combination with the bark of *Holoptelea integrifolia* for bloat. Occasionally, single plant species was used for specific diseases. For example, *Jatropha curcas* for bloat, *Azadirachta indica* for common fever, *Argemone maxicana* for lack of appetite and *Terminalia chebula* for ephemeral fever.

The drug preparations and their therapeutic uses have always differed from region to region. For examples, herbal healers of Andhra Pradesh used, *Tinospora cordifolia* while local people of Salem district in Tamil Nadu used *Cardiospermum halicacabum* for treating fever in cattles. However, traditional practitioners of Jaglur taluk used *Azadirachta indica* or *Leucas aspera*, *Momordica charantia*, *Andrographis paniculata* to treat the same disease. The local healers also used certain plant species to treat the most common multiple ailments. For example *Withania somnifera* to treat bloat. Common fever, lack of appetite, anthrax and *Wrightia tinctoria* to treat fever, cough and snake bite. Herbal healers had their own methods of the prepation of herbal formulation, mode of application, dosage and duration. The present study revealed that all respondents of the study area were male individuals, who learnt traditional healing therapy from their parents and their own experience. Rural people of Jagalur taluk have faith in herbal medicines and utilized locally available plants for veterinary health care as they are easily available.

This lack of effort to sustainable utilization of resources may result in depletion of medicinal herbs in natural habitats. There is a great need to create awareness among the indigenous communities about endangering medicinal plants, if over exploited meet market demand. So that the present status of the economically and medicinally important plants of the study area needs to be determined in order to develop plants for their protection. Improved awareness of conservation issue is needed. Proper documentation of indigenous knowledge about the plants could be supportive constructive of conservation programmes and phytochemical investigation.

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