Ethno Veterinary Therapeutic Practices of Medicinal Flora in Livestock Health Care by Attappadi Tribal farmers of Kerala

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Research

Keywords: Attappadi tribes, Consensus factor, Ethno Veterinary Medicinal plants, Livestock Health, Medicinal uses

Posted Date: March 4th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-258368/v1>

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Abstract

Background- Attappadi is the largest tribal settlement area in Kerala with three tribes viz., Irulas, Mudugas and Kurumbas who are traditionally engaged in livestock activities. The present study was undertaken to document the different plants of ethnoveterinary uses and to identify the most prevailing livestock disease category among livestock farmers of Attappadi tribal area. Hence this study was designed and conducted to understand and effectively use the knowledge, and for the proper selection of important plant species for the most prevailing illness.

Methods- This study was conducted in the period of December 2018 – April 19 using a structured interview with tribal farmers, EVM healers and key informants engaged in the livestock farming.

Results- The present study documented 55 plant species under 39 families for treatment of 15 categories of ailments with their dosages and parts used in Attappadi tribal area. There was great agreement among the informants regarding ethno veterinary uses of plants with Factor of Informants Consensus (F_{IC}) value ranging from 0.50 to 0.97, with an average value of 0.87.

Conclusion- The study reports 55 medicinal plants with their uses and dosage along with the highlighted high F_{IC} values indicates that the species traditionally used to treat these ailments are worth searching for bioactive compounds and this has illuminated the cultural importance of this ethno veterinary wisdom which is consonantly blended with the tribal culture of the area.

Introduction

Indian economy and its population depend greatly on agriculture and the livestock. Livestock contributes 4.11% GDP and 25.6% of total Agriculture GDP. About 20.5 million people depend upon livestock for their livelihood. Livestock provides livelihood to two-third of rural community [1, 2, 3]. Hence the diseases in livestock should be given more importance owing to their significant role in micro and macro economy of nation. Ethnic communities keep their livestock as a symbol of heritage and pride, and they follow indigenous practices to treat their animals. Knowledge on traditional and indigenous practices has been transferred orally over ethnic generations but under the semblance of civilization this knowledge is under great threat of cultural extinction [4]. About 80% of people in the developing world use natural remedies and traditional plant-based medicines for their primary healthcare [5]. Tribal communities are the torch bearers of the Ethnoveterinary knowledge. In Kerala, there are 36 tribal communities consist of a total population 4, 84,839 [6]. Palakkad, one among the largest tribal concentrated districts of Kerala has 10.1 per cent of the total tribal population of the state. Attappadi is the largest tribal settlement area of

Palakkad district with three tribes viz., Irulas (84 per cent), Mudugas (10 per cent) and Kurumbas (six per cent) who are traditionally engaged in livestock activities [7, 8]. Hence this study was designed and conducted to understand and effectively use this knowledge, and the proper selection of important plant species for the most prevailing illness must be determined.

Materials And Methods

The present study was conducted purposively in Attappadi block of Palakkad district in Kerala as this is one among the largest tribal settlements with considerable livestock population. Attappadi block comprised of three panchayats, Agali, Pudur and Sholayoor (Fig. 1). A total of 40 tribal livestock farmers from each of the three panchayats, thus a total of 120 tribal livestock farmers were selected randomly as respondents for the study. Ethno veterinary medicine healers and key informants were interviewed along with the tribal farmers to gather information on EVM practises. Prior Informed Consent (PIC) was taken from the Knowledge Providers. A descriptive research design was employed. Personal interviews by pretested interview schedule and Participatory Rural Appraisal (PRA) approach was used to serve the purpose of data collection ((Fig. 2). During the field study, information on uses of plants to treat different illnesses of livestock, parts used, modes of preparation, dosage and administration of medicine have been collected. Based on the information obtained from the informants in the study area, all the reported ailments have been grouped into 15 categories.

The level of homogeneity among information provided by different informants was calculated by the Informants' Consensus Factor, F_{IC} [9] using the following formula:

$$F_{IC} = \frac{Nur - Nt}{(Nur - 1)} \text{ Where,}$$

Nur = number of use reports from informants for a particular plant-use category

Nt = number of taxa or species that are used for that plant use category for all informants.

Here in this study each polyherbal remedy has been considered as single use-report. The value of F_{IC} provides a range of 0 to 1, where a higher value signifies its greater authenticity as a fixed group of plants are used frequently for that disease or disease category. On the other hand, lower value signifies disagreement among the informants. The similar studies were conducted to know the consent of relevant ethnoveterinary practices in livestock. [10, 11, 12].

Results And Discussion

In the present study the traditional EVM in treatment of different livestock ailments were recorded through the interactive discussions with the tribal farmers and traditional healers (Fig. 3). More than three – fourth of the respondents (81.67%) shared their knowledge on EVM. A minority (18.37%) felt that the sharing of information would lead to the loss of healing potential of these plants. A total of 55 plant species under 39 families in Attappadi area have been documented for treatment of 51 categories of

ailments. Factors for Informants' consensus (F_{IC}) have been used to identify most potentially effective medicinal plant species as well as plant-based remedies used in the culture of rural people of the study area [10]. Here in this study each polyherbal remedy has been considered as single use-report.

As Table 1.1. bespeaks, there was a medium to high level of consensus among the informants in the study area. The F_{IC} value for different disease categories has ranged from 0.50 to 0.97 with an average value of 0.87 that has indicated the level of agreement among the informants regarding different phyto therapeutic uses of medicinal plants. Similar findings were reported from Velliangiri holy hills [13].

Table 1.1
Categories of ailments and informant consensus factor (F_{IC}) for each category

Sl.no	Illness Category	N_{ur}	N_t	F_{IC}
1.	Gastro-Intestinal disorders	89	8	0.92
2.	Poisoning	9	3	0.75
3.	Respiratory disorders	42	4	0.92
4.	Skin diseases	48	7	0.87
5.	Dewormer	29	4	0.89
6.	Fever, Cold	46	4	0.93
7.	Mastitis	46	5	0.91
8.	Reproductive disorders	61	8	0.88
9.	Acaricides	28	2	0.96
10.	Musculo Skeletal disorders	19	3	0.88
11.	FMD	91	5	0.96
12.	Pox	76	3	0.97
13.	Anti - Inflammatory	5	3	0.50
14.	HS	4	2	0.67
15.	Snake bite	25	2	0.96

Pox showed highest F_{IC} value, 0.97 with 76 use reports for three plant species, which was followed by FMD (0.96) with 91 use reports for five plant species, ectoparasitism (0.96) with 28 use reports for two plant species, and snake bite (0.96) with 25 use reports for two plant species. High F_{IC} values possibly showed that these ailments were common in the study area which could be attributed to the better care of farmers since theses disease categories had direct negative influence on production of the animals. Medicinal plants supposed to be efficient in treating ailments having high F_{IC} value [14].

This was followed by gastro - intestinal disorders, respiratory disorders, mastitis, fever and cold with values ranged from 0.93 to 0.91. The least agreement (low F_{IC} value) between informants was observed for plants used to cure inflammatory conditions (0.50) with 5 use reports for three plant species which could be due to the fact that those conditions were remained unnoticed by the farmers as they had no direct influence on animal's production [15]. Similar results were reported among the tribal farmers of Malda district of Bengal [16].

Different EVM practises have been identified and discussed under the following subheads

1. Gastrointestinal disorders - diarrhoea, constipation, indigestion, bloat and stomach pain
2. Respiratory ailments, fever and cold
3. General poisoning and snake venomation conditions
4. Skin diseases - Lacerated wounds, Umbilical wounds, warts, traumatic myiasis,
5. Deworming and ectoparasiticides
6. Reproductive disorders - Infertility, anoestrus, retention of foetal membranes, uterine prolapsed, uterine infection, uterine involution and dystocia.
7. Musculoskeletal disorders - arthritis / joint pain, fracture and sprain.
8. Mastitis
9. Foot and Mouth Disease
10. Pox
11. Inflammatory conditions
12. Haemorrhagic septicaemia

Table 1.2
Ethnoveterinary Medicinal Plants Utilized by Tribal Farmers of Attappadi to manage Livestock Gastro Intestinal Diseases

Ailment/Disease: Gastro Intestinal Diseases					
Sl.no	Vernacular name/ Scientific name (Family)	Parts used	Conditions	Route of administration	Dosage
1.	Adaykka Arecanut <i>Areca catechu</i> (Arecaceae)	Fruit	Worm infestation	Orally as pulverized or bolus form	50 g
2.	Ajowan <i>Trachyspermum ammi</i> (Apiaceae)	Leaf, seed	Indigestion	Orally mixed with boiling water	300 ml
3.	Betel <i>Piper betle</i> (Piperaceae)	Seed	Indigestion	Oral mix	30 g
4.	Bitter gourd <i>Momordica charantia</i> (Cucurbitaceae)	Leaf	Worm infestation	Pulp as oral dose	500 g
5.	Coconut <i>Cocos nucifera</i> (Arecaceae)	Flower, tender water	Diarrhoea	Oral dose	3–5 lr
6.	Curry leaves <i>Murraya koenigii</i> (Rutaceae)	Leaf	Stomach pain	Ground and orally given	100 g
7.	Fenugreek <i>Trigonella foenum-graecum</i> (Leguminosae)	Seed, leaf	Worm infestation	Orally as paste	50–80 g
8.	Garlic <i>Allium sativum</i> L. (Amaryllidaceae)	Clove	Diarrhoea, Indigestion	Orally as paste	50 g

Ailment/Disease: Gastro Intestinal Diseases					
9.	Ginger <i>Zingiber officinale</i> Rosc. (Zingiberaceae)	Rhizome	Constipation, Indigestion	Orally with other ingredients	100 g
10.	Guava <i>Psidium guajava</i> (Myrtaceae)	Leaf	Bloat	Orally as paste	150 g
11.	Jeerakam <i>Cuminum cyminum</i> (Umbelliferae)	Fruit	Constipation	Orally	25 g
12.	Kaayam Asafoetida <i>Ferula asafoetida</i> L. (Apiaceae)	Resin	Indigestion	Orally mixed with boiling water	25 g
13.	Lemon <i>Citrus limon</i> (Rutaceae)	Leaf, fruit	Worm infestation	Orally	250 g
14.	Mukkutti <i>Biophytum nervifolium</i> (Oxalidaceae)	Stem	Diarrhoea	Orally	500 g
15.	Neem <i>Azadirachta indica</i> (Meliaceae)	Juice of the plant, leaf	Worm infestation	Orally as liquid drench	300– 500 ml
16.	Papaya <i>Carica papaya</i> (Caricaceae)	Fruit, seed, leaf	Indigestion, Worm infestation	Orally as paste	300 g
17.	Pepper <i>Piper nigrum</i> L. (Piperaceae)	Seed, leaf	Indigestion	Oral	100 g

Ailment/Disease: Gastro Intestinal Diseases					
18.	Red chilly <i>Capsicum annum</i> L. (Solanaceae)	Fruit, stem	Constipation	Orally	15 no / 30 g
19.	Red onion <i>Allium sepa</i> L. (Liliaceae)	Bulb	Diarrhoea, Indigestion	Orally as paste	200 g
20.	Shathavari <i>Asparagus racemosus</i> Wild (Liliaceae)	Extracts from dried root	Worm infestation	Orally	100– 150 ml
21.	Spinach <i>Spinacia oleracea</i> (Amaranthaceae)	Leaf,	Worm infestation	Orally as paste	200 g
22.	Tamarind <i>Tamarindus indica</i> (Fabaceae)	Leaf, fruit	Diarrhoea	Orally as paste	100 g
23.	Touch me not <i>Mimosa pudica</i> (Fabaceae)	Leaf, root, stem	Diarrhoea	Paste is given orally	100 g
24.	Turmeric <i>Curcuma domestica</i> vallars (Zingiberaceae)	Rhizome	Constipation	Orally mixed with boiling water	100 g
25.	Ungu Milletia <i>Millettia pinnata</i> (Fabaceae)	Root, stem, bark	Indigestion	Orally mixed with boiling water	100 g

As Table 1.2. depicts butter milk with garlic paste, a combination of red onion, little tree plant, jaggery and coconut flower is ground in equal proportion and ground curry leaves were used by 66.32 per cent of the respondents to treat diarrhoea. This clearly indicated that the above practise were highly effective in treating diarrhoea. Leaves of touch me not mixed with water was recommended for diarrhoea by 8.16 per cent of the respondents and tamarind by 6.12 per cent of the respondents. Under the condition constipation, the documented practises were use of honey in warm water by 10.20 per cent of the

respondents, and a mixture of 10 g turmeric, 25 g cumin, 100 g jaggery, 100 g ginger and 15 red chillies by 26.53 per cent of the respondents.

There were four practises documented for the indigestion condition in animals. They were use of raw papaya (3.06%), ground mixture of ginger, garlic, pepper, asafoetida, and betel (16.33%), a combination of ajowan and red onion (18.37%), stem bark of millettia is boiled in water which was dried to one – third and was given to animal by 4.08 per cent of the respondents. Bloat was treated with ground guava leaves (36.73%) and stomach pain was treated with ground curry leaves orally (45.91%).

To deworm the animals, powdered arecanut, mixture of papaya seeds and sugar was given for 5 days in calf by 6.12 per cent of the respondents. Ground neem leaves (33.67 %), spinach leaves, lemon in sesame oil, fenugreek, neem oil for three days (42.86 %), pulp of ground bitter gourd leaves, thumba plant, papaya and asparagus were given to deworm the animals by 29.60 per cent of the respondents. Widely used ectoparasitocides were neem oil, calcium hydroxide, cassia and ceylon leaves by majority of the respondents (54.08%).

Table 1.3
Ethnoveterinary Medicinal Plants Utilized by Tribal Farmers of Attappadi to manage Livestock
Reproductive Health

Ailment/Disease: Reproductive Health					
Sl.no	Vernacular name/ Scientific name (Family)	Parts used	Conditions	Route of administration	Dosage
1.	Aloe vera <i>Aloe barbadensis</i> Mill. (Asphodelaceae)	Leaf, extract and latex of plant skin	Infertility, Mastitis	Orally	4 hands
2.	Bamboo <i>Bambusa arundinacea</i> (Retz.) Wild. (Poaceae)	Young stem, leaves	Retention of foetal membranes	Orally	250 g
3.	Banana <i>Musa paradisiacal</i> L. (Musaceae)	Plant juice, Fruit, leaf	Anoestrus	Orally	300 g
4.	Chaff flower <i>Achyranthes aspera</i> L. (Amaranthaceae)	Herb, leaves, seeds, root <i>flower</i> (whole <i>plant</i>)	Dystocia	Externally	200 g
5.	Greater yam <i>Dioscorea alata</i> (Dioscoreaceae)	Tuber, Leaf	Retention of foetal membranes	Orally	500 g
6.	Malabar kino <i>Pterocarpus marsupium</i> (Fabaceae)	Bark, leaf	Uterine infection	Orally	300 g
7.	Mango <i>Mangifera indica</i> Linn. (Anacardiaceae)	Leaf	Retention of foetal membranes	Orally	500 g

Ailment/Disease:					
Reproductive Health					
8.	<i>Muringa</i> <i>Moringa oleifera</i> Lamk. (Moringaceae)	Leaf, root, juice of the stem	Infertility, dystocia	Orally & Externally	300 g – 500 g
9.	Njerinjil <i>Tribulus terrestris</i> (Zygophyllaceae)	Seed	Uterine prolapse	Orally	250 g
10.	Pineapple <i>Ananas comosus</i> (Bromeliaceae)	Fruit	Retention of foetal membranes	Orally	3 no / 1500 g
11.	Piranda <i>Cissus quadrangularis</i> (Vitaceae)	Stem, leaf	Infertility	Orally	500 g

A perusal of Table 1.3 indicates that the infertility conditions were treated with boiled egg in sesame oil and equi proportion of *aloe vera* (4 hands), drumstick leaves, curry leaves and bone setter plant by 13.27 per cent of the respondents. Banana leaves were used to treat anoestrus (9.18 %). Retention of foetal membranes was treated with unripened pineapple, mango leaves, stem of bamboo and greater yams' leaves by 83.67 per cent of the respondents which indicated that the practises were highly effective to treat retention of foetal membranes.

Puncture vine boiled water is given in uterine prolapsed condition (12.24 %), ground *Malabar kino's* sap is taken to prepare starch gruel was given to ail uterine infection (23.47 %). Uterine involution was hastened by papaya fruit (29.60 %). To avoid dystocia, *muringa* leaves' extract was pasted over the vulva, and chaff flower was given by 37.76 per cent of the respondents.

Table 1.4

Ethnoveterinary Medicinal Plants Utilized by Tribal Farmers of Attappadi to manage Livestock Production Diseases

Ailment/Disease:					
Production Diseases					
Sl.no	Vernacular name/ Scientific name (Family)	Parts used	Conditions	Route of administration	Dosage
1.	Cashew <i>Anacardium occidentale</i> (Anacardiaceae)	Extract of the seed	FMD	Externally in wounds	100 g
2.	Erukku <i>Calotropis procera</i> (L.) (Apocynaceae)	Juice of the plant	HS		250 g
3.	Henna <i>Lawsonia inermis</i> (Lythraceae)	Leaf	FMD	Externally in wounds	3 hand full
4.	Nutmeg <i>Myristica fragrans</i> (Myristicaceae)	Seed	FMD	Externally in wounds	150 g
5.	Tassel flower <i>Ruppia maritime</i> (Asteraceae)	Leaf, seed	Mastitis	Externally	150 g
6.	Thazhudama <i>Boerhavia diffusa</i> (Nyctaginaceae)	Leaf, root	Mastitis		100 g
7.	Thulasi <i>Ocimum tenuiflorum</i> L. (Lamiaceae)	Leaf	FMD	Externally in wounds	100 g
8.	Umam Datura <i>Datura meta</i> / Linn. (Solanaceae)	Ripen fruit, leaf, root	Mastitis	Externally	100 g

It could be observed from Table 1.4 that majority of the respondents (73.47 %) encountered mastitis with mixture paste of aloe vera (250g), turmeric (50g), calcium hydroxide (10g) as external application. Similarly, tarvine leaves, uncoated seeds of datura in fenugreek water were boiled in milk and was applied externally as paste. Tassel flower was used for rosy milk mastitis (11.22 %).

Touch me not leaves was ground and the paste was given orally for three days by 12.24 per cent of the respondents.

FMD was treated with paste made from cumin (10g), fenugreek (10g), turmeric (10g), pepper (10g), garlic (4 no.), jaggery (100g) with one coconut was given orally thrice a day by the 54.08 per cent of the respondents. Lard of wild boar in banana (89.80%), veldt grape, curd (0.75 l), with turmeric, neem leaves and red onion was given orally to counter FMD by 57.14 per cent of the respondents

The wound lesions were externally applied with thulasi leaves, henna leaves, neem leaves, turmeric, and garlic in coconut oil by 16.31 per cent of the respondents. Similarly, nutmeg oil, cashew oil was rubbed with hen feather in wound lesions (12.24 %). Turmeric powder with coconut oil and luke - warm water was applied to the lesion and was tied by 18.37 per cent of the respondents. Pox lesions in fowl and small ruminants were treated with neem leaves, turmeric in coconut oil by majority of the respondents (59.18%).

Puncture vine and calotropis were used to treat inflammatory conditions. Edema lesions of HS were treated with paste of drumstick roots (31.63%), lard of wild boar (22.44%), calotropis and puncture vine leaves.

Table 1.5

Ethnoveterinary Medicinal Plants Utilized by Tribal Farmers of Attappadi to manage Livestock Respiratory conditions

Ailment/Disease:					
Respiratory conditions					
Sl.no	Vernacular name/ Scientific name (Family)	Parts used	Conditions	Route of administration	Dosage
1.	Ginger <i>Zingiber officinale</i> Roscoe. (Zingiberaceae)	Rhizome	Respiratory distress, Cough	Orally	50 g – 100 g
2.	Jeerakam <i>Cuminum cyminum</i> (Umbelliferae)	Fruit	Cough	Orally	50 g – 100 g
3.	Malabar nut <i>Justicia adhatoda</i> (Acanthaceae)	Leaf	Respiratory distress, Cough	Orally	100 g
4.	Neem <i>Azadirachta indica</i> (Meliaceae)	Juice of the plant, leaf	Respiratory distress	Inhalant	250 g
5.	Pepper <i>Piper nigrum</i> L. (Piperaceae)	Seed, leaf	Cough	Orally	50 g – 100 g
6.	Red onion <i>Allium sepa</i> L. (Liliaceae)	Bulb	Cough	Orally	250 g
7.	Thulasi <i>Ocimum tenuiflorum</i> L. (Lamiaceae)	Leaf	Respiratory distress	Inhalant	250 g

The Table 1.5 denoted that Malabar nut with 50g ginger, 200g jaggery was given for 6 days in treatment for respiratory distress by 21.43 per cent of the respondents. Other followed practises included camphor vapour, neem leaves' vapour, ginger and thulasi leaves. Cough was given with mixture of 500g ginger,

200g jaggery (20.41%) and Malabar nut for 6 days (14.29%), and cuminum, pepper, red onion, zingiberis were given for fever by 20.41 per cent of the respondents.

Table 1.6
Ethnoveterinary Medicinal Plants Utilized by Tribal Farmers of Attappadi to manage Livestock Skin & Bone conditions

Ailment/Disease:					
Skin & Bone conditions					
Sl.no	Vernacular name/ Scientific name (Family)	Parts used	Conditions	Route of administration	Dosage
1.	Aatha Sweetsop <i>Annona squamosa</i> (Magnoliales)	Leaf, fruit	Wounds, myasis	External application	100 g
2.	Cassia <i>Cassia fistula</i> Linn. (Fabaceae)	Seed	External parasites	External application	100 g
3.	Ficus <i>Ficus benghalensis</i> Linn (Moraceae)	Leaf, root	Myasis	External application	100 g
4.	Garlic <i>Allium sativum</i> L. (Amaryllidaceae)	Clove	warts, myasis	External application	10 no.
5.	Henna <i>Lawsonia inermis</i> (Lythraceae)	Leaf	Myasis	External application	3 hand full
6.	Jeerakam <i>Cuminum cyminum</i> (Umbelliferae)	Fruit	warts, fracture	External application	25 g
7.	Kanjiram Strychnine <i>Strychnos nux-vomica</i> Linn (Loganiaceae)	Root	Wounds	External application	100 g

Ailment/Disease:					
Skin & Bone conditions					
8.	Mukkutti <i>Biophytum nervifolium</i> (Oxalidaceae)	Stem	wounds	External application	150 g
9.	Neem <i>Azadirachta indica</i> (Meliaceae)	Juice of the plant, leaf	wounds, myasis, external parasites, Pox	External application	150 g
10.	Piranda <i>Cissus quadrangularis</i> (Vitaceae)	Stem, leaf	fracture	As immobilizer	250 g
11.	Thulasi <i>Ocimum tenuiflorum</i> L. (Lamiaceae)	Leaf	warts	External application	100 g
12.	Thumba <i>Leucas zeylanica</i> (Lamiaceae)	Leaf, stem	External parasites	External application	500 g
13.	Tobacco <i>Nicotiana tabacum</i> (Solanaceae)	Leaf, extract from leaf	Wounds	External application	500 g
14.	Touch me not <i>Mimosa pudica</i> (Fabaceae)	Leaf, root, stem	wounds, sprain	External application	250 g
15.	Turmeric <i>Curcuma domestica</i> vallars (Zingiberaceae)	Rhizome	warts, myasis, Pox	External application	100 g
16.	Vatha kodi <i>Nervalia zeylanica</i> (Rununculaceae)	Leaf	Fracture	External application	500 g

Table 1.6 indicates that Lacerated wounds were treated with touch me not plant leaves by 6.12 per cent of the respondents, sweetsop (8.16%), strychnine roots in human urine by 6.12 per cent of the

respondents and leaves of little tree plant with coconut oil (12.24%). Umbilical wounds were treated with tobacco leaves and neem oil by 13.26 per cent of the respondents. Treatment of warts with mixture of garlic (10 no.), turmeric (10g), cumin (25g), thulasi leaves and butter was followed by 21.42 per cent of the respondents.

For traumatic myiasis, out of the six practises documented, ceylon leaves in slaked lime was followed by 16.33 per cent of the respondents, sweetsop leaves (8.16%) and a mixture of neem leaves, turmeric (20g), garlic, thulasi leaves and henna leaves (18.37%) were applied for myiasis. Saps of ficus in wick was sundried and were tied in maggot wounds by 8.16 per cent of the respondents. Young leaves of custard apple were impregnated to maggot wounds (21.43 %).

Ground mango leaves in goats' urine was given orally for 2–3 days for arthritis / joint pain (8.16%). Majority of the farmers (48.97%) used stem of veldt grape (3–4 no.) with cumin (a pinch) was made to a paste and was tied over the fracture site in animals and the lesion was externally fixed with stem of umbrella tree for four weeks. Sap of *Vatha kodi* with castor and chaff flower was used in fractures (33.67%). Touch me not leaves were ground and paste was used in sprain conditions (58.16%).

Table 1.7

Ethnoveterinary Medicinal Plants Utilized by Tribal Farmers of Attappadi to manage Livestock General Health & Poisoning conditions

Ailment/Disease:					
General Health & Poisoning conditions					
Sl.no	Vernacular name/ Scientific name (Family)	Parts used	Conditions	Route of administration	Dosage
1.	Betel <i>Piper betle</i> (Piperaceae)	Seed	Poisoning, Immunity	Orally	10 no
2.	Capsicum <i>Capsicum annuum</i> (Solanaceae)	Fruit	Immunity	Orally	50 g
3.	Coconut <i>Cocos nucifera</i> (Arecaceae)	Flower, tender water	Immunity	Orally	2–3 lr
4.	Corinader <i>Coriandrum sativum</i> (Apiaceae)		Immunity	Orally	20 g
5.	Curry leaves <i>Murraya koenigii</i> (Rutaceae)	Leaf	Immunity	Orally	500 g
6.	Jeerakam <i>Cuminum cyminum</i> (Umbelliferae)	Fruit	Immunity	Orally	10 g
7.	Neem <i>Azadirachta indica</i> (Meliaceae)	Juice of the plant, leaf	Poisoning	Orally	500 g
8.	Pepper <i>Piper nigrum</i> L. (Piperaceae)	Seed, leaf	Poisoning, Snake venomation, Immunity	Orally	150 g

Ailment/Disease:					
General Health & Poisoning conditions					
9.	Sweetflag <i>Acorus calamus</i> (Acoraceae)	Leaf, fruit	Snake venomation	Orally	100 g
10.	Thulasi <i>Ocimum tenuiflorum</i> L. (Lamiaceae)	Leaf	Immunity	Orally	200 g
11.	Kaayam Asafoetida <i>Ferula asafoetida</i> L. (Apiaceae)	Resin	Snake venomation	Orally	250 g

As the Table 1.7 depicts, in order improve milk production, boiled papaya, spinach leaves, *muringa* leaves and asparagus were given orally by 57.14 per cent of the respondents. Immunity was promoted using the combination of pepper (10g), cumin (10g), coriander (20g), aloe vera (100g), garlic (50g), coconut, curry leaves, betel leaves, ginger (50g), capsicum (50g), thulasi leaves, jaggery (100g) and rock salt.

Lard of wild boar (2.04%), ground neem leaves (8.16%) and a mixture of 10g rock salt, 10 no. betel, 10 no. pepper was ground, and the paste was given orally for general poisoning conditions (12.24%). Asafoetida, garlic, pepper and sweet flag was given orally for snake venomation by 16.33 per cent of the respondents.

Conclusion

The present work is one of the initial efforts to quantify the ethno medicinal information used in livestock health care in Attappadi that facilitates better option for the selection of widely used medicinal plants for searching and identifying bioactive compounds to treat ailments. The study reported 55 medicinal plants with their uses from the Attappadi area. The highlighted high F_{IC} values in the present study have indicated that the species traditionally used to treat these ailments are worth searching for bioactive compounds and this has illuminated the cultural importance of this ethno veterinary wisdom which is consonantly blended with the tribal culture of the area. There is an urgent need to formulate suitable conservation strategies for naturally growing ethno medicinal plants to overcome their depletion from natural resources and to make these practices more eco- friendly.

Ethics approval and consent to participate

Not applicable

Consent for publication

Prior and informed consent of local people's pictures had been obtained for publication.

Declarations

Ethics approval and consent to participate

Not applicable

Consent for publication

Prior and informed consent of local people's pictures had been obtained for publication.

Availability of data and materials

All data generated or analysed during this study are included in this published article

Conflict of Interest

None declared.

Author Contributions

All authors equally contributed.

Funding

No funding from any agencies.

Acknowledgement

The authors are grateful to the tribal livestock farmers of Attappadi tribal belt for willingness to share their valuable indigenous knowledge despite their hectic timings and thankful to Tamil Nadu Veterinary and Animal Sciences University for approving to conduct the study.

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Figures

Figure 1

MAP SHOWING THE STUDY AREA

Figure 2

FIELD SURVEY AND PRIMARY DATA COLLECTION

Figure 3

ETHNOVETERINARY MEDICINES USED BY THE ATTAPPADI TRIBAL FARMERS