Plant based ethno-veterinary medicine used by farmers in Udupi District of Karnataka

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Abstract
The review on scientific rationale behind the people’s Indigenous Technical Knowledge (ITK) practiced by farmers of Udupi district showed the striking relevance for the sustainability in farming system. Perusal of the technologies listed indicated that the close observation of the nature and the experience in interaction with its components were largely responsible for their evolution. Low cost, simplicity and affordability made the technologies more popular and practical. The influence of ethnobotanical knowledge in crop management, plant protection and animal health, mitigation of nature’s fury in storage practices and immediate requirements for simplicity, manoeuvrable and handy farm implements were the main reasons for the general acceptance. It is observed that instead of single drug local people of this region used combined formulations of medicinal plants. Because they believe that the combined formulation is more powerful than single plant or mixture. In the present formulation 19 plants species were used with 7 other ingredients. Ethnobotanical knowledge for curing the ailments of cattle was evident. The rationale was also supported with the scientific relevance. However, the validation of dosage need to be made before the acceptance.

Keywords: ITK, Ethnoveterinary medicinal plants

Introduction
Indigenous Technical Knowledge (ITK) is the knowledge that has been developed over time in a community mainly through accumulation of experiences and intimate understanding of the environment in a given culture. Indigenous knowledge need to be recorded and can be of good use to devise innovative research for agricultural researchers, extension workers, development practitioners, and environmentalists for sustainable agriculture development and management of natural resources. Understanding Indigenous Knowledge in agriculture helps to ensure that farming practices will not cause so much plant genetic erosion and environmental erosion. In fact it should cater for sustainable food security and conservation of the variety and variability of animals, plants and very vital soil properties such as physical, biological and chemical properties. Conservation of natural resources depends on human beings and their interaction with the environment which is very much related to the Indigenous knowledge that has been communicated and passed down from generation to generation through family members and communities.

Ethnoveterinary medicine often provides cheaper options than comparable western drugs and the products are locally available and more easily accessible. In the face of these and other factors, there is increasing interest in the field of ethnoveterinary research and development. Some studies on ethno veterinary practices from different regions of India have been reported but there is no such studies are available for Karnataka except a few studies in the last decade. In view of this, the present study was conducted to identify, collect and document the ethnoveterinary medicinal plants used by farmers of Udupi district and their utilization for primary health care of animals in treatments of different ailments.

Methodology
The present study was conducted in 2016-17 in organic villages of Udupi and Karkala taluks in Udupi district of coastal Karnataka. Udupi and Karkala taluks is an important district of Karnataka which has picturesque landscapes dotted with hillocks, lakes, temples and forts etc. The present study was conducted in six villages, which are located very close to forest area of Western Ghats hills of Udupi district. The people of the study area are basically agriculturists and most of them are having domestic animals such as cow and buffalo.
But the area has not been supported by the veterinary, hospitals and any such dispensaries. The villagers in the district are usually going to the nearby hobli place of the taluk to treat their animals. In case of emergency the ethno veterinary healers of the study area offer some necessary indigenous treatments with medicinal plants.

The Focussed Group Discussion method was followed to gather indigenous technical knowledge from the farmers. The villagers were asked to deliberate on their skills passed onto them by their elders in tackling the different problems in agricultural enterprises that were deemed to be the best practices with practical relevance even for the day. Care was taken to confirm that the deliberations were not influenced by the scientific findings of any of the institutions. The presented practices were also confirmed with the follow up field survey and personal interactions with the villagers.

### Results

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Local and Botanical name</th>
<th>Control of Diseases/cured</th>
<th>Method of preparation and application</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Black pepper (<em>Piper nigrum</em>)</td>
<td>Cough, fever, cold, gastric and other diseases in cows</td>
<td>Feeding of the decoction is prepared by the grind all mixture with equal proportion of water</td>
</tr>
<tr>
<td>2</td>
<td>Mangana balli (<em>Tinospora malabarica</em>)</td>
<td>Reduces the infestation of worms in the animal hooves.</td>
<td>Grind ingredients and feed the mixture along with water</td>
</tr>
<tr>
<td>3</td>
<td>Kodasana togate (<em>Cleistanthus collinus</em>)</td>
<td>Smearing it on the udder reduces the mastaities</td>
<td>Apply the paste in equal proportions on udder</td>
</tr>
<tr>
<td>4</td>
<td>Garlic (<em>Allium sativum</em>)</td>
<td>Reduces the gastric problems and worms</td>
<td>Grind ingredients and feed the mixture</td>
</tr>
<tr>
<td>5</td>
<td>Ginger (<em>Cuminum cyminum</em>)</td>
<td>Reduces ticks infestation</td>
<td>Administering the grind extract of 100g seeds with 2 liter of water to animals</td>
</tr>
<tr>
<td>6</td>
<td>Black pepper (<em>Piper nigrum</em>)</td>
<td>Reduces the mastitis but also the mosquito menace.</td>
<td>Application of lime on walls</td>
</tr>
<tr>
<td>7</td>
<td>Onion (<em>Allium cepa</em>)</td>
<td>Against fever and cold and increased the digestion capacity of animals.</td>
<td>Grind ingredients and feed the mixture</td>
</tr>
<tr>
<td>8</td>
<td>Ginger</td>
<td>Effective against calf worms and digestion problems</td>
<td>Grind ingredients and feed the mixture</td>
</tr>
<tr>
<td>9</td>
<td>Sour buttermilk and tulsi leaves</td>
<td>Reduces the tick infestation</td>
<td>Grind ingredients and feed the mixture as ganji</td>
</tr>
<tr>
<td>10</td>
<td>Turmeric and fenugreek</td>
<td>Enumerating the grind extract of 100g seeds with 2 liter of water to animals</td>
<td>Administering the grind extract of 100g seeds with 2 liter of water to animals</td>
</tr>
<tr>
<td>11</td>
<td>Mimosa (<em>Mimosa pudica</em>)</td>
<td>Effective during animal pregnancy</td>
<td>Grind ingredients and feed the mixture</td>
</tr>
<tr>
<td>12</td>
<td>Rice bran</td>
<td>Reduced the respiratory disorders in calves</td>
<td>Administering on body</td>
</tr>
<tr>
<td>13</td>
<td>Vegetables</td>
<td>To enhance the milk yield</td>
<td>Feed the mixture</td>
</tr>
</tbody>
</table>

The local and botanical names of the medicinal plants followed by the diseases, ingredients preparation and administer or application were given in Table 1. It is observed that instead of singal drug, local people of this region used combined formulations of medicinal plants. Because they believe that the combined formulation is more powerful than singal plant or mixture. In the present formulation 19 plants species used with 7 other ingredients. They are Black pepper, Mangana balli, Kodasana togate, Garlic, Jeerige, Chilli, Onion, Ginger, Wild ginger, Anemoogina thogate, Vante huli, Jaggery, ROXB, Lakki, Tumbe leaves, Salt, Basale leaves, White rice, Sour butter milk, Asafetida, Fenugreek seeds, Lime, Mimosa, Rice bran, hot water and Areca nut fronds. Different plant parts were used for treatment of the animal. In general leaves were highly used followed by fruits, roots, flowers, seeds, whole plant and stem. In majority of the cases herbal drugs were prepared in the form of as juice, decoction, paste and powder.
Discussion

The plant species reported in the present study were cross checked with available literatures. Some of the plant species mentioned in the present study recorded earlier. The chemical compounds in the Piper nigrum was reported to contain bioactive compounds like piperine, pellitorine, guineensine, piphoohine, trichostachine and piperonal. *Tinospora malabarica* was said to contain phytoconstituents viz. Alkaloid, Steroid, Cardiac Glycoside & Saponin Glycoside, Tannin & Phenolic compound. *Cleistanthus collinus* (ROXB.) was found to contain Ellagic acid with anti-inflammatory and antinociceptive properties. *Allium sativum* was identified as a beneficial hypolipidemic and antiatherosclerotic agent. *Cuminum cyminum* was said to contain cuminaldehyde, limonene, α- and β-pinene, 1,8-cineole, α- and p-cymene, α- and γ-terpinene, safranal and linalool. Major components of *Capsicum annuum* were capsaicin, dihydrocapsaicin and nonivamide (pelargonic acid vanillylamide). Biological activities of *Allium cepa* was mainly due to the thiosulfonates, volatile sulfur compounds present in it. The major compounds identified in *Zingiber Officinal* were α-Gingerinere and β-Seiphiphellandrene, α-Curcumene, Cyclo Hexane, α-Fernesene, Cit-6-Shagole, Gingerol and Gingeroil. The major components of the *Alpinia pahangensis* rhizome oil were γ-selinene, β-pinene, (E,E)-farnesyl acetate and α-terpinole, while those of the leaf oil were β-pinene, α-pinene and limonene. The investigation of the antimicrobial activity of the essential oils revealed that the rhizome oil inhibited five Staphylococcus aureus strains and four selected fungi. Alkaloids, phenols, fats, lipids and waxes present in the roots and stems of *Oroxylum indicum* showed antimicrobial effects. Jaggery was reported to contain high nutritional value with 12-15 per cent protein that was higher in lysine content than rice endosperm protein or any other cereal bran proteins. The protein efficiency ratio values for rice bran concentrates ranged from 2.0 to 2.5. Protein digestibility of rice bran was greater than 90 per cent and was considered a good source of hypoallergenic proteins. Appetite stimulation and dehydration correction were reported by providing calves with 1 gallon of warm water and electrolytes per 100 lbs. of body weight. Areca fronds were reported to contain Cellulose (43%), crude fiber (33%) and ash (5%).

Conclusion

Studies on medicinal plants conducted in Kodagu, Chikkamagalore, Shimoga, Uttarakannada, Mangalore and Udupi districts of Karnataka. However, in Udupi district also the studies were conducted on etnobotanical knowledge for curing the ailment of cattle was evident. Hence, the present study represents the contribution to the existing knowledge of the local people. The rationale was also supported with the scientific relevance. However, the validation of dosage need to be made before the acceptance.

References


