Some observations on Saudi medicinal plants of veterinary importance

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Accepted 19 October, 2010

Current study was undertaken during summer 2010 in Saudi Arabia, with the aim to investigate the significance of medicinal plants and their use in the treatment of different ailments in livestock. The plants were collected, properly identified, and their folklore traditional uses were recorded. Ethno-veterinary information was collected through the show-and-tell/semi-structured method and personal interviews during field trips. The methodology was largely based on the Sustainable Livelihood Framework, which is based on the premise that livelihood is not about resource productivity but it was about people and their lives. The study revealed 24 plants species to be of ethno-veterinary importance in traditional Saudi Medicine. The major traditional uses were to treat livestock for ailments such as: gastrointestinal disorders, fever, cough, respiratory tract infection, and urinary tract diseases, promote lactation, wound healing, placenta removal, devorming, carminative, and to cure paralysis and flatulence. It was noticed that a few plants were used singly while the others were used in combination with other plants or edible items. It was interesting to notice that some plants species were selectively used to treat a specific disease while several other plants had multiple uses. The data was collected on the local uses; local recipe preparation, application and disease treated for each medicinally important plant species. The data collected and observations made are useful for future record. The study concluded that knowledge of traditional healers about various medicinal plants used for animals health was strongly influenced by information recorded in Traditional Saudi Medicine. The current study accomplished the gaps existing between Traditional Saudi Medicine and the proper use of medicinal plants in animal care. It also became obvious that there was a strong influence on the standardization of plant knowledge among rural populations in Saudi Arabia. However, distinct local use of plants also existed; indicating that plant knowledge specific to the local Badous is alive and practiced. The study recommends scientific validity and toxicity tests of the medicinal plants used in traditional Arab system of medicine. Interestingly, it was observed that a type of interaction existed among the local Bedouins using medicinal plants to treat their animals and the traditional healers and experts practicing Traditional Saudi Medicine in rural population of Saudi Arabia. However, the current study recommended scientific validity and toxicity tests to be conducted on the medicinal plants used in traditional Arab system of medicine.

Key words: Medicinal plants, livestock, diseases, traditional system of medicine, local recipes.

INTRODUCTION

Saudi Arabian medicinal plants were found to provide cure for several human and animal diseases in different regions of the country. The plants belonging to family: Leguminosae, Labiatae, Amaranthaceae, Compositae, Capparidaceae, Polygonaceae, Solanaceae and Euphobiaceae were reported to be of great importance. However, scientific work on other plants is a part of continuous process (Abulafatih, 1987; Sher et al., 2010; 2010a; Katerere and Luseba, 2010). The current study was conducted in different parts of Saudi Arabia having high ecological and economic significance. The Kingdom is about 1,969,000 sq km and covers two thirds of the Arabian subcontinent. The country is known to have

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different natural sites with great biological diversity and productivity and such sites are fundamental in the synergistic framework of associated ecosystems (Ahmad and Ghazanfar 1991; Ghazanfar 2007). Medicinal plants are known to show some variations in their distributional behaviour in different countries, which may be attributed to changes in water resources, climatic factors, edaphic variables and anthropogenic pressures along the elevation gradient (Wheater et al., 1997; Al-Quran, 2008; Al-Yemeni and Sher, 2010b; Djoghlaf, 2010).

The vegetation composition of Saudi Arabia reflects the geographical position of the Arabian Peninsula between Asia, Africa and Europe. As a result, the flora has many elements of two of the eight global terrestrial realms; namely the Palaeartic (Europe and Asia) and the Afro-tropical (Africa south of the Sahara) as well as a smaller complement of elements from the Indomalayan terrestrial realm. It is thus, an area of ecological and academic significance (Ghazanfar, 2007; Saganuwan, 2010). The general scope of ethno-botany, an area of human ecology, was well defined earlier as the interface between people and their plant resources and offers clues needed for rural development based on sustainable yields of forest products (Ali et al., 2002; Soetan and Aiyelaagbe, 2009; Bachaya et al., 2009).

The climate of Saudi Arabia can be characterized as arid (Azaizeh et al., 2003; Al-Yemeni et al., 2006; Al-Quran, 2008). Ecologically, such zones are fragile and difficult to develop and use. Except in limited areas, the vegetation of arid areas is sparse and usually highly specialized both morphologically as well as physiologically (Zahran et al., 1985; Blench, 2004). Hence, this region has been regarded as a natural reservoir for the collection of a variety of wild medicinal and aromatic plants (Sher et al., 2010). Unfortunately, many such plant species are collected by local communities without any reference to conservation needs in Saudi Arabia; rather they collect and sell plants both in local as well as international market, just to earn some money to support their lives in mountainous and arid environment.

Such practices in turn might lead to cause irreversible damages in the fragile ecosystems in different zones of the country (Sher et al., 2004). In addition, conversion of natural habitats into agricultural land has greatly decreased the population size of many economically important medicinal plants and other forest resources in Saudi Arabia. As a result, many economically and pharmaceutically important plant species become rare and sparse in several parts of Saudi Arabia (Earth, 2003; Sher and Hussain, 2009; Djoghlaf, 2010).

Both for human as well as animals, medicinal plants occupy important position in traditional as well as modern system of medicines due to their low toxicity (Sher and Hussain, 2009; Saganuwan, 2010). Ethnobotany allows interaction between researchers with the local people that have the knowledge about the use of plants (Abbas et al., 2002). These people manage and conserve significant amounts of biological resources useful for industry, commercial products and world community (Hussain and Sher, 2005; Ozcan, 2005). Ethnobotany also can provide useful information in drug development thus saving time and money (Joshi, 1982; Sher et al., 2010). The study of medicinal plants from traditional use by local people can lead to valuable information, allowing research to be done based on the empirical knowledge that should be tested scientifically (Abbas et al., 2002). For that, there should be an analysis of medicinal plants in several aspects: anthropological, social, chemical, pharmacological, botanical, ecological, agronomic and others (Katerere and Luseba, 2010; Sushila et al., 2010).

Collection and processing of medicinal plants is well recognized practice in Saudi Arabia with particular reference to the present study areas. However, the unregulated collection of medicinal plants for routine domestic use or its market sale have long been an important economic activity in the Arabian Peninsula, which is known to cause habitat loss of plant species survival, their genetic depletion and in an often-rapid downward trend of their populations. Therefore, the present endeavour was initiated with the aim to prepare an ethnoveterinary inventory of medicinal plants along with its current traditional uses in traditional system of Arab medicine for the treatment of different livestock ailments. The present study area is ethnobotanically unexplored and rich in plants resources. The finding may be of help for further research and for those working in relevant disciplines of biodiversity conservation. Moreover, the documentation of plant knowledge will be useful also as a baseline for future questions related to poverty alleviation, such as whether the cultivation of medicinal plants could provide an additional income source for farmers in the area.

MATERIALS AND METHODS

A combination of quantitative and qualitative research methods was undertaken in various parts of the study. Qualitative data were particularly useful in understanding people’s perspectives, meanings, attitudes, beliefs, goals and processes for interpreting quantitative data (Abbas et al., 2002). The concepts of validity and reliability were applied for the integration of qualitative and quantitative techniques. The fieldwork was conducted during summer 2010 in various parts of Saudi Arabia. A semi-structured questionnaire was devised to document the traditional knowledge of local people regarding medicinal plants. Generally, elder persons whose practical knowledge was respected by others and those who practice popular folk medicines for the curing of different livestock diseases were contacted and interviewed about the plants.

Information about the local names, local uses, parts used, time of collection, processing and recipe preparation were known and recorded from those local peoples. Plants specimens were collected dried preserved and mounted on standard herbarium sheets and were identified with the help of available literature (James, 1990; Chaudhary and Al-Jowaid, 1999) and The International Plant Names Index (IPNI 2008). The information on medicinal plants of the present study was compared with standard literature on medicinal plants in the Arabian Peninsula (Sher et al., 2010).
The study revealed that there were total 24 plants species used in ethnoveterinary practices by the local people rearing different livestock especially cows, goats, sheep and camels. These 24 species were distributed among 20 families, out of 18 are dicotyledons and 2 are monocots families. Medicinal plants of ethno-veterinary importance are used either in isolation or in combination with other medicinal plants.

Similarly, few plants species are considered for the treatment of only one specific disease while several other have multiple such uses (Table 1). The results shown in Table 1 also showed that more than 12 different diseases, therapeutic indications and pharmacological actions were recorded while documenting plant remedies. The most often mentioned ailments were urinary tract infection, digestive system, fever, cold or flu inflammations, flatulence, removal of external parasites, deworming. The main uses coincide with the Arab Traditional System of Medicine descriptions but, additional administrations and preparations were also found in the study areas.

### Table 1. Medicinal plants used in ethnoveterinary practices in Saudi Arabia.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Family name</th>
<th>Botanical name</th>
<th>Local name</th>
<th>Diseases, treated</th>
<th>Animals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aliaceae</td>
<td>Allium sativum</td>
<td>Tums</td>
<td>Gastrointestinal disorders</td>
<td>Camels, cows</td>
</tr>
<tr>
<td>2</td>
<td>Araceae</td>
<td>Arisaema flavum</td>
<td>Dakhaf</td>
<td>Cough and respiratory tract infection</td>
<td>Cows and Camels</td>
</tr>
<tr>
<td>3</td>
<td>Asteraceae</td>
<td>Artimisia scoparia</td>
<td>Silka,</td>
<td>Gastrointestinal disorders</td>
<td>All types of livestock</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Senecio asiensis</td>
<td>Hashma</td>
<td>Fever</td>
<td>Sheeps, goats, cow and Camels</td>
</tr>
<tr>
<td>4</td>
<td>Barbeyaceae</td>
<td>Barbeya oleoides</td>
<td>Kathah</td>
<td>Gastrointestinal disorders</td>
<td>Camels, cows, goats and sheep</td>
</tr>
<tr>
<td>5</td>
<td>Brassicaceae</td>
<td>Lipidium sativum</td>
<td>Rashaad</td>
<td>Gastrointestinal disorders</td>
<td>Cows and Camels</td>
</tr>
<tr>
<td>6</td>
<td>Caryophyllaceae</td>
<td>Stellaria media</td>
<td>Qazzaza</td>
<td>Gastrointestinal disorders</td>
<td>All livestock</td>
</tr>
<tr>
<td>7</td>
<td>Flacouriaceae</td>
<td>Oncoba spinosa</td>
<td>Unqab</td>
<td>Urinary tract diseases</td>
<td>Cows and Camels</td>
</tr>
<tr>
<td>8</td>
<td>Fumariaceae</td>
<td>Fumaria abyssinica</td>
<td>Shahtaraj</td>
<td>Fever</td>
<td>All types of livestock</td>
</tr>
<tr>
<td>9</td>
<td>Frankeniaceae</td>
<td>Frankenia aucheri</td>
<td>Hamrah</td>
<td>Promote lactation</td>
<td>Cows and Camels</td>
</tr>
<tr>
<td>10</td>
<td>Hypericaceae</td>
<td>Hypericum revolutum</td>
<td>Idrhar</td>
<td>Wound healing</td>
<td>Cows, Camels, goats and sheep</td>
</tr>
<tr>
<td>11</td>
<td>Loranthaceae</td>
<td>Oncocalyx schimperi</td>
<td>Ghashiyah</td>
<td>Flatulence</td>
<td>Cow, Camels and goats</td>
</tr>
<tr>
<td>12</td>
<td>Malvaceae</td>
<td>Alcea rosea</td>
<td>Khatami</td>
<td>Carminative and deworning agent</td>
<td>Cows, Camels goats and sheep</td>
</tr>
<tr>
<td>13</td>
<td>Pittosporaceae</td>
<td>Pittosporum viridiflorum</td>
<td>AlHowarradasb</td>
<td>Increase lactation and tonic</td>
<td>Cows, Camels and goats</td>
</tr>
<tr>
<td>14</td>
<td>Primulaceae</td>
<td>Primula verticillata</td>
<td>Khaa</td>
<td>Fever and body tonic</td>
<td>Camels</td>
</tr>
<tr>
<td>15</td>
<td>Polygonaceae</td>
<td>Polygonon argyrocoeleum</td>
<td>Qorda'b</td>
<td>Paralysis</td>
<td>Cows, Camels and goat</td>
</tr>
<tr>
<td>16</td>
<td>Rumex nervosus</td>
<td>Aathrab</td>
<td>Aathrab</td>
<td>Constipation</td>
<td>Cows, Camels and goat</td>
</tr>
<tr>
<td>17</td>
<td>Ranunculaceae</td>
<td>Ranunculus muricatus</td>
<td>Shaqaq</td>
<td>As deworming agent</td>
<td>All types of livestock</td>
</tr>
<tr>
<td>18</td>
<td>Sterculiaceae</td>
<td>Glossostemon bruguieri</td>
<td>Moghat</td>
<td>Gastrointestinal disorders</td>
<td>Cows, Camels, sheeps and Goats</td>
</tr>
<tr>
<td>19</td>
<td>Salvadoraceae</td>
<td>Salvadora persica L</td>
<td>Miswak plant</td>
<td>Gastrointestinal disorders, increase milk production</td>
<td>Goats, Cows and Camels</td>
</tr>
<tr>
<td>20</td>
<td>Tiliaceae</td>
<td>Grewia giletti</td>
<td>Nasham</td>
<td>For killing ticks, lices etc</td>
<td>Cows and Camels</td>
</tr>
<tr>
<td>21</td>
<td>Urticaceae</td>
<td>Urtica dioica</td>
<td>Haraqa</td>
<td>Increase milk production</td>
<td>Cows and Camels</td>
</tr>
</tbody>
</table>

2010). The nomenclature was later on confirmed from Herbarium, King Saud, Riyadh, Saudi Arabia. The Plants are arranged and documented according to their evolutionary division.

**RESULTS**

The study revealed that there were total 24 plants species used in ethnoveterinary practices by the local people rearing different livestock especially...
Ethnoveterinary uses of some medicinal plants

A. Dicotyledons families

1. Family: Asteraceae

1. **Artimisia scoparia** Waldst. and Kit.
   - Habit: Herb
   - Part used: Leaves and floral parts
   - Local name: Slika, Salmas
   - Voucher specimen number: H-KAU / 04-21
   - Local uses: Powdered leaves and floral parts are mixed with wheat flour and is given in bolus form to camels and cows for improving their digestive power.

2. **Senecio asirensis** Boulos and JRI Wood
   - Habit: Herb
   - Part used: Root
   - Local name: Hashma
   - Voucher specimen number: H-KAU / 05-22
   - Local uses: Fresh or dried ground roots are mixed with wheat or corn flour, locally and is given to goats and sheep for the treatment of fever.

2. Family: Barbeyaceae

3. **Barbeya oleoides** Schweinf.
   - Habit: Tall Shrub
   - Part used: Root
   - Local Name: Kathah
   - Voucher specimen number: H-KAU / 06-23
   - Local uses: Dried ground bark of the root is mixed with wheat flour and is given to cows, goats and sheep for improving digestion. It is also considered to maintain health.

3. Family: Brassicaceae

4. **Lipidium sativum** L.
   - Habit: Herb
   - Part used: Fruit (Seed)
   - Local Name: Rashaad
   - Voucher specimen number: H-KAU / 04-24
   - Local uses: A decoction of mature seeds is given orally to cows for curing colic problem. It is also considered as purgative.

4. Family: Caryophyllaceae

5. **Stellaria media** (L.) Cyr.
   - Habit: Herb
   - Part used: Whole plant
   - Local Name: Qazzaza
   - Voucher specimen number: H-KAU / 04-25
   - Local uses: The plant is mixed with other fodder crops and is considered as appetizer agent.

5. Family: Flacourtiaceae

6. **Oncoba spinosa** Forssk.
   - Habit: Tree
   - Part used: Fruit
   - Local Name: Unqab
   - Voucher specimen number: H-KAU / 04-26
   - Local uses: Powdered fruit is mixed with wheat or corn flour and is given to cattle for the treatment of urinary tract diseases.

6. Family: Fumariaceae

7. **Fumaria abyssinica** Husskin
   - Habit: Herb
   - Part used: Whole plant
   - Local Name: Shahtaraj
   - Voucher specimen number: H-KAU / 05-27
   - Local uses: Decoction of plants is given to all type of livestock for curing of fever and also considered as refrigerant agent.

7. Family: Frankeniaceae

8. **Frankenia aucheri** Jaub and sapch
   - Habit: Shrub
   - Part used: Roots
   - Local Name: Hamrah
   - Voucher specimen number: H-KAU / 05-28
   - Local uses: The powdered rhizome is mixed with milk and is given to cows and camels especially in winter to promote lactation.

8. Family: Hypericaceae

9. **Hypericum revolutum** Vahl.
   - Habit: Herb
   - Part used: Root
   - Local Name: Idhrar
   - Voucher specimen number: H-KAU / 06-29
   - Local uses: Dry powdered root is mixed with wheat flour and is given to cattle for the treatment of wounds.

9. Family: Loranthaceae

10. **Oncocalyx schimperi** (Hochst.ex A. Rich)M.G.
    - Habit: Shrubby Herb
    - Part used: Leaves
    - Local name: Ghashiyah
    - Voucher specimen number: H-KAU / 05-30
    - Local uses: Dried ground leaves are used locally in bolus form to relieve flatulence in cattle.

11. **Plicosepalus curviflorus** (Benth)
    - Habit: Woody Parasite
    - Part used: Stem
    - Local name: A’namah
    - Voucher specimen number: H-KAU / 05-31
    - Local uses: Dried ground Stems are used to increase lactation in cattle.

    - Habit: Woody Parasite
    - Part used: Stem
    - Local name: Hadhal
Voucher specimen number: H-KAU / 05-32
Local uses: Fresh Stems are given orally to all types of livestock for the treatment of fever and removal of placenta after parturition.

10. Family: Malvaceae
13. Alcea rosea L.
Habit: Herb
Part used: Leaves and fruits
Local Name: Khatami
Voucher specimen number: H-KAU / 05-33
Local uses: The powdered leaves, young branches and fruits are locally mixed with wheat flour and used as a carminative and de-warming agent, in cattle.

11. Family: Pittosporaceae
14. Pittosporum viridiflorum Sim.
Habit: Tall Shrub
Part used: Roots
Local Name: Al-Howarradasb
Voucher specimen number: H-KAU / 05-34
Local uses: Powdered roots are given to cattle in bolus form, to increase lactation, and also as general body tonic.

12. Family: Primulaceae
15. Primula verticillata Forrsk
Habit: Herb
Part used: Rhizome
Local Name: Khaa.Hainan
Voucher specimen number: H-KAU / 05-35
Local uses: The ground rhizome is given to the Camels in water to treat fever and as a general body tonic.

13. Family: Polygonaceae
16. Polygonum argyrocoleum Ssteudel ex Kunze
Habit: Herb
Part used: Root
Local Name: Qorda'b
Voucher specimen number: H-KAU / 06-36
Local uses: Fresh ground root is given to cattle in bolus for curing of paralysis in cattle.

17. Rumex nervosus Vahl.
Habit: Herb
Part used: Leaves
Local Name: Aathrab
Voucher specimen number: H-KAU / 04-37
Local uses: Fresh crushed leaves are mixed with wheat flour for the treatment of constipation in cattle.

14. Family: Ranunculaceae
18. Ranunculus muricatus L.
Habit: Herb
Part used: Rhizome
Local name: Shaqaiq
Voucher specimen number: H-KAU / 05-38
Local uses: The powdered rhizome is mixed with wheat flour and Dalda Ghee and is used as dewarming agent in cattle.

15. Family: Sterculiaceae
19. Glossostemon bruguieri Desf
Habit: Herb
Part used: Root
Local Name: Moghat
Voucher specimen number: H-KAU / 04-39
Local uses: Locally, the dried leaves are crushed and mixed with wheat flour and are used to cure diarrhea in cattle.

16. Family: Salvadoraceae
20. Salvadora persica L.
Habit: Tree
Part used: Leaves
Local Name: Miswak Tree
Voucher specimen number: H-KAU / 05-40
Local uses: Dried ground leaves are given orally to the cattle for the removal of liver fluke and intestinal worms. Also used in stomach disorders.

17. Family: Tiliaceae
Habit: Shrub
Part used: Shoot and leaves
Local Name: Nasham
Voucher specimen number: H-KAU / 05-41
Local uses: Locally, the decoction is applied superficially on skin for killing the ticks, lives and other insects in the skin of cattle.

18. Family: Urticaceae
22. Urtica dioica L.
Habit: Herb
Part used: Leaves
Local Name: Haraqa
Voucher specimen number: H-KAU / 06-42
Local uses: The whole plant is mixed with other fodder crops in considerable amount for increase in milk production in cattle.

B. Monocot families

19. Family: Aliaceae
23. Allium sativum L.
Habit: Herb
Part used: Bulb
Local Name: Tums
Voucher specimen number: H-KAU / 05-43
Local uses: Locally, the ground bulb of Allium sativum is mixed with wheat flour and is given to Camels and cows to combat digestive tract diseases and to enhance digestion. It is also used for heating the cows
and camels.

20. Family: Araceae
24. Arisaema flavum (Forrsk.) Schott
Habit: Herb
Part used: Rhizome
Local name: Dakhaf
Voucher specimen number: H-KAU / 04-44
Local uses: Its dry rhizome is boiled for a little while and then is crushed and given to cows and Camels in small amount with wheat flour for curing of respiratory tract infections with cough.

DISCUSSION

The result of the present investigation can generally be applied to agriculture forestry. In addition, the findings might be of great interest to the pharmaceutical industries dealing with medicinal plant products. The inhabitants of the area might be benefited from their forest which comes mainly in the form of vast array of forest products, most of which are non-timber forest products, especially medicinal plants. In this context, ethno-veterinary knowledge deals with the traditional uses of plants in the indigenous system for the curing of different livestock ailments. The present study area is rich in plant diversity, which is most significantly associated with the life and practices of the hill side dwellers of the area. The present investigation revealed that 24 plant species are used for the treatment of different livestock diseases. These plants are used to treat about 13 different types of livestock diseases. Among various classes of traditional uses, all across the globe, various types of gastrointestinal disorders are predominant, and a sizeable number of plant species have been discovered to cure such illness across different ethnic communities. Similar results have been reported (Yazicioglu and Tuzlaci, 1996; Abbas et al., 2002; Dilshad et al., 2010; Sher et al., 2010; Sher et al., 2010a) in other parts of the world and some of their documented medicinal plants species are different from our documented plants. The results of the present study were also supported by earlier findings documenting some plants species used in health care of livestock in different parts of Afghanistan (Davis et al., 1995). However, those documented plant species were different from our reported plant species.

It is worth mentioning that during current study, some plants were found to be used for the treatment of a single disease, while many other plants had multiple therapeutic uses. These were invariably used for curing various diseases and for earning livelihood. The finding of the present study are in line with the reports available in the scientific literature reporting ethnobotanical studies to be important for exploring plants and human interaction to find alternate sources of income and treating any disease state in humans or animals (Trumble et al., 2004; Abdillahi et al., 2010; Saganuwan, 2010). However, it was also noticed that the reported plants were severely grazed by the local livestock. Overgrazing caused the destruction, as green parts were removed and/or damaged due to trampling. Therefore, it became imperative to manage the grazing system and encourage the regeneration of medicinal plants (Goshi, 1997; Sher et al., 2010).

The present study, suggested to introducing some management measures to be taken jointly with the participation of local communities, via village administrative council, in order to conserve medicinal plant resources from becoming extinct. The foremost important thing is to give awareness and training to local communities on multidimensional basis about sustainable exploitation of medicinal plant wealth in hillsides management for plant resources. Finally, the present study, also recommend scientific validity and toxicity tests of the reported medicinal plants used for the treatment of different livestock ailments in Traditional Arab Medicine.

ACKNOWLEDGEMENTS

The authors greatly thank the College of Science Research Center Deanship for Scientific Research of King Saud University for their financial support. They also thankful to the local communities for their willingness to sharing their valuable empirical knowledge and experiences on wild medicinal plants use for curing different livestock ailments.