



Folk herbal veterinary medicines of Tehran watershed (Iran)

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ARTICLE INFO

Type: Original Research

Topic: Ethno-veterinary

Received November 6th 2014

Accepted January 5th 2015

Key words:

- ✓ Ethnoveterinary
- ✓ Herbal Veterinary Medicines
- ✓ Livestock
- ✓ Tehran

ABSTRACT

Background & Aim: The use of medicinal plants is an option for livestock farmers who do not want to use allopathic drugs under certified organic programs or cannot afford to use allopathic drugs for minor health problems of livestock. Thus, the main aim of this study is the identification of some ethnoveterinary medicinal plants of Tehran watershed and their medicinal effects on livestock.

Experimental: Initially, plant species were collected from the watershed, and then using reliable literature collected species was identified. After that, medicinal plants from veterinary value perspective by comparison with the published literature were determined. Moreover, identified species with disease therapy value were classified.

Results & Discussion: Initially 278 medicinal plant species were identified in this area. From those, 47 species were identified with ethnoveterinary medicinal value, which were belonged to 28 families. Identified species were used for treating different disease and syndromes such as parasites (17%), oestrusovis (7%), gastrointestinal diseases (12%), diarrhea (7%), pain killer (9%), mastitis (7%), skin infection (5%), wounds (17%), lack of some vitamins and nutrients (10%) and some other diseases and syndromes such as theileriosis, immunomodulation and bloat in livestock.

Industrial and practical recommendations: This information can be improved our knowledge of native plants that are useful for curing animal disease and attempt to conserve the area and its plant species.

1. Introduction

The interest in medicinal plants has increased significantly in recent years not only to cure humans but also to cure animals. The ever growing use of

synthetic drugs can be attributed to the growing ease of their preparation and administration, making them suitable for the accelerating modern development.

However, there is a growing preference for natural rather than synthetic products because people think, rightly or wrongly, that natural products produce less side effects and undesirable consequences (Laudato and Capasso, 2013). On the other hand, the use of homeopathic and phytotherapeutic remedies in veterinary medicine has gained interest due to increasing demands on the quality of meat and milk products such as the requirements for producing organic foods (Pieroni *et al.*, 2004). In addition, there are limited veterinary health centers in rural areas. Under such circumstances these people treat their domestic animals with plants remedies on the basis of their empiric knowledge (Juyal and Ghildiyal, 2013). Studying of folk herbal veterinary medicines and traditional methods for health, hygiene and treatment of animal diseases is called Ethnoveterinary (Bahmani *et al.*, 2012). Ethnoveterinary medicine means prevention and curing of diseases by plants (phytotherapy), bee products (apitherapy), milk and dairy products and etc, as well as manual removing of Ixodidae from the body of animals and use of fly larvae in the cleaning of suppurated wounds. In animal health care, the use of plants as supporting therapy in preventive purposes or as a complete therapy has a huge potential (Davidovic *et al.*, 2009). Medicinal plants are a title for costly studying in developed countries and it makes good trading for its productive countries (Sherry and Koontz, 1979). Despite the fact that Ethnoveterinary medicine has been very crucial for the animal healthcares of most developing countries, it has not yet been well documented and much effort is required in research and integration activities in these countries (Yinegeret *et al.*, 2007). There are 11 different climates, 300 sunny days in year and 50°C temperature difference between the coldest and warmest place in Iran (Hoseini *et al.*, 2009). Due to the beneficial conditions for using unique ecological conditions in this country, rich flora of Iran includes more than 7500 plant species and many of them are called medicinal plants (Omidbeigi, 1997). However, the effects of these plants on animal health have not been significantly considered. Thus, the main aim of this study is the identification and documentation of some ethnoveterinary medicinal plants of Tehran watershed and their medicinal effects on livestock.

2. Materials and Methods

2.1. Study area

Tehran watershed with 206484 ha is located in 51°10'26'' to 51°41'00'' E and latitude of 35° 22' 26'' to 35° 57' 17'' N in Iran. The height of this area varies between 900 to 3957m. Average precipitation varies from 150 to 750 mm. August is the hottest month of year in Tehran watershed with the average temperature of 38°C and coldest month is January with the average temperature of -9.6°C. Due to climate variability, different plants are growing in this region.

2.2. Samples collection and identification

Samples were transferred to the laboratory and all collected species were identified using reference flora, such as: Flora Iranica (Rechinger, 1963-1998), Flora Iran (Assadi *et al.*, 1988-2013), Colored flora of Iran (Ghahreman, 1979-1992), Iranian *Astragalus* (Maassoumi, 1986-2005), Cromophytes of Iran (Ghahreman, 1996), plants of Iran (Mobayen, 1975-1996) and etc. Scientific names of species were assigned using International Plant Name Index (IPNI, 2013). For determining life forms, Raunchier's (1934) classification method was applied. Published article and references, such as Takhtajan (1986), Zohary (1963), Zohary *et al.* (1993), Ghorbani *et al.* (2013) and etc. were used for determining chorology of the identified folk herbal veterinary medicinal species.

3. Results and discussion

Identified folk herbal veterinary medicinal species are presented in Table 1. Generally, 278 plant species collected by fieldworks and identified in Tehran watershed. However from those, 47 species were identified with ethnoveterinary medicinal value which was belonged to 28 families. Main identified folk herbal veterinary medicinal families are presented in Figure 2. As can be seen, most of the folk herbal veterinary medicinal species in Tehran watershed were belonged to Asteraceae and Lamiaceae families with 17.02% and 14.82% species, respectively.

Identified species were used for treating different disease and syndromes such as alopecia, oestrusovis, gastrointestinal diseases, diarrhea, endoparasites, mastitis, burns, bloat, skin infection, scab, wounds, ectoparasites, theileriosis, immunomodulation, lack of some vitamins and some other disease and syndromes in livestock.

Table 1. List of ethnoveterinary species of Tehran watershed. IT: Irano-Toranian; M: Mediterranean; ES: Euro-Siberian; SS: Sahara Sandy; cosm: Cosmopolitan species; Hem: Hemicryptophytes; Th: Therophytes; Ch: Chamaephytes; Ph: Phanerophytes

No.	Family and Scientific name	Elevation	Chrotype	Life forms	Used parts	Application and species of animal
	1. Anacardiaceae					
1	<i>Pistacia atlantica</i> Desf. sub sp. <i>mutica</i> (Fisch. & C. A. Mey.) Rech.	1200-2000	IT	Ph	Aerial parts	Alopecia (goat), cough (all the animals), <i>Pistacia khinjuk</i> Stocks Oestrusovis (sheep)
	2. Apiaceae					
2	<i>Prangos ferulacea</i> (L.) Lindly.	1600-2300	IT, M	Hem	Aerial parts	Treatment of thick and louse (Ruminants)
	3. Asteraceae					
3	<i>Achillea millefolium</i> L.	1400-2300	Cosm	Hem	Aerial parts	Mastitis, wounds, sternal abscess (Ruminants)
4	<i>Achillea wilhelmsii</i> C. Koch.	1000-3000	IT	Hem	Leaves and flowers	Wound healing (cow, sheep and camel)
5	<i>Artemisia vulgaris</i> L.	1400-1700	IT, ES	Ch	Whole Plant	Zinc deficiency (Ruminants)
6	<i>Cichorium intybus</i> L.	900-2400	Cosm	Hem	Aerial parts	Endoparasites (Ruminants)
7	<i>Arctium lappa</i> L.	900-2200	IT, ES	Hem	Root	Mastitis (Ruminants)
8	<i>Cirsium arvense</i> (L.) Scop.	1400-2200	Cosm	Hem	Aerial parts	Vitamin A (Ruminants)
9	<i>Gundelia tournefortii</i> L.	1300-2000	IT	Hem	Stems, small leaves and stem brain	Treatment for scab (sheep and goats)
10	<i>Taraxacum officinalis</i> Webber.	1500-2500	IT	Hem	Root and leaves	Treatment of gastrointestinal diseases (all animals)
	4. Boraginaceae					
11	<i>Anchusa italica</i> Retz.	1600-2300	IT, ES ,M	Hem	Flowers	Treatment of Theileriosis (cow)
	5. Brassicaceae					
12	<i>Capsella bursa –pastorris</i> (L.) Medik.	1300-2500	Cosm	Th	Leaves, Aerial parts, Whole plant	Treatment of Wounds, Haemorrhages, reproductive disorders, breastfeeding, care of the udder (all animals)
	6. Caesalpiniaceae					
13	<i>Cercis siliquastrum</i> L.	1500-1700	IT, ES	Ph	Leaves, stems and skin of stem	Treatment of infected and deep wounds (all animals)
	7. Capparidaceae					
14	<i>Capparis spinosa</i> L.	1400-2000	IT, M, SS	Ch	Bud and root	joint pain killer (horses)
	8. Caryophyllaceae					
15	<i>Stellaria media</i> (L.) Cyr.	1700-2200	Cosm	Th	Aerial part	increasing the laying of eggs

						(poultry)
9. Chenopodiaceae						
16	<i>Chenopodium album</i> L.	1700-2400	Cosm	Th	Aerial part	Treatment of diarrhea (sheep and goat), wounds and injuries, Lenient (all animals)
10. Cupressaceae						
17	<i>Juniperus excelsa</i> M. B.	1500-2500	IT	Ph	Secreted gum	Treatment of topical and limb pain (camel)
11. Elaeagnaceae						
18	<i>Hippophae rhamnoides</i> L.	1200-1500	IT	Ph	Berries and wood	killing gastrointestinal endoparasites, useful against ocular and nasal parasites (sheep and cattle)
12. Fabaceae						
19	<i>Astragalus sverus</i> Olivier. Syn: <i>Ast. Parrowianus</i> Boiss. & Hausskn.	1400-2200	IT	Ch	Wood	Antiparasitic, antimycotic and immunomodulatory activities (all animals)
20	<i>Glycyrrhiza glabra</i> L.	900-2000	IT, ES, M	Hem	Root	gastrointestinal diseases, otitis (horses)
21	<i>Lotus corniculatus</i> L.	900-2000	IT, ES, M	Th	Aerial parts	Endoparasites (all animals)
22	<i>Medicago sativa</i> L.	900-2000	IT, ES, M	Hem	Aerial parts	Pellets from high selenium, Selenium deficiency, nutrition after calving Regions (all animals)
13. Geraniaceae						
23	<i>Erodium cicutarium</i> (L.) L' Her. exAiton.	1400-1600	IT, ES, M	Th	Seeds and Aerial parts	Lenient (sheep and horses)
14. Hypericaceae/ Guttiferae/ Clusiaceae						
24	<i>Hypericum perforatum</i> L.	1500-3200	Cosm	Hem	Flowers	Proud flesh, Wounds (Ruminants)
15. Juglandaceae						
25	<i>Juglans regia</i> L.	900-2000	IT, ES	Ph	Leaves, fruits and skin	Antiparasitic (all animals)
16. Lamiaceae						
26	<i>Ajuga chamaecistus</i> Ging. exBenth.	1200-1700	IT	Ch	Leaves and flowering branches	Eliminate louse and parasites of skin (goat and sheep)
27	<i>Marrubium vulgare</i> L.	1500-2500	Cosm	Hem	Aerial parts	Treatment of wounds and injuries (all animals)
28	<i>Melissa officinalis</i> L.	1100-1800	IT	Th	Leaves	Anxiety, stress (Ruminants)
29	<i>Mentha piperita</i> L.	1600-1800	IT	Hem	Leaves	Ectoparasites and endoparasites (Ruminants)
30	<i>Nepeta cataria</i> L.	1500-2000	IT	Hem	Aerial parts	Pain killer (Ruminants)

31	<i>Stachys lavandulifolia</i> Vahl.	1500-3000	IT	Hem	Aerial parts	Treatment of diarrhea (goat and sheep)
32	<i>Teucrium polium</i> L.	1500-2500	IT, M	Ch	Leaves and flowering branches	Treatment of gastrointestinal diseases (cow and sheep)
17. Linaceae						
33	<i>Linum usitatissimum</i> L.	1000-2000	IT	Hem	Seed	Treatment of Dystocia (sheep)
18. Malvaceae						
34	<i>Malva sylvestris</i> L.	1800-1900	IT, ES, M	Hem	Aerial parts	Immunomodulation, respiratory diseases (all animals)
19. Plantaginaceae						
35	<i>Plantago major</i> L.	1500-2500	Cosm	Hem	Leaves	Treatment of gastrointestinal diseases, wounds, hits or inflammations (Ruminants)
20. Poaceae						
36	<i>Avena sativa</i> L.	1100-1800	IT	Th	Aerial parts	Mastitis (Ruminants)
37	<i>Sorghum halepense</i> (L.) Pers.	900-2000	IT	Hem	Aerial parts	Induction of abortion, oestrous synchronization (cow)
21. Polygonaceae						
38	<i>Polygonum aviculare</i> L.	1600-1800	Cosm	Th	Aerial parts	dewormer (Sheep, horse and cattle)
39	<i>Rumex crispus</i> L.	1100-2000	IT, ES	Hem	Root	Treatment of pulmonary edema and watering pulmonary (sheep)
22. Punicaceae						
40	<i>Punica granatum</i> L.	900-1500	IT	Ph	Fruit	Treatment of Diarrhea (all animal)
23. Rosaceae						
41	<i>Amygdalus lycioides</i> Spach.	1200-2500	IT	Ph	Aerial parts	to treat ulcerative lesions of leishmaniasis, Oestrusovis larvae (Sheep)
42	<i>Rosa canina</i> L.	900-2500	IT, ES, M	Ph	Hip	Inflammation (all animals)
24. Solanaceae						
43	<i>Datura stramonium</i> L.	900-1500	Cosm	Hem	Leaves and seeds	Treatment of Burns, Infected wounds, Parasite (Cattle and Sheep)
25. Tamaricaceae						
44	<i>Tamarix aphylla</i> (L.) Karst.	1000-1500	IT, SS	Ph	Leachate	Treatment for wool loss (camels)

26. Thymelaeaceae						
45	<i>Denderostellera lessertii</i> Van Tiegh	1600-2200	IT	Ch	Leaves and flowering branches	Treatment of stomach ache and bloating (sheep)
27. Urticaceae						
46	<i>Urtica dioica</i> L.	900-3200	Cosm	Hem	Seed	Endoparasites, diarrhea, it is rich in aminoacids, proteins, minerals and vitamins and also tannins, formic and salicylic acid (all animals)
28. Zygophyllaceae						
47	<i>Peganum harmala</i> L.	900-2500	IT,M, SS	Hem	Seed	Treatment of Snakebite (all animals)

Comparison of life forms and Chrotype percent among ethnoveterinary medical species in Tehran watershed is shown in Table 2 and Figure 1, respectively. These life forms are including IT (Irano-Toranean), M (Mediterranean), ES (Euro-Siberian), SS (Sahara Sandy) and cosm (Cosmopolitan species). The Chrotypes are also including Hem (Hemicryptophytes), Th (Therophytes), Ch (Chamaephytes) and Ph (Phanerophytes). As it can be observed, most of these plants are in Hemicryptophytes life forms and Irano-Toranean Chrotype.

Table 2. Comparison of life forms percent among ethnoveterinary medicinal species in Tehran watershed.

Life forms	Ch	Ph	Th	Hem	Total
Number	6	9	8	24	47
Percent	12.77	19.15	17.02	51.06	100

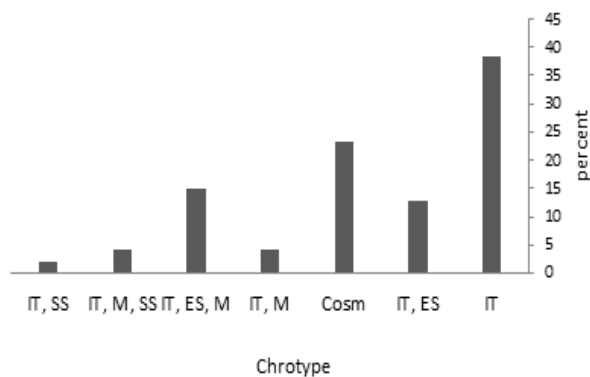


Fig 1. Comparison of Chrotype percent among ethnoveterinary medicinal species in Tehran watershed

Distribution of used part of ethnoveterinary medical species in Tehran watershed is shown in Figure 3. Different parts of species such as leaves, flower, root, fruit, seed, aerial part, whole plant and etc. can be used in the treatment of each disease. According to Figure 3, aerial parts and leaves are used in most of the identified folk herbal veterinary medicinal species. Most common treated disease and syndromes with ethnoveterinary species is shown in Figure 4. According to this figure, wound and anti-parasitic are the most common cured diseases by folk herbal veterinary medicinal species in Tehran watershed.

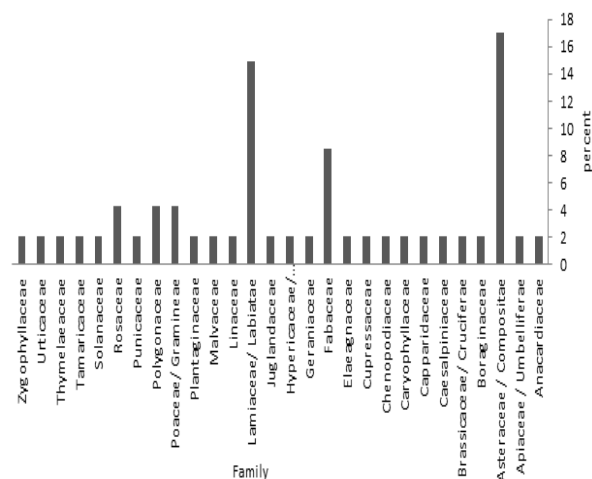


Fig 2. Distribution of ethnoveterinary medicinal species families in Tehran watershed

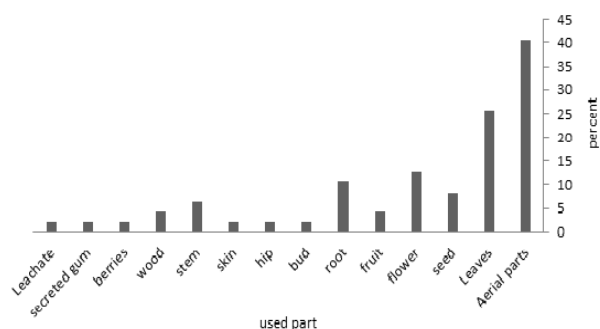


Fig 3. Distribution of ethnoveterinary medical species by parts used in Tehran watershed.

Some of the identified ethnoveterinary species from this study area have already been reported in other studies. For example, Bahmani et al. (2012) in their ethnobotanical study which is used by Kurdish Owner's in south range of Ilam province reported that *Pistacia atlantica* is used in treating of alopecia in goats, cough in all of the animals and oestrusovis in sheep. In addition to the antiparasitic activity of *Astragalus*, Chalechale et al. (2013) found that recent evidences implicating antimycotic and immunomodulatory activities of *Astragalus verus* (Black milkvetch; Siahgavan in Kurdish) in animal models (Nikbakht-Brujeni et al., 2013). Furthermore, Lans et al. (2007) reported that Chewed up leaves of yarrow (*Achillea millefolium*), are put on wounds and then wrapped with breathable tape in ruminants. These researchers found that peppermint (*Mentha piperita*) essential oils are dissolved in water and used for fly control, too. Herbal treatments seem to be particularly efficacious against mastitis. Raspberry leaves, herb-robert *Avena sativa* and *Linum usitatissimum* are useful to treat or prevent mastitis in cattle because of their anti-inflammatory and emollient properties (Laudato & Capasso, 2013).

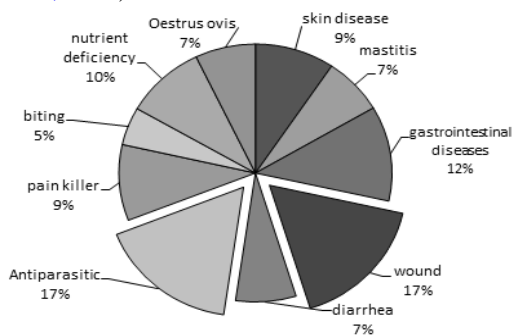


Fig 4. Most common treated disease and syndromes with ethnoveterinary species in Tehran watershed.

In another study, Guarrera and Lucia (2007) reported that the primary use of the *Urticadioica* leaves is for gastrointestinal disorders and the secondary use is for rheumatic pains. Chalechale et al. (2013) found that *Amygdalus lycioides* which is growing in Kurdistan province of Iran can be mixed and grounded with the bark of brinjl (egg-plant) in vinegar and used as paste during 10 days to treat ulcerative lesions of leishmaniasis. Koochpayeh et al. (2011) in a research about ethnoveterinary medical species of Kerman reported useful effects of *Ajuga chamaecistus*, *Anchusa italic*, *Achillea wilhelmsii*, *Capparis spinosa*, *Cercis siliquastrum*, *Datura stramonium*, *lessertii dendrostellera*, *Erodium cicutarium*, *Glycyrrhiza glabra*, *Medicago sativa*, *Teucrium polium* and etc. on livestock disease and syndromes. Davidovic et al. (2009) in a review of plants used in ethnoveterinary medicine in Serbia reported that in some regions the place of snake bite is being thrashed by a dog-rose branch (*Rosa canina*, Rosaceae) in tradition treatment method.

4. Conclusions

Documentation of medicinal species is valuable for the communities and future generations and for scientific consideration of wider uses of traditional knowledge in treating domestic animals. In present study, we could identify 47 species of ethnoveterinary medicinal plants in Tehran watershed that they are useful not only for human, but also for Livestock. Using these plants for curing domestic animals can help us to produce healthier animal products. On the other hand, the treatment costs can also be reduced.

5. Acknowledgement

This research project has been supported by Islamic Azad University, Isfahan (Khorasgan) branch, Isfahan, Iran.

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