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Traditional Arab ethno-veterinary practices in small ruminant breeding in Israel

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ABSTRACT

The activity of shepherding in the Middle-East is laden with millennia-old cultural content – not the least of which is the recognition by shepherds of the medicinal uses of indigenous vegetation for treating humans and animals. In Israel of the 21st century, this knowledge survives in no more than fifty individuals and there is serious concern that all the ethno-veterinary knowledge in Israel, including drug preparation from local plants, could be lost in this generation. We have surveyed the ethno-veterinary practices of 30 informants in the Galilee, the Carmel Heights, the Samaria Hills, the Northern Negev, and the Golan Heights. Most of the retrieved information was related to the treatment of small ruminants. We grouped our findings into the following categories of ailments: external parasites; stomach disorders, internal parasites, and poisoning; infections, fevers and external wounds; reproductive management; bites and stings; and *kai* or *wasm* – cauterization medicine. We added a category of magical practices. Most herbal recipes consisted of plants offered as fodder, monospecies infusions or decoctions, ointments with olive oil as excipient, generally involving wild plant taxa that were neither rare nor endangered such as *Pistacia lentiscus*, *Inula viscosa*, oak and cypress or cropped species such as tobacco, barley, sesame or grapevine. We also report management practices aimed at improving reproductive performance, improving sanitation in premises, and coping with toxic plants on rangelands. Comparisons of our results with other published sources from the Mediterranean and the Arab world suggest that the same plant species are often used with different applications. Some preparations and practices having proven anthelmintic and anti-coccidial value might gain interest as anthelmintics are under consumers' scrutiny and challenged by parasitic resistance and chemical coccidiostats are being ruled out. Some practices that emerge from this survey challenge our understanding of plant chemistry and pharmacology and animal physiology.

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1. Introduction

There is a great interest in ethno-veterinary uses of local plants. This is because: (i) chemical treatments on animals

are suspected of leaving residues in animal products; (ii) a number of drugs once thought indispensable to breed animals, such as antibiotics used a growth promoters or used to prevent ailments such as coccidiosis and respiratory problems are being phased out; and (iii) parasites develop resistance to chemicals worldwide and treatment become inefficacious. These constraints have triggered recent surveys of ethno-veterinary practices around the

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Mediterranean. In particular, [Viegi et al. \(2003\)](#) established in Italy the biggest data-bank (256 plant species) used in ethno-veterinary studies while [Bullitta et al. \(2007\)](#) found 41 plant species involved in curing animals in the island of Sardinia (Italy). A total of 110 plant species used as remedies were recorded by [Pieroni et al. \(2006\)](#) in a circum-Mediterranean survey, encompassing regions of Morocco, Algeria, Spain, Italy, Cyprus, Greece – and in particular, the island of Crete – and Egypt (Southern Sinai).

Located at cross-roads between Asia, Africa and Europe, Israel encompasses 2600 plant species, of which 700 have potential to serve as drugs or pesticides ([Said et al., 2002](#)). Arabic human herbal medicine has been the object of numerous publications in Israel ([Friedman et al., 1986](#); [Said et al., 2002](#); [Azaizeh et al., 2006](#)). A recent report of Arabic ethno-veterinary medicine encompasses only the Southern, non-Mediterranean part of the Arab world ([Alyemeni et al., 2010](#)). Even though surveys in Europe ([Bullitta et al., 2007](#); [Guarrera et al., 2005](#)) have established that plants used in traditional human medicine are widely used as ethno-veterinary medicines, it is not obvious that the Arabic human medicine that flourished in urban communities of the Middle-East from the 10th century A.D. had impact on shepherds in remote areas of a-Sham (Syria, Israel, Palestine, and Jordan of today). In particular, the *matéria medica* in medieval cities included materials imported from India and Africa ([Lev and Amar, 2006](#)) that were not available to shepherds. Therefore, ethno-veterinary medicine is expected to be based on local materials and to develop independent practices.

All the publications on ethno-veterinary procedures cited above – none of them in animal science literature – are focused on the use of plants; results are tabulated row-wise with plant latin names in alphabetic order in each row ([Viegi et al., 2003](#); [Pieroni et al., 2006](#); [Bullitta et al., 2007](#)). Even though using plants as remedies is the corner-stone of ethno-veterinary medicine, other practices, described in medieval Arabic medicine as early as the 10th century A.D., such as the use of drugs of animal origin ([Lev and Amar, 2006](#)) and cauterization medicine (*wasm* or *kai*; [Chazanfar, 1995](#)), still survive in the Mid-Eastern veterinary treatments.

The flocks – 600,000 sheep and goats – in Israel undergo a process of rapid intensification. As result of urbanization, availability of recycled water, and land tenure limitations, the acreage dedicated to small ruminant grazing is decreasing. Even though the ecological contribution of flocks is recognized and the society is ready to pay for these ecological services, the percentage of small ruminants on pasture is dwindling and the number of active shepherds is decreasing; new shepherds are not recruited and instructed in traditional methods. In 2007, it was estimated that ethno-veterinary knowledge survived in no more than fifty individuals and there was serious concern that all this knowledge, including drug preparation from local plants, could be lost in this generation.

Therefore, the aim of the present study was to retrieve Arab traditional ethno-veterinary knowledge used in Israel, including the uses of plants and of animal products as remedies, and Arab cauterization medicine (*kai*).

2. Materials and methods

2.1. Survey

Basically, the methodology was as reported by [Said et al. \(2002\)](#). In 2009 and 2010, we surveyed a total of 30 informants: ten Druze shepherds, of which eight shepherded flocks on the Carmel Heights, one in Upper Galilee, and one was a respected traditional healer and stock-breeder on the Golan Heights; thirteen Fallahin shepherds, of which six were located in Lower Galilee and six in the Samaria Hills; one veterinary practitioner exposed to traditional shepherds in Northern Israel; and seven Bedouin shepherds from the Negev Desert seasonally transhumant in the Judean Hills. All informants were men. The information was retrieved by interviewing the informants at least once. If information had to be refined, it was done by phone – all respondents owned a cellular phone – or by an additional visit. The interview was based on an ailment-wise questionnaire, as opposed to a plant-wise questionnaire. In other words, shepherds were asked: “How do you cure this disease?” and not “What do you do with this plant?” This is because we realized that it was much easier to identify a disease, based on symptoms, than plants. Also, diseases share the same names in Arabic in all parts of Israel but one plant may bear a different name in different regions. The titles of columns of the questionnaire, written in Hebrew and Arabic were: ailment, animal species (cattle, goat, sheep, and poultry), plant or other ingredients used, location of the informant, drug preparation and therapeutic use (including *kai* cauterization medicine). In contrast with [Said et al. \(2002\)](#), because of the small number of candidates, we included in our data-base all non-redundant information, even if it sourced from dwellers of the same village, members of one family, and parented shepherds. In order to ensure confidence, each of the authors conducted the survey in his own ethnic group. Most talks were conducted in Arabic, but some talks were conducted jointly in Arabic and in Hebrew.

2.2. Disclaimer

Many of the ethno-veterinary practices reported here are not consistent with the Israeli regulation on Animal welfare ([ICACG, 1994](#)). The efficacy of most procedures has not been verified in Israel or elsewhere. Therefore, they are reported here but are not endorsed by authors.

2.3. Definitions

Definitions are according to [Wynn and Fougere \(2007\)](#):

- Decoction: the liquid product obtained by boiling plants with water for 20 min or more;
- Infusion: the liquid product obtained by soaking herbs for a few minutes in boiled water;
- Maceration: the liquid product obtained by soaking chopped dry plants in water at room temperature for a few days.
- Succ: juice extracted from crushed, pressed fruit or bulbs

2.4. Statistics

The regions surveyed differed in the occurrence and frequency of plant species; in addition, the independence of respondents could not be ensured as many of them lived in the same village and/or had family ties. Therefore, calculating globally the “fidelity level” and its derivative, the “informant consensus factor” ([Friedman et al., 1986](#)), in order to establish rank-order priority, was not relevant. Instead, we verified if recipes were cited in other surveys of ethno-veterinary medicine around the Mediterranean or in ethno-pharmacological surveys in the Levant, inferring that the use of a remedy to cure a common disease in different regions would strengthen the odds of its efficacy.

3. Results

The survey enabled us to identify 4 categories of ethno-veterinary procedures. Three of them were aimed at making and using 65 medicines: (i) by using plants (herbal medicine, $n = 51$); (ii) By using mineral components ($n = 8$); and (iii) by using animal products ($n = 6$). In addition,

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