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An Ethnoveterinary Remedies Used in the Treatment of Diseases of Aksaray Malaklısı Shepherd Dogs*

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Summary: The subjects of our study were to report the usage of herbal, animal and mineral remedies on Aksaray Malaklısı shepherd dogs from traditional ethnoveterinary medicine knowledge and to compare the remedies used in traditional veterinary medicine with those used in the other locations of Turkey and countries. The work was carried out in Aksaray province (Turkey) by interviewing dog breeders. Fifty participants provided the information in this paper on the ethnoveterinary remedies used for treatment of diseases in Aksaray Malaklısı shepherd dogs. Ethnoveterinary remedies traditionally utilised for treatments of Aksaray Malaklısı shepherd dogs against ecto and endo-parasites, open skin wounds, diarrhea, constipation, abscess, toxication, mastitis, distemper, keratoconjunctivitis and fracture were identified. It was found that 13 plants in total were being used in the treatment of dog disorders in Aksaray pasturelands. *Pinus nigra* L. (tar) and *Allium sativum* L. were the most used plant species. Used motor oil, naphthalene, dikloro difenil trikloroethan (DDT), sulfur, crop powder and salt were the most utilised substances among mineral remedies. The most commonly used animal remedies included the milk and milk products (butter, yogurt and ayran), fat, and eggs. The present study showed that a number of reported herbal, animal and mineral substances, some of them with promising rational therapeutic applications, have been detected.

Key words: Aksaray Malaklısı shepherd dog, Aksaray province, ethnoveterinary medicine, medicinal remedies

Aksaray Malaklısı Çoban Köpeklerinin Hastalıklarının Tedavisinde Kullanılan Halk Veteriner Hekimliği İlaçları

Özet: Bu çalışmada, Aksaray Malaklısı çoban köpeği hastalıklarında geleneksel olarak kullanılan bitkisel, hayvansal ve madensel ilaçları kayıt altına almak, Türkiye'nin ve dünyanın çeşitli yerlerindeki uygulamalarla karşılaştırmasını yapmak amaçlandı. Çalışma, Aksaray yöresinde 50 Malaklı köpeği yetiştiricisi ile yüz yüze görüşme yapılarak gerçekleştirildi. Aksaray Malaklısı çoban köpeği hastalıklarında kullanılan halk veteriner hekimliği ilaçları bu kaynak kişilerden sağlanan bilgiler ile derlendi. Çalışmada, Aksaray Malaklısı çoban köpeğinin iç ve dış parazitleri, deri yaralanmaları, ishal, kabızlık, apse, zehirlenme, mastitis, köpek gençlik hastalığı, keratokonjunktivitis ve kırık gibi hastalık tedavilerinde kullanılan halk veteriner hekimliği ilaçları belirlendi. Bu hastalıkların tedavisinde toplam 13 adet bitkisel ilacın kullanıldığı tespit edildi. En çok kullanılan bitkisel ilaçlar arasında çam katranı ve sarımsak yer aldı. Mineral ilaçlar olarak motor atık yağı, naftalin, DDT, kükürt, ekin tozu ve tuz kullanılırken, yağ, yoğurt, ayran, kuyruk yağı ve yumurta gibi hayvansal ürünlerde hayvansal ilaçlar arasında yer aldı. Bu çalışma ile çeşitli bitkisel, hayvansal ve mineral ilaçlar tespit edilmiş olup, bazı ilaçların rasyonel tedavi uygulamaları kapsamında değerlendirilebileceği belirlendi.

Anahtar kelimeler: Aksaray Malaklısı çoban köpeği, Aksaray yöresi, halk veteriner hekimliği, tıbbi ilaçlar

Introduction

Ethnoveterinary medicine implying traditional animal health care includes the knowledge, skills, methods, practices, and beliefs about animal health care (15,36). A constant trial and error from ancient times to modern age by humankind brought various skills in the treatment of surrounding animals via using plant-based medicines as a part of ethnoveterinary medicine (32). The treatment of animals involves the low cost medicinal plants for animal health care which is called ethnoveterinary medicine (20).

Turkish folk medicine and ethnoveterinary medicine are originated from traditional Turkish culture and history and come from the ancient culture of Anatolia such as Hittite, Persian, Romans, Byzantines, Seljuks and Ottamans. Dogs are among the animals accepted sacred in

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Turkish folklore (35). People in Europe and Asia used dogs long time as guards for domesticated animals against wild predators and thieves. The livestock guarding dogs, also known as shepherd dogs, have been come out as a distinct group of special dogs from Portugal to Tibet for centuries (30).

Shepherd dogs are crucially important, particularly among traditional farmers. Three of the five dog breeds is known as shepherd dog breeds in Turkey. These shepherd dogs are raised in Central Anatolia's cities which have intensive sheep breeding. One of them is called "Aksaray Malaklısı" (Malaklı) shepherd dog is bred in Aksaray region. "Aksaray Malaklısı" is a dog breed which has large body, gray colour, distinguished pendulous lips as well as its paws are more larger and thicker than Kangal shepherd dogs (3).

Although many ethnoveterinary information is available in domestic animals such as cows, sheep, horses, ethnoveterinary medicine for dogs has recently received greater attention from researchers throughout the world (5,7,8,16,18-22). In Turkey, there are few comparative studies focusing on dogs (31).

The aims of the study were to document the medicinal remedies used to treat the dog diseases, to compare the remedies used in traditional veterinary medicine with those used in the other locations of Turkey and countries and to introduce new herbal, animal and mineral drugs that can be appropriate in the treatment of disorders in dogs. This paper presented the remedies used for an evaluation of their safety for dogs.

Material and Methods

Study area

Aksaray is located in the central of Turkey at latitude of 38-39° North and longitude of 30-35° East (Figure 1), mountainous region 965 m above mean sea level. Its area is 7821 km^2. The climate in Aksaray is cold and snowy in winter, whereas hot and dry in summer. The annual mean temperature value is 12.2 °C; the low is -0.3 °C and the high is 22.8 °C (26).

Aksaray has a rich tradition of ethnoveterinary practices. The local economy is based on livestock. Some of the domestic animals common to Aksaray include cattle, sheep, goats, and Aksaray Malaklı dogs (17).

Figure 1. Study area: Aksaray province

Data collection

The work was carried out in Aksaray province by interviewing dog breeders (50 resource person) and filling questionnaires in order to record ethnoveterinary practices for dog health care. Ethnoveterinary data were collected for Malaklı dogs between the 2015 to 2016. Interviews were conducted with taking notes, and made audio or video recordings of the interviewees when possible.

A questionnaire was administered to the dog breeders, through face-to-face interviews. The information was compiled included plant species and family, vernacular name, the parts of the plant used, methods of preparation and administration and traditional therapeutic effects.

Published sources on pharmacology, ethnomedicine and ethnoveterinary references available on the internet such journals, books, reviews in electronic databases: Science Direct, PubMed, and Google Scholar were sought to place the plants' known chemical ingredients and clinically tested physiological effects. All the plants were identified at the Selçuk University Herbarium (KNYA), but no voucher specimens were deposited.

We had the permission of verbal prior informed consent (PIC) from each participant, and local research ethics committee approval (No. 2015/05) of Faculty of Veterinary Medicine, Selçuk University.

Results

The study indicated the use of several traditional ethnoveterinary remedies against specific diseases. Reported medicinal remedies were used against 14 different kinds of diseases including ecto and endo-parasites, open skin wounds, diarrhea, dermatitis, constipation, ab-

scess, toxication, mastitis, distemper, keratoconjunctivitis and fracture.

Medicinal remedies used for the mange showed a high incidence (20%, 14 remedies) followed by open skin wounds (16%, 11 remedies), constipation, toxication (10% each, 7 remedies), diarrhea (8%, 6 remedies) and so on Figure 2-3. It was found that in total 13 plants were being used in the treatment of dog disorders in Aksaray pasturelands. These plants are presented in Table 1. The products of plant origin such as olive oil, linseed oil, pine tar, molasses, were also used alone or in combination with other substances to prepare remedies. *Pinus nigra* L. (tar) and *Allium sativum* L. were among the most used species, indicated by 36 and 4 interviewees, for the treatment of 3 different diseases.

The most frequently used parts of plants are the leaves (31%), fruits (23%), bulbs and grains

Table 1. Ethnoveterinary herbal remedies used for Malaklı dogs in Aksaray province

Plant species and family	Vernacular name	Part(s) used	Preparation/ Administration	Therapeutic effect
Allium cepa L. *(Liliaceae)*	Soğan	Bulb	Poultice/External	OSW, A
Linum usitatissimum L. *(Linaceae)*	Keten	Seed (linseed oil)	Topical application/ External	A
Olea europaea L. *(Oleaceae)*	Zeytin	Fruit (olive oil)	Offered as drink/ Internal	C
Allium sativum L. *(Liliaceae)*	Sarımsak	Bulb	Crushing (mixed yogurt) then dogs are bottle-fed/Internal, pasted on afflicted areas/External	C, Dis, M
Cydonia oblonga Mill. *(Rosaceae)*	Ayva	Leaves	Infusion put in drinking water/Internal	Di
Lawsonia inermis L. *(Lythraceae)*	Kına	Leaves	Powdering and applied on dog/External	LF
Vitis vinifera L. *(Vitaceae)*	Üzüm	Fruit (molasses)	Grapes boiled to syrup and rubbed on affected areas/ External	M
Hordeum vulgare L. *(Poaceae)*	Arpa	Grain	Decoction and served as food/ Internal	Dis
Oryza L. *(Poaceae)*	Pirinç	Grain	Grains boiled in water and dogs are fed/ Internal	Di
Capsicum annuum L. *(Solanaceae)*	Kırmızı biber	Fruit	Blowed out to eyes with pipette/External	K
Camellia sinensis L. *(Theaceae)*	Çay	Leaves	Infusion is given orally/Internal	Di
Salix alba L. *(Salicaceae)*	Söğüt	Leaves	Infusion is given orally/Internal	Di
Pinus nigra L. *(Pinaceae)*	Karaçam	Tar	Topical application/ External	OSW, M, F

Di: Diarrhea, K: Keratoconjunctivitis, Dis: Distemper, M: Mange, T: Tick, LF: Louse and Flea, C: Constipation, A: Abscess, OSW: Open Skin Wounds, F: Fracture

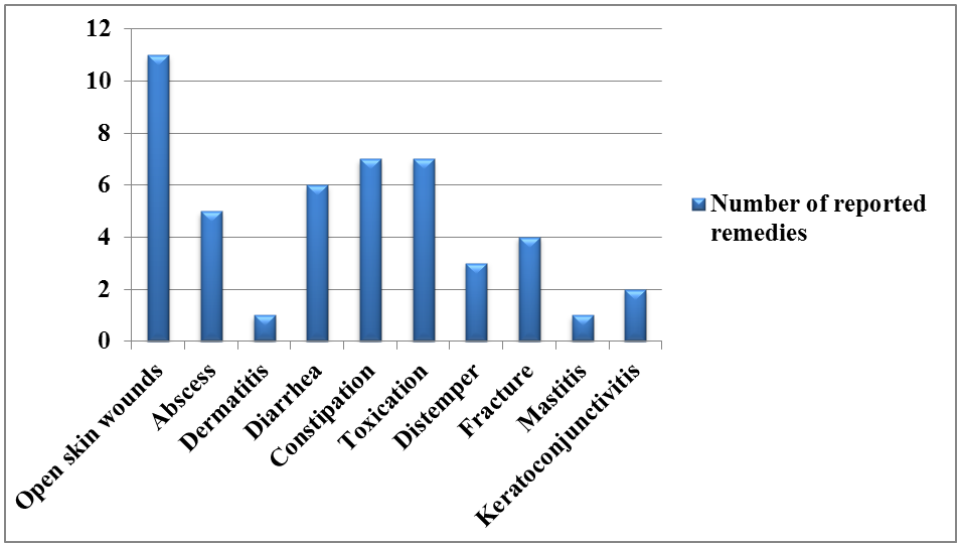

Figure 2. Number of reported remedies in use for treatments of Malaklı dogs against diseases

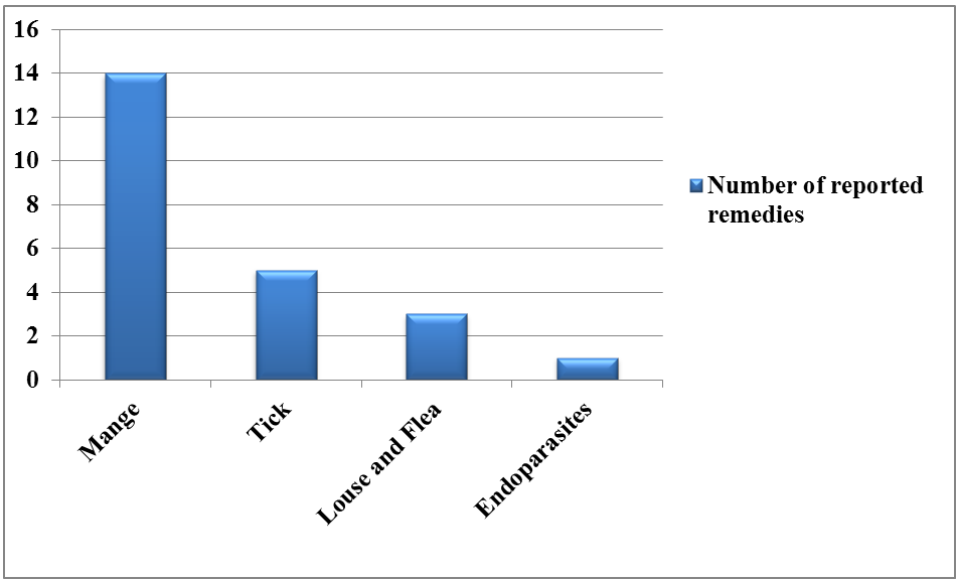

Figure 3. Number of reported remedies in use for treatments of Malaklı dogs against endo and ecto-parasites

Table 2. Animal or mineral derived remedies and treat Malaklı dog diseases in Aksaray Province

Components Animal/Mineral	Local name	Ailments (No)	Informants (No)	Preparation	Medicinal Use
Used motor oil	Yanık yağı	4	36	Externally applied	Wound healing, anti-lice, anti-tick, to heal scabies
Naphthalene	Asfinik	3	27	Topical application	To stop bleeding, vulnerary, anti-tick, to heal scabies
Yogurt	Yoğurt	3	15	Oral	Laxative, to treat distemper, to heal toxication
DDT	Ekin tozu	2	18	Topical application	Vulnerary, anti-tick
Ayran	Ayran	2	17	Oral, Topical application	Laxative, to heal toxication, snakebite and scorpion stings
Salt	Tuz	2	11	Externally applied	Antiseptic for wounds, to fix fracture
Crop powder	Ekin tozu	2	11	Topical application	Vulnerary, anti-tick
Egg	Yumurta	2	11	Oral	To heal toxication and fix fracture
Soap	Sabun	2	5	Oral, enema with water	Purgative, suppository to heal constipation
Urine	İdrar	2	2	Externally applied	Against abscess and mange
Butter	Tereyağı	1	17	Externally applied	Vulnerary, to heal scabies
Sulphur	Kükürt	1	16	Externally applied	To heal scabies
Mechanical grease	Gres yağı	1	14	Topically as used paste	To heal scabies
Ash	Kül	1	13	Topical as is in dry form	To stop bleeding
Soil	Köstü, kösnü toprağı	1	6	Oral	To heal toxication and snakebite
Feces	Kık	1	6	Externally applied	Vulnerary
Fuel oil	Mazot	1	5	Topical application	Anti-tick
Milk of goat	Keçi sütü	1	4	Oral	Laxative
Green mold	Gal	1	4	Boiled and administered as an oral	To heal toxication
Glass	Cam	1	3	After crushed glass, blow out to eyes with pipette	To heal keratoconjunctivitis
Tortoise shell	Tosbağa	1	1	Crushed tortoise shell pasted on skin	To heal scabies
Tail fat	Kuyruk yağı	1	1	Oral	Laxative

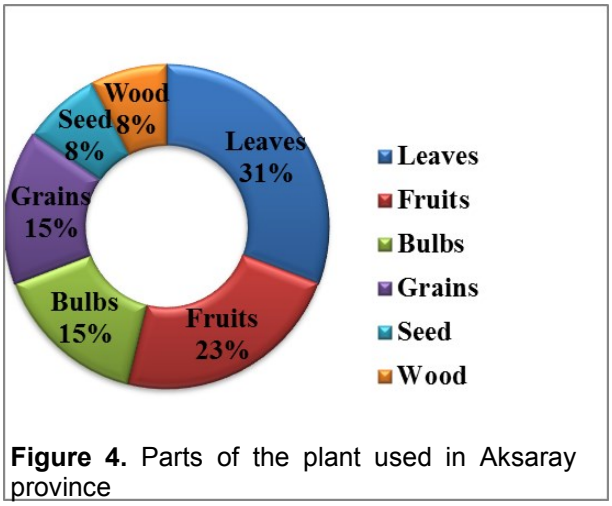

Figure 4. Parts of the plant used in Aksaray province

(15%), seed and wood (8%) (Figure 4). Various methods of administrations such as internal administration and external administration of preparation were used to cure the diseases. External applications compared with internal applications on the affected area were preferred in most cases. Among the external administrations, the topical application is the most common route for the treatment diseases.

Used motor oil, naphthalene, DDT, sulphur, crop powder and salt were the most utilised substances among the mineral remedies. The most commonly used animal remedies included the milk and milk products (butter, yogurt and ayran), fat, and eggs. Some of the more unusual remedies come from animal excrements, including faeces and urine. Details regarding the ingredients of animal or mineral derived remedies are presented in Table 2. As shown on Table 2, used motor oil was indicated by 36 interviewees for the treatment of four diseases, naphthalene was indicated by 27 interviewees for the treatment of three diseases, among the substances of animal origin, yogurt was indicated by 15 interviewees for three diseases.

Discussion and Conclusion

On comparing our results with other ethnoveterinary studies in other regions of Turkey, pine tar is used on animal as a treatment for mange, tick and to cure wounds inflicted by wolves in Afyonkarahisar province, Central Western Turkey (1). Tar is well known in Turkey folk medicine as an anti-inflammatory, and is used against snakebites and wounds. Tar is also used for dermatitis madidans and mange in Aegean region (2). It is applied to heal skin diseases in Antalya province (4). For widespread species, similar uses were found in different regions in Turkey. For example *Allium cepa* L. for open skin wounds (34,37), and *Allium sativum* for mange are used in ethnoveterinary medicine of the Lower Euphrates Basin (37). Olive oil is used for open skin diseases in Aegean region (2).

The plants used for ethnoveterinary remedies in dogs are also used in Sivas ethnoveterinary medicine in Turkey for similar reasons. For example, mange, open skin wounds, constipations, toxications and diarrhea were ranked as some of the most important diseases by dog breeders; this was similar to the findings of Sinmez and Yaşar (31) who reported that ectoparasitic diseases, skin diseases, diarrhea and toxication, were ranked as the most important diseases focused on Kangal shepherd dog in Sivas folklore.

Related to Malaklı dog ethnoveterinary medicine of Aksaray province shows some similarities with that reported for other studies. In this context, Jernigan (16) listed 35 plant species used to treat gastrointestinal and miscellaneous illnesses among the Aguaruna in Peru. Lans et al. (19) reported that 36 plant species and three animals used either to improve dogs' ability to track and or to treat common ailments such as injuries, snakebite, mange and other skin conditions in Trinidad. The twenty plants were used to treatment for flea and ear problems in dogs (20) and six medicinal plants were used for reproductive health in pets in British Columbia, Canada (21). Bahmani and Eftekhari (5) found that 22 plants were being used in the treatment of dog disorders such as diarhea, snakebite, endo and ecto-parazites in Ilam province, Iran.

The leaves of *Cydonia oblonga* L. is used for diarrhea in our study (Table 1). *Cydonia oblonga* leaves used to treat diarrhea on ethnoveterinary medicine in Turgutlu/Manisa/Turkey (11) and ethnomedicine in Balıkesir/Turkey (27). In Aksaray province, the ethnoveterinary use of *Cydonia oblonga* for diarrhea seems to parallel human folk use. According to our study results, we consider that ethnoveterinary uses of tea *(Camellia sinensis* L.) and rice (*Oryza* L.) for diarrhea have possibly derived from the folk medicine use.

Ethnoveterinary practices are discussed according to reports of similar procedures in other countries. The use of garlic (*Allium sativum* L.) as antiseptic and antiparasitic showed in Table

1. These results correlate strongly with the findings of Martínez and Luján (23), who recorded garlic as a remedy for wounds and injuries in Argentina. Garlic is used to dogs for the treatment of ear problems in British Columbia (20). Garlic is also reported as a traditional remedy of antiparasitic (9,29).

Infection of wolf bite, abscess and open skin wounds in Malaklı dogs are prevented with a poultice of *Allium cepa* L. in Aksaray province (Table 1). Similarly, Bulb of *Allium cepa* is used as an anti-inflammatory to treat cattle in Iberian Peninsula (10). Olive (*Olea europaea* L.) oil is used to treat constipation for Malaklı dogs in study area (Table 1). This plant is used for the same purpose in other animals as well. In Spain, olive oil has been used as detoxifying for internal use (7), and as vulnerary, antiseptic, cicatrising (10). The present study indicated the linseed oil from *Linum usitatissimum* L. was used to treat abscess (Table 1). The seed of *Linum usitatissimum* was used to support pregnancy and to aid conception in dogs in ethnoveterinary medicine of British Columbia (21). Franco et al. (14) found that the topical administration of linseed oil (1% or 5%) in experimental excisional wounds promoted reepithelialization in 100% of the animals treated. Three methods of animal-based medicine are in use containing 1- the whole or parts of the animal body, 2- metabolic products of the animal (secretions or excrement), and 3- other things created by animals such as nests, honey, and eggs (12). As an example of this source, eggs are used in treatment of toxication and fixing fractures. In Italy and Albania, eating boiled eggs are used as a diarrhea remedy (28). In the present study, yogurt and ayran were recorded in a list of dog remedies in Aksaray province, against snakebites and scorpion stings (Table 2). Also, internal intake of soap, yogurt, milk of goat, ayran were caused in reduced constipation to dogs. Due to the harmful effects and persistent residues of the standard drugs, organic flea treatments is preferred by the pet owners of other non-target species (20). Similarly, the present study showed that *Lawsonia inermis* L. has been widely used for flea repellent (Table 1). Although Başoğlu et al. (6) mention that antifungal activity of *Lawsonia inermis* leaves, scientific evidence for the antiparasitic effectiveness of *Lawsonia inermis* is limited. In addition, fuel-oil, used motor oil, naphthalene, crop powder, and DDT are given to dogs in Aksaray province to expel louse, fleas and ticks (Table 1).

The common use of used motor oil is known by farmers (13,24). Used motor oil had potential acaricidal activities against ticks according to the study of Moyo et al. (25). It may act by clogging the spiracles and causing the ticks to suffocate (13). However, the danger in using these compounds can be potential toxicity to the animal. This was in agreement with the studies by Sinmez and Yaşar (31) and Yaşar et al. (33) who reported common use of these materials by livestock and dog breeders, respectively in Sivas province and Konya region.

Some plants of the present work which are used for dog diseases such as *Allium cepa* L., *Linum usitatissimum* L., *Lawsonia inermis* L., *Pinus nigra* L., *Camellia sinensis* L., *Salix alba* L. have some new effects that have not been documented, but other plants used in the treatment of dog disorders such as *Allium sativum L.* and *Capsicum annuum* L. are mentioned. For example; *Capsicum annuum* is employed to enhance olfaction in Ecuador (8) and *Allium sativum* is used to treat distemper, diarrhea and toxications to Kangal dogs in Sivas province (31).

We believe that the present work will provide knowledge yet undocumented ethnoveterinary literature which will help in the conservation of many rare and gradually disappearing important medicinal remedies. This ethnoveterinary survey results showed the wealth of indigenous knowledge and traditional remedies associated with the dog breeders of Aksaray province. The present study showed that a number of reported herbal, animal and mineral substances have been detected, some of them with promising rational therapeutic applications.

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