

Medicinal Plants in the Ethnoveterinary Practices of Borana Pastoralists, Southern Ethiopia

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ABSTRACT

A survey was conducted in the Borana rangeland pastoral areas of southern Ethiopia between October 1998 and May 1999 to generate information on the ethnoveterinary use of plants. Information was collected by direct interview of 24 healers and 97 livestock owners. Forty-three plant species were collected, compressed, and submitted to the national herbarium for botanical classification. Roots, leaves, barks, shoots, and other parts of plants were recorded that could be employed to treat sick animals. Oral administration of infusions, decoctions, and other preparations comprised 56.42% of the applications, followed by topical application of poultice, sap, and other forms (37.2%). Infusion was the most frequently used preparation (35.6%), followed by poultice (30.13%) and decoction (17.8%). Knowledge of medicinal plants can empower pastoralists to solve animal health problems cost-effectively.

INTRODUCTION

With pressure from an increasing human population and declining per-capita production of food in Africa, there is an urgent need to develop marginal resources such as the semi-arid and arid lowlands and optimize their use through appropriate livestock production. In Ethiopia as well as in most developing countries, animal disease remains one of the principal causes of poor livestock performance, leading to an ever-increasing gap between the supply of, and the demand for, livestock products.¹

Pharmacotherapy is one of the most important means of controlling livestock diseases, but it is possible only if livestock owners can afford to cover the cost of treatments. Cost of treatment is therefore an important determinant of the usefulness of veterinary drugs. In Ethiopia, conventional veterinary services have been playing a paramount role in the control and prophylaxis of livestock diseases in the last three decades. However, they cannot yet deliver complete coverage in preventive and curative health care practices because of inadequate labor, logistical problems, an erratic supply of

drugs, and the high cost of drugs and equipment. Consequently, the majority of those raising stock in rural areas are far from the site of veterinary stations, and those who have access to veterinary services may not be able to afford to pay for them. Additionally, reduced funding for animal disease control is an issue in Ethiopia and is likely to influence the incidence of some serious livestock diseases.

Cutbacks in modern veterinary services mean that livestock owners cannot rely on veterinary services for control of various important livestock diseases. Thus the pastoralists who occupy remote, inaccessible areas of the arid and semi-arid lowlands (such as the Borana pastoralists) are highly vulnerable to such problems. A practical solution to this problem is to develop socially acceptable and effective remedies from reasonably inexpensive sources that can complement modern medicine.² The practice of traditional veterinary medicine provides such a short cut.

In Ethiopia people have used traditional veterinary methods to treat both human and livestock diseases for generations. Plants comprise the largest component of the diverse therapeutic elements of traditional livestock health care practices. Herbal medicine is the branch of traditional practices that is most amenable to scientific investigation. Herbs are also invaluable subjects of international development. More than 30% of modern drugs are derived from plants.³ The use of indigenous expertise, especially that of ethnobotanists, has received considerable attention in recent years. However, information on veterinary herbal medicine has not been systematically documented.

This study was conducted to document and present various herbal preparations used by Borana pastoralists in Ethiopia and to collect medicinal plants for botanical classification in the hopes of furthering knowledge of veterinary herbal medicine.

MATERIALS AND METHODS

Study Area

The study was conducted in the Borana zone of the Oromia regional state in southern

Ethiopia in four selected districts between October 1998 and May 1999. The Borana zone is geographically located between 3° 36' - 6° 38' N latitude and 36° 43' -41° 40' E longitude. The largest proportion of the Borana zone (62.5%) can be classified as lowlands with a semi-arid to arid climate. Nomadism and semisedentary practices are typical livestock-rearing practices in these areas.

Two rainy seasons are recorded in the area: the spring and autumn rains, referred to as "gannaa" and "hagayyaa," respectively. The spring rain starts around mid-February and ceases around the end of May, and the autumn rain starts around mid-September and ends around mid-November. The mean annual temperature varies from 10°C to over 25°C.⁴ The natural vegetation is forest and lowland bushy savannah or steppe-type vegetation.

Data Collection

Information on different aspects of ethno-veterinary medicine in the study area was collected by direct interviews of known healers and livestock owners. A total of 24 well-known healers and 97 livestock owners were interviewed in four districts of Borana rangelands. Baseline data on healers' sources and specialty were collected. Subsequent discussions centered on details of the healers' practice. An ethnobotanical survey was conducted by transect walking or driving with respondents along culverts. Parts of the plants that were identified as having medicinal value were collected, compressed, and submitted to the National Herbarium of Addis Ababa University for botanical classification.

RESULTS

A total of 77 different plants used by Borana pastoralists to treat or prevent a wide range of livestock disease situations were collected. Of these, 64 were submitted to Addis Ababa University for botanical classification. Forty-three of the submitted plant specimens were botanically classified. Table 1 presents a summary of their indications, component used, routes of administration, and forms of preparations.

Table 1. Summary of Medicinal Plants Used by Borana Pastoralists in Controlling Livestock Diseases

| Local Name | Botanical Name | Parts Used | Routes | Preparation | Indications |
|------------|-------------------------------|--------------|------------------|--|--|
| Hammaressa | <i>Accacia brevispica</i> | Bark of root | Oral | Paste infusion | Cowdriasis, 3-day sickness, diarrhea |
| Hallo | <i>Accacia busei</i> | Inner bark | Topical | Paste with or without butter; infusion | Wounds and burns, mastitis, swollen teats, and retained fetal membrane |
| Jamas | <i>Accacia mellifera</i> | Bark | Oral | Red colored; infusion | Diarrhea |
| Jirme | <i>Accacia nilotica</i> | Root | Oral | Infusion | Retained fetal membrane |
| | | | Oral | Infusion | Diarrhea |
| | | | Oral/Nasal | Paste | Snake bite |
| | | | Auricular/Ocular | Paste | Cowdriasis |
| Dhadacha | <i>Accacia tortilis</i> | Inner bark | Oral | Infusion | Diarrhea |
| | | Inner bark | Topical | As suture | Surgery |
| Hawacho | <i>Albezia anthelimentica</i> | Root bark | Oral | Decoction | Helminthiasis |
| Qullubbi | <i>Allium sativum</i> | Bulb | Oral | Paste or as is | As expectorant, antiseptic, and antimalarial (for humans) |
| Chakke | <i>Aloe kedongesis</i> | Whole plant | Oral | Infusion | Abdominal distension |
| | | | Topical | Paste | Dermatophilosis |
| Hargessa | <i>Aloe scundiflora</i> | Shoot | Topical | Sap | Ear pain, ophthalmia, wounds, burns |
| | | Root | Oral | | Ear pain, ophthalmia, wounds, burns |
| | | Leaf | Topical | | Ear pain, ophthalmia, wounds, burns |
| Neem | <i>Azardrachta indica</i> | Roots | Oral | Infusion | Ecto- and endoparasites |
| | | Leaf | Topical | Paste | Ectoparasites |
| Baddana | <i>Balanites rotundifolia</i> | Branches | Topical | Ash | Dermatophilosis, mange mites |
| Mimmixa | <i>Capsicum annum</i> | Pods | Oral | Infusion | Cowdriasis |
| | | | Oral | | Diarrhea |
| | | | Topical | Paste | Tick infestation |
| Dhagamsa | <i>Carissa edulis</i> | Roots | Oral | Decoction | Helminthiasis |
| | | | Oral | Paste | Ringworm |
| | | Leaf | Topical | Paste | Mastitis |
| Baaitokkee | <i>Cissus adenocaulis</i> | Root | Oral | Paste | Snake bite |
| Burii | <i>Cissus rotundifolia</i> | Roots | Oral, anal | Infusion | Cowdriasis |
| Jaideessaa | | | | | |
| Gurracha | <i>Clotalaria natalatia</i> | Roots | Oral | Decoction | Sudden illness |
| | | Leaf | | | |
| Babaressa | <i>Coes edulis</i> | Roots | Oral | Infusion | Snake bite |

Table 1. continued

| Local Name | Botanical Name | Parts Used | Routes | Preparation | Indications |
|----------------------------|--|--|--|--|--|
| Hagatsu | <i>Comiphora erythraea</i> | Bark Gum/Resin Gum/Resin Gum | Oral Topical Oral Topical | Infusion Paste Infusion Paste | Retained fetal membrane Foot rot Cowdriasis Skin diseases |
| Qumbi Mokofa | <i>Comiphora holdai</i> <i>Croton dichogamous</i> | Gum/Resin Root | Topical Vaginal | Paste Paste | Anthrax, navel illness Poor mothering |
| Makkanisa | <i>Croton macrostachys</i> | Leaf/Twig | Oral Topical | Infusion Sap | Bloat Ringworm |
| Nyappo | <i>Croton megalocarpus</i> | Branches | Topical | Sap | Bleeding wounds |
| Ocho | <i>Diospyros scabra</i> | Branches | Topical | Moistened ash | Mange mites, liver fluke |
| Chersi | <i>Dobera glabra</i> | Branches | Topical | Sap | Mange mites |
| Adama | <i>Euphorbia abyssinica</i> | Stem | Topical | Sap | Mange mites |
| Anno | <i>Euphorbia truncalli</i> | Shoots | Topical | Paste | Skin diseases |
| Oda | <i>Ficus sycamoros</i> | Leaf | Oral | Infusion | Liver fluke |
| Haroressa | <i>Grewia bicolar</i> | Bark | Topical | Paste | Contagious camel skin necrosis |
| Ogumdi Xaxessa Qobbo | <i>Grewia villosa</i> <i>Rhus abyssinica</i> <i>Ricinus communis</i> | Root/Leaf Leaf Leaf/Root Leaf/Stalk | Oral Topical Oral Topical Oral | Infusion Threads Decoctions Paste Infusion | Retained fetal membrane As suture material Sudden illness Skin and eye problems Retained fetal membrane Application of medicine |
| Gora Hudha Daysa | <i>Rosa abyssinica</i> <i>Salvadora persica</i> <i>Sesbania sesban</i> | Root Bark, root Root-bark Leaf | Topical Oral Topical Topical | Paste Decoction Infusion Decoction | Skin problems Trypanosomiasis, anthrax Mastitis Tsetse flies |
| Butee Hiddi | <i>Steroxylon oxycantha</i> <i>Solanum incanum</i> | Whole plant Fruit | Oral Oral/nasal Topical | Infusion Infusion Roasted Decoction Decoction Paste | Bloat, fascioliasis Cowdriasis Dermatophilosis Pasteurellosis Blackleg Skin diseases |

Table 1. continued

| Local Name | Botanical Name | Parts Used | Routes | Preparation | Indications |
|------------|------------------------------|--------------------|--------------------|---------------------------|--|
| Walqabbisa | <i>Sphaeranthus steetzii</i> | Leaf | Oral | Infusion | Bloat |
| Qollobbo | <i>Sterculia alexandri</i> | Stem Latex | Topical Topical | Decoction Sap | Mange mites Mange mites |
| Roqa | <i>Tamarindus indica</i> | Stem Fruit/pulp | Oral Oral | Infusion Infusion | Diarrhea Malaria in humans |
| Qorsa dima | <i>Woodfordia uniflora</i> | Root | Oral | Decoction Paste Sap | Rabies 3-day sickness, sudden illness Evil eye |
| Gadah | <i>Zanthoxylum chalybeum</i> | Seeds | Oral | Infusion | Pneumonia, diarrhea |
| Ginger | <i>Zingiber officinale</i> | Rhizome | Topical Oral | Paste | Emesis Colic, rubefacient |
| Qurqura | <i>Zizyphus mauritiana</i> | Bark | Oral | Decoction | Bloat |

The most widely practiced administration of medicinal plant preparations was oral administration of infusions, decoctions, and other preparations (56.4%); topical applications of paste (poultice), sap, and other formulations were also common (37.2%). Relatively small numbers of preparations were applied through nasal, ocular, auricular, anal, and vaginal routes. A few herbs were ignited to produce ash, which was used to treat skin diseases. The most frequently used form of preparation was infusion (35.6%), followed by poultice (30.1%) and decoction (17.8%); other methods were used less frequently. Most (62.5%) of the pastoralists interviewed frequently use herbal preparations to treat their animals, whereas the remaining 37.5% preferred the complementary use of both herbal preparations and modern drugs.

DISCUSSION

The literature on ethnoveterinary botanicals is extensive. People inhabiting different ecological zones use different plants and plant parts in their treatment arsenal. The pharmaceutical value and concentration of active ingredients in each plant varied depending on climatic and edaphic factors.

In this survey 43 different plants were documented. Different modes of application and preparations were used depending on the perceived diagnosis and which plant parts were intended for use. These remedial approaches have been established among communities other than Borana pastoralists.⁵⁻⁸ However, most of the plants recorded in this study have been noted elsewhere in Ethiopia and other parts of the world to have medicinal value.⁶⁻¹⁶

The efficacy of some of the herbs such as *Albezia anthelimentica* against intestinal helminthosis¹⁷ and that of the *Aloe* species in treating *Trychostogylus* species in sheep² has also been confirmed and their pharmaceutical ingredients identified. *Azadirachta indica* is known to contain chemicals that could help to control more than 200 pest species as well as antimalarial limonoids that showed good antimalarial action in vitro.^{16,18}

Aqueous extracts of *Euphorbia* species have been found to have bacteriostatic effects in vitro against *Staphylococcus aureus*, and *Zingiber officinale* has been shown to contain zingerone, which is known to be a good remedy for colic.¹⁷

CONCLUSIONS

Borana pastoralists were shown in this study to have a wealth of knowledge about herbal medicine. Medicinal plants that are found in the rangelands are harvested and used for treatment of sick animals. Recognizing the value of this indigenous knowledge empowers livestock owners to attempt to solve their animals' health problems in a cost-effective way.² A comparative investigation of traditional and modern veterinary services has been suggested.^{2,18,19} Lambert has tried to show the economic advantages of collecting and marketing medicinal plants.¹⁸

Herbal preparations are crude and could potentially be toxic. Research is therefore needed to determine optimal doses and concentrations of the preparations and to identify the side effects of the remedies. Moreover, the efficacy of the preparations, techniques, and practices need to be investigated to identify promising plants for use in livestock development proposals. The documentation and conservation of medicinal plants is therefore highly recommended.

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