



A Survey of Traditional Health Remedies Used by the Maasai of Southern Kaijiado District, Kenya

John Warui Kiringe

Research

Abstract

This study investigated the use of traditional health remedies among the Maasai of Kuku Group Ranch of Southern Kaijiado District, Kenya. A structured and semi-structured questionnaire was administered to heads or adult members of households in the study area as well as key people who are knowledgeable in Maasai traditional medicine. Use of ethno-medicine was prevalent, with 73% of the respondents indicating this was their preferred type of treatment. Traditional medicine was the primary health care system for the community even though 98% of the respondents mentioned that they frequently sought modern medical care provided by local dispensaries and clinics. Knowledge on traditional plant health remedies was immense, and a wide variety of illnesses and body conditions were treated and managed using locally available medicinal plants. The community had an elaborate and complex pharmacopoeia supported by a wide range of plant species majority of which were readily harvested within the group ranch. Knowledge about the use of ethno-medicinal resources and the resources themselves appeared to be threatened by rapid changes in traditional lifestyles and cultural practices particularly the spread of Christianity, formal education and emphasis on reliance of modern medical care. Plants recognized to be of medicinal value by the community appeared to be equally threatened by a myriad of factors particularly land use changes. There is great need to conserve the rich plant biodiversity in the ranch as well as preserve knowledge on the value and use of traditional plant based remedies amidst a rapidly changing society.

Introduction

For generations, human beings have engaged in the development of detailed botanical pharmacopoeia through

trial and error with a view to combat illnesses that were often specific to their localities. In Kenya, for instance, the Samburu people who inhabit the northern part of the country make use of a wide range of ethno-medicinal resources comprising of about 120 or more plant species which are used to treat many diseases including malaria, gonorrhoea, hepatitis and polio (Fratkin 1996). Similar elaborate and rich pharmacopoeia systems have also been documented for other Kenyan communities such as the Maasai, Gusii, Luo, Abaluyia and the Kikuyu people (Simiyu 1995, Sindiga 1995, Sindiga *et al.* 1995, Wandimba 1995). For most tribes of Kenya, knowledge and use of ethno-medicine was passed down orally from generation to generation (Sankan 1995) presumably to trustworthy persons (usually first-born sons) that would continue the tradition and practice (Kokwaro 1976). Thus, it is only of recent that humans have curtailed their heavy dependence on plants as critical sources of therapeutic remedies perhaps due to the advent of modern technology and synthetic chemistry (Plotkin 1991).

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Although Western medicine has become widespread in developing countries, many rural communities are still heavily dependent on plant-based therapies for their primary healthcare (Fratkin 1996, Schocke *et al.* 2000, Swanson 1995). According to the World Health Organization (WHO) approximately 80% of the world's population relies on traditional medicine to fulfill their daily health needs (Hamann 1991, Marshall 1998). In Kenya, statistics show that 75 to 90 percent of local communities rely on ethno-medicine as the dominant health care system, and this is a pointer to the importance of these resources (Ochieng'Obado & Odera 1995, Sindiga *et al.* 1995). The high dependence on traditional plant remedies in most African populations is partly attributed to traditional beliefs and lack of reliable modern health care (Sindiga 1995).

It is interesting to note that traditional medicine, which had been shunned, stigmatized, and disregarded in the past for its "witchcraft" and other "illegitimate" superstitious customs and practices, is now being actively promoted by Western and international institutions as the dominant primary health care in developing countries (WHO 2002). Since 1977, when the World Health Assembly (WHA) first drew attention to the potential of traditional medicine (Sindiga *et al.* 1995), its benefits have reached popular international rhetoric. In 1987, the WHA urged member states to, "initiate comprehensive programs for the identification, evaluation, preparation, cultivation, and conservation of medicinal plants used in traditional medicine" (Eloff 1998). Since then, the world has witnessed increased legitimacy and utilization of traditional plant remedies. One of the great benefits of this health care system is the independence it provides people who practice it, since they can treat themselves without relying on outside institutions (Brown 1995).

For generations, ethno-medicine has been an integral component of the Maasai culture, and its practice is learned progressively throughout one's life (Sankan 1995). This knowledge is passed down orally from generation to generation (Ochieng' Obado & Odera 1995, Sindiga 1995, Sindiga *et al.* 1995), a practice that is similar to that of other Kenyan tribes such as the Kikuyu, Luo and Gusii. In the event that home remedies do not work and traditional professional help is sought, there are multiple categories of *oloibonok* whom a Maasai person can consult (Sindiga 1995). These range from the small-scale private practitioner to those selected individuals that oversee such important rituals as circumcision. These leadership positions are passed on to kin (Sindiga 1995). The Samburu, Nilotic-speaking pastoralists like the Maasai, also rely heavily on medicinal plants (Fratkin 1996). Diseases perceived to be of natural origin are treated using either traditional herbs or modern medicine, while sickness of a supernatural origin is attended to by a **laibon** (Fratkin 1996). Treatment is first attempted within the home, and if, after a significant period, the patient does not respond to the treatment, he/she may be taken to a **laibon** (pl. **oloi-**

bonok), or medicine man (Sindiga 1995). It is important to note that initial home treatment of sick persons is a common practice among African communities (Brown 1995, Iwu 1993, Sindiga *et al.* 1995).

Study Area

The study area, Kuku Group Ranch, Southern Kajiado District of Kenya has been previously described (Kiringe 2005). Among the Maasai of Kuku Group Ranch, plants are important resources without which their survival would be compromised. However, there are fears that collectively, changes taking place in the ranch have increased the demand for natural resources including plants (Campbell *et al.* 2000, Katampoi *et al.* 1990, Kiringe & Okello 2005). Consequently, the future of these plants amidst an increasing human population, increased agricultural practices and medicinal plants' sale for commercial gain is unclear. Furthermore, changes within the Maasai community may lead to a breakdown of the intergenerational transfer of information on the identification and use of medicinal plants. By cataloging these species, the human ailments they are used to treat and documenting their preparation, this valuable knowledge and pharmacopoeia can be preserved despite the current socio-economic changes.

Objectives

This study was conducted between 2000 and 2001 with the aim of documenting the use of ethno-medicinal plant resources among the Maasai of Kuku Group Ranch. This survey and documentation became necessary so as to safeguard these vital resources and knowledge about their use from total loss amidst the rapidly changing land use practices, traditional and cultural practices among the Maasai people across the country. It is also a key motivating factor towards promoting and advocating their conservation. More specifically this study attempted to achieve the following objectives:

1. Document plant species that were utilized for medicinal purposes among the Maasai of Kuku Group Ranch
2. Document human ailments and conditions treated or managed using traditional plant remedies, methods of preparation and mode of administration

Materials and Methods

The study area was divided into four blocks or sectors within which interviews targeting fifty percent (50%) coverage of households were undertaken. For each household, a structured and semi-structured questionnaire was administered (Martin 1995) to the heads or adult members with the help of local Maasai guides who also acted as interpreters. The questions asked to the respondents and discussions during the survey focused on the following

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aspects; types of medicinal plant species found within or outside the group ranch that were recognized by the community to be of medicinal value, part(s) used (e.g. roots, bark), human ailments and conditions treated or managed using ethno-medicinal plants, how they were prepared and administered. The same questionnaires were administered to key informants in the community knowledgeable in traditional medicine.

Plants identified by informants were collected by the author with specimens deposited in the the University of Nairobi, herbarium.

Results

All the respondents had used medicinal plants for the treatment of different types of human diseases. There was a significant difference between respondents who indicated that ethno-medicine was their preferred source of treatment or primary health care (73%) and those who preferred Western or modern medicine (27%) ($X^2 = 19.893$,

d.f = 1, $p=0.05$). This showed that majority of the respondents still relied on traditionally based plant medication but 98% mentioned that they periodically visited local clinics and dispensaries as their second or alternative health care source. When the respondents were asked who prepares and administers traditional medication, 71% said that everyone in the community does, while 26% said that only men could.

Forty-one (41) different species of plants were used to treat and manage a variety of human ailments and conditions (Table 1). Majority of the species (54%) were trees followed by shrubs (29%), succulents (10%), lianas (5%) and a lichen (2%). Most of the species were readily harvested or gathered within the rangelands of Kuku Group Ranch except *Usnea* sp., *Maesa lanciolata* (Forssk.), *Warbugia ugandensis* (Bertol.f.) Choiv. which were principally found in the Mt. Kilimanjaro Forest and Chyulu Hills National Park. *Salvadora persica*, *Albizia anthelmintica* (Brongn.), *Warbugia ugandensis*, *Balanites glabrus*, *Acacia nilotica* (L.) Del., *Rhamnus prinoides* (L'Herit.) and

Table 1. Medicinal plant species recognized by respondents from the Maasai community of southern Kaijiado District of Kenya, and their medicinal applications within the community. Locations (CHNP= Chyulu Hills National Park, KGR= Kuku Group ranch, MK= Mt. Kilimanjaro). T= Considered as threatened/endangered by informants.

Plant Taxa	Habit	Location	Status	Maasai Name	Medicinal Uses
Acanthaceae					
<i>Blepharis linariifolia</i> Pers.	Liana	KGR		Oltontolian	Lung problems
Amaranthaceae					
<i>Achyranthes aspera</i> L.	Shrub	KGR		Olerobat	Skin diseases, open wounds
<i>Sericocomopsis hildebrandtii</i> Schinz.	Shrub	KGR		Olaisai	Malaria, stomachache, weight loss in pregnant women through induced vomiting, induced bile release from the gallbladder
Asphodelaceae					
<i>Aloe volkensii</i> Engl.	Herb	KGR		Osukuroi	Cleaning children's stomachs
Burseraceae					
<i>Commiphora africana</i> (A. Rich.) Engl.	Tree	KGR		Olchilishili	Open wounds, skin moisturizer, killing chiggers
<i>Commiphora</i> sp.	Tree	KGR	T	Oltemuai	Tuberculosis, coughing, killing chiggers, skin moisturizer, open wounds
Commelinaceae					
<i>Aneilema spekei</i> (C.B. Clarke)	Liana	KGR		Enkaiteteyiai	Prevention of fever; for blessings
Canellaceae					
<i>Warburgia salutaris</i> (Bertol. f.) Chiov.	Tree	MK & CHNP	T	Osokonoi	Stomachache, internal wounds, bloat, malaria, coughing, appetizer, chest & lungs related problems

Plant Taxa	Habit	Location	Status	Maasai Name	Medicinal Uses
Fabaceae					
<i>Acacia ancistroclada</i> Brenan	Tree	KGR		Olchurrai	Enhance/facilitate digestion, appetizer, strength/nutrient supplement
<i>Acacia drepanolobium</i> Harms ex Sjostedt	Tree	KGR	T	Oluai	"Cleaning" women after giving birth
<i>Acacia mellifera</i> (Vahl) Benth.	Tree	KGR	T	Oiti	Appetite enhancer, strength/nutrient supplement, enhance/facilitate digestion
<i>Acacia nilotica</i> (L.) Willd. ex Delile	Tree	KGR	T	Oikiloriti	Appetite enhancer, enhance/facilitate digestion, strength/nutrient supplement, painful joints/arthritis, stomachache, cleaning circumcision wounds
<i>Acacia nubica</i> Benth.	Tree	KGR		Oldepe	Facilitate placenta expulsion after giving birth, "cleaning" women after giving birth
<i>Acacia robusta</i> Burch.	Tree	KGR riverine habitats only)		Ormumunyi	Facilitate placenta expulsion/ removal after giving birth
<i>Acacia tortilis</i> (Forssk.) Hayne	Tree	KGR		Oltepesi	Treatment of sexually transmitted diseases e.g. gonorrhoea, mouth ulcers
<i>Acacia xanthophloea</i> (Benth.)	Tree	KGR mostly		Olerai	Pneumonia, appetite enhancer
<i>Albizia anthelmintica</i> Brongn.	Tree	KGR		Ormukutan	Malaria, Anthelmintic, stomachache, backache, induce vomiting and diarrhea if one is suspected to have malaria, induce bile release from the gall bladder
Euphorbiaceae					
<i>Croton dichogamus</i> Pax	Tree	KGR		Oloiborrbenek or Enkitarru	Not used directly for its medicinal value but is normally used by a oloiboni to treat ailment(s) thought to be due to witchcraft
<i>Croton megalocarpoides</i> Friis & M.G. Gilbert	Tree	CHNP		Ormegweit	Stomachache, induce vomiting and bile release if one is suspected to have malaria
<i>Euphorbia meridionalis</i> Bally & S. Carter	Climber	KGR		Enkokuruoi	Malaria, sexually transmitted diseases, induce diarrhea as a means of cleansing the body
Icacinaeae					
<i>Pyrenacantha malvifolia</i> Engl.	Climber	KGR		Empalua	Induce vomiting in pregnant women or those suspected to have malaria
Lamiaceae					
<i>Leucas jamesii</i> Baker	Shrub	KGR		Entiolog'o	Cholera, stomachache
Malvaceae					
<i>Grewia bicolor</i> Juss.	Shrub	KGR		Esiteti	Eye infections

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Plant Taxa	Habit	Location	Status	Maasai Name	Medicinal Uses
<i>Grewia tembensis</i> Fresen.	Shrub	KGR		Oiriri	Combined with sheep dung to close gaps in skull fissures
<i>Grewia villosa</i> Willd.	Shrub	KGR		Olmangulai	Appetite enhancer
<i>Melhania parvifolia</i> Chiov.	Shrub	KGR		Orporokwai-lekop	Arthritis, pneumonia and other lung related problems
Myrsinaceae					
<i>Maesa lanceolata</i> Forssk.	Tree	MK & CHNP		Iloodua	Flu, antihelmenthic, appetizer, stomachache, sexually transmitted diseases (e.g. syphilis & gonorrhea), malaria, backache, arthritis
Oleaceae					
<i>Olea europaea</i> L.	Tree	MK & CHNP		Oloirien	Malaria, Pneumonia
Opiliaceae					
<i>Opilia campestris</i> Engl.	Shrub	MK & CHNP		Enkirashai	Malaria, induce vomiting and bile release when one is suspected to have malaria
Portulacaceae					
<i>Talinum portulacifolium</i> (Forssk.) Asch. ex Schweinf.	Shrub	KGR	T	Ormame	Arthritis, sexually transmitted diseases (e.g. gonorrhea), backache
Rhamnaceae					
<i>Rhamnus prinoides</i> L'Hér.	Tree	KGR mostly in CHNP & MK	T	Olkonyil	Sexually transmitted diseases (e.g. syphilis & gonorrhea), arthritis, flu/cold, back pains, stomachache, pneumonia, brucellosis, strength/nutrient supplement, enhancing/facilitating digestion
<i>Rhamnus staddo</i> A. Rich.	Tree	CHNP		Olkokola	Strength/nutrient supplement, sexually transmitted diseases, flu/cold
Ruscaceae					
<i>Sansevieria intermedia</i> N.E. Br.	Succulent	KGR		Oldupai	Sexually transmitted diseases e.g. gonorrhea
Rutaceae					
<i>Zanthoxylum chalybeum</i> Engl.	Tree	KGR	T	Oloisuki	Sexually transmitted diseases, flu/cold, enhance/facilitate digestion, throat infection
Salvadoraceae					
<i>Salvadora persica</i> L.	Tree/ Shrub	KGR	T	Oremit	Malaria, flu/cold, stomachache, induce vomiting if one is suspected to have malaria, internal wounds, induce bile release from the gall bladder
Sapindaceae					
<i>Pappea capensis</i> Eckl. & Zeyh.	Tree	CHNP		Oltimigomi	Backache, strength/nutrient supplement in morans, appetizer, enhance/facilitate digestion
Solanaceae					
<i>Solanum incanum</i> L.	Shrub	KGR		Entulele	Throat infection, stomachache

Plant Taxa	Habit	Location	Status	Maasai Name	Medicinal Uses
<i>Solanum taitense</i> Vatke	Shrub	KGR		Entemelua	Arthritis, malaria, typhoid, stomachache
Usneaceae					
<i>Usnea</i> sp.	Lichen	CHNP		Intanasoito	Stomachache, malaria, backache, fever
Verbenaceae					
<i>Lantana trifolia</i> L.	Shrub	CHNP		Ormokongora	Stomachache
Zygophyllaceae					
<i>Balanites glabrus</i> Mildbr. & Schltr.	Tree	KGR		Orng'osua	Inducing vomiting in pregnant women or if one is suspected to have malaria, induce bile release from the gallbladder, pneumonia

Maesa lanciolata were used to treat and manage most of the ailments and conditions mentioned by the respondents (Table 1).

A wide range of human ailments were treated or managed using plant based traditional medicine (Table 1). Eighteen ailments were mentioned more frequently than others (Table 2). Many of the diseases were treated using herbal medication from different plant species and possibly this was meant to ensure that if one form of treatment failed another one would provide an alternative (Table 2). In particular, malaria which was one of the most frequently mentioned diseases, was treated using twelve species.

For most of the species, bark and roots were the predominant sources of ingredients for treatments (Table 3). These were prepared either by boiling or soaking in water and then taken orally directly or in a few cases with milk, tea or soup. Other sources of biological ingredients included leaves, seeds and fruits but these were rarely used.

Discussion

Historically, all tribes of Kenya relied on ethno-medicinal resources as their primary health care system (Nyamweya 1995, Sindiga 1995). The Maasai people like most pas-

Table 2. Most common human ailments that are treated/managed by traditional medicine in the Maasai community of Southern Kajiado District of Kenya, and the number of plant species used.

Frequency mentioned	Number of species used	Ailment
100%	13	Malaria
100%	12	Stomachache
95%	8	Sexually transmitted diseases
92%	8	Loss of appetite
62%	3	Backache
45%	5	Indigestion
45%	5	Reduced body vigor and vitality
42%	4	Coughing and chest problems
36%	4	Flu or common cold
32%	2	Internal wounds
31%	5	Arthritis
29%	2	Open wounds
11%	4	Pneumonia
3%	1	Skin diseases
3%	1	Tuberculosis
2%	1	Brucellosis
2%	1	Cholera
2%	1	Typhoid

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Table 3. Medicinal plants according to their medicinal uses, part(s) used, preparation and administration.

Ailment	Plant and Part(s) used	Plant part, method(s) of preparation and administration (All remedies are taken orally unless otherwise stated.)
Amoebiasis	<i>Leucas jamesii</i>	Leaves-boil in water, then sieve.
Anti-helmenthic	<i>Albizia anthelmintica</i>	Roots-remove outer part, boil in water, then sieve. Roots-remove outer part, dry, soak in water, then sieve.
	<i>Maesa lanceolata</i>	Seeds & fruits-grind/crush, boil with milk, then sieve. Seeds & fruits-dry, grind/crush, boil in water, then sieve.
Arthritis	<i>Maesa lanceolata</i>	Seeds & fruits-boil in water, then sieve.
	<i>Melhania parvifolia</i>	Roots-boil in water, then sieve.
	<i>Pappea capensis</i>	Bark-boil in water, then sieve. Take for 1-2 days.
	<i>Rhamnus prinoides</i>	Roots-boil in water, then sieve. Roots-remove outer cover, grind/crush, then mix with tea.
	<i>Solanum taitense</i>	Roots-chew or boil in water, then sieve.
Backache	<i>Maesa lanceolata</i>	Fruits-crush, boil in water, then sieve.
	<i>Rhamnus prinoides</i>	Roots-dry, grind/crush, mix with water or use it with tea or soup. Roots-remove outer part, boil in water, then sieve.
	<i>Talinum portulacifolium</i>	Roots-boil with soup, then sieve.
Brucellosis	<i>Rhamnus prinoides</i>	Roots-boil in water, then sieve.
Cholera	<i>Leucas jamesii</i>	Leaves-boil in water, then sieve.
Coughing	<i>Commiphora</i> sp.	Sap-used without processing.
	<i>Warburgia ugandensis</i>	Bark-grind, then chew.
Diarrhea	<i>Leucas jamesii</i>	Leaves-crush, soak in water, sieve.
	<i>Warburgia ugandensis</i>	Bark-dry, remove inner cover, mix with water, then sieve.
Excess bile in the gall bladder (used to enhance bile release)	<i>Balanities glabra</i>	Bark-remove outer part, grind/crush, mix/soak in water, then sieve.
	<i>Sericocomopsis hildebrandtii</i>	Roots-remove outer part, grind/crush, mix/soak in water, then sieve.
Facilitate placenta expulsion after birth	<i>Acacia depanolobium</i>	Roots-boil or soak in water.
	<i>Acacia nubica</i>	Roots-boil in soup.
Fever	<i>Aneilema spekei</i>	Whole plant-mix with other herbs in milk. Sprinkle the mixture onto a person/patient. Mostly administered by a an oloibon when there is an outbreak of fever.
Flu/common cold	<i>Salvadora persica</i>	Roots-remove outer part, grind/crush, soak in water, then sieve.
	<i>Zanthoxylum chalybeum</i>	Roots-remove outer cover, boil in water or mix with tea, then sieve.
	<i>Rhamnus prinoides</i>	Roots-boil in water, then sieve; can sometimes be mixed with tea. Bark-grind/crush, boil in water, then sieve. Take with tea or soup.
Indigestion / reduced digestion	<i>Acacia ancistroclada</i>	Roots-boil in water. Bark & roots-boil in water. Branches-cut small pieces, boil in water. May be added to soup.
	<i>Acacia mellifera</i>	Bark-boil in water, then sieve.
	<i>Acacia nilotica</i>	Bark-boil in water, then sieve. Bark & roots-boil in water, then sieve.
	<i>Acacia senegal</i>	Bark-boil in water, then sieve. May be taken after boiling or added to soup.

Ailment	Plant and Part(s) used	Plant part, method(s) of preparation and administration (All remedies are taken orally unless otherwise stated.)
Indigestion / reduced digestion	<i>Rhamnus prinoides</i>	Roots-remove outer part, grind/crush, boil in water, then sieve.
Internal wounds, e.g. ulcers	<i>Commiphora</i> sp.	Sap-taken directly.
	<i>Warburgia ugandensis</i>	Bark-remove outer part, grind/crush, then mix with water and fat.
Loss of appetite	<i>Acacia ancistroclada</i>	Roots-boil in water. Bark & roots-boil in water. Branches-cut small pieces, boil in water. May be taken after boiling or added to soup.
	<i>Acacia mellifera</i>	Bark-soak in water, then sieve.
	<i>Acacia nilitica</i>	Bark & roots-boil in water. Taken with soup.
	<i>Acacia nilotica</i>	Roots-grind/crush, boil in water, then sieve.
	<i>Maesa lanceolata</i>	Seeds & fruits-dry, grind/crush, soak/mix with water, milk or tea.
	<i>Opilia campestris</i>	Bark-grind/crush, boil in water, then sieve.
	<i>Pappea capensis</i>	Roots- boil in water. Taken with water or soup.
	<i>Rhamnus prinoides</i>	Bark & roots- boil in water. Taken with soup.
	<i>Usnea</i> sp.	Plant-boil in water, then sieve.
	<i>Warburgia ugandensis</i>	Bark-dry, remove inner part, soak/mix with water.
Malaria symptoms (used to induce vomiting)	<i>Albizia anthelmintica</i>	Bark-grind/crush, soak/mix with water, sieve. Roots-remove outer part, grind/crush, mix / soak in water.
	<i>Aloe volkensii</i>	Leaves-boil with water, then sieve.
	<i>Balanities glabra</i>	Bark-remove outer part, grind/crush, mix/soak or in water, then sieve.
	<i>Opilia campestris</i>	Bark-remove outer part, mix/soak in water Branches-cut, dry, remove the bark, mix/soak in water, then sieve.
	<i>Salvadora persica</i>	Roots-remove outer part, mix/soak in water or boil in water.
Malaria	<i>Acacia mellifera</i>	Bark-soak/boil in water, then sieve. Pith-boil in water, then sieve.
	<i>Acacia nilotica</i>	Roots-boil in water, sieve then mix with oil or soup.
	<i>Acacia tortilis</i>	Sap-taken directly.
	<i>Albizia anthelmintica</i>	Roots-remove outer cover, grind/crush, soak or boil in water, then sieve. Bark-remove outer cover, grind/crush soak in water, then sieve. Roots-remove outer cover, grind/crush, boil in water then mix with blood.
	<i>Aloe volkensii</i>	Leaves-boil in water, then sieve.
	<i>Balanities glabra</i>	Bark-remove inner part, grind/crush, soak in water, then sieve.
	<i>Euphorbia meridionalis</i>	Stem-mix with water or soup, then sieve.
	<i>Maesa lanceolata</i>	Seeds/fruits-boil in water, then sieve.
	<i>Opilia campestris</i>	Roots-remove outer cover, mix with soup.
	<i>Salvadora persica</i>	Roots-remove outer cover, grind/crush, soak in water, sieve and then add some salt and little milk.
	<i>Sericocomopsis hildebrandtii</i>	Roots- grind/crush, mix with water, then sieve.
	<i>Solanum incanum</i>	Roots-Chew.
<i>Warburgia ugandensis</i>	Bark-remove inner part ,soak in water then sieve.	

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Ailment	Plant and Part(s) used	Plant part, method(s) of preparation and administration (All remedies are taken orally unless otherwise stated.)
Open wounds	<i>Achyranthus aspera</i>	Roots-grind/crush, extract sap. Apply on to open wound.
	<i>Commiphora africana</i>	Sap-extract from the bark/stem. Apply on to open wound.
Pneumonia	<i>Rhamnus prinoides</i>	Roots-boil in water, then sieve.
Reduced general body strength and nutrients	<i>Acacia ancistroclada</i>	Roots-boil in water. Bark & roots-boil in water. Branches-cut small pieces, boil in water. May be taken after boiling or added to soup.
	<i>Acacia nilotica</i>	Roots-remove outer part, soak or boil in water. Used by morans .
	<i>Maesa lanceolata</i>	Roots-boil in water.
	<i>Pappea capensis</i>	Roots-boil in water. Used by morans .
	<i>Rhamnus prinoides</i>	Roots-boil in water. Taken with milk.
	<i>Rhamnus staddo</i>	Roots-boil in water.
Sexually transmitted diseases e.g. syphilis & gonorrhoea	<i>Euphorbia meridionalis</i>	Stem-boil in soup. Taken with goat/sheep soup.
	<i>Maesa lanceolata</i>	Seeds/fruits-grind/crush, mix/soak in water.
	<i>Rhamnus prinoides</i>	Roots-dry, remove outer part, grind/crush put in tea or take with goat/sheep bone or fat soup. Roots-dry, remove outer part, boil with milk.
	<i>Rhamnus staddo</i>	Roots-boil in water, then sieve. Taken with bone soup.
	<i>Sansevieria intermedia</i>	Stem—boil in soup.
	<i>Talinum portulacifolium</i>	Roots-boil in water. Taken with soup or animal fat.
	<i>Warburgia ugandensis</i>	Bark-remove inner part?, soak/mix with water.
	<i>Zanthoxylum chalybeum</i>	Roots-boil in water
Skin diseases	<i>Albizia anthelmintica</i>	Bark-grind/crush, then use as soap. Use/apply on the affected area.
Stomachache	<i>Acacia mellifera</i>	Bark-boil in water, then sieve.
	<i>Albizia anthelmintica</i>	Roots-remove outer part, dry, grind/crush, soak in water, then sieve.
	<i>Croton megalocarpus</i>	Bark-grind, soak in water, then sieve.
	<i>Leucas jamesii</i>	Leaves-grind/crush, soak in water, then sieve.
	<i>Olchani-onyokie</i>	Roots-boil or soak in water, then sieve.
	<i>Rhamnus prinoides</i>	Roots-dry, grind/crush, mix with water. Roots-dry, grind/crush, mix with tea or boil roots in water and mix with tea.
	<i>Salvadora persica</i>	Roots-remove outer part, soak in water, add salt, sieve, then add some milk.
	<i>Solanum taitense</i>	Roots-boil in water, then sieve.
	<i>Usnea</i> sp.	Whole plant-boil in water, then sieve. Roots-grind/crush, boil in water, then sieve.
	<i>Warburgia ugandensis</i>	Bark-dry, remove inner part, grind, mix with water, sieve, then mix with honey.
Throat and chest infection	<i>Solanum incanum</i>	Roots-chew.
	<i>Warburgia ugandensis</i>	Bark-dry, remove inner part, mix/soak in water or animal fat.
	<i>Zanthoxylum chalybeum</i>	Roots-remove outer cover, grind/crush, boil in water.
Tuberculosis	<i>Commiphora</i> sp.	Sap-taken directly.

Ailment	Plant and Part(s) used	Plant part, method(s) of preparation and administration (All remedies are taken orally unless otherwise stated.)
Typhoid	<i>Opilia campestris</i>	Bark-grind/crush, mix with water.
	<i>Salvadora persica</i>	Roots-remove outer part, soak/mix with water.
	<i>Usnea sp.</i>	Whole plant-boil in water, then sieve.

toral communities are renowned for their strong tradition and cultural practices which have withstood the impacts of Western influence. However, during the colonial days and since independence efforts have been made by the government, some local and international non-governmental organizations to integrate the Maasai into the mainstream economy like other tribes. Thus, formal Western education and religion are now part of Maasai land even though they have not made significant inroads. Like other Maasai communities in the country, the Southern Kajiado District Maasai who belong to the ilkisongo sub-tribe still adhere to their culture and traditional practices including use of traditional medicines. Although modern medicine was widely sought by a large proportion of the community, traditional perceptions of health issues and diseases, and their management using herbal medicine remain popular even among those who periodically seek Western-based medication. In most cases, illnesses were first treated using local herbs but if there was no improvement or the patient was in critical condition, Western medication was sought in the few locally available clinics and dispensaries. Initial home treatment of sick people is quite common among the African people (Brown 1995, Iwu 1993, Sindiga *et al.* 1995). Therefore, traditional plant based medicines, which are used to treat and manage various health related problems still remain their primary health care system amidst the influence of modern medicine. Malaria, cough and chest problems, stomachache, sexually transmitted diseases, reduced body vigor and vitality were frequently mentioned as some of the very common ailments that afflicted the community. Their treatment was mostly done using different herbal remedies with relatively high level of success. The respondents indicated that in most cases this form of treatment was effective in their management but in instances where they persisted, a patient would willingly resort to Western medicine. Use of both modern and traditional sources of medicine by rural communities has also been documented elsewhere in Africa (Iwu 1993). The finding that the Maasai of Kuku Group Ranch frequently visited local health centers is a pointer that the community and Maasai's in general are gradually accepting Western based medical health care system though at a very slow pace. During the study, some of the respondents (especially the elderly and the young people who lack formal education) indicated that they did not trust Western medicine and even insinuated that herbal remedies were more superior and reliable. According to the World Health Organization (WHO 2002), traditional medicine owes its popularity among rural communities of the world since it is readily accessible, affordable and more

importantly it is an integral part of their traditional and cultural beliefs and practices. This can partly explain why the Maasai of Kuku were still heavily dependent on their traditional based health system despite the on-going campaign by the government to popularize Western medical care.

Use of traditional herbs among the Maasai people is deeply rooted and widespread. A lot of knowledge has been retained within the community on different plant resources that are of medicinal value (Holford-Walker 1951; Sheldon & Balick 1995; Sindiga 1995). This was evident in this study as all the respondents indicated that they were conversant with and had used different plant species to treat and manage different types of human related health conditions and diseases. Although the main objective of this research was to document human health problems treated using locally available plants, respondents also mentioned some important livestock diseases that were managed using herbal remedies. This showed how valuable traditional medicine was to the community as well the diversity of health conditions it could be used to manage. The finding that a variety of locally available plants provided medical remedies to different types of human illnesses and conditions was a clear manifestation that the Maasai of Southern Kajiado had a very rich pharmacopoeia that has been their primary health care system for generations. It also demonstrated the intricate skills and knowledge the community had accumulated for generations in an endeavor to manage and improve their health. According to Sindiga (1995) and Sheldon and Balick (1995), the Maasai are known to procure and seek treatment and management of diverse health problems in humans and livestock mostly from traditional herbs that naturally grow across their lived-in landscape. While everybody in the society can make use of herbal medicine, in certain instances traditional professionalism on their use is sought from renowned healers (**oloibonok**) (Fratkin 1996, Sindiga 1995).

Although herbalists play a fundamental role in providing herbal remedies, nearly everybody in the community can make use of traditionally available medication but within limits. Unlike Western medicine where the chemical ingredients and dosage are known, traditional medicine practiced by the Maasai never determine how much of the active substances are taken by a patient (Sindiga 1995). There is therefore a risk of overdose which can sometimes be fatal. Consequently, members of the community have knowledge not only of plant species that are

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of medicinal value, mode of harvesting them, the diseases they treat but also their mode of preparation, administration and the required dosage. They even know species which can lead to death if taken in large quantities or when mixed with other species. However, there are those members of the community, both men and women, who are renowned for their skills in use of herbal remedies and their services are sought whenever a need arises. These skills and knowledge are normally passed on orally from generation to generation (Sankan 1995, Sindiga 1994, 1995) and has helped retain and shape a detailed pharmacopoeia among the Maasai. Even with the advent of modern Western education and Christianity, every Maasai youth is expected to learn from elders the use of local medicinal plants as they grow up (Sankan 1971). Normally, boys learn from older men especially their fathers and grandfathers while girls learn from their mothers and grandmothers whom they spend a lot of time with (Sindiga 1994). This partly explains why knowledge on traditional medicine is well entrenched among the Maasai people (Sindiga 1995) including the ilkisongo Maasai of Southern Kaijiado where this study was done. Further, belief that plant based health remedies are superior and more reliable than Western medicine, high levels of illiteracy, inadequate modern health facilities and inaccessibility to these facilities all contribute to perpetual dependence of the Maasai on their traditional practices and cultural beliefs on ethno-medicine (Sindiga 1995). This has been found to be the case for other pastoral communities of Kenya such as the Turkana, Samburu and Rendille (Fratkin 1996). While the Kenya Government has tried to expand and improve medical facilities and services among pastoral communities, vast areas including the Maasai dominated Southern Kaijiado remain extremely underserved (Fratkin 1996). Even where such facilities exist, they are not only few compared to the local human population but are understaffed, poorly equipped, lack most of the essential drugs and are inaccessible to a majority of the community due to very poor infrastructure.

An emerging threat to local plants in Kuku Group Ranch, including those of medicinal value, is land use changes especially expansion of agriculture. The Maasai of Southern Kaijiado District have practiced traditional pastoralism for centuries but in the recent past they have increasingly embraced agriculture as an alternative source of income and for subsistence food production (Berger 1993, Katampoi *et al.* 1990). Consequently, Kuku Group Ranch and the Loitokitok area in general are now important agricultural areas (Campbell *et al.* 2000, Eliezer 1991, Kiambi 1991, Republic of Kenya 1990). Clearing of natural vegetation in the open range and key wetlands for crop production is wide spread (Campbell *et al.* 2000), and this is likely to cause significant degradation of valuable plant resources to the community including those that have supported their primary health care system. Respondents indicated that some of the medicinal plant species are already threatened (Table 1) and expressed concern that

unless short and long term intervention strategies are put in place, some of them would disappear in the near future. Among other threat factors, overuse and commercial sale of these species were considered to contribute significantly to their decline. They are sold in local markets in Southern Kaijiado District such as Kimana, Loitokitok, Irrasit and Emali and far places like Nairobi. Interestingly, the respondents felt that even the very abundant *A. mellifera* is currently under threat due to charcoal burning, increased consumption emanating from increase in local human population and land use changes particularly expansion of agriculture which concurs with the findings of Kiringe and Okello (2005) and Kiringe (2005) in the same group ranch. Overexploitation and commercial sale of plant resources such as medicinal plants is today recognized as one of the key threats that has driven some species to extinction (Marshall 1998, Primack 1998). It is therefore imperative that the extent and impact of exploitation and commercialization of medicinal plant resources species in Kuku and other neighboring Maasai ranches in Southern Kaijiado District be elucidated as a first step towards their enhanced conservation. Of particular concern are species such as *S. persica*, *A. nilotica* and *O. campensis* where roots which are critical in their survival are harvested sometimes in large quantities for medicinal use. Others include *W. ugandensis* and *R. prinoides* where the bark and roots are the most important source of medicine as well species which are habitat specific (e.g. *T. portulacifolium*) or those that are endemic to the Chyulu Hills National Park and Mt. Kilimanjaro (e.g. *Usnea* sp. and *R. prinoides*).

The value of plant resources among the Maasai goes beyond provision of herbal remedies. In a recent study, Kiringe and Okello (2005) found that the Maasai of Kuku used large quantities of locally available trees and shrubs for fire wood, fencing (homesteads/bomas and agricultural fields) and construction of houses. Considering that Kuku region is a relatively dry environment and is characterized by poor soils (Campbell *et al.* 2000, Katampoi *et al.* 1990, Livestock Production Department 1989, Republic of Kenya 1990), it is probable that soils on abandoned agricultural fields will take long to regain their fertility (Brady 2000, Brady & Weil 1999, Coe & Beentje 1991, Noad & Birnie 1989), and this can affect the natural regeneration of local vegetation. Other potential sources of degradation of these traditional plants include general environmental degradation that has become wide spread across the group ranch, increased human population and overexploitation of trees and shrubs. Although Kiringe and Okello (2005) found tree and shrub resources were still readily available across much of the ranch, the community expressed much concern about what appears to be a systematic and gradual decline of tree and shrub cover. Based on their findings and this study, it is imperative that a comprehensive assessment of the status of locally useful plant resources in the ranch be undertaken. An evaluation on the impacts of formal education, modern health

care and Christianity on the knowledge and use of ethno-medicine as well as the primary health care system for the community should be undertaken as well.

In conclusion, this study has shown the knowledge base of traditional medicine among the Maasai community of Kuku Group Ranch. This includes a variety of plant resources for diverse health problems. However, this knowledge, availability of plant resources recognized to be of medicinal value and their use is probably threatened by changing lifestyles, traditional and cultural practices. This would be a tremendous loss to the community considering the poor availability and access to modern medical care and health facilities. Since the community is heavily dependent on medicinal plants, they must be protected and measures taken to promote their sustainable utilization. A sustainable approach to harvesting these resources is likewise necessary; a strategy that will ensure that common land use types like agriculture, range degradation due to overstocking with livestock, general land degradation and development do not destroy valuable plant resources to the community and their habitats within the group ranch. Likewise, integrating traditional herbal treatment into the national health plan as recently envisaged by the government would have several benefits to pastoral communities such as the Maasai of Kuku Group Ranch. In particular it would improve access to cheap and easily affordable health care and at the same time promote conservation of important ethno-medicinal plant resources that are locally available on their land. The Maasai traditional ethics and practices that govern use of communal resources like medicinal plants have been instrumental in helping conserve these important biodiversity types for generations (Barrow 1996). Even though respondents indicated they are gradually disintegrating in the group ranch and across most of Maasai land, they could be one of the key strategies or practice that can help mitigate overuse and general abuse of ethno-medicinal plant species.

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