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Ethnomedicinal Knowledge of the Contemporary Maasai Community in Kenya

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Abstract

In this study, plant uses and knowledge of medicinal plants species among the Maasai Community in Kenya were evaluated. Traditional practitioners from Narok County willing to participate in the study were selected. Data was collected through interviews; field observations and administration of close and open ended, semi-structured questionnaires. It aimed at collecting comprehensive ethnotherapeutic information. The data was analyzed using descriptive statistics, some responses were quoted verbatim. A total of 27 ailments and conditions were mentioned; most cited communicable disease included; stomach ache (11.7%) and non-communicable included, heart burn (5.8). Ailments were treated using several herbs individually or in combination. A total of thirty-five plants distributed in 26 families and 35 genera were documented. The wide ethnobotanical knowledge revealed in this study pointed at the importance of traditional medicine in managing health in the face of escalating costs of conventional medicine and growing number of diseases resistant to modern medicine. The study concluded that the present Maasai herbal practitioners had exceptional broad understanding of medicinal plants used in the treatment of various diseases affecting members of their community. The study further recommended efficacy studies of the documented medicinal plants.

Keywords: Ethnomedicinal Knowledge, Maasai Community, Traditional, Medicine, Plants

INTRODUCTION

Worldwide there is increasing attention in the unconventional systems of therapeutics and approximately about 60–80% of the world's inhabitants rely on traditional medicine to accomplish their everyday health requirements (WHO, 2002, Azam *et al.*, 2014; Krupa *et al.*, 2018). The main reason towards probable use of herbal drugs in developing countries especially Africa is cultural background of each community, accessibility and affordability (Elujoba *et al*., 2005; Shaikh and Hatcher, 2005). Documentation of traditional practices in the management of diseases by different communities plays a key role in comparative analysis of traditional treatment approaches. It may also facilitate rapid dissemination and accessibility of such information that may benefit other communities.

Utilization of therapeutic plants among the Maasai has definitely been used for many centuries and forms a vital part of their traditions (Kigen *et al.*, 2013). The Maasai are an indigenous nilotic ethnic group in Africa inhabiting northern, central and southern Kenya and northern Tanzania (Lawson *et al.*, 2014; Fontefrancesco & Lekanayia, 2018). They classify themselves as all those who speak the *maa* language and belong to the Chari-Nile branch (Kipuri, 2020; Bussmann *et al*., 2006).

Dating back a few decades, western medicine has become prevalent in developing countries especially in Kenya however, many rural communities still greatly rely on traditional medicine (Schocke *et al*., 2000; Peters *et al.,* 2008). Modernization have led to an increasing reduction of this tradition related plant resource base (Gurib-Fakim, 2006). Loss of medicinal plants and the information associated to them would have overwhelming impacts on the Maasai community (Nankaya *et al.,* 2020). For that reason, documenting the knowledge and available traditional medicinal plant species is paramount in order to transmit the knowledge to the younger generations so as to protect this knowledge against attrition and likely loss. The rationale of the study was to collect data on plant use and knowledge of medicinal plants species among the Traditional Herbal Practitioners from the current Maasai Community living in Narok County, Kenya. The study would identify any gap or inconsistency in transmission of traditional knowledge across Narok Maasai generations, as observed in some communities as a result of civilization.

MATERIALS AND METHODS

Study Area and Ethnographic Background

The Maasai are a well-known community worldwide for their strong beliefs and adherence to traditional beliefs and practices. The County has 4 referral health facilities, 30 health centers, 84 dispensaries and 40 private clinics (Narok County HIV & AIDs Strategic plan).

Data Collection and Data Analysis

The study involved descriptive survey design; purposive sampling was used to select 30 respondents willing to participate in the study. Data about medicinal plants used to treat various diseases was collected through interviews; field observations and administration of semi-structured questionnaires. The questionnaires comprised of closed- ended and open-ended items. It aimed at collecting information about type of plant used to treat various diseases, form and habitat, parts used, method of preparation and administration. Identification of cited medicinal plants was carried out by both the traditional herbal practitioner and botanist in the study field.

Statistical Data Analysis

Data was analyzed using descriptive statistics. Some responses were quoted verbatim. Relative importance was calculated as described by Hoffman and Gallaher (2007) and Phillips and Gentry (1993).

RESULTS

Respondents' Demographics

The findings indicated that, 94% of the Traditional Herbal Practitioners (THPS) were males and 6% females. Majority of respondents (48.1%) were mature adults of over 57 years old while 25.9% and 18.5% were aged between 48-57 and 37-48, respectively. Fifty-six (56%) of the respondents had no formal education while 36% and 8% had acquired primary and secondary education, respectively. Fifty-four percent (54%) did not have professional qualification. They mainly acquired their ethnobotanical knowledge from apprenticeship (57.1%) and elders (52%).

Plants Used in the Management of Human Diseases

Frequency of citation was used to present data (Table 1). A total of 27 ailments and conditions were mentioned; the most cited communicable diseases included; stomach ache (11.7%), malaria (10%), respiratory diseases (9%), and syphilis (6.9 %), skin diseases (4.2%), gonorrhea (4.2 %) and diarrhea (3.7%). Non communicable diseases included, heart burn (5.8%), cancer (4.8%), fibroids (4.2%) and diabetes (3.7%). Ailments were treated using several herbs

individually or in combination. For example, malaria, respiratory diseases and joints were treated using a cocktail of herbs. One of the traditional healers elaborated; "*Our treatment is holistic because besides addressing the specific ailments, it seeks to address other concerns associated with sicknesses such as general body weaknesses and poor appetite, hence the need for multiple therapeutic approaches."*

Table 1: Ailments Treated using Plants by the Maasai Traditional Herbal Practitioners in Narok County

Name of Disease	Local name	Therapeutic herbs	Frequency
Stomach ache	*Enkoshekea engoshoke/naporsesen*	*Acacia nilotica (L.) Olea europaea, Juniperus procera, Periploca linearifolia*	22
Malaria	*Enkojongoni/oltikana*	*Toddalia asiatica, Rapanea melanophloeos, Ekebergia capensis, Trimeria grandifolia*	19
Respiratory diseases	*Orkirobi*	*Toddalia asiatica, Rhamnus staddo, Rhamnus prinoides, Zanthozylum usambarense*	17
Syphilis	*Orbae*	*Rotheca myricoides*	13
Heart burn	*Emakit/olodwa*	*Olea europaea, Aloe secundiflora,*	11
Cancer	*oseriki*	*Toddalia asiatica, Olea europaea, Sarcostemma stolonifera, Synadenium grantii*	9
Skin disease/rashes	*Enkeea ochani*	*Toddalia asiatica, Tarchonanthus camphoratus, Warbugia ugadensis*	8
Gonorrhea	*Ormakutkut*	*Rhamnus staddo, Cucumis* spp.	8
Fibroids	*oseriki*	*Toddalia asiatica, Olea europaea, Sarcostemma spp, Synadenium* grantii	8
Diarrhea	*Nkiriata*	*Ekebergia capensis*	7
Diabetes	*Emuyian esukari*	*Rhamnus staddo*	7
Backache	*Enkoriong*	*Rhamnus staddo, Carissa edulis*	6
Headache	*Endukuya/enkea ekwe*	*Rhamnus prinoides, Rhamnus staddo*	6
Wounds	*Orbae*	*Maytenus heterophylla, Croton megalocarpus*	6
Typhoid	*Maleria engare/ elototo engoshoke*	*Rhamnus prinoides, Myrsine 12africana*	6
Arthritis	*Nangida*	*Barleria spp, Periploca linearifolia, Carissa edulis*	6
Respiratory/ Chest	*orgoo*	*Ekebergia capensi, Acokanthera schimperi*	6
Amoebiasis	*Olong'o ng'wen, ng'wensho*	*Albizia anthelmintica*	6
Joints pain	*Eno orbat*	*Vernonia brachycarlyx, Barleria spp, Combretum molle, Rhamnus prinoides, Rhamnus staddo*	5
Eye problem	*Emwoyian o nkanyeki*	*Acacia kirkii*	4
Madness	*ormilo*	*Trimeria grandifolia*	4
Asthma	*Asma / Engea orgoo*	*Zanthozylum usambarense*	3
Energizer	*elopa*	*Trimeria grandifolia*	2
Boils	*Emorloo/Oldututai*	*Chenopodium opulifolium, Rapanea melanophloeos*	2
Breast cancer	*Enaoyinyie*	*Solanum nigrum*	1
Detoxification		*Rhamnus prinoides, Rapanea melanophloeos, Prunus africana*	1
Dizziness		*Trimeria grandifolia*	1

Medicinal plants used by the Maasai community to manage health included thirty-five plants distributed in 26 families and 35 genera (Table 2). Mimosaceae family had the highest representation (3) while Rhamnaceae, Apocynaceae, Solanaceae, Myrsinaceae and Euphorbiaceae had two medicinal plant citation. The most important medicinal plants in decreasing order of user value included; *Aloe Secundiflora* (0.1), *Warburgia salutaris* and *Toddalia asiatica* (0.09), *Rhamnus prinoides and Zanthozylum usambarense* (0.08) (Table 2). The commonly used types of medicinal plants were shrubs (76%) and trees (12%) as indicated in (Figure 1). Most preferred plant parts were roots (44%) and barks (24%) as outlined in Figure 1. One of the THPs expounded that roots are believed to have higher concentrations of medicinal substances. As a conservatory measure, two roots are picked if they are five while one is picked out of two or three. For the bark, a section is cut without ringing. Harvested plant parts were dried, boiled or soaked to make decoctions which were taken orally per cup periodically in a day. One of the THPs explained that the traditional pastoral life of the Maasai community exposed them to wild ecosystems which provided a rich source of medicinal herbs.

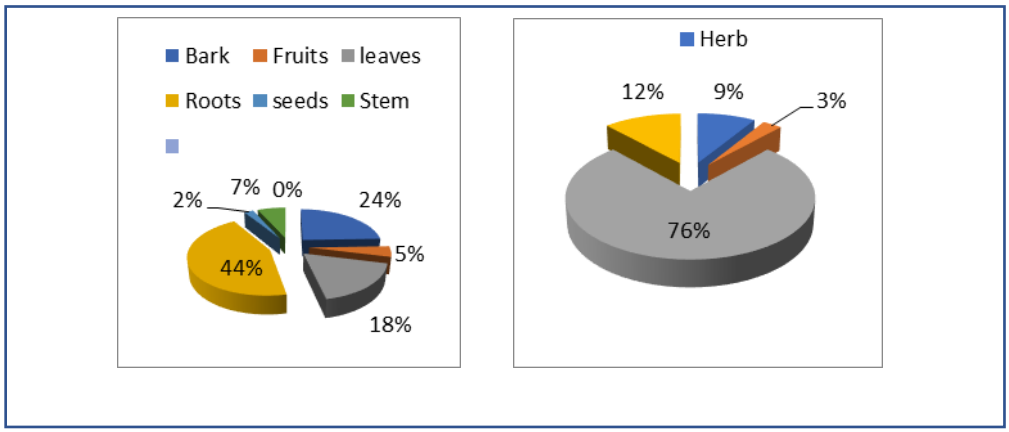

Figure 1: Commonly Harvested Parts and Growth Forms of Medicinal Plants Used to Treat and Manage Diseases by the Traditional Herbal Practitioners in Narok County.

Table 2: Therapeutic Plants Used in Treatment and Management of Diseases by Traditional Herbal Practitioners in Narok County

Plant Family	Botanical name/ voucher specimen	Local name	Therapeutic use	Preparation	Plant Part used	Growth form	Habitat	NCs	Use Value Index
Liliaceae	*Aloe secundiflora* Engl. LNM15/15	Osuguroi	Malaria, stomach ache, ulcers, gonorrhea, headache, wound, skin diseases, diabetes, cold fever	Decoction	leaves	Shrub	Wild	15	0.1
Canellaceae	*Warburgia salutaris* Sprague LNM15/16	Osokonoi	Headache, stomach ache, eye problem, constipation, gouts, gingivitis, tooth ache	Decoction	Bark	Tree	Wild	13	0.09
Rutaceae	*Toddalia asiatica* (L.) Lam. LNM15/17	Oleparmunyo	Chest, cold, cough, malaria, whooping cough, cancer	Decoction	Roots/ bark	Shrub	Wild	13	0.09
Rhamnaceae	*Rhamnus prinoides* L'Hérit. LNM15/18	Orkonyiel	Sore throat, weight loss, fatigue, backache, stomach ache, digestion, malaria, colds, headache, typhoid, joint pain, detoxification	Decoction	roots	Shrub	Wild	12	0.08
Rutaceae	*Zanthozylum usambarense* (Engl.) Kokwaro LNM15/19	Oloisiki	Cold, nourish the children, sore throat	Decoction	Fruits, Roots/ bark	Shrub	Wild	11	0.08
Mimosaceae	*Albizia anthelmintica* A.Rich. LNM15/20	Ormukutan	Malaria, ulcers, Amoeba	Decoction	roots bark	Shrub	Wild	9	0.07
Rhamnaceae	*Rhamnus staddo* A. Rich LNM15/22	Orkokola	Cold, pneumonia, backache, diabetes, malaria, joint pain	Decoction	roots	Shrub	Wild	9	0.07
Flacourtiaceae	*Trimeria grandifolia* (Hochst.) Warb. LNM15/21	Oledat	Malaria, cold, typhoid	Decoction	Roots/ bark	Shrub	Wild	8	0.06
Apocynaceae	*Carissa edulis* (Forssk.) Vahl. LNM15/25	Olamuriaki	Malaria, common cold, cough rickets, blood diseases	Decoction	roots	Shrub	Wild	7	0.05

Myrsinaceae	*Myrsine africana* L. LNM15/20	Iseketet	Worms, stomach ache, heart burn	Decoction	Fruits seeds	Shrub	Wild	*7*	0.05
Caesalpinaceae	*Senna didymobotrya* (Fresen.) Irwin and Barneby LNM15/23	Osenetoi	Malaria, deworming, diarrhea, stomach ache	Decoction	leaves	Shrub	Wild	6	0.04
Solanaceae	*Solanum indicum* L. LNM15/29	Entemelua	Cough, allergy, chicken pox	Decoction	roots	Shrub	Wild	6	0.04
Mimosaceae	*Acacia nilotica* (L.) Willd. ex Delile LNM15/27	Orkiloriti	Constipation, stomach ache, cleaning wounds	Decoction	Bark	Tree	Wild	5	0.03
Meliaceae	*Azadirachta indica* A. Juss. LNM15/25	Omwaarobaini	Bloating, malaria, cough, malaria	Decoction	leaves	Tree	Wild	5	0.03
Rosaceae	*Rubus steudneri* Schweinf. LNM15/24	Oremit	Cold, fever	Decoction	Roots/ bark	Scrambler	Wild	4	0.03
Fabaceae	*Acacia robusta* Burch. LNM15/26	Ormumunyi	Remove placenta, ease delivery	Decotion	roots	Shrub	Wild	4	0.03
Urticaceae	*Urtica massaica* Mildbr. LNM15/28	Entamenjoi	Blood pressure, injury, typhoid, gouts	Decoction	Roots/ leaves	Herb	Wild/ Farms/Riverine	4	0.03
Anacardiaceae	*Rhus natalensis* Bernh. ex Kraus LNM15/ LNM15/40	Ormisigioi	Cold, fatigue, stomach ache	Decoction	Bark/stem	Shrub	Wild	3	0.02
Asphodelaceae	*Bulbine abyssinica* A.Rich. LNM15/38	Oloikine	Malaria	Decoction	bark	Herb	Wild	3	0.02
Portulacaceae	*Talinum portulacifolium* (Forssk.) Asch. Ex Schweinf. LNM15/36	Ormame	Injury, diuretic, STD	Decoction	roots	Shrub	Wild	3	0.02
Myrsinaceae	*Rapanea melanophloeos* LNM15/34		Malaria, boils, detoxification	Decoction	Root/ bark	Shrub	Wild	3	0.02
Oleaceae	*Olea europaea* LNM15/32	Oloirien	Cancer, stomach problems, heart burn, fibroids	Decoction	Root/Bark	Tree	Wild	3	0.02
Euphorbiaceae	*Synadenium grantii* Hook f. LNM15/30	Olkorbobit	Laxative, cancer	Decoction	roots	Shrub	Wild	2	0.01

Lamiaceae	*Rotheca myricoides* (Hochst.) Steane and Mabb. LNM15/31	ormakutkut	Gonorrhea, Syphilis, libido	Decoction	roots	Shrub	Wild	2	0.01
Acanthaceae	Barleria spp LNM15/33	Olerubat	Joint pain, arthritis	Decoction	Bark/ leaves	Shrub	Wild	2	0.01
Asclepiadaceae	*Sarcostemma stolonifera* LNM15/35		Cancer	Decoction	Root	Shrub	Wild	1	
Mimosoideae	Acacia kirkii LNM15/37	Olerai	Eye problem	Decoction	Roots	Shrub	Wild	1	
Apocynaceae	Acokanthera schimperi LNM15/39	ormorijoi	Respiratory diseases	Decoction	Leaves	Shrub	Wild	1	
Asteraceae	*Vernonia brachycarlyx* LNM15/41	Ologumati	Joint pain	Decoction	Leaves	Shrub	Wild	1	
Chenopodiaceae	Chenopodium opulifolium LNM15/43	Enaboi	Boils	Sap	Stem	Shrub	Wild	1	
Solanaceae	*Solanum nigrum* LNM15/45	Ormomoi	Breast cancer	Decoction	Root	Herb	Farms	1	
Celastraceae	*Maytenus heterophylla* LNM15/47		Wounds	sap	Leaves	Shrub	Wild	1	
Euphorbiaceae	*Croton megalocarpus* LNM15/49		Wounds	Sap	Stem	Shrub	Wild	1	
Combretaceae	*Combretum molle* LNM15/48		Joint pain	Decoction	Roots	Shrub	Wild	1	

DISCUSSION

The traditional healers were mixed gender with men being the majority. This indicates the importance of women in the management of health in the Maasai community. The findings are consistent to that reported by Kamanja *et al.* (2015). In Narok County, the herbalists were distributed across the old, middle and young ages which indicated evidence of passing knowledge from one generation to another. The THPs lacked formal education and professional training; they acquired ethnobotanical knowledge from apprenticeship. This contends with findings of Muthee *et al.* (2011) from the Maasai of Loitoktok district.

Diseases that were mainly treated using herbs have also been cited by Bussman *et al.* (2006) and Mutiso *et al.* (2016) in their ethnobotanical surveys among the Maasai of Sekenani Valley and Losho, in Narok County. Kiringe (2006) has reported similar findings in Kajiado County. However, a notable finding in the present study that had hardly been mentioned in the ethno medicine studies among the Maasai is treatment of diabetes and cancer. This is a pointer that non communicable diseases have slowly creeped into the lives of the Maasai community. Findings from the current study showed that, gradual changes in the Maasai community from pastoral to sedentary lifestyles due to urban influence was a potential opportunity for the emergence of non-communicable diseases.

The reported wholesome treatment using multiple herbs has also been reported in studies done among the Kikuyu community (Njoroge and Bussman, 2006). According to Gessler *et al.* (1994), drugs may only be active in combination due to synergistic effects of several compounds that are active singly. The most popular families reported in the present study in decreasing order included; Mimosaceae, Rhamnaceae, Apocynaceae, Solanaceae, Myrsinaceae, Euphorbiaceae and Rhamnaceae. Family Rhamnaceae, Mimosaceae, and Euphorbiaceae had also been reported as dominant medicinal plants among the Maasai (Mutiso *et al.,* 2016). The reported additional important plant families in the present study rationalized the need to undertake research for documentation of plant herbs among traditional communities. The recounted dominance of some plant herbs in the management of health among the Maasai community in the present study have been reported in other studies. For example, *Warburgia salutaris, Rhamnus prinoides, Toddalia asiatica, Carissa edulis have* been reported to be salient in the management of diseases among the Maasai of Loita and Kajiado (Nankaya, 2014; Kiringe, 2005). *Zanthozylum usambarense* have been cited as dominant by Muthee et *al.* (2011) and Mutiso *et al.* (2016) among the Maasai of Loitoktok and Losho in Kajiado and Narok counties, respectively. *Aloe Secundiflora,* most dominant plant in the management of health was reported in the present study. It has also been cited as one of the dominant medicinal plants among the Ilkisonko Maasai of Kajiado County (Kimondo *et al.,* 2015). In the present study, *Toddalia asiatica*, *Olea europaea*, Sarcostemma *stolonifera* and *Synadenium grantii* was used in the treatment of cancer. This was the first time they had been mentioned in the existing ethnobotanical studies in Kenya; more fundamentally, the use, *Sarcostemma stolonifera.* Treatment of cancer had not been mentioned before. However, extracts from *Toddalia asiatica* (Vishnu, 2012), *Olea europaea* (Chloe *et al.,* 2015) and *Synadenium grantii* (de Oliveira *et al.,* 2013) had been reported outside Kenya.

The reported wider use of shrubs compared to trees and herbs as medicinal plants has also been cited in other studies (Kimondo *et al.,* 2015). This is perhaps

due to semi-arid nature of the Maasai land ecosystem (Bussman, 2006). On the similar vein, use of roots and barks has been reported by Mutiso *et al.* (2016). Notably, use of roots for medicinal purposes is a potential threat to survival plant use (Jeruto *et al.*, 2010). However, Maasai herbal practitioners used selective removal of roots. Similar conservation measure has been reported by Nankaya (2014). The dominant use of wild plants as medicinal herbs has also been mentioned in the current study. This can be traced to the traditional pastoral life of the Maasai which exposed the community to a wide range of wild habitats. Preparation and administration of the herbs have been reported in other studies (Jeruto *et al.*, 2010). The major challenge facing THPs in Narok County was the potential threat to survival of medicinal plants, as a result of charcoal burning and human encroachment of forest. Similar findings have been reported among the Samburu and Maasai of Loita (Kamanja *et al.*, 2015; Nankaya, 2014).

CONCLUSION AND RECOMMENDATIONS

Both genders are involved in managing the health of the Maasai community. Distribution of traditional herbal practitioners at various age groups revealed that, ethnobotanical knowledge was being passed from one generation to another in the contemporary Maasai community of Narok. Further scientific investigation of medicinal plants with high citations in this study is recommended, to validate their use.

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