The ethnomedicinal plants of Purko, Maasai in Central Narok, Kenya

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Research

Abstract

Background: Indigenous plants are integral to the Maasai community's healthcare throughout East Africa. This research documented traditional medicinal knowledge (TMK) among the Purko Maasai community in Kenya. While this knowledge has typically been orally transmitted, a request was made by local elders to write it down for future generations.

Methods: Using a Participatory Action Research (PAR) approach, researchers and community members collaborated with the director of Olosho Initiatives in study design, participant recruitment, and data gathering.

Results: The community identified 31 plant species. Common medicinal usage was determined through In-depth interviews and consensus analysis. From the total, there were 15 plants noted specifically for their preventative health benefits, including body strengthening and immunity enhancement.

Conclusions: Almost half of the plants documented had uses that were preventative in nature, which highlights how this traditional knowledge both endures and remains relevant

Keywords: Maasai; Ethnobotany; Traditional Medicinal Knowledge

Background

Indigenous communities globally have long used traditional medicinal plants to address their healthcare needs (WHO 1990). Increasingly however, globalization, demographic pressures, and external sociopolitical influences threaten these knowledge systems and cause a rapid decline in ethnobotanical knowledge (Gomez-Baggethun *et al.* 2015). This study aimed to support intergenerational transmission and long-term cultural sustainability of the Purko Maasai community in Narok, Kenya, by documenting and preserving the traditional medicinal plant knowledge in written records.

This project occurred on the outskirts of Narok Town, Kenya, in a semi-urban area among the Purko Maasai community. One of the most widely recognized ethnic groups in East Africa, Maasai are often portrayed as a cultural symbol of the region, but they are highly diverse (Hodgson 2017). Though visible, Maasai have been dispossessed of their land throughout history (Speak & Waller 1993) and relocated to infertile and semi-arid lands (Hodgson 2001). There has been persistent political and

economic marginalization. Like many others in recent decades, the Purko Maasai have experienced significant socio-economic and environmental transformation. Among them are widespread land loss, evolving systems of land tenure (Aggarwal & Thouless 2009, Galaty 2013, Seno & Shaw 2002), increased reliance upon wage labor, cash-based economic participation (Homewood *et al.* 2009, Serneels *et al.* 2001), and urban sprawl encroaching into what were traditionally Maasai territories (Nankaya *et al.* 2019). Maasai livelihoods and cultural identity have been profoundly affected, and many within the community have questioned what it now means to be "Maasai" (Hodgson 2011, Orech & Schwarz 2017). Maasai traditional medicinal knowledge (TMK) has included using local herbs for common household health concerns (Sankan 1995, Sindiga 1994) and has been orally transmitted across generations as with other African Indigenous knowledge systems (Sankan 1995, Sindiga 1994).

There is a growing body of ethnobotanical research within Maasai communities (Bussmann *et al.* 2006, Bussmann *et al.* 2018, Innocent *et al.* 2016, Kimondo *et al.* 2015, Maundu *et al.* 2001, Parker *et al.* 2007). Parker *et al.* (2007) noted potential risk reduction for the measles infection as well as other antiviral properties in certain Maasai medicinal plants. Through focus group discussions, Innocent *et al.* (2016), documented Maasai mosquito control and malaria treatment using specific medicinal plants. Among the Ilkisonko Maasai, Kimondo *et al.* (2015) revealed that the primary healthcare system remains traditional medicine. Nankaya *et al.* (2019) built on this ethnomedicinal research with interviews of 31 knowledgeable informants among the Loita Maasai and documented 63 key medicinal plant species. With earlier studies, these findings align and indicate that traditional medicine remains the preferred form of healthcare among many Maasai communities (Kimondo *et al.* 2015, Kiringe 2005).

These studies were of remote communities in Maasailand. In contrast, this study took place around the Central division of Narok District, Kenya, among the Purko Maasai. By adding a peri-urban component within a community that has faced intense urbanization over the past decades, this project makes a unique contribution to the study of Maasai ethnobotany.

Materials and Methods

Study area

This project is located in southwestern Kenya, Narok County is a region predominantly inhabited by the Maasai ethnic group (KIRA 2014). This study was grounded in a Participatory Action Research (PAR) framework. Throughout all phases of the project, PAR emphasizes the active involvement of community members from design to data collection and analysis (Ervin 2005). PAR's collaborative aim is to advance objectives that have been locally defined together with community stakeholders, and this ensures that participating populations are directly benefited by directly relevant research outcomes(Bernard 1998). The research design, participant recruitment, and data collection were done in close collaboration between the primary author and the director of Olosho Initiatives (third author). Likewise, the analysis and dissemination phases involved ongoing collaboration between the primary author and the director. The primary objective of the study was determined by the community to document in writing their traditional medicinal knowledge (TMK). The project expanded over subsequent years to address additional topics among the Kenyan Purko Maasai, such as contributing factors to perceived TMK intergenerational decline (Hedges et al.2020) as well as preventative medicine within TMK practices (Hedges & Kipila 2021). As identified through the project, this paper focuses specifically on presenting a compiled inventory of key medicinal plants and their documented usage.

The Grand Valley State University Human Research Review Committee (17-159-H) and the Kenyan National Commission for Science, Technology, and Innovation (NACOSTI/P/17/73653/17823) approved this research. Additionally, this research was conducted by the primary author in affiliation with the National Museums of Kenya (NMK/CBD/TRN/4). During this project all participants recruited went through the informed consent process and provided informed consent.

For this study, field data were collected over three separate seasons from 2017 to 2019. Gathering botanical information on significant plant species within each locality and interviewing elders and local households regarding their use of these plants were the two primary objectives. The two study sites are within the Narok North Constituency of Narok County, both situated adjacent to Narok Town, identified in Figure 1. The first site, Kipangas group ranch, was subdivided in 2000, and is a peri-urban area about three kilometers from Narok town. Urban expansion, with its increasing immigration and ongoing urbanization, has driven significant cultural shifts for this community. Naisoya village, the second site, is classified as rural, being about 30 kilometers west of Narok town. In 1975, Naisoya Village was subdivided into private parcels.

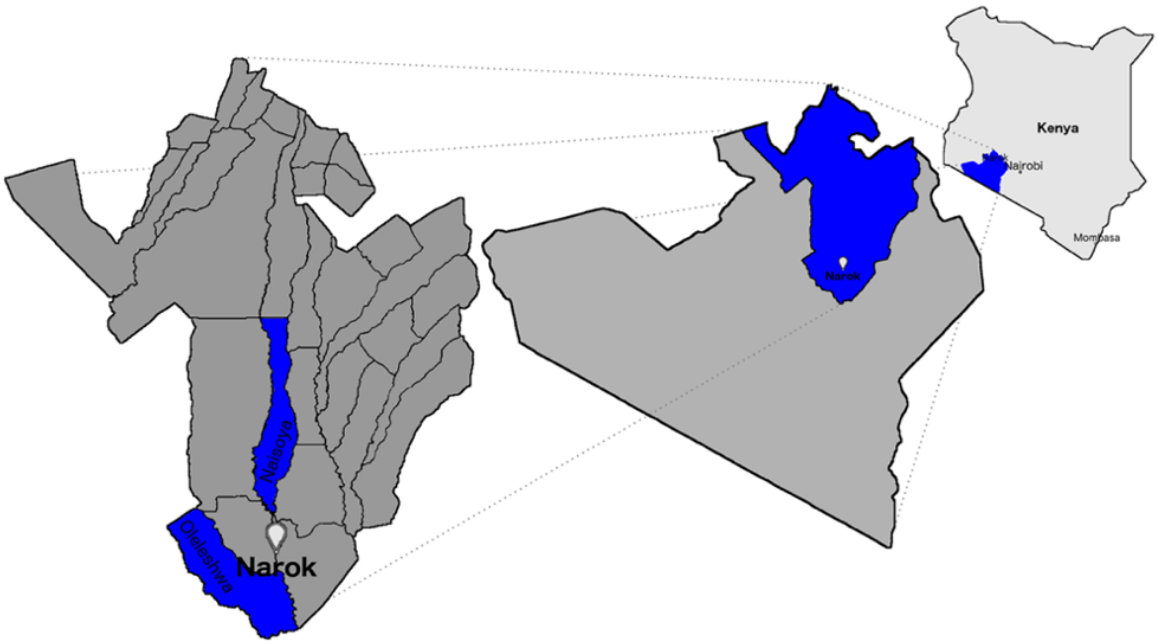

Figure 1. Map of Narok, Narok North Constituency, and Narok County where sample areas were located

Plant Identification Walks

Data was collected alongside a local community member (third author of this paper) who was recognized for his expertise in traditional medicine. One walk traversed a homestead in Kipangas and another a homestead in Naisuya, both private properties. Before each walk, property owners granted informed consent and permission. Medicinally important herbs, shrubs, and trees were collected and pressed. The dried voucher specimens were prepared and deposited in the established Olosho Herbarium and Learning Center, Naisuya. For each plant, the local Maa language name was determined and then identified (by Evans, second author) to the genus or species. Since Ki-Maasai is traditionally an oral language, written Maa plant names have considerable variability in spelling (Bussmann *et al.* 2006). Geographic coordinates and audio recordings documenting ethnobotanical uses were made at each plant collection site.

Recruitment

Older community members who were recognized for their expertise in traditional medicine were prioritized in recruitment. Purposive sampling techniques were used to select informants (Bernard 2002: 183). Members of Olosho Initiatives identified elders with medicinal plant knowledge within the study areas. These individuals were engaged by the project coordinator (third author) to secure their participation in formal interviews. Similarly, household interviews were facilitated by Olosho Initiatives. Selected households were then recruited, and family members residing in each respective homestead were interviewed.

In-depth Interviews

Documenting traditional medicinal knowledge at the household level was the primary objective of the interviews, and each was conducted in the participants' preferred language: English, Ki-Maasai, or Ki-Swahili. Interviews in 2017 were done predominantly within households of the two study sites: Kipangas (peri-urban) and Naisoya (rural). Data collection in 2018 extended to the urban center of Narok Town, and interviews were conducted in diverse urban settings such as office buildings, cafés, and local restaurants. Thirty participants (Table 1) were recruited for in-depth household interviews. Recruitment occurred in three different areas (rural, peri-urban, and urban) and across multiple field seasons as described above. For further qualitative analysis on traditional knowledge transmission across generations, see (Hedges et al 2020).

Data Analysis

All audio-recorded interviews were transcribed verbatim. These resulted in 10- to 25-page text documents. MAXQDA qualitative software was used to analyze the transcripts, both the coding process and the development of coding frameworks, based on frequently occurring codes. Preliminary themes and coding structures were collaboratively reviewed with members of Olosho Initiatives, incorporating their feedback and enhancing the analysis, in alignment with Participatory Action Research (PAR) principles. For further description of the qualitative analysis of in-depth interviews, see (Hedges et al 2020, Hedges &

Kipila 2021). Finally, a consensus analysis (Singer et al 2025) was conducted with transcripts of household interviews to find the common usage for each plant and for determining the degree of cultural agreement within a group (Singer et al 2025: 64). To count and collate the most common reported usage across the interviews, descriptions of plant usage for each household were reviewed by hand during this quantitative procedure. A full draft of the common usage of each plant was sent to Olosho Initiatives to review with community elders for accuracy and corrections once completed.

Table 1: Demographics of In-depth Interview Participants

	Rural ('17)	Peri-Urban ('17)	Urban ('18)
Age			
18-35	0	2	5
35-50	4	2	5
51-70	4	4	0
over 70	2	2	0

Results

A total of 31 medicinally important plant species, representing 23 plant families, were documented (Table 1). Similar to other Maasai ethnobotany projects, the results of this project found that many (twenty-four out of thirty-one; 77.4%) of the plant species listed as important medicinal plants were trees, shrubs, or woody vines, with relatively few (seven out of thirty-one; 22.6%) herbaceous species. The results from the plant identification walks are displayed in the first four columns of Table 1. The results of the consensus analysis of in-depth interviews are displayed in Table 1 under the medicinal properties column.

Discussion

Maasai disease etiology commonly understands illnesses to result from pollutants that obstruct or impair digestion (Bussmann *et al.* 2006). Therapeutic interventions, therefore, involve herbal purgatives that intend to cleanse a patient (Bussmann *et al.* 2006). Preventative health practices also represent a significant portion of Maasai healthcare (Johns et al., 1999; Kiringe, 2005; Kimondo et al., 2015). The most common preventative health practice to strengthen a person's immune system within Maasai healthcare is the consumption of medicinal herbs prepared as 'soups' or combined with milk (Johns *et al.* 1999, Kimondo *et al.* 2015, Maundu *et al.* 2001, Orech & Schwarz 2017). Combining herbs with milk or meat soup is the primary mode used to process and administer (Hedges & Kipila 2021). In this study, Purko Maasai discussed that to produce effective medicine from any plant material, one must consume it with milk or meat soup.

Among many Maasai, the term "herb" is not confined to a specific plant form or structure but broadly encompasses various plant materials, including leaves, bark, roots, and even trees (Olsson 1989). The Maa word olchaani, which translates to "tree," is commonly used to denote medicine (Arhem, 1989; Caucci, 2015; Olsson, 1989, Fieldnotes). This linguistic practice reflects the cultural perception that all parts of plants possess inherent medicinal properties (Olsson 1989). All plant material is not only widely used by the Maasai but also respected. There is a spiritual relationship between the plants and people. All aspects of nature are considered to be blessings of God with the gift of sustaining life (Casucci 2015, Hodgon 2005). In a condensed symbolic statement told by a Maasai participant to Arhem (1989: 75), 'trees are medicine because they live and grow from rain which is God', see (Hodgson 2005) for more details.

Engolon (strength in Maa language) was one of the top leading codes found within the majority of in-depth interviews, with 21 out of the 30 (70%) interviewees mentioning 'strength' as a medicinal usage of the identified plant. Strength was used as a description for a number of medicinal benefits of plants identified in this project. The term engolon, derived from the Maa language, translates as "building the body" and was identified as the primary medicinal attribute of the majority of plants documented in this study. Although there has been a general decline in traditional medicinal knowledge (TMK) within this community, the use of traditional medicine aimed at promoting engolon (or enhancing immunity) remains prevalent; this aspect is explored in greater detail in a separate publication stemming from this research (Hedges & Kipila, 2021). Of the thirty-one plants identified, fifteen were specifically described as preventative medicines used to strengthen the body or boost the immune system. The fact that nearly half of the documented plants serve preventative health functions highlights the enduring resilience of these traditional health practices.

Table 2. Plant species and usage identified in this project

Family Name	Species	Maasai Name	Key Field Characteristics	Medicinal Properties	GPS coordinates	Voucher Number
Amaranthaceae	*Achyranthes aspera* L.	Olekidongo	Herb with simple opposite leaves, axillary buds	Induce vomiting to treat illness or poison	lat -0.939 long 35.852	17
Anacardiaceae	*Rhus natalensis* Bernh. ex C.Krauss	Olmusigiyioi	Shrub with alternate trifoliate leaves	Reduced vomiting and diarrhea in children while teething	lat -1.096 long 35.82	5
Apocynaceae	*Carissa spinarum* G.Lodd.	Olamuriaki	Shrub with opposite simple leaves, large thorns	Reduces pain, treats sexually transmitted infections, and builds strength	lat -0.949 long 35.860	4
Asphodelaceae	*Aloe lateritia* var. *graminicola* (Reynolds) S.Carter	Osuguroi	Succulent herb with leaves in a rosette; large fleshy leaves	Heals wounds and burns. Treats chest congestion. Helps reduce stomach pain	lat -1.077 long 35.812	22
Canellaceae	*Warburgia ugandensis* Sprague	Osokonoi	Tree with spiral leaf arrangement, strap shaped leaves	Treats stomach pain, constipation, rebuilds strength after birth. Stem used for toothaches. Leaves can be used to treat rashes	lat 0.946 long 35.842	10
Celastraceae	*Mystroxylon aethiopicum* (Thunb.) Loes.	Olodo-nganayioi	Shrub or tree with simple, alternately arranged leaves; small green flowers	Immune booster, builds strength in children	lat -0.947	12
Euphorbiaceae	*Euphorbia tirucalli* Thunb.	Oloilei	Herbaceous green vine, no leaves, white latex	Treats chest congestion, bronchitis, pneumonia	lat -0.949 long 35.85	21
Fabaceae	*Acacia gerrardii* Benth.	Olguenguenyi	Tree with alternate twice pinnately compound leaves, large thorns	Treats infection and builds strength in soup	lat -1.098 long 35.82	7
Fabaceae	*Erythrina abyssinica* Lam.	Oloponi	Tree with large trifoliate leaves, end leaflet is broader; prickles on entire plant.	Increases strength and builds immune system	lat -0.950 long 30.850	30
Hamamelidaceae	*Trichocladus ellipticus* Eckl. & Zeyh.	Olpalagilagi	Shrub or tree with alternate simple leaves, upper leaf surface green, lower leaf surface dense hairs; flowers with long thin yellow petals	Treats heartburn, hiccups, stomach problems	lat -0.938 long 35.85	15
Lamiaceae	*Plectranthus* sp. L'Hér.	Olmudash Olmekuaya	Herb with square stems, bilaterally symmetric flowers	Treats stomach problems. Treats skin rashes	lat -1.096 long 35.82	1
Lamiaceae	*Rotheca myricoides* (Hochst.) Steane & Mabb.	Ologumati	Shrub with opposite leaves with serrate margins; bilateral flowers,	Treats nausea and diarrhea	lat -0.949 long 35.858	31

Lamiaceae	*Satureja* sp. L.	Enkoloshoo	Herb with square stem, small leaves with opposite arrangement; axillary clusters of flowers, several flowers per cluster	Improves strength for children, build immune system.	lat -0.948 long 35.86	25
Loranthaceae	*Phragmanthera usuiensis* (Oliver) M.G.Gilbert	Olmeigaru-Kewan	Parasitic shrub with opposite simple leaves; axillary orange flowers	Improves infant's strength, build immune system and weight gain, especially first months	lat -1.096 long 35.825	6
Malvaceae	*Sida tenuicarpa* Vollesen	Oltutu	Shrub with small heart shaped leaves; small yellow/white flowers	Strengthen contractions, assist in labor, assists with afterbirth, delivery of placenta		16
Moraceae	*Ficus sycomorus* L.	Olgaboli	Tree with alternate leaves, waxy leaf margin	Assists with bleeding and pain after childbirth, can stop post-partum bleeding	lat -0.937 long 35.85	14
Moraceae	*Ficus thonningii* Blume	Oreteti	Tree with simple leaves with spiral arrangement, large tree with broad trunk	Treats diarrhea	lat -0.951 long 35.862	27
Oleaceae	*Olea europaea* subsp. *africana* (Mill.) P.S.Green	Olorien	Tree with opposite leaf arrangement, new leaves different color, leaves glossy on upper surface	Assists with stomach pain, de-wormer, ulcers, induces vomiting, assists during childbirth	lat -0.949 long 35.86	26
Phyllanthaceae	*Meineckia* sp.	Olkiparnyany	Shrub or tree with spiral leaf arrangement, small flowers in axillary clusters	Treats pneumonia, prevents coughing, assists with aching joint, builds strength	lat -0.950 long 35.860	29
Polygonaceae	*Rumex usambarensis* Dammer ex Peter	Enkaisuishoi	Shrub or vine with arrow shaped leaves, with ocrea (sleeve) around stem above each leaf	Treats stomach pains. Chewing roots helps with stomach pain. Strength for children	lat -0.948 long 35.85	23
Rhamnaceae	*Rhamnus staddo* A.Rich	Olkokola	Shrub or tree with simple alternate leaves, elliptical leaves	Treats sexually transmitted infections	lat -0.946 long 35.873	18
Rhamnaceae	*Scutia myrtina* (Burm.f.) Kurz	Osanankururi	Shrub with opposite to sub opposite leaves, thorns	Builds strength, stomach pain	lat -1.098 / long 35.82	8
Rutaceae	*Toddalia asiatica* (L.) Lam.	Oleparmuyo	Woody vine with trifoliate leaves, alternate arrangement	Treats colds, coughs, fever, malaria	lat -0.950 long 35.86	2
Rutaceae	*Vepris simplicifolia* Endl. or *V. nobilis* (Delile) Mziray	Olgilai	Shrub or tree with alternate simple leaves; fruit is red with one seeded berry	Helps reduce pain and cleanse the womb after childbirth. Also used to help with breathing problems, such as asthma or persistent cough	lat -0.947 long 35.84	19

Rutaceae	*Zanthoxylum chalybeum* Engl.	Oloisuti	Shrub or tree with alternate pinnately compound leaves, prickles	treats colds, running nose, sneezing	lat -0.946 long 35.856	13
Salicaceae	*Dovyalis abyssinica* (A.Rich.) Warb.	Olmorogi	Shrub or tree with simple leaves, stipular prickles, single large prickle per leaf	Heals wounds, heals bone fractures, strength for after childbirth	lat -0.95 long 35.86	33
Salicaceae	*Trimeria grandifolia* (Hochst.) Warb.	Oledat	Tree with alternate leaf arrangement, slightly lobed leaf	Treats stomach and builds strength	lat -0.95 long 35.86	3
Santalaceae	*Osyris lanceolata* Hochst. & Steud.	Olosesiai	Shrub or tree with alternate simple leaves; endangered	Build strength and immune system, as tea or soup to treat long term illnesses	lat-0.9465	9
Scrophulariaceae	*Craterostigma pumilum* Hochst.	Enkorika Oomotonyi	Small herb, no stem; purple flowers, found only during rainy season	Improves infant's strength, build immune system and weight gain, especially first months	lat -0.950 long 35.859	32
Urticaceae	*Urtica massaica* Mildbr.	Entamejoi	Herb with opposite leaves; axillary flowers	Food supplement to increase iron and strength	lat -0.948 long 35	20
Vitaceae	*Rhoicissus revoilii* Planch.	Olkilenyai	Woody vine, low shrub or tree with trifoliate alternate leaves, tendrils	Antiseptic, cleans wounds	lat -0.946 long 35.843	12

Conclusion

Responding to community elders' expressed desire to preserve this knowledge in written form for future generations, this study's primary objective was to systematically document the traditional medicinal knowledge (TMK) of the Purko Maasai community in Central Narok, Kenya, a body of knowledge historically transmitted exclusively through oral tradition. A significant proportion of medicinal plants were revealed as primarily utilized for preventive health, with an emphasis on strengthening the immune system. Qualitative interviews indicated that 70% of participants referenced an enhancement of bodily strength when describing these uses of identified plants. Nearly 50% of the documented species were associated with medicinal applications that specifically aimed to build strength and boost immunity. Like other studies, these results underscore how persistent and resilient the Maasai ethnomedical system is, especially given its focus on preventative healthcare practices.

Declarations

List of abbreviations: PAR- Participatory Action Research , TMK- Traditional Medicinal Knowledge, NACOSTI- National Commission for Science, Technology, and Innovation

Ethics approval and consent to participate: This research was approved by the Grand Valley State University Human Research Review Committee (17-159-H) and the Kenyan National Commission for Science, Technology, and Innovation (NACOSTI/P/17/73653/17823. All participants recruited during this project went through the approved informed consent process.

Consent for publication: Not applicable

Availability of data and materials: data available upon request

Competing interests: Not applicable

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Author contributions: Conceptualization, KH, TE and JK.; methodology, KH, TE and JK.; validation, TE.; formal analysis, KH and TE.; writing—original draft preparation, KH.; writing—review and editing, KH, TE and JK.; project administration, KH and JK.; funding acquisition, KH and TE. All authors have read and agreed to the published version of the manuscript.

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