

A survey of ethnobotany of the *AbaWanga* people in Kakamega County, western province of Kenya

Ndondolo Shiracko¹, Bethwell Onyango Owuor¹, Martin Muthee Gakuubi² & *Wycliffe Wanzala^{1,3}

¹Department of Natural Sciences, Faculty of Science, The Catholic University of Eastern Africa, P O Box 62157-00200, Nairobi, Kenya; ²Mwenge Catholic University, Department of Biology, Faculty of Science, P O Box 1226, Moshi, Tanzania;

³Department of Biological Sciences, School of Science and Information Sciences, Maasai Mara University, P O Box 861-20500, Narok, Kenya

E-mails: shirakotony@yahoo.com; bowuor2001@yahoo.com; owuorbethwell@cuea.edu; bromarto@yahoo.co.uk; osundwa1@yahoo.com

Received 31 December 2014, revised 30 July 2015

AbaWanga people of western Kenya are known to have a rich history of ethnobotanical knowledge, probably due to their long interactive history of migration from North Africa to West Africa and then to Central and finally to East Africa. Their collective and accumulative ethnobotanical knowledge largely remains unknown and is likely to be just as rich and worth documenting, hence the current study. Non-alienating, dialogic, participatory action research (PAR) and participatory rural appraisal (PRA) approaches involving 100 women and men aged over 30 yrs old were utilized. A set of triangulation approach involving snowball and purposive sampling methods were used to select 100 key respondents. A total of 66 plant species distributed in 31 families were documented with Fabaceae family having the highest number of species (16.67%), followed by Euphorbiaceae (9.09%) and Asteraceae (6.06%). The study showed extensive ethnic-based and varied ethnobotanical uses. There were 54 human diseases/ill-health conditions treated, controlled and managed together with those plants offering nutritional, socio-cultural/economic and veterinary values. This showed an ethnobotanical system that was practically developed and could confidently supplement and complement conventional medicine, where appropriate following an in-depth scientific research.

Keywords: Ethnobotanical knowledge, *AbaWanga* people, *Luhya* tribe, Plants products, Kenya

IPC Int. Cl.:⁸ A61K 36/00

Ethnobotany is conventionally considered the scientific study of the complex relationships and interactions that exist between peoples and plants, focusing primarily on how plants are used, managed and perceived across human societies and their cultures¹. The history of ethnobotany is as old as that of humanity but the search involving its observation, recognition and application in human life is traced to have been pioneered during the Pythagoreanism era around 500 BC while the orderly recorded ethnobotany is traced to have started with Dioscorides, a Greek Philosopher who published *De Materia Medica*, that cataloged about 600 plants in the Mediterranean around 77 AD². Ethnobotany has evolved through human civilization to improve human well-being via increasingly maximizing benefits accruing from the complex centuries' old interactions between plants and humans¹. That plants

have played a pivotal role in the cultural and traditional life of the *AbaWanga* people, is manifested in their rich plant-based *Wanga* dialect, the rich ethnobotanical knowledge and ethnopractices of herbalism for primary healthcare at community and family levels³. Although the encroachment of development on and modernization of cultural and traditional life has affected the *Wanga* community, the livelihood of people and their lifestyles has remained relatively traditional⁴ and traditional plant use remained important. This is reflected in the existence of sacred traditional forests and shrines comprising of certain specific plant species for performing specialized cultural ceremonies, prayers, oathing and healing as well as for conducting community- and individual-based curses. Nevertheless, the *AbaWanga* people continue to rely heavily on a wide range of indigenous plant species for medicinal, agricultural, narcotic/hallucination, timber, fuel, fences/boundaries, supporting crops, shrines/

*Correspondence author

worshipping and dietary purposes. This reliance has necessitated and promoted cultural-based classification of identified useful and none-useful plant species into unique and important folkloric groups as early as the beginning of their plant-human interaction and civilization processes^{4,5}. To date, insignificant research has been conducted on *Wanga* ethnobotany to understand and document plant-human interactions in their environment. This important ethnoknowledge has been neglected and is therefore, at risk of being lost⁶⁻⁸. In this paper, we focus on the survey conducted to evaluate ethnobotany of the *AbaWanga* people, partly focusing on their traditional uses of various plant species. The study demonstrates an important link between plant biodiversity and the livelihood of the *AbaWanga* people.

Methods

Prior to starting the project, an informed consent was sought from the individual key respondents through organized meetings and discussions held with village elders and the local administration, which represents the local office of the president, Government of Kenya.

Description of the study area: *AbaWanga* people and their geographical location

The name *Wanga* refers to the people as well as their descent and geographical location⁹. The *Wanga* people (also known as *AbaWanga*) are one of the 19 ethnic groups (sub-tribes) of the East African Bantu-speaking *Luhya* tribe in Kakamega County, western province of Kenya. They dominantly occupy Mumias and Matungu districts located between latitude, 0.34° North and longitude, 34.49° East at an altitude ranging from 1240 to 1641 m asl¹⁰. The size of the study area is 940 km² with a population of about 732,000 people and a population density of 609 persons / sq km. The study site is located between Rivers, Lusumu and Nzoia within the Lake Victoria Basin, which greatly influences weather and climate of the area (Fig. 1). The neighbours of the *AbaWanga* people to the North are, the *Bukusu* and the *Banyala*; to the South are, the *Marama*; to the East are, the *Batsotso*; to the West are, the *Marachi* and to the South-West are, the *Luo*-speaking Lake Nilotes (Fig. 1). Historically, before the advent of British colonialism in the early 1900s, the *Wanga* people belonged to the most highly developed and centralised Kingdom of *Wanga* in western Kenya. The Kingdom, a splinter of the *Buganda* Kingdom in Uganda,

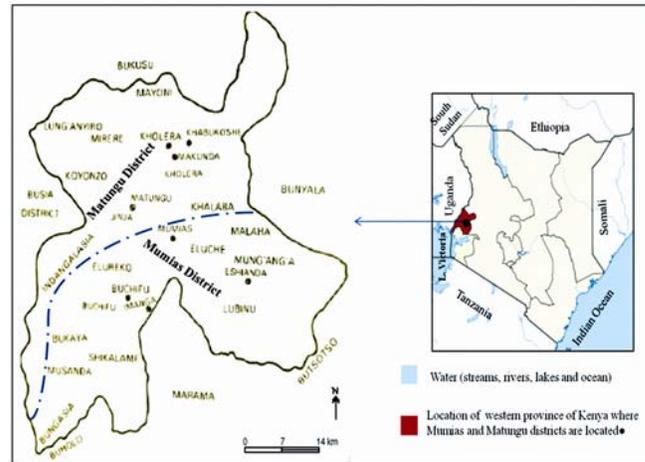


Fig. 1 — Map of study area (Kenya) showing the geographical location of the *AbaWanga* people (in the former *Wanga* Kingdom, currently comprising Mumias and Matungu districts) in Kakamega County, western province of Kenya. Sources: Adapted and modified from Dederling (2011)¹¹ under GNU Free Documentation License.

extended as far west as *Buganda* in Uganda (current *Jinja*); as far South as *Samia* in Busia; as far North as Mount Elgon and as far East as Naivasha in Rift Valley¹¹. In the process of expansion of the Kingdom, the *AbaWanga* people encountered many people with diversified ethnic backgrounds and cultural life that gradually changed their original lifestyles¹. This further explains the extent to which the cultural and traditional life of the *AbaWanga* people has been influenced over time by the diverse ethnicity in the neighbourhood and that of visitors (such as the Arabs, Swahili and British missionaries) and mercenaries, mainly of Semitic and Plain Nilotic ethnic extraction.

The *AbaWanga* people have retained the *Nabongo* (Kingship title) to date as their cultural monarch and symbol of peace, love and unity¹. As a *Luhya* sub-tribe, the *Wanga* is a composition of the following 22 clans (locally known as *tsihanga*) with reference to female given in brackets, namely: - 1. *Abashitsetse* (*Bwibo*), 2. *Abakolwe* (*Nabakolwe*), 3. *Abaleka* (*Nabaleka*), 4. *Abachero* (*Njero*), 5. *Abashikawa* (*Nashikawa*), 6. *Abamurono* (*Oronda*), 7. *Abashieni* (*Shieni*), 8. *Abamwima* (*Namwima*), 9. *Abamuniafu* (*Ngakhwa*), 10. *Abambatsa* (*Luleti*), 11. *Abashibe* (*Nashibe*), 12. *Ababere* (*Nebere*), 13. *Abamwende* (*Luchimbo*), 14. *Abakhami* (*Nabakhami*), 15. *Abakulubi* (*Akwanyi*), 16. *Abang'ale* (*Namang'ale*), 17. *Ababonwe* (*Nabonwe*), 18. *Abatsoye* (*Nabatsoye*), 19. *Abalibo* (*Namwasi*), 20. *Abang'ayo* (*Nang'ayo*), 21. *Ababule*

(*Nabule*) and 22. *Abamulembwa* (*Namulembwa*). These clans generally speak the *Wanga* dialect, a *Bantu* language in East Africa but heavily influenced by the neighbouring dialects of the *Lake Nilotes*, the *Luo* community and other *Bantu*-speaking *Luhya* sub-tribes with slightly different oral histories, ethnicity, cultures and mythology (Fig. 1). This great diversity in clans reflects a similar diversity in ethnobotany of the *AbaWanga* people. Nevertheless, the *AbaWanga* people exhibit a much older *Bantu* characteristic phenomenon in grammar and phonetic forms than any other languages of the *Bantu*-speaking neighbours in the region (Fig. 1), an implication of their advanced civilized livelihood.

The rainfall pattern is characteristically bimodal with long periods of rain occurring from March to May and short periods occurring from August to September. The mean annual rainfall ranges from 1,500 to 2,500 mm per year. A dry spell occasionally occurs between the months of December and February. The climate of the *Wanga* region comprises mean annual temperature of 27 °C, relative humidity of the range 90 - 100%, wind velocity of 33.3 m/s, Isokeraunic level of 180 thunderstorm days and Seismicity Coefficient of 0.16.

Vegetation of the study area of the *AbaWanga* people

The dominant vegetation is commonly green bushes with tall trees along river valleys, and, in the higher areas, is purely savanna with scattered tall trees. Nevertheless, once forested hills, particularly their tops, and river valleys have been deforested over time to pave way for commercial and subsistence farming, leaving patches and corridors of bushes along rivers, river valleys and hilltops, as well as scattered tall trees in large expanses of arable farm land.

Socioeconomic activities of the *AbaWanga* people

The *AbaWanga* people freely combine both commercial and subsistence farming, with sugar cane being the preferred medium to large scale crop while the subsistence food crops include: - maize, millet, finger millet, a variety of fruits, cassava, sweet potatoes, beans and bananas, etc. Market gardening and zero-grazing and tethering forms of livestock farming are also practiced for their socioeconomic development but there is very little livestock farming (mainly dairy cattle) as much of farming is mainly focused on sugarcane. Most of the inhabitants in the two districts have continually

fragmented their arable land into small plantations of sugarcane, with an average size of plot holdings being two acres in an effort to earn cash from the commercial sugarcane farming on individual basis. These agricultural practices have negatively affected biodiversity in the area, in particular, the haphazard destruction of indigenous plant species and natural habitats of wild species, which are the sources of ethnopharmacologically active agents upon which people's livelihood has depended on for provision of primary healthcare services for centuries⁶. The commercial farming together with modernization and change of traditional lifestyles of *AbaWanga* people has negatively impacted on the sustainability of harvesting already constrained wild species of plants and animals for their medicinal and nutraceutical values.

Composition and administration of questionnaire to key respondents

Ethnopractitioners offering primary healthcare services to humans and local livestock industry were considered the target key respondents in the study and the selection process was based on the knowledge base, experience and current herbal practices in human and ethnoveterinary medicine of the target individual. The first step in this study was the generation of a purposive sample of the key respondents from a wide range of sources mentioned above. Key respondents were considered local experts or people in the study area with knowledge of a particular issue or technology of interest (in this case, *Wanga* ethnobotanical knowledge)¹²⁻¹⁴. They have a more extensive understanding of local socio-cultural systems than others in the community. A purposive sample referred to a particular subset of knowledgeable people in *Wanga* ethnobotanical knowledge system. Intensive and extensive collaboration and interaction with these key respondents was considered an effective research strategy of accessing the relevant information^{15, 16}. A probability random sampling technique would not have been appropriate for this type of socio-cultural set-up, as not everyone sampled randomly may have the required knowledge^{12, 17-19}. A combination of snowball and purposive sampling methods was employed to select the key respondents. Once a few ethnopractitioners and others with interest in *Wanga* ethnobotanical knowledge, had been identified using the above sources, fruitful initial contacts were made and more key respondents were

identified using their existing networks. Upon the establishment of the snowball sample, a purposive sampling technique was then employed to select a sample of 100 key respondents from Mumias and Matungu districts. This procedure is widely used in ethnoknowledge studies to get information from hidden populations, which are difficult for researchers to access^{7, 20-23}. The purposive sampling technique ensured that only key respondents with the desired qualities and quantities of information on *Wanga* ethnobotanical knowledge were selected²⁴. Administration of questionnaire to key respondents was conducted as previously described²⁵.

Personal interviews/discussions with selected key respondents

After filling of the well structured questionnaire, an interview/discussion with the selected key respondents was held. This was guided exchanges, semi-structured by a mental checklist of relevant points to confirm the validity of the information in the questionnaires of other key respondents interviewed earlier.

Collection of specimens of plants and plant products

Following a personal interview with the selected key respondents, a field trip was made to identify and collect the listed plant specimens and/or ethnobotanical products from the bushes along river valleys, open grasslands and disserted arable farm lands of the study area (Fig. 1). The specimens were harvested, prepared, packaged and stored according to the herbarium rules and regulations until transported to Herbarium at The Catholic University of Eastern Africa, Nairobi, Kenya for botanical identification using voucher specimens and according to the Hutchinson Phylogenetic system of classification. While in the herbarium, further non-experimental studies were also conducted. For each plant species collected from the field, a voucher specimen was prepared and deposited in the Herbarium at The Catholic University of Eastern Africa, Nairobi, Kenya.

Results and discussion

Enumeration of documented plants from the survey study

The results of the survey study are comprehensively summarized in Table 1. The key respondents gave a

local name and/or names to the identified plants, including their corresponding literal meanings in *Wanga* dialects and their uses together with the specific plant parts used (Table 1). In some circumstances, the key respondents were not able to give the literal meaning of some of the indigenous plant names (Table 1). Probably, these were the newest plants to be identified in the community for use and applications⁶.

A total of 66 plant species distributed in 31 families were documented to be used in *Wanga* community (Table 1). Fabaceae family was represented by 11 plants followed by Euphorbiaceae family (6 plants), Asteraceae family (4 plants), Poaceae, Rutaceae, Anacardiaceae, Bignoniaceae and Myrtaceae families (each was represented by 3 plants) while the rest of the families were represented by either one or two plant species. Some of the documented plant species were reported in literature to be used elsewhere by other ethnic communities and/or conventionally evaluated and found to have bioactive compounds^{6,7}.

According to the *AbaWanga* people, a name bestowed first and foremost an identity to the individual organism and that such an identity defined the individual's ancestry and circumstances prevailing in the land at the time of starting to exist. Plants were a major source of human food and this was confirmed by key respondents who named majority of plants as being used as food (Table 1). This was an indication of the local community's concern for food security in life from the very beginning, signals for development of effective and efficient nutraceuticals that are ethnically based¹⁷⁻¹⁹.

The study showed varied ethnobotanical uses and existence of a complex and extensive ethnic-based plant nomenclature system with more monomials than polynomials. There were 54 human diseases/ill-health conditions sustainably treated, controlled and managed together with those plant species offering nutritional, socio-cultural/economic and veterinary values to people. This showed a complex ethnobotanical system that was practically developed and could confidently supplement and complement conventional ways particularly those that concerned nutrition and medicine, where appropriate, following an in-depth scientific research¹⁹⁻²¹.

Table 1—Enumeration of documented plants and plant products that were traditionally used in the *Wanga* community, including their local names and the corresponding literal meanings in *Wanga* dialects and the species use value indices a cross all respondents (n = 66).

Botanical name of the plant [Family]	Local name of the plant	Literal meaning of the local name(s)	Part(s) of plant used	Use(s) of the described plants	Herbarium voucher specimen number
<i>Acanthospermum glabratum</i> (DC.) Wild. [Asteraceae]	<i>Kwilisungura</i>	That plant, which is used for rubbing at the site(s) for boils' development on victim's body.	Leaves and bark	Treats boils and broken limbs.	N/B/MW/07-2012/ 019
<i>Ajuga remota</i> Benth. [Lamiaceae]	<i>Imbusi ya amutakha</i>	A poor man's goat.	leaves	Treats indigestion, malaria and menstrual problems	N/B/MW/07-2012/ 042
<i>Albizia coriaria</i> Welw. ex Oliver [Fabaceae]	<i>Omubele</i>	Milk plant.	Stem and bark	Treats TB, genital thrush and gonorrhea	N/B/MW/07-2012/ 023
<i>Allophylus abyssinicus</i> Hochst. Radlk. [Sapindaceae]	<i>Shisasari</i>	That plant, which causes scratching/itching	Leaves and roots	Treats boils, hunchback and rickets.	N/B/MW/07-2012/ 014
<i>Amaranthus graecizans</i> L. [Amaranthaceae]	<i>Litoto</i>	Weak.	Stem s and leaves	Used as vegetables.	N/B/MW/07-2012/ 031
<i>Amaranthus hybridus</i> L. [Amaranthaceae]	<i>Tsimboka</i>	Easily sprouting following rains and plugged from the ground once it has matured.	Stems, leaves and seeds	Used as vegetables.	N/B/MW/07-2012/ 032
<i>Vernonia amygdalina</i> Delile. [Asteraceae]	<i>Omulusia</i>	Bitter.	Leaves, stems, barks and roots.	The plant has a lot of medicinal and cultural values. Leaves used as vegetables	N/B/MW/07-2012/ 066
<i>Azadirachta indica</i> A. Juss. [Meliaceae]	<i>Mutwele (Mwarobaini)</i>	A tree and/or plant of the forty diseases.	Barks, fruits, leaves and roots	Treats about forty diseases such as eye and ear infections, typhoid, skin-fungal infection, ring-worms, genital thrush, herpes and malaria etc.	N/B/MW/07-2012/ 007
<i>Basella alba</i> L. [Basellaceae]	<i>Inderema</i>	Smooth/slippery plant due to its mucilaginous-like texture.	Leaves	Vegetables	N/B/MW/07-2012/ 040
<i>Bersama abyssinica</i> Fresen. [Melianthaceae]	<i>Omuyundi</i>	Just like a small bird called <i>omuyundi</i> and also due to the plant's spike inflorescence, which is similar to one that is traditionally made in homes used as brooms, called <i>omuyundi</i> .	Roots and barks	Treats urinary tract infections.	N/B/MW/07-2012/ 013
<i>Bridelia micrantha</i> (Hochst.) Baill. [Euphorbiaceae]	<i>Omulongang' mbe</i>	That which follows tracks of cattle.	Roots , fruit and bark	Used to treat boils, flu, stomachache, joints, backbone, STDs, dysentery and diarrhea.	N/B/MW/07-2012/ 006

(Contd.)

Table 1—Enumeration of documented plants and plant products that were traditionally used in the *Wanga* community, including their local names and the corresponding literal meanings in *Wanga* dialects and the species use value indices across all respondents (n = 66). (Contd.)

Botanical name of the plant [Family]	Local name of the plant	Literal meaning of the local name(s)	Part(s) of plant used	Use(s) of the described plants	Herbarium voucher specimen number
<i>Carica papaya</i> L. [Caricaceae]	<i>Lipaipai</i>	Hollow trunk like a pipe but etymologically originating from the species name in <i>Swahili</i> language, <i>paipai</i> .	Leaves and roots	Human food	N/B/MW/07-2012/ 030
<i>Celtis gomphophylla</i> Bak. [Ulmaceae]	<i>Omuswa</i>	Just like the ant hill termite mount.	Stem s and leaves	Treats backache and general body illness	N/B/MW/07-2012/ 057
<i>Cleome gynandra</i> L. [Cleomaceae]	<i>Tsisaka</i>	That plant, which branches and/or spreads out.	Roots, stem s and leaves	Vegetable and medicine for stomachache	N/B/MW/07-2012/ 037
<i>Clerodendrum myricoides</i> (Hochst.) Vatke [Lamiaceae]	<i>Shisila-ngokho</i>	Enemy of chicken.	Roots and leaves	Treats sore-throat, ear infections and malaria. Ethnoveterinary medicine (to treat infections affecting poultry.	N/B/MW/07-2012/ 035
<i>Corchorus olitorius</i> L. [Tiliaceae]	<i>Omurere</i>	Slippery.	Leaves	Vegetables	N/B/MW/07-2012/ 065
<i>Crotalaria brevidens</i> Benth. [Fabaceae]	<i>Emiroo</i>	That plant, which sprouts.	Roots, bark and leaves	Vegetables	N/B/MW/07-2012/ 064
<i>Croton macrostachyus</i> Hochst. ex Ferret et Galinier. [Euphorbiaceae]	<i>Omutswitswi</i>	Commonly found at a place called <i>Shitswitswi</i> .	Leaves, seeds, roots and bark	Treats sore throat, flu, TB, stomachache, measles, dysentery and malaria.	N/B/MW/07-2012/ 015
<i>Curcubita maxima</i> Duchesne [Cucurbitaceae]	<i>Lisebebe</i>	Came from the Kikuyu community, implying that which moves from place to place.	Bark and twigs	Vegetable and other human food	N/B/MW/07-2012/ 036
<i>Diospyros abyssinica</i> (Hiern) F.White [Ebenaceae]	<i>Lusui</i>	A cock's comb.	Seeds	Treats diarrhea	N/B/MW/07-2012/ 045
<i>Eleusine coracana</i> (L.) Gaertn. [Poaceae]	<i>Obulee</i>	That plant, which lacks.	Bark, leaves and twigs	Human food and of medicinal value.	N/B/MW/07-2012/ 009
<i>Entada abyssinica</i> Steud. ex A.Rich. [Fabaceae]	<i>Musembe</i>	A lamb's tail.	Stem and bark	Treats scabies, flu, infertility, cough, deworming, body aches, dysentery, cardiac and kidney	N/B/MW/07-2012/ 016
<i>Erythrina abyssinica</i> Lam. ex DC. [Fabaceae]	<i>Omurembe</i>	Tree of peace (due to its use during oathing).	Stem, roots and bark.	Treats swollen lymph glands	N/B/MW/07-2012/ 047
<i>Erythrococca bongensis</i> Pax [Euphorbiaceae]	<i>Eshirietso</i>	-	Roots	Treats arthritis.	N/B/MW/07-2012/ 044
<i>Euclea divinorum</i> Hiem. [Ebenaceae]	<i>Muchendasi</i>	That plant, which crawls on the ground.	Roots and sap of twigs/bark	Treats sore throat.	N/B/MW/07-2012/ 033

(Contd.)

Table 1—Enumeration of documented plants and plant products that were traditionally used in the *Wanga* community, including their local names and the corresponding literal meanings in *Wanga* dialects and the species use value indices a cross all respondents (n = 66). (*Contd.*)

Botanical name of the plant [Family]	Local name of the plant	Literal meaning of the local name(s)	Part(s) of plant used	Use(s) of the described plants	Herbarium voucher specimen number
<i>Euphorbia tirucalli</i> L. [Euphorbiaceae]	<i>Obukhoni</i>	Protection cloth.	Sap	Treats eye infection.	N/B/MW/07-2012/ 025
<i>Fagaropsis angolensis</i> (Engl.) Dale [Rutaceae]	<i>Shingululutse</i>	The one that climbs.	Bark	Treat chest problems, gut and induces menopause.	N/B/MW/07-2012/ 034
<i>Ficus natalensis</i> Hochst [Moraceae]	<i>Omutoto</i>	The big and wide.	Bark and leaves	Treats toothache conditions.	N/B/MW/07-2012/ 046
<i>Ficus sycomorus</i> L. [Moraceae]	<i>Omukhuyu</i>	Name of a place.	Bark and roots	Bark and sap used to treat diarrhea, nausea and vomiting.	N/B/MW/07-2012/ 005
<i>Harrisonia abyssinica</i> Oliv. [Rutaceae]	<i>Eshipondwe</i>	That plant, which is intact.	Leaves, fruits/bark	Treats gonorrhoea and syphilis.	N/B/MW/07-2012/ 043
<i>Harungana madagascariensis</i> Lam. ex Poiret [Hypericaceae]	<i>Namalasile (Mwinyalira matsai)</i>	That plant, which urinates blood.	Leaves, fruits, bark and roots	Treats eye infection, scabies, flu, stomachache and heavy menstruation.	N/B/MW/07-2012/ 027
<i>Ipomea batatas</i> (L.) Lam. [Convolvulaceae]	<i>Amapwoni</i>	Packed plant.	Roots and leaves	Used as human food.	N/B/MW/07-2012/ 061
<i>Kedrostis foetidissima</i> (Jacq.) Cogn. [Cucurbitaceae]	<i>Likunietse</i>	That plant, which spreads out.	Leaves	Used as vegetables.	N/B/MW/07-2012/ 060
<i>Lablab purpureus</i> (L.) Sweet [Fabaceae]	<i>Ihranda</i>	That plant, which spreads out.	Leaves and fruits	Used as vegetables.	N/B/MW/07-2012/ 010
<i>Mangifera indica</i> L. [Anacardiaceae]	<i>Liembe</i>	Adopted from the Swahili name, <i>embe</i> .	Leaves and bark	Used as human food.	N/B/MW/07-2012/ 066
<i>Markhamia lutea</i> (Benth.) K. Schum. [Bignoniaceae]	<i>Olusiola</i>	To prune.	Leaves, stem and roots	Treats throat diseases, eye infection, toothache and snake bites.	N/B/MW/07-2012/ 002
<i>Mondia whitei</i> (Hook.f.) Skeels [Asclepiadaceae]	<i>Omukombera</i>	One admires playing sex once the plant is used.	Roots, fruit and flowers	Used as an appetizer.	N/B/MW/07-2012/ 017
<i>Musa paradisiaca</i> L. [Musaceae]	<i>Liramwa</i>	That plant, which is cut down during harvesting.	Bark, roots and roots	Used as human food and treats ear infections, asthma and cough in humans	N/B/MW/07-2012/ 039
<i>Olea capensis</i> L. [Oleaceae]	<i>Omutukuyo</i>	Dwarf plant.	Bark, fruits and roots.	Treats scabies, chest problems, constipation and urinary infections	N/B/MW/07-2012/ 053
<i>Persea americana</i> Mill. [Lauraceae]	<i>Mukado</i>	That plant, which lies.	Fruit and leaves	Human food	N/B/MW/07-2012/ 059
<i>Piliostigma thonningii</i> (Schum.) Milne-Redh. [Fabaceae]	<i>Shiboyelambako</i>	That plant, which is tied on a jembe.	Leaves and roots.	Generally used in ethnoveterinary medicine.	N/B/MW/07-2012/ 049

(*Contd.*)

Table 1—Enumeration of documented plants and plant products that were traditionally used in the *Wanga* community, including their local names and the corresponding literal meanings in *Wanga* dialects and the species use value indices a cross all respondents (n = 66). (Contd.)

Botanical name of the plant [Family]	Local name of the plant	Literal meaning of the local name(s)	Part(s) of plant used	Use(s) of the described plants	Herbarium voucher specimen number
<i>Pittosporum manii</i> Hook f. [Pittosporaceae]	<i>Mmonyomonyio</i>	The whispering plant.	Bark.	Treats boils and sexually transmitted diseases.	N/B/MW/07-2012/ 056
<i>Prunus africana</i> (Hook.f.) Kalkman. [Rosaceae]	<i>Mwilitsa</i>	The final one.	Bark, roots and fruit.	Treats joint aches and prostate cancer in men.	N/B/MW/07-2012/ 050
<i>Psidium guajava</i> L. [Myrtaceae]	<i>Lipera</i>	Adopted from the Swahili name, <i>mpera</i> .	Fruit and roots.	Used as human food.	N/B/MW/07-2012/ 038
<i>Rhus natalensis</i> Bernh. ex Krauss [Anacardiaceae]	<i>Omusangula omukhasi</i>	Female <i>Rhus</i> plant.	Leaves, barks, seeds and roots.	Treats influenza, abdominal pains and gonorrhoea in humans and East Coast fever.	N/B/MW/07-2012/ 021
<i>Rhus vulgaris</i> Meikle [Anacardiaceae]	<i>Omusangula omusatsa</i>	Male <i>Rhus</i> plant.	Leaves and roots.	Treats pregnant mothers to ease delivery and promotes fertility and treats gastrointestinal ill-health conditions.	N/B/MW/07-2012/ 003
<i>Sapium ellipticum</i> Hochst. ex Krauss Pax. [Euphorbiaceae]	<i>Omusetso</i>	That plant, which sieves.	Leaves and roots.	For general use in ethnoveterinary medicine.	N/B/MW/07-2012/ 051
<i>Senna septemtrionalis</i> (Viv.) H. Irwin & Barneby. [Fabaceae]	<i>Omukusa</i>	That plant, which tightens.	Leaves and seeds.	Used as an inhalant.	N/B/MW/07-2012/ 048
<i>Sesbania sesban</i> (L.) Merr. [Fabaceae]	<i>Omukhule</i>	Ever old.	Seed and leaves	Used to treat stomach ailments and ulcers.	N/B/MW/07-2012/ 052
<i>Solanum incanum</i> L. [Solanaceae]	<i>Indulandula</i>	The bitter one and bouncing like football when thrown on the ground.	Leaves, fruit, stem and roots	Treats ear infections and constipation.	N/B/MW/07-2012/ 022
<i>Solanum nigrum</i> L. [Solanaceae]	<i>Lisutsa</i>	Bitter.	Leaves and seeds	Vegetables	N/B/MW/07-2012/ 063
<i>Sorghum bicolor</i> (L.) Moench Poaceae]	<i>Amabelee</i>	While raw and fresh, produces a milky (<i>amabele</i>) substance.	Leaves, bark/seeds	Human food	N/B/MW/07-2012/ 012
<i>Spathodea campanulata</i> P. Beauv. [Bignoniaceae]	<i>Omutsurio</i>	Raw firewood.	leaves	Treats liver disorders, severe headache, sore throat & stomachache.	N/B/MW/07-2012/ 041
<i>Stereospermum kunthianum</i> Cham. [Bignoniaceae]	<i>Maholushikhholobo</i>	Flowers of a bitter tree.	Fruit and bark	Treats cough, malaria, ulcers, venereal diseases and wounds.	N/B/MW/07-2012/ 058
<i>Syzygium cumin</i> (L.) Skeels. [Myrtaceae]	<i>Zambarau</i>	Plant of purple colour.	Bark and fruits	Used as human food and to treat dysentery in humans.	N/B/MW/07-2012/ 0 01

(Contd.)

Table 1—Enumeration of documented plants and plant products that were traditionally used in the *Wanga* community, including their local names and the corresponding literal meanings in *Wanga* dialects and the species use value indices across all respondents (n = 66).

Botanical name of the plant [Family]	Local name of the plant	Literal meaning of the local name(s)	Part(s) of plant used	Use(s) of the described plants	Herbarium voucher specimen number
<i>Syzygium guineense</i> (Willd.) DC. [Myrtaceae]	<i>Omusirinya</i>	That plant, which annoys.	leaves	Bark/sap used to treat infertility and typhoid.	N/B/MW/07-2012/ 018
<i>Tagetes minuta</i> L. [Asteraceae]	<i>Inzaka</i>	Bhang (because the plant looks like bhang).	Bark and leaves	Treats fever.	N/B/MW/07-2012/ 029
<i>Tamarindus indica</i> L. [Fabaceae]	<i>Omukhuwa</i>	Name of a place.	Leaves	Treats nausea, vomiting and diarrhea.	N/B/MW/07-2012/ 055
<i>Tithonia diversifolia</i> (Hemsl.) A.Gray [Asteraceae]	<i>Maua malulu</i>	Bitter flowers.	Leaves	Treat indigestion	N/B/MW/07-2012/ 004
<i>Tragia brevipes</i> Pax. [Euphorbiaceae]	<i>Isambakhulu</i>	Burning leaves once in contact with human body.	Leaves	Treats hair loss, indigestion, ulcers, anemia &hypertension.	N/B/MW/07-2012/ 008
<i>Trichilia emetica</i> Vahl. [Meliaceae]	<i>Omunyama</i>	One to do with meat, i.e. meat-like plant.	Leaves	Treats flu, and general body weakness.	N/B/MW/07-2012/ 024
<i>Vangueria apiculata</i> K. Schum.[Fabaceae]	<i>Shikhomoli</i>	That plant, which massages and shows off.	Leaves and seeds	Used to stop prolonged menstruation.	N/B/MW/07-2012/ 028
<i>Vigna subterranea</i> (Linn.) Verdc. [Leguminosaceae]	<i>Tsimbande</i>	Hard and round like human testis.	Nuts and leaves	Used as food and as nutritional supplement.	N/B/MW/07-2012/ 011
<i>Vigna unguiculata</i> (L.) Walp. [Fabaceae]	<i>Likhubi</i>	One which is Offensive and/ or unpleasant and beats.	leaves	Used as vegetables.	N/B/MW/07-2012/ 062
<i>Zanthoxylum gillettii</i> (De Wild.) Waterman [Rutaceae]	<i>Shikhuma</i>	A hard plant.	Seeds	Treats asthma, bronchitis and sore throat.	N/B/MW/07-2012/ 054
<i>Zea mays</i> L. [Poaceae]	<i>Amatumwa</i>	A plant sent, mainly from abroad by foreigners.	Seeds	Used as human food.	N/B/MW/07-2012/ 020

Key: Field information not available for documentation, implying that probably, these plants existed but were less important and therefore rarely used in the community; N, no leading bioactive information from literature was found (for 6 plant species in this case) to support the traditionally claimed uses within the community.

N/B – The Swahili names adopted by the *AbaWanga* people were as a result of the cultural influence of the Swahili-speaking Arabs in the *Wanga* Kingdom as the main collaborators in business (mainly slave trade) from the Coastal region and legal advisers of the *AbaWanga* King, Mumia *Nabongo*.

Conclusion

That the *AbaWanga* people of Mumias and Matungu districts in western Kenya had a system of plant taxonomy and nomenclature, which was based on locality, utility, morphological characteristics, origin and events associated with various uses of plant species. The basis was more on plant utility and morphological characteristics of plant species. The *AbaWanga* people only classified and named plants that were useful to them as non-useful plants did not

have clear local names and the corresponding literal meanings in *Wanga* dialects. The study also revealed that there exist a strong relationship between medicinal plants and people's health. Different plant species and their corresponding parts (roots, bark, gum, sap, seeds, fruit, flowers and twigs) were valued for treating varied or similar diseases. Diseases managed ranged from the common upper respiratory tract infections to reproductive health. Also management of health conditions involved such

chronic and complicated conditions such as barrenness, mental illness, cancer, schizophrenia and stroke, an indication that traditional herbal medicine was fairly developed and could confidently supplement and complement conventional medicine, where appropriate. With proper screening, effective plants and plant products can be identified and be used for drug development in health industry.

Acknowledgement

The authors wish to acknowledge the financial and material support received from The Catholic Scholarship Programme (CSP) to support the scholarship of Fr. Ndongolo Shiracko at the Department of Natural Sciences, Faculty of Science, The Catholic University of Eastern Africa and later, this research. Our deepest gratitude goes to all the respondents interviewed during the survey study; the *Wanga* ethnopractitioners of who, while responding to our inquiry for information used in this research and throughout the guided field excursions, trusted us to share the treasured ethnoknowledge. These are truly the actual owners of the information submitted in this manuscript!

References

- 1 Soejarto DD, Fong HHS, Tan GT, Zhang HJ, Ma CY, *et al.*, Ethnobotany/ethnopharmacology and mass bioprospecting: Issues on intellectual property and benefit-sharing, *J Ethnopharmacol*, 100 (1–2) (2005) 15–22.
- 2 Pan S, Litscher G, Gao S, Zhou S, Yu Z, Chen H, Zhang S, Tang M, Sun J & Ko K, Historical Perspective of Traditional Indigenous Medical Practices: The Current Renaissance and Conservation of Herbal Resources, *J Evid Based Comple Altern Med*, Article ID 525340 (2014) 20 pages.
- 3 Anangwe A & Marlo RM, *Wanga-English Dictionary*. https://www.google.co.ke/?gws_rd=ssl#q=Abawanga+dictionary, as retrieved on Saturday, October 5th, 2014 at 2:54PM East African Time, 2008.
- 4 Kenyanchui S, Makers of Kenyan History; Nabongo Mumia, Heinemann Kenya Limited, <http://abeingo.com/SUBTRIBE%20DOCS/wanga%20origins.pdf>, as retrieved on Saturday, October 24th, 2015 at 4:43 PM East African Time, 1992.
- 5 Ngarivhume T, van't Klooster CIEA, de Jong JTVM, van der Westhuizen JH, Medicinal plants used by traditional healers for the treatment of malaria in the Chipinge district in Zimbabwe, *J Ethnopharmacol*, 159 (15) (2015) 224–237.
- 6 Wanzala W, Takken W, Mukabana WR, Pala AO & Hassanali A, Ethnoknowledge of Bukusu community on livestock tick prevention and control in Bungoma district, western Kenya, *J Ethnopharmacol*, 140 (2) (2012) 298–324.
- 7 Cunningham AB, *African Medicinal Plants: Setting priorities at the interface between conservation and primary health care*, (Working paper 1. UNESCO, Paris), 1993.
- 8 World Health Organization (WHO), *The World Health Report, 1996: Fighting Diseases, Fostering Development*, WHO, Geneva, 1996.
- 9 Siundu G, *Nabongo Mumia in the Struggle for Post-Colonial Kenya's Histories*, Afrika Zamani, (17) (2009) 45–62.
- 10 Anonymous, *Abawanga: History, Present and Future*. <https://abawanga.wordpress.com/>, as retrieved on Saturday, October 24, 2015; 3:42PM East African Time, 2012.
- 11 Dederig U, *Western province of Kenya map*. http://en.wikipedia.org/wiki/Western_Province_%28Kenya%29#mediaviewer/File:Western_in_Kenya.svg, as retrieved on Friday, October 3rd, 2014 at 10:51PM East African Time, 2011.
- 12 Maroyi A & Cheikhoussef A, A comparative study of medicinal plants used in rural areas of Namibia and Zimbabwe, *Indian J Tradit Knowle*, 14 (3) (2015) 401–406.
- 13 Sela O, Old Concepts, New Tools: An Action Research Project on Computer-Supported Collaborative Learning in Teacher Education, *J Online Learn Teach*, 9(3) (2013) 418–429.
- 14 McCorkle MC, Rangnekar VD & Mathias E, Introduction: whence and whither ER&D? In: *Ethnoveterinary Medicine: Alternatives for Livestock Development*. Proceedings of an International Conference held in Pune, India, November 4–6, 1997. Volume 1: Selected Papers. File 2 of 9: Part 4: Introduction and Part 1: Applied Studies of Ethnoveterinary Systems, edited by Mathias E, Rangnekar VD, McCorkle MC, Martin M, (BAIF Development Research Foundation, Pune, India), 1997.
- 15 Bergold J & Thomas S, Participatory Research Methods: A Methodological Approach in Motion [110 paragraphs], *Forum Qual Soc Res*, 13(1) (2012) Art. 30.
- 16 Ali A, Okeyo B, Tewodros T, Handa C, Wanzala W, Gerd F, Rugger W, Jane N & Neema M, Water use conflicts in East Africa: Lessons Learnt from International DAAD Alumni Expert Seminars on Integrated Water Resources Management within Tsavo River Catchment. *Science* Policy* Africa*, Newslett The African Acad Sci*, 18(2) (2014) 10.
- 17 Martin JG, *A 'people and plants' conservation manual*, Vol 7, (Chapman & Hall Publishers, London, New York), 1996.
- 18 Cotton CM, *Ethnobotany: principles and applications*. 1st edition, (John Wiley & Sons, Chichester, New York, USA), 1996.
- 19 Cunningham AB, *Applied ethnobotany: people, wild plant use and conservation*, 1st edn, (Earthscan, London, UK), 2001.
- 20 Heckathorn DD, Respondent-driven sampling: a new approach to the study of hidden populations, *Soc Probl*, 44(2) (1997) 174–199.
- 21 Heckathorn DD, Respondent-driven sampling II: deriving valid estimates from chain-referral samples of hidden populations, *Soc Probl*, 49(1) (2002) 11–34.
- 22 Salganik MJ & Heckathorn DD, Sampling and estimation in hidden populations using respondent-driven sampling, *Sociol Methodol*, 34(1) (2004) 193–239.
- 23 Tongco D, Purposive sampling as a tool for informant selection, *Ethnobot Res Appl*, 5(1) (2007) 147–158.
- 24 Russell B, *Research methods in anthropology: qualitative and quantitative methods*, 3rd edn, (Altamira Press, California, USA), 2002.
- 25 Kioko J, Kiffner C, Ndibalema V, Hartnett E & Seefeld C, *Maasai people and elephants: values and perceptions*, *Indian J Tradit Knowle*, 1(1) (2015) 13–19.