



Medicinal plant species used by local communities around Queen Elizabeth National Park, Maramagambo Central Forest Reserve and Ihimbo Central Forest Reserve, South western Uganda



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ABSTRACT

Ethnopharmacological relevance: The application of ethnobotanical indigenous knowledge is very important in improving primary healthcare systems among the local communities living around and within protected areas in South Western Uganda. In this area, there are biodiversity endowed Queen Elizabeth National Park (QENP), Maramagambo Central Forest Reserve (MCFR) and Ihimbo Central Forest Reserve (ICFR). Despite the rich floral diversity and cultural heritage, there is no published documentation on the use of medicinal plants in this area. This information can be used as a basis for the selection of medicinal plants for further phytochemical and pharmacological studies.

Study aim: This study identified and documented the use of medicinal plants, plant parts used, and mode of preparation and administration by the local communities living around and within QENP, MCFR and ICFR.

Materials and methods: A cross-sectional study was used to collect data from 202 informants using semi-structured questionnaires, open interviews and field visits. Ethnobotanical data was analyzed using use reports (UR), frequency of citation (FC) and Informant Consensus Factor (F_{IC}). The plants species were identified by botanists and voucher specimens were deposited.

Results: A total of 302 medicinal plant species were mentioned by informants, out of which only 211 species belonging to 65 families and 165 genera were collected, identified and documented. The remaining 91 species were not available for collection and informants stated that they had become very rare within the study area. Herbs (35.8%) were the main source of herbal medicine. Leaves (60.4%) were the most commonly used plant parts used in the preparation of herbal remedies. Most of the medicinal plants were harvested from the wild, either growing in abundance (41%) or as rare species (21%). The most common mode of administration was oral, while other exceptional modes such as touching with bare hands and sweeping over the affected part were reported for the first time. The medicinal plant species were reported to treat 134 physical ailments, which were grouped into 16 ICPC-2 disease categories. Digestive disorders (854 UR) and general and unspecified disorders (507) scored the highest F_{IC} value of 0.83. The highest number of medicinal plants (146 plant species) was used for treatment of digestive disorders. Among the species with higher use reports, *Gouania longispicata* had the highest frequency of citation ($FC = 174$) and was mentioned to be used to treat 41 physical ailments. The most important ailment treated by *Gouania longispicata* was allergy with 102 use reports.

Conclusions: A variety of medicinal plants are used by communities living near protected areas in South Western Uganda. Most species were used in the treatment of digestive disorders, followed by general and unspecified disorders. Much as allergy has not been identified as a major threat by the health sector in Uganda, the study found out that it is one of the prevalent ailments in the study area. While the therapeutic value of some of the documented medicinal plant species, especially those with higher frequency of citation have been scientifically validated, the efficacy and safety of other species with wide application need to be investigated. In this study, we recommend further scientific studies on *Gouania longispicata* to validate its wide usage in the study area.

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1. Introduction

Medicinal plants have been used to treat various ailments in many cultures of the world (Idu and Onyibe, 2007; Beyene et al., 2016; Yuan et al., 2016). About 80% of population in developing countries relies on plant-based medicines for primary health care needs (Verma and Singh, 2008; Kunle et al., 2012; WHO, 2013). Plant-based medicines have stood out as a way of coping with the relentless rise of chronic non-communicable diseases (WHO, 2013). Herbal medicines are believed to be affordable, accessible, culturally accepted (Elujoba et al., 2005; Katuura et al., 2007a; Teklehaymanot and Giday, 2007; Ogbe et al., 2009; Karunamoorthi and Tsehaye, 2012), nutraceutical and with less side effects compared to allopathic medicine (Calixto, 2000; Karunamoorthi and Tsehaye, 2012; Ekor, 2014); which have made them trusted sources of primary health care needs by many people.

The knowledge and use of medicinal plants in Uganda can be traced to early civilization (Kakooko and Kerwagi, 1996); they are used to manage a range of common disease conditions including; digestive and respiratory problems, malaria, skin diseases, toothaches and childbirth complications (De Coninck, 2016) and have also been used as a source of income (Namukobe et al., 2011). South Western Uganda and particularly the Western Rift valley region, is an area with rich biodiversity and its importance for conservation cannot be overlooked as many species that occur here are not found anywhere else in the world (Katende et al., 1995; Rukungiri Final District Abstract (RFDA), 2009; Hatter et al., 2012). This study focused on areas surrounding protected areas in South Western Uganda, particularly Queen Elizabeth National Park (QENP), Maramagambo Central Forest Reserve (MCFR) and Ihimbo Central Forest Reserve (ICFR) in Rukungiri district. South Western Uganda which is mainly made up of Kigezi and Ankole sub-regions is well known for rich biodiversity and cultural heritage. The Kigezi sub-region is made up of Kabale, Kanungu, Kisoro and Rukungiri districts and is a densely populated rural area settled mainly by the Bakiga ethnic group (UBOS, 2006). Other ethnic groups of Kigezi are the Bahororo, Banyarwanda, Banyabutumbi, Batwa and Bahunde (Rutanga, 1991). These ethnic groups have exhibited outstanding cultural diversity and knowledge on the use of plants species for both medicinal and supernatural powers, which were even used in the anti-colonial struggles like in the 1896 rebellion and Nyabingi spiritual movement of 1910 (Rutanga, 1991). As early as 1930, the Bakiga migrated from the populated Kabale to forested areas of Bwamabara sub-county in Rukungiri district, which they cleared for farming and settlement (Hatter et al., 2014). This caused the indigenous Banyabutumbi minority ethnic group in the area, whose livelihood mainly depends on forest resources and fishing to migrate into the protected areas, especially Queen Elizabeth National Park (Hatter et al., 2014) which they occupy to date. Because of the remoteness of this area, the local population still depends on gathering of plants for food, medicine and other forest resources for their livelihood. QENP, MCFR and ICFR are some of the areas that have been encroached on by the local communities due to search for land for farming and human settlement and in search for other forest resources like timber, charcoal and firewood (Nampindo and Plumptre, 2005; Hatter et al., 2014) which has led to human-wild animal conflicts.

According to RDDP (2015), Rukungiri district has only two private hospitals, and its public health department has only 6 doctors; this puts a constraint on access to health services. On the other hand, herbal medicine and herbalists are readily available in the local communities; with an estimated ratio of 1 traditional health practitioner for every 200 Ugandans as compared to 3 medical doctors per 100,000 people, causing the majority of the local population to largely depend on medicinal plants for their primary healthcare (De Coninck, 2016). The study area has three health center level III and two health center level II facilities, serving 6 parishes of Bikurungu, Bwambara, Kikarara, Kikongi, Nyabubare and Rweshama, which altogether are made up of 79 villages (RDDP, 2015). These health facilities are poorly stocked and

with few health workers. Moreover, a survey by Sauti za Wananchi (2017) revealed that 60% of Ugandans cannot access good services at health centers due to unavailability of medicine and neglect by medical staff. Furthermore, the majority of the population in the study area cover long distances to access public health facilities (UBOS, 2017) and live below poverty line (RFDA, 2009; RDDP, 2015). These conditions have made it difficult for majority of the local population to access the required healthcare services, leaving them at the mercy of medicinal plants.

While some ethnobotanical studies have been reported about communities in some districts around Queen Elizabeth National Park (Kamatenesi-Mugisha and Oryem-Origa, 2005, 2007), there is insufficient information about the local communities living within and around Queen Elizabeth National Park (QENP), Maramagambo Central Forest Reserve (MCFR) and Ihimbo Central Forest Reserve (ICFR) in Rukungiri district, South Western Uganda. This study area was selected due to the proximity of the three protected areas, rich biodiversity, rich ethnocultural diversity and exchange of indigenous knowledge among the local population. Furthermore, there is no published information about indigenous knowledge of medicinal plants used by the local communities to treat various ailments, and much of this indigenous knowledge is still carried and orally transmitted (Buyene et al., 2016), which has led to its loss with time due to non-documentation (Katuura et al., 2007a). Ethnobotanical information on medicinal plants and their use by indigenous cultures is not only useful for conservation of cultural traditions and biodiversity, but also for community health care needs (Sheng-Ji, 2001; Beyene et al., 2016) and the discovery of new drugs (Heinrich, 2000; Yuan et al., 2016). This study aimed at answering key questions (i) what are the medicinal plants used by local communities living within and around QENP, MCFR and ICFR? (ii) what are the different ailments treated? (iii) which plant species have great ethnomedicinal relevance and therefore can be used for further scientific studies leading to isolation and identification of bioactive molecules?

2. Materials and Methods

2.1. Study area

The study was carried out in five parishes adjacent to and within either QENP or MCFR or ICFR. The parishes were; Bwambara, Kikarara, Rweshama, Nyabubare and Kikongi. All these parishes are found in Bwambara sub-county in Rukungiri district, South Western Uganda. These parishes were used as sampling areas because of either being close to (Bwambara, Kikongi and Nyabubare) or within (Kikarara and Rweshama) the protected areas as shown in Fig. 1, hence they have a richer wild flora diversity (RFDA, 2009).

There are also various activities within and around these protected areas that are of great threat to sustainability of the rich biodiversity (Table 1).

2.2. Ethnobotanical data collection

An ethnobotanical survey was carried out between December 2017 and June 2018. The study was cross-sectional, in which data was collected using semi-structured questionnaires, open interviews and field visits. Eight field visits were made, once monthly from January to April, and then twice in May and June. Two local people conversant with the local language, *Runyankole/Rukiga*, and cultures of the people in the study area were trained in data collection procedures and then employed as research assistants. A total of 202 participants were interviewed during the study. All the participants were adults of 18 years and above, and included traditional healers, herbal medicine gatherers and users of medicinal plants. The ages of informants ranged from 18 to 85 years. More females (57.9%) than males (42.1%) participated in the study. Majority of the participants attended primary school (56.4%),

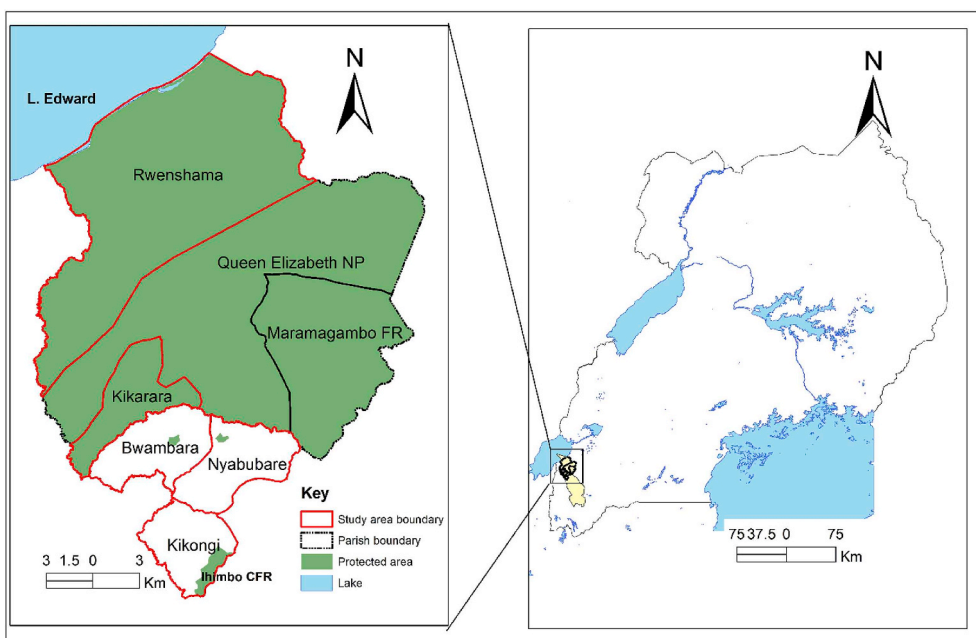


Fig. 1. Location of the study area in South Western Uganda.

while 28.2% did not attend school at all and none of the participants had attained university level (Table 2). Majority of the informants (83.2%) were 30 years and above.

The interview questions mainly focused on medicinal plants used. Each participant was required to provide the local name, disease treated, part(s) of the plant used, mode of preparation and administration, and dosage. Field visits involved collection of medicinal plant voucher specimens under the guidance of traditional healers and herbal medicine gatherers. Voucher specimens identified and authenticated by a botanist at Mbarara University of Science and Technology and other specimens were identified at Makerere University Herbarium.

2.3. Ethical issues

The study was approved by Mbarara University of Science and Technology Research Ethics Committee (MUST-REC) under Protocol number 19/08–17 and Uganda National Council for Science and Technology (UNCST) under Protocol number NS34ES. Before going to the study area, written permission was first sought from the Resident District Commissioner (RDC) of Rukungiri district. With a copy of the approved letter from the RDC, the Chairman Local Council I (LCI) of each village where samples were collected from granted verbal permission.

The purpose and nature of the study was explained to the participants to allow them to make informed decisions on whether to participate in the study or not. The participants were then requested to sign a consent form to confirm their approval to participate in the study. Both the questionnaire and informed consent form were translated into *Runyankole/Rukiga*, which is the most common dialect used in the study area.

Table 1 Activities threatening biodiversity within and around QENP, MCFR and ICFR.

Site	Co-ordinates	Area (km ²)	Activities
QENP	00°12'S and 30°00'E	1978	Habitat destruction for farmland, poaching, encroachment, human settlements, illegal extraction of park resources and political pressure to de-gazette park land (CARE Uganda, 2007; RFDA, 2009; Hartter et al., 2014)
MCFR	00°33'S and 29°53'E	153.0769	Hunting of bush meat, illegal harvesting of timber and other plant products, charcoal making, encroachment for farmland mining, political pressure to de-gazette or change the land use of forest reserves (Plumptre, 2002; Kamugisha-Ruhombe, 2007)
ICFR	00°40'S and 29°49'E	5.66	108 km ² has been cleared for eucalyptus tree planting (RFDA, 2009)

Table 2 Demographic characteristics of Informants (n = 202).

Characteristic	Number of informants	Percentage (%)	
Sex	Female	117	57.9
	Male	85	42.1
Age group	< 30	34	16.8
	30–50	81	40.1
	> 50	87	43.1
Education	None	57	28.2
	Primary level	114	56.4
	Secondary level	23	11.4
	College	8	4.0
	Graduate	0	0

2.4. Ailment categories

All the mentioned ailments were sorted and categorized using the International Classification of Primary Care, second edition (ICPC-2) (<http://www.who.int/classifications/icd/adaptations/icpc2/en/>). Some diseases like pica, cellulitis, among others, could not match the broad disease categorization, therefore some modifications were made in order to categorize all the mentioned ailments. For example, pica and sty were placed in General and unspecified, while cellulitis was put under Musculoskeletal since it affects the muscles and skeleton. The categorization resulted in a total of 16 disease groups, namely: (1) General and Unspecified; (2) Blood, Blood Forming Organs and Immune Mechanism; (3) Digestive; (4) Eye; (5) Ear; (6) Cardiovascular; (7) Musculoskeletal; (8) Neurological; (9) Psychological; (10) Respiratory; (11) Skin; (12) Endocrine/Metabolic and Nutritional; (13) Urological; (14) Pregnancy, Childbearing, Family Planning; (15) Female Genital;

(16) Male Genital.

2.5. Ethnobotanical data analysis

Use report was recorded whenever an informant mentioned a medicinal plant species or part(s) used for a particular ailment. Ethnobotanical data were assessed by quantifying the use reports and frequency of citation (FC). Informant Consensus Factor (F_{IC}) was used to determine the uniformity of the information about a specific plant species for a particular disease category. F_{IC} was calculated using Trotter and Logan (1986); $F_{IC} = (N_{ur} - N_i)/(N_{ur} - 1)$. N_{ur} is the number of use reports in each category and N_i is the number of taxa used in each category. The F_{IC} value gives information about the agreement or consistency of the informants on medicinal plants for the treatment of a certain use-category. It also suggests the cultural coherence of the selection of a set of medical plants used in the treatment of a certain disease category and nothing about the importance of the single plant species used (Heinrich et al., 2009). A high value ($F_{IC} \approx 1$) indicates that relatively few medicinal plant species are used by a large proportion of the informants. Low F_{IC} value indicates that the informants disagree on the medicinal plant species to be used in the treatment within a particular disease category (Heinrich et al., 1998). Similarly, F_{IC} value close to 1 indicates that informants exchange indigenous knowledge on use of medicinal plants and/or use a well-defined selection criterion in the community, while a low F_{IC} value indicates that informants do not exchange information about their use, or that plant species are randomly selected (Juárez-Vázquez et al., 2013).

3. Results and discussion

3.1. Medicinal plant species

A total of 302 medicinal plants were mentioned by informants in the local language. Of these, only 211 plants species were collected, identified and documented in the current study (Table 3). The remaining 91 plants of the mentioned plant species were not available for collection; these species were mentioned by informants to have become very rare in the study area and were therefore excluded. This indicates that there is loss and destruction of plant habitats within the study area, which Nalumansi et al. (2014) earlier reported as a big threat in Uganda. Habitat destruction is a major threat in the study area due to various human activities and has been reported by various researchers (Table 1). This calls for conservation strategies in order to preserve the rare and endangered species. For the collected medicinal plants, authentication was done by a botanist at Mbarara University of Science and Technology, and at Makerere University Herbarium, where voucher specimens were deposited. The family, genera and plant species names were given according to the International Plant Name Index (www.ipni.org) and The Plant List (www.theplantlist.org). The documented plant species were used to treat 134 ailments across 16 ICPC-2 disease categories. This is the first ethnobotanical survey in Uganda to report ailments according to ICPC categorization.

This high number of medicinal plant species documented shows that herbal remedies are highly utilized to treat various diseases among the local communities living within and around QENP, MCFR and ICFR. According to Tugume et al. (2016), the high number of plant species also indicates that the study area has a rich floral diversity being used in treatment of various ailments and traditional knowledge on medicinal plants in the community. Poor access to health services characterized by unavailability of medicine, neglect by medical staff (Sauti za Wananchi, 2017), covering long distances to the available health centers (RDDP, 2015) and high poverty levels (RFDA, 2009) have left many people in the study area to largely depend on medicinal plants; which are also considered by most Ugandans to be culturally acceptable, readily accessible (Katuura et al., 2007b), financially affordable and with readily available herbal practitioners (De Coninck, 2016).

The habitat, growth form, diseases treated, parts used, use reports (UR), frequency of citation (FC), mode of preparation and mode of administration of each of the medicinal plants were documented (Table 3). The most commonly used medicinal plants were of families; Asteraceae, Fabaceae, Solanaceae, Lamiaceae, Poaceae and Euphorbiaceae with 26, 21, 12, 21, 11 and 10 species cited respectively. Previous studies around and within QENP which targeted medicinal plants for erectile dysfunction, labor induction during childbirth, fungal and bacterial infections reported Rubiaceae (Kamatenesi-Mugisha and Oryem-Origa, 2005), Solanaceae (Kamatenesi-Mugisha and Oryem-Origa, 2007) and Lamiaceae (Kamatenesi-Mugisha et al., 2008) respectively as the most used plant families. Much as the current study focused on all medicinal plants being used in treatment of various ailments, some of the plant species in Rubiaceae, Solanaceae and Lamiaceae families are in agreement with the previous findings. For example, *Coffea canephora* from family Rubiaceae was used to treat erectile dysfunction, *Physalis minima* from Solanaceae was used to treat pregnancy complications, while *Leonotis nepetifolia*, *Leucas martinicensis*, *Ocimum suave*, *Plectranthus actites*, *Plectranthus barbatus* and *Tetradenia riparia* in family Lamiaceae are used to treat fungal and bacterial infections like tinea capitis, diarrhea, dysentery, cough, ulcers, dysentery and flue.

The most commonly cited plant species were; *Gouania longispicata*, *Vernonia amygdalina*, *Plectranthus barbatus* and *Mangifera indica*, being cited 174, 98, 62 and 52 times respectively (Table 3). The frequency of citation could be an indication of the perceived therapeutic value (Asimwe et al., 2014) and great cultural significance of the plant species (Namukobe et al., 2011). *Gouania longispicata* was mentioned to treat 41 ailments, with allergy having the highest use reports (102 UR). Moreover, two informants claimed that it can be used to treat all sicknesses. *Gouania longispicata* has also been reported to treat; stomachache in Uganda (Hamill et al., 2000), oral thrush in Ethiopia (Giday et al., 2010) and livestock diseases in the Democratic Republic of Congo (Chifundera, 1998). However, no phytochemical or pharmacological studies have been reported on it.

A number of medicinal plants used by the local communities within the study area were also found to be common edible plant species, where 47 plant species are used for both medicinal and food purposes. This shows the nutraceutical nature of medicinal plants as reported by Ekor (2014) and guarantees their safety, with less or no side effects (Karunamoorthi and Tsehaye, 2012). For example, some of the cultivated medicinal plants are eaten either as spices such as *Allium cepa*, *Allium sativum*, *Zingiber officinale* and *Capsicum frutescens* or as main food such as *Solanum gilo*, *Cajanus cajan*, *Manihot esculenta*, *Ipomoea batatas* and all *Musa species* or as beverages such as *Camellia sinensis* and *Coffea canephora* or as edible fruits such as *Citrus aurantiifolia*, *Citrus limonum*, *Psidium guajava*, *Mangifera indica* and *Artocarpus integer*. The mostly used wild edible plant species included; *Basella alba* (27 UR), *Ocimum suave* (22 UR), *Rhus vulgaris* (8 UR), *Mondai whitei* (6 UR), *Urtica massaica* (6 UR) and *Garcinia huillensis* (3 UR). The use of wild edible plants as medicine has been previously reported by Teklehaymanot and Giday (2010). There are some medicinal plant species with only one citation such as *Celosia schweinfurthii*, *Sericostachys scandens* and *Carissa edulis* among others (Table 3). This could indicate that these plant species have either fallen into disuse because of cultural adaptation or are ineffective for the condition(s) reported or have become rare species or might belong to cultural fringe of knowledge and may therefore not be a representative of the area under study (Heinrich et al., 2009).

3.2. Methods of preparation and mode of administration

The medicinal plants were prepared using various methods. Boiling the plant parts (decoction) was commonly used (59.72%), followed by pounding/crushing and mixing with water (49.76%) and use of crushed plant material for rubbing or smearing (28.44%) (Fig. 2).

Table 3
Medicinal plants used by local communities living around and within QENP, MCFR and ICFR.

Family, species, Local Name, Voucher number	Growth form	CS	Part (s) used	Disease treated (UR)	Preparation and Administration	FC
Acanthaceae						
<i>Acanthus pubescens</i> Engl., Amatojo, GH18-097	Shrub	W/A	L	Chicken pox (4), wounds (1)	Boil and drink; 250 ml OR burn dry leaves, make powder and spread on the wound	7
<i>Justicia betonica</i> L., Nalongo, GH18-192	Climber	W/C/R	L	Cough (2) Colic pain (1), worms(1)	Boil and drink; 4 spoonfuls daily Boil and drink 2 spoonfuls	2
<i>Justicia</i> sp., Kwiniini (read as Quinine), GH18-147	Herb	C/R	L	Malaria (2), kidney disease(1)	Boil, sieve and drink 3 spoonfuls 2xdaily	1
<i>Justicia wynaadensis</i> B. Hyene, Nyarwehindura, GH17-0010	Shrub	W/C/R	L	Worms (1), anemia (6), stomachache (1), inflammations (1), ulcers (1)	Boil and drink 250 ml 2xdaily	7
Alliaceae						
<i>Allium cepa</i> L., Obutunguru, GH18-032	Herb	C/A	L	induce labor ((1), anorexia (1), ulcers (1) Snake bite (1)	Pound, add water and drink 2 spoonfuls Squeeze, mix with ash, put on the affected area	2
<i>Allium sativum</i> L., Katungurucumu, GH18-088	Herb	C/A	L	Urinary retention (1), conjunctivitis allergic (1), itching larynx (1)	Chewing/eating raw	2
Aloaceae						
<i>Aloe vera</i> (L.) Burm.f., Rukaka, GH18-136	Herb	C/A	L	Malaria (35), blood cleanser (1), allergy (2), typhoid (2), yellow fever (4), stomachache (2), worms (1) Wounds (1), burns (1)	Chop into small pieces, add water OR Boil and drink, 250 ml 3xdaily Smear sap on the affected area	46
Amaranthaceae						
<i>Achyranthes aspera</i> L., Omuhurura, GH18-051	Herb	W/A	R L	Kidney disease (2) Cervical cancer (1), allergy (1), hernia (1)	Boil and drink 1 glass Boil and drink 500 ml OR shade dry, grind into powder and drink 1 teaspoon in 500 ml of drink or water 3xdaily	9
<i>Achyranthes leiantha</i> (Seub.) Standl., Akahurura, GH17-001	Herb	W/A	L	Kidney disease (2)	Pound, add water and drink 250 ml 2xdaily	8
<i>Amaranthus spinosus</i> L., Doodo yamahwa, GH18-164	Herb	W/R	L	Witch craft(2)	Pound and rub on affected part OR pound, add water and drink	2
<i>Chenopodium ambrosioides</i> L., Runuuka/Seriyasi/kanuka, GH18-024	Herb	W/C/R	L	Pleurisy (2) Diarrhea (1), stop vomiting (2) Headache (5), febrile seizures (2), stomachache (1), Worms (children) (1)	Pound, add some paraffin and smear on affected area Boil and drink 250 ml Pound, add water and drink 250 ml daily OR squeeze and smear on affected areas and inhale Boil and drink 250 ml 2xdaily	8
<i>Celosia schweinfurthii</i> Schinz., Omucuguzanyonyi, GH18-010	Herb	W/A	L	Worms (children) (1)	Boil and drink 250 ml 2xdaily	1
<i>Sericostachys scandens</i> Gilg & Lopr., Omuna, GH18-198	Herb	W/R	Wp	Abortion (1)	Touch with bare hands	1
Anacardiaceae						
<i>Mangifera indica</i> L., Omuyembe, GH18-069	Tree	C/A	Bk, L	Cough (44), influenza (1), splenomegaly (1), worms (2), stomach wounds (1), nausea (1), kidney disease (1)	Boil with some rock salt and drink, 3 spoonfuls or Chew and swallow liquid OR pound, add water and drink 2 spoonfuls 2xdaily	52
<i>Rhus vulgaris</i> Meikle, Omukanja, GH18-121	Shrub	W/A	L Fr	Diarrhea (3), meat allergy (1), stomach warts (1), worms (children) (1), colic pain (1) Ulcers (2), cough (1)	Pound, add water and drink, 2 spoons 2xdaily OR pound, sun dry, grind into powder and eat it in soup Scorch unripe fruits on sunshine, pound, add to hot water and drink 500 ml daily	8
Apiaceae						
<i>Centella asiatica</i> (L) Urb., Kutukumwe, GH17-004	Vine	W/A	L	Ear pain (1), fractures (6), cough (1) Ulcers (2)	Bake in hot ash, squeeze the juice into the ear, 2 drops 2xdaily OR Squeeze and smear on fracture Pound, add to hot water and drink 500 ml daily	9
<i>Steganotaenia araliaceae</i> Hochst., Omuhanurankuba, GH18-018	Shrub	W/R	L	Obstructed labor (4), abnormalities (1)	Pound, add water and drink 2 spoonfuls, smear residue on the stomach	3
Apocynaceae						
<i>Carissa edulis</i> Vahl, Amayonza, GH17-007	Shrub	W/A	R, Bk	Stomachache (1), diarrhea (1)	Pound, add water and drink	1
<i>Thevetia peruviana</i> (Pers). K. Schum., Musenene, GH18-091	Tree	C/A	L, R L	Febrile seizures (29), stomachache (children) (1), cough (3) Wounds (1), tinea capitis (1)	Scorch/bake in hot ash, chew and swallow liquid OR Pound, add water and drink 1 spoonful. For febrile seizures, also bathe and then splash some extracts in anus, ears, armpits, nose and eyes; 3xdaily for 1 month Pound and smear sap on the affected area	36
Asclepiadaceae						
<i>Mondia whitei</i> (Hook. f.) Skeels, Omurondo, GH18-037	Vine	W/R	R	Erectile dysfunction (2), colic pain (2), cough (2)	Chew raw or dry	6
<i>Secamone africana</i> (Oliv.) Bullock, Omwefuuzo, GH18-114	Tree	W/A	Bk	Hernia (2)	Boil (cover to retain steam and allow to cool) and drink; 3 spoonfuls 3xdaily	2
Asteraceae						
<i>Adenostemma mauritianum</i> DC., Omuhuurambwa, GH18-171	Herb	W/R	L	Marasmus (2)	Shade dry, grind into powder and drink one teaspoonful in 500 ml	2

(continued on next page)

Table 3 (continued)

Family, species, Local Name, Voucher number	Growth form	CS	Part (s) used	Disease treated (UR)	Preparation and Administration	FC
<i>Ageratum conyzoides</i> L., Bukabuka, GH18-047	Herb	W/A	R	Kidney disease (1), miscarriage (1), cervical cancer (2)	Boil and drink 1 glass	11
			L	Ring worms (1), oral thrush (1), xiphoidalgia (2), diarrhea (1) Colic pain (1), tonsillitis (1)	Pound and smear on affected areas OR pound, add water and drink 250 ml Boil and drink 500 ml OR shade dry, grind into powder and drink 1 teaspoonful 3xdaily	
<i>Berkheya spekeana</i> Oliv., Akajembajembe, GH18-001	Shrub	W/A	L	Abnormalities (1) Colic pain (1), worms (1)	Pound, add water and drink; dry root bark, ground powder, mix in vaseline and smear Boil with rock salt and drink 250 ml 2xdaily	3
<i>Berkheya</i> sp., Orujembajembe, GH18-138	Shrub	W/A	L	Malaria (2), worms (1)	Boil and drink 3 spoonfuls (adult) 3xdaily /1 teaspoonful (child) 2xdaily	2
<i>Bidens pilosa</i> L., Enyabarashana, GH18-160	Herb	W/A	L	Colic pain (2), pleurisy (1), ulcers (9), worms (1) Wounds (8), skin rash (1), eye disease (1)	Pound, add water OR Boil and drink; 1 glass 3xdaily Squeeze or pound and tie on the wound OR dry, grind, mix powder with vaseline and smear	26
			Fl	Malaria (3), dizziness (2), erectile dysfunction (1)	Boil young flowers and drink as tea; 500 ml daily for 2 days	
<i>Bothriocline longipes</i> (Oliv. & Hiern) N.E.Br, Ekyoganyanja, GH18-043	Herb	W/A	L	Worms (18), abnormalities (1), urinary retention (1), cervical cancer (2), cough (5), diarrhea (1), colic pain (7), stomachache (4), malaria (1), pica (1), herpes zoster (1) Misfortune (1), pregnancy complications (1) Snake bite (1)	Pound, add water OR boil (with some rock salt) and drink; 250 ml (adult)/1 spoonful (children) 3xdaily Boil and bathe Make incisions on snake bite	39
			R	Febrile seizures (2)	Dry, grind into powder and eat in food or drink 1 teaspoonful 2xdaily	
<i>Conyza bonariensis</i> (L.) Cronquist, Wambuba, GH18-097, GH18-140	Herb	W/A	L	Ring worms (4), pleurisy (1) Malaria (1), stomachache (1), miscarriage (1) Wounds (1), colic pain (1), witch craft (1)	Pound/squeeze and smear on affected area 3x daily Pound, add water and drink 250 ml daily Pound and tie on affected area OR chew and swallow liquid	8
<i>Crassocephalum crepidioides</i> (Benth.) S. Moore, Ekyinaami, GH18-094	Herb	W/A	L	Malaria (1)	Pound, add water and drink 500 ml	2
<i>Crassocephalum mannii</i> (Hook.f.) Milne-Redh, Omukoona, GH18-033	Shrub	W/C/R	L			4
<i>Crassocephalum vitellinum</i> S.Moore, Esunuunu, GH18-084	Herb	W/A	L, Fl	Urinary retention (1), kidney disease (1), colic pain (13), ulcers (1), worms (3), stomachache (2), toothache (1)	Boil (with rock salt) and drink OR pound, add water and drink (kidney disease); 1 glass 2xdaily OR brush teeth with flowers for toothache	23
			L	Pregnancy complications (1) Pneumonia (children) (1)	Boil and bathe Pound and rub on affected part	
<i>Dichrocephala integrifolia</i> (L.f.) Kuntze, Omubuza, GH18-119	Herb	W/R	L	Tinea capitis (1), herpes zoster (1), cellulitis (1) Abnormalities (11), miscarriage (1), sweating (1) Skin rash (1)	Pound and smear on affected areas 3xdaily OR tie on cellulitis Pound, add water and drink little, spit twice and swallow the third time Dry, grind, mix powder with vaseline and smear on affected area	18
			L	Febrile seizures (1)	Pound, add water, sieve, drink 2 spoonfuls and rub residue on whole body 2xdaily	
<i>Galinsoga parviflora</i> Cav., Empunika, GH18-157	Herb	W/A	L	Worms (1)	Boil with cow ghee and drink 1 spoonful 3xdaily	1
<i>Gutenbergia cordifolia</i> Benth. ex Oliv., Akatooma, GH18-089	Shrub	W/A	L	Worms (4), pica (1) Diarrhea (1), stomachache (4) Pneumonia (child) (1)	Boil and drink 500 ml 2xdaily Pound, add water (boil) and drink 250 ml	11
<i>Guizotia scabra</i> Chiov., Ekiterankuba, GH18-178	Herb	W/A	L	Allergy (1)	Pound and rub on affected part Pound, add water and drink	1
<i>Helichrysum schimperi</i> (Sch.Bip. ex A.Rich.) Moeser, Ekyeeza, GH18-151	Herb	W/R	L	Colic pain (3), worms (children) (2) Rectal prolapse (1)	Chew and swallow liquid OR pound, add water and drink or boil and drink 3 spoonfuls 2xdaily Pound and sit on	6
<i>Melanthera scandens</i> (Schumach. & Thonn.) Roberty, Ekarwe, GH18-017	Shrub	W/A	L	Dysfunctional uterine bleeding (2), febrile seizures (4), abnormalities (1), urinary retention (1), eye disease (2), toothache (1), colic pain (1), malaria (1) Fracture (1)	Pound, add water and drink 500ml (adult)/2 spoonfuls (child) OR shade dry, grind into powder and drink in porridge/tea OR rub on teeth for toothache OR squeeze and drop in the eye (eye disease) Pound and rub on affected part	14
			R	Allergy (2)	Pound, shade dry, grind into powder and eat it in hot porridge	
<i>Solanecio angulatus</i> (Vahl.) C.Jeffrey, Omwanga, GH18-011	Herb	W/R	L	Cough (1), hernia (1)	Chew bark and swallow liquid OR boil (with rock salt- hernia) and drink warm 1 teaspoonful (cough), OR 300 ml for hernia 4xdaily	2
<i>Solanecio cydoniifolius</i> (O. Hoffm.) C. Jeffrey, Eirarira, GH18-022	Herb	W/A	R			1

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Table 3 (continued)

Family, species, Local Name, Voucher number	Growth form	CS	Part (s) used	Disease treated (UR)	Preparation and Administration	FC
<i>Sonchus oleraceus</i> L., Ekizimamuro, GH18-070	Herb	C/A	L	Fever (children) (4), cervical cancer (1)	Boil, drink and bathe when cold OR boil with other herbs and steam bath OR insert in the anus	6
<i>Tagetes minuta</i> L., Mukazimurofa, GH18-100	Herb	W/A	L	Pleurisy (1) Meat allergy (1)	Squeeze and rub on affected area Boil and drink 250 ml 3xdaily	3
<i>Tithonia diversifolia</i> (Hemsl.) A.Gray, Ngaroeitano, GH18-007	Shrub	W/A	L, Bk	Malaria (7), worms (8), colic pain (1)	Pound, add paraffin and rub 2xdaily Boil (with cow ghee) and drink; 1 spoon (child)/250 ml (adult) 3xdaily	16
<i>Vernonia amygdalina</i> Delile, Omubirizi, GH18-041	Shrub	W/A	L	Cervical cancer (1) Worms (24), febrile seizures (2), malaria (73), stomachache (9), headache (3), typhoid (1), induce labor (1), backache (1), colic pain (3), diarrhea (1), splenomegaly (1), fever (1), body cleanser (1), anorexia (1),	Pound and drink 500 ml Squeeze/pound, add water or boil and drink; ½ glass (child), 1 glass (adult) 3xdaily for 3 days OR also bathe for febrile seizures	98
			R	Worms (children) (4), colic pain (7), stomachache (10), splenomegaly (1) Yellow fever (2), herpes zoster (2), malaria (5) Ulcers (1) Dizziness (1)	Boil root bark with cow ghee and drink; 1 spoon (child), 250 ml (adult) Boil and drink; half a glass 2xdaily Pound, add water, sieve and drink 1 glass 2xdaily Dry, grind into powder, drink in water; 1 glass 3xdaily	
<i>Vernonia auriculifera</i> Hiern, Ekigaragara, GH18-107	Shrub	W/A	L	Worms (1)	Boil and drink 250 ml 2xdaily	1
<i>Vernonia brachycalyx</i> O.Hoffm, Omuhe, GH18-098	Climber	W/A	L	Headache (1), allergy (3), kidney disease (1), sweating (1), worms (children) (4), cough (2), ulcers (2), splenomegaly (1), colic pain (7), malaria (1), inflammations (1)	Pound, add water OR boil and drink 2 spoons (child)/250 ml (adult) OR chew and swallow liquid	26
			R	Febrile seizures (2), chest congestion (1)	Pound root bark with leaves, dry, grind into powder and drink 1 teaspoon in 250 ml (chest congestion) or 1 spoonful for febrile seizures 2xdaily	
			Bk	Hernia (1)	Boil (cover to retain steam and allow to cool) and drink; 3 spoonfuls 3xdaily	
<i>Vernonia lasiopus</i> O. Hoffm, Omujuma, GH18-156	Shrub	W/A	L, R	Worms (17), colic pain (1), cough (1), inflammations (1), stomachache (7), anorexia (1), malaria (2), body cleanser (1), fever (1), splenomegaly (1)	Boil (with cow ghee) and drink 1 spoonful (child)/250 ml (adult) 3xdaily or chew and swallow liquid; 3xdaily (for 2 weeks for worms)	29
Basellaceae						
<i>Basella alba</i> L., Enderema, GH18-036	Vine	W/A	L	Colic pain (1), ulcers (8), meat allergy (1), induce labor (1), yellow fever (1), sex dysfunction (1), hernia (1), rectal prolapse (1)	Pound, add water or boil (with banana juice) and drink 250 ml 3xdaily OR 2 spoonfuls for labor pains OR eat as sauce for sex dysfunction	27
			Wp	Cervical cancer (11), uterine disease (1)	Pound, add water and drink 250 ml 3xdaily, to the residues add little water and sit in every morning for 4 days	
Bignoniaceae						
<i>Markhamia lutea</i> K.Schum, Omusaavu, GH18-110	Tree	W/C/A	Fl	Ear disease (6)	Bake dropped flowers in hot ash and squeeze juice into the ear OR 3 drops of water trapped within the flower 3xdaily	12
			R	Worms (2), malaria (1)	Boil and drink 250 ml (adult)/3 spoonfuls (child) 3xdaily	
			L	Headache (2)	Boil and drink 250 ml	
			Bk	Colic pain (1)	Boil with rock salt and drink 3 spoonfuls	
<i>Spathodea nilotica</i> Seem., Ekifurafure, GH18-131	Tree	W/A	Bk	Hernia (1), worms (1)	Boil (cover to retain steam and allow to cool) and drink; 3 spoonfuls 3xdaily	2
Brassicaceae						
<i>Brassica oleracea</i> L., Kabegy (read as Cabbage), GH18-096	Herb	C/A	L	Gastric cancer (1)	Pound, squeeze and drink juice ½ glass	1
Bromeliaceae						
<i>Ananas comosus</i> (L.) Merr., Enanansi, GH18-162	Herb	C/A	Fr	Yellow fever (2), ulcers (1), allergy (1), scoliosis (2)	Boil and drink 1 glass or pound unripe fruit, add water and drink 500ml 2xdaily	6
Caesalpinaceae						
<i>Cassia mimosoides</i> L., Mukuruteitwebye, GH18-184	Shrub	W/R	L	Cough (1), abnormalities (7)	Pound, add water and drink	4
<i>Senna occidentalis</i> (L.) Link, Omwitanjoka, GH18-064	Shrub	W/C/R	L	Worms (children) (22), stomachache (1), splenomegaly (1), kwashiorkor (1)	Boil with cow ghee and drink 500 ml (adult)/2 teaspoonful (children ≤ 8 months) daily	35
			R	Worms (2), scoliosis (2), cough (1), induce labor (1), ring worms (1)	Pound, add water and drink OR chew and swallow liquid 3xdaily	
			Sd	Hypertension (2)	Pick dry seeds, roast, ground into powder and drink as tea 1 spoonful in 500 ml 3xdaily	

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Table 3 (continued)

Family, species, Local Name, Voucher number	Growth form	CS	Part (s) used	Disease treated (UR)	Preparation and Administration	FC
Canellaceae						
<i>Warburgia ugandensis</i> Sprague, Omwiha, GH18-040	Tree	W/C/R	L, Bk	Colic pain (7), abnormalities (1), worms (14), allergy (4), malaria (1), general body weakness (1), stomachache (7), erectile dysfunction (1), cough (4), diabetes (1), snake bite (1)	Boil fresh leaf or dried bark and drink 1 tea spoonful 3x daily	31
Capparaceae						
<i>Cleome gynandra</i> L., Eshogyi, GH18-175	Herb	C/R	L Fl	Cough (1), allergy (1), hypertension (1) Colic pain (2)	Boil and drink 250 ml daily OR eat as sauce Boil and drink OR chew and swallow liquid; 3 spoonful	7
			R	Induce labor (2), febrile seizures (1), flue (1)	Chew and swallow liquid OR boil and drink 100 ml for colic pain	
Caricaceae						
<i>Carica papaya</i> L., Ekipapari (female), GH18-038	Herb	C/A	L, R	Malaria (4) Cough (4)	Pound, add water and drink 250 ml 3x daily Boil and drink 100 ml daily OR chew root and swallow liquid 3xdaily	15
			R	Malaria (2), worms (1)	Boil in banana juice or local brew and drink 250 ml OR chew and swallow liquid (cough) 3xdaily	
			Fr	Malaria (1), fever (1)	Pound young fruits, add water and drink ½ cup 2x daily	
			Sp	Worms (5)	1 spoonful of sap , add 1 spoonful of honey and add 250 ml of hot water and drink 50 ml 2xdaily	
			Sd	Worms (1)	Sun dry, grind and eat 1 teaspoonful of powder in food daily	
<i>Carica papaya</i> L., Ekipapari (male), GH18-038	Herb	C/A	Bk R	Malaria (2) Toothache (2)	Boil and drink 500 ml Chew and hold/rub on the affected tooth	1
Ceropiaceae						
<i>Myrianthus holstii</i> Engl., Ecuufu, GH17-008	Tree	W/R	L	Rectal prolapse (2)	Pound, bake in hot ash and rub on anus	2
Chenopodiaceae						
<i>Beta vulgaris</i> L., Beetroot, GH18-052	Herb	C/R	Tb	Anemia (1)	Eat raw	1
<i>Chenopodium opulifolium</i> Schrad. ex DC., Omwetango, GH18-076	Shrub	W/C/R	L	Herpes zoster (1), liver disease (1), allergy (1), tinea capitis (1), worms (1) Abnormalities (17), allergic dermatitis (1)	Pound and smear on affected areas 3xdaily OR pound, add water and drink; 1 glass 3xdaily OR dry, and drink powder as tea Pound, add water and drink little, spit twice and swallow the third time (with enchantments) OR pound, dry, mix powder with vaseline and smear on whole body	29
<i>Chenopodium procerum</i> Hochst. ex Moq., Omujumbajumba, GH18-093	Herb	W/R	L	Worms (2), pleurisy (1), stomachache (1)	Pound, add water OR Boil and drink 500 ml daily OR for pleurisy, pound and rub on affected part	4
Clusiaceae						
<i>Garcinia huillensis</i> Welw., Eishararazi, GH18-028	Tree	W/C/R	Bk, L	Stomachache (2), cough (1)	Pound, boil with rock salt and drink warm; 1 spoonful 4xdaily OR chew and swallow liquid	3
Combretaceae						
<i>Combretum molle</i> R.Br. ex G.Don, Omurama, GH18-200	Tree	W/R	L	Worms (2), stomachache (2), cough (9), colic pain (1), erectile dysfunction (1)	Boil and drink OR pound, add water and drink 500 ml (adult)/2 spoonfuls (child) daily	14
Commelinaceae						
<i>Commelina benghalensis</i> L., Entiija, GH18-120	Vine	W/A	L	Cervical cancer (1), dysentery (1)	Pound, add water and drink 500 ml daily	1
<i>Commelina diffusa</i> Burm.f., Akatiija, GH18-065	Vine	W/A	L	Tinea capitis (2) Red eyes (1)	Squeeze and rub on affected part 2xdaily Scorch, squeeze and add 3 drops in the eyes 2xdaily	4
Convolvulaceae						
<i>Ipomoea batatas</i> (L.) Lam., Ekitakuri, GH18-081	Vine	C/A	Tb	Colic pain (children) (1), burns (2) Malaria (1), dysentery (1)	Burn to charcoal, pound and use powder to make incisions OR spread powder on burns Pound, boil with other herbs and drink 500ml OR pound, add water and drink 500ml (adult)/2 spoonfuls (child) 3xdaily	5
<i>Ipomoea cairica</i> (L.) Sweet., Akarandarugo, GH18-125	Vine	W/R	L	Cervical cancer (4), uterine disease (1), colic pain (1)	Pound, add water and drink 500ml 2xdaily and sit in OR for colic pain boil and drink 250 ml	6
<i>Ipomoea sp.</i> , Ekihubuuba, GH18-019	Vine	W/R	L	Cervical cancer (2), dysfunctional menstrual bleeding (1)	Pound, add water, sieve and drink 500 ml	3
Crassulaceae						
<i>Bryophyllum pinnatum</i> (Lam.) Kurz, Enkyenankylene, GH18-077	Herb	W/C/A	L	Cough (7), ulcers (1), flue (2) Navel healing in neonates (2), wounds (1)	Scorch/steam to soften, squeeze and drink extract; 2 teaspoonful for children OR squeeze, add drops in the nose for flue Scorch, squeeze and drop juice on the wound or navel	8
<i>Kalanchoe densiflora</i> Rolfe, Ekinyondo, GH18-112	Herb	C/A	L	Ulcers (1)	Boil and drink 250 ml	1
Cucurbitaceae						

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Table 3 (continued)

Family, species, Local Name, Voucher number	Growth form	CS	Part (s) used	Disease treated (UR)	Preparation and Administration	FC
<i>Citrullus lanatus</i> (Thunb) Matsum. & Nakai, Watermelon, GH18-034	Vine	C/A	Fr	Anemia (1), dehydration (1)	Eat raw OR make juice	1
<i>Cucurbita maxima</i> Duchesne, Ekyozi, GH18-049	Vine	C/A	L	Headache (1)	Pound, add water and drink 500 ml daily	1
<i>Lagenaria sphaerica</i> E.Mey., Omutanga, GH18-050	Vine	W/A	L	Cervical cancer (1), abnormalities (2), colic pain (1)	Boil and drink 250 ml (adult) 2xdaily	5
<i>Momordica foetida</i> Schumach., Omwihura, GH18-144	Shrub	W/A	L	Ring worms (1), head injury (1) Colic pain (32), stomachache (5), evacuation (2), backache (1), allergy (3), cough (2), worms (4), bloating (1), anorexia (1)	Pound and rub on affected part Add 3 handfuls of fresh leaves, with rock salt to 1 L of water and boil covered until half volume remains and drink 250 ml OR dry, grind into powder and drink 1 spoonful in 1 glass of drink or water 3xdaily	45
<i>Momordia</i> sp., Efuuha, GH18-025	Liane	W/R	L	Stomachache (1), febrile seizures (1)	Pound, add water and drink 500 ml	2
<i>Peponium vogelii</i> Engl., Omugoshoora, GH18-180	Climber	W/R	L	Abnormalities (3)	Pound, dry, mix powder with vaseline and smear whole body	4
<i>Zehneria scabra</i> Sond., Akabindiizi, GH18-117	Vine	W/A	L	Tinea capitis (3), sores (1)	Pound and rub on affected area OR boil and bathe whole body 2xdaily	11
				Eye disease (1)	Apply sap OR bake in hot ash, squeeze and drop in the eye 2xdaily	
				Uterine disease (1), colic pain (2), stomachache (1), syphilis (2)	Pound, add water OR boil and drink 500 ml	
Cyperaceae						
<i>Cyperus rotundus</i> L., Omugugu, GH17-005	Grass	W/A	L	Snake bite (1)	Pound, add warm water and drink, smear the residue on affected area	1
Dracaenaceae						
<i>Dracaena fragrans</i> Ker Gawl., Omugoroora, GH18-166	Shrub	C/A	L	Kidney disease (1), malaria (1), Obstructed labor (2), toothache (1)	Boil and drink; 250 ml 2xdaily	7
			R		Tie with other herbs and sweep over the belly OR chew and swallow liquid 2 spoonfuls	
			L	Ear pain (2)	Pluck young leaf and drop trapped liquid/ water OR pound/scorch and squeeze into ear 3 drops	
<i>Dracaena steudneri</i> Engl., Ekigorogoro, GH18-172	Tree	W/C/R	Bk	Splenomegaly (4), yellow fever (1), worms (1), scoliosis (1), stomachache (1)	Pound, add water or boil and drink; 1 glass 2xdaily	9
			L	Snake bite (1)	Pound and smear on affected area	
Ebenaceae						
<i>Diospyros abyssinica</i> (Hiern) F.White, Omuhoko, GH18-127	Shrub	W/A	L	Diarrhea (1), leg pain (2) Induce vomiting (1) Cellulitis (1), tinea capitis (1) Allergic dermatitis (3)	Boil and drink 250 ml OR shower (leg pain) Pound, add water and drink very little Pound and tie/rub on affected areas	9
<i>Euclea divinorum</i> Hiern, Omusikizi, GH18-102	Shrub	W/R	L	Cervical cancer (1)	Boil and bathe Pound, add water and drink 500 ml and also sit on 2xdaily	1
Euphorbiaceae						
<i>Acalypha villicaulis</i> Hochst. Ex A.Rich, Omugonampiri, GH18-109	Herb	W/A	L	Worms (4), stomachache (2) Colic pain (2), kwashiorkor (1)	Boil and drink 5 teaspoonful Chew root and swallow liquid OR Boil and drink; 1 glass daily	9
<i>Euphorbia hirta</i> L., Kamaramahano, GH18-086	Herb	W/R	L	Tinea capitis (1) Abnormalities (8)	Pound and smear on affected areas 3xdaily Pound, add water and drink little, spit twice and swallow the third time (with enchantments) OR dry, grind into powder and drink	10
				Xiphoidalgia (1)	Dry, grind into powder and drink in tea/ porridge 2 spoonfuls in 500 ml	
<i>Euphorbia tirucalli</i> L., Oruyenje, GH18-048	Tree	W/C/R	St, L	Cough (16)	Scorch or bake in hot ash, chew and swallow liquid, give ½ teaspoonful for children	16
<i>Flueggea virosa</i> (Wild.) Viogt, Omukarara, GH18-123	Shrub	W/A	R	Worms (children) (8), anorexia (1), stomachache (1) Splenomegaly (1), colic pain (1)	Boil with cow ghee and drink 2 spoonfuls 3xdaily Wash, peel back, dry and grind into powder. Take powder as tea or in porridge or food	13
			L	Cervical cancer (1), colic pain (3)	Pound, add water and drink 500 ml	
<i>Jatropha curcas</i> L., Ekikarikari/ Ekituuti/Ekyomooro, GH18-068	Shrub	W/C/R	L	Kidney disease(1), worms (children) (2), diarrhea (1), pica (1)	Pound a handful, add water OR boil and drink; 250 ml (adult), 1 spoonful (child) 2xdaily	18
			Sp	Tinea capitis (1), fresh wounds (15)	Apply sap and then pound and smear/tie on affected area	
			R	Worms (children) (2)	Boil and drink 1 glass daily	
<i>Manihot esculenta</i> Crantz., Muhogo, GH18-073	Shrub	C/A	L	Malaria (3), headache (1), induce vomiting (1), cough (1)	Pond, add water OR boil and drink 250 ml 3x daily	5
<i>Phyllanthus capillaris</i> Schumach & Thonn., Omuturika, GH18-154	Herb	W/R	L	Cellulitis (1), measles (1), chicken pox (1)	Pound, add little water and tie on affected area OR bathe	4
				Colic pain (1)	Scorch, chew and swallow liquid	
<i>Ricinus communis</i> L., Ekishogashoga, GH18-133	Shrub	C/A	L	Worms (children) (1), stomach wounds (1), scoliosis (1), head injury (1) Rectal prolapse (1)	Pound, add water, sieve and drink a handful 2xdaily Pound and sit on	5

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Table 3 (continued)

Family, species, Local Name, Voucher number	Growth form	CS	Part (s) used	Disease treated (UR)	Preparation and Administration	FC
<i>Tetrorchidium didymostemon</i> (Baill.) Pax & K.Hoffm, Omuziraafu, GH18-090	Shrub	W/R	L	Colic pain (1), allergy (1), stomachache (1)	Boil and drink 250 ml and shower (allergy) 2xdaily	2
<i>Tragia brevipes</i> Pax., Engenyeni, GH18-104	Vine	W/R	L	Colic pain (1), febrile seizures (1)	Pound, add water and drink	2
Fabaceae						
<i>Acacia hockii</i> De Wild., Akagando, GH18-101	Tree	W/A	Bk	Cough (1), malaria (1), asthma (1)	Boil with some rock salt and drink 1 glass 3xdaily	4
<i>Aeschynomene abyssinica</i> (A. Rich) Vatke, Entaambabyoona, GH18-020	Shrub	W/R	R	Worms(1)	Boil root bark and drink 1 glass daily	4
			R	Cough (1)	Chew root bark and swallow liquid	
			L	Hypertension (1), allergy (1), chronic wound (1)	Pound, shade dry and add powder in any drink, 1 spoonful in 500 ml daily	
<i>Albizia coriaria</i> Welw., Omusisa, GH18-111	Tree	W/A	Bk	Cough (9), diabetes (1), pleurisy (1), allergy (1), sore skin (1), chest congestion (1), worms (5), stomachache (1), colic pain (4), toothache (2)	Boil with rock salt and drink 100 ml OR dry, pound into powder and drink 1 teaspoonful in 1 glass OR boil and bathe for skin rash; 3xdaily OR pound with rock salt and rub on the teeth for toothache	25
				Hernia (2)	Boil with <i>Erythrina abyssinica</i> while covered to retain steam and allow to cool, and drink 3 spoons 3xdaily	
<i>Albizia grandibracteata</i> Taub., Omukungashebeya, GH18-146	Tree	W/A	R	Dysentery (1), worms (1), stomachache (1)	Chew root bark and swallow liquid	1
			Bk	Worms (1), cough (1)	Boil and drink 250 ml	
<i>Albizia gummifera</i> C.A.Sm, Omushebeya, GH18-085	Tree	W/A	L	Obstructed labor (3), placenta expulsion (1)	Pound/squeeze (dropped leaves), add water and drink 500 ml	6
			Bk	Colic pain (1)	Boil and drink 1 glass	
<i>Arachis hypogaea</i> L., Ebinyobwa, GH18-057	Herb	C/A	Sd	Erectile dysfunction (1), good skin (1)	Eating raw or roasted	2
<i>Cajanus cajan</i> (L.) Millsp., Entondiirwa, GH18-082	Shrub	C/R	L	Ear disease (5)	Bake in hot ash, squeeze juice into the ear; 3 drops 2xdaily	6
				Xiphoidalga (1), erectile dysfunction (1)	Pound, add water and drink 250 ml and smear residue on affected part	
<i>Canavalia ensiformis</i> DC., Ekihimba, GH18-165	Herb	W/C/R	Sd	Snake bite (4)	Split carefully, attach a clean piece on the affected area	4
<i>Crotalaria glauca</i> Willd., Ekyinyamajugo, GH18-054	Shrub	W/A	R	Cough (1)	Chew or pound and drink 3 spoonfuls	1
<i>Crotalaria verrucosa</i> L., Ekijugajuga, GH18-014	Shrub	W/A	L	Kwashiorkor (1)	Boil and drink 500 ml daily	1
<i>Erythrina abyssinica</i> Lam., Ekiko, GH17-002	Tree	W/A	Bk	Colic pain (4), cough (3), splenomegaly (2), dysentery (2), stop vomiting (1), hernia (2), asthma (1),	Boil with rock salt and drink 250 ml OR pound, add water and drink 2 spoonfuls 2xdaily	27
			Bk, R	Hernia (1), asthma (1)	Boil (cover to retain steam and allow to cool while covered) and drink; 3 spoonfuls 3xdaily	
			Fl	Rectal prolapse (1), abnormalities (1), febrile seizures (1), irregular periods (1), ulcers (1)	Boil and drink; 500 ml OR pound, add water, sieve and drink 3 spoonfuls OR for rectal prolapse, scorch, squeeze and drop juice on the anus; 3xdaily	
			R	Worms (3), colic pain (1)	Pound, add water OR boil and drink; 1 glass (adult)/1 spoonful (child) daily	
<i>Indigofera arrecta</i> A. Rich, Omusorooza, GH18-129	Shrub	W/A	L	Pleurisy (2), fracture (3), splenomegaly (2), xiphoidalga (1), skin rash (1), hernia (1)	Pound or squeeze and rub on affected area OR add water, sieve, drink 250 ml and also smear residue on area affected by splenomegaly 3xdaily	19
				Urinary retention (neonates) (1)	Squeeze, boil, sieve and drink few drops	
				Skin rash (1)	Dry, grind, mix powder with vaseline and smear whole body	
<i>Macrotyloma axillare</i> (E.Mey.) Verdc., Akeihabukuru, GH17-003	Herb	W/R	L	Worms (1), obstructed labor (1)	Scorch, chew and swallow liquid	5
				Snake bite (1)	Enchantments using roots	
				Colic pain (3), allergy (1), warts (1)	Pound, add water and drink 500 ml daily OR scorch/steam and drop juice in the nose or anus for warts OR shade dry, pound into powder and drink it in porridge 2 spoonfuls in 500 ml 2xdaily	
<i>Neonotonia wightii</i> (Arn.) J.A.Lackey, Omucwafuka, GH18-016	Liane	W/A	R	Cough (1)	Chew and swallow liquid	2
<i>Pisum sativum</i> L., Amashaza, GH18-062	Herb	C/R	Sd	Cancer (1)	Roast, grind and eat 3 teaspoonful daily	1
<i>Pseudarthria confertiflora</i> Baker, Omukongorano, GH18-181	Shrub	W/A	L, R	Pneumonia (children) (1), cough (2), ulcers (1)	Scorch leaf, chew and swallow liquid OR pound, boil with rock salt and drink 200 ml 2xdaily	4

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Table 3 (continued)

Family, species, Local Name, Voucher number	Growth form	CS	Part (s) used	Disease treated (UR)	Preparation and Administration	FC
<i>Pseudarthria hookeri</i> Wight & Arn., Eikaranzya, GH18-159	Shrub	W/A	L	Diarrhea (2)	Pound, add water, sieve and drink 500 ml	2
<i>Senna didymobotrya</i> (Fresen.) H.S.Irwin & Barneby, Omugabagaba, GH18-149	Shrub	W/A	L	Worms (8), obstructive defecation (2), constipation (1), colic pain (2), malaria (1)	Boil with cow ghee (rock salt) and drink 250 ml (adult) /1 spoonful (child) and also bathe for malaria; 2xdaily	21
<i>Senna spectabilis</i> (DC.) H.S.Irwin & Barneby, Kasiya, GH18-006	Tree	W/C/A	Fl	Splenomegaly (2), kidney disease (1) Ring worms (1), pain killer (1) Splenomegaly (1)	Pound, add water and drink 500 ml Pound and smear on affected area 2x daily	3
<i>Sesbania sesban</i> (L.) Merr., Omunyeganyegye, GH18-143	Shrub	W/A	R	Febrile seizures (1) Splenomegaly (2), colic pain (4)	Pound, add water, sieve OR boil and drink, 500 ml (adult)/2 spoonful (child) OR chew and swallow liquid and also smear residue on the area affected by splenomegaly 3xdaily	12
			L	Cervical cancer (1)	Dry, grind and drink powder in tea; 1 teaspoonful in 500 ml	
			L, R	Febrile seizures (5), dysentery (1)	Pound leaves with root bark, add water; leave outside overnight and bathe when cold at 6am for 4 days for febrile seizures AND/OR sieve drink 500 ml (adult)/2 spoonfuls (child)	
<i>Tephrosia nana</i> Kotschy ex Schweinf., Omukingangabo, GH18-182	Herb	W/R	R	Worms (children) (1)	Boil with rock salt and cow ghee, and drink 1 spoonful	1
Flacourtiaceae						
<i>Trimeria grandifolia</i> (Hochst.) Warb., Omwatanshare, GH18-059	Tree	W/R	Bk	Colic pain (1)	Boil and drink 2 spoonfuls 3xdaily	5
			L	Worms (children) (3), syphilis (1)	Pound, add water, sieve and drink a handful 2xdaily	
Lamiaceae						
<i>Achyrosperrum axillare</i> E.A.Bruce, Kitiinwa, GH17-006	Herb	W/R	L	Allergy (13)	Shade dry, pound and add powder to any drink like porridge, tea, water & food or even lick 2 spoonfuls OR pound, add water and drink 500 ml; 1xdaily	13
				Colic pain (1)	Boil and drink 250 ml	
<i>Clerodendrum capitatum</i> (Wild.) Schumach, Ekyishekashkeye, GH18-092	Shrub	W/A	L, R	Worms (16), malaria (5), yellow fever (1), colic pain (4), stomachache (6), body cleanser (1), anorexia (1)	Pound, add water or boil with cow ghee/rock salt and drink 250 ml 3xdaily	30
<i>Clerodendrum myricoides</i> R.Br., Omukuzanyana, GH18-176	Shrub	W/A	R	Worms (children) (2), febrile seizures (8), stomachache (1), boils (1), colic pain (1)	Chew and swallow liquid, 1 teaspoonful (child) OR dry, grind into powder and drink 2 spoonfuls in 500 ml 2xdaily	12
			L	Kwashiorkor (1)	Boil, sieve and mix extract in porridge	
<i>Hoslundia opposita</i> Vahl, Esitimu, GH18-023	Shrub	W/A	L	Colic pain (1), allergy (1)	Boil and drink 500 ml daily	2
<i>Leonotis nepetifolia</i> (L.) R.Br., Ekicucumumu, GH18-044	Herb	W/A	L	Colic pain (6), febrile seizures (1), rectal prolapse (1), stomachache (11), worms (7), headache (1), malaria (1), diarrhea (1), stop vomiting (1)	Pound (with charcoal), add water and drink 1 glass 2xdaily OR bake in hot ash, chew and swallow liquid	30
				Pneumonia (1)	Pound and rub on affected part	
<i>Leucas martinicensis</i> (Jacq.) R.Br., Akanyamafundo, GH18-108	Herb	W/A	L	Stomachache (children) (9), colic pain (2), dysentery (1), worms (1), tinea capitis (1), constipation (children) (1)	Chew and swallow liquid OR pound, add water and drink 250 ml (adult)/1 spoonful (child) OR bake in hot ash, pound, squeeze and drink extract 3xdaily OR pound and rub on tinea capitis	16
<i>Ocimum lamiifolium</i> Hochst. ex Benth., Omwenyemushija, GH18-148	Shrub	W/A	L	Colic pain (men) (1) Cervical cancer (1)	Boil and drink 250 ml 2xdaily	2
<i>Ocimum suave</i> Wild., Omujaaja, GH18-118	Shrub	W/C/A	L	Colic pain (7), erectile dysfunction (1), stomachache (4), worms (children) (3), stop vomiting (1), hoarseness (1), allergy (1), urinary retention (1), cough (3), headache (1), body cleanser (1)	Pound, add water and drink 250 ml 2xdaily Boil (with rock salt) and drink 500 ml (adult)/2 spoonfuls (child) OR bake in hot ash, chew and swallow liquid	22
<i>Plectranthus actites</i> P.I.Forst, Akacuncu akakye, GH18-196	Herb	C/R	L	Cervical cancer (1) Ulcers (1)	Boil and drink 500 ml	2
<i>Plectranthus amboinicus</i> (Lour.) Spreng., Akacuncu, GH18-134	Herb	C/R	L, R	Colic pain (2), kidney disease (1)	Scorch, chew and swallow liquid Pound, add water OR boil and drink 500 ml daily	2
<i>Plectranthus barbatus</i> Andrews, Ekicuncu, GH18-152	Herb	C/A	L	Colic pain (24), inflammations (1), worms (22), stomachache (10), diarrhea (2), flue (1)	Pound, add water OR boil (with cow ghee) and drink 250 ml 3xdaily OR Chew raw & swallow liquid OR scorch, squeeze and drink juice, 2 leaves 2xdaily	62
				Cough (5)	Scorch, chew with rock salt and swallow liquid	
<i>Tetradenia riparia</i> (Hochst.) Codd, Omuravunga, GH18-009	Herb	C/A	L	Allergic dermatitis (2) Eye disease (1) Stomachache (2), allergy (1), cough (3), worms (1)	Pound and smear on affected areas Scorch, squeeze and drop into the eye Scorch, chew and swallow liquid OR boil and drink 1 teaspoonful	8

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Table 3 (continued)

Family, species, Local Name, Voucher number	Growth form	CS	Part (s) used	Disease treated (UR)	Preparation and Administration	FC
Lauraceae						
<i>Persea americana</i> Mill., Ovacado, GH18-066	Tree	C/A	L	Dizziness (2), anemia (1), cough (1), worms (1), diarrhea (1), influenza (1), body cleanser (1)	Boil and drink 500 ml 3xdaily	10
			Fr, Sd	Good skin (1), ulcers (3)	Eating fruit OR pound seed, dry, grind into powder and drink as tea 1 spoonful in 500 ml 3xdaily	
Malvaceae						
<i>Grewia similis</i> K.Schum., Orukoma, GH18-029	Shrub	W/R	L	Cervical cancer (2)	Pound, add water and drink 500 ml and sit on 2xdaily	2
<i>Hibiscus fuscus</i> Garcke, Omusinga, GH18-153	Shrub	W/A	L	Splenomegaly (1), kidney disease (1), obstructed labor (1), febrile seizures (1), pleurisy (1), fracture (1)	Pound, add water, sieve, drink 500 ml (adult)/ 150 ml (child) and smear residue on the affected part; 3xdaily OR make incisions on the fracture	6
			L	Pneumonia (children) (1) False teeth (4), ulcers (1)	Pound and rub on affected part Dry, pound to powder and use to make incisions OR boil and drink 100 ml	
<i>Malva parviflora</i> L., Ekituruguma, GH18-132	Herb	W/A	L	Snake bite (1), ear disease (1), pleurisy (2), cellulitis (5), fracture (1), migraine (1), colic pain (1)	Pound, add warm water and drink, AND/OR smear/tie the residue on affected area	10
<i>Sida alba</i> L., Omucundeezi, GH18-113	Shrub	W/A	R	Fracture (1)	Boil and drink 500 ml	5
			L	Abnormalities (3), snake bite (1)	Pound, dry, mix powder with vaseline and smear OR pound, add water and drink 3 spoonfuls	
<i>Sida veronicifolia</i> Lam., Eihoza, GH18-012	Shrub	W/R	L	Heart disease (1)	Squeeze juice and drink 5 drops	5
			L	Abnormalities (3), snake bite (1)	Pound, dry, mix powder with vaseline and smear OR pound, add water and drink 3 spoonfuls	
Melastomataceae						
<i>Dissotis brazzae</i> Cogn., Omwonyo g'wente, GH18-095	Shrub	W/A	R	Worms (children) (1)	Boil and drink; 1 glass daily	1
Meliaceae						
<i>Azadirachta indica</i> A.Juss., Niimu, GH18-071	Tree	C/R	L	Malaria (16), cough (1), diarrhea (1), hypertension (1), preventive measure for malaria (1)	Pound, add water, sieve OR boil and drink 250 ml OR shade dry, grind into powder and drink as tea, 1 teaspoonful in 500 ml; 3xdaily	15
Menispermaceae						
<i>Cissampelos mucronata</i> A.Rich., Orusikaasikye, GH18-045	Climber	W/A	R	Stomachache (7), worms (children) (2),	Chew and swallow liquid OR pound, add water and drink; 1 spoonful 2xdaily (child); 1 glass 3xdaily (adults)	11
			L	Toothache (1), febrile seizures (1)	Hold/brush on the affected tooth OR pound, add water and drink one spoonful for febrile seizures	
Mimosaceae						
<i>Acacia sieberiana</i> Scheele, Omunyinya, GH18-155	Tree	W/A	L	Abnormalities (1)	Boil with other herbs and bathe	1
<i>Dichrostachys cinerea</i> (L.) Wight & Arn., Omuremanjojo, GH18-199	Tree	W/A	L	Diarrhea (2), stomachache (1), colic pain (1), dysentery (1)	Pound 2 handfuls, boil and sieve while still warm and drink 300 ml (adult), 150 ml (child)	4
Moraceae						
<i>Artocarpus integer</i> (Thunb.) Merr., Fenensi, GH18-035	Tree	C/A	Fr	Ulcers (3), allergy (1)	Chop ripe fruits, boil and drink 500 ml 3xdaily	7
			L Sd	Backache (1), headache (1) Erectile dysfunction (1), uterine pain (1), fatigue (1)	Pound, add water and drink 250 ml 2xdaily Pound dry seeds, use powder as tea	
<i>Ficus natalensis</i> Hochst., Ekitooma, GH18-039	Tree	W/C/A	R	Backache (2), induce labor (1), erectile dysfunction (1)	Burn adventitious root, crush into powder and use to make incisions (backache) OR Boil and drink 250 ml daily OR pound fresh root bark, add water and drink 100 ml 3xdaily	5
			Bk	Splenomegaly (1)	Boil and drink 250 ml 2xdaily	
Moringaceae						
<i>Moringa oleifera</i> Lam., Moringa, GH18-187	Tree	C/R	Sd, L	Uterine pain (1), erectile dysfunction (1), malaria (1)	Pound dry seeds, use powder as tea OR eat leaves as sauce OR boil and drink 100 ml	2
Musaceae						
<i>Musa acuminata</i> Colla, Enyamwonyo, GH18-067	Herb	C/A	Fr	Splenomegaly (1)	Burn peels, grind into powder and make incisions on the affected area	1
			Fl	Induce labor (1) Ulcers (3), backache (1)	Pound, add water and drink 500 ml Slice the white stalk, cook and eat as sauce OR slice whole, boil with banana juice and drink 250 ml 3xdaily	
<i>Musa paradisiaca</i> L., Gonja, GH18-061	Herb	C/A	Fr	Backache (1)	Burn peel, crush into powder and use to make incisions	2
			R	Dysentery (1)	Pound, boil and drink 100 ml	
<i>Musa sp.</i> , Omutumba, GH18-053	Herb	C/A	St	Fracture (1)	Warm (fermented stem) and rub on affected area	1
			L	Malaria (1)	Pound, boil with other herbs and drink 500 ml 3xdaily	

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Table 3 (continued)

Family, species, Local Name, Voucher number	Growth form	CS	Part (s) used	Disease treated (UR)	Preparation and Administration	FC
Myricaceae						
<i>Myrica salicifolia</i> Hochst. ex A.Rich., Omujeje, GH18-135	Tree	W/R	Bk	Epilepsy (1), worms (6)	Pound, boil and drink 2 spoonfuls	5
Myrsinaceae						
<i>Maesa lanceolata</i> Forssk., Omuhanga, GH18-026	Tree	W/R	St	Obstructed labor (1), febrile seizures (1), colic pain (1)	Boil and drink 2 spoonfuls OR tie with other herbs and sweep over the belly for obstructed labor	2
Myrtaceae						
<i>Callistemon citrinus</i> (Curtis) Skeels, Bottle brush, GH18-190	Tree	C/A	L	Cough (2)	Boil with other herbs and rock salt, drink warm 1 spoonful OR chew and swallow liquid 4xdaily	2
<i>Eucalyptus grandis</i> W.Hill, Karutusi, GH18-099	Tree	C/A	L	Cough (27), malaria (2)	Chew and swallow juice or boil and drink 200 ml (adult), 1 spoonful (child) 3xdaily	30
<i>Psidium guajava</i> L., Eiper, GH18-047	Tree	C/A	Bk	Toothache (1)	Pound with rock salt and rub on the teeth	24
			L	Cough (6), diarrhea (7), ulcers (1), colic pain (3), stomachache (1), headache (1), influenza (1)	Pound, add water OR boil (with rock salt) and drink 250 ml	
Onagraceae	Herb	W/R	L	Worms (children)(2), kidney disease (1), hernia (1)	Boil with <i>Erythrina abyssinica</i> covered to retain steam and drink ½ a glass 3xdaily for 2 weeks	1
				Anal warts (1)	Bake in hot ash, squeeze and drop extract on the anus	
Oxalidaceae						
<i>Ludwigia abyssinica</i> A.Rich., Omuzigangore, GH18-188	Herb	W/R	L	Anal warts (1)	Bake in hot ash, squeeze and drop extract on the anus	1
<i>Biophytum petersianum</i> Klotzsch, Yebumbe/Yerunde, GH18-115	Herb	W/A	L	Fracture (1), scoliosis (1), febrile seizures (1), xiphoidalgia (1)	Squeeze/pound, add paraffin/shoe polish and smear on affected part OR pound, add water and drink ½ jerrycan cover (child)/500 ml (adult)	7
<i>Oxalis corniculata</i> L., Otunyunyanbuzi, GH18-194	Herb	W/A	L	Uterine infections (1), heart disease (1), miscarriage (1)	Shade dry, grind powder and eat 3 spoonfuls in 500 ml cold water or in food daily OR shower it	6
<i>Oxalis latifolia</i> Kunth, Obunyunyanbuzi, GH18-169	Herb	W/A	L	Snake bite (1)	Dry, pound into powder and smear on affected part	
Passifloraceae	Liane	C/A	L	Colic pain (neonate) (2), stomachache (neonate) (10), fracture (1), constipation (children) (1)	Bake in hot ash, crush and drink juice 1 teaspoonful OR rub on fractured part 2xdaily	16
				Red eyes (1)	Scorch, squeeze and add 3 drops in the eyes 2xdaily	
<i>Passiflora edulis</i> Sims, Amatuunda, GH18-130	Liane	C/A	L	Cough (3)	Bake in hot ash, chew and swallow liquid OR boil with rock salt and drink 250 ml 2xdaily	1
Plantaginaceae						
<i>Plantago palmata</i> Hook.f., Embatabata, GH18-195	Herb	W/C/R	L	Chest pain (1), pneumonia (1)	Shade dry, grind into powder, mix with vaseline and smear	2
Poaceae	Grass	W/R	Fr	Dysentery (1), cervical cancer (1)	Pound, add water, sieve and drink 3 spoonfuls	2
				Witchcraft (2)	Wearing	
<i>Coix lacryma-jobi</i> L., Amarira, GH18-042	Grass	W/R	Fr	Worms (children) (1)	Pound with rock salt, squeeze juice and drink	3
<i>Cymbopogon citratus</i> Stapf, Ekiteete, GH18-193	Grass	W/A	L	Cough (2)	Chew and swallow liquid	13
<i>Cymbopogon nardus</i> (L.) Rendle, Omuteete, GH18-055	Grass	C/A	St	Cough (10), worms (1), stomachache (1)	Scorch, chew with rock salt and swallow liquid OR boil with cow ghee and drink 1 teaspoonful for worms	
<i>Cynodon dactylon</i> (L.) Pers., Akacwamba, GH18-191	Grass	W/A	St	Diarrhea (1), Snake bite (1)	Boil and drink ½ glass	1
<i>Cynodon sp.</i> , Omucwamba, GH18-141	Grass	W/C/A	Wp	Snake bite (4)	Tie above OR pound and smear on the affected part	4
<i>Digitaria abyssinica</i> (Hochst.) Stapf., Orumbugu, GH18-056	Grass	W/A	L	Yellow fever (1)	Pound, add water and drink 500 ml	15
			L	Malaria (7), urinary retention (1), fracture (1), diarrhea (3)	Pound, add water OR boil and drink 1 glass 3xdaily OR pound and rub on fracture	
<i>Imperata cylindrica</i> (L.) P.Beauv., Omushojwa, GH18-079	Grass	W/A	St	Worms (children) (2)	Boil covered to retain steam, with cow ghee and drink ½ a glass 3xdaily for 2 weeks	4
			L	Kidney disease (1), snake bite (1)	Boil and drink 250 ml daily	
			L	Malaria (1), urinary retention (1), snake bite (1), kidney disease (1)	Boil and drink 250 ml 3xdaily OR tie above the affected area (snake bite)	

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Table 3 (continued)

Family, species, Local Name, Voucher number	Growth form	CS	Part (s) used	Disease treated (UR)	Preparation and Administration	FC
<i>Pennisetum purpureum</i> Schumach, Ekibingo, GH18-074	Grass	W/C/A	L	Epilepsy (1), poison antidote (1), cervical cancer (1), stomach wounds (1), cellulitis (1), obstructive labor (3), ulcers (1), dysentery (1), gonorrhea (1), scoliosis (2) Abnormalities (4) Snake bite (1)	Pound the young leaf, (boil) and drink 500 ml (adult)/2 spoonfuls (child) OR pound and tie on the affected area for cellulitis OR bathe for gonorrhea Pound, add water and drink little, spit twice and swallow the third time (with enchantments) Pound, add warm water and drink, smear the residue on affected area	22
<i>Saccharum officinarum</i> L., Ekikojo, GH18-158	Grass	C/A	St, L Fl St	Malaria (2) Induce labor (1) Malaria (1)	Chop, boil and drink; 1 glass Scorch, chew and swallow liquid Chop, boil and drink; 1 glass	2
<i>Sorghum bicolor</i> (L.) Moench, Omugusha, GH18-116	Grass	C/A	Sd	Colic pain (2), diarrhea (2)	Pound, add water and drink 500 ml	3
<i>Zea mays</i> L., Ekicoori, GH18-161	Grass	C/A	Fr L	Burns (2), tinea capitis (1) Headache (1)	Burn the cob to charcoal, pound and spread/ smear powder on affected area Boil while covered and steam bath for about 30 min	2
Polygonaceae						
<i>Oxygonum sinuatum</i> Dammer, Akacumitambogo, GH18-015	Herb	W/R	L	Cellulitis (1)	Pound and rub on affected area	1
<i>Rumex abyssinicus</i> Jacq., Omufumbigyesha, GH18-170	Herb	C/A	L	Mastitis (13), syphilis (4)	Chew and swallow liquid OR pound, add water and drink 150 ml 3xdaily	15
<i>Rumex usambarensis</i> (Dammer) Dammer, Akafumbwa, GH18-174	Herb	C/R	L	Allergy (17) Worms (children) (2), colic pain (2), syphilis (1)	Dry, grind into powder and eat it in food or drink Pound, add water, sieve and drink 250 ml (adult)/handful (child) 2xdaily	8
Portulacaceae						
<i>Portulaca grandiflora</i> Hook., Kabarashaaha, GH18-150	Herb	C/R	L	Cellulitis (1)	Squeeze and tie on the affected part	1
Ranunculaceae						
<i>Clematis hirsuta</i> Guill. & Perr., Omunkaamba, GH18-003	Vine	W/R	L Fl	Allergy (10), sty (1), hoarseness (1), erectile dysfunction (1), stomachache (1) Flue (1)	Pound, shade dry, grind and sieve to fine powder and drink as tea or in food OR pound, add water and drink for erectile dysfunction OR pound and rub on sty Squeeze and hold on the nose	15
Rhamnaceae						
<i>Gouania longispicata</i> Engl., Omufurura, GH18-002	Liane	W/R	L	Allergy (102), urinary retention (2), palpitations (1), febrile seizures (1), heat rash (1), smelly feet (1), stomachache (2), mastitis (1), anorexia (1), limb pains (2), syphilis (4), sweating (3), tooth decay (4), sore throat (3), wounds (5), itching eyes (13), inflammations (3), skin rash (3), skin infections (1), lymphangioma (1), itching throat (3), epiglottitis (1), colic pain (9), itching vagina (1), chest pain (3), hoarseness (3), worms (4), cough (2), hypertension (2), flue (2), dizziness (4), headache (10), asthma (7), all sicknesses (2), abnormalities (1), body weakness (4), itching body(6), tinea capitis (2), lactation insufficiency (1), neck pain (1), typhoid (1) Abnormalities (1)	Shade dry, pound and add powder to any drink like porridge, tea, water & food or even leak; 1 spoon 3xdaily OR smear powder (smelly feet) Pound, dry, grind into powder and smear in vaseline	174
Rosaceae						
<i>Prunus africana</i> (Hook.f.) Kalkman, Omumba, GH18-185	Tree	W/R	Bk	Urinary retention (2), prostate cancer (3)	Boil and drink 100 ml OR shade dry, grind into powder and drink in tea/porridge 3 teaspoonful in 500 ml daily	5
<i>Rubus pinnatus</i> Willd., Enkyerere, GH18-142	Liane	W/A	L	Tonsillitis (1), snake bite (1) Syphilis (1)	Roast, grind with rock salt and drink 250 ml 3xdaily OR dry, grind and smear powder on snake bite Pound, add water and drink 300 ml	3
Rubiaceae						
<i>Coffea canephora</i> Pierre ex A.Froehner, Omwaani, GH18-063	Shrub	C/A	L, Fr L	Erectile dysfunction (1), allergy (1), colic pain (1), dysentery (1) Worms (children) (1), cough (4), ulcers (1) Induce labor (1), stomachache (1), headache (1)	Boil leaves and drink OR boil ripe fruits, then dry and chew seeds Boil covered to retain steam, with cow ghee (rock salt) and drink ½ a glass 3xdaily for 2 weeks Pound, add water, sieve and drink 500 ml	13

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Table 3 (continued)

Family, species, Local Name, Voucher number	Growth form	CS	Part (s) used	Disease treated (UR)	Preparation and Administration	FC
<i>Galium spurium</i> L., Kaboha, GH18-137	Herb	W/R	L	Pleurisy (1), warts (1), stomachache (1), herpes zoster (1)	Squeeze, mix extract with cow ghee or vaseline and smear on affected parts OR boil and drink 250 ml daily	4
<i>Mitragyna stipulosa</i> Kuntze, Engomera, GH18-122	Shrub	W/R	Bk	Colic pain (1), kidney disease (1)	Pound, boil with other herbs while covered and drink 1 spoonful 2xdaily	2
<i>Pavetta oliveriana</i> Hiern., Omuturaibare, GH18-030	Shrub	W/R	L	Worms (1), splenomegaly (1)	Dry, pound and drink 1 teaspoonful of powder in 1 glass of water 3xdaily	1
<i>Rubia cordifolia</i> L., Akaramata, GH18-173	Herb	W/R	L	Pneumonia (1)	Chew and swallow liquid	4
Rutaceae						
<i>Citrus aurantifolia</i> (Christm.) Swingle, Omucungwa, GH18-072	Tree	C/A	Fr	Hypertension (1) Cough (2), stop nosebleed (1)	Eat the fruit Boil and drink ½ glass	3
<i>Citrus limonum</i> Risso, Endimu, GH18-106	Tree	C/A	Fr, L	Cough (9), influenza (1), anorexia (1), dysentery (1), hypertension (1), typhoid (1)	Chop peels, boil OR pound, add water, sieve and drink 250 ml (adult)/3 spoonfuls (child) daily	14
<i>Clausena anisata</i> (Willd.) Hook.f., Omutanu, GH18-004	Shrub	W/A	L	Colic pain (3), malaria (1), worms (children) (5), snake bite (1), sweating (1), syphilis (1)	Boil with rock salt and drink 250 ml OR dry, grind and smear powder on snake bite	8
<i>Clausena dentate</i> M.Roem, Omutana, GH18-013	Shrub	W/A	L	Body cleanser (1), anorexia (1) Worms (children) (1)	Boil with rock salt and drink a handful 3xdaily Boil covered to retain steam, with cow ghee and drink ½ a glass 3xdaily for 2 weeks	4
<i>Toddalia asiatica</i> (L.) Lam., Kabakura, GH18-145	Shrub	W/R	R	Worms (6), epilepsy (1), stomachache (1)	Pound, add water and drink; 1 spoonful OR dry root, chew bark and swallow liquid	7
<i>Zanthoxylum gillettii</i> (De Wild.) P.G.Waternnan, Omutateembwa, GH18-167	Tree	W/R	Bk L Fr	Pneumonia (1), witchcraft (1) Head injury (1) Abnormalities (1)	Burn to charcoal, grind into powder and use it to make 2 incisions for 4 days Pound and smear on the clean cut Boil and drink very little	3
Sapindaceae						
<i>Blighia unijugata</i> Baker, Omwataibare, GH18-139	Tree	W/R	Bk	Splenomegaly (1)	Boil and drink 2 spoonfuls 3xdaily	1
<i>Dodonaea angustifolia</i> L.f., Omushambya, GH18-118	Shrub	W/A	L	Diarrhea (1)	Chew and swallow	1
<i>Pancovia harmsiana</i> Gilg, Engango, GH17-011	Tree	W/R	L,R	Rectal prolapse (1)	Boil and drink 250 ml AND shade dry, grind into powder, mix with vaseline and smear on anus 3xdaily	1
Simaroubaceae						
<i>Harrisonia abyssinica</i> Oliv., Omurarikye, GH18-005	Shrub	W/A	L R, Bk	Worms (5), sweating (1), inflammations (1), colic pain (6), ulcers (1) Diarrhea (1), stomachache (1), kidney disease (1)	Pound, add water or boil and drink 500 ml daily Boil root bark in cow ghee and drink OR pound bark, add water and drink 2 spoonfuls 3xdaily	16
Solanaceae						
<i>Capsicum frutescens</i> L., Eshenda, GH18-103	Shrub	C/A	Fr	Ulcers (3)	Swallow 3 unripe fruits daily	3
<i>Cyphomandra betacea</i> (Cav.) Sendtn, Orutotoima, GH18-126	Shrub	C/R	L	Wounds (1)	Squeeze, tie on the wound (it fixes on until it is healed)	1
<i>Cyphomandra sp.</i> , Ekitonganwa, GH18-080	Shrub	C/R	L	Colic pain (1)	Pound, add water and drink 250 ml	1
<i>Nicotiana tabacum</i> L., Etaabe, GH18-128	Herb	C/R	L	Snake bite (1) Worms (2)	Squeeze and tie on the affected area Bake in hot ash, squeeze and swallow liquid OR pound, dry, chew and swallow liquid OR boil with cow ghee and drink 1 spoonful (child)/250 ml (adult) 3xdaily	5
<i>Physalis minima</i> L., Akatuutu, GH18-163	Herb	W/A	L	Burns (1) Colic pain (children) (1), worms (2) Snake bite (2)	Squeeze and smear liquid on the affected areas Chew and swallow liquid	3
<i>Physalis peruviana</i> L., Ekituutu, GH18-124	Herb	W/C/A	L	Colic pain (9), cervical cancer (1), worms (3), stomachache (9), body cleanser (1), anorexia (1), splenomegaly (1), syphilis (1), headache (1) Pregnancy complications (1)	Dry, grind and smear powder on snake bite Pound, add water and drink 500 ml (adult)/3 spoonfuls (child) OR chew and swallow liquid 3xdaily	26
<i>Solanum aculeastrum</i> Dunal, Omutugunda, GH18-189	Shrub	W/A	L R	Fracture (1) Worms (1)	Boil and bathe Pound, heat on piece of clay and press/rub on fracture Boil with cow ghee and drink 500 ml (adult)/3 spoonfuls (child)	1
<i>Solanum anguivii</i> Lam., Obutakara (green), GH17-009	Shrub	W/A	Fr	Tinea unguium (1), stomachache (1), anorexia (children) (1)	Pound, add water, drink 1 spoonful and also tie residue on affected finer nails or toes OR for hypertension, eat as sauce/in food	3
<i>Solanum gilo</i> Raddi, Entonga, GH18-078	Shrub	C/A	Fr	Skin rash (children) (1)	Pound, add water and bathe 2xdaily	2
<i>Solanum lycopersicum</i> Mill., Enyaanya, GH18-087	Herb	W/C/A	Fr L	Ulcers (1) Pleurisy (4), Ulcers (1), splenomegaly (1)	Eat raw Pound, add some paraffin and rub on affected area Pound and drink 500 ml	9

(continued on next page)

Table 3 (continued)

Family, species, Local Name, Voucher number	Growth form	CS	Part (s) used	Disease treated (UR)	Preparation and Administration	FC
<i>Solanum nigrum</i> L., Eshwiga, GH18-058	Herb	W/C/R	L	Bile (1), eye disease (1), lactation insufficiency (2)	Chew it raw OR eat it as sauce OR squeeze and put 3 drops into the eye	4
<i>Solanum tuberosum</i> L., Emondi, GH18-083	Herb	C/A	Tb	Gastric cancer (1)	Peel, chew and swallow	1
Theaceae						
<i>Camellia sinensis</i> (L.) Kuntze, Amajani, GH18-186	Shrub	C/A	L	Stomach wounds(1)	Boil with other herbs and drink 500 ml	1
Tiliaceae						
<i>Triumfetta cordifolia</i> A.Rich., Omunaaba, GH18-021	Herb	W/A	L	Misfortune (1), hernia (1)	Boil with other herbs and shower OR boil and drink 500 ml	2
<i>Triumfetta rhomboidea</i> Jacq., Oruhigura, GH17-012	Shrub	W/A	L	Sweating (1), tinea unguium (1), urinary retention (1), obstructed labor (1), worms (children) (1)	Pound, add water and drink 250 ml (adult)/2 spoonfuls (child) daily	5
Urticaceae						
<i>Urtica massaica</i> Mildbr., Ekyicuringanyi, GH18-075	Herb	W/C/R	L	Backache (1)	Pound, add water and drink 250 ml 2xdaily	6
Verbanaceae						
<i>Lantana camara</i> L., Muhima, GH18-055	Shrub	W/A	L	Toothache (1), ring worms (1)	Squeeze and brush/rub on to the affected part 2xdaily	7
<i>Lantana trifolia</i> L., Omuhuukye, GH18-183	Shrub	W/A	L	Stomachache (2), cough (2), diarrhea (2), dysentery (1), colic pain (1) Cough (15), urinary retention (1), stomach warts (1), worms (children) (1), epilepsy (1), allergic dermatitis (1), diarrhea (1)	Chew and swallow liquid OR boil with rock salt and drink 250 ml 3xdaily Pound, add water OR boil and drink 1 glass daily OR for allergic dermatitis, rub on the skin	20
Vitaceae						
<i>Cissus adenocaulis</i> Steud. ex A.Rich., Ekibombo, GH18-191	Liane	W/A	L	Allergy (1), kidney disease (1), body cleanser (1), urinary retention (1), hook worms (1), induce vomiting (1), allergic dermatitis (1), colic pain (2) Ulcers (1) Swollen eye (1) Skin rash (2)	Pound, add water and drink 500 ml or bathe (for colic pain, pound with charcoal) Boil and drink 500 ml 3xdaily Pound and smear Dry, grind, mix powder with vaseline and smear	13
<i>Cyphostemma adenocaulis</i> (Steud.) Desc., Akabombo, GH18-177	Liane	W/A	R L	Colic pain (2) Cervical cancer(1), headache(1)	Boil and drink 250 ml daily Pound, add water and drink 500 ml daily	1
<i>Rhoicissus tridentata</i> (L.f.) Wild. & R.B.Drumm., Omumara, GH18-027	Shrub	W/R	L R, L	Cough (2), herpes zoster (1) Abnormalities (5) Obstructed labor (1), febrile seizures (1), dysfunctional uterine bleeding (1)	Chew and swallow liquid Pound, dry, grind, mix powder with vaseline and smear Pound, add water and drink OR dry root bark, grind, mix powder in vaseline and smear	12
Zingiberaceae						
<i>Aframomum angustifolium</i> K.Schum., Amatehe, GH18-105	Herb	W/A	Fr	Allergic dermatitis (1)	Pound seeds into powder and lick 3xdaily	1
<i>Zingiber officinale</i> Roscoe, Tangawuzi, GH18-168	Herb	C/A	St	Body cleanser (1), cough (3), flue (1)	Chew and swallow liquid OR drink crushed stem in tea	5

CS, Conservation status: C/A, cultivated and abundant; C/R, cultivated and rare; W/A, wild and abundant; W/R, wild and rare; W/C/A, wild and/or cultivated and abundant; W/C/R, wild and/or cultivated and abundant. Parts used; L, leaf; St, stem; Tb, tuber; R, root; Bk, stem bark; Fr, fruit; Fl, flower; Wp, whole plant; Sp, sap; Sd, seed. UR use report; FC, frequency of citation.

This is in agreement with previous studies around and within QENP which have reported boiling and pounding as the mostly used methods for herbal preparation (Kamatenesi-Mugisha and Oryem-Origa, 2005; Kamatenesi-Mugisha and Oryem-Origa, 2007; Kamatenesi-Mugisha et al., 2008). Chewing (25.59%) is commonly used when mothers bake or steam the plant materials, chew them and give the resultant juice to infants through the mouth, which was also reported by Namukobe et al. (2011).

Medicinal plants were either used singly or as a mixture of more than one species to make a particular remedy. The use of different plants in a mixture for effective treatment of one particular disease could be due to the synergistic effect (Ekor, 2014). Most of the herbal remedies were prepared using water as a solvent, probably because water is a common, readily available and cheap solvent, and can dissolve a good number of active components commonly used in traditional medicine (Bhattarai et al., 2010). Other ingredients like cow ghee, rock salt, charcoal, paraffin, shoe polish, vaseline, banana juice,

honey and local brew “*tonto in Runyankole/Rukiga*” (whose main ingredient is ethanol) were sometimes added during the preparation of herbal remedies. The addition of these substances could be to increase the solubility of some of the bioactive compounds which may not be soluble in water (Bhattarai et al., 2010). Some additives like honey, banana juice and cow ghee are also used to improve palatability, especially for bitter plant species (Benarba, 2015). On the other hand, vaseline was mainly used as a suitable medium for use in preparing herbal medicine for smearing, which can double as an extracting medium since it is an organic solvent. From the study, it was revealed that a single plant such as *Gouania longispicata* could be used for several ailments. This raises a need to investigate such plants on whether their potency is due to the presence of various bioactive compounds in one particular plant and/or the fact that the same molecule can be active on different pathogens.

Most of the herbal remedies were orally administered in different ways through drinking, chewing or eating (95.26%), followed by

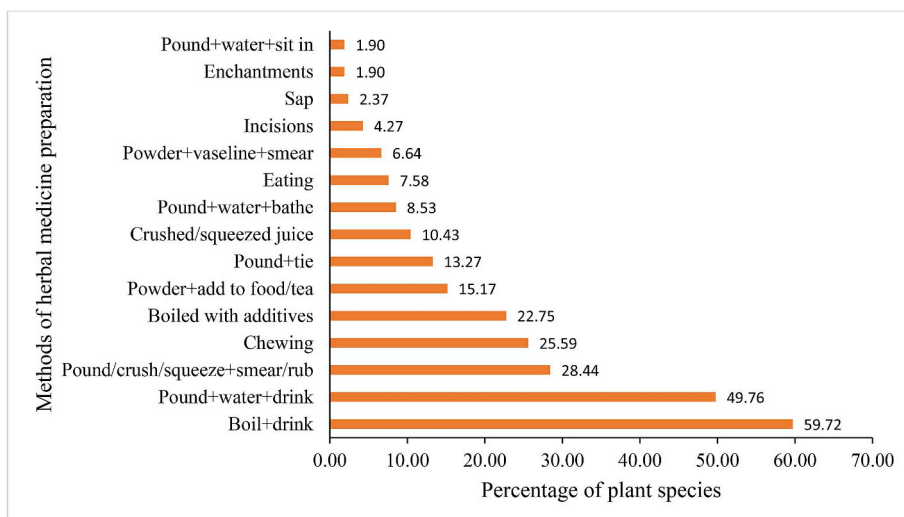


Fig. 2. Percentage of plant species prepared using various methods (n = 211).

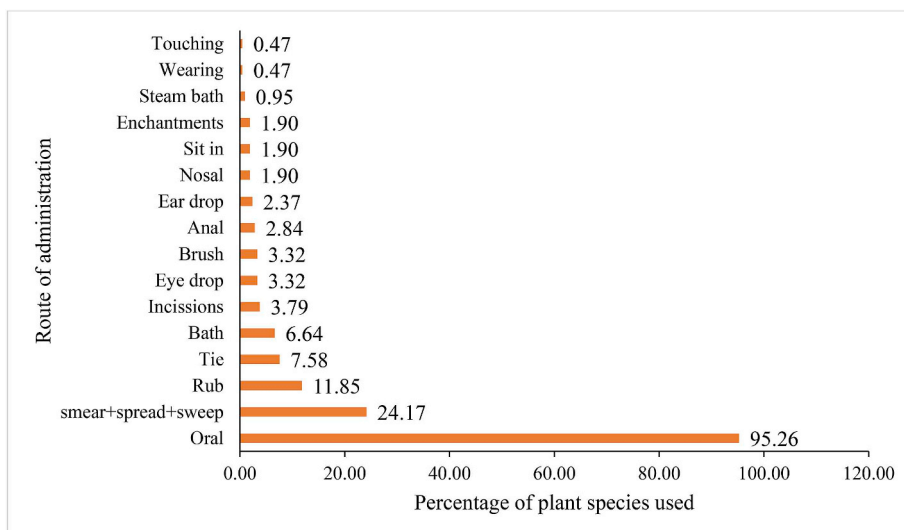


Fig. 3. Mode of drug administration based on the number of medicinal plants used (n = 211).

application on the body surface through smearing, spreading and sweeping (24.17%) and by rubbing/massaging (11.85%) (Fig. 3).

The prevalence of internal ailments like the digestive disorders and malaria in the study area as reported by RDDP (2015) could have promoted the use of oral administration. Tugume et al. (2016) reported oral as the most common route of administering herbal medicine, mainly because additives such as water and food are usually used as ‘vehicles’ for transportation of herbal remedies. In this study, some uncommon modes of administration like wearing (0.47%), touching with bare hands (0.47%) and sitting in the plant material (1.90%) and sweeping were reported. For example, wearing *Coix lacryma-jobi* protects from witchcraft, and touching *Sericostachys scandens* with bare hands is used to carry out abortion. Sitting in the plant material, either boiled or pounded and water added, included the use *Laggera alata* and *Ricinus communis* for rectal prolapse and *Basella alba*, *Ipomoea cairica*, *Euclea divinorum* and *Grewia similis* for female genital disorders.

The amount of herbal remedies administered at a time were described in terms of teaspoonful, spoonful (tablespoonful), glass, half a glass, cup (estimated as 500 ml or half liter), half a cup (approximately 250 ml) and a third of a cup. The mentioned amounts in milliliters in Table 3 were converted from one cup as an equivalent of 500 ml, which is a common medium for measuring half liter in the study area. The

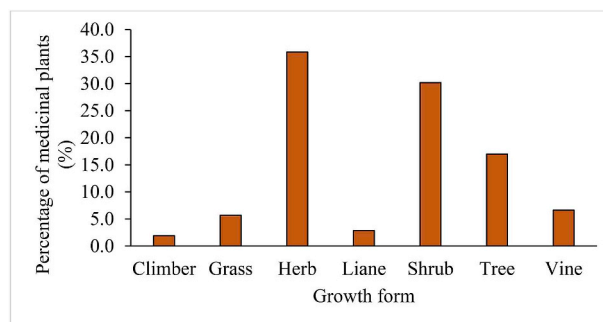


Fig. 4. Percentage of growth forms of the medicinal plants.

remedies were prescribed to be taken once, twice or thrice daily until the patient gets healed or sometimes for a specified period like four days or a week. However, some remedies, like for stopping or inducing vomiting, were administered only once. Certain precautions were also necessary, for example, taking the treatment very early in the morning before dawn and in the cold, boiling herbs in a steam-tight container, making enchantments, eating raw or shade drying. Such precautions are mainly linked to preserving the stability of bioactive compounds

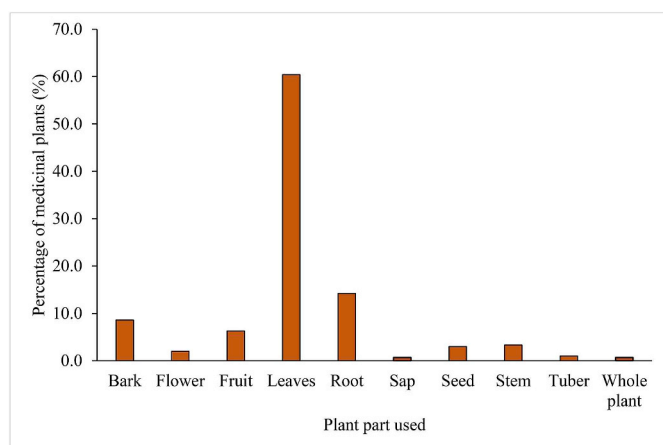


Fig. 5. Parts of the medicinal plants used to make herbal remedies.

and at times spiritual powers, like in making enchantments. For instance, Rocha et al. (2011) reported that drying is the most common way to preserve quality of medicinal plants, during which necessary precautions must be observed.

Most informants were specific about the dosages but not precise about the quantities of the plant material and volumes of the extracting medium, commonly water, used to prepare the herbal remedies. This could be attributed to the fact that, the amount of the active compounds within the plants are not known to the herbal users. The study revealed that adults were always given larger dosages of a particular herbal remedy than children, mimicking administration of allopathic medicines. It was also observed that for certain medicinal plants, like *Markhamia lutea* (Table 3), different parts were used to treat different diseases. This suggests that, such plants store bioactive compounds in their parts differently. However, such claim needs to be confirmed by carrying out phytochemical and pharmacological studies on such plants.

3.3. Growth forms of medicinal plants, parts used to make herbal remedies and conservation status

The medicinal plants grew as climbers, grasses, herbs, lianes, shrubs, trees and vines. Most of the medicinal plants were herbs (35.8%), shrubs (30.2%) and trees (17.0%) (Fig. 4). However, similar studies in and around QENP but in Kasese district have reported shrubs (42.4%) as the most commonly used (Kamatenesi-Mugisha and Oryem-Origa, 2005). The use of herbs as the main source of medicinal plants could be attributed to their abundance and hence ease of access.

The plant parts used for medicinal preparations were leaves, roots, barks, flowers, fruits, sap, seeds, stem and tubers. In some instances the whole plant is utilized including the roots (Fig. 5).

Most of the herbal medicines were prepared from leaves (60.4%) and roots (14.2%). The least used was whole plant (0.7%) and sap (0.7%). The frequent use of certain plant parts could indicate their high therapeutic potency. The potency of the plant parts can be improved through engineering to produce more of the needed compound through agronomic biofortification. The common use of roots in the preparation of herbal remedies pose a great threat to the future survival of natural plants sources, since harvesting involves destruction of the whole plant. Therefore, domestication and propagation strategies of medicinal plants need to be adopted for sustainability (Kamatenesi-Mugisha and Oryem-Origa, 2005). While the use of whole plant is equally destructive, it was not common in the study area. For some plants, more than one part was used to prepare herbal medicines, for either similar or different diseases. Moreover, the same plant part was could be to treat different ailments depending on the mode of preparation used. For instance, the roots of *Vernonia amygdalina* are used to treat worms, colic pain and splenomegaly by boiling root bark with cow ghee and drinking. The

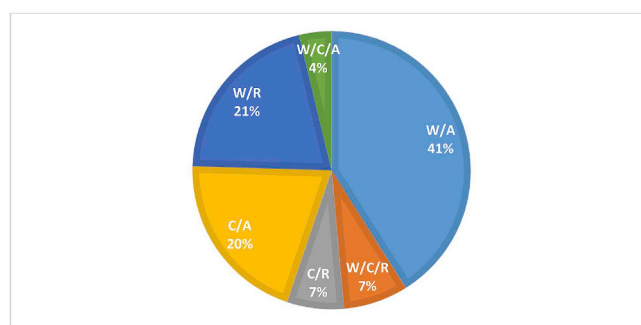


Fig. 6. Conservation status of medicinal plants (Conservation status: C/A, cultivated and abundant; C/R, cultivated and rare; W/A, wild and abundant; W/R, wild and rare; W/C/A, wild and/or cultivated and abundant; W/C/R, wild and/or cultivated and abundant.).

root also treats ulcers by pounding, adding water, sieving and drinking the extract. For treatment of dizziness, the root bark of *Vernonia amygdalina* is dried, ground into powder and drank in water (Table 3). The different modes of preparation may be aimed at extracting different bioactive compounds for the different ailments. This suggests that, phytochemical and pharmacological studies done on medicinal plants need to mimic the local modes of preparation to ascertain the molecules extracted by each mode.

Most of the medicinal plants were wild and abundant (41%), followed by wild and rare (21%) (Fig. 6).

This shows that most of the medicinal plants are collected from the wild. The least number of medicinal plants were those gathered from the wild and/or cultivated but abundant (4%). This shows that there is need to devise means for responsible harvesting, especially of the rare species to avoid their extinct.

3.4. Informant Consensus Factor (F_{IC})

The F_{IC} values for different disease categories ranged from 0.08 to 0.83 (Table 4). F_{IC} value above 0.5 signify informants' agreement about the use of medicinal plants to treat ailments. Conversely, F_{IC} values below 0.5 indicate poor interactions between people in sharing their knowledge on medicinal practices. Digestive disorders scored the same F_{IC} value as general and unspecified disorders, which was the highest ($F_{IC} = 0.83$); indicating that the local population exchange of information and/or used a well-defined selection criterion for plant species for these disease categories (Juárez-Vázquez et al., 2013).

Digestive disorders recorded the highest number of use-reports (852 UR) and medicinal plant species (146 plant species) used for treatment. This indicates homogeneity of information provided by informants on the variety of medicinal plants used to treat digestive disorders. It also suggests that digestive disorders are a prevalent disease category among the locals within the study area. The highest number of use reports and plant species for the digestive disease category is due to the highly reported cases of worms (303 UR), colic pain (227 UR) and stomachache (152 UR), indicating that they are prevalent diseases in the study area. Worms was the major ailment for both children and adults. However, children were highly affected by worms, even were reported to have specific medicinal plants for their treatment as indicated in parentheses in Table 3 (in the column for diseases). Poor hygiene and sanitation have been reported within the study area (RDDP, 2015) and could probably be the main cause of worm infestation.

According to RDDP (2015), gastrointestinal disorders rank 3rd, intestinal worms 4th and diarrhea 5th among the top five causes of morbidity in the study area, which is in agreement with high F_{IC} value for digestive disorders that suggested their prevalence. Previous studies

Table 4
Informant Consensus agreement about uses of medicinal plants.

Disease category	Ailments (use reports)	N _t	N _{ur}	F _{IC}
General and Unspecified (A)	Chicken pox (5), allergy (174), malaria (191), measles (1), cancer (1), fatigue (1), poison antidote (1), pica (3), fever (5), body cleanser (8), sweating (8), chest pain (4), body weakness (5), typhoid (5), yellow fever (11), witch craft (6), abnormalities (70), tonsillitis (3), sty (1), high temperature (2), pain killer (1), prevention (1)	88	507	0.83
Blood, Blood Forming Organs and Immune Mechanism (B)	Blood cleanser (1), anemia (9), splenomegaly (27)	24	37	0.35
Digestive (D)	Ulcers (53), stomachache (152), worms (303), colic pain (227), hook worms (1), bile (1), epiglottitis (1), teeth decay (4), evacuation (2), bloating (1), anal warts (1), nausea (1), constipation (3), obstructed defecation (2), false teeth (4), vomiting (8), gastric cancer (2), rectal prolapse (8), toothache (11), liver disease (1), dysentery (14), diarrhea (36), hernia (15), stomach warts (2), oral thrush (1)	146	854	0.83
Eye (F)	conjunctivitis allergic (1), swollen eye (1), itching eyes (13), red eyes (2), eye disease (6)	9	23	0.61
Ear (H)	Ear pain (3), ear disease (12)	5	15	0.67
Cardiovascular (K)	Palpitations (1), heart disease (2), hypertension (9)	9	12	0.25
Musculoskeletal (L)	Inflamations (8), neck pain (1), limb pain (4), backache (8), cellulitis (11), scoliosis (9), fracture (18), xiphoidalgia (6)	35	65	0.46
Neurological (N)	Head injury (3), migraine (1), epilepsy (4), dizziness (9), headache (31), febrile seizures (67)	41	115	0.64
Psychological (P)	Anorexia (11), misfortune (2), sex dysfunction (1)	13	14	0.08
Respiratory (R)	Itching larynx (1), cough (238), nosebleeds (1), itching throat (3), sore throat (3), hoarseness (5), boils (1), chest congestion (2), asthma (10), pneumonia (8), flue (7), pleurisy (19), influenza (4)	70	302	0.77
Skin (S)	Snake bite (26), fresh wounds (15), wounds (37), chronic wound (1), tinea unguium (2), itching body (6), lymphangioma (1), skin infections (1), smelly feet (1), good skin (2), sores (2), herpes zoster (7), allergic dermatitis (9), burns (6), tinea capitis (14), ring worms (9), rash (11), warts (2)	58	152	0.62
Endocrine/Metabolic and Nutritional (T)	Dehydration (1), diabetes (2), marasmus (2), kwashiorkor (4)	8	9	0.11
Urological (U)	Urinary retention (15), kidney disease (20)	28	35	0.20
Pregnancy, Childbearing, Family Planning (W)	Induce labor (10), lactation insufficiency (3), placenta expulsion (1), pregnancy complications (3), navel healing (2), abortion (1), obstructed labor (14), miscarriage (4), mastitis (14)	28	52	0.46
Female Genital (X)	Itching vagina (1), syphilis (15), irregular periods (1), uterine pain (2), uterine disease (3), cervical cancer (37), dysfunctional uterine bleeding (2)	32	61	0.48
Male Genital (Y)	Prostate cancer (1), gonorrhea (1), erectile dysfunction (13)	13	15	0.14

N_t, number of taxa used in each disease category; N_{UR}, number of mentions in each usage category; F_{IC}, Informant Consensus Factor.

have reported digestive disorders with highest F_{IC} values in Uganda (Asimwe et al., 2014). The most important remedies with higher use reports in this category include fresh leaves of: *Bothriocline longipes*, *Senna occidentalis* and *Warburgia ugandensis* against worms; *Plectranthus barbatus* and *Momordica foetida* (also dried bark) against colic pain; *Leonotis nepetifolia* against stomachache.

General and unspecified disorders recorded the second highest number of use-reports (504 UR) and medicinal plant species (88 plant species). The higher number of use reports and plant species for this disease category is attributed to the higher reported cases of allergy (174 UR) and malaria (191 UR), signifying their high prevalence this area. The high prevalence of allergy could be attributed to presence of various allergens in this area including weather changes, particulate matter mainly from kitchens since firewood is the sole source of fuel and from dust particles from farmlands, and reactions towards foods, drinks, cosmetics among others. This is the first time allergy has been reported as one of the major ailments being managed by medicinal plants. Much as allergy has not been given much attention in Uganda, it has become one of the major ailments in Uganda. In fact Morgan et al. (2017), reported a high prevalence of allergic disorders in Uganda, which is even expected to increase due to urbanization. The most important medicinal plant species used for treatment of allergy is *Gouania longispicata*. On the other hand, malaria has been a major problem in the tropics and has been the leading cause of mortality in this area (UBOS, 2009). The most important medicinal plant species used for treatment of malaria is *Vernonia amygdalina* with 73 use mentions for malaria out of 98 use reports (Table 3). The use of *Vernonia amygdalina* in the treatment of malaria in Uganda has earlier been reported by other researchers (Katuura et al., 2007a; Ssegawa and Kasenene, 2007; Namukobe et al., 2011).

Another disease category with higher F_{IC} value (F_{IC} = 0.77) was respiratory disorders. The most common respiratory disorder was cough (238 use reports). *Mangifera indica* was the most important medicinal plant species used in treatment of cough with 44 use reports. According to RDDP (2015), pneumonia-cough or cold is the leading

cause of morbidity at 27.6%, which indicates its prevalence.

High F_{IC} values for different disease categories indicate that the ethnobotanical sample is large enough to identify medicinal plants species that are culturally important, which may be of relevance for further detailed phytochemical and pharmacological studies (Heinrich, 2000). Therefore, categories of General and Unspecified, Digestive and Respiratory may contain a number of highly potential medicinal plants.

3.5. Pharmacological potential of plants species with high frequency of citation

To establish the pharmacological relevance of some medicinal plants with high FC values, a cross-validation was made in relation to published literature (Table 5). Some of the current recorded uses of medicinal plants were found to be coherent with the known pharmacological activities. For instance, *Aloe vera* which was used to treat malaria was reported to exhibit antimalarial activity and contain alkaloids (Ibe et al., 2014), which are well known antimalarial class of compounds (Greenwood, 1992; Şener et al., 2003). It was also found out that the same species can be used against the same ailment by different cultures in different areas or countries, which confirms the confidence users have in such herbal remedies. For example *Vernonia amygdalina* was reported to treat headache in Ethiopia (Giday et al., 2010), diarrhea and herpes zoster in Tanzania (Kisangau et al., 2007), which are also among the reported ethnomedical uses in the current study.

Among the selected plant species for cross-examination, most of the species had reported pharmacological properties and compounds identified in them. This validates the therapeutic properties in some reported species and medicinal knowledge of the local population. Much as some pharmacological properties and active compounds for some of these plants are known, a comprehensive analysis of the therapeutic and phytochemical properties need to be evaluated. On the other hand, pharmacological and phytochemical properties of *Gouania longispicata* have not been reported and hence need to be established.

Table 5
Pharmacological properties of the mostly cited medicinal plants.

Medicinal Plant	Current study		Previous studies		Pharmacological properties	Some reported compounds	
	Parts used	Aliments treated	FC	Parts used			Medicinal uses (country)
<i>Gouania longispicata</i> Engl.	Leaf, Root	Allergy, urinary retention, palpitations, febrile seizures, heat rash, smelly feet, stomachache, mastitis, anorexia, limb pains, syphilis, sweating, tooth decay, sore throat, wounds, itching eyes, inflammations, skin rash, skin infections, lymphangioma, itching throat, epiglottitis, colic pain, itching vagina, chest pain, hoarseness, worms, cough, hypertension, flu, dizziness, headache, asthma, all sicknesses, abnormalities, body weakness, itching body, tinea capitis, lactation insufficiency, neck pain, typhoid	174	Leaf	Stomachache (Uganda) (Hamill et al., 2000), oral thrush (Ethiopia) (Giday et al., 2010), livestock diseases (DR Congo) (Chifundera, 1998)	No reported work available	No reported work available
<i>Vernonia amygdalina</i> Delile	Leaf, Root	Worms, febrile seizures, malaria, stomachache, headache, typhoid, induce labor, backache, colic pain, diarrhea, splenomegaly, fever, body cleanser, anorexia, yellow fever, herpes zoster, ulcers, dizziness	98	Leaf	Malaria, convulsions, stomachache (Uganda) (Tugume et al., 2016), headache (Ethiopia) (Giday et al., 2010), skin rashes, chronic diarrhea, herpes zoster, herpes simplex, cryptococcal meningitis (Tanzania) (Kisangau et al., 2007)	Antiplasmodial (Lacroixa et al., 2011), antioxidant (Igle et al., 1994) and antidiabetic (Ebong et al., 2008), antibacterial (Erasto et al., 2006),	Vernolide and vernodalol (Erasto et al., 2006), steroid glycosides and sesquiterpene Lactones (Namukobe et al., 2011)
<i>Plectranthus barbatus</i> Andrews	Leaf	Colic pain, inflammations, worms, stomachache, diarrhea, flue, cough	62	Leaf	Malaria (Katuura et al., 2007a), cough, tape worms (Namukobe et al., 2011)	Intestinal relaxant, antiplasmodial (Camara et al., 2003), neuronal acetylcholinesterase inhibitor (Falé et al., 2011)	Diterpenoids and essential oil (Alasbahi and Melzig, 2010)
<i>Mangifera indica</i> L.	Bark, Leaf	Cough, influenza, splenomegaly, worms, stomach wounds, nausea, kidney disease	52	Bark, root, all parts	Diarrhea (Tabuti et al., 2003), cough, wound healing, dysentery, anaemia, asthma, bronchitis, hypertension, insomnia, rheumatism, toothache (Shah et al., 2010), heel cracks, fever, snake bite, diabetes (Pakistan) (Umair et al., 2017)	Antidiabetic, anti-viral, cardiotoxic, anti-inflammatory, anti-oxidant (Shah et al., 2010), antibacterial, antifungal, antiparasitic, antitumor, antipyretic, antidiarrheal, antiallergic and gastroprotective properties (Wauthoz et al., 2007).	Mangiferin (Wauthoz et al., 2007), flavonoids, phenolic compounds and carotenoids (Auerbach et al., 2012)
<i>Aloe vera</i> (L.) Burm.f.	Leaf	Malaria, blood cleanser, allergy, typhoid, yellow fever, stomachache, worms, burns	46	Leaf	Stomachache, malaria (Uganda) (Tugume et al., 2016), yellow fever (Uganda) (Namukobe et al., 2011), mouth ulcers (Uganda) (Ssegawa and Kasene, 2007)	Antimalarial (van Zyl and Viljoen, 2002; Kumar et al., 2017) and anti-inflammatory (Vázquez et al., 1996)	Anthraquinones, polysaccharides, salicylic acid, tannin, lignin, alkaloids, saponins, fatty acids, and amino acids (Ibe et al., 2014)
<i>Momordica foetida</i> Schumacher	Leaf	Colic pain, stomachache, evacuation, backache, allergy, cough, worms, bloating, anorexia	45	Leaf	Flue, cough, worms (Uganda) (Namukobe et al., 2011), stomachache (Uganda) (Hamill et al., 2000)	Antiplasmodial, inhibition of heme degradation (Froelich et al., 2007)	Triterpenoids (Mutholland et al., 1997)
<i>Bothriocline longipes</i> (Oliv. & Hiern) N.E.Br	Leaf, root	Worms, abnormalities, urinary retention, cervical cancer, cough, diarrhea, colic pain, stomachache, malaria, pica, herpes zoster, Misfortune, pregnancy complications, snake bite, febrile seizures	39	Leaf	Malaria (Katuura et al., 2007a)	Antiplasmodial (Katuura et al., 2007b)	Guaianolides and 5-alkylcoumarins (Jakupovic et al., 1987)
<i>Thevetia peruviana</i> (Pers.) K. Schum.	Leaf, root	Febrile seizures, stomachache (children), cough, wounds, tinea capitis	36	Leaf	Cough (Uganda) (Namukobe et al., 2011)	Anti-termite, antimicrobial (Kareru et al., 2010)	Glycosides (Tewtrakul et al., 2002), pulegone, linoleic acid and palmitic acid (Gata-Gonçalves et al., 2003)

4. Conclusion

The study reveals that local communities living around and within QENP, MCFR and ICFR use a number of medicinal plants to treat various ailments. The communities possess an immense amount of indigenous knowledge of plants and their uses. Besides the common oral mode of administration of herbal remedies, this study reports touching with bare hands and sweeping on the affected area, as other exceptional modes of administration.

General and unspecified disorders, digestive disorders and respiratory disorders were the most representative disease categories basing on the many use reports and high F_{IC} values. The high F_{IC} values show that the local population exchange of information and/or used a well-defined selection criterion for plant species for these disease categories. *Gouania longispicata* used to treat allergy, *Plectranthus barbatus* used to treat colic pain and *Mangifera indica* used to treat cough, had the highest use reports for the treatment of these disease categories respectively. Basing on use reports and F_{IC} values, allergy has been found to be one of the prevalent ailments in the area, much as it has been given little attention by the health sector in Uganda.

Some of the more extensively medicinal plants with high frequency of citation, such as *Gouania longispicata*, no phytochemical or pharmacological studies have been reported so far. Thus, basing on the reported ethnomedical uses, there is need for further studies to support the claimed therapeutic uses and to also identify the active metabolites.

It was also noted that some medicinal plant species have become very rare in the study area, which meant that some of the medicinal plants are at a risk of extinction through over-exploitation or habitat destruction. This raises a need for the conservation measures of flora at both local and national level.

Conflicts of interest

All the authors declare no conflict of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jep.2019.111926>.

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