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Ethnobotanical survey of medicinal plants utilized by forest edge communities in southern Sierra Leone

Jonathan Johnny¹, Aiah Lebbie² and Richard Wadsworth²

¹Department of Wildlife Management and Conservation, School of Natural Resources Management, Njala University, Sierra Leone.
²Department of Biological Sciences, School of Environmental Sciences, Njala University, Sierra Leone.

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A total of 128 medicinal plant species belonging to 71 genera and 46 families were identified and used to treat 42 human ailments. Euphorbiaceae was the leading family with 14 species, followed by Rubiaceae and Leg-Caesalpiniaceae with 12 and 8 species, respectively. Seven species (Coffea stenophylla, Garcinia afzelii, Mitragyna stipulosa, Irvingia gabonensis, Nauclea diderrichii and Nesogordonia papaverifera) are of conservation concern. Herbs are the highest followed by shrubs, trees, climbers and epiphytes. Leaves are the most used parts, followed by roots, fruits, stems, flowers, nuts, tubers and seeds. The highest calculated Relative Frequency of Citations Index (RFC) was for Musa sapientum, followed by Zingiber officinale, Anisophyllea laurina, Cola nitida, Nauclea latifolia, Tetracera potatoria, Allophylus africanus, Cassia sieberiana and Termitomyces microcarpus. The highest Use Value index (UV) was calculated for Cola nitida (1.9) followed by Nauclea latifolia (1.56), Zingiber officinale (1.55) Ficus exasperata and Tetracera potatoria (1.44) respectively. Medicinal plants knowledge is strongly associated with the elderly in secret societies which are structured along gender lines. Plant use for medicinal reason actually addresses a significant part of the way of life and customs of the people living in this area and other rural locations in Sierra Leone.

Key word: Medicinal plants, ethnobotany, indigenous technical knowledge, Sierra Leone forests.

INTRODUCTION

Traditional medicine in Africa relies very heavily on plants the continued use of which depends on connected cultural and economic factors (Birhan et al., 2011; Diaz et al., 2013). The world health organisation (WHO) has urged African member states to advance and coordinate traditional medical practices in their health system (WHO, 2008). In many places medicinal plants are the most easily accessible health resource accessible to the community. Also, they are regularly the favored choice for the patients (Opara and Osayi 2016; Stangeland et al., 2011). For the majority of these individuals, traditional healers offer data, guiding, and treatment to patients and their families in an individual way just as having a comprehension of their patient's environment (Gurib-Fakim and Mahomoodally, 2013). Explanations for its continued popularity is credited to its minimal expense,
availability, arrangement with patient's cultural and religious values, and perceived efficacy and safety as well as disappointment with conventional healthcare (Birhan et al., 2011; Malik et al., 2013). Traditional medicine in Sierra Leone is normal with large percentage of the populace utilizing it (Diaz et al., 2013; James et al., 2018).

Most traditional medicinal remedies in this country use plants as the primary component. One unusual feature is the use of mixtures of plants or in combination with other non-plant materials. In Sierra Leone, medicinal plant use cuts across regional and tribal divide with an enormous extent of the population relying on plants for their health care needs. In specific regions, particularly in the north where livestock domestication is rampant, wild plants assumed a basic part in the health of the animals (Van der Merwe et al., 2001; Sanhokwe et al., 2016; Sankoh, 2017; Abebe, 2019).

Nationally, provincial regions are starved of medical facilities and medical staff are reluctant to live and work in rural areas because of the poor working conditions. Besides, health centers in distant regions are sparse, making its availability practically impossible for many communities. Of the six communities sampled in this survey, only two were within walking distance of health centers (less than 28 km).

The Rebel war (1991-2001) and the Ebola outbreak (2014-2015) both had a detrimental impact on natural resources of the region and particularly on forests such as the Kasewe forest reserve.

After the war, a large number of internally displaced persons (IDP) were unable to obtain land to farm and took advantage of weak central Government control to move into the “protected” forest either as charcoal burners, loggers or to make farms. A similar phenomenon happened during and after Ebola when people withdrew from settlements and “self-isolated”, and relied on exploiting the forest through logging, non-timber forest products (NTFP) harvesting, fuel wood collection, pole harvesting, plant parts and fruit collection, hunting and charcoal burning. Loggers and charcoal burners are now being “sponsored” by outside actors who provide power saws (chain saws) that allow significantly more exploitation to occur. Kasewe is conveniently situated on the main road connecting the capital (Freetown) to the largest provincial city (Bo), and hence allows easy sale or products.

There are very limited data regarding the use of traditional medicinal plants in central Sierra Leone, and it was uncertain whether there were significant differences between the Temne and Mende tribes that inhabit this region. The main aim of the current investigation is to document the ethnomedicinal information from the traditional healers of the forest edge communities. Specific objectives include: to identify medicinal plants used for the management of various disease conditions, and to perform quantitative analysis of the documented data using quantitative ethnobotanical indexes.

MATERIALS AND METHODS

Study area

The study was conducted in communities around the Kasewe forest reserve. Field data for this research was conducted from March to July, 2020. The reserve forest is located in the south-central portion of Sierra Leone approximately 170 km east of Freetown. This lowland forest gives way to medium-altitude forest (approximately >100 m) on the slope and peaks at the Kasewe hill ridges. Kasewe Forest Reserve (8°18′53″N 12°15′43″W / 8.31472°N 12.26194°W) is approximately 2,331 ha in size (UNEP, 2008). It is located in an area of hills along the Freetown-Bo highway in the Moyamba District, southern Sierra Leone. It is a tropical rainforest and contains a mosaic of moist semi-deciduous forest, evergreen forest and savanna (UNEP, 2008). The area is made up of volcanic rock with the hills standing up to about 500 m above the interior plains of the country, serving as an important water catchment area for all communities around the reserve (Lytwyna et al., 2006).

Demography

Kasewe Forest Reserve lies between Moyamba District in the Southern Province and Tonkolili District in the Northern Province of Sierra Leone. Communities around the Kasewe Forest Reserve are sparsely populated, except for three of these communities which are densely populated with a total population of 48,256, and over half of this population is made up of women (Statistics Sierra Leone, 2015). In terms of religion, Muslims dominate, followed by Christians and others. Administratively, Kasewe forest reserve is between three chiefdoms: Yoni in Tonkolili district, Kori and Fakunya in Moyamba district. Bush-fallow farming remains the mainstay of the residents outside the forest and the largest sector of the economies in these districts, providing livelihoods for over 80% of these communities (OCHA, 2015). Very few of the residents are involved in small scale trading in and outside these communities; formal employment is limited to teachers, police and health workers. Crops grown in these communities include cereals (maize, rice, sorghum and millet), other starch food crops (yam, cassava and sweet potato) and vegetables and spices like okra, pepper, ginger, in addition to fruits like pineapple and sugar cane. Moyamba junction is a resting stop for long-distance Government buses and is an important market for crops coming from Moyamba and Bonthe districts.

Sampling design and plant identification

Ethnobotanical survey was conducted in six villages where the two ethnic groups, Mende and Temne reside. The method utilized to collect data is essentially based on Participatory Rural Appraisal (PRA). Both qualitative and quantitative approaches were used to collect information on medicinal use of the plants. The qualitative methods included informal conversations, semi-structured interviews, field excursions and visits to some of their patients and treatment areas while the quantitative methods included preference ranking, relative frequency of citation and pairwise ranking (Giday et al., 2001; Gari et al 2015; Yineger and Yehwahaw, 2007). We worked with traditional herbalists, identified through consultative meetings held in the community where the village, section and paramount chiefs were resident. During the inception meetings, the community stakeholders identified established Traditional Medicinal Practitioner (TMP) and Traditional Birth Attendant (TBA) and locally recognised herbalists (H) in each of the communities. A total of 14 traditional healers were interviewed. For each of the plants listed, the part(s) used and where possible, the disease(s) treated were recorded. At each of the six forest edge communities, interview
was conducted with the informants on knowledge about the local flora, and the practicing traditional healer provided information on the ethnomedical uses of each species. Two traditional healers who served as informant from each community were taken to the field on a separate day and time to prevent collaborated answers. During the inventory, informant started from their backyards and walked into the forest patch providing information on the local names, uses, parts utilized, and collection and preparation methods of the species. With each informant, voucher specimens of the plants were collected and identified at the National Herbarium of Sierra Leone (at Njala University), and voucher specimens were deposited there as well. The status of the collected plants has been verified according to the International Union for Conservation of Nature and Natural resource (IUCN).

Pair wise and preference ranking techniques were used to study the ranking given to each of the different types of plants. The ranking was done with 6 respondents, 2 from each of the categories of herbalists. Each respondent ranked six different types of species in their order of preference. Preference ranking was done in order of preference of medicinal plant collected to obtain total ranks by the total number of rankers. While pair wise ranking was done to obtain a total score computed for each type of species. The higher the total score, the more preferred the given type of species.

Calculation of indices

The importance of each plant was calculated based on five attributes:

(i) Frequency of citation (FC) (Tardio and Pardo-de Santayana, 2008)
(ii) Relative frequency of citation (RFC) (Tardio and Pardo-De-Santayana, 2008).
(iii) Use value.
(iv) Fidelity level (FL) (Friedman et al., 1986)
(v) Preference index (PI) (Amatya et al., 1996)

Frequency of citation (FC) is calculated as follows (Tardio and Pardo-De Santayana, 2008):

\[ FC = \frac{100 \times N_u}{N_r} \]

Where: \( N_u \) = Number of times a particular species was mentioned
\( N_r \) = Number of times that all species were mentioned \( \times \) 100.

Relative Frequency of Citations Index (RFC) is calculated (Heinrich et al., 1998):

\[ RFC = \frac{N_u - N_i}{N_u - 1} \]

Where: \( N_u \) = total number of use reports from informants for a particular plant-use category; \( N_i \) = total number of taxa or species associated with that plant-use category across all informants. Use Value index is calculated as:

\[ UV = \frac{X}{N} \]

Where: \( X \) = number of uses mentioned by the informants for a given species; \( N \) = total number of informants interviewed

Fidelity level (FL) is calculated as (Friedman et al., 1986):

\[ FL = \frac{Ni \times 100}{N} \]

Where: \( Ni \) = the number of informants mentioning the use of plant species for a particular disease category; \( N \) = the number of informants citing the usage of that plant species for any disease category; Fidelity level shows the percentage of informants claiming the use of a certain plant species for the same major purpose. This is designed to quantify the importance of the species for a given purpose.

Preference Index (PI) is calculated (Amatya et al., 1996) thus:

\[ \text{Preference Index} = \text{Sum} \left( \text{Preference level} \times \text{No. of respondent} \right) / \text{Total no of respondents} \]

RESULTS AND DISCUSSION

Demography and knowledge variation

Demographic data demonstrates that women (average known species = 5.72; average cited uses = 9.38) had more knowledge about plants than men (average known species = 4.98; average cited uses = 8.05), and the paired sample t-test of p-value = 0.024 indicated a significant difference between the gender and knowledge about medicinal plants score. Age was used as second classification criterion and informants were classified into three major categories that is, above 60, between 40-60 and less than 40. Elders (age above 60) had more knowledge (71.43%) about plants than younger people (28.57%). It was evident that 89% of the traditional healers in all communities around Kasewe forests are “title holders” (highly placed) in both the male and female secret societies, and they are also highly skilled in the utilization of plants for purposes other than traditional medicine. Lebbie and Guries (1995) made similar observations about the Kpaa Mende tribe in the Moyamba District of Sierra Leone where they found ethnobotanical information about medicinal plants frequently dwelling with specific individuals or families, often women. Much of this knowledge was found to be acquired through their enrollment in specialized social groups, such as ‘secret societies’, which are also structured along gender lines (Hughes et al., 2015; Langat et al., 2021).

Age and gender seem to be closely related in terms of medicinal plant use and knowledge, and these relationships have been observed in various studies involving medicinal plant knowledge (Asfaw and Mekuria 2016; Aziz et al., 2018). In general, older people are far more knowledgeable about medicinal plants than the younger people (Lebbie et al., 2017; Morka, 2021; Silva et al., 2011; Ghorbani 2005; Voeks and Leony, 2004; Onyiapat et al., 2011). For male herbalists in Western Cameroon, it was reported that they held more knowledge of medicinal plants than female herbalists (Tsobou et al., 2015), although another study from Nigeria found men and women holding similar knowledge (Ayantunde et al., 2011). In three rural communities in Niger, Guimbo et al. (2011) stated that the average and total number of medicinal plant species cited by men and women did not differ significantly. They also observed women were vastly knowledgeable with edible plants, but less detailed on construction plant species. These results indicate the fact that plant knowledge variation among gender and
age largely depends on the culture, gender roles and values of different communities.

**Medicinal plants of the study area**

A total of 128 medicinal plant species belonging to 71 genera and 46 families were used by the local communities to treat 42 human ailments (Table 1). Euphorbiaceae was the leading family with fourteen species (10.38%), followed by Rubiaceae and Leguminosae-Caesalpiniaceae with twelve and eight species respectively. Chetri et al. (2018) conducted a similar study in Gosiling Gewog, Bhutan and reported that Euphorbiaceae have the highest number of medicinal plants species that are used by local people. This trend has also been observed by Ibrahim et al. (2010); Giday et al., 2007 and Soladoye et al. (2010) in Nigeria wherein they recorded the highest number of species of medicinal plants among the Fabaceae followed by Euphorbiaceae. Of the species recorded, more than three-quarters (79.74%) were collected from the wild and the remaining (16%) were from home gardens. Hunde et al. (2006) and Regassa et al. (2017) reported that about 54 and 49% of medicinal plants, were collected from the wild in Tehuledere and Halaba districts, respectively. Gonfa et al. (2020) reported Fabaceae and Asteraceae as the leading families each represented by five species in studies conducted in the Gera District in Ethiopia.

In Sierra Leone, Kabba (2016) recorded 48 medicinal plants species used by communities around Kasewe Forest Reserve, with 32 species recorded in both studies, while 14 medicinal plant species recorded in that study could not be accounted for in the current study. The largest percentage of medicinal plants obtained belonged to the family Rubiaceae followed by Euphorbiaceae, Leguminosae, Apocynaceae, Malvaceae and Anacardiaceae. Ethnobotanical assessment of the Kpaa Mende tribe recorded 75 medicinal plants from sacred groves in Moyamma District, Sierra Leone. With the highest number of medicinal plants obtained belonging to the family Euphorbiaceae followed by Rubiaceae, Apocynaceae, Asteraceae, Leguminosae, Malvaceae and Anacardiaceae.

Through market survey, Cuni-Sanchez and Jusu (2014) recorded more than 40 species traded in urban markets, with nine of the most frequently traded species recorded here. Lebbie and Turay (2017) recorded a total of 18 plant species belonging to 14 plant families reportedly used as anti-venom plants by herbalists treating snakebites in 14 villages in the Kori chiefdom in southern Sierra Leone. The family Euphorbiaceae was recorded with the highest number of species followed by Gramineae in the management of snake bite in the area. In an investigation of ethnomedicinal uses of plants among the Bassa of Rivercess County in Liberia, they recorded a total of 112 species belonging to 52 families in 93 genera.

Seven plant families were reported to account for 43.9% of the total number of species utilized, including Annonaceae, Apocynaceae, Costaceae, Rubiaceae, Euphorbiaceae, Fabaceae and Verbenaceae. The list of species and uses from the Kasewe herbalists are given in (Table 1 and Figure 1).

**Growth form and plant parts used as medicine**

The growth form analysis of medicinal plants revealed that the largest proportion were herbs (33 species, 31.13%), followed by shrubs (17 species, 24.3%), trees (24 species, 22.64%), climbers (14 species, 13.21%) and epiphytes (8 species, 7.55%). Similar findings were also reported in work done by Kyoshabire et al. (2017), which recorded herbs and shrubs as the two leading growth forms. Lautenschläger et al. (2018) reported related observations in northern Angola, while Hamilton (2004) and Tabuti et al. (2003) confirmed the dominance of herbs in local medicinal plant remedies. In agreement with this, several authors have recorded that, herbs with medicinal plant properties were dominant in local plant remedies (Amsalu et al., 2018; Bahadura et al., 2020; Ali et al., 2020; Chekole et al., 2015). Mbuni et al. (2020) have observed shrubs as the most used form, followed by trees, herbs, climbers, epiphytes and parasitic plants in Western Kenya. Lagnika et al. (2016) indicated that among the reported plants, trees were the most cited, followed by shrubs and herbs. Similar findings were also reported in work done by Adefa and Abraha (2011), where shrubs were the dominant lifeform applied in treatment.

Results showed that leaves (48%) and bark (21%) were the most commonly used plant parts, followed by roots (9%), fruits (7%), stems (6%), flowers (2%), nuts, tubers and seeds (1.5%). Amjad et al. (2020), reported leaves, whole plant, and roots as the most preferred plant parts used in herbal preparations. Studies by Poffenberger et al. (1992) and Giday (2001) made similar observations that mirror results obtained by Kumar et al. (2013); Hosseini et al. (2021); Urso et al. (2016) and Naghibi et al. (2014); Morshed and Nandni (2012). On the contrary, Mbuni et al. (2020) observed roots as the most dominant parts followed by leaves, bark, fruits and branches in studies in Western Kenya. Nankayaya et al. (2019) cited roots as the most dominant plant parts used in traditional medicine in the Maasai community in Kenya. Luitel et al. (2014) recorded the fruits and seeds as the frequently used plant parts followed by leaves and petioles in central Nepal. In an ethnobotanical investigation carried out in Turkey, Emre et al. (2021) observed that the aerial parts are the most frequently used plant parts followed by leaves, fruits and flowers. Tsoutsou et al. (2019) reported flowers and inflorescences as the most used plant parts followed by aerial parts, leaves, fruits and seeds, and underground.
Table 1. Medicinal plants and ethnomedicinal uses reported by herbalists in Kasewe.

| Scientific name                        | Family                  | Collection no | Parts use       | UV | RFC | Ethnobotanical values                                                                 |
|----------------------------------------|-------------------------|---------------|-----------------|----|-----|---------------------------------------------------------------------------------------|
| *Acioa scabrifolia* Hua               | Rosaceae                | JJ 222        | Leaves          | 1  | 0.21| Heart pain                                                                            |
| *Aframomum latifolia* K. schum         | Zingiberaceae           | JJ 364        | Leaves          | 1  | 0.07| Fever, abdominal swelling                                                            |
| *Aframomum sceptum* (Oliv. & Hanb.) K Schum | Zingiberaceae           | JJ 228        | Stems           | 1  | 0.07| Fever                                                                                 |
| *Aframomum sp*                        | Zingiberaceae           | JJ 226        | Leaves          | 1  | 0.21| Fever                                                                                 |
| *Ageratum conyzoides* L.              | Compositae              | JJ 353        | Leaves          | 1  | 0.29| Fever                                                                                 |
| *Albizia adiantifolia* W.Wight         | Leguminosae Mimosaceae  | JJ 389        | Bark, roots and leaves | 1 | 0.21| Hip-pain, body wounds, toothache                                                        |
| *Albizia zygia* (DC.) JF Macbride      | Leguminosae Mimosaceae  | JJ 363        | Barks           | 1  | 0.07| Body pains, headache, reproductive problems in women, respiratory problems, wounds and pain, skin diseases, diabetes, eye problems, aphrodisiac |
| *Alchornea cordifolia* (Schumach. &Thonn.) Mull. Arg | Euphorbiaceae | JJ 290        | Leaves          | 1.25 | 0.29| Bleeding from a new wound, high blood Pressure                                         |
| *Alchornea hirtella* Benth.           | Euphorbiaceae           | JJ 220        | Leaves and or barks | 2  | 0.07| Excessive bleeding from new wounds                                                     |
| *Amaralai sherbourniae* Benth         | Rubiaceae               | JJ 284        | Leaves          | 1  | 0.14| Heart problems, cough                                                                  |
| *Amorphophallus aphyllus* (Hook.) Hutch. | Araceae                | JJ 280        | Leaves          | 1  | 0.07| Witch gun(fetish)afflictions                                                           |
| *Amphimas pterocarpoides* Harms        | Leguminosae-papilionoideae | JJ345        | Bark, root, leaves | 3  | 0.14| Fever (including malaria) and female sterility, aphrodisiac                           |
| *Ananas comosus* (L) Merr.            | Bromeliaceae            | JJ 366        | Stems           | 3  | 0.36| Asthma, malaria, typhoid and fever                                                     |
| *Anisochrocladus barten* Sc. Elliot    | Araceae                 | JJ 356        | Leaves /barks   | 2  | 0.29| Potency, stomach pain                                                                 |
| *Anisophyllum laurina* R Br.          | Rhizophoraceae          | JJ 275        | Stems and leaves | 1.25 | 0.79| Eye problems, stomach pain                                                            |
| *Anthocleista vogelii* Planch.         | Gentianac               | JJ 315        | Leaves/Barks    | 1  | 0.07| Severe body pains                                                                     |
| *Bacopa erecta* Hutch. & Dalziel      | Scrophulariaceae        | JJ 265        | Leaves          | 1  | 0.07| Severe head ache                                                                      |
| *Baphia polygalacea* (Hook. f.) Bak.   | Leguminosae Papilionaceae | JJ 385       | Leaves          | 1  | 0.29| Common cough                                                                          |
| *Bombax buonopozense* Beauv.           | Bombacaceae             | JJ 343        | Leaves          | 1  | 0.14| Head ache                                                                             |
| *Bridelia micrantha* (Hochst.)         | Euphorbiaceae           | JJ 266        | Leaves          | 1  | 0.07| Ulcer                                                                                 |
| *Cajanus cajan* (Linn.) Millsp.        | Leguminosae Papilionaceae | JJ 219       | Leaves          | 2  | 0.03| Measle                                                                                |
| *Carica papaya* Linn.                 | Cariciaceae             | JJ 380        | Leaves          | 1  | 0.14| Stop bleeding                                                                         |
| *Carapa prodera* DC                   | Meliaceae               | JJ 248        | Bark, root, fruits and seeds | 1  | 0.07| Cough, Fever, Syphilis skin diseases and Kwashiorkor                                  |
| *Cassia alata* Linn.                  | Leguminosae Caesalpinaceae | JJ 305      | Leaves          | 3  | 0.03| Excretion problems, constipation                                                       |
| *Cassia sieberiana* DC.                | Leguminosae Caesalpinaceae | JJ 269      | Leaves and Fruits | 1.25 | 0.57| Stomach ache, malaria                                                                 |
| *Ceiba pentendra* Linn                | Bombacaceae             | JJ 401        | Bark            | 1  | 0.14| Paralysis                                                                              |
| *Chasmopodium caudatum* (Hack.) Stapf  | Gramineae               | JJ 292        | Leaves          | 2  | 0.02| Snake bite                                                                            |
| Plant Name                                    | Family          | Common Name(s)                                                                 | Use(s)                                                                 |
|----------------------------------------------|-----------------|--------------------------------------------------------------------------------|----------------------------------------------------------------------|
| Chromolinia odorata (L.) R.M.King & H.Rob.   | Compositae      | Leaves, JJ 221                                                                 | 1.04                                                                  |
| Cleistopholis patens Engl. & Diels          | Annonaceae      | Barks, JJ 368                                                                  | 1.04                                                                  |
| Clerodendron scandens Beauv.                 | Verbanaceae     | Leaves, JJ 397                                                                 | 0.21                                                                  |
| Cnestis ferruginea DC.                       | Conaraceae      | Leaves, JJ 259                                                                 | 1.25, 0.57                                                            |
| Cola canecfeolia (G. Don) K. Schum.          | Sterculiaceae   | Leaves, JJ 302                                                                 | 1.07                                                                  |
| Cola heterophylla (P. Beauv.) Schott & Endl. | Sterculiaceae   | Leaves, JJ 287                                                                 | 2.0                                                                  |
| Cola latenita K Schum.                       | Sterculiaceae   | Barks, JJ 224                                                                  | 1.36                                                                  |
| Cola nitida (Vent.) Schott & Endl.           | Sterculiaceae   | Leaves, JJ 301                                                                 | 1.9, 0.71                                                             |
| Combretum smeathmannii G.Don                 | Combretaceae    | Leaves, JJ 344                                                                 | 1.21                                                                  |
| Thaumatococcus danielli (Benn.) Benth.       | Marantaceae     | Leaves and roots, JJ 217                                                       | 1.07                                                                  |
| Combretum comosum G.Don                     | Combretaceae    | Leaves, JJ 330                                                                 | 2.03                                                                  |
| Costus afer Ker Gawl                         | Zingiberaceae   | Stems, JJ 309                                                                  | 1.14                                                                  |
| Cymbopogon citratus (DC.) Stapf              | Gramineae       | Leaves and root, JJ 421                                                        | 2.03                                                                  |
| Cuviera acutiflora DC.                       | Rubiaceae       | Leaves, JJ 284                                                                 | 1.06                                                                  |
| Daniellia thurifera (Harms) Rolfe ex Holland| Leguminosae     | Leaves and bark, root, JJ 315                                                   | 1.14                                                                  |
| Datura montele L.                            | Solanaceae      | Leaves, JJ 300                                                                 | 1.06                                                                  |
| Dialium guineense Wild.                     | Leguminosae     | Leaves, JJ 329                                                                 | 1.21                                                                  |
| Dichrostachys glomerata (Forssk.) Chiov.     | Leguminosae     | Barks, JJ 323                                                                  | 1.05                                                                  |
| Dioscorea multiflora Mart. ex Griseb         | Dioscoreaceae   | Stem, JJ 296                                                                   | 1.24, 0.23                                                           |
| Diospyros heudelotii Hiern                   | Ebenaceae       | Roots, JJ 304                                                                  | 1.05                                                                  |
| Dissotis paucistellata Stapf.                | Melastomaceae   | Leaves, JJ 350                                                                 | 1.09                                                                  |
| Elaeis guineensis Jacq.                      | Palmae          | Roots and Barks, JJ 289                                                        | 1.05                                                                  |
| Erythrococca anomala (Juss. ex Poir.) Prain  | Euphorbiaceae   | Leaves, JJ 396                                                                 | 1.14                                                                  |
| Euphorbia lateriflora Schum. & Thonn.        | Euphorbiaceae   | Leaves, JJ 308                                                                 | 1.18                                                                  |
| Fagara macrophylla Engl.                     | Rutaceae        | Leaves, bark and root, JJ 388                                                   | 1.21                                                                  |
| Ficus capensis Thumb                         | Moraceae        | Roots, JJ 238                                                                  | 1.43                                                                  |
| Ficus exasperata Vahl                        | Moraceae        | Roots, JJ 270                                                                  | 1.44, 0.29                                                           |
| Futunmia africana (Benth.) Stapf             | Apocynaceae     | Roots and Leaves, JJ 282                                                       | 1.32                                                                  |
| Geophila obvallata (Schumach. & Thonn.) Didr | Rubiaceae       | Leaves, JJ 236                                                                 | 1.43                                                                  |
| Gmelia arborea Roxb.                         | Verbanceae      | Barks, JJ 254                                                                  | 1.07                                                                  |
| Gossypium barbadense L.                      | Malvaceae       | Bark, JJ 322                                                                   | 1.07                                                                  |

**Note:** The table contains information on the medicinal uses of the plants mentioned. The columns represent the plant name, family, common names, uses, and related symptoms or effects. The table continues with additional entries that are not fully visible in the image provided.
| Scientific Name                      | Family            | Code  | Part Used                        | Quantity | Weight | Use                                                                 |
|-------------------------------------|-------------------|-------|----------------------------------|----------|--------|----------------------------------------------------------------------|
| **Garcinia afzelii Engl.**          | Guttiferae        | JJ 347| Leaves, bark, seed and root      | 1        | 0.21   | Aphrodisiac, cough and stomach-ache,                                   |
| **Gracina kola Heckel**             | Guttiferae        | JJ 231| Seed, root and bark              | 2        | 0.07   | Purgative, antiparasitic, throat infection, diarrhea, bronchitis, and  |
| **Guibourtia copalifera Benn.**     | Leguminosae-Caesalpinaceae | JJ 375| Bark                             | 1.14     | 0.5    | Diarrhea, fevers                                                       |
| **Hallea stipulosa (DC.)**          | Rubiaceae         | JJ 380| Leaves                           | 1        | 0.07   | Coughs arthritis, rheumatism and colic                                |
| **Harunga madagascariensis Poir.**  | Hypericaceae      | JJ 327| Leaves Root and Bark             | 1        | 0.14   | Ear pain, internal stomach pain, bodily wounds                         |
| **Hibiscus esculentus (L.) Moench** | Malvaceae         | JJ 387| Leaves, root and bark            | 1        | 0.21   | Fever. cuts, wounds and boils diuretic                                |
| **Hibiscus sabdaritta (Roselle)**   | Malvaceae         | JJ 358| Leaves                           | 1        | 0.07   | Cough                                                                |
| **Hibiscus sterciliitolius Balf.f.**| Malvaceae         | JJ 311| Leaves                           | 2        | 0.21   | Tooth ache, sickle cell                                               |
| **Hippocratea iotricha Loes.**      | Celastraceae      | JJ 245| Leaves/Roots                     | 1        | 0.14   | Split head, sexual desires in men                                     |
| **Holarrhena africana A. DC**       | Apocynaceae       | JJ 361| Leaves                           | 1        | 0.03   | Spinal problem, impotency in men                                      |
| **Homalium letestui Pellegr.**      | Samydaceae        | JJ 39  | Bark                             | 1        | 0.07   | Swollen body parts                                                     |
| **Hymenocardia lyrate Tul.**        | Euphorbiaceae     | JJ 244| Leaves/Barks                     | 1        | 0.05   | Joint pains and Cough                                                  |
| **Imperata cylindrica Linn.**        | Gramineae         | JJ 351| Leaves                           | 2        | 0.04   | Bone problems                                                         |
| **Ipomoea batatas (L.) Lam**        | Convolvolaceae    | JJ 436| Leaves and Stem                  | 1        | 0.07   | Dysentery, constipation, fatigue, kidney ailments                      |
| **Ipomoea involucrata P.Beauv.**    | Convolvolaceae    | JJ 381| Leaves                           | 1        | 0.21   | Malaria and boils                                                     |
| **Irvingia gabonensis**             | Irvingiaceae      | JJ 248| Bark, leaves and root             | 1        | 0.07   | Headache, asthma, liver and kidney                                     |
| **Lecaniodiscus cupanioides Planch.**| Sapindaceae       | JJ 255| Leaves                           | 2        | 0.29   | Strengthening young babies with physical weakness to growth healthy   |
| **Lonchocarpus cyanescens (Schum. & Thonn.) Benth.** | Leguminosae Papilionaceae | JJ 349| Leaves                           | 1        | 0.02   | Split head and miscarriage                                            |
| **Luffa aegyptiaca Mill.**          | Cucurbitaceae     | JJ 264| Leaves                           | 1        | 0.14   | Stomach ache                                                          |
| **Macaranga barteri Mull.-Arg.**    | Euphorbiaceae     | JJ 367| Leaves                           | 1        | 0.07   | Gonorrhoea                                                           |
| **Magifera indica L.**              | Anacardiaceae     | JJ 360| Barks                            | 1        | 0.21   | Skin rash and infections                                              |
| **Manihot esculentus Crantz**       | Euphorbiaceine    | JJ 288| Leaves                           | 1        | 0.14   | Witch gun(fetish) afflictions                                         |
| **Mareya micrantha Müll.Arg.**      | Euphorbiaceae     | JJ 239| Leaves                           | 1        | 0.07   | Frequent stooling, constipation, broken hands and legs, fracture      |
| **Margantaria discoideus (Baill.) Webster** | Euphorbiaceae    | JJ 216| Leaves                           | 1.33     | 0.21   | Swollen stomach, Boils, ribs pain, witch gun (fetish)                 |
| **Marsdenia latifolia (Benth.) K.Schum.** | Asclepiadaceae   | JJ 253| Leaves                           | 1        | 0.07   | Stomach pain                                                          |
| **Massularia acuminata(G.Don) Bullock ex Hoyle** | Rubiaceae | JJ 336| Root                             | 1        | 0.14   | Potency in men                                                        |
| **Mezoneurum berthamianum Baill.**  | Leguminosae Caesalpinaceae | JJ 299| Leaves                           | 1        | 0.07   | Internal stomach problem, body pain, enable children with weak legs to walk faster |
| **Microdesmis puberula Hook.f. ex Planch.** | Euphorbiaceae    | JJ 372| Leaves                           | 1        | 0.14   | Witch-crafts activities (Fetish), rectum projection                   |
| **Milicia regia (A.Chev.) C.C.Berg**| Moraceae          | JJ 392| Bark                             | 2        | 0.07   | Blood pressure                                                        |
| **Milletia sanagoma Sc. Elliot**    | Leguminosae Papilionaceae | JJ 346| Leaves                           | 1        | 0.21   | Bodily pains                                                          |
| **Monodora spp**                    | Annonaceae        | JJ 298| Leaves                           | 0.23     | 0.43   | Malaria, Pain killers                                                 |
Table 1. Contd.

| Plant Name                              | Family                      | Code   | Part Used                     | Strength | Description                                                                 |
|-----------------------------------------|-----------------------------|--------|-------------------------------|----------|-----------------------------------------------------------------------------|
| Mimosa pudica L.                        | Leguminosae-Mimosaceae      | JJ 383 | Leaves/stems                  | 1        | 0.14 Pregnancy pain, skins boil, nervous system and swollen foot            |
| Monodora spp                            | Annonaceae                  | JJ 298 | Leaves                        | 0.23     | 0.43 Malaria, Pain killers                                                 |
| Morinda germinata DC.                   | Rubiaceae                   | JJ 215 | Leaves                        | 1        | 0.07 Heart attack, stomach ache, deworming. Resolve stomach ache problems in newly born babies |
| Musa sapientum L.                       | Musaceae                    | JJ 286 | Leaves / fruit                | 1        | 0.86 Stomach upset, vomiting                                               |
| Napoleona heudelotii A.Juss.            | Lecythidaceae               | JJ 306 | Leaves                        | 1        | 0.21 Dysentery, diarrhoea                                                  |
| Nauclea diderrichii (De Wild. & Th.Dur.)| Rubiaceae                   | JJ 370 | Barks/Roots                   | 1        | 0.07 Malaria                                                                 |
| Coffea stenophylla G.Don                | Anonaceae                   | JJ 250 | Leaves / Bark / Roots         | 1        | 0.29 Influenza, anemia, edema and body pain                               |
| Newbouldia laevis Seem.                 | Bignoniaceae                | JJ 325 | Roots                         | 1        | 0.14 Rectum pains, pile                                                   |
| Olyra latifolia Smith                   | Ixonanthaceae               | JJ 359 | Leaves                        | 1        | 0.13 Waist bone                                                            |
| Octoknema boreale Hutch. & Dalziel      | Octoknemataceae             | JJ 345 | Leaves                        | 1        | 0.12 Ear-drum pains                                                       |
| Palinari excelsa Sabine                 | Chrysobalanaceae            | JJ 248 | Leaves and bark               | 1        | 0.07 Enlargement of body parts                                             |
| Phyllocosmus africanus (Hook.f.) Klotsch| Ixonanthaceae,             | JJ 272 | Leaves                        | 1        | 0.07 Hip and ribs pains                                                   |
| Piptadeniastrum africanum (Hook.f.) Brenn| Leguminosae-Mimosaceae    | JJ 227 | Bark                          | 1        | 0.05 Elephantiasis                                                        |
| Pleicarpa tricarpellate Benth.          | Apocynaceae                 | JJ 223 | Bark                          | 1        | 0.14 Malaria                                                                |
| Premna hispida Benth.                   | Verbancheae                 | JJ 328 | Roots                         | 1        | 0.14 Boil                                                                  |
| Psidium guajava L.                      | Myrtaceae                   | JJ 246 | Leaves                        | 1        | 0.07 Dysentery                                                              |
| Psychoria reptans Benth.                | Rubiaceae                   | JJ 218 | Leaves                        | 1        | 0.02 Skin infections, Gonorrhea                                             |
| Rauvolfia vomitoria Wennberg            | Apocynaceae                 | JJ 320 | Roots, leaves, and stem       | 1        | 0.04 Convulsions, fever, weakness, inability to sleep, mental disorders, pain and prolonged menstruation |
| Rhaphiostrylis beninensis (Hook.f.) Planch. | Icacinaceae                | JJ 277 | Stem                          | 1        | 0.14 Broken hand or leg, fracture                                          |
| Rhigiocarya racemifera Miers            | Menispermaceae              | JJ 225 | Stem                          | 1        | 0.21 Enlargement of body parts                                             |
| Salacia senegalensis (Lam.) DC.         | Celastraceae                | JJ 362 | Roots                         | 1        | 0.14 Inflammation from fire burn, Stomach-ache                             |
| Terminalia ivorensis A. Chev            | Combretaceae                | JJ 337 | Barks and Leaves              | 1        | 0.07 Malaria, waist bone problem, enlargement of body parts                |
| Samanea dinklagei (Harms) Keay          | Leguminosae Mimosaceae      | JJ 324 | Bark                          | 1        | 0.07 Bodily wounds                                                        |
| Santinia trimera (Oliv.) Aubrev.        | Burseraeae                  | JJ 233 | Root, Leaves and Bark         | 1        | 0.14 Constipation, Kwashiwokor                                              |
| Selaginella myosorus (Sw.) Alston        | Selaginellaceae             | JJ 213 | Leaves                        | 1        | 0.13 Skin infections (Alay), Cough, body pains                            |
| Sida latifolia L.                       | Malvaceae                   | JJ 314 | Leaves                        | 1        | 0.07 Pregnancy pain                                                        |
| Sida stipulata Cav.                     | Malvaceae                   | JJ 409 | Leaves, roots                 | 1        | 0.14 Nasal congestion, cough, urinary tract infections, headaches         |
| Sorindia junglandifolia A. Chev          | Anacardiaceae               | JJ 341 | Leaves                        | 1        | 0.06 Internal stomach problems                                            |
| Spondias mombin Linn.                   | Anacardiaceae               | JJ 278 | Leaves                        | 1        | 0.07 Menstrual problems                                                   |
### Table 1. Contd.

| Species                                    | Family             | Preparation | Use                                                                                             |
|--------------------------------------------|--------------------|-------------|-------------------------------------------------------------------------------------------------|
| Steganotaenia araliacea Hochst.            | Umbellifera        | JJ 365      | Barks                                                                                           | Enlargement of body parts, stomach pain |
| Sterculia tragacantha Lindl.               | Sterculiaceae      | JJ 271      | Leaves                                                                                          | Head ache, gonorrhea, barreness, liver diseases |
| Termomysis microcarpus (Berk. & Broome) R. Heim, Mem. | Lyophylliaceae. | JJ 352      | Leaves                                                                                          | Head ache, gonorrhea, barreness, liver diseases |
| Tetracera potatoria G.Don                  | Dilideniaceae      | JJ 319      | Leaves                                                                                          | Witch gun (fetish), tooth-ache, gonorrhoea. |
| Tragia tenuifolia Benth.                   | Euphorbiaceae      | JJ 278      | Leaves                                                                                          | Stomach complication                    |
| Trichilia heudelotii Planch. ex Oliv.      | Meliaceae          | JJ 333      | Leaves                                                                                          | Malaria                               |
| Triclisia patens Oliv.                     | Menispermacae      | JJ 374      | Roots                                                                                           | Testicle enlargement (scrotrum), scrotrum problem in men |
| Triumfetta cordifolia A Rich.             | Tiliaceae          | JJ 237      | Leaves                                                                                          | Pregnancy pain (aid in delivery).      |
| Uapaca guineensis Mull.-Arg.               | Euphorbiaceae      | JJ 407      | Leaves                                                                                          | Internal stomach ache                  |
| Uncaria africana G.Don                     | Rubiaceae          | JJ 294      | Leaves                                                                                          | Cough                                 |
| Uvaria afzelii Sc. Elliot                 | Anonaceae          | JJ 230      | Roots                                                                                           | Malaria                               |
| Uvaria chamae P. Beauv.                   | Anonaceae          | JJ 274      | Roots/Bark                                                                                     | Malaria and fever                      |
| Vismia guineensis Druce                    | Hypericaceae       | JJ 348      | Leaves                                                                                          | Wounds                                |
| Xylopia aethiopica A.Rich.                | Anonaceae          | JJ 241      | Fruits                                                                                         | Lung problems                          |
| Zanthoxylum gilletii (De Wild.) P.G.Waterman | Rutaceae           | JJ 283      | Leaves                                                                                          | Headache, stomach-ache, toothache and pain after childbirth, cough, colds, skin complaints |
| Zinger officinale (L.) H. Karst.           | Zingiberaceae      | JJ 237      | Roots and leaves                                                                               | Catarrh, asthma, stroke, toothache, constipation, diabetes |

### Method and condition of plant preparations

Several modes of preparation are employed; decoction is the most common (31.11%), followed by drying and turning into a powder (24.45%), dried extract (20%), poultices/dressing (15.56%) and infusion (8.8%). Fongod et al. (2014) in Southern Cameroon observed the preparation of plants in this order: decoctions, infusions, macerations, powders, mixtures, squeezing, boiling, and direct eating. Nankaya et al. (2019) recorded decoction as the most common preparation method followed by pounding and burning. Tsioutsiou et al. (2019) reported infusion or decoction as the principal method of herbal preparations followed by maceration in alcohol or oil, used raw, poultice, and other. Kadir et al. (2014) and Song et al. (2013) and James and Bah (2014) observed various preparation methods for administering medicinal plants including decoction, infusion, juice, powder, paste, pills, sirup, smoke and raw. In contrast to this, Gonfa et al. (2020) reported crushing as the principal method of plant remedy preparation followed by exudation, squeezing, concoction, and pounding among local people in Ethiopia. Infusion was reported by Erasto et al. (2005) as the commonest method of herbal preparation in Eastern Cape Province (South Africa). In western Nepal, Singh et al. (2012) observed herbalists making juice preparation to be common followed by decoction. The variations reported here in the modes of preparations depend on the diseases, area of infection, experience of traditional healer, intensity of sickness and availability of plant species or alternatives. Kadir et al. (2014) and Song et al. (2013) observed various preparation methods for administering medicinal plants including decoction, infusion, juice, powder, paste, pills, sirup, smoke and raw, and bear some similarity to some of the findings obtained in the Kasewe area in Sierra Leone.

The majority of the remedies (91.78%) in the study area were prepared exclusively from fresh parts, with a few made from previously prepared and stored material (2.63%). Two-thirds (67.8%) of remedies consist of a single species, the remaining are a mixture of two or more plants.
Similar results were reported by Abdurhman (2010) indicating that 86% of preparations were in fresh form. Eshete et al. (2016), as well as others (James et al., 2016; Megersa et al., 2013; Ranasinghe et al., 2015; Bahadura et al., 2020; and Chekole (2017) reported the use of single plant species or parts for traditional medicinal plant treatment. Among secret society women in Sierra Leone, it was reported that multi-species combinations are common in the treatment of afflictions. Multi-species use in traditional medicine is known to have synergistic effect which might serve to explain the common practice among some herbalists. They recorded a concoction of the following five plants is used as a remedy for malaria, *Napoleona heudelotii*, *Nauclea latifolia*, *Morinda geminata*, *Gouania longipetala*, and *Alstonia boonei*.

**Sources of knowledge about medicinal plants**

Most informants (73.2%) said they were taught about medicinal plants by their parents, friends (23.81%), traditional healers (9.52%) and husbands (9.52%). All of the informants were members of the Poro (male) and Sande (female) secret societies and their adherence to secrecy often prevents them from saying anything about what they learnt in the “sacred bush”. Ethnobotanical information on the Kpaa Mende tribe in Sierra Leone reported similar research observations, although the former was able to get female herbalists of such a secret society to have their knowledge of medicinal plants documented. Secrecy of traditional medicinal practices is a wide spread phenomenon among traditional healers in some regions of the world. Several studies have however, revealed that some traditional healers might have considered knowledge transfer whilst others maintain secrecy (Mesfin et al., 2014; Agisho et al., 2014; Tora and Heliso, 2017). The idea that medicinal plants will lose their mending power and the dread of losing cultural acknowledgment and notoriety which traditional healers have earned because of their insight are reasons forwarded by Agisho et al. (2014) and Mesfin et al. (2014).

**Relative frequency of citation index (RFC)**

The RFC of the reported species ranged from 0.07 to 0.86%, with an average of only 9% (Table 1). The highest RFC was calculated for domesticated plants such as *Musa sapientum* (0.86%), *Zingiber officinale*, *Anisophyela aurina* (0.79% each), *Cola nitida* (0.71%), and farmbush species such as *Nauclea latifolia*, *Tetracera potatoria* (0.64%) and *Allophylus africanus*, *Cassia sieberiana*, *Termitomyces microcarpous* (0.57%). Giday (2001) and Lautenschläger et al. (2018) made similar observations in Ethiopia and Angola respectively with slight differences, like some of the species are more farm bush and domesticated, while we have a mix of forest and domesticated. Lautenschläger (2018) and Ngbolua et al. (2019) used the RFC in their study in Angola and Gabon to determine the most important local plant species of the various communities. Lautenschläger (2018) recorded RFC below 0.05 and 14% between 0.05 and 0.1, and 20% more than 0.1. The values ranged from 0.37 to 0.02, and majority of the species are from the wild.

**Use value index (UV) and fidelity index (FL)**

The use value (UV) index demonstrates the relative
importance of plant species and families for a population. In the present investigation, the UV of the reported medicinal plant species varied from 1 to 1.9. If a plant secures a high UV score, that indicates there are many use reports for that plant, while a low score indicates fewer use reports cited by the informants. The highest UV was calculated for Cola nitida (1.3) followed by Nauclea latifolia (1.56), Zingiber officinale (1.55) Ficus exasperata and Tetracera potatoria (1.44). A low UV for plants like Panicu dinklagei, Parinari excelsa, Pentaclethra macrophylla, Phyllocosmus africanus and Piper umbellatum may be partly due to less accessibility and limited ethnobotanical uses to the informants. Afolayan et al. (2014) employed this analytical tool to do quantification and cross verification of the ethnobotanical information for the management of skin disorders in the study area. They observed twenty-five skin disorders, classified under five categories. The highest ICF (0.45) was linked to bacteria-related skin disorders, comprising of 57 use citations; 3 skin disorders; with sore throat being the most frequently mentioned. Rokaya et al. (2010) Kretchy et al., 2014; Kumar et al., 2011 and Gui et al. (2012) employed the use value index to determine the overall effectiveness of the mentioned plant species in the context of curing skin ailments. They documented 161 plant species belonging to 61 families used for treating 73 human ailments. Gastro-intestinal ailments have the highest ICF (0.80), whereas ophthalmological uses have the lowest (zero) ICF. Mentha spicata and Rumex hastatus had the highest FL (100% each) both being used for gastro-intestinal ailments.

Fidelity level shows the percentage of informants claiming the use of a certain plant species for the same major purpose. Accordingly, the FL of Nauclea latifolia (155.56%) and Zingiber officinale (154.55%) were very similar for two different ailments: one for eye problems and the other for bodily pain, while the FL of 100% each were calculated for Gmelina arborea and Cassia occidentalis for fever diseases. The FL of Geophila obvallata and Citrus limon was found to be 100% each for the treatment of malaria. Islam et al. (2014) and Malik et al. (2019) used the FL index to determine the relevance of medicinal species in their areas of research. They concluded that, the use value (UV) of P. granatum and O. ferruginea was higher (0.84), while P. somniferum had the highest FC value (98) with V. thapsus having the lowest FC (0.13). The RFC value of P. somniferum is highest (0.93) among other species. The higher RFC shows the importance of P. somniferum in local Piran community in the treatment of cough. Ugulu (2012) used Fidelity level index to determine that Cucumis sativus followed by Rosmarinus officinalis have the highest use among plant remedies in local communities in Turkey.

Preference ranking

Plant species of various types are used for the treatment of different ailments. In such cases, indigenous people show preference towards plant species on the basis of their healing power against a given disease. Preference ranking was applied to five medicinal plant species used to treat Diarrhea; Musa sapientum ranked first followed by Anisophyllum laurina. Informants further stated that Musa sapientum works best when it is roasted and mixed with honey. Ghani (2003); reported that all parts of the banana plant have medicinal uses, while flowers are used in treating bronchitis, dysentery, menorrhagia and ulcers. Rabbani et al. (2001) described the anti-diarrhoeal activity of green banana diet to be very effective in children with diarrhea, but fruits of Musa sapientum L. can also be consumed as a treatment for dysentery (Rahmatullah et al., 2017; Lavanya et al., 2016).

General features of home gardens in the study area

Home gardens vary a lot, but generally tend to be smaller at higher elevations in the Kasewe area due to the apparent high elevation gradient. Gardens are rain fed and are not under any irrigation apart from limited hand watering of vegetables in the dry season. Fongod et al. (2014) observed an increase in the domestication of some wild plants such as Alstonia boonei De Wild., Baillonela toxicperma Pierre, Bidens pilosa L., Cymbopogon citratus (DC.) Stapf, Senna alata (Linn.) Roxb., Eremomastax speciosa (Hochst.) Cuf., Centella asiatica (L.) Urb., Morinda lucida Benth., Ricinus communis Linn. by the indigenous people of southern Cameroon. Ibrahim et al. (2016) observed that a total number of 33 plant species were reportedly cultivated by the TMPs in Nasarawa state, Nigeria. Most gardens are dominated by perennials and species that can withstand a 6-month dry season. In the study area, many home gardens contain Musa paradisiaca L., Musa sapientum L., Saccharum officinarum L. and Cola nitida (Vent.) Schott and Endl. which were multi-use (medicinal, fruit and income generating) species. Other common crops noted were Citrus limon (Linn.) Burm.f., Citrus simensis Osbeck, Aframomum sp, Carica papaya Linn., Hibiscus esculenta (L.) Moench., Capsicum annum L., Allium sativum L., Zea mays L. and Sorghum bicolor (L.) Moench. Most of the TMP gardens cultivate trees that are easy to propagate and fast growing (Moringa oleifera Lam, Carica papaya Linn) than other species that are slow growing (Kujawska et al., 2018; Peroni et al., 2016; Poot-Pool et al., 2015; Cheikhyoussif and Embashu 2013). Observed also were trees that were used for dual purposes as for food and medicine as in Anacardium occidentale L. (Cashew), Citrus spp and Magnifera indica L. (Ibrahim et al., 2016; Cheikhyoussif and Embashu 2013; Kumar and Jnanesha 2018).

In terms of home garden management studies in Tilzapota (Mexico), Ortiz-Sánchez et al. (2015) reported that 84% of plants were cultivated, 17% were enhanced, 15% were tolerated and 4.2% were protected.
Conclusion

The current investigation demonstrates that traditional medicinal plants still form a fundamental part of health care in remote rural locations in Sierra Leone. Knowledge of medicinal plants is strongly associated with the elderly in secret societies (poro and bondo/sande) which are structured along gender lines. This societal delineation and secrecy might have limited the ability of informants in sharing information about the usefulness of some medicinal plants with outsiders. Plant use for medicinal reason actually addresses a significant part of the way of life and customs of the people living in this area. The investigation uncovered that there is still a higher floristic richness in the area, although this is recognized as being under threat by key informants. The forest patches have been impacted by agrarian activities, with logging and charcoal burning consisting of the two major threats to plant life in the forest. There is still a wealth of medicinal plant within the forest, but their long-term survival might be in question as the forces of exploitation collide with conservation needs, limiting future availability of such plants for traditional medicinal use.

As rural-urban development spreads and a growing decline in customary traditions prevails, there is the likelihood that most of the plant knowledge will also disappear as the forest continues to decline. Recording this information is important as the older people might eventually be gone in the near future and the knowledge of medicinal plant use held by them disappears. Medicinal plants in the Kasewe area are also confronted with the risk of destruction since the herbalists claimed to travel longer distances searching for certain medicinal plants that used to be close by. This examination similarly highlighted certain perils faced to the local flora including cultivation, deforestation, logging and charcoal burning that is affecting sustainability. Hence, sound management frameworks ought to be executed for the sustainable use of medicinal flora and safeguarding of traditional knowledge.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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