

# Diversity of Species Used as Toothbrushes in the District of Kpakpamè (Commune of Za-Kpota) in the Department of Zou in Benin

Rachad K. F. M. Ali 

Department of Geography and Territorial Planning, Faculty of Human and Social Sciences, University of Abomey-Calavi, Beninese, Benin

Email: ali.rachad2022@gmail.com

**How to cite this paper:** Ali, R. K. F. M. (2024). Diversity of Species Used as Toothbrushes in the District of Kpakpamè (Commune of Za-Kpota) in the Department of Zou in Benin. *Journal of Geoscience and Environment Protection*, 12, 388-402. <https://doi.org/10.4236/gep.2024.1212023>

**Received:** November 25, 2024

**Accepted:** December 27, 2024

**Published:** December 30, 2024

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## Abstract

Vegetable toothbrushes are secondary forest products with health, medicinal, and pharmaceutical properties. They constitute an important resource permanently exploited by the populations of the Kpakpamè District. This research aims to identify the different plants used by the populations of Kpakpamè as toothbrushes and their therapeutic values. To reach this objective, documentary research, direct observation, and data collection from hundred and ninety-five (195) people randomly chosen but following well-defined criteria were carried out. The consensus value for plant parts noted CPP, is calculated to find the number of times a plant part is cited (Px) divided by the total number of times all parts are cited (Pt), and also to determine the most frequent collection sites, the consensus value for collection sites is calculated. In total, nineteen (19) species have been cited and grouped into nineteen (19) genera and eleven (11) families. *Pseudocedrella kostchyi* and *Zanthoxylum zanthoxyloides* are the most cited species with respective citation frequencies of 0.27 and 0.14. They come more from village lands with a Consensus value for collection sites (CCS) of 0.49 and are used to cure about twelve (12) diseases including dental caries (33.33%). These species are now almost threatened with extinction according to the IUCN. It is therefore important to develop safeguarding and sustainable conservation actions for these plant species. This work has made it possible to identify the different species used by the populations of the Kpakpamè district as toothbrushes despite the urbanization and modernization of this locality formerly known in the Zou department as the most endogenous region. Several studies have focused on the diversity of plants used for oral hygiene and even the phytochemical properties of the species identified without taking into account the phytodistrict, social and perceptions of local populations.

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## Keywords

Benin, Biodiversity, Forest Products, Vegetable Toothbrush

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### 1. Introduction

African rural communities have traditional knowledge about the value of many plant species (Moupela et al., 2011: p. 7). Thus, the use of plant brushes is not only a habit transferred from generation to generation for oral toileting but also a cheap solution that is necessary due to the precarious purchasing power of rural populations (Akpona et al., 2009: p. 3). To do this, the list of plant brush species should be quite dynamic since rural populations tend to use new species in the event of a drastic reduction in the individuals of species to which they are accustomed (Ako-déwou et al., 2014: p. 2). In conditions where hygiene and oral care are very far from daily priorities, the use of the tooth rub stick could make it possible to maintain good oral health, essential for the general condition and quality of life as recalled by the World Health Organization (Janot, 2013: p. 8).

For Sher et al. (2009: p. 12), the effectiveness of the toothbrush is therefore to be credited to its mechanical action via its plant fibers, but also to the release of its chemical active ingredients which inhibit growth and the production of acids of bacterial origin. The toothbrush is as effective as the traditional toothbrush in removing bacterial plaque from dental surfaces (Batwa et al., 2006: p. 12). The proper use of the plant brush is also an aspect that escapes everyone's knowledge. Thus, the meaning of cleaning consists of frequent elimination of food products remaining attached to the teeth and eminently fermented targets with the production of acids and foul odors (Barrau and Portères, 2018: p. 2).

There is also, on the one hand, a clear relationship between the part of the plant exploited and the regeneration of the species (Delvaux et al., 2009: p. 7), and on the other hand, the method of collection and the harvesting intensity on species regeneration (Gaoué and Ticktin, 2007: p. 9).

For Adjakpa (2015: p. 42), *Jatropha curassa* is revealed as the plant most used by households for the treatment of dental caries due to its frequency of citation which is the highest in the Communes of Dassa-Zoumé and of Savè. This species seems to contain active ingredients with disinfectant, antifungal, and antiparasitic activity in terms of oral hygiene (Blanco, 2011: p. 2).

In the Municipality of Za-Kpota, a diversity of plant species is intended for several uses. Thus, the stem of *Prosopis Africana* is used as a toothpick in the Commune of Za-Kpota (Ali, 2016: p. 18). Precisely in the Kpakpamè District, there are plant species commonly used by households for oral hygiene as a plant brush. However, the proven knowledge of these plant species remains a concern among indigenous populations and the scientific world. This research provides answers to these numerous questions, in particular, the different species of plants for oral and dental use by the populations of the District of Kpakpamè and their

therapeutic values.

## 2. Material and Method

### 2.1. Study Environment

Located to the north of the Municipality of Za-Kpota, the District of Kpakpamè is one of the eight (08) administrative subdivisions that make up the Municipality of Za-Kpota. It is between the parallels 7° 14'27" and 7° 20'30" north latitude and then between 2° 05'09" and 2° 14'27" east longitude. It covered a population of 15,327 inhabitants in 2013 with an area of 230 km<sup>2</sup>. This district is made up of seven (07) villages: Kpakpamè, Somè, Dramè, Mlinkpin-guingni, Tangbé, Affosowogba, and Davègo (Akpohè, 2018: p. 22). The capital of this district is the village of Kpakpamè (Figure 1).

Kpakpamè has a subequatorial climate characterized by two rainy seasons and two dry seasons (Akpohè, 2018: p. 26). The annual rainfall average varies between 900 and 1000 mm. This climate is favorable for the growth of plant species in general and those used as brush in particular. The research area belongs to the coastal sedimentary basin zone. The relief as a whole is not very rugged and dominated by plateaus with an altitude varying between 20 and 200 m. However, elevations with some rocky outcrops are observed in the Kpakpamè District. The village of Togadji is also the seat of outcrops of magmatic rock with vertical outlets of the earth from the rock in places similar to human construction. The same goes for the arrangement of the blocks of rock on top of each other. Nature itself has carved the rock with various shapes. But, this rock disintegrates with detachments of blocks, and cracks in the rock allowing the emergence of saxicolous vegetation (Delvaux et al., 2009: p. 708). This relief favors the growth of several plant species including those used as plant brush in the Kpakpamè District. The vegetation is characterized by a savannah, which experiences a fair amount of anthropogenic pressure, in particular the mosaics of crops and fallows which can be under palm trees, the zones of tree and shrub savannah. However, this plant formation is very populated by species such as *Daniellia Oliveri*, *Adansonia digitata*, *Vitex doniana*, *Ceiba pentandra*, *Parkia biglobosa*, etc. Some other species such as *Lophira lanceolata*, *Vitellaria paradoxa*, *Prosopis africana*, and *Anogeissus leiocarpa* in the research sector where most are used as plant brushes in the treatment of oral hygiene.

### 2.2. Sampling

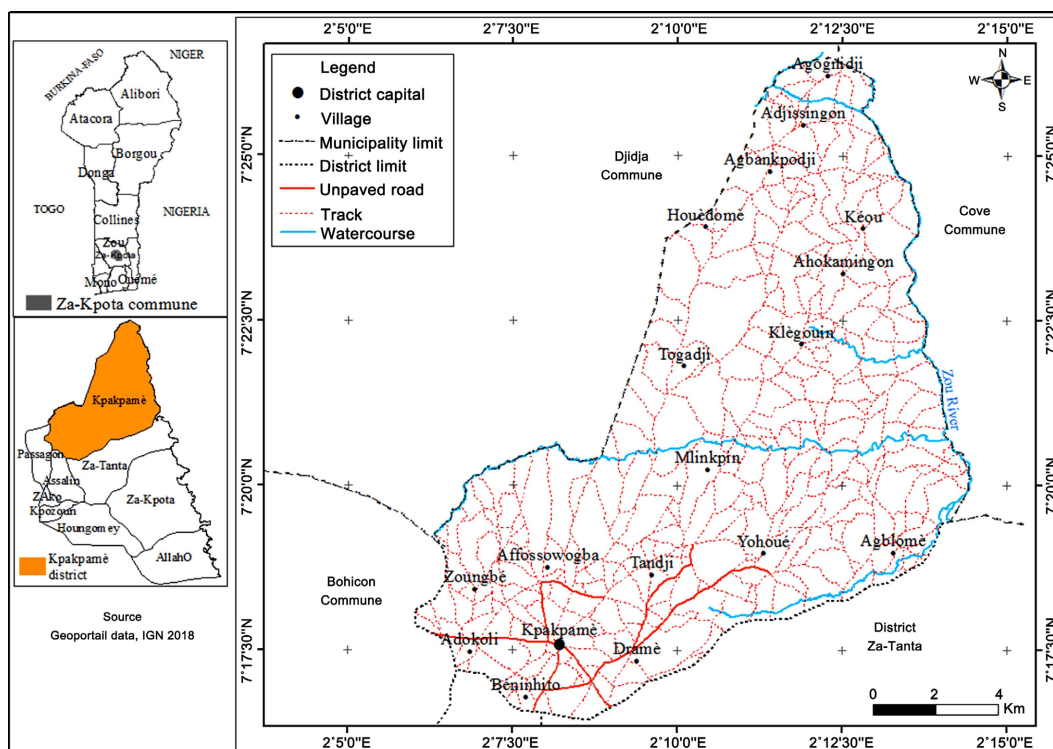
The data used are of two types (qualitative and quantitative) and collected either from existing literature (documentary research) or from fieldwork.

Surveys are carried out in all villages in the Kpakpamè District. Thus, the sample was determined by the formula of Schwartz (1995):

$$N = Z\alpha^2PQ/d^2$$

with: N is the sample size per district;  $Z\alpha$  is the difference set at 1.96 and corresponds to a confidence level of 95%; P is the number of households in the village divided by the total number of households in the District; Q is the difference of

one and  $P(Q = 1 - P)$ ;  $d$  is the margin of error which is equal to 5%. **Table 1** shows the distribution of the sample by village.



**Figure 1.** Geographical location of the District of Kpakpamè.

**Table 1.** Distribution of the sample by village.

Villages	Sample	Proportion (%)
Affossowogba	20	10
Davègo	26	13
Dramè	36	19
Kpakpamè	39	20
Guingni-Mlinkpin	17	9
Somè	29	15
Tangbé	28	14
<b>Total</b>	<b>195</b>	<b>100</b>

**Source:** Fieldwork, August 2023.

In total, one hundred and ninety-five (195) people were identified and investigated.

### 2.3. Collection of Data

To achieve the objective of this research, an identification sheet of plant species used as toothbrush was designed based on previous studies carried out by other

authors, an ethnobotanical and oral survey sheet to know the different uses and virtues of the species and a GPS to take the geographical coordinates of the points of presence of the inventoried plant species were used.

The different data collection techniques focused on direct observations made to identify the species used as toothbrush plants; the questionnaire survey for the collection of species recognized and used by each person surveyed to obtain precision on the species used as toothbrush plants.

Regarding the information relating to the therapeutic values of the species used as toothbrush plants, the interview in the local Fon language was the technique used. It was supported by focus groups with herbalists, in this case the sellers of the organs of the plant species in the Kpakpamè district. Endogenous knowledge was the main basis of this research given that the study was carried out in a very rural environment with an illiteracy rate of 90% but which is home to a large number of herbalists with quality endogenous knowledge.

## 2.4. Data Analysis

After listing the plant brush species, the scientific names were first identified using the analytical flora of [Akoègninou et al. \(2006\)](#). The following parameters were calculated. These include:

### ■ Consensus value for Plant Parts (CPP)

This value is calculated to know the number of times the part of a plant is cited (Px) divided by the total number of times all parts are cited (Pt).

$$CPP = Px/Pt \text{ (Koura et al., 2011: p. 10)}$$

### ■ Consensus value for Collection Sites

To determine the most frequent collection sites, the consensus value for collection sites from ([Monteiro et al., 2006: p. 5](#)) is calculated. The consensus value for collection sites is calculated as follows:

$$SCC = Sx/St$$

with Sx: the number of times a collection site is cited; St: the total number of collection site citations. QGIS 2.18 software was used to create the situation map.

## 3. Results

### 3.1. Diversity and Therapeutic Values of Plant Brush Species in Kpakpamè District

Nineteen (19) plant species divided into nineteen (19) genera and eleven (11) families are used as plant toothbrushes in the Kpakpamè District ([Table 2](#)).

**Table 2.** List of species used as vegetable toothbrushes.

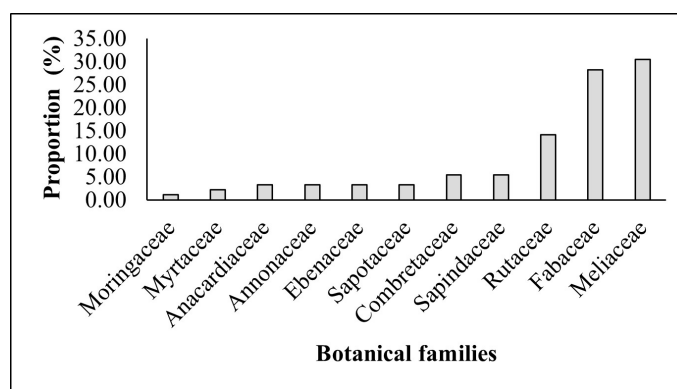
N°	Local Names	Scientific Names	Family	TB	TP
1	Acadjutin	<i>Anacardium occidentale</i> L.	Anacardiaceae	mPh	Pan
2	Gniglo	<i>Annona senegalensis</i> Pers.	Annonaceae	np	SZ

## Continued

3	Kininutin	<i>Azadirachta indica</i> A. Juss.	Meliaceae	mPh	Pal
4	Zatin	<i>Daniellia oliveri</i> (Rolfe) Hutch. & Dalziel	Fabaceae	mPh	S
5	Hlihon	<i>Diospyros mespiliformis</i> Hochst. ex A. DC.	Ebenaceae	mPh	SZ
6	Batin	<i>Lonchocarpus sericeus</i> (Poir.) Kunth ex DC.	Fabaceae	mPh	SG
7	Assianssian	<i>Millettia thonningii</i> (Schumach. & Thonn.) Baker	Fabaceae	mPh	GC
8	Yovokpatin	<i>Moringa oleifera</i> Lam.	Moringaceae	mPh	Pal
9	Ahouatin	<i>Parkia biglobosa</i> (Jacq.) R. Br. ex G. Don	Fabaceae	mPh	SZ
10	Ganganlissè	<i>Paullinia pinnata</i> L.	Sapindaceae	Lmph	At
11	Klontin	<i>Piliostigma thonningii</i> (Schumach.) Milne-Redh.	Fabaceae	mPh	SG
12	Kakè	<i>Prosopis africana</i> (Guill. & Perr.) Taub.	Fabaceae	mPh	SZ
13	Dorkpé	<i>Pseudocedrela kotschyi</i> (Schweinf.) Harms	Meliaceae	mPh	S
14	Kinkoun	<i>Psidium guajava</i> L.	Myrtaceae	mPh	Pan
15	Djèvivi	<i>Tamarindus indica</i> L.	Fabaceae	mPh	Pan
16	Alotoun	<i>Terminalia glaucescens</i> Planch. ex Benth.	Combretaceae	mPh	SG
17	Casia	<i>Vachellia sieberiana</i> (DC.) Kyal. & Boatwr.	Fabaceae	mPh	S
18	Hougo	<i>Vitellaria paradoxa</i> C. F. Gaertn.	Sapotaceae	mPh	S
19	Hètin	<i>Zanthoxylum zanthoxyloides</i> (Lam.) Zepern. & Timler	Rutaceae	mPh	SG

Source: Survey results, August 2023.

### 3.1.1. Botanical Families of Plant Brush Species



**Figure 2.** Botanical families of plant brush species. Source: Field-work, August 2023.

**Figure 2** shows the distribution of species used as plant brushes in the Kpakpamè District according to their botanical family. Eleven (11) botanical families are presented in this figure. The most represented families are Meliaceae (30.43%), Fabaceae (28.26%), and Rutaceae (14.13%). On the other hand, Moringaceae (1.09%) and Myrtaceae (2.17%) are the least dominant. These plant species used as plant-based toothbrushes are exploited by the Fon (84%), Adja (3%), Mahi (6%), Peuhl (2%), and other ethnic groups (5%). Furthermore, among the species

inventoried, some are mentioned more than others. This demonstrates their great usefulness in the care of oral treatment and other illnesses in the district.

### 3.1.2. Species Citation Frequency

**Table 3** presents the frequency of citation of species.

**Table 3.** Frequency of citation of species used as a vegetable toothbrush.

Scientific Names	Px	CPP
<i>Pseudocedrela kotschyi</i>	25	0.27
<i>Zanthoxylum zanthoxyloides</i>	13	0.14
<i>Prosopis africana</i>	6	0.07
<i>Paullinia pinnata</i>	5	0.05
<i>Terminalia glaucescens</i>	5	0.05
<i>Daniellia oliveri</i>	4	0.04
<i>Vachellia sieberiana</i>	4	0.04
<i>Anacardium occidentale</i>	3	0.03
<i>Annona senegalensis</i>	3	0.03
<i>Azadirachta indica</i>	3	0.03
<i>Diospyros mespiliformis</i>	3	0.03
<i>Lonchocarpus sericeus</i>	3	0.03
<i>Millettia thonningii</i>	3	0.03
<i>Tamarindus indica</i>	3	0.03
<i>Vitellaria paradoxa</i>	3	0.03
<i>Piliostigma thonningii</i>	2	0.02
<i>Psidium guajava</i>	2	0.02
<i>Moringa oleifera</i>	1	0.01
<i>Parkia biglobosa</i>	1	0.01
Pt	<b>92</b>	<b>1</b>

**Source:** Fieldwork, August 2023.

From **Table 3**, it appears that of the 19 species cited by the populations, only *Pseudocedrella kostchyi* and *Zanthoxylum zanthoxyloides* are more used as plant brushes with a respective citation frequency of 0.27 and 0.14. **Plate 1** presents these species.

According to the surveys, the people surveyed (100%) declared that they often used *Pseudocedrella kostchyi* to treat tooth decay, constipation, and cough, and *Zanthoxylum zanthoxyloides* to also treat tooth decay and stomach aches.



**Plate 1.** *Pseudocedrela kostchyi* and *Zanthoxylum zanthoxyloides*. **Shooting:** Ali, August 2023.

### 3.2. Organs of Species Used as Plant Toothbrushes

Different organs are taken from these species to serve as plant brushes (**Table 4**).

**Table 4.** Organs of species used as plant toothbrushes.

Parts of the Plants	Px	CPP
Stem	77	0.84
Root	12	0.13
Stem and root	3	0.03
<b>Pt</b>	<b>92</b>	<b>1</b>

**Source:** Fieldwork, August 2023.

It appears from the analysis of **Table 4** that the stem (0.84) is the organ most used as a vegetable toothbrush. Roots (0.13) are also used and for some species, both organs (stems and roots) can be used. The tools used to remove these organs are the cutter (73.91 %) and the hand (26.09 %). **Photo 1** shows the processing of plants before selling.



**Photo 1.** Processing the collected plants for sale. **Shooting:** Ali, August 2023.

It appears from the observation of **Photo 1** that the species are cut into small pieces and peeled. Then, the sellers use the oil palm leaflets to make small batches. These batches are the plant brushes sold to the populations (**Plate 2**).



**Plate 2.** Sale of vegetable toothbrushes in Tindji market. **Shooting:** Ali, August 2023.

From the observation of **Plate 2**, it appears that in the market, some sellers are itinerant and walk around to release their products. On the other hand, other sellers park in the same location for the sale.

### 3.3. Consensus Values of Supply Methods and Locations

During field surveys, data is collected on the methods of supplying species as well as the places of supply. These collected data made it possible to calculate the consensus values (**Table 5**).

**Table 5.** Consensus values of supply methods.

Supply methods	Sx	CCS
Purchase	24	0.26
Harvest	68	0.74
St	92	1

**Source:** Fieldwork, August 2023.

From the analysis of **Table 5**, it appears that two main methods allow resellers to supply plant brushes: harvest (0.74) and purchase (0.26). The majority of sellers go directly to the fields, fallows, and markets to harvest/collect the species. But sometimes, they order the species from young people or from farmers who take the samples to resell them. The places where these species are collected are diverse (**Table 6**).

**Table 6.** Consensus values of supply locations.

Supply Locations	Sx	CCS
Villages	45	0.49
Togadji	18	0.20
Market	15	0.16
Davègo	8	0.09
Farm	5	0.05
Home made	1	0.01
St	92	1

**Source:** Fieldwork, August 2023.

It emerges from the analysis of **Table 6** that the species used as plant brush come from six places namely: village lands, Togadji, market, Davègo, farm, and house.

### 3.4. Therapeutic Values of Species Used as Plant Brush in the District of Kpakpamè

#### 3.4.1. Phyto-Therapeutic Uses of Plant Brush

In the Kpakpamè District, it has been indicated that plant species used as brushes are used to treat certain conditions. **Table 7** shows the different species used as plant brushes which are used in traditional medicine.

**Table 7.** Phyto-therapeutic uses of plant brush.

Species	Used parts	Usage	Cure
<i>Vachellia sieberiana</i>	Stem	Teeth Brushing	Tooth decay
	Leaf + Root	Decoction	Typhoid fever
<i>Anacardium occidentale</i>	Stem	Teeth Brushing	Tooth decay
	Bark + Leaves	Decoction	Diabetes
<i>Azadirachta indica</i>	Stem	Teeth Brushing	Tooth decay
	Leaves + Seeds + Fruits	Decoction	Malaria
	Seeds + Water	Decoction	Bad breath
<i>Daniellia Oliveri</i>	Root	Decoction	Toothache
	Stem	Teeth Brushing	Bad breath
	Stem	Teeth Brushing	Bad breath
<i>Dyospyros mespiliformis</i>	Stem	Teeth Brushing	Bad breath
	Stem + Leaves + Roots	Decoction	Dentition trouble
<i>Lonchocarpus sericeus</i>	Roots	Teeth Brushing	Tooth decay
	Stem	Teeth Brushing	Bad breath
	Leaves	Decoction	Coughing
	Leaves	Decoction	Dentition trouble
<i>Milletia thonningii</i>	Root	Teeth Brushing	Tooth decay
	Stem	Decoction	Sickle cell anaemia
<i>Moringa oleifera</i>	Stem	Teeth Brushing	Tooth decay
	Seeds	Infusion	Malaria
<i>Parkia biglobosa</i>	Root	Mastication	Tooth decay
<i>Paullinia pinnata</i>	Stem	Teeth Brushing	Tooth decay
	Stem + Root	Decoction	Typhoid fever
<i>Piliostigma thonningii</i>	Stem	Teeth Brushing	Tooth decay
<i>Prosopis africana</i>	Stem	Teeth Brushing	Gingivitis
	Stem + Root	Decoction	Dentition trouble

## Continued

<i>Pseudocedrella kotschy</i>	Root	Teeth Brushing	Tooth decay
	Root + Leaves	Decoction	Constipation
	Stem	Gargling	Malaria
	Bark + Leaves	Decoction	Coughing
	Stem + Root	Decoction	
<i>Psidium guajava</i>	Stem	Teeth Brushing	Toothache
	Leaves + Root + Fruits	Infusion	Malaria
<i>Tamarindus indica</i>	Stem	Teeth Brushing	Tooth decay
	Seeds	Infusion	Malaria
	Stem	Decoction	Stomach-ache
<i>Terminalia glaucescens</i>	Stem	Teeth Brushing	Tooth decay
		Gargling	Gingivitis
<i>Vitellaria paradoxa</i>	Root	Teeth Brushing	Tooth decay
	Stem	Decoction	Stomach-ache
	Root + Leaves	Gargling	Dentition trouble
<i>Zantoxylum zantoxylodes</i>	Root	Teeth Brushing	Tooth decay
	Root + Ahowé + Sasalikui + Ayokpè + Gbaata	Decoction	Sickle cell anemia
	Stem	Decoction	Stomach-ache

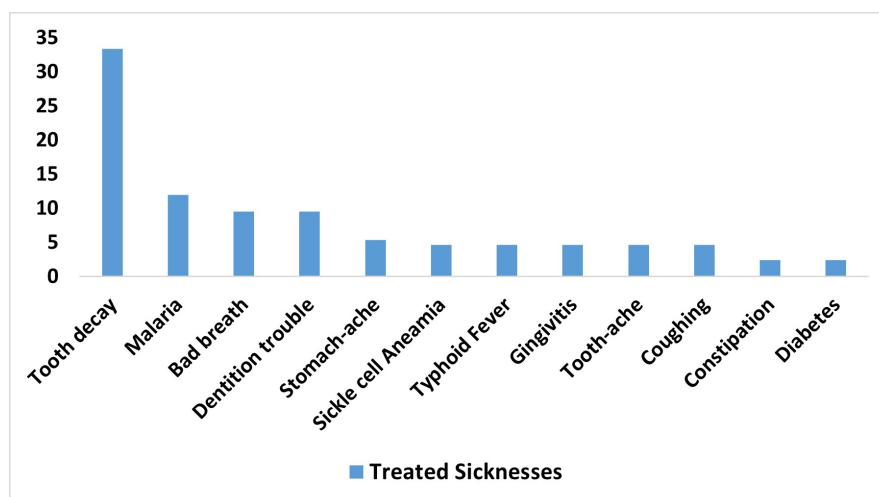
Source: Field survey, August 2023.

From the analysis of **Table 7**, it appears that eighteen (18) plant species are used as brushes and to cure certain pathologies such as dental caries, teething problems, gingivitis, malaria, stomach aches, coughs, toothaches, etc. The usages identified during this study are: brushing teeth, decoction, and infusion, chewing and swallowing the juice, gargling, and drinking. The different methods of transformation such as decoction, infusion, and gargles are taken as a drink, bath, or massage. Knowledge about the use of these medicinal plants as brushes and their properties is passed down from generation to generation. The virtues of these plants constitute secrets for populations.

### 3.4.2. Treatments of Conditions Using Plant Brush Species

Plant brush species are used by the populations of the Kpakpamè District to treat various conditions (**Figure 3**).

It appears from the analysis of **Figure 3** that tooth decay (33.33%) is the disease most commonly treated by plant species used as brushes among populations. Next come malaria (11.90%), bad breath (9.52%), and teething problems (9.52%). On the other hand, constipation and diabetes with a proportion of 2.38% each, are diseases that are sometimes treated. Thus, local populations have strong knowledge of the treatment of diseases through the use of plant brush species.



**Figure 3.** Proportion of different diseases treated. **Source:** Field surveys, August 2023.

The many uses made of plant brush species make them vulnerable. The different pressures identified on the ground concern activities linked to vegetation. These include agricultural activities, medicinal exploitation, timber exploitation, and livestock breeding.

As measures of sustainability and protection of the species identified and used as a vegetable toothbrush by the population, these are reforestation (13.04%), awareness raising (19.57%), and the creation of vegetable garden. The creation of home gardens is the best-recommended measure to facilitate the domestication of species.

#### 4. Discussion

The District of Kpakpamè (Commune of Za-Kpota) is diversified in plant brushes used by the population. This research made it possible to identify plant species used as toothbrushes to treat various ailments. The use of these species varies depending on the ailments they treat. A total of 19 plant species are grouped into 19 genera and belong to 11 families. The most represented families are Meliaceae (30.43%), Fabaceae (28.26%), and Rutaceae (14.13%). This plant diversity is similar to that of 18 species recorded in the Municipality of Dassa-Zoumè and Savè by Adjakpa (2015: p. 4). On the other hand, it is low compared to the number of plant species used as brushes (35) found by Akpona et al. (2009: p. 7) in southern and central Benin. These differences could be explained by the specific richness of the environment, the climatic conditions of each environment, etc. *Pseudocedrela kostchy* and *Zanthoxylum zanthoxyloides* are the plant species most cited as being used by the local population as a vegetable toothbrush. This result is similar to that obtained by Attikassou (2013: p. 31) in the Municipality of Za-Kpota, who already identified the species *Zanthoxylum zanthoxyloides* as a species used for the treatment of oral and gastric conditions. Stems and roots are essentially the organs of species used as plant brushes. This result corroborates with that of Barrau and

Portères (2018: p. 17) on chewed vegetable sticks used as teeth rubs. For these authors, it is only the stems and roots of plant species that serve as toothbrushes for African populations. Depending on the different organs of the species used, the harvesting method ranges from simple removal to pulling out the plant. This does not bode well for the sustainability of the species, whereas for Djossou (1985: p. 23), the plant brush is a traditional means of oral hygiene for Africans. From the point of view of the method of harvesting the organs of the species used as a vegetable toothbrush, this research has shown that it is harmful to biodiversity in general and in particular to the vegetation of the district of Kpakpamè, therefore, the treatment of conditions oral hygiene in the traditional way constitutes a threat to plant species. These results are different for plant organs used for the treatment of childhood diseases in which the leaves are more used (Bouraïma, 2018: p. 28). This work has made it possible to note in the list of identified species that some are already cited by the populations of Benin in the work carried out by Yédomonhan et al. (2017), as being species used as a vegetable toothbrush by the populations of Benin. On the other hand, this study has identified others that are not found in these works previously carried out in Benin. This could be due to the geographical nature of the studies because the others were carried out throughout Benin and this one was carried out at a lower administrative level so can only be more precise and specific. This research did not take into account the ethanoic and phytochemical aspects like those carried out by Olayé et al. (2018).

## 5. Conclusion

This research was a contribution to the knowledge of the species used as plant brush in the District of Kpakpamè. After data collection and processing, a diversity of nineteen (19) species is used as a brush in the Kpakpamè district. These plant species are grouped into nineteen (19) genera and 11 families. This research made it possible to identify the most frequently used plant species through the frequency of citation. Thus, *Pseudocedrela kostchyi* is the most cited plant species. Stems and roots are essentially the organs of species used as plant brushes.

The listed species are used to treat various diseases, of which dental caries are the most cited, accompanied by malaria, bad breath, teething problems, etc. The most commonly used methods for treating those affections are tooth brushing and decoction.

The many uses made by populations of plant species used as toothbrush impact their conservation. Thus, the establishment of family gardens of plants used as toothbrush is of great use in the conservation of plant species. However, many efforts remain to be made to ensure sustainable management of these resources. Among other things, it is necessary to take into account the plant species listed in resource protection programs; and develop awareness-raising policies for populations to teach them good practices for harvesting plant species. Specifically, Water and Forestry agents must come to an agreement with municipal authorities in order to plant the said species during the next three days in community forests.

Scientific research on phytochemical analysis of the species cited and inventoried will be carried out in order to confirm or refute the results from endogenous knowledge to those scientifically identified using laboratory results.

## Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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