

# Ethnobotanical Survey of Three Spices (*Syzygium aromaticum*, *Curcuma longa*, *Zingiber officinalis*) and Three Aromatic Plants (*Petroselinum crispum*, *Laurus nobilis*, *Rosmarinus officinalis*) Used in Central and Southern Benin

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## Abstract

A descriptive ethnobotanical study of three spices (*Syzygium aromaticum*, *Curcuma longa* and *Zingiber officinalis*) and three aromatic plants (*Petroselinum crispum*, *Laurus nobilis* and *Rosmarinus officinalis*) was carried out in southern and central Benin. The aim was to gather information on local populations' therapeutic uses of these medicinal plants. Using 164 questionnaire forms sent to market herbalists and traditional practitioners, semi-structured individual interviews using a non-probability sampling technique were conducted from the beginning of August to the end of October 2022. We visited a total of 15 markets in 15 different communes in Benin. The results showed that spices and herbs are used as seasoning in everyday dishes and in treating a range of illnesses, gastroenteritis, respiratory infections, nasal congestion, cardiovascular disease, as well as frigidty and libido stimulation. Infusions are the most popular method of preparation. These herbal teas are administered orally. Regular users (herbalists and tra-

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ditional practitioners) obtain their supplies during seasons of abundance when costs are lower. The results have also shown that medicinal plants are also used to treat many other ailments in a variety of galenic forms. Spices are generally used more often than aromatic plants, especially for gastroenteritis. These results can be used to identify the different groups of aromatic compounds that are of interest to health and meet consumers' dietary requirements to reduce certain diseases and guarantee food safety through the appropriate use of aromatic herbs and spices.

## Keywords

Ethnobotanical Study, Aromatics Herbs, Spices, Therapeutic Use, Herbalist, Benin

## 1. Introduction

Since time immemorial, spices and herbs have been and continue to be in the news, both nutritionally and medicinally. In Asia, and specifically in India, conventional medicine has been actively exploring its health-promoting potential in recent years, with several popularized scientific works of articles published on the subject [1]. The word "spice" comes from the Latin "species", meaning species or substance [2]. Spices are the dried parts of aromatic plants: leaves, flower buds, berries, seeds, bark, fruit and roots. Used alone or mixed, they are intended to spice up perfume and color, while imparting a particular flavor. With the exception of salt, which is a mineral substance, spices and herbs are substances of plant origin whose main function is to season food. The popularity that spices still enjoy today is linked to the properties and virtues attributed to them [2]. Spices and aromatic herbs contain remarkable quantities of vitamins A, C and B and minerals such as calcium, phosphorus, sodium, potassium and iron [3]. They also have antibacterial properties against many gastroenteritis pathogenic bacteria such as *Listeria*, *Staphylococci* and *Escherichia coli* [4] [5].

Several chemical components in herbs and spices modulate the intestinal flora (microbiota) and thus reduce the number of certain pathogenic bacteria such as salmonella [6]. They also have potential effects that require further study, *i.e.* they could prevent and treat digestive problems [7]. Spices and aromatic plants are also an important source of antioxidants and natural antibacterial substances for food processing plants [2], preventing the degradation of free radicals [8] and delaying the oxidation of lipids, thereby extending the shelf life of foods [8] [9]. While local aromatic plants were the primitive seasonings, with the evolution of trade, certain particularly sought-after species became expensive items transported over long distances [10]-[12]. Spices such as pepper and cinnamon already graced the desks of the upper classes of the Roman Empire, a symbol of wealth, political significance and mercantile importance. Communities in present-day India and Indonesia grew affluent from selling spices and aromatic plants, which proliferated

only in characteristic locations [13]. In the Middle Ages and Renaissance, spices and aromatic herbs were exclusively dedicated to the Romanian elites, who went to great lengths to have them on their plates during banquets [14]. However, spices and aromatic plants have evolved according to time and culture. The example of sugar, which was considered a spice with medicinal properties, is a good illustration of this [15]. In Benin, spices and herbs are used in almost all culinary preparations, but little is known about most of their compounds, particularly the aromatic compounds responsible for their many properties. Some studies have been carried out in Benin on processing and storage methods [16]. Still, very few studies have been carried out on the spices and aromatic herbs commonly used in Benin regarding health, nutrition and so on.

The potential benefits of herbs and spices have been studied in various infectious diseases, animal models, and human trials [17]. The present ethnobotanical survey of three spices (*Syzygium aromaticum*, *Curcuma longa* and *Zingiber officinalis*) and three aromatic plants (*Petroselinum crispum*, *Laurus nobilis* and *Rosmarinus officinalis*) is intended to contribute to a better understanding of these plants from a health perspective. More specifically, the aim is to find out from market herbalists and traditional practitioners the health-related indications for using these drugs, how they are prepared, the route of administration and the duration of treatment.

## 2. Materials and Methods

### 2.1. Study Environment

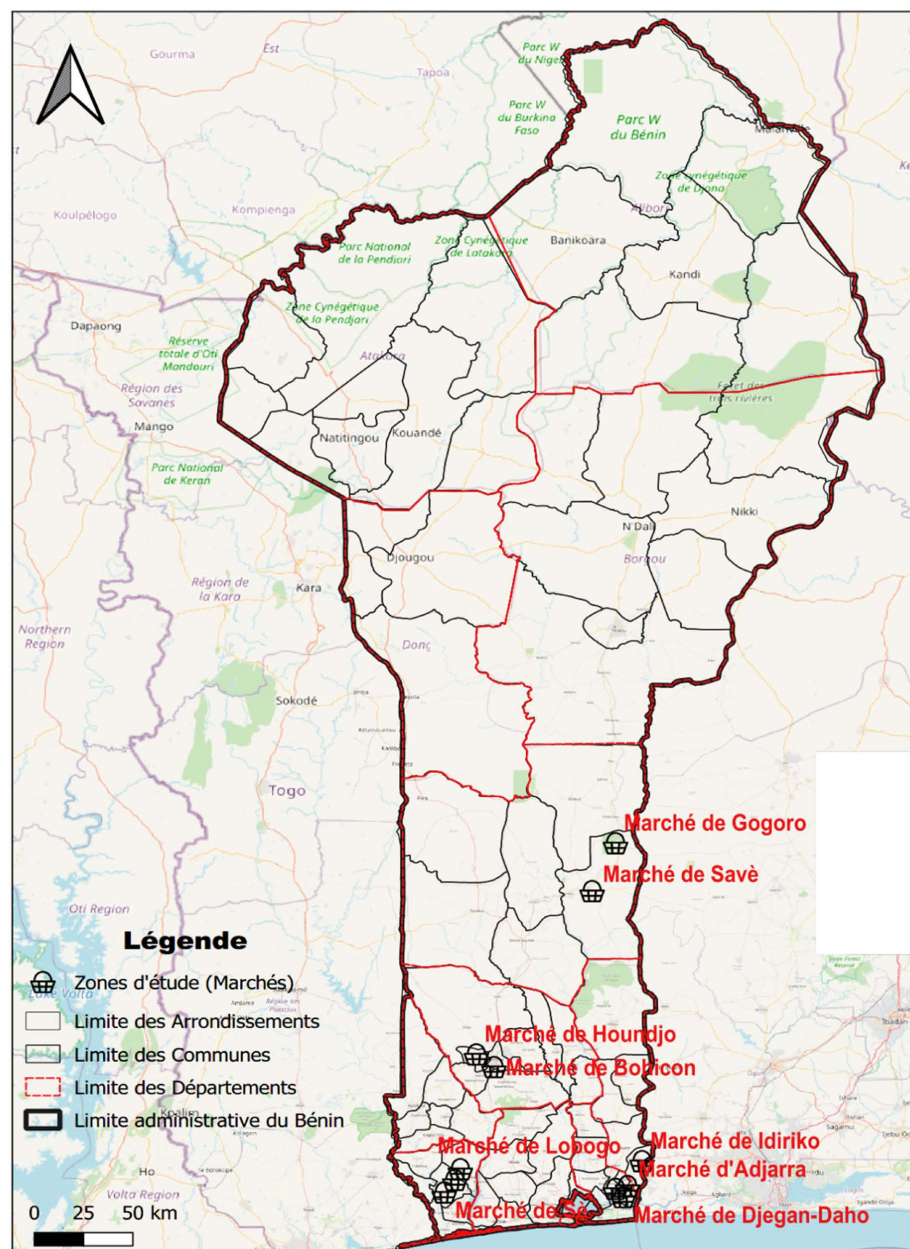
The study was carried out in the south and center of Benin, in Mono and Couffo, Zou and Collines, and the department of Ouémé. We visited 15 markets selling medicinal plants and visited traditional practitioners in their homes. **Figure 1** shows a summary of the study areas surveyed. The parameters that justified our choices were the accessibility and integrity of the information, ease of communication, the effectiveness of the traditional healers and herbalists, demographics and geographical diversification involving different cultures with distinct practices. The survey material consisted mainly of survey sheets, a recorder, a camera and samples of fresh and dried spices and aromatic plants.

The study was conducted using a descriptive, cross-sectional approach. Data were collected using face-to-face questionnaires administered to participants recruited by convenience sampling. Prior to their participation, informed consent was obtained after explaining the objectives and nature of the survey.

### 2.2. Data Collection

From the beginning of August to the end of October 2022, we visited 15 markets where medicinal plants are traded and traditional practitioners in 15 communes. Using the non-probability convenience sampling technique, 164 herbalists from our markets and traditional practitioners were surveyed for a descriptive ethnobotanical study [18]. Available market herbalists and conventional practitioners

who had given their consent were interviewed. We had two meetings with them. The first meeting was used to explain the survey objectives and show the samples. The second meeting recorded the interview and filled in the survey forms. These pre-prepared sheets were used to conduct a semi-structured individual interview lasting about an hour. During these interviews, information was requested about the respondent (age, level of education, primary profession and length of time in the domain) and about the spices and aromatic plants (therapeutic use, dose, treatment time, galenic form, method of administration, harvesting time and origin).



**Figure 1.** Map of markets surveyed in Benin for the ethnobotanical survey on spices and aromatic herbs.

### 2.3. Data Processing

Most of the time was spent collecting and processing data. The data recorded on the cards was entered into a database using an Excel spreadsheet. Power Query and STATA were used to process the data. Frequencies and variances were calculated. Significance tests on the frequencies were carried out according to the formula below. At the 5% threshold, we have the U statistic,

$$U = \frac{f - 0}{\sqrt{f(1-f)/n}}$$

where  $f$  is the frequency and  $n$  is the total number of individuals.  $U$  is approximated to the reduced centered normal distribution. In practice,  $H_0$  is rejected if  $U$  is greater than 2.

$U$  is approximated by a reduced centred normal distribution. When the calculated value of the test falls within the rejection zone, the null hypothesis is rejected outright. In practice, the null hypothesis is rejected when the value is less than or equal to the 5% threshold. In the context of a one-tailed right-sided test, a value of  $U$  greater than 2 falls within the rejection region, so the null hypothesis is rejected. However, there are also rejection regions for values between 1.96 and 2. In other words, if  $U$  is strictly greater than 2 and this implies a  $p$ -value less than 5%, then  $H_0$  is systematically rejected.

## 3. Results and Discussion

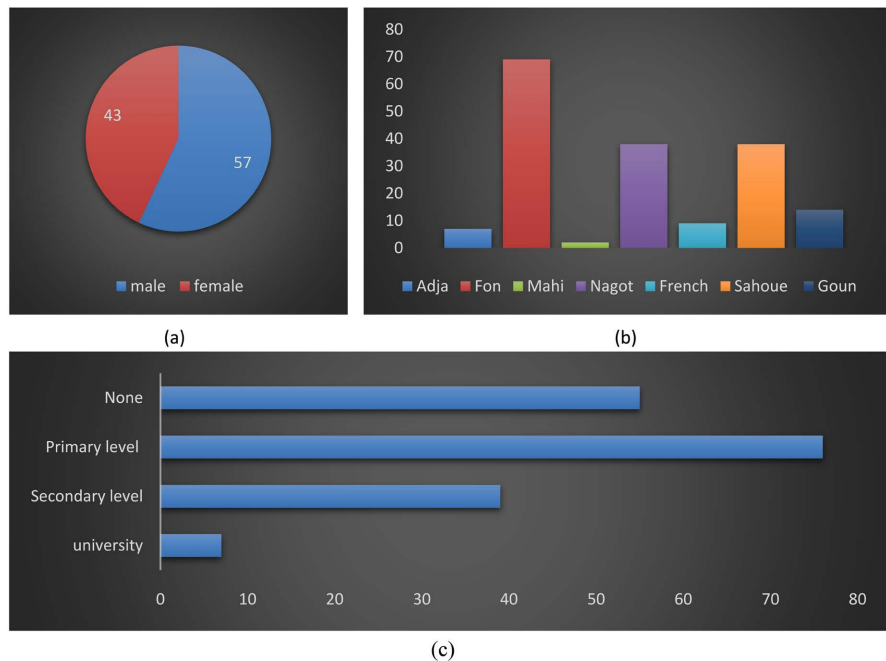
### 3.1. Socio-Cultural Characteristics of Respondents

Our study involved 164 people, including 100 market herbalists and 64 full-time traditional practitioners, with an average length of service of 19 years. Their ages ranged from 18 to 77, with an average age of 46. The majority are women (57%) compared with men (43%), and 42% of them speak Fon (**Figure 2**). These results confirm those obtained by [16] [19] [20] in Benin; [21] in Algeria; [22] in Morocco and [23] in Togo. This predominantly female profile can be explained by the fact that women mainly sell spices and medicinal and aromatic plants in markets. The virtues of medicinal plants are also ancestral knowledge passed down from generation to generation [24] [25]. Since women are the primary carers in households, they are the holders of this knowledge and the prior users of plants for herbal medicine [21] [26]. In Senegal, on the other hand, in the markets of Dakar, men are the most numerous sellers of medicinal plants [27]. Socio-cultural characteristics can explain this difference.

### 3.2. Distribution by Gender, Language and Level of Education

According to **Figure 2**, of all the people surveyed, 32.93% were illiterate, 42.68% had primary education and only 3.04% had a university education (traditional practitioners). This result contradicts that of [25], who found that market herbalists are illiterate in most cases. This contradiction is justified by our sample comprising market herbalists and traditional practitioners [28] found that the literacy

rate among traditional practitioners was 42%. [29] found that 64.29% of those surveyed (vendors, traditional healers and consumers) had at least primary education. Tradithérapeutes constitute a more restricted class of knowledge about traditional plants. They often combine their expertise with other sciences, such as geomancy and Chinese medicine. Hence they need to know at least how to read and write.



**Figure 2.** Shows three graphs showing the gender, ethnicity and educational level of the subjects surveyed.

### 3.3. Harvesting Time and Origin of Spices and Aromatic Plants

Most respondents obtain their herbs and spices on a seasonal basis in Benin. Only ginger is supplied on a full-time, seasonal basis. They justify seasonal supply by the fact that there are bidding periods on the supply markets.

### 3.4. How Spices and Aromatic Herbs Are Prepared

To treat patients, these medicinal species are administered in several forms: infused, decocted, macerated, raw, paste, alcohol, powder and juice. However, infusion is the most commonly used method of preparation for these spices and aromatic plants. The preparation method differs depending on the plants and, above all, the plant parts used to make the herbal tea. Infusion is best suited to flowers and leaves (delicate or aromatic). This is shown in **Table 1** and **Table 2**, which list the different uses of spices in **Table 1** (*S. aromaticum*, *Z. officinalis* and *C. longa*) and herbs in **Table 2** (*P. crispum*, *L. nobilis* and *R. officinalis*). It involves pouring boiling water over plants precisely when it comes to a boil [30]. The container is then covered and left to infuse for as long as necessary. This result is similar to that of [26], who also found, in Algeria, that infusion is the preparation method

most frequently used in treating dermatoses with several leaves, including thyme, an aromatic plant. Conversely, decoction is the preferred method cited by several studies [25] [31]. This is undoubtedly linked to the nature of these medicinal plants, which are neither spices nor aromatic.

Depending on the species and the pathology, the respondents also use other methods of preparation: powder, alcohol and raw material. Local people also believe in the decoction method and find it suitable for warming the body and disinfecting the plant from moderately resistant germs [32]. Finally, according to other studies, decoction collects the most active principles and attenuates or cancels out the toxic effects of specific recipes [33].

**Table 1.** Galenic forms used for spices.

Galenic form	Workforce	Frequency (%)	Standard deviation	Statistic U
<i>C. longa</i>				
alcoholature	15	14.42	3.428	4.207
Decoction	4	3.84	1.875	2.048
Infusion	44	42.30	4.821	8.774
Juice	9	8.65	2.743	3.153
Paste	8	7.69	2.6	2.958
Powder	23	22.11	4.05	5.459
Maceration	0	0	0	-
Raw material	1	0.96	0.952	1.008
<i>Z. officinalis</i>				
Alcoholature	12	10.61	2.884	3.679
Decoction	13	11.50	2.988	3.849
Infusion	31	27.43	4.179	6.564
Juice	4	3.53	1.728	2.043
Paste	2	1.76	1.232	1.429
Powder	19	16.81	3.502	4.8
Maceration	3	2.65	1.504	1.762
Raw material	29	25.66	4.091	6.272
Alcoholature	11	10.38	2.962	3.504
<i>S. aromaticum</i>				
Decoction	12	11.32	3.077	3.679
Infusion	44	41.5	4.786	8.671
Juice	3	2.83	1.611	1.757
Paste	1	0.94	0.937	1.003
Powder	23	21.69	4.003	5.418
Maceration	3	2.83	1.611	1.757
Raw material	9	8.49	2.707	3.136

**Table 2.** Galenic forms used for aromatic herbs.

Galenic form	Workforce	Frequency (%)	Standard deviation	Statistic U
<i>C. longa</i>				
alcoholature	15	14.42	3.428	4.207
Decoction	4	3.84	1.875	2.048
Infusion	44	42.30	4.821	8.774
Juice	9	8.65	2.743	3.153
Paste	8	7.69	2.6	2.958
Powder	23	22.11	4.05	5.459
Maceration	0	0	0	-
Raw material	1	0.96	0.952	1.008
<i>Z. officinalis</i>				
Alcoholature	12	10.61	2.884	3.679
Decoction	13	11.50	2.988	3.849
Infusion	31	27.43	4.179	6.564
Juice	4	3.53	1.728	2.043
Paste	2	1.76	1.232	1.429
Powder	19	16.81	3.502	4.8
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<i>S. aromaticum</i>				
Decoction	12	11.32	3.077	3.679
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Juice	3	2.83	1.611	1.757
Paste	1	0.94	0.937	1.003
Powder	23	21.69	4.003	5.418
Maceration	3	2.83	1.611	1.757
Raw material	9	8.49	2.707	3.136

### 3.5. Use and Phytotherapy

Turmeric (*Curcuma longa*), ginger (*Zingiber officinalis*), parsley (*Petroselinum crispum*), rosemary (*Rosmarinus officinalis*) and bay leaf (*Laurus nobilis*) are used both in cooking and to treat illnesses. In the kitchen, they are used to spice and flavor meals. The culinary use of these spices is recognised in Japanese, Indian, African and even European cuisine. Examples include ginger, which is used to make drinks in Africa, Gari Shoga or pickled ginger in Japan [34], and turmeric, which adds a unique color to dishes. It is a natural food coloring called E100 [35] that has long been used in the food industry.

Unlike other spices, *S. aromaticum* is used less in cooking. This observation was also reported by Hancock in 2021 [36]. According to the author, since ancient times, cloves, also known as “bird’s tongue,” have been used much more in medicine than in food preparation. They were used to freshen breath.

Thousands of plants worldwide are used in phytotherapy to treat one or more diseases, alone or in combination with others. They have a variety of specific effects on different parts of the body. We have identified several pathologies besides the spiritual aspect from the results obtained from using these medicinal species for healing. These include.

Articulo-muscular, oral-dental, cardio-vascular cerebral, digestive, respiratory, endocrine, gynaeco-obstetrical, neurological, hematological, psychological, tumoral, urogenital and cutaneous pathologies.

Digestive tract ailments rank first among the phytotherapeutic uses of the six spices and aromatic herbs studied. These results corroborate those of other studies which have found that medicinal plants are most favored for disorders of the digestive tract, such as nausea, vomiting, digestive problems, bloating, gas, abdominal pain, intestinal colic, epigastric pain, etc. [37] [38].

### 3.6. *Zingiber officinalis*: Ginger

*Z. officinalis* or ginger has been recognized by the WHO since 1999 as a preventive agent against nausea, whatever the etiology, particularly nausea and vomiting due to pregnancy or motion sickness. *In vivo*, it has been shown that ginger has numerous analgesic, sedative, antipyretic and antibacterial properties and that it increases the motility of the gastrointestinal tract [39]. It has a decisive action on the mucosa of the gastrointestinal tract, regulating intestinal function to facilitate absorption. Ginger is shown in **Figure 3**.



**Figure 3.** Photo of fresh ginger (*Z. officinalis*).

### 3.7. *Curcuma longa*: Turmeric

The World Health Organisation recognizes turmeric as “clinically justified” for “difficult digestion with hyperacidity and flatulence.” It also recognizes its traditional use in the treatment of ulcers. The efficacy of turmeric in the treatment of symptoms of irritable bowel syndrome, peptic ulcer and digestive disorders has been approved by several studies 72 to 144 mg of turmeric extract consumed daily

for eight weeks significantly improve irritable bowel symptoms [40] and 600 mg of carmine extract of turmeric consumed five times a day for twelve weeks cures irritable bowel symptoms [40].

Five times a day for twelve weeks cures 76% of peptide ulcers and significantly reduces abdominal pain after 1 to 2 weeks [41]. *C. longa* is shown in **Figure 4**.



**Figure 4.** Photo of turmeric (*C. longa*).

### 3.8. *Syzygium aromaticum*

In the kitchen, *S. aromaticum*, commonly known as clove, is a flavoring used mainly to flavour drinks such as “Vermouth” [42]. The traditional use of cloves to treat digestive disorders dates back to ancient times in Chinese medicine and has been demonstrated by several studies. They were used as tonics and stimulants and were prescribed as digestive aids and antiseptics. Cloves were used to treat many conditions, including intestinal disorders, diarrhea, vomiting and cholera, and to stimulate appetite [36], flatulence and bloating [43]. The antibacterial efficacy of clove essential oil against *Staphylococcus aureus*, *Escherichia coli* and digestive tract bacteria also justifies its traditional use in digestive pathologies [44] [45]. It is also scientifically recognized as having an anti-diabetic and insulin-mimetic effect [46]. Many plant drugs have been identified as having pharmacological properties attributable to their phytoelements, such as glycosides, terpenes, polyphenols, catechins, alkaloids, saponins, etc. *S. aromaticum* (clove) is a traditional spice that can be used to preserve food and has enormous pharmacological activity. *S. aromaticum* contains phytochemical compounds such as sesquiterpenes, monoterpenes, hydrocarbons and phenolic compounds [47]. The following **Figure 5** is that of clove.



**Figure 5.** Photo of clove (*S. aromaticum*).

### 3.9. *Laurus nobilis*: The Laurel

Laurel is a particularly well-known condiment in cooking. For physiotherapists, bay leaves have digestive and aperitif properties, rather than flavoring dishes, teas and liqueurs. In its native countries, infusions of one or two teaspoons of dried bay leaves or flowers are commonly made at mealtimes to stimulate digestion after a heavy meal. This bears witness to its traditional use in digestive disorders [48] [49]. Bay leaves are used in the symptomatic treatment of digestive disorders such as epigastric bloating, slow digestion, belching, flatulence and loss of appetite. A concentrated decoction of bay leaves can be used as a gargle to treat mouth ulcers [50]. This use of bay leaves in digestive pathologies is linked to their antibacterial [51] [52], antifungal [53] and anti-infectious [54].

Like other aromatic plants, Rosemary has traditionally been used more for digestive system disorders. This use is also confirmed in the literature. In Germany and other countries, it is used as a symptomatic treatment for digestive disorders such as epigastric bloating, slow digestion, belching and flatulence, to aid digestive functions and as a mouthwash for oral hygiene. This aromatic stimulates gastric secretion and appetite thanks to its essential oil content. It treats nausea and tones the liver. It is also an anti-spasmodic. Thanks to its tonic effect on the liver and its stimulating action on the biliary function. Rosemary is highly appreciated in cases of sluggish stomach, gall bladder inflammation, and liver congestion accompanied by painful attacks. The following **Figure 6** is that of laurel.



**Figure 6.** Photo of laurel (*L. nobilis*).

### 3.10. *Rosmarinus officinalis*: Rosemary

Fresh parsley has been used as a seasoning and garnish since ancient times. As a condiment, it is used whole or most often chopped. It is used to garnish fish, meat, rice and other dishes. It is used to flavour raw vegetables, salads, sauces and vegetable dishes [55]. It is used in Oriental, European, American and African cuisine. In digestive therapy, these leaves are recognized as an antiseptic for the intestinal tract, an intestinal stimulant and a vermifuge. They contribute to good digestion [56]. **Figure 7** that comes is that of fresh rosemary.



**Figure 7.** Photo of fresh Rosemary (*R. officinalis*).

### 3.11. *Petroselinum crispum*: Parsley

Long used for its therapeutic virtues in the pharmaceutical, food and cosmetic industries, *P. crispum* is known for its richness in antioxidant compounds [1]-[2]. This plant is much more used to treat liver inflammation for its hepatoprotective effect [1]. Its phytochemistry has made it possible to note the presence of polyphenols of fatty acids and alkaloids which are compounds at the origin of the properties cited. Parsley leaves have excellent antimicrobial activity against both bacteria and fungi. **Figure 8** is a photo of locally grown parsley leaves.



**Figure 8.** Photo of parsley (*P. crispum*).

### 3.12. Treatment of Diseases and Frequency of Use of Herbs and Spices

**Table 3** shows the frequency of use of the spices and herbs studied in treating other diseases. Analysis of the table indicates that *Z. officinalis* is the most frequently used spice, especially for respiratory infections, followed by *S. aromaticum*, which is used for oral, dental, and skin diseases. Next come *R. officinalis*, *C. longa* and *P. crispum*, used respectively to treat skin lesions, dermatoses and obstetric and gynecological disorders.

**Table 3.** Frequency of use of species for the treatment of various other pathologies.

Specie	Pathology	Frequency %	Standard deviation	Statistic U
	Bucco-dentals	16.03	3.563	4.498
<i>S. aromaticum</i>	Dermatoses	13.20	3.288	4.015
	Urogenital	11.32	3.077	3.678
<i>Z. officinalis</i>	Respiratory	31.57	4.353	7.252
<i>C. longa</i>	Skin diseases	16.19	3.595	4.503
<i>P. crispum</i>	Gyneco-obstetrical	14.01	3.355	4.176
<i>R. officinalis</i>	Skin lesion	16.66	3.689	4.516
<i>L. nobilis</i>		14.42	3.445	4.186

*L. nobilis* and *R. officinalis* are also regularly used for spiritual purposes, with the following statistical values: (F: 14.42%; S: 3.445; U: 4.186) and (F: 10.78%; S: 3.071; U: 3.510) respectively.

*Z. officinalis* is cited very significantly in the treatment of respiratory tract diseases. The available data show that several pathophysiological factors aggravate chronic respiratory ailments. Dysregulation of the immune system, inflammation and musculoskeletal contusions generate these illnesses [57]. Ayurvedic pharmacopeia helps to rebalance diseases linked to congestion or a cold (colds, coughs, chronic bronchitis) [58]. Components extracted from ginger improve asthma symptoms if used in combination with bronchodilators. They promote relaxation of the respiratory muscles, helping asthmatics to breathe more easily [59]. The increased frequency of use of *Z. officinalis* is due to its many virtues, namely immunomodulatory, antihypertensive, antihyperlipidaemic, antihyperglycaemic, antimicrobial and cytotoxic [60]. Other accumulated research has shown that *Z. officinalis* has a multitude of biological activities, including antioxidant, anti-inflammatory, anti-cancer, neuroprotective, cardiovascular protective, respiratory, anti-obesity, anti-diabetic, anti-nauseant and anti-emetic activities [61].

When treating dermatoses, *C. longa* is recognized as a surprising beauty ally. It fights acne and scars, reduces dark circles and signs of fatigue, and combats dull skin. The spice helps to reduce skin infections, such as eczema and psoriasis, by reducing redness and soothing itching sensations. A study on the preventive effect of papillomavirus-induced skin cancers on mice showed that daily doses of turmeric essential oil did not develop skin signs of papillomavirus infections [62]. Its traditional use in dermatoses, therefore, seems justified.

Another study carried out this year (2023) by [63] showed that, in addition to curcumin, bisacurone is a component of turmeric that helps to reduce liver weight by lowering the levels of serum parameters such as cholesterol, triglycerides and blood viscosity in laboratory animals, including mice. White blood cells in the spleen treated with bisacurone also showed lower levels of pro-inflammatory cytokines. Turmeric, therefore, has anti-inflammatory and lipid-lowering properties [63].

*S. aromaticum* or clove is much more involved in treating oral, dental, urogenital and skin pathologies. Indeed, the clove tree is used as an analgesic for treating dental pain. It treats oral ailments and is used as a mouthwash for oral hygiene. It is a disinfectant used to treat wounds [64]. Its antifungal activity against *Candida albicans* and *Trichophyton rubrum* and its external analgesic effect make it an ally in treating urogenital pathologies and dermatoses [65]. Its active ingredient, eugenol, has several products on the dermis, inhibiting keratinocyte proliferation [66].

Parsley or *P. crispum* is also recognized for its beneficial effect on blood circulation in treating gynaecological and obstetric conditions. It is regarded as a menstrual regulator. It is thought to encourage contractions of the uterus and, therefore, the onset of menstruation [56]. It contains apiol and phenol ester, which promote the beginning of menstrual flow and make parsley an emmenagogue plant used by traditional medicines to treat menstrual disorders such as dysmenorrhoea and amenorrhoea.

For our phytotherapists, *R. officinalis* or Rosemary is a preferred plant for treating wounds. Some authors have confirmed this application in the management and traditional treatment of wounds, *R. officinalis* reduces inflammation and improves wound contraction, re-epithelialization and regeneration of granulation tissue, angiogenesis and collagen deposition [67] and clinical evidence has been obtained from studies carried out on animals. These leaves are used in compresses to prevent delay and improve healing [48]. *R. officinalis* infusion is used to clean wounds [68].

*L. nobilis* leaves are traditionally used orally to treat gastrointestinal symptoms, such as epigastric bloating and flatulence [69]. Laurel leaf essential oil is widely used in the perfume and soap industries [70]. In addition, it has been used to relieve haemorrhoidal and rheumatic pain [71]. It also has diuretic and antifungal properties. It is also helpful to know that *L. nobilis* essential oil is used to preserve the antimicrobial quality of foods according to [72].

Convenience sampling was chosen due to logistical and time constraints, facilitating access to participants who were available at the time of the study. However, this type of sampling limits the representativeness of the results, as it introduces a potential selection bias. Consequently, the conclusions should be interpreted with caution and cannot be generalised to the entire target population. As for the self-reported uses of herbs and spices covered by our survey, we will conduct laboratory tests in future publications to obtain more accurate results.

#### 4. Conclusion

Far from mere condiments, colourings or flavourings, spices and aromatic plants are medicinal plants used worldwide. This study has highlighted the endogenous knowledge and role of market herbalists and traditional practitioners in primary healthcare in Benin. In this role, they mainly use ginger, turmeric, cloves, parsley, Rosemary and laurel to combat digestive disorders, dermatitis, gynecological and

obstetric conditions, injuries and respiratory ailments. This descriptive study shows that spices and aromatic plants are a source of biodiversity that should be promoted and enhanced in terms of nutrition and health.

## Patents

This section is not mandatory but may be added if there are patents resulting from the work reported in this manuscript.

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Data Availability Statement: Not applicable.

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This work was carried out thanks to the collaboration of traditional practitioners from the localities visited. I want to pay here a posthumous tribute to the herbalist from the Djegan market.

## Conflicts of Interest

The authors declare no conflicts of interest.

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