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Unveiling the potential and specificity of the Mahoran ethnopharmacopoeia: a field survey

--Manuscript Draft--

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Abstract:	Ethnopharmacological relevance: A significant portion of Mahoran people relies on traditional medicine to address their healthcare needs. However, very few studies have been carried out on this subject, and few data are available on the practices, plants used, and ailments most commonly treated by their traditional medicine. Aim of the study: Within this context, the aim of this study was to identify the diseases most commonly treated by traditional Mahoran medicine, as well as the plants most commonly used against these various ailments. Materials and methods: From January to April 2023, a semi-structured survey was carried out in Mayotte island. A total of 103 participants were interviewed including 65 non specialists, 21 knowledgeable, and 17 specialists. A thorough literature review was performed on the most cited plant species to evaluate the benefit-risk of each remedy. Results: Participants mentioned using 474 remedies (prepared mostly with herbal ingredients) to treat 65 diseases. These diseases belong to various health categories of which the most represented ones were digestive system, respiratory system, genital system, general, and muscular system. The two most common ailments cited by participants were stomachache (41/103) and cough (36/103). A total of 154 plant species were identified, with Coleus amboinicus, Citrus aurantiifolia, Moringa oleifera, and Ocimum gratissimum being the main plants reported. Massage therapy was the second most important traditional practices reported after the use of herbal remedies. Conclusion: Our survey confirms the importance of traditional medical pratices in Mayotte island. The following plants: Aerva lanata, Cardiospermum halicacabum, Coleus madagascariensisPaullinia pinnata, and Woodfordia fruticosa stand out from the others in terms of their use and number of citations, and it would be interesting to study their pharmacological and toxicological properties. Traditional medicine in Mayotte also possesses specificities, notably with the use of particular ingredients such as salt, coral stone, or even white clay. Furthermore, throughout the study, we noticed that chronic diseases such as diabetes or hypertension were extensively treated. This could be linked to the fact that the prevalence of these diseases is quite high on the island.
Suggested Reviewers:	Sergio Ortiz Aguirre, PhD Assistant professor, University of Strasbourg Faculty of Pharmacy ortizaguirre@unistra.fr He is an expert in the field of ethnobotany and phytochemistry
	Marco Nuno de Canha, PhD

	Postdoctoral fellow, University of Pretoria marcodecanhasa@gmail.com He is an expert in the study of medicinal plants from South Africa
Response to Reviewers:	

Toulouse, 13TH November 2024

To *Journal of Ethnopharmacology* editors;

Dear editors,

On behalf of my colleagues, I am submitting a revised version of our manuscript entitled: "Unveiling the potential and specificity of the Mahoran ethnopharmacopoeia: a field survey" written by Thibault Tam-Hui, Yannick Eveno, Abassi Dimassi, Cédric Bertrand, Mohamed Haddad, and François Chassagne to be considered for publication as a Research Article in *Journal of Ethnopharmacology*.

As suggested by the reviewers, we have made substantial changes to the manuscript and answered all their comments. More specifically, we have reduced the length of the manuscript by adding a new table (Table 4) and by removing some useless parts. We have also included the Use-Reports values in our analysis, provided more details on our methodology, removed the FL and IFC calculation, provided more data on the definition of a "fundi", discussed the importance of exotic plants in our dataset, and compared our data to the plants used in the other Comoros islands. We think these changes clearly improve the manuscript.

Please find attached a point-by-point response to reviewer's concerns.

We hope that you find our responses satisfactory and that the manuscript is now acceptable for publication.

Sincerely,

François Chassagne

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JOURNAL OF ETHNOPHARMACOLOGY CHECKLIST

Have you consulted the author-pack and verified that your submission adheres to the "Rules of 5"?	◉ YES	○ NO	
Have you provided a list of all authors which clearly states the contribution of each co-author to the article?	◉ YES	○ NO	○ NA
Is the corresponding author's postal address, telephone numbers and e-mail address provided in full?	◉ YES	○ NO	
Have you included a list of all authors' email addresses?	◉ YES	○ NO	○ NA
Do you declare that all the listed authors have read and approved the submitted manuscript?	◉ YES	○ NO	
Do you declare that this manuscript/data, or parts thereof, has not been submitted for possible publication to another journal or that the work has previously been published elsewhere?	◉ YES	○ NO	
Is the title precise, clear and specific (do not use uncommon acronyms)?	◉ YES	○ NO	
Have you provided a clear and easily verifiable scientific reference to the traditional or clinical use of the herbal medicine under investigation (inserted directly next to the related traditional use)?	○ YES	○ NO	◉ NA
Do you declare that the present study was performed according to international, national and institutional rules considering animal experiments, clinical studies and biodiversity rights?	◉ YES	○ NO	○ NA
Does the activity studied clearly relate to the traditional use?	◉ YES	○ NO	○ NA
Have you provided full botanical plant names (refer to www.theplantlist.org), including authorities of all plants? (This applies to all plant species mentioned in the manuscript)	◉ YES	○ NO	○ NA
In case of organisms other than plants, are the full scientific names with authorities provided?	○ YES	○ NO	◉ NA
Have you provided details of the voucher specimen number for each plant species studied, and the name of the recognized herbarium where they are stored?	◉ YES	○ NO	○ NA
Have you provided a proper chemical profile (e.g. TLC, HPLC, GC, MS or NMR) for future reference, particularly where there no voucher specimens were retained?	○ YES	○ NO	◉ NA
In case of mixtures, are all the ingredients listed by their full scientific names with authorities?	○ YES	○ NO	◉ NA
In case of single compound study, have you provide a direct comparison of the activity of the plant extract and the pure compound?	○ YES	○ NO	◉ NA
In case of industrial products, are full details of the batch number, contents, method of extraction and preparation of the final formulation, including quality control data provided?	○ YES	○ NO	◉ NA
Surveys – have you provided absolute/primary quantitative data on the frequency of plant use as mentioned in the interviews? And is there a critical assessment of the traditional uses considering regional and global uses and known scientific information on the chemistry and biological effects?	◉ YES	○ NO	○ NA
Antimicrobial activity – did you provide an in depth analysis of the antimicrobial activity including proper MIC values, and information on whether the activity is at a reasonable dose, and whether it is just inhibitory or microbicidal?	○ YES	○ NO	◉ NA
Quality control – is your study on quality control clearly linked to the claimed activity of the herbal medicine?	○ YES	○ NO	◉ NA
Is the abstract in the required structured format? (Ethnopharmacological relevance, Materials and methods, Results, Conclusion)	◉ YES	○ NO	
Have you provided a graphical abstract according to the authors guidelines? (no explicit animal or organ photographs are allowed)	◉ YES	○ NO	○ NA
Did you use the correct format for the references? (numerical referencing is not allowed)	◉ YES	○ NO	○ NA
Have you provided a list of abbreviations?	○ YES	○ NO	◉ NA
Have you provided a list of compounds studied?	○ YES	○ NO	◉ NA

For Reviews

Are the conclusions critical and specific defining the current state of the art?	(●) YES	( ) NO	
Does the MS provide a comprehensive review of the current literature going beyond an overviews of articles indexed in common databases?	( ) YES	( ) No	(●) NA
If pharmacological or clinical studies are reviewed, have you assessed the quality of the studies under review?	( ) YES	( ) NO	(●) NA
For reviews of individual species: Have you included a detailed review of local and traditional uses based on primary sources?	( ) YES	( ) NO	(●) NA

RESPONSES TO REVIEWERS:

We thank the three reviewers for their constructive and positive comments. Here, we provide a point-by-point response to each comment.

Reviewer 1:

I recommend major revisions, paying particular attention to authoritative statements which should be accompanied by references, see specific comments below.

We would like to thank Reviewer 1 for their valuable comments. We appreciate your suggestion regarding authoritative statements and have carefully revised the manuscript accordingly.

1. Lines 93-99, these are authoritative statements, please insert appropriate references

References have been added on lines 93-95 (updated to lines 95-104 after revisions).

2. Lines 144-149, references required

References have been added on lines 144-149 (updated to lines 156-160).

3. Line 160, see also Abstract, line 64 where you indicated that the study was unertaken from February to April

The study indeed took place from January 31st to April 28th. As a result, we have corrected the mention of February on line 65 to January

4. Line 245 « *in vitro* » should be in italics

The term « *in vitro* » has been italicized on line 245 (updated to line 259).

5. Line 316, see also Abstract, line 70, you mentionned « 64 diseases » but here you have « 65 health problems » !

The text in line 70 has been updated from « 64 diseases » to « 65 diseases ».

6. Table 3, a significant proportion of the listed plant species are exotics. I think it's important to indicate the species that are exotic to the Island and in the Discussion, also provide some explanation as to why there is high demand for exotic species as sources of traditional medicines

A sentence was added in section 3.4.3 to clarify the proportions of exotic, indigenous, and endemic plants among the 154 species identified (i.e., "Among the 154 species, 98 are exotic (63.7%), 53 are indigenous (34.4%), 1 is endemic to the Comoros islands (*Aloe alexandrei*) and 2 are endemic to Mayotte (*Aloe mayottensis*, *Croton mayottae*)").

Additionally, we included a paragraph in section 4.1 of the Discussion to elaborate on the fact that exotic plants are predominantly used in traditional medicine in Mayotte. Several factors account for this widespread use of exotic species. First, as a former French colony, Mayotte experienced the introduction of many plant species during the colonial period, such as *Cananga odorata*, which has now become an integral part of local culture. Second, Mayotte has always been a hub of exchange with surrounding regions, especially East Africa, the Middle East, and Madagascar. These interactions are reflected in the island's linguistic diversity, influenced by Bantu and Malagasy languages, as well as in the dominant religion, Islam, and traditional medicine. Therefore, the extensive use of exotic species in traditional medicine in Mayotte can be attributed to these historical and cultural exchanges, which have shaped local practices.

7. Line 983, « Hébert, J.-C., and Hébert, O., 2011 » should be « Hébert and Hébert, 2011 »

Changes have been made in line 983 (updated to line 1036)

8. Lines 1028-1029, Reference is required

In response to Reviewer three's request, we removed the paragraph on lines 1028-1029, so additional references are no longer necessary

9. Lines 1071-1073, Reference is required

In response to Reviewer three's request, we removed the paragraph on lines 1071-1073, so additional references are no longer necessary

10. Line 1083, reference is required

In response to Reviewer two's request, we removed the paragraph on line 1083, so additional reference is no longer necessary

11. Lines 1112-1113, reference is required

In response to Reviewer two's request, we removed the paragraph on lines 1112-1113, so additional references are no longer necessary

12. Lines 1149-1151, reference is required

In response to Reviewer two's request, we removed the paragraph on lines 1149-1151, so additional references are no longer necessary

13. Line 1186, reference is required

In response to Reviewer two's request, we removed the paragraph on line 1186, so additional references is no longer necessary

14. Line 1220, reference is required

In response to Reviewer two's request, we removed the paragraph on line 1220, so additional reference is no longer necessary

15. Lines 1252-1253, reference is required

In response to Reviewer two's request, we removed the paragraph on lines 1252-1253 so additional references are no longer necessary

Reviewer 2:

The rationale for conducting this survey is well-established as only two (incomplete) surveys have previously been conducted on the islands of Mayotte. The current study reports on a wide survey revealing much valuable information on the use of traditional remedies in this under-studied area. The description of cultural practices as well as use of non-plant materials is valuable and adds interest to the paper. An impressive number of plant-based remedies were documented and the distinction between levels of knowledge held by informants is noteworthy. It would be fascinating to compare the use of plants by inhabitants of Mayotte with uses specifically in other islands in the Comoros archipelago. What similarities and difference are there ?

We thank the Reviewer 2 for her/his positive and encouraging comments. We agree that it would be valuable to investigate the similarities and differences between the specificities of traditional medicine in Mayotte and those of the other islands in the Comoros archipelago. It is important to note that Mayotte only has 49 strictly endemic species out of the 1341 documented species, with the others being either indigenous (663 plants including 614 also present in the other Comoros islands) or exotic (Barthelat, 2019). This highlights the fact that the flora of Mayotte is very similar to that of the other Comorian islands, and this similarity is reflected in the remedies used. A review conducted by Saive et al., in 2020, lists more than 207 medicinal plants used throughout the Comoros archipelago, with many plants being used in similar ways to treat the same ailments across the different islands.

Furthermore, the use of non-plant materials, such as coral stone, is another feature shared by these islands (Daroueche, 2024). This practice is not exclusive to the Comoros, as other Indian Ocean islands, like Madagascar, also use coral stone in their traditional pharmacopoeia (Mesa et al., 2021).

However, when it comes to identifying differences in traditional medical practices between the islands of the archipelago, the task becomes more challenging. The available literature on the subject is very limited, making it difficult to pinpoint the unique practices of each island. Very few in-depth studies have been conducted, leaving a wide field for further exploration. A dedicated study comparing the traditional remedies and medical practices of Mayotte with those of the other Comorian islands would be essential to gain a better understanding of local specificities.

We have added a paragraph in lines 966-980 to discuss the similarities and differences between the Comoros islands.

1. In line 188, change « photographies » to « photographs ».

Changes have been made in line 188 (updated to line 199)

2. In line 297, « tradipratician » should perhaps rather be phrased as « traditional practitioner »

The term « tradipractician » has been removed. Additionally, we have replaced « tradipractitioners » with « traditional practitioners » throughout the manuscript to ensure consistency and clarity.

3. In section 3.2 how exactly was an informant ascertaines to be a « *fundi* » ? A little more detail is required here

Upon reviewing Section 3.2. We believe the definition and criteria for identifying an informant as a « *fundi* » are already well-explained in the text. Nevertheless, we would like to provide additional clarity by reiterating the key points.

In our study, a « *fundi* » is defined as an individual who is widely recognized within the community for their knowledge and practice of traditional Mahoran medicine. Importantly, this status is not self-declared; it is the people of the community or neighboring villages who bestow this title upon the practitioner. Many "fundi" inherit their knowledge from their ancestors, and some specialize in the treatment of specific ailments, such as sprains, fractures, or illnesses affecting children. Additionally, some individuals are believed to possess a natural gift for healing, received at birth, which is sometimes linked to local beliefs (the belief that fraternal twins have healing abilities). However, having such a gift alone does not necessarily make a person a « *fundi* ». To be considered a « *fundi* », one must also be recognized by the community for their expertise and skill in traditional healing.

The qualification of an informant as a « *fundi* » in this study was therefore based on their established reputation within the community, their ancestral knowledge, and their demonstrated ability in traditional medicine, rather than any formal certification or self-identification.

We have extended our paragraph defining the “fundi” and added this information in it.

4. In section 3.4.4 it is mentioned that four animal-derived ingredients are used but then more than four such ingredients are detailed so this can be corrected. In the last paragraph of this section it could be explained how such ingredients as white clay and a sewing needle are used. This could perhaps be elucidated in the Discussion

There are indeed more than four animal-derived ingredients detailed in section 3.4.4. We have corrected the text accordingly. Additionally, a paragraph has been added at the end of the section to describe how the white clay and the sewing needle are used

5. In line 909, replace « Monday or Wednesday » with « Monday or Wednesday »

Changes have been made in line 909

6. With such a wealt of information presented, the manuscript is extremely long. It could be considered to present some information on the discussion of plants in section 4.3 in a table as this section is quite descriptive

In response to your suggestion, we have revised the manuscript by replacing the entire section with a comprehensive table (Table 4). This table now presents the information in a more concise format and focuses on synthesizing the ethnobotanical uses specific to the Indian Ocean and African regions. We believe this adjustment improves the readability and clarity of the manuscript.

Reviewer 3:

This is a descriptive study about the traditional remedies used by people living on Mayotte island. Maybe it should be made clear earlier that this territory belongs to France. The graphical abstract looks like it would illustrate a methods paper showing a researcher in the field. However, it should reflect the content of the MS. I think the first sentence of the intro is wrong: An island cannot be "made up" of people; people live there… Apparently, most plant species occurring on Mayotte are exotic. How does this reflect in the medical flora? There is no information about primary health care facilities present and health issues faced by the inhabitants. Is there no information available? The survey has been done in a relatively short time (3 months). This seems to shine through in the results where for most uses consensus is absent (1 "use-report" only; not citation!). This is clearly a limitation to this study and should be mentioned (1 year field research is recommended, see Weckerle et al., 2018 JEP).

We thank Reviewer 3 for her/his valuable feedback. We have carefully considered each of your comments and have made the following changes to strengthen our manuscript. We agree that it is essential to specify the status of Mayotte as part of France early in the manuscript. We have added a sentence in the introduction to clarify this point.

The graphical abstract has been revised to more accurately reflect the descriptive nature of this study, rather than resembling a methods paper. We hope this adjustment aligns better with the manuscript's focus and content.

The phrasing of the introduction's opening sentence has been updated to avoid the impression that the island itself is "made up" of people. Thank you for catching this, we believe the revised wording is now more precise.

We have added a paragraph to discuss the predominance of exotic plants in traditional medicine in Mayotte. This addition is in response to comments from both you and Reviewer 1, helping to contextualize why the medical flora on the island is primarily composed of exotic species.

Information about the primary health care situation on the island is included in the manuscript, specifically noting that traditional medicine is often the first recourse for many residents. The low rate of general practitioner and specialist consultations among low-income individuals underscores the importance of traditional remedies, especially in a population where 77% live below the national poverty threshold (Balicchi et al., 2014). For instance, only 53% of low-income individuals consulted a general practitioner when ill, and a mere 11% saw a specialist that same year (Thibault et al., 2021). These figures support the context and relevance of our study in documenting traditional remedies as primary healthcare options. We have added this information in the introduction section (lines 119-125).

We acknowledge the limitation posed by the three-month data collection period. This is now explicitly stated in the discussion, with a note referencing Weckerle et al. (2018) as per your suggestion. We understand that a longer field study would allow for a more comprehensive representation and greater consensus across use reports, and we highlighted this in the revised manuscript.

1. I do not understand the field methods : Were there open interviews or « closed » questionnaires ? (what does submit a questionnaire mean ?). Were plant species collected together with the informant or were written questionnaires the basis ?

To clarify, the study employed a semi-structured interview that facilitated open-ended responses while also allowing us to gather specific information. This method provided flexibility for the informants to share their knowledge and experiences regarding traditional remedies and practices. To explain this, we have made changes in the paragraph (line 171-175).

Regarding your question about the term "submit a questionnaire," we have removed the word “submit” to avoid any confusions.

2. For assessing or understanding whether a specific plant drug (not species !) is used for a range or health issues or only for a few or one there is certainly no need for calculating the FL. A look at table 1 provides all information you need.

We agree that calculating the Frequency of Use (FL) is not necessary for assessing the range of health issues associated with specific plant drugs. In light of your comment, we have removed the FL calculations from the manuscript. We appreciate your guidance in streamlining our analysis and enhancing the clarity of our findings.

3. 3.4. : « biological treatments (472 remedies, 472 citations) » and then : « The most commonly used ingredients in biological treatments are plants (916 citations) »… I have a problem with the numbers here.

Thank you for pointing out the discrepancies in the numbers related to biological treatments. We have revised the figures for clarity and accuracy. Biological treatments had 472 remedies and 1017 use reports.

4. I still think citations are being mixed up with use reports. The relevance of the numerical analysis and composition of remedies does not really become clear and it is still not clear how many use reports were collected overall

We have replace all instances of « citations » with « use-reports » throughout the manuscript to ensure clarity. You were right some of them was being mixed up together. To clarify the numerical analysis, overall 1017 use reports were collected. Regarding the composition of remedies, we document the ingredients based on the

information provided by the informants. We aim to present this information clearly, and we appreciate your input on enhancing this aspect.

5. The FICs are relatively low because few use reports were gathered. The FIC is not a very robust method. FL can be deleted. Also, too often % values are stated (even for one informant (0.9%) : it is enough to state « one informant »).

We removed the sections regarding the FIC in the manuscript. We also did the same for the FL. Additionally, we have reduced the number of percentage values stated throughout the manuscript, ensuring clarity and conciseness in our reporting.

6. Section 3.5 should be streamlined and shortened. Also, the discussion repeats a lot of results or presents results for the first time comparing them with older literature. This should be shortened or streamlined in one way or another. There is a lot of nutritional, dietary, sanitary and epidemiological information presented in the discussion (4.2) that would have better be presented upfront as background.

We have implemented your suggestions for Section 3.5 by streamlining and condensing it for greater clarity and conciseness. The discussion has been also shortened and a table (Table 4) have been added to summarize the data on the seven most cited plant species.

Regarding the nutritional, dietary, and epidemiological information originally included in the discussion (Section 4.2), we have moved some of the most relevant elements to the introduction to strengthen the background. However, we chose not to include all of this information there to avoid overloading the introduction and to maintain its readability. Therefore, we retained certain details in the discussion where they better contextualize and support the interpretation of our results in relation to existing literature.

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Unveiling the potential and specificity of the Mahoran ethnopharmacopoeia: a field survey

Highlights section

- 103 participants from Mayotte, 474 remedies cited for 65 health problems, 154 plants identified
- Most frequently cited health disorders: stomachache, cough, headache, fever, high blood pressure
- Most frequently cited plants: *Coleus amboinicus*, *Citrus aurantiifolia*, *Moringa oleifera*, *Ocimum gratissimum*, *Psidium guajava*, *Syzygium aromaticum*, *Woodfordia fruticosa*

Graphical Abstract

Mayotte ethnopharmacopoeia

154 plants

474 remedies

Results

Field survey
103 interviews

White clay

Coral stone

Specificity

Unveiling the potential and specificity of the Mahoran ethnopharmacopoeia: a field survey

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List of abbreviations

~~**FL:** Fidelity level~~
HBP: High blood pressure
~~**ICF**: Informant consensus fidelity~~
ICPC-3: International Classification of Primary Care
ORS: Regional health observatory
UR: Use-Reports
WHO: World Health Organization

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Abstract

Ethnopharmacological relevance: A significant portion of Mahoran people relies on traditional medicine to address their healthcare needs. However, very few studies have been carried out on this subject, and few data are available on the practices, plants used, and ailments most commonly treated by their traditional medicine.

Aim of the study: Within this context, the aim of this study was to identify the diseases most commonly treated by traditional Mahoran medicine, as well as the plants most commonly used against these various ailments.

Materials and methods: From JanuaryFebruary to April 2023, a semi-structured survey was carried out in Mayotte island. A total of 103 participants were interviewed including 65 non specialists, 21 knowledgeable, and 17 specialists. A thorough literature review was performed on the most cited plant species to evaluate the benefit-risk of each remedy.

Results: Participants mentioned using 474 remedies (prepared mostly with herbal ingredients) to treat 654 diseases. These diseases belong to various health categories of which the most represented ones were digestive system, respiratory system, genital system, general, and muscular system. The two most common ailments cited by participants were stomachache (41/103) and cough (36/103). A total of 154 plant species were identified, with *Coleus amboinicus*, *Citrus aurantiifolia*, *Moringa oleifera*, and *Ocimum gratissimum* being the main plants reported. Massage therapy was the second most important traditional practices reported after the use of herbal remedies.

Conclusion: Our survey confirms the importance of traditional medical pratices in Mayotte island. The following plants: *Aerva lanata*, *Cardiospermum halicacabum*, *Coleus madagascariensis Paullinia pinnata*, and *Woodfordia fruticosa* stand out from the others in terms of their use and number of citations, and it would be interesting to study their pharmacological and toxicological properties. Traditional medicine in Mayotte also possesses specificities, notably with the use of particular ingredients such as salt, coral stone, or even white clay. Furthermore, throughout the study, we noticed that chronic diseases such as diabetes or hypertension were extensively treated. This could be linked to the fact that the prevalence of these diseases is quite high on the island.

Keywords: ethnobotany, Comoros islands, traditional medicine, medicinal plants, Africa

1. Introduction

The island of Mayotte is the 101st French departement. It is inhabited~~made up by of~~ three main ethnic groups (Hagège et al., 2022). The Mahorans represent the main ethnic group, while the two others are the Comorians and the Malagasy (Hagège et al., 2022). This diversity is also reflected in the languages spoken on the island: Shimaoré (a language of Bantu origin, close to the languages of southern Africa) is the most widely used mother tongue on the island, spoken by 71% of the population (Rombi, 2003). The second most widely spoken language is Shibushi (a language of Austronesian origin, close to the Malagasy languages), used by 23% of the population (Rombi, 2003). French is the mother tongue of just 2% of the population, but is understood and spoken by around 60% of Mayotte's inhabitants (Rombi, 2003)~~(Hagège et al., 2022)~~.

Formatted: Superscript

Mayotte's flora includes over 1,300 vascular species, of which 49 are endemic to Mayotte, 70 are endemic to the Comoros archipelago, 145 are endemic to the western Indian Ocean region, 400 species are indigenous, and the remainder are exotic (Barthelat, 2019). The inhabitants of Mayotte have taken advantage of this biodiversity by making frequent use of traditional medicine in their health practices. In Mayotte, according to Fadul (2023), one person out of two use plants to treat themselves, although this proportion is probably much lower than the reality, since as in Reunion Island, 8 to 9 people out of 10 use phytotherapy for occasional treatment. In other words, a large proportion of the population of the island practice self-medication when they fall ill (Fadul, 2023). This is mainly due to the fact that it is easier to treat minor ailments (fever, flu, diarrhea) directly with plants, as it often takes several hours to see a doctor in a dispensary. For more serious illnesses (diabetes, high blood pressure), the Mahorans generally diagnose the condition in hospital and then use both modern and traditional medicine to treat it (Lartigau-Roussin, 2002). According to the regional health observatory (ORS), in 2019, only 53% of very low-income individuals consulted a general practitioner when they were sick, and only 11% of these individuals saw a specialist that year. In comparison, 70% of non-poor individuals consulted a general practitioner when sick, and 30% of them consulted a specialist in 2019 (Thibault et al., 2021). These figures are also justified by the fact that 77% of Mayotte's inhabitants live below the national poverty threshold (Balicchi et al., 2014).

So far, two ethnobotanical studies have been conducted on the island. The first was carried out in 2012 by Salaün. This initial study helped highlight the ethnobotanical knowledge of Maoulida Mchangama, who was the sole informant interviewed during the study. The survey identified 65 ailments and identified 127 plant species involved in the 65 remedies mentioned by Mchangama (Mchangama and Salaün, 2012). The second study was conducted in 2018 by Saive, during which 29 individuals were interviewed. The informants were distributed across the north,

south, and center of the island. This survey led to the identification of 69 plant species (Saive et al., 2018). Overall, very few ethnobotanical studies have taken place in Mayotte. Furthermore, the studies that have been conducted did not focus on the entirety of the island and involved few informants.

So, with a view to the future development of products from the Mahoran ethnopharmacopoeia, we decided to conduct an ethnobotanical survey aiming to know which ailments are predominantly treated by traditional therapeutic practices, while identifying the plants most commonly used to treat these ailments. The data collected during the survey will be used to select one or more pathologies of interest to the community, as well as to select some culturally accepted medicinal plants that demonstrate potential therapeutic efficacy and safety profiles. The ultimate goal of this project is to help the Mahoran community capitalize on its terrestrial biodiversity so that it can subsequently benefit from new economic sectors, thereby contributing to the overall development of the island.

2. Materials and methods

2.1. Study area

The island of Mayotte is part of the Comoros archipelago in the Indian Ocean. It covers an area of 374 km², divided between Grande Terre and Petite Terre (Daroueche et al., 2024). Grande-Terre is the department's main island, with a surface area of 363 km², and its highest peaks are Monts Bénara, Choungui, Mtsapéré and Combani (Goff et al., 2013). This island is home to Mayotte's capital and economic hub, Mamoudzou (Dumont, 2005). The department's second largest island, Petite Terre, covers an area of just 11 km² (Daroueche et al., 2024). With regard to the island's demographics, it should be noted that in 2019 the number of inhabitants counted was 270,372 (Hagège, 2019). Mayotte's mainland is made up of 17 communes and 13 cantons. This island has five main types of natural vegetation including mangrove, coastal forest, dry forest, high-altitude rainforest and low-altitude rainforest (Boullet, 2016), and it's inhabited by different communities (Mahoran, Malagasy, Comorian). To ensure a wide range of information, we performed our survey in all communes of mainland Mayotte, and 1 commune out of 2 from Petite Terre (**Figure 1**).

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2.2. Data collection

The survey was conducted from January 31, 2023 to April 28, 2023. A ~~questionnaire~~ semi-structured interview was designed to gather information on the diseases most commonly encountered, as well as the remedies used to treat them. A questionnaire was used to guide the investigator in conducting the survey. This~~e~~ questionnaire was divided into 4 main sections:

- The first section deals with socio-demographic information: age, gender, place of residence, place of birth, mother tongue, occupation, education and religion
- The second section aimed to classify the informants into different categories of expertise: type of person treated (children, family, neighbors, people from other villages or outside Mayotte), source of knowledge, type of traditional practices (herbal therapies, massage, apitherapy, others)
- The third section focuses on the illnesses treated by the informants
- The last section provides information on the remedies used

Two different methods were used to meet informants: the first consisted in going door-to-door in a village to find potential informants to interview (93 interviews). The second method consisted in setting up an appointment with an informant at his home or on his plot, in order to perform the interview~~submit the questionnaire~~ (10 interviews). These informants were previously selected based on snow ball sampling or by word of mouth. Several interviews required the presence of

a translator (39 informants), given that the mother tongue of the majority of informants is shimaoré or shibushi. The majority of interviews were conducted individually (98 interviews), with only 2 interviews conducted in groups.

2.3. Botanical identification

Plants cited by participants were collected in the field by following the guidelines for collection of plant materials from Chassagne and Quave (2021). First, photographies of the plant to be collected were taken, then information on the plant characteristics, location, and habitat were recorded. Finally, three similar voucher specimens of each plant species were collected and deposited at three different herbaria. One was brought to the Herbier de l'Université de La Réunion (REU), Saint-Denis, La Réunion, another one was deposited at the herbarium from the Jardin Botanique Henri Gaussen (TL), Museum d'Histoire Naturelle, Toulouse, France and the last one was deposited at the Pôle d'Excellence Rurale, Coconi, Mayotte. Botanical identification of each plant species was realized by M. Abassi DIMASSI. All plant names have been checked and updated according to international and local databases such as Plants of the World Online (https://powo.science.kew.org/).

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2.4. Ethical considerations

In France, access to traditional knowledge in French overseas territories (except for French Guiana and Wallis and Futuna) does not require specific declarations to the authorities as part of the Nagoya protocol. However, this study has been developed in close consultation with the local authorities (Department of Mayotte and the Agency for Development and Innovation of Mayotte) and is part of a larger project aiming to help Mahoran people valorize their terrestrial resources. This project is directly related to the Rural Excellence Pole of Coconi, where a scientific laboratory has been developed to help achieve this valorization, which is part of the Integrated Innovation Pole of Mayotte (PI²M).

Before each interview, a consent form was submitted to the participant. The first part of the form described the objectives of the study and how it would be carried out, in the form of an explanatory note. This first sheet was given to the informants before the start of the interview. The second part of the form contained the consent information, and was signed by the participant and the interviewer before the interview began. No personal information (last name, first name, date of birth, personal address) was collected during the survey, allowing the participants to remain anonymous.

2.5. Data analysis and visualization

A database was created, using Excel software, from the information collected during the survey. The diseases cited were classified according to the International

Classification of Primary Care (ICPC-3), which is a classification centered on the reason why a patient comes to consult a practitioner (https://flyer.icpc-3.info/). Within the database, identical remedies cited several times were grouped together, avoiding counting several times the same remedy. For the purposes of this study, two remedies are considered similar if their ingredients and the condition they treat are exactly the same.

In addition, remedy preparation and administration methods were grouped together when analyzing the data. For example, if the method is "boil the plant in water and stand under a sheet with the pot". In the database, the preparation method would be "decoction" and the route of administration "inhalation". Version 0.10.1 of the Gephi software was used to create relational graphs depicting the connections between plants and the treated diseases.

Use-reports (UR) were employed to assess the quantitative importance of each plant species and other ingredients used. We followed the definition provided by Chassagne et al. (2023).

~~The Fidelity Level (FL) index is used to assess whether a reported plant species is specifically utilized for treating a particular condition. We calculated FL using the formula developed by Friedman et al. (1986). A high FL index for a given condition suggests that the plant is primarily used for that condition.~~

~~The Informant Consensus Factor (ICF) measures the degree of agreement among participants regarding the use of similar plant species for a specific disease category. We calculated ICF according to the method established by Trotter and Logan (1986). A higher ICF indicates greater consensus on the types of plants used for a given disease category. The ICF ranges from 0 to 1.~~

To assess the efficacy and safety of the most frequently cited plants, we conducted a bibliographic search focusing on preclinical studies (*in vitro* and animal studies) using Google Scholar with the following keywords: "scientific name of the plant" AND ["ethnobotany" OR "pharmacology" OR "toxicology" OR "phytochemistry"]. We included only scientific articles and reviews published in journals with an impact factor above 1 and listed in the Scimago database (https://www.scimagojr.com/).

To create the map representing the study sites, we used QGIS software v. 3.30.0.

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3. Results

3.1. Socio-demographic data

A total of 103 informants were interviewed (**Table 1**), the majority of whom were women (66 informants, 64.1%). The average age of all informants was 50 years, with the most represented age groups being 41-50 (27 informants, 26.2%) and 51-60 (23 informants, 22.3%). Regarding the different communities surveyed, most informants were of Mahoran origin (90 informants, 87.4%), followed by people of Comorian (9 informants, 8.7%) and Malagasy (4 informants, 3.9%) origin. The most common mother tongue among informants was shimaoré (58 informants, 56.4%), followed by shibushi (40 informants, 38.8%), malagasy (4 informants, 3.9%) and finally comorian (1 informant, 0.9%).

Table 1: Socio-demographic characteristics of participants

Characteristics		Frequency	Percent (%)
Gender			
	Female	66	64.1
	Male	37	35.9
Age			
	14-20 years	4	3.9
	21-30 years	9	8.7
	31-40 years	14	13.6
	41-50 years	27	26.2
	51-60 years	23	22.3
	61-70 years	19	18.5
	71-80 years	5	4.9
	81-90 years	2	1.9
Residence (commune)			
	Acoua	1	0.9
	Bandraboua	4	3.9
	Bandrélé	5	4.9
	Bouéni	9	8.7
	Chiconi	4	3.8
	Chirongui	17	16.6
	Dembeni	8	7.8
	Dzaoudzi	4	3.9
	Kani-Kély	12	11.6
	Koungou	5	4.9
	Mamoudzou	2	1.9

	M'tsamboro	7	6.8
	M'tsangamouji	6	5.9
	Ouangani	9	8.7
	Sada	3	2.9
	Tsingoni	7	6.8
Origin			
	Mahoran	90	87.4
	Comorian	9	8.7
	Malagasy	4	3.9
Native language			
	Shimaoré	58	56.4
	Shibushi	40	38.8
	Malagasy	4	3.9
	Comorian	1	0.9
Religion			
	Muslim	102	99.1
	None	1	0.9
Education			
	No school	36	34.9
	Primary school	8	7.8
	Secondary school	8	7.8
	High school	5	4.9
	High school diploma	8	7.8
	Vocational diploma	21	20.4
	University	16	15.5
	ND	1	0.9

Legend: ND = Not documented

3.2. Classification of the informants

The second section of the questionnaire provides information on the expertise level of informants. Based on the answers obtained from the various stakeholders, it is possible to establish a classification of the people we met. This classification is based on five different criteria, as follows:

- Reputation of the person
- Extent of people treated (family, neighbors, other villages, outside of Mayotte)
- Full-time or occasional practice of traditional medicine
- Remuneration by people treated
- Source of knowledge

Based on these criteria, it is possible to classify informants into three categories:

- The first category comprises the « experts » in traditional Mahoran medicine, known locally as "*fundi*" (21 informants, 20.4%). The average age of people in this category is 59 years old. There are more women than men in this category (14 women, 7 men). According to the results of this work, a "*fundi*" is a person who is known throughout the island of Mayotte for his or her knowledge of traditional medicine, and many "*fundi*" even provide remedies for people outside Mayotte. They are generally paid for their services (fixed price or not), and hold their knowledge from their ancestors. It is ~~important to notice~~noteworthy that this status is not self-declared; it is the people of the community or neighbo~~r~~ring villages who bestow this title upon the practitioner. Some "*fundi*" are specialized in the treatment of well-defined illnesses such as sprains, fractures or diseases affecting children. In addition, there are "*fundi*" who, from birth, have a gift for healing people that can be passed down from generation to generation. There is also a local belief that fraternal twins possess a gift for healing people with traditional Mahoran medicine. The qualification of an informant as a "*fundi*" was therefore based on their established reputation within the community, their ancestral knowledge, and their demonstrated ability in traditional medicine, rather than any formal certification or self-id~~n~~entification. ~~It is also important to specify that a person cannot declare herself to be a "*fundi*", it is the people of the community or other villages who name the tradipratician as such.~~

- The second category consists of individuals who are known within a commune in Mayotte for their knowledge of traditional medicine (17 informants, 16.5%). The average age of people in this category is 52 years old. The proportion of men and women within this class is nearly equal (9 men, 8 women). These individuals are not considered experts or "*fundi*". They give remedies to patients from other villages within the same commune, but not outside Mayotte. They may receive payment for their services. Unlike the "*fundi*", these individuals are not known throughout the entire island.

- Finally, the last category corresponds to individuals who practice traditional medicine for themselves and their close ones (family, friends, neighbors) (65 informants, 62.5%). These individuals rarely go to the hospital as they have grown up using traditional medicine. The average age of this group is 45 years, and it consists of more women than men (45 women, 21 men).

3.3. Overview of the diseases reported

A total of 65 health problems were mentioned during the interviews (**Table 2**). The categories of diseases with the highest number of conditions are those affecting

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the digestive system (15 diseases, 23.1%), the respiratory system (8 diseases, 12.3%), and the genital system (7 diseases, 10.7%). In terms of the number of mentions by the informants, the category of diseases affecting the digestive system is the most frequently cited (107 mentions, 27.4%), followed by the respiratory system (65 mentions, 16.6%) and the genital system (45 mentions, 11.5%).

During the interviews, the informants mentioned an average of four different health disorders. The highest number of diseases mentioned by a single informant is 16. The five most frequently cited diseases are stomachache (41 mentions, 10.5%), cough (36 mentions, 9.2%), headache (30 mentions, 7.7%), fever (20 mentions, 5.1%), and high blood pressure (HBP) (16 mentions, 4.1%). Among all the diseases, seven were mentioned with names in shimaore, five were mentioned in shibushi and the rest were in french.

Seven diseases could not be classified according to the ICPC-3. Therefore, these seven diseases were grouped under the category of "other unclassified diseases". Among these, 4 could not be classified due to the absence of a vernacular name in french, and the other three do not appear in the ICPC-3 list.

Table 2: Categories, names and citations of the diseases

ICPC-3 classification	Disorders (english translation)	Disorders (shimaoré, shibushi and / or french name)	Number of informants	Percent (%)
Digestive system				
	Stomachache	Maux de ventre (french)	41	39.8
	Diarrhea	Diarrhée (french)	15	14.5
	Hernia	Mushipa (shimaoré), hernie (french)	12	11.6
	Hemorrhoids	Hémorroïdes (french)	8	7.8
	Intestinal pain	Douleurs intestinales (french)	8	7.8
	Toothache	Maux de dents (french)	7	6.8
	Belly cleansing for the women who have just given birth	Lavage d'estomac pour les femmes qui viennent d'accoucher (french)	3	2.9
	Jaundice	Jaunisse (french)	2	1.9
	ND	Foudzoi (shimaoré)	2	1.9
	Acid reflux	Remontée gastrique (french)	1	0.9
	Constipation	Constipation (french)	1	0.9
	Mouth ulcer	Niochy (shimaore), aphte	1	0.9

		(french)		
	Liver pain	Douleurs au foie	1	0.9
	ND	Touhigni (shibushi)	1	0.9
	ND	Travé (shimaoré), adoua mimba (shibushi)	1	0.9
Respiratory system				
	Cough	Toux (french)	36	34.9
	Asthma	Asthme (french)	7	6.8
	Covid-19	Covid-19 (french)	6	5.8
	Tonsilitis, sore throat	Maux de gorge (french)	5	4.9
	Influenza, flu	Grippe (french)	4	3.9
	Nasopharyngitis, cold	Rhume (french)	3	2.9
	Nosebleed	Saignement du nez (french)	3	2.9
	ND	Wanatsa (shimaoré)	1	0.9
Genital system				
	Female infertility	Infertilité féminine (french)	14	13.6
	Painful periods	Règles douloureuses (french)	12	11.6
	Impotence	Impuissance (french)	11	10.7
	Fibroma	Fibrome (french)	5	4.8
	Long-lasting periods	Règles qui durent longtemps (french)	1	0.9
	Perineal massage	Massage du périnée (french)	1	0.9
	Vaginal inflammation	Inflammation vaginale (french)	1	0.9
Neurological system				
	Headache	Maux de tête (french)	30	29.1
	Dizziness	Malaises (french)	5	4.9
	Epilepsy	Épilepsie (french)	3	2.9
Musculatory system				
	Joint, muscle pain	Douleurs articulaires et musculaires (french)	16	15.5
	Sprain	Entorse (french)	8	7.8
	Back pain	Douleurs aux dos	3	2.9
	Feet pain	Douleurs aux pieds (french)	3	2.9
	Fracture	Fracture (french)	3	2.9
General				
	Fever	Fièvre (french)	20	19.4
	Rash, itching	Boutons, démangeaisons	3	2.9

		(french)		
	Dengue	Dengue (french)	2	1.9
	Chickenpox	Varicelle (french)	1	0.9
	Chikungunya	Chikungunya (french)	1	0.9
Circulatory system				
	High blood pressure	Hypertension artérielle (french)	16	15.5
	Blood circulation problem	Problème de circulation sanguine (french)	3	2.9
Endocrine system				
	Diabetes	Diabète (french)	14	13.5
Skin				
	Wounds, injury	Plaies, blessures (french)	9	8.7
	Haematoma	Hématome (french)	2	1.9
	Skin depigmentation	Décoloration pigmentaire (french)	2	1.9
	Furuncle	Furoncle (french)	1	0.9
Ear				
	Otitis externa	Otite (french)	6	5.8
Psychological system				
	Child enuresis	Énurésie chez les enfants (french)	3	2.9
	Anaphrodisia	Anaphrodisie (french)	1	0.9
Pregnancy and child bearing				
	Facilitation of child birth	Facilitation de l'accouchement (french)	2	1.9
	Pain during child birth	Douleurs lors de l'accouchement (french)	1	0.9
Urinary system				
	Urinary tract infection	Infection urinaire (french)	2	1.9
	Difficulty urinating	Difficulté à uriner (french)	1	0.9
Eye				
	Infectious conjunctivitis	Conjonctivite (french)	2	1.9
Other unclassified diseases				
	Abscess	Abcès (french)	4	3.9
	Fontanelle	Fontanelle (french)	3	2.9
	ND	Vourgnegni (shibushi)	2	1.9

	ND	Tchéwé (shimaoré)	1	0.9
	ND	Baridi mimba (shimaoré)	1	0.9
	ND	Kadi (shibushi)	1	0.9
	People who wants to lose belly fat	Personne qui veulent perdre du ventre (français)	1	0.9

Legend: ND = Not documented

3.4. Overview of traditional medicine practices in Mayotte

3.4.1. Presentation of the practices

Based on the data collected from the informants, traditional medicine in Mayotte predominantly involves biological treatments (472 remedies, 10176~~6~~~~472~~ UR ~~citations~~) and manipulation-based treatments (2 treatments, 4 UR~~citations~~). These manipulation-based treatments consist of massages performed using coconut oil for sprains (2 ~~citations~~UR) and fractures (2 ~~citations~~UR).

The most commonly used ingredients in biological treatments are plants (916 ~~citations~~UR, 90.1%), followed by processed or food products (items that have undergone processing or purchased at the market, such as salt, coconut oil, sugar, rice) (55 ~~citations~~UR, 5.4%), animal products (coral stone, honey, shark oil, horse excrement, egg white, milk) (43 ~~citations~~UR, 4.3%), mineral products (white clay locally known as "tany malandy" in shibushi) (2 ~~citations~~UR, 0.2%), and other products (sewing needle) (1 ~~citation~~UR, 0.1%).

3.4.2. The remedies

A total of 474 remedies were mentioned during the interviews, out of which 394 remedies were unique. These unique remedies have different ingredients, use different parts of the plant when ingredients are the same, and are employed for distinct diseases. The maximum number of remedies cited by a single informant was 15, and on average, informants mentioned 5 remedies.

Among these 394 unique remedies, the majority were single-ingredient remedies (199 remedies, 246 UR~~citations~~). Following the single-ingredient remedies were those composed of two ingredients (102 remedies, 126 UR~~citations~~), followed by three-ingredients remedies (43 remedies, 46 UR~~citations~~), four-ingredients remedies (27 remedies, 29 UR~~citations~~), five-ingredients remedies (11 remedies, 11 UR~~citations~~), six-ingredients remedies (7 remedies, 7 UR~~citations~~), and seven-ingredients remedies (4 remedies, 5 citations). The most complex remedy consisted of eight ingredients (1 remedy, 1 ~~citation~~UR).

A significant portion of these unique remedies were solely composed of plants (327 remedies, 68.9% of the total remedies, 383 ~~citations~~UR). The remaining remedies mentioned were mixtures of plants and other ingredients (processed or food products, animal products, mineral products, other products) (66 remedies, 87 ~~citations~~UR), with only one remedy not containing any plant ingredients (1 remedy, 1 ~~citation~~UR). Among the other ingredients, salt was the most cited (45 ~~citations~~UR~~, 45%~~), followed by coral stone (27 ~~citations~~UR~~, 27%~~) and honey (11 ~~citations~~UR~~, 11%~~).

The diseases that had the highest number of remedies mentioned were stomachache (43 remedies, 56 ~~citations~~UR), cough (34 remedies, 54 ~~citations~~UR), headache (33 remedies, 38 ~~citations~~UR), fever (25 remedies, 30 ~~citations~~UR), HBP (19 remedies, 21 ~~citations~~UR), and diabetes (19 remedies, 24 ~~citations~~UR).

3.4.3. Herbal ingredients

A total of 154 plants were identified in our survey (**Table 3**). The eleven most cited species are as follows: *Coleus amboinicus* (44 ~~citations~~UR, 5.4 %), *Citrus aurantiifolia* (32 ~~citations~~UR, 3.9 %), *Moringa oleifera* (31 ~~citations~~UR, 3.8 %), *Ocimum gratissimum* (31 ~~citations~~UR, 3.8 %), *Psidium guajava* (25 ~~citations~~UR, 3.1 %), *Syzygium aromaticum* (22 ~~citations~~UR, 2.7 %), *Woodfordia fruticosa* (~~22 citations~~UR, 2.7 %), *Cocos nucifera* (18 ~~citations~~UR, 2.2 %), *Curcuma longa* (18 ~~citations~~UR, 2.2 %), *Aerva lanata* (17 ~~citations~~UR, 2.1 %) and *Coleus madagascariensis* (17 ~~citations~~UR, 2.1 %).

The 154 plant species considered belong to 65 distinct botanical families. Among these 154 species, 98 are exotic (63.7%), 53 are indigenous (34.4%), 1 is endemic to the Comoros islands (*Aloe alexandrei*) and 2 are endemic to Mayotte (*Aloe mayottensis, Croton mayottae*)~~and 3 are endemic to the island (1.9%)~~. The botanical families mentioned with the highest number of species are the Fabaceae (15 species, 9.7%), the Lamiaceae (12 species, 5.1%), the Asteraceae (8 species, 5.2%), the Euphorbiaceae (7 species, 4.5%), the Annonaceae (5 species, 3.2%), the Malvaceae (5 species, 3.2%), and the Rutaceae (5 species, 3.2%).

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The plant parts most commonly used are the leaves (114 species, 74%), followed by the roots (25 species, 16.2%), the vines (17 species, 11.1%), the fruits (11 species, 7.1%), the bark (9 species, 5.8%), and the stems (5 species, 3.4%). In terms of citations, the leaves are still the most prevalent (558 ~~citations~~UR, 69.1%), followed by the fruits (46 ~~citations~~UR, 5.7%), the vines (43 ~~citations~~UR, 5.3%), the roots (39 ~~citations~~UR, 4.8%), the rhizomes (35 ~~citations~~UR, 4.3%), and the bark (17 ~~citations~~UR, 2.1%).

438

439
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Table 3: Ethnobotanical data of the 154 plant species identified

Scientific name	Botanical family	Voucher No	Shimaoré name	Shibushi name	French name	Number of persons citing the plants	Type of disorders treated	Parts used	Method of preparation	Method of administration	Number of ~~citations~~ [illegible] ~~for each disorder treated~~
Abrus precatorius L.	Fabaceae	TTH 031	M'bilimbitsi	Maso na ombygara	Œil du diable	7	Cough	Leaf	Crush in water / Cold maceration	Oral	5
							Fever	Leaf	Cold maceration	Cutaneaous	1
							Headache	Leaf	Crush, press	Cutaneaous	1
Acalypha indica L.	Euphorbiaceae	TTH 077	Chamanakora	Hayti ambandriha	Herbe chat	3	Asthma	Leaf	Crush in water	Oral	3
Adansonia digitata L.	Malvaceae	TTH 022	M'buyu	Boyo	Baobab	3	Diabetes	Bark	Decoction	Oral	1
							Female infertility	Bark	Decoction	Oral	1
							Haematoma	Fruit	Eat	Oral	1
Aerva lanata (L.) Juss. ex Schult.	Amaranthaceae	TTH 057	Shiva arya	Hanga moti	ND	12	Female infertility	Dry leaf / Leaf / Liana	Decoction / Decoction until color changes	Oral	10

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							Hemorrhoids	Leaf	Decoction until color changes	Oral	2
							Belly cleansing for the women who have just given birth	Leaf	Decoction until color changes	Oral	1
							Fibroma	Leaf	Decoction until color changes	Oral	1
							Hernia	Leaf	Decoction	Oral	1
							Painful periods	Leaf	Decoction	Oral	1
							Stomachache	Dry leaf	Decoction until color changes	Oral	1
Ageratum conyzoides L.	Asteraceae	NC	Mwana be	Be mahiimbo kely	Herbe de bouc	1	Female infertility	Leaf	Decoction	Oral	1
Allium sativum L.	Amaryllidaceae	NC	ND	ND	Ail	4	Blood circulation problem	Bulb	Crush	Oral	1
							Diabetes	Bulb	Cold maceration	Oral	1
							Female infertility	Bulb	Cold maceration	Oral	1
							High blood pressure	Bulb	Cold maceration	Oral	1
							Impotence	Bulb	Crush	Oral	1
Aloe alexandrei Ellert	Asphodelaceae	TTH 013	Shizya m'lili	Sakoankankini	Aloe des Comores	1	Diabetes	Leaf	Decoction	Oral	1

Aloe mayottensis A.Berger	Asphodelaceae	NC	Shizya m'lili	Sakoankankini	Aloe de Mayotte	2	Wounds, injury	Gel	Direct application	Cutaneaous	2
Aloe vera (L.) Burm.f.	Asphodelaceae	NC	ND	ND	Aloe	2	Wounds, injury	Gel	Direct application	Cutaneaous	2
							Fever	Gel	Direct application	Cutaneaous	1
Annona muricata L.	Annonaceae	TTH 103	Konokono miba	Konokono fatsiky	Corossol	6	Dizziness	Leaf	Crush	Nasal	1
							Fever	Leaf	Decoction	Inhalation	1
							Headache	Leaf	Grate	Cutaneaous	1
							High blood pressure	Leaf	Decoction until color changes	Oral	1
							Joint, muscle pain	Leaf	Decoction	Oral	1
Annona senegalensis Pers.	Annonaceae	TTH 007	Konokono manga	Porpetraka	Annone du Sénégal	8	Sprain	Root	Scraping on coral stone	Cutaneaous	5
							Abscess	Branch / Root	Scraping on coral stone	Cutaneaous	2
							Asthma	Bark / Leaf / Root	Decoction	Oral	1
							Fracture	Root	Scraping on coral stone	Cutaneaous	1
							Intestinal pain	Fruit	Scraping on coral stone	Oral	1

								Haematoma	Branch	Scraping on coral stone	Cutaneaous	1
Annona squamossa L.	Annonaceae	TTH 014	Konokono matsu	Konokono	Pomme cannelle	8	Dizziness	Dry fruit / Leaf	Crush / Heat	Nasal / Oral	3
							Headache	Fruit / Leaf	Crush in water / Scraping on coral stone	Cutaneaous	2
							Nosebleed	Leaf	Crush	Cutaneaous	2
							Constipation	Fruit	Scraping on coral stone	Oral	1
							Fever	Leaf	Decoction	Inhalation	1
							Stomachache	Fruit	Scraping on coral stone	Oral	1
Apodytes dimidiata E. Mey. Ex Arn.	Metteniusaceae	TTH 045	Bako m'dzuani	Bako mdzoani mena	Peau gris	1	Joint, muscle pain	Leaf / Root	Decoction	Cutaneaous	2
Artemisia sp.	Asteraceae	TTH 079	ND	ND	ND	1	"Vourgnegni" (shibushi)	Flower / Leaf	Decoction	Oral	2
							Hernia	Leaf	Decoction	Oral	1
Averrhoa bilimbi L.	Oxalidaceae	NC	Waju	Madiro	Bilimbi	1	Asthma	Leaf	Crush, filter	Oral	1
							Cough	Leaf	Crush, filter	Oral	1
Avicennia marina (Forssk.) Vierh.	Acanthaceae	TTH 004	M'siri	Afy Afy	Palétuvier blanc	2	Impotence	Leaf	Decoction until color	Oral	1

									changes		
							Stomachache	Leaf	Decoction	Oral	1
Ayapana triplinervis (Vahl) R.M.King & H.Rob.	Asteraceae	TTH 113	Lalapona	ND	ND	1	Hernia	Leaf	Decoction	Oral	1
Azadirachta indica A. Juss.	Meliaceae	TTH 005	ND	ND	Margousier	2	All diseases	Leaf / Stem	Decoction	Oral	1
							Diabetes	Leaf	Decoction	Oral	1
Barleria lupulina Lindl.	Acanthaceae	TTH 053	ND	Mamy lahy	Barbelé mahorais	1	Toothache	Leaf	Decoction	Oral	1
Bidens pilosa L.	Asteraceae	TTH 027	Tailamba	Tyalamba be	Herbe sornette	3	Dizziness	Leaf	Put the plant in a pot until it smokes	Inhalation	1
							High blood pressure	Leaf	Decoction until color changes	Oral	1
							Wounds, injury	Leaf	Crush	Cutaneaous	1
Blepharis maderaspatensis (L.) B.Heyne ex Roth	Acanthaceae	NC	Mani malilo	Tsipotiky vavy	ND	1	"Adoua mimba" (shibushi)	Leaf	Decoction	Oral	1
							Female infertility	Leaf	Decoction	Oral	1
Bruguiera gymnorhiza (L.) Lam. Ex Savigny	Rhizophoraceae	NC	M'honko n'dzishe	Honko vavy	Manglier gros poumon	1	Hernia	Root	Decoction until color changes	Oral	1
Cajanus cajan (L.) Huth	Fabaceae	TTH 084	M'tsuzi	Ambatry	Ambréva de	2	Feet pain	Root	Decoction	Cutaneaous	1

								Toothache	Root	Decoction in sea water	Oral (gargle)	1
Calophyllum inophyllum L.		Calophyllaceae	NC	M'tondro	Mtondro	Takamaka	1	Diarrhea	Leaf	Decoction until color changes	Oral	1
Cannabis sativa L.		Cannabaceae		ND	ND	Chanvre	1	Jaundice	Leaf	Crush	Oral	1
								Stomachache	Leaf	Crush	Oral	1
Cardiospermum halicacabum L.		Sapindaceae	TTH 128	Kanussa	Motso hokatso	Liane poc-poc	11	Fever	Leaf	Cold maceration / Crush in water	Cutaneaous	6
								Headache	Leaf / Liana	Crush in water	Cutaneaous	3
								Cough	Leaf	Crush in water	Cutaneaous	1
								Hemorrhoids	Leaf	Decoction	Oral	1
								"Vourgnegni" (shibushi)	Leaf	Decoction, bath	Cutaneaous	1
Carica papaya L.		Caricaceae	NC	M'papaya	ND	Papayer	11	Covid-19	Leaf	Decoction	Inhalation	5
								Fever	Leaf	Decoction	Inhalation	5
								Constipation	Leaf	Decoction until color changes	Oral	2
								Dengue	Leaf	Decoction	Inhalation	2
								Chikungunya	Leaf	Decoction	Inhalation	1
								Influenza, flu	Leaf	Decoction	Inhalation	1
								Hernia	Root	Decoction until color	Oral	1

									changes		
Carissa spinarum L.	Apocynaceae	NC	M'djanfari	Taola na omby	Bois sandal	1	Headache	Wood	Scraping on coral stone	Cutaneaous	1
Cassytha filiformis L.	Lauraceae	TTH 001	Shirunga kange tandri	Tsihitafotrota tamotamo	ND	2	Impotence	Root	Decoction	Oral	1
							Stomachache	Liana	Decoction	Oral	1
Catharanthus roseus (L.) G.Don	Apocynaceae	NC	ND	ND	Pervenche de Madagascar	2	Diarrhea	Leaf	Decoction	Oral	2
							Diabetes	Leaf / Root	Decoction	Oral	1
Ceiba pentandra (L.) Gaertn.	Malvaceae		M'pembafuma	Pemba fuma	Kapok	1	Headache	Young leaf	Crush	Cutaneaous	1
Chamaecrista pratensis (R.Vig.) Du Puy	Fabaceae	TTH 048	Shibalabala maitso	Sary fatsiky ambili	ND	1	Wounds, injury	Leaf, stem	Burn and recover ashes	Cutaneaous	1
Cinnamomum verum J.Presl	Lauraceae	NC	M'darasini	ND	Cannelle	2	Diabetes	Bark / Leaf	Decoction	Oral	2
							Impotence	Bark	Crush, infusion / Decoction	Oral	2
Cissampelos pareira L.	Menispermaceae	TTH 102	Nya nyombe	Sala lobo	Liane blanche	2	Headache	Liana	Crush in water / Grate	Cutaneaous	2
Citrus aurantiifolia (Christm.) Swingle	Rutaceae	NC	ND	ND	Citron vert	19	Cough	~~Feuille~~ Leaf / Fruit	Crush / Decoction until color changes	Oral	7

								Covid-19	Leaf / Fruit	Crush / Decoction	Inhalation / Oral	6
								Fever	Leaf / Fruit	Crush / Decoction	Cutaneaous / Inhalation / Oral	6
								Influenza, flu	Leaf / Fruit	Decoction	Inhalation / Oral	3
								Dengue	Leaf / Fruit	Crush / Decoction	Inhalation / Oral	2
								Headache	Leaf / Fruit	Decoction / Decoction until color changes	Oral	2
								Feet pain	Leaf	Decoction	Cutaneaous	1
								Female infertility	Leaf	Decoction until color changes	Oral	1
								Hemorrhoids	Leaf	Decoction	Oral	1
								Stomachache	Leaf / Fruit	Cold maceration / Decoction until color changes	Oral	2
								Tonsilitis, sore throat	Fruit	Crush	Oral	1
Citrus hystrix DC.		Rutaceae	NC	ND	ND	Combava	1	Stomachache	Dry leaf	Decoction until color changes	Oral	1
Citrus sinensis f. sekkan Hayata		Rutaceae	NC	ND	ND	Oranger	2	Anaphrodisia	Fruit	Crush	Oral	1

								Fever	Leaf	Decoction	Inhalation	1
Cleome viscosa L.	Cleomaceae	TTH 075	M'ramli	Ramli	Cléome visqueux	1	Otitis externa	Leaf	Crush	Auricular	1
Clitoria ternatea L.	Fabaceae	TTH 092	Shilepe	Femehifary	Corbeille d'or	1	Infectious conjunctivitis	Flower	Cold maceration	Ocular	1
Cocos nucifera L.	Arecaceae		M'nadzi irashi	Voanyo morashi	Cocotier	12	Headache	Fruit / Fruit (milk) / Fruit (oil)	Crush, press / Crush, heat / Decoction / Grate	Cutaneaous	4
							Cough	Fruit (milk) / Fruit (oil)	Crush / Crush in water	Cutaneaous / Oral	3
							"Foudzoi" (shimaoré)	Leaf / Fruit (oil)	Burn and recover ashes	Cutaneaous	2
							Back pain	Fruit	Grate	Cutaneaous	1
							Fever	Fruit (milk)	Crush in water	Oral	1
							Fracture	Fruit	Crush	Cutaneaous	1
							Furuncle	Fruit (oil)	Crush	Cutaneaous	1
							Haematoma	Fruit	Crush	Cutaneaous	1
							Impotence	Fruit (empty shell)	Decoction	Oral	1
							Liver pain	Fruit (milk)	Heat	Inhalation	1
							Otitis externa	Fruit (oil)	Crush	Auricular	1
							Sprain	Fruit	Grate	Cutaneaous	1

Coleus amboinicus Lour.	Lamiaceae	TTH 60	Parauvi	Paraovy lahy	Gros thym	30	Cough	Leaf	Crush / Crush, press / Decoction / Decoction until color changes / Eat	Cutaneaous / Oral	30
							Headache	Leaf	Crush / Crush, press / Decoction until color changes / Eat	Cutaneaous / Oral	6
							Fever	Leaf	Crush / Crush in water	Cutaneaous / Oral	3
							Hernia	Leaf	Decoction	Oral	2
							High blood pressure	Leaf	Decoction until color changes	Oral	1
							Nasopharyngitis, cold	Leaf	Crush	Nasal	1
							Tonsilitis, sore throat	Leaf	Crush in water	Oral	1
Coleus madagascariensis (Pers.) A.Chev.	Lamiaceae	TTH 098	Parauvi doumé	ND	Parauvi de Madagascar	17	Stomachache	Leaf	Crush, infusion / Crush in water /	Oral	13

									Decoction		
							Diarrhea	Leaf	Decoction / Decoction until color changes	Oral	2
							Painful periods	Leaf	Crush in water	Oral	2
Coleus sp.	Lamiaceae	TTH 074	ND	ND	ND	1	Stomachache	Leaf	Decoction	Oral	1
Combretum micranthum G.Don	Combretaceae	NC	ND	Kinkéliba	ND	1	Stomachache	Branch	Decoction	Oral	1
							Urinary tract infection	Branch	Decoction	Oral	1
Cordia myxa L.	Boraginaceae	TTH 036	M'rovu	Salelo	La colle	3	"Baridi mimba" (shimaoré)	Leaf	Decoction	Inhalation	1
							Covid-19	Leaf	Decoction	Oral	1
							Female infertility	Leaf	Decoction	Oral	1
							Hemorrhoids	Leaf	Decoction	Oral	1
							Painful periods	Leaf	Decoction until color changes	Oral	1
							Stomachache	Leaf	Decoction until color changes	Oral	1
Corymbia citriodora (Hook.) K.D.Hill & L.A.S.Johnson	Myrtaceae	NC	ND	Kinini	Eucalyptus citronnelle	4	Fever	Leaf	Decoction / Cold maceration	Oral / Inhalation	2
							Covid-19	Leaf	Decoction	Inhalation	1
							High blood	Leaf	Decoction	Oral	1

							pressure		until color changes		
Crocus sativus L.	Iridaceae	NC	ND	ND	Safran	1	Jaundice	Leaf	Crush, bath	Cutaneaous	1
Croton mayottae P.E.Berry & Kainul	Euphorbiaceae	TTH 015	Muhuve	Sary laza laza	Croton glanduleux	1	Impotence	Root	Decoction	Oral	1
Cucumis anguria L.	Cucurbitaceae	TTH 126	Shirangu m'ba	Antsikiri vaolavo	Concombre marron	1	High blood pressure	Liana	Decoction	Oral	1
Cucumis melo L.	Cucurbitaceae	NC	ND	ND	Melon	1	Headache	Fruit	Scraping on coral stone	Oral	1
Curcuma longa L.	Zingiberaceae	NC	M'tsinzano	Tamotamo	Curcuma	14	Joint, muscle pain	Rhizome	Heat / Crush	Cutaneaous	4
							Sprain	Rhizome	Scraping on coral stone	Cutaneaous	2
							Wounds, injury	Rhizome	Crush / Scraping on coral stone	Cutaneaous	2
							Abscess	Rhizome	Crush	Cutaneaous	1
							Asthma	Rhizome	Crush, filter	Oral	1
							Diabetes	Rhizome	Crush	Oral	1
							Fever	Rhizome	Crush	Cutaneaous	1
							"Foudzoi" (shimaoré)	Rhizome	Burn and recover ashes	Cutaneaous	1
							Fracture	Rhizome	Crush	Cutaneaous	1

								Haematoma	Rhizome	Crush	Cutaneaous	1
								High blood pressure	Rhizome	Crush	Oral	1
								Jaundice	Rhizome	Crush	Oral	1
								Stomachache	Rhizome	Decoction	Oral	1
Cyanthillium albicans (DC.) H.Rob.		Asteraceae	TTH 096	ND	ND	ND	1	"Vourgnegni" (shibushi)	Whole plant	Decoction	Inhalation	1
Cymbopogon citratus (DC.) Stapf		Poaceae	TTH 058	ND	ND	Citronnelle	5	Influenza, flu	Leaf	Decoction	Inhalation	2
								Covid-19	Leaf	Decoction	Inhalation	1
								Diabetes	Leaf	Decoction	Oral	1
								Feet pain	Leaf	Decoction	Cutaneaous	1
								Fever	Leaf	Decoction	Inhalation	1
								Headache	Leaf	Crush in water	Oral	1
								Intestinal pain	Leaf	Crush in water	Oral	1
Daucus carota L.		Apiaceae	NC	ND	ND	Carotte	1	Anaphrodisia	Root	Crush	Oral	1
Decalobanthus peltatus (L.) A.R Simões & Staples		Convolvulaceae	NC	ND	Fakamboka	La liane	11	Belly cleansing for women who have just given birth	Leaf	Decoction, bath	Cutaneaous, inhalation	3
								Female infertility	Dry liana / liana / Root	Decoction / Decoction until color changes	Oral	3
								Stomachache	Leaf /	Decoction /	Oral	2

								Liana	Decoction until color changes		
							"Baridi mimba" (shimaoré)	Leaf	Decoction	Inhalation	1
							Covid-19	Leaf	Decoction	Inhalation	1
							Fever	Leaf	Decoction	Inhalation	1
							Headache	Liana	Decoction	Cutaneaous	1
							High blood pressure	Dry liana	Decoction	Oral	1
							Influenza, flu	Leaf	Decoction	Inhalation	1
Dodonaea viscosa Jacq.	Sapindaceae	TTH 037	Shihoja	Dinga dinga	Bois d'arnette	15	Cough	Leaf	Decoction	Oral	3
							Stomachache	Leaf	Decoction / Decoction until color changes	Oral	3
							Headache	Leaf	Crush, heat / Crush, press	Cutaneaous	2
							"Baridi mimba" (shimaoré)	Leaf	Decoction	Inhalation	1
							Child enuresis	Leaf	Decoction until color changes	Oral	1
							Diarrhea	Leaf	Decoction	Oral	1
							Hemorrhoids	Leaf	Decoction	Oral	1
							Impotence	Leaf	Decoction until color changes	Oral	1

								Painful periods	Leaf	Decoction	Oral	1
								Joint, muscle pain	Leaf	Decoction until color changes	Oral	1
								Urinary tract infection	Leaf	Decoction until color changes	Oral	1
Dracaena canaliculata (Carrière) Byng & Christenh		Asparagaceae	TTH 030	M'kokoboa	Vitiposha	Sansevière	1	Otitis externa	Leaf	Crush	Auricular	1
Elephantopus mollis Kunth		Asteraceae	TTH 123	M'kambwi	Sary lobaka	Herbe tabac	7	Stomachache	Leaf	Crush in water / Decoction until color changes	Oral	2
								Abscess	Flower, leaf	Crush	Cutaneaous	1
								Fibroma	Stem	Decoction until color changes	Oral	1
								Hemorrhoids	Leaf	Decoction	Oral	1
								Intestinal pain	Leaf	Decoction	Oral	1
								Rash, itching	Leaf	Crush	Cutaneaous	1
Erythroxylum platyclados Bojer		Erythroxylaceae	TTH 008	M'honko wa malavuni	Tapiyaka	Érythroxylon à cladodes	3	Hernia	Wood	Decoction	Oral	1
								High blood pressure	Leaf	Decoction	Oral	1
								Impotence	Leaf	Decoction	Oral	1

								Stomachache	Leaf	Decoction	Oral	1
Euphorbia hirta L.	Euphorbiaceae	TTH 124	Dzyadziki n'drume	Kimenamen a lahy	Herbe à dysenteri e	7	Diarrhea	Leaf	Decoction	Oral	2
							Female infertility	Leaf	Decoction	Oral	1
							"Foudzoi" (shimaoré)	Liana	Decoction until color changes	Oral	1
							Intestinal pain	Leaf	Decoction	Oral	1
							Stomachache	Leaf	Decoction until color changes	Oral	1
							"Tchéwé" (shimaoré)	Leaf	Decoction, bath	Cutaneaous	1
Flacourtia indica (Burm.f.) Merr.	Salicaceae	TTH 006	M'tsongoma	Lamonti	Prunier de Madagasc ar	1	High blood pressure	Leaf	Decoction	Oral	1
							Impotence	Root	Decoction	Oral	1
Flueggea virosa (Roxb. Ex Willd.) Royle	Phyllanthaceae	TTH 021	M'homba	Koutrika	Fluegée vireuse	1	Blood circulation problem	Leaf, stem	Decoction	Oral	2
Grona triflora (L.) H.Ohashi & K.Ohashi	Fabaceae	TTH 085	Tsomouadzi	ND	ND	1	"Vourgnegni" (shibushi)	Liana	Decoction until color changes	Oral	1
Guilandina major (Medik.) Small	Fabaceae	TTH 100	M'tso	Katra	Cadoque	4	Impotence	Leaf / Root	Decoction / Decoction until color changes	Oral	3
							Hernia	Leaf	Decoction	Oral	2

Gymnema sylvestre (Retz.) R.Br. Ex Sm.	Apocynaceae	TTH 002	ND	Pamba soisoi lava raviny	ND	1	Infectious conjunctivitis	Liana	Crush	Ocular	1
Hemionitis viridis (Forssk.) Sw.	Pteridaceae	TTH 118	Moukalakatra	Kangadja	Pellée verte	1	Hemorrhoids	Leaf	Decoction until color changes	Oral	1
Hibiscus surattensis L.	Malvaceae	TTH 040	Uhaha	Rango rango balala	Oseille malbar	3	Child enuresis	Liana	Decoction	Oral	1
							Female infertility	Leaf	Decoction	Oral	1
							Hemorrhoids	Leaf	Decoction	Oral	1
Hyparrhenia rufa (Nees) Stapf	Poaceae	NC	Sandze	Hai mosy	Jarahua	2	Fever	Leaf	Decoction	Inhalation	1
							"Tchéwé" (shimaoré)	Leaf	Decoction, bath	Cutaneaous	1
Illicium verum Hook.f.	Schisandraseae		ND	ND	Anis étoilé	1	Fibroma	Fruit	Decoction	Oral	1
Indigofera hirsuta L.	Fabaceae	TTH 135	ND	Sary orova	Indigotier hirsute	1	Pain during child birth	Leaf	Decoction until color changes	Oral	1
Ipomoea fistulosa Mart. Ex Choisy	Convolvulaceae	NC	ND	Fakanboka	Ipomée fistuleuse	1	"Vourgnegni" (shibushi)	Leaf	Decoction, bath	Cutaneaous	1
Ipomoea obscura (L.) Ker Gawl.	Convolvulaceae	TTH 086	Koveani	Mohoveni malandy	Ipomée obscure	12	Headache	Leaf / Liana	Crush in water / Decoction / Scraping on coral stone	Cutaneaous / Oral	8
							Fever	Leaf / Liana	Cold maceration / Crush in	Cutaneaous	4

									water		
							Cough	Leaf / Liana	Crush in water	Oral	2
Ipomoea pes-caprae (L.) R.Br.	Convolvulaceae	TTH 003	Pupum'tsanga	Lalandrana	Patate à Durand	5	Covid-19	Leaf	Decoction	Inhalation	2
							Feet pain	Leaf	Decoction	Cutaneaous	1
							Joint, muscle pain	Leaf	Decoction	Cutaneaous	1
							Joint, muscle pain	Leaf, stem	Decoction	Cutaneaous	1
Jasminum officinale L.	Oleaceae	NC	ND	ND	Jasmin	2	Back pain	Flower	Grate	Cutaneaous	1
							Headache	Flower	Grate	Cutaneaous	1
							Joint, muscle pain	Dry flower	Direct application	Cutaneaous	1
							Sprain	Flower	Grate	Cutaneaous	1
Jatropha curcas L.	Euphorbiaceae	TTH 016	M'tsumu	Valavelo	Médicinier	8	Toothache	Bark	Decoction	Oral (gargle)	3
							Wounds, injury	Sap	Direct application	Cutaneaous	3
							Diarrhea	Leaf	Crush in water	Oral	1
							Stomachache	Leaf	Cold maceration	Oral	1
							"Wanatsa" (shimaoré)	Leaf	Crush in water	Cutaneaous	1
Kalanchoe pinnata (Lam.) Pers.	Crassulaceae	TTH 017	Meawani	Sodifafa	Choux de fafe	11	Cough	Leaf	Crush / Crush, filter	Cutaneaous / Oral	3

								Joint, muscle pain	Leaf	Heat / Crush	Cutaneaous	3
								Headache	Leaf	Heat / Crush	Cutaneaous	2
								Asthma	Leaf	Crush, filter	Oral	1
								Diabetes	Leaf	Infusion	Oral	1
								Fracture	Leaf	Crush	Cutaneaous	1
								Haematoma	Leaf	Crush	Cutaneaous	1
								Otitis externa	Leaf	Crush	Auricular	1
								Wounds, injury	Leaf	Heat	Cutaneaous	1
Lagenaria siceraria (Molina) Standl.		Cucurbitaceae	TTH 044	Shitsuva	Kasingi	Calebasse	1	Impotence	Leaf	Decoction	Oral	1
Lantana camara L.		Verbenaceae	TTH 090	M'bwasera	Fatsiky madani	Corbeille d'or	7	Stomachache	Leaf	Crush / Crush in water / Decoction	Oral	8
								Covid-19	Leaf	Decoction	Inhalation	2
								Fever	Leaf	Crush / Decoction	Cutaneaous / Inhalation	2
								"Adoua mimba" (shibushi)	Leaf	Decoction	Oral	1
								Dengue	Leaf	Decoction	Inhalation	1
								Female infertility	Leaf	Decoction	Oral	1
								Joint, muscle pain	Leaf	Decoction	Inhalation	1
Lantana strigocamara		Verbenaceae	TTH 109	ND	ND	ND	1	High blood pressure	Leaf	Decoction	Oral	1

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Lawsonia inermis L.	Lythraceae	NC	Hina	Mwina vavy	Henné	1	Feet pain	Leaf	Decoction	Cutaneaous	1
Leptadenia madagascariensis Decne.	Apocynaceae	TTH 054	ND	Pamba soisoi	Leptadenia de Madagascar	3	Asthma	Leaf	Decoction	Oral	1
							Diabetes	Leaf	Decoction	Oral	1
							Wounds, injury	Leaf / sap	Crush / Direct application	Cutaneaous	1
							Painful periods	Leaf	Decoction	Oral	1
Leucas grandis Vatke	Lamiaceae	TTH 089	M'tsamoa	Ahody tsiheny	ND	4	Nasopharyngitis, cold	Leaf	Crush	Nasal	2
							Headache	Leaf	Crush	Cutaneaous	1
							Long-lasting periods	Leaf	Crush in water	Oral	1
Lippia alba (Mill.) N.E.Br. Ex Britton & P.Wilson	Verbenaceae	TTH 129	Nana	ND	ND	2	Diabetes	Leaf, stem	Decoction until color changes	Oral	1
							Hemorrhoids	Leaf	Decoction	Oral	1
							Stomachache	Leaf, stem	Decoction until color changes	Oral	1
Litsea glutinosa (Lour.) C.B.Rob	Lauraceae	NC	M'zavoca maro	Zavoca maro	Avocat sauvage	1	Wounds, injury	Sap	Direct application	Cutaneaous	1
Lygodium kerstenii Kuhn	Lygodiaceae	TTH 011	Tandri ya puruku	Vahy lambo	Petite liane cochon	1	Stomachache	Leaf, stem	Decoction	Oral	1

Mangifera indica L.	Anacardiaceae	NC	Manga	Manga	Manguier	14	Diabetes	Leaf	Decoction	Oral	7
							Fever	Leaf	Decoction	Inhalation	3
							Covid-19	Leaf	Decoction	Inhalation	2
							High blood pressure	Leaf	Decoction	Oral	2
							Cough	Leaf	Crush	Oral	1
							Feet pain	Leaf	Decoction	Cutaneaous	1
							Stomachache	Leaf	Decoction	Oral	1
Manihot esculenta Crantz	Euphorbiaceae	NC	Muhugo	Mohogo feliky	Manioc	1	Headache	Rhizome	Grate	Cutaneaous	1
Melia azedarach L.	Meliaceae	TTH 136	M'lila	Lila	50 maladies	2	Covid-19	Leaf	Decoction	Inhalation	1
							Dengue	Leaf	Decoction	Inhalation	1
							Diabetes	Leaf	Decoction	Oral	1
Mentha suaveolens Ehrh.	Lamiaceae	NC	ND	Alicoli	Menthe	1	Cough	Leaf	Decoction until color changes	Oral	1
							Headache	Leaf	Decoction until color changes	Oral	1
							Stomachache	Leaf	Decoction	Oral	1
Miconia crenata (Vahl) Michelang.	Melastomaceae	TTH 047	M'fobo	Voa totroko lahy	Clidémie hérissé	1	Diabetes	Leaf	Decoction	Oral	1
							High blood pressure	Leaf	Decoction	Oral	1
							Liver pain	Leaf	Decoction	Oral	1
Microsorum	Polypodiaceae	NC	Many	Kangadja	Langue	1	"Adoua mimba"	Leaf	Decoction	Oral	1

punctatum (L.) Copel.			mahondra	lavaraviny	de vache		(shibushi)				
							Female infertility	Leaf	Decoction	Oral	1
Mimusops comorensis Engl.	Sapotaceae	TTH 034	Mavuhu	Nato	Natte des Comores	1	Fibroma	Leaf	Decoction	Oral	1
							Hemorrhoids	Leaf	Decoction	Oral	1
Momordica charantia L.	Cucurbitaceae	TTH 038	Margoz	Antsatsaka tarondro	Margose	8	Stomachache	Leaf / Liana	Decoction / Decoction until color changes	Oral	3
							Hernia	Leaf / Stem	Decoction / Decoction until color changes	Oral	2
							Child enuresis	Leaf	Decoction	Oral	1
							Diabetes	Leaf	Decoction	Oral	1
							High blood pressure	Leaf	Decoction	Oral	1
							Impotence	Liana	Decoction	Oral	1
							Intestinal pain	Fruit	Decoction until color changes	Oral	1
							Painful periods	Leaf	Decoction until color changes	Oral	1
Moringa oleifera Lam.	Moringaceae	TTH 127	Mvoungé	Morongy	Moringa	23	Stomachache	Leaf	Crush / Crush in water / Decoction / Infusion	Oral	12

								High blood pressure	Leaf / Root / Seed / Stem	Crush in water / Decoction / Decoction until color changes /	Oral	8
								Diarrhea	Leaf	Crush in water	Oral	5
								Constipation	Leaf	Eat	Oral	1
								Diabetes	Leaf	Crush in water	Oral	1
								Facilitation of child birth	Leaf	Crush in water	Oral	1
								Infectious conjunctivitis	Leaf	Crush	Ocular	1
								Intestinal pain	Leaf	Crush in water	Oral	1
								Otitis externa	Leaf	Crush	Auricular	1
Murraya koenigii (L.) Spreng.		Rutaceae	TTH 024	ND	ND	Cary poulet	1	Diabetes	Leaf	Decoction	Oral	1
								High blood pressure	Leaf	Decoction	Oral	1
								Impotence	Leaf	Decoction	Oral	1
Musa paradisiaca L.		Musaceae	NC	Trovi	Hontsy	Bananier	7	Covid-19	Dry leaf / Leaf	Decoction	Inhalation	2
								Fever	Dry leaf / Leaf	Decoction	Inhalation	2
								Chikungunya	Leaf	Decoction	Inhalation	1
								Dengue	Leaf	Decoction	Inhalation	1

								Feet pain	Leaf	Decoction	Cutaneaous	1
								Influenza, flu	Dry leaf	Decoction	Inhalation	1
								Joint, muscle pain	Dry leaf	Direct application	Cutaneaous	1
Myristica fragrans Houtt.		Myristicaceae	NC	Kungu mana	Kongo manga	Muscadier	1	Blood circulation problem	Seed	Scraping on coral stone	Cutaneaous	1
Nigella sativa L.		Ranunculaceae	NC	ND	ND	Nigelle	1	Painful periods	Seed	Decoction until color changes	Oral	1
Ocimum americanum L.		Lamiaceae	TTH 064	Sadzani	Kanza mdzade	Petit basilic sauvage	8	Painful periods	Leaf	Decoction until color changes	Oral	3
								Stomachache	Leaf	Decoction / Decoction until color changes	Oral	3
								Cough	Leaf	Crush in water	Oral	1
								Hernia	Leaf	Decoction	Oral	1
								Intestinal pain	Leaf	Decoction	Oral	1
								Nosebleed	Leaf	Crush	Nasal	1
Ocimum basilicum L.		Lamiaceae	NC	M'kadi	Karanzany vazaha	Basilic commun	2	Back pain	Leaf	Grate	Cutaneaous	1
								Headache	Leaf	Grate	Cutaneaous	1
								Otitis externa	Leaf	Crush	Auricular	1
								Sprain	Leaf	Grate	Cutaneaous	1
Ocimum canum Sims		Lamiaceae	TTH 088	ND	ND	ND	1	Intestinal pain	Leaf	Infusion	Oral	1

	Ocimum gratissimum L.	Lamiaceae	TTH 073	M'rule	Kanza mdzade	Basilic sauvage	21	Female infertility	Dry leaf / Leaf	Decoction / Decoction until color changes	Oral	6
								Painful periods	Leaf	Crush in water / Decoction	Oral	6
								Stomachache	Dry leaf / Leaf	Crush in water / Decoction until color changes	Oral	4
								Covid-19	Leaf	Decoction	Inhalation	3
								Hemorrhoids	Leaf	Crush / Decoction	Cutaneaous / Oral	3
								"Adoua mimba" (shibushi)	Leaf	Decoction	Oral	1
								Asthma	Leaf	Crush in water	Oral	1
								Cough	Leaf	Crush in water	Oral	1
								Dengue	Leaf	Decoction	Inhalation	1
								Fever	Leaf	Decoction	Inhalation	1
								Hernia	Leaf	Decoction	Oral	1
								Influenza, flu	Leaf	Decoction	Inhalation	1
								Nosebleed	Leaf	Crush in water	Nasal	1
								Perineal massage	Leaf	Decoction, bath	Cutaneaous	1
	Ocimum	Lamiaceae	NC	ND	ND	Basilic	1	Cough	Leaf	Decoction	Oral	1

tenuiflorum L.					tulsi						
Oxalis corniculata L.	Oxalidaceae	TTH 122	Waju mamotsi	Madiro antany	Petit trèfle	1	Impotence	Leaf	Decoction	Oral	1
Passiflora edulis Sims	Passifloraceae	NC	ND	Grinadel	Fruit de la passion	2	Cough	Leaf	Crush in water	Oral	1
							Diabetes	Leaf	Decoction	Oral	1
Passiflora suberosa L.	Passifloraceae	TTH 029	Nyungo	Nioungou	Grain d'encre	2	Facilitation of child birth	Liana	ND	ND	1
							Painful periods	Liana	Crush in water	Oral	1
Paullinia pinnata L.	Sapindaceae	TTH 099	Mhotso-hotso	Vahy mari ranha	Liane carrée	12	Stomachache	Leaf / Liana	Decoction / Decoction until color changes	Oral	3
							Blood circulation problem	Bark / Leaf	Decoction	Oral	2
							Female infertility	Liana	Decoction	Oral	2
							Sprain	Bark	Scraping on coral stone	Cutaneaous	2
							Back pain	Liana	Direct application	Cutaneaous	1
							Facilitation of child birth	Liana	Decoction until color changes	Oral	1
							Fracture	Liana	Scraping on coral stone	Cutaneaous	1
							Furuncle	Bark	Scraping on coral	Cutaneaous	1

									stone		
							Headache	Liana	Decoction	Cutaneaous	1
							Hernia	Leaf	Decoction until color changes	Oral	1
							Impotence	Leaf	Decoction until color changes	Oral	1
							Joint, muscle pain	Leaf	Scraping on coral stone	Cutaneaous	1
Persea americana Mill.	Lauraceae	NC	M'zavoca	Zavoca	Avocatier	4	Diabetes	Leaf	Decoction	Oral	2
							High blood pressure	Leaf	Decoction	Oral	1
							Intestinal pain	Leaf	Decoction until color changes	Oral	1
Petroselinum crispum (Mill.) Fuss	Apiaceae	NC	ND	Hanga vazaha	Persil	1	Blood circulation problem	Stem	Decoction	Oral	1
Phoenix reclinata Jacq.	Arecaceae	TTH 062	M'randra	Mihala	Dattier du Sénégal	1	Female infertility	Root	Decoction	Oral	1
							Painful periods	Root	Decoction	Oral	1
Phyllanthus niruri L.	Phyllanthaceae	NC	ND	ND	Herbe du chagrin	1	Female infertility	Leaf	Decoction	Oral	1
Phyllarthron comorense DC.	Bignoniaceae	TTH 055	Shivundze	Tahila	Phyllarthron des Comores	13	Cough	Leaf	Decoction / Decoction until color	Oral	5

									changes		
							Impotence	Leaf	Crush / Decoction / Decoction until color changes / Infusion	Oral	4
							Fracture	Wood	Scraping on coral stone	Cutaneaous	1
							Hernia	Leaf	Decoction until color changes	Oral	1
							Intestinal pain	Leaf	Decoction	Oral	1
							Joint, muscle pain	Leaf	Decoction	Oral	1
							Painful periods	Leaf	Decoction	Oral	1
							Sprain	Wood	Scraping on coral stone	Cutaneaous	1
							Tonsilitis, sore throat	Leaf	Decoction	Oral	1
Piper nigrum L.	Piperaceae	NC	Filifili	Vilivili	Poivre	1	Mouth ulcer	Bay	Crush	Oral	1
Plumeria acuminata W.T.Aiton	Apocynaceae	NC	ND	ND	Frangipanier	1	Back pain	Flower	Grate	Cutaneaous	1
							Headache	Flower	Grate	Cutaneaous	1
							Sprain	Flower	Grate	Cutaneaous	1
Polyalthia longifolia (Sonn.)	Annonaceae	TTH 141	ND	ND	Laurier	1	Cough	Leaf	Decoction	Oral	1

Benth. & Hook.f. ex Thwaites											
Premna serratifolia L.	Lamiaceae	TTH 009	M'vetsi	Myavivi	Bois sureau	5	Covid-19	Leaf	Decoction	Inhalation	1
							Fever	Leaf	Cold maceration	Cutaneaous	1
							Hemorrhoids	Root	Decoction	Oral	1
							Nosebleed	Leaf	Crush in water	Nasal	1
							"Vourgnegni" (shibushi)	Leaf	Decoction, bath	Cutaneaous	1
Psidium guajava L.	Myrtaceae	TTH 041	Mapwera	Mapoera	Goyavier	17	Diabetes	Fruit / Young leaf	Decoction	Oral	4
							Diarrhea	Leaf	Crush in water / Decoction	Oral	4
							Stomachache	Leaf	Crush in water / Decoction	Oral	4
							High blood pressure	Leaf	Decoction	Oral	3
							Fever	Leaf	Cold maceration / Decoction /	Cutaneaous / Inhalation	2
							Headache	Leaf	Decoction	Inhalation / Oral	2
							Covid-19	Leaf	Decoction	Inhalation	1
							Dengue	Leaf	Decoction	Inhalation	1

							Dizziness	Leaf	Put the plant in a pot until it smokes	Inhalation	1
							Feet pain	Leaf	Decoction	Cutaneaous	1
							Hernia	Leaf	Decoction	Oral	1
							Intestinal pain	Leaf	Decoction	Oral	1
Psychotria calothyris (Bremek.) A.P.Davis & Govaerts	Rubiaceae	NC	ND	Moaro	Psychotrie à tiges épaisses	1	"Tchéwé" (shimaoré)	Leaf	Decoction, bath	Cutaneaous	1
Punica granatum L.	Lythraceae	NC	Tundra peponi	ND	Grenadier	1	Anaphrodisia	Fruit	Crush	Oral	1
							Stomachache	Leaf	Decoction	Oral	1
Ravenala madagascariensis Sonn.	Strelitziaceae	NC	ND	Ravinala	Arbre du voyageur	1	Diabetes	Leaf	Decoction	Oral	1
Rhynchosia sublobata (Schumach.) Meikle	Fabaceae	TTH 010	Tandri shivarya	Sary antaka makondry	Rynchosie sublobée	4	Acid reflux	Liana	Decoction	Oral	1
							Facilitation of child birth	Leaf	Decoction until color changes	Oral	1
							Female infertility	Liana	Decoction	Oral	1
							Hemorrhoids	Leaf	Decoction until color changes	Oral	1
							Painful periods	Liana	Decoction	Oral	1

Ricinus communis L.	Euphorbiaceae	TTH 083	M'ri wa katoto	Kinana ravy	Ricin	1	Covid-19	Leaf	Decoction	Inhalation	1
Rubus rosifolius Sm.	Rosaceae	TTH 051	Frambaz	Rotirotiki	Framboisier	1	Dizziness	Fruit	Crush	Oral	1
Scaevola taccada (Gaertn.) Roxb.	Goodeniaceae	TTH 017	ND	Sodifafa hazo	Veloutier vert	1	Joint, muscle pain	Leaf	Heat the leaf until color changes	Cutaneaous	1
Senna alata (L.) Roxb.	Fabaceae	TTH 025	Hasa n'drume	Andra be ila	Bois dartre	8	Otitis externa	Leaf	Crush	Auricular	2
							Skin depigmentation	Leaf	Direct application	Cutaneaous	2
							Constipation	Leaf	Decoction until color changes	Oral	1
							Chikungunya	Leaf	Decoction	Inhalation	1
							Fever	Leaf	Crush in water	Cutaneaous	1
							Furuncle	Leaf	Crush	Cutaneaous	1
							"Wanatsa" (shimaoré)	Leaf	Crush in water	Cutaneaous	1
Senna occidentalis (L.) Link	Fabaceae	TTH 012	Hasa n'drume	Voa tsirongoto kely	Bentamaré	4	Back pain	Leaf	Decoction	Oral	1
							Epilepsy	Leaf	Crush in water	Nasal	1
							Impotence	Root	Cold maceration	Oral	1
							Stomachache	Root	Cold maceration	Cutaneaous	1

							Toothache	Bark	Decoction	Oral (gargle)	1
Senna singueana (Delile) Lock	Fabaceae	TTH 134	M'ri m'buzi	Sambaravatsi	ND	1	Impotence	Bark	Decoction until color changes	Oral	1
Sida acuta Burm.f.	Malvaceae	TTH 039	Shifunga n'dzya n'titi	Sandra ory kely	Sida aigu	1	Impotence	Root	Decoction	Oral	1
Sieruela rutidosperma (DC.) Roalson & J.C.Hall	Cleomaceae	TTH 111	M'kssi	ND	ND	1	Hernia	Leaf	Decoction	Oral	1
Solanum melongena L.	Solanaceae	NC	ND	ND	Aubergine	1	Mouth ulcer	Leaf	Crush	Oral	1
Solanum torvum Sw.	Solanaceae	NC	M'ri n'guja	Sary angivi kely	Anghive marron	1	Intestinal pain	Fruit	Decoction	Oral	1
Spondias dulcis G.Forst.	Anarcardiaceae	NC	Sakwa	Mssakoua	Zévi	2	Toothache	Bark / Root	Decoction in sea water / Decoction until color changes	Oral (gargle)	2
Stachytarpheta urticifolia Sims	Verbenaceae	TTH 072	M'ri wagwegwe	Jakwe maitso	Epi bleu	1	Hernia	Leaf	Decoction	Oral	1
							Vaginal inflammation	Leaf	Decoction	Oral	1
Struchium sparganophorum (L.) Kuntze	Asteraceae	NC	M'lalihapana	Mlaylyhapana be	Oreille mouton	1	Intestinal pain	Leaf	Decoction	Oral	1
Strychnos spinosa Lam.	Loganiaceae	TTH 043	M'kutra	Mronga	Calebassier du pays	1	High blood pressure	Leaf	Decoction	Oral	1

Syzygium aromaticum (L.) Merr. & L.M.Perry	Myrtaceae	NC	Karafu	Karafo	Giroflier	13	Headache	Flower / Leaf	Crush / Decoction / Decoction until color changes / Direct application / Scraping on coral stone	Cutaneaous / Oral	7
							Cough	Flower / Leaf	Crush / Decoction until color changes	Oral	3
							Impotence	Flower	Crush / Crush, infusion / Decoction	Oral	3
							Toothache	Flower	Crush	Oral	3
							Back pain	Flower	Direct application	Cutaneaous	1
							Covid-19	Flower	Decoction	Inhalation	1
							Fibroma	Flower	Decoction	Oral	1
							Influenza, flu	Flower	Decoction	Inhalation	1
							Joint, muscle pain	Flower	Crush	Cutaneaous	1
							Otitis externa	Flower	Crush, press	Auricular	1
Tacca leontopetaloides	Dioscoreaceae	TTH 061	Trindri	Kabidza	Papaye songe	1	Intestinal pain	Rhizome	Crush in water	Oral	1

(L.) Kuntze											
Tamarindus indica L.	Fabaceae	TTH 032	Waju urehagini	Madiro kakazo	Tamarinier	5	Cough	Leaf	Crush / Decoction	Oral	3
							Fracture	Leaf	Crush / Crush, decoction	Cutaneaous / Oral	2
Tephrosia noctiflora Bojer ex Baker	Fabaceae	NC	Shitsudzi	Ingity be	Téphrosie nocturne	2	Female infertility	Leaf	Decoction / Decoction until color changes	Oral	2
							Fibroma	Leaf	Decoction until color changes	Oral	1
							Hemorrhoids	Leaf	Decoction until color changes	Oral	1
Teramnus labialis (L.f.) Spreng.	Fabaceae	TTH 023	Shipwa kofu n'titi	Ovyji matra	Pistache marronne	2	Child enuresis	Leaf	Decoction	Oral	1
							Female infertility	Leaf	Decoction	Oral	1
							Hemorrhoids	Leaf	Decoction	Oral	1
Theobroma cacao L.	Malvaceae	NC	Kakao	Kakao	Cacaoyer	1	Diabetes	Leaf	Decoction	Oral	1
Tephrosia pumila (Lam.) Pers.	Fabaceae	TTH 020	Chitsidza outoungou	Sary hamo	ND	4	Female infertility	Leaf	Decoction / Decoction until color changes	Oral	2
							Hemorrhoids	Leaf, stem	Decoction until color changes	Oral	2
							Child enuresis	Leaf,	Decoction	Oral	1

								stem			
							Fibroma	Leaf	Decoction until color changes	Oral	1
							"Foudzoi" (shimaoré)	Leaf	Decoction until color changes	Oral	1
Tithonia diversifolia (Hemsl.) A.Gray	Asteraceae	TTH 050	Fu nyongo	Bostoani	Petite fleur soleil	1	Diabetes	Leaf	Decoction	Oral	1
Tragia furialis Bojer	Euphorbiaceae	TTH 046	Shileni	Ampisy	Ortie	5	Difficulty urinating	Leaf / Stem	Decoction	Oral	2
							Liver pain	Leaf / Seed	Decoction	Oral	2
							Child enuresis	Liana	Decoction	Oral	1
							Female infertility	Leaf	Decoction	Oral	1
							Headache	Leaf	Decoction	Oral	1
							Hernia	Root	Decoction until color changes	Oral	1
							Impotence	Leaf	Decoction until color changes	Oral	1
							Joint, muscle pain	Leaf	Crush	Cutaneaous	1
Trema orientale (L.) Blume	Cannabaceae	TTH 035	M'besi	Ambesy	Bois d'andrèze	2	Asthma	Bark / Leaf / Root	Decoction / Decoction until color changes	Oral	4
Tribulus cistoides	Zygophylaceae	TTH 026	ND	Ambiliki	Herbe	1	Blood circulation	Leaf	Infusion	Oral	1

L.					pagode		problem				
Turraea sericea Sm.	Meliaceae	TTH 018	N'drume n'ku	Sary mwandziwa	Turée séricée	1	Impotence	Leaf	Decoction	Oral	1
Typhonodorum lindleyanum Schott	Araceae	NC	Bunga muri	Bonga	Via	1	"Touhigni" (shibushi)	Dead leaf	Burn and recover ashes	Cutaneaous	1
Vepris boiviniana (Baill.) Mziray	Rutaceae	NC	Manimararu	Sary tsoha	Vépris de Boivin	1	Diabetes	Leaf	Decoction until color changes	Oral	1
Volkameria sp.	Lamiaceae	TTH 137	ND	Gombe dumé	ND	1	Constipation	Leaf	Decoction until color changes	Oral	1
							Epilepsy	Leaf	Decoction	Inhalation	1
Woodfordia fruticosa (L.) Kurz	Lythraceae	TTH 019	M'lazi	Lamboenza	ND	14	Impotence	Leaf / Root	Decoction / Decoction until color changes	Oral	8
							Hernia	Leaf / Root / Wood	Decoction / Decoction until color changes	Oral	5
							Female infertility	Leaf	Decoction / Decoction until color changes	Oral	2
							Joint, muscle pain	Leaf / Liana	Decoction / Decoction until color changes	Oral	2
							Diabetes	Leaf	Decoction	Oral	1

								Hemorrhoids	Leaf	Decoction	Oral	1
								Intestinal pain	Leaf	Decoction	Oral	1
								Painful periods	Leaf	Decoction	Oral	1
								Stomachache	Leaf	Decoction until color changes	Oral	1
Zea mays L.		Poaceae		M'rama	Tsakotsako	Maïs	2	Child enuresis	Inflorescence	Decoction	Oral	1
								High blood pressure	Inflorescence	Decoction	Oral	1
Zingiber zerumbet (L.) Roscoe ex Sm.		Zingiberaceae		Tsingizo masera	Sakai viro	Gingembre	12	Cough	Rhizome	Crush / Decoction	Oral	5
								Tonsilitis, sore throat	Rhizome	Decoction / Chew	Oral	4
								Sprain	Rhizome	Scraping on coral stone	Cutaneaous	1
								Fracture	Rhizome	Scraping on coral stone	Cutaneaous	1
								Headache	Rhizome	Decoction until color changes	Oral	1
								Impotence	Rhizome	Crush	Oral	1
								Mouth ulcer	Rhizome	Crush	Oral	1
								Nasopharyngitis, cold	Rhizome	Decoction	Oral	1
Ziziphus spina-christi (L.) Desf.		Rhamnaceae		Tsinavu n'dzishe	Mokonazi vavy	Jujubier épineux	1	Haematoma	Leaf	Crush	Cutaneaous	1

Legend: A slash ("/") corresponds to the term "or"; a comma (",") correspond to the term "and"; NC = plants not collected identified from literature (Barthelat, 2019); ND = Not documented; NI = Not identified.

Regarding the methods of plant preparation, the most commonly used method is decoction (**Figure 2A**) (119 species, 77.2%). The others most employed preparation methods involve crushing the dried plant using a mortar or in the palm of one's hand (**Figure 2B,C**) (35 species, 22.7%), crushing the plant in water (20 species, 12.8%), and scraping the plant on coral stone (11 species, 7.1%). In terms of citations, the prevalence order is the same: decoction (478 ~~citations~~UR, 59.2%), crushing the dried plant (104 ~~citations~~UR, 12.9%), crushing the plant in water (45 ~~citations~~UR, 5.6%), and finally scraping the plant on coral stone (28 ~~citations~~UR, 3.5%).

The most commonly used administration methods are as follows: oral route (128 species, 83.1%), cutaneous route (58 species, 37.7%), inhalation (25 species, 16.2%), and nasal route (8 species, 5.2%). Once again, the prevalence order is the same in terms of citation: oral route (602 ~~citations~~UR, 65.7%), topical route (204 ~~citations~~UR, 22.3%), inhalation (86 ~~citations~~UR, 9.4%), and nasal route (12 ~~citations~~UR, 1.3%).

Regarding the dosage (duration and frequency of treatment, quantity administered), it is specified for 345 out of the 393 unique plant-based remedies (72.8% of the total remedies). Among these remedies, 49 remedies have a treatment duration of seven days. Within these 49 remedies, 23 remedies are administered three times a day, 19 are administered twice a day, and seven are administered once a day. Sixteen remedies have a treatment duration of three days. Among these 16 remedies, three are administered three times a day, seven are administered twice a day, and six are administered once a day. Finally, 287 remedies have an unknown treatment duration. Among these 287 remedies, there are 110 remedies administered three times a day, 83 administered twice a day, and 94 administered once a day.

3.4.4. Other ingredients

Among the 394 unique remedies, ~~four~~ six animal-derived ingredients are mentioned by the participants, with a total of 4~~3~~4 ~~citations~~UR. Among these ingredients, the most cited one is coral stone (20 participants, 28 ~~citations~~UR) (**Figure 3A,B,C**), followed by honey (10 participants, 11 ~~citations~~UR), egg (1 participant, 1 ~~citation~~UR), horse manure (1 participant, 1 ~~citation~~UR), milk (1 participant, 1 ~~citation~~UR), and shark oil (1 participant, 1 ~~citation~~UR). The most referenced administration method is the cutaneous route (20 participants, 23 ~~citations~~UR). Sprained ankle is the most treated condition with these ingredients (8 participants, 9 ~~citations~~UR), followed by headaches (5 participants, 6 ~~citations~~UR), and cough (5 participants, 6 ~~citations~~UR).

Within the unique remedies, four ingredients are derived from food or processed products. Among these ingredients, salt is the most cited (33 participants, 45 ~~citations~~UR), followed by coconut oil (6 participants, 6 ~~citations~~UR), rice (3 participants, 3 ~~citations~~UR), and sugar (1 participant, 1 ~~citation~~UR). The other non-

plant ingredients used are white clay locally known as "*tany malandy*" (2 participants, 2 citations) (**Figure 3D**), and a sewing needle (1 participant, 1 citation). White clay is used in remedies against evil spirits, also known as "*djinn*" in Shimaoré. The clay is mixed with other plants in a decoction for purification rituals. One informant also mentioned the use of sewing needles as a remedy for impotence. The needles are stuck into tree bark, which is then boiled together with the bark itself. After boiling, the liquid is poured into another container without the bark (and without the needle) and drink by the afflicted person.

3.4.5. Other aspects of traditional medicine in Mayotte

During the study, some informants provided additional information regarding traditional medicine in Mayotte. Participants often mentioned that the use of certain remedies imposes dietary restrictions, but this practice is specific to women undergoing fertility treatments. Nine participants ~~(14.4%)~~ stated that when a woman takes a remedy for infertility, she should not consume chili peppers (9 out of 9 participants), limes (8 out of 9 participants), carbonated drinks (3 out of 9 participants), chives (2 out of 9 participants), turmeric (2 out of 9 participants), ice-cold water (2 out of 9 participants), garlic (1 out of 9 participants), and ginger (1 out of 9 participants). Additionally, two participants emphasized the importance of not taking conventional medications when a sick person is already treating with herbal remedies. Another restriction mentioned by one informant ~~(0.9%)~~ is to avoid going out during sunrise and sunset for the remedy to work effectively. Also, one informant ~~(0.9%)~~ highlighted the need to consume traditional remedies with food and not on an empty stomach.

Another characteristic of traditional medicine in Mayotte pertains to the harvesting of plants. According to six participants ~~(5.8%)~~, it is important to recite a prayer before harvesting the plant to ensure the effectiveness of the remedy. This prayer is locally known as "bismillah" (a formula used by Muslims as a blessing). Regarding the timing of plant harvesting, four participants ~~(3.8%)~~ mentioned the importance of picking plants on specific days of the week, preferably on Mondays or Wednesdays.

3.4.6. Dangerous practices reported by participants

Several participants provided information on the risks associated with certain traditional practices or treatments. Four participants ~~(3.8%)~~ emphasized the importance of respecting dosage.

In fact, three informants mentioned that excessive consumption of the floral buds of *Syzygium aromaticum* can cause dizziness when used for toothaches.

Another informant ~~(0.9%)~~ highlighted the need to be cautious when using

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Lantana strigocamara and *Decalobanthus peltatus* for HBP. According to the participant, if these two plants are individually consumed in excessive quantities, they can cause low blood pressure leading to dizziness or fainting.

Lastly, one informant ~~(0.9%)~~ stated that the leaves of *Jatropha curcas* can induce vomiting when crushed in water.

3.5. Therapeutic management for the most cited health disorders

~~The FIC shows that there are some convergences among informants regarding the plants used to treat diseases. Cough has an FIC of 0.73 (81 citations, 22 species), which is the highest FIC, followed by stomachache with an FIC of 0.57 (84 citations, 36 species), fever with an FIC of 0.5 (63 citations, 32 species), headaches with an FIC of 0.48 (62 citations, 33 species), and diarrhea with an FIC of 0.43 (22 citations, 13 species).~~

~~Calculating the FL allows us to see that certain plants are predominantly mentioned for a specific disease. The plants with higher FL are as follows: *Trema orientalis* has an FL of 100% for asthma, *Cardiospermum halicacabum* has an FL of 75% for fever, *Abrus precatorius* has an FL of 71.4% for cough, *Coleus madagascariensis* has an FL of 70.6% for stomachaches, *Ipomea obscura* has an FL of 69.23% for headaches, and *C. amboinicus* has an FL of 68.18% for cough. It should be noted that although *C. aurantiifolia* and *M. oleifera* are among the most cited plants (32 and 31 citations, respectively), they have very low FL for the diseases they are mentioned for. The maximum FL for *C. aurantiifolia* is 21.9% for cough, and for *M. oleifera*, the maximum FL is 38.7% for stomachache.~~

3.5.1. Stomachache

In total, 41 informants (39.4%) mentioned stomachache. Within the remedies, stomachache accounted for 63 ~~citations~~ UR (13.4%). According to the ICPC-3, this health disorder is classified under the "digestive system" category. Ten informants ~~(9.6%)~~ stated that the causes of this condition are related to poor diet. According to these ten informants, the symptoms of this health disorder include pain in the liver, intestine, and stomach. The informants did not provide information regarding the diagnosis of the disease.

A total of 42 unique remedies were mentioned to treat this disease. Among these 42 remedies, 27 were single-ingredient remedies (39 ~~citations~~UR, 61.9%), 10 were composed of two ingredients (19 ~~citations~~UR, 30.1%), two remedies were composed of three ingredients (2 ~~citations~~UR, 3.2%), and three remedies consisted of four ingredients (3 ~~citations~~UR, 4.8%).

The informants mentioned 36 plant species belonging to 20 different botanical

families. The most cited plants were *Coleus madagascariensis* [leaf] (12 ~~citations~~UR, 11.9%), *Moringa oleifera* [leaf] (11.9%), and *Lantana camara* [leaf and roots] (8 ~~citations~~UR, 9.9%).

The most cited remedy by the informants was made of the leaves of *C. madagascariensis*. To prepare the remedy, the fresh leaves are crushed in water. Eight informants mentioned this remedy ~~(19.5%)~~. Among these eight informants, four ~~(50%)~~ added a pinch of salt to the remedy. According to the eight participants, the remedy is taken orally once or twice a day. The participants did not specify the duration of the treatment. ~~Another two informants reported using the decoction of *C. madagascariensis* fresh leaves to treat stomachache. This remedy is administered orally and it should be consumed three times a day for seven days.~~

~~The second most mentioned remedy involved crushing the fresh leaves of *M. oleifera* in water and adding a pinch of salt. This remedy was mentioned by four informants (9.8%). All participants who mentioned this remedy stated that it should be consumed orally twice a day for 3 days.~~

3.5.2. Cough

A total of 36 informants treats cough (34.6%), which represent 55 ~~citations~~ UR (11.7%). According to the ICPC-3 classification, this condition falls under the "respiratory system" category. Participants did not provide information regarding the disease diagnosis. Regarding the causes, eight informants ~~(22.2%)~~ mentioned overexertion and climate. Concerning symptoms, eight informants stated that this condition causes chest pain and vomiting.

Overall, participants mentioned 35 unique remedies for treating cough, with the number of ingredients ranging from one to five. Fifteen remedies are single-ingredient (29 ~~citations~~UR, 52.7%), 12 remedies consist of two ingredients (18 ~~citations~~UR, 32.7%), three remedies consist of three ingredients (3 ~~citations~~UR, 5.4%), three remedies consist of four ingredients (3 ~~citations~~UR, 5.4%), and finally, two remedies consist of five ingredients (2 ~~citations~~UR, 3.6%).

Informants mentioned 22 plant species belonging to 15 botanical families for treating coughs. The most mentioned plant were *Coleus amboinicus* [leaf] (30 ~~citations~~UR, 37.1%), followed by *Citrus aurantiifolia* [leaf and fruit] (7 ~~citations~~UR, 8.6%), and *Abrus precatorius* [leaves] (5 ~~citations~~UR, 6.2%).

The most common remedy reported for cough consisted of chewing the fresh leaves of *C. amboinicus* directly (oral route). Ten informants mentioned this remedy ~~(27.7%)~~, and no participant provided information regarding the dosage of the remedy. As for the quantity of leaves to use, it varies between three to five leaves.

~~The second most cited remedy combined two ingredients, *C. aurantiifolia* (fruit) and honey. Two informants mentioned this remedy (5.5%). They prepare the juice of *C. aurantiifolia* with honey, and the remedy is consumed orally three times a day. Regarding quantities, three informants (8.3%) specified the need to use a single *C. aurantiifolia* fruit to obtain a tablespoon of liquid when mixing *C. aurantiifolia* and honey.~~

3.5.3. Headache

A total of 30 informants mentioned headache (28.8%), representing 41 ~~citations~~ UR (8.7%). According to the ICPC-3, this disease falls under the "neurological system" category. Six informants ~~(20%)~~ stated overexertion and fatigue as causes of this condition. As for symptoms, four informants ~~(13.3%)~~ emphasized pain in the forehead and pulsations in the head.

In total, participants mentioned 33 unique remedies for headache with the number of ingredients ranging from one to five. Among these 33 remedies, 15 are single-ingredient remedies (21 ~~citations~~UR, 51.2%), nine consist of two ingredients (9 ~~citations~~UR, 21.9%), six remedies have three ingredients (6 ~~citations~~UR, 14.6%), two remedies consist of five ingredients (2 ~~citations~~UR, 4.9%), and finally, one remedy consists of four ingredients (3 ~~citations~~UR, 2.4%).

Within these remedies, 33 plant species representing to 16 families were mentioned. The most mentioned species were *Ipomea obscura* [leaf and vine] (8 ~~citations~~UR, 12.9%), followed by *Syzygium aromaticum* [leaf and fruit] (7 ~~citations~~UR, 11.3%), and *Coleus amboinicus* [leaf] (6 ~~citations~~UR, 9.7%).

The most cited remedy was composed of the leaves of *I. obscura* (5 informants~~), 16.6%)~~. To prepare the remedy, the leaves of *I. obscura* are crushed in water. The liquid is then applied to the forehead (topical route). According to the five informants who mentioned the remedy, a handful of leaves is needed to make the remedy, and it should be applied once a day.

~~The second most cited remedy was made of the leaves of *C. amboinicus* (2 informants, 6.7%). Dried leaves are crushed dry in a mortar or in the palm of the hand and then applied directly to the forehead once a day. The two informants did not specify the quantity of leaves to use for preparing the remedy.~~

~~Two other informants (6.7%) described another remedy based on the vines of *Cardiospermum halicacabum*. In this remedy, the vines are crushed with water in a basin to take a bath with. Two handfuls of vines are used by the two informants. The bath should be taken three times a day. The informants did not provide information on the~~

~~duration of the treatment.~~

3.5.4. Fever

During the study, 20 informants mentioned fever (19.2%), representing 30 ~~citations~~ UR (6.4%). According to the ICPC-3, this ailment is classified under the "general" category. Only two informants provided information on the symptoms and diagnosis of the disease. Symptoms include an increase in body temperature and dizziness. Diagnosis is made through touch, 20 informants who mentioned fever did not provide information regarding the causes of the disease.

In total, participants mentioned 25 unique remedies with the number of ingredients ranging from one to seven. Two-ingredients remedies were the most common ones (8 remedies, 12 ~~citations~~UR), followed by single-ingredient remedies (7 remedies, 8 ~~citations~~UR), four-ingredients remedies (4 remedies, 4 ~~citations~~UR), three-ingredients remedies (3 remedies, 3 ~~citations~~UR), six-ingredients remedies (2 remedies, 2 ~~citations~~UR), and finally, only one remedy was composed of 7 ingredients (1 ~~citation~~UR).

Within these 25 remedies, 33 plant species belonging to 15 different botanical families were mentioned. The two most mentioned species were *Cardiospermum halicacabum* [leaf and vine] (6 ~~citations~~UR, 9.5%) and *Citrus aurantiifolia* [leaf and fruit] (6 ~~citations~~UR, 9.5%).

The most cited remedy was composed of the leaves of *Coleus amboinicus*. Two informants mentioned this remedy ~~(10%)~~. The fresh leaves of *C. amboinicus* is crushed dry in a mortar or in the palm of the hand, and then the leaves are~~is~~ applied directly to the forehead (cutaneaous). According to the two informants, the remedy is applied once a day, and participants did not provide information regarding the duration of the treatment. The other 24 unique remedies were each mentioned only once.

3.5.5. High blood pressure

In total, 16 informants mentioned HBP (15.4%), representing 30 ~~citations~~ UR (6.4%). According to the ICPC-3 classification, this disease is categorized under the "circulatory system". Regarding the causes of the disease, only one informant ~~(6.3%)~~ mentioned excess salt, fatty foods, and excessive consumption of processed products as causes of hypertension. The same informant also mentioned respiratory problems, accelerated heart rate, dizziness, vision disturbances, and headaches as symptoms of this condition. For the diagnosis, a traditional practitioner mentioned that he observes if the person has a fever, difficulty breathing, or if their eyes become reddish.

In total, participants mentioned 19 unique remedies for HBP with the number

of ingredients ranging from one to three. The majority of the described remedies were single-ingredient (13 remedies, 17 ~~citations~~UR), followed by two-ingredients remedies (4 remedies, 11 ~~citations~~UR), and three-ingredients remedies (2 remedies, 2 ~~citations~~UR).

Within the 19 mentioned remedies, 20 plant species belonging to 18 different botanical families were mentioned. The two most cited plants were *Moringa oleifera* [leaf, seed, root, stem] (8 ~~citations~~UR, 26.7%) and *Psidium guajava* [leaf] (3 citations, 10%).

Among these 19 remedies, two have two citations (from two different informants), while the other remedies were mentioned only once. The first remedy mentioned twice was composed of the leaves of *M. oleifera*. To prepare the remedy, the fresh leaves are crushed in water, and a pinch of salt is added. Then, the sick person consumes the liquid orally. A handful of *M. oleifera* leaves is needed to make the remedy, and it should be consumed twice a day. The two informants who mentioned this remedy did not provide information regarding the duration of the treatment.

~~The second most cited remedy combined the fresh leaves of *M. oleifera* and *Annona muricata* in decoction. The decoction is made until the water used for it changes color. The remedy is consumed orally and requires a handful of leaves from each plant. The two informants who mentioned the remedy did not provide information on the dosage of the remedy.~~

3.5.6. Diarrhea

During the study, 15 informants mentioned diarrhea (14.4%), representing 20 citations (4.2%). Referring to the classification of ICPC-3, diarrhea falls under the category "digestive system". Regarding the causes of the disease, only one participant ~~(6.6%)~~ mentioned diet. Two informants cited intestinal pain and liquefaction of stools as symptoms of diarrhea. Among the 15 informants who mentioned diarrhea, none provided information on the disease's diagnosis.

In total, participants mentioned 16 unique remedies for diarrhea with the number of ingredients ranging from one to three. Single-ingredient remedies were predominant (9 remedies, 9 ~~citations~~UR), followed by two-ingredients remedies (6 remedies, 9 ~~citations~~UR), and three-ingredients remedies (1 remedy, 1 ~~citation~~UR).

Among the 16 unique remedies reported, 13 plant species belonging to 8 different botanical families were mentioned. The most cited plant was *Moringa oleifera* [leaf] (5 ~~citations~~UR, 22.7%), followed by *Psidium guajava* [leaf] (4 ~~citations~~UR, 18.2%), *Euphorbia hirta* [leaf] (2 ~~citations~~UR, 9.1%), and *Coleus madagascariensis* [leaf] (2 ~~citations~~UR, 9.1%).

The most cited remedy was composed of *M. oleifera* leaves, and three participants mentioned this remedy ~~(20%)~~. To prepare the remedy, three or four fresh leaves are crushed in water, and a pinch of salt is added. The remedy is then taken orally once a day. The duration of the treatment was not specified by the three informants.

~~The second most cited remedy was made of *P. guajava* leaves, and two informants suggested this remedy (13.3%). The remedy is prepared by crushing *P. guajava* fresh leaves in water, and it is consumed orally three times a day until the person is cured. The two participants who mentioned the remedy did not specify the quantity of leaves to use.~~

3.5.7. Diabetes

In total, 14 informants mentioned diabetes (13.5%), representing 29 ~~citations~~ UR (6.2%). According to ICPC-3, diabetes falls under the category "endocrine system". As for the diagnosis, the 14 informants did not provide information. Only one informant ~~(7.1%)~~ described the causes and symptoms of the disease. According to this informant, the causes of this condition would be the excess consumption of sugar or alcohol. The symptoms include decreased vision, weight loss, constant urination, slow healing, and constant hunger.

In total, participants mentioned 19 unique remedies for diabetes with the number of ingredients ranging from one to four. The majority of remedies were single-ingredient (12 remedies, 16 ~~citatons~~UR), followed by two-ingredients remedies (3 remedies, 9 ~~citations~~UR), three-ingredients remedies (2 remedies, 2 ~~citations~~UR), and four-ingredients remedies (2 remedies, 2 ~~citations~~UR).

The 19 mentioned remedies included 28 plant species belonging to 20 different botanical families. The most cited plants were *Mangifera indica* [leaf] (6 ~~citations~~UR, 15.4%) and *Psidium guajava* [leaf and fruit] (4 ~~citations~~UR, 10.2%).

The most cited remedy (2 ~~citations~~UR, 6.9%) combined *P. guajava* and *M. indica* leaves. The remedy is a decoction. According to the two informants who mentioned the remedy, the water should be boiled until it changes color. The remedy should be taken orally. Regarding the quantity, the informants specified that 3 leaves of each plant are needed to prepare the remedy. The remedy should be consumed twice a day, and the participants did not provide information on the treatment duration. The other 18 remedies are all mentioned once by different informants.

3.5.8. Female infertility

During the study, 14 informants mentioned female infertility (13.5%), representing 18 ~~citations~~ UR (3.8%). According to the ICPC-3 classification, female infertility is part of the "genital system" category. Two informants ~~(14.3%)~~ described the causes of the disease. The first informant mentioned cysts, fibroma, and menstrual cycle irregularities as causes of female infertility. The second informant cited a lack of hormones. Participants did not provide information on the symptoms and diagnosis of the disease.

Overall, informants described 17 unique remedies for infertility with the number of ingredients ranging from 1 to 8. Two-ingredients remedies were predominant (5 remedies, 6 ~~mentions~~UR), followed by single-ingredient remedies (4 remedies, 4 ~~mentions~~UR), and three-ingredients remedies (3 remedies, 3 ~~mentions~~UR). Remedies with four to eight ingredients were mentioned only once by one informant each.

Among the 17 mentioned remedies, 35 plant species belonging to 17 botanical families were reported. The plant with the highest number of citations was *Aerva lanata* [leaf and vine] (10 ~~citations~~UR, 18.2%), followed by *Ocimum gratissimum* [leaf] (6 ~~citations~~UR, 10.9%), and *Decalobanthus peltatus* [vine and root] (3 ~~citations~~UR, 5.5%).

One remedy stands out from the others in terms of number of citations. This remedy combines the vines of *Decalobanthus peltatus* and *Paullinia pinnata*.

Two informants ~~(14.3%)~~ mentioned the vines of *Decalobanthus peltatus* mixed with the vines of *Paullinia pinnata* for treating infertility. The vines are prepared by decoction. One vine of each plant is used to prepare the remedy, which is taken orally three times a day for seven days.

3.5.9. Hernia

In total, 12 participants mentioned hernia (11.5%), representing 15 ~~citations~~UR (3.1%). In shimaoré, this condition is defined by the term "*mushipa*". According to ICPC-3, this condition is part of the "digestive system" category. Participants did not provide information regarding the causes of this condition. As for the symptoms, two informants ~~(16.6%)~~ provided information on this matter. The first informant mentioned pain, tension in the genital areas, as well as blood in the stool as symptoms of the disease. Another informant emphasized that swelling in the genital areas (testicles) is also a symptom for men. Both participants stated that the diagnosis is made by touching the organ affected.

Informants described 14 unique remedies for hernia, with the number of

ingredients ranging from one to five. Three-ingredients remedies were predominant (5 remedies, 5 ~~citations~~UR), followed by four-ingredients remedies (4 remedies, 4 ~~citations~~UR), single-ingredient remedies (2 remedies, 2 ~~citations~~UR), five-ingredients remedies (2 remedies, 2 ~~citations~~UR), and two-ingredients remedies (1 remedy, 1 ~~citation~~UR).

Among the 14 mentioned unique remedies, 20 plant species belonging to 15 different botanical families were mentioned. The most mentioned plant was *Woodfordia fruticosa* [wood and leaf] (4 ~~citations~~UR, 14.3%).

There is no standout remedy, all 14 unique remedies were mentioned once by different informants.

3.5.10. Impotence

In total, 11 informants mentioned impotence (10.6%), and it represented 14 ~~citations~~ UR within the remedies (2.9%). According to ICPC-3, impotence is part of the "genital system" category. Two informants ~~(18.2%)~~ described the causes of this condition. The first informant ~~(9.1%)~~ emphasized drinking too much cold water and sorcery as potential causes. The second informant mentioned stress, fatigue, depression, and trauma as other causes of this condition. Symptoms were described by three informants ~~(27.3%)~~. All three participants cited erection problems as symptoms. One informant ~~(9.1%)~~ also mentioned a decrease in strength as a symptom. The 11 informants who mentioned impotence did not provide information on the diagnosis of the disease.

In total, participants mentioned 14 unique remedies for impotence, with the number of ingredients ranging from one to five. Three-ingredients remedies were predominant (5 remedies, 5 ~~citations~~UR), followed by four-ingredients remedies (4 remedies, 4 ~~citations~~UR), single-ingredient remedies (2 remedies, 2 ~~citations~~UR), five-ingredients remedies (2 remedies, 2 ~~citations~~UR), and two-ingredients remedies (1 remedy, 1 ~~citation~~UR).

Among the 14 unique remedies reported, 36 plant species belonging to 18 different botanical families were cited. The most mentioned plant was *Woodfordia fruticosa* [leaves and root] (8 ~~mentions~~UR, 15.4%), followed by *Phyllarthron comorense* [leaf and root] (4 ~~mentions~~UR, 7.7%), and *Syzygium aromaticum* [fruit] (3 ~~mentions~~UR, 5.8%).

There is no predominant remedy; all 14 unique remedies were mentioned once by different informants.

The data are summarized in **Figure 4**, which report the relationships between the eleven most cited plants and the diseases they treat. The thickness of the links

871 provides information on the plants most commonly used to treat a particular
872 condition. The diameter of the clusters helps identify the diseases with the highest
873 number of citations. For example, **Figure 4** allows us to see that stomachache is the
874 most commonly mentioned illness by the informants during the study. It also allows
875 us to see that the most used plant against cough is *C. amboinicus*.
876

4. Discussion

4.1. Users and specificity of traditional Mahoran medicine

The users of traditional medicine have been classified into three groups: the expert or "*fundi*" (known throughout the island), the individuals known within a specific municipality only, and those who use traditional medicine to treat themselves or their relatives (part 3.2). In this survey, the majority of informants (62,5%) belong to the last category. This classification presents some similarity with the one established by Lartigau-Roussin (2002), where the category of "*fundi*" and individuals practicing self-medication is present. However, in the same article, other categories of traditional practitioners are also mentioned and include the "*mwalimu*", the "*fundi des djinn*", and locally known sorcerers referred to as "*mutsayi*" or "*mgangi*". In our survey, we did not find these categories of traditional practitioners. It might come from the fact that we focused on Mahoran pharmacopeia and not on spiritual and religious practices. Another reason could be that these traditional practitioners do not openly talk about these practices as they consider them as secrets.

The majority of individuals interviewed in this study are women. Similar results were observed in an ethnobotanical survey conducted by Saive et al. (2018) in Mayotte. In that study, 29 individuals were interviewed, among whom there was 25 women and 4 men (Saive et al., 2018). When looking at the "*fundi*" category, women are also more represented than men. In the Mahoran society, it is primarily women who take care of children when they fall ill. This might explain the high proportion of women included in our survey. During the study, the majority of remedies for treating children were mentioned by women.

Regarding the specificity of traditional Mahoran medicine, it is noteworthy that among ingredients other than plants, salt and coral stone are the most frequently mentioned by participants. In the work of Mchangama and Salaün (2012), over 60 remedies were described. Among these remedies, two use salt in combination with plants to treat bruises from blows and paronychia. Coral stone, on the other hand, is cited in the preparation of eight different remedies. Additionally, *tany malandy* (white clay) is also mentioned in the publication by Mchangama and Salaün (2012), playing a role in the formulation of four different remedies in combination with plants (Mchangama and Salaün, 2012).

Another specificity of traditional Mahoran medicine is the fact that the majority of the plants used are exotic. This can be linked to Mayotte's history as a former French colony (Blanchy, 2002). The colonial past of Mayotte played a crucial role in introducing numerous exotic plants to the island. For instance, *Cananga odorata* was introduced to the Indian Ocean during the 18th century (Benini et al., 2010). This plant, native to Indonesia, is widely used in Mayotte. Its essential oil has become one of the

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island's main economic resources and is now a part of Mahoran culture. This example highlights the cultural and economical significance of exotic plants on the island. Additionally, Mayotte's geographical location fosters exchanges with the surrounding territories (Blanchy, 2002). The main exchanges have occurred with East Africa, the Middle East, and Madagascar (Blanchy, 2002). The Mahorans have progressively integrated plants from these regions into their medicinal practices (Blanchy, 2002). Furthermore, the island is subject to significant migratory movements, primarily from Madagascar and the Comoros, which likely promote the introduction and dissemination of external therapeutic knowledge (Blanchy, 2002).

~~Another specificity of traditional Mahoran medicine involves the plant parts used~~Regarding the most commonly plant parts used in traditional Mahoran medicine, ~~,~~ ~~l~~Leaves ~~are the most commonly used~~rank first (utilized for 73% of plant species). This characteristic of Mahoran traditional medicine is also described in the works of Lartigau-Roussin (2002), affirming that leaves are indeed the most employed in the preparation of traditional Mahoran remedies. This is also echoed in the publication by Saive et al. (2018), where leaves are the most used and cited plant parts by study participants.

During the study, it was observed that the most commonly used administration route is oral (used for 78.5% of plant species), and the most employed preparation method is decoction (used for 72.6% of plant species). Once again, these results align with those stated by Lartigau-Roussin (2002), which assert that the preferred administration route for herbal treatments is oral, often in the form of a decoction-based herbal tea.

One notable specificity of traditional Mahoran pharmacopoeia is the treatment duration of remedies, which is specified for 13.7% of the total remedies. Among these 65 remedies, 49 have a treatment duration of seven days, and 16 have a treatment duration of three days. These treatment durations are also mentioned in the works of Mchangama and Salaün (2012). Indeed, in this article, six remedies have a seven-day treatment duration, and two remedies have a three-day treatment duration. It is interesting to note that there are more remedies consumed for seven days than three days, consistent with the results obtained during the study. The article by Saive et al. (2018) also mentions a remedy with a seven-day treatment duration. Additionally, the number seven holds religious significance, which may justify why most treatments last for seven days (Lartigau-Roussin, 2002).

Another characteristic of traditional Mahoran medicine relates to the harvesting of plants. Several participants (6 informants) mentioned that before harvesting a plant, it is important to recite a prayer called "*bismillah*". Other informants (4 informants) asserted that there are specific days for harvesting medicinal plants, such as M~~m~~onday

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or W~~w~~ednesday. To the best of our knowledge, no scientific article explains the use of "*bismillah*" in Mayotte. However, the work of Lartigau-Roussin (2002) mentions the existence of "*nuhusi*" days (in Shimaoré). "*Nuhusi*" days are days during which the harvest of plants is considered impossible. The word "*nuhusi*" has Arabic origins and can be translated as misfortune or inauspicious. According to local beliefs, harvesting medicinal plants on a "*nuhusi*" day would render the remedy ineffective against the targeted illness (Mchangama and Salaün, 2012).

Compare to the surrounding islands, traditional Mahoran medicine share some similarities. First, it's noteworthy that the flora of Mayotte is very similar to that of the other Comoros islands. Indeed, 614 out of the 663 indigenous plants from Mayotte are also found in these islands. In our study, 152 out of the 154 plants identified are also present in the Comoros archipelago. Second, in a review, Saive *et al*. (2020) lists more than 207 medicinal plants used throughout the Comoros archipelago, with many plants being used in similar ways to treat the same ailments across the different islands (Saive et al., 2010). Furthermore, the use of non-plant materials, such as coral stone, is another feature shared by these islands (Daroueche, 2024). This practice is not exclusive to the Comoros, as other Indian Ocean islands, like Madagascar, also use coral stone in their traditional pharmacopoeia (Mesa et al., 2021). Because the available literature on the medicinal plants used in the Comoros islands is limited, further research is needed to document these practices and thus explore both similarities and differences in the specific practices of traditional medicine across this culturally interconnected region.

~~It would be particularly interesting to compare the traditional medical practices of Mayotte with those of other islands in the Comoros archipelago, in order to explore both similarities and differences not only in the use of plant and non-plant based remedies but also in the specific practices of traditional medicine across this culturally interconnected region.~~

4.2. Healthcare system issues, health conditions and the use of traditional medicine in Mayotte

~~Overall, the difficulty in accessing healthcare professionals is one of the reasons that justify the use of traditional medicine in Mayotte. According to the regional health observatory (ORS), in 2019, only 53% of very low income individuals consulted a general practitioner when they were sick, and only 11% of these individuals saw a specialist that year. In comparison, 70% of non-poor individuals consulted a general practitioner when sick, and 30% of them consulted a specialist in 2019 (Thibault et al., 2021). These figures are also justified by the fact that 77% of Mayotte's inhabitants live below the national poverty threshold (Balicchi et al., 2014).~~

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Based on established categories using the ICPC-3, the “digestive system” category has the highest number of diseases and is also the most cited category. Thus, it is possible to hypothesize that the most frequently encountered diseases in Mayotte affect the digestive system. The study mentioned that the main cause of these diseases affecting the digestive system is diet. According to the ORS, the diet in Mayotte is limited in variety and characterized by low intake of dairy products, calcium, fruits, and vegetables. Dietary intake revolves around staple foods such as rice (40% of dietary intake), chicken wings (18.3% of dietary intake), chicken thighs (16.2% of dietary intake), bread (10.1%), fish (8.1%), and other foods such as bananas, cassava, and breadfruit. Furthermore, new products are gradually entering consumption habits. The consumption of bread and pastries has doubled since 2005, and spending on carbonated or flavored beverages increased by 45% between 2010 and 2011 (Aboudou et al., 2019). This limited diet could therefore be responsible for numerous conditions such as stomachaches, diarrhea, obesity, or even diabetes.

Additionally, it is important to note that in Mayotte, 29% of households do not have access to running water. Among these 29%, 9% of households use water from rivers or streams. However, these streams or rivers do not provide satisfactory conditions for food or hygiene use. Indeed, there are places where waste is dumped and are also habitats for animals. This contaminated water could therefore be a cause of stomachaches. It is also important to highlight that in the late 1990s, Mayotte saw the resurgence of diseases such as cholera. Between 1998 and 2000, 10 cases of cholera were bacteriologically confirmed and recorded in Mayotte (Deroche et al., 2022). In 2024, a new cholera epidemic was declared and 122 persons have been affected so far.

The second most cited category of diseases by informants is the "respiratory system" category. The causes, symptoms, and diagnosis of diseases in this category were very briefly described by the participants. However, it is interesting to note that in the work of Mchangama and Salaün (2012), a remedy was mentioned for treating each of the following diseases: cough, sore throat, flu, and sinusitis. Additionally, a report mentions acute respiratory infections as a major cause of infant mortality in Mayotte (Sissoko et al., 2005). According to this report, acute respiratory infections can be of bacterial or viral origin, including common infections, bronchitis, and pneumonia. Tuberculosis, on the other hand, had an incidence rate of 23 per 100,000 inhabitants in Mayotte in 2001 (Sissoko et al., 2005). The national public health agency also reported several cases of influenza. During the period 2021-2022, there were two flu epidemics. In the first epidemic, a total of 235 emergency department visits and 49 secondary hospitalizations were recorded. The second epidemic was less severe, with 124 emergency department visits and 23 secondary hospitalizations (Santé publique France, 2022). Thus, diseases affecting the respiratory system are highly prevalent in Mayotte.

The third most cited category by participants is the "genital system" category. Similar to diseases classified in the "respiratory system" category, very few informants described the causes, symptoms, and diagnosis of diseases affecting the genital system. Female infertility and impotence are among the most mentioned conditions in this category of diseases. In Mayotte, reproduction is at the core of the society. Population growth is very dynamic, primarily driven by a strong surplus of births over deaths. Fertility in Mayotte is very high, with 4.6 children per woman in 2021 (Balicchi et al., 2014). This high birth rate is due to the representation of the child in Mahoran culture which symbolizes wealth. Having a large family in Mayotte is therefore a sign of wealth. Furthermore, when the child reaches adulthood, they can provide for their family's needs. Another important aspect is that in Mahoran society, a woman only gains status once she becomes a mother (Hébert and Hébert, ~~, J. C. and Hébert, O.,~~ 2011). Additionally, according to the testimony of several informants, a woman is considered infertile if she does not become pregnant within two to three months after marriage. Therefore, it is possible to hypothesize that these reasons lead women suffering from infertility to consult a traditional healer or practice self-medication. The same applies to men affected by impotence in Mayotte. Moreover, it is important to note that generally in Africa, sexuality plays a prevalent role in daily life. Thus, male sexual impotence is a sign of great misfortune for a family (Musabyimana, 2016). This further justifies the importance of natural remedies for impotence in Mayotte.

The results of the study have shown that chronic diseases such as diabetes and HBP were frequently mentioned by the participants. Type 2 diabetes is the most common form in Mayotte, with a prevalence of 12% in 2018, and this prevalence increases with age (Grave et al., 2021). Diabetes also affects the neighboring islands of Mayotte. In the Comoros, the prevalence of diabetes was 5.9% in 2016, and like in Mayotte, it increases with age, with a predominance of type 2 diabetes (WHO, 2016a). In Madagascar, the prevalence of diabetes was 3.9% in 2016 (WHO, 2016b). Diabetes has a higher prevalence in Mayotte than in the Comoros and Madagascar. As for HBP, its prevalence in Mayotte is higher than that of diabetes. Indeed, the prevalence of HBP was 38.4% in 2019 (Grave et al., 2021). Once again, the prevalence of HBP is higher in Mayotte than in the Comoros and Madagascar. In the Comoros, a survey conducted in 2011 revealed an HBP prevalence of 25% (Ali et al., 2020). Another study conducted in Madagascar in 2014 showed an HBP prevalence of 27.6% (Ratovoson et al., 2014). Given these figures, Mahoran traditional healers have developed, just like for diabetes, numerous remedies based on local medicinal plants to treat HBP. It is interesting to note that many remedies presented in the study use salt in combination with plants. Furthermore, among the 19 remedies mentioned against HBP, there is one remedy that uses salt in combination with *M. oleifera* leaves. Although this salt-containing remedy

is a minority among those mentioned, it is important to highlight this practice, given that salt is a factor that promotes HBP (WHO, 2023).

~~Among health problems not belonging to a defined medical category according to the ICPC-3, the fontanelle was mentioned three times. Informants who mentioned the fontanelle described the following symptoms: the baby's skull moves, and their head is soft. Remedies mentioned in the study for treating the fontanelle include applying egg white and grated white beans, which are scraped on a coral stone, directly onto the child's skull. The last remedy involves scraping the fruit of a plant called "*moussmuni*" on a coral stone to obtain a paste that is applied to the newborn's skull. The fontanelle is a problem that affects babies under six months old. It refers to the soft spots on a newborn's head, which disappear as the skull bones fuse together. This concept of the fontanelle is also present in southwest Madagascar and in continental Africa. An ethnobotanical study identified six different plant species used for the fontanelle in Madagascar (Ledoux et al., 2014), while another survey conducted in Ivory Coast identified three different plant species used for the fontanelle (Bi et al., 2008).~~

~~It is worth noting that out of the seven diseases not classified by the ICPC-3, five of them affect children. It should be understood that Mayotte experiences very rapid population growth (Balicchi et al., 2014). Moreover, access to modern medicine is relatively limited, as 77% of the population lives below the poverty line. Thus, when a child falls ill, Mahoran women prefer to use traditional medicine first before going to the hospital. This approach is also widespread in Africa. According to a study conducted in 2015 in Mali, 73% of children receive traditional care from their first weeks of life (Doumbia, 2015).~~

~~Finally, the consensus factors among informants for diseases are rather low, meaning there is little or no consensus on the plants used for a given disease. Within the study, the highest ICF is for cough (0.73) and the others are relatively low. Several hypotheses could justify these low ICFs. One hypothesis could be that informants do not exchange information regarding the remedies they use for treatment. This lack of exchange could be related to the fact that Mayotte has a great ethnic diversity (Hagège et al., 2022). Other hypotheses justifying this low ICF for diseases could be similar effectiveness of several different plants, as well as limited accessibility to plants and their presence in specific geographical areas.~~

4.3. Benefit-risk balance of the most cited plants

A table presenting the ethnobotanical uses (in Mayotte and in the surrounding regions), pharmacological activities and toxicological studies of the

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seven most cited plants is provided to assess the efficacy and toxicity of these plants (Table 4). Here, we provide conclusive remarks on these plants.

The leaves of *C. amboinicus* present ethnobotanical and pharmacological data justifying its use in cough treatment. However, toxicological data on the plant remains limited and further studies are necessary to demonstrate its safety and the doses to be respected.

The leaves and fruits of *C. aurantiifolia* are widely used for cough all over the world. The antibacterial activity of the leaves and fruit has also been confirmed. It is worth noting that the World Health Organization (WHO) recommends using lemon juice with honey as a soothing remedy for cough problems (WHO, 2001).

M. oleifera leaves present ethnobotanical and pharmacological data justifying their use against hypertension and diarrhea. However, the plant does not seem to be widely used for stomachache in general. Therefore, it would be interesting to conduct ethnomedical studies in Mayotte to better understand what individuals mean when referring to stomachache.

O. gratissimum leaves present ethnobotanical data confirming their use against female infertility and painful menstruation. However, it would be interesting to conduct tests to confirm the pharmacological activity of this plant against infertility and pain. Moreover, future clinical trials could be considered to justify the anti-inflammatory and antioxidant activity of the leaves.

From an ethnobotanical perspective, *P. guajava* has been repeatedly mentioned as a remedy for diarrhea in several different countries. *In vitro* and *in vivo* tests have proven the antidiarrheal properties of the leaves. Additionally, clinical trials have also confirmed the efficacy of the plant. However, it would be interesting to further research bioactive phytochemicals due to the lack of information on the subject.

S. aromaticum is a widely used plant in traditional medicine for its activity against fever and pain. Many therapeutic applications have been developed, particularly for treating dental problems. It would be interesting to further study the combined activity of cloves and coral stone reported in this study.

The leaves of *C. halicacabum* present ethnobotanical and pharmacological data justifying its use against fever. However, it would be interesting to identify the molecules responsible for the plant's antipyretic activity.

Overall, none of these plants have shown to induce toxicity at reasonable dosage.

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4.3.1. *Coleus amboinicus*

C. amboinicus (Lamiaceae) is an herbaceous plant native to East Africa, India, and the Arabian Peninsula (Arumugam et al., 2016). *C. amboinicus* was the most cited plant (44 citations) in our study. This plant was primarily mentioned for its use in treating cough. The leaves are prepared by decoction or by crushing them (either in water or dry). It is also possible to consume them directly. The plant is usually prepared on its own.

This plant has been previously mentioned in the work of Mchangama and Salaün (2012) in the formulation of a remedy for cough. In this article, the leaves of *C. amboinicus* are mixed with pieces of coconut and salt, then consumed orally (Mchangama and Salaün, 2012). This species is also used in Africa for cough. The leaves are prepared as an infusion or syrup, then consumed orally (Rice et al., 2011). The leaves of *C. amboinicus* are also used in India, the Caribbean islands, and Cuba for cough (Arumugam et al., 2016).

In vivo assays have been conducted on hydroalcoholic extracts of *C. amboinicus* leaves. These studies have demonstrated that the leaves possess anti inflammatory and antitumor activities (Gurgel et al., 2009). Additionally, other tests have also proven that leaves extracted with hexane possess antioxidant and antibacterial activities (Nizar Ahamed et al., 2023).

Several bioactive compounds have been found within the essential oil of *C. amboinicus*. The identified compounds include carvacrol (major compound), thymol, β caryophyllene, α humulene, γ terpinene, p cymene, α terpineol, and β selinene. These compounds have numerous properties and are primarily active against asthma, headaches, fever, and cough (Arumugam et al., 2016).

Regarding the toxicity of the leaves, a study was conducted on mice with a maximum dose of 2000 mg/kg from a methanolic extract of *C. amboinicus*. After seven days of treatment, no mortality related to the test substance was observed. Furthermore, there was no significant changes in weight, respiratory rate, and heart rate of the tested individuals (Pillai et al., 2011).

In conclusion, the leaves of *C. amboinicus* present ethnobotanical and pharmacological data justifying its use in cough treatment. However, toxicological data on the plant remains limited and further studies are necessary to demonstrate its safety and the doses to be respected.

4.3.2. *Citrus aurantiifolia*

C. aurantiifolia (Rutaceae) is a tree native to the Eastern Himalayas. It is the second most cited plant (32 citations) in this study. The most cited ailment for this plant is cough. The fruits and leaves of *C. aurantiifolia* are crushed and consumed orally to relieve cough. It is also possible to prepare the leaves by decoction.

This plant is also used in Africa to treat cough. A study reported that in Uganda, *C. aurantiifolia* leaves are prepared by decoction for cough (Tabuti et al., 2003). Other works have shown that in Nigeria, the fruit is used for cough (Ojimelukwe et al., 2013). *C. aurantiifolia* is also utilized for its medicinal properties against cough in French Polynesia and Indonesia (Asmah et al., 2020).

Tests on dry extracts of *C. aurantiifolia* have highlighted the antibacterial activity of its fruit (Lee et al., 2018). This activity is attributed to the presence of monoterpenes in the fruit, such as limonene (major compound) and linalool (Weimer et al., 2021). Another study also investigated the antibacterial activity of *C. aurantiifolia* leaves by conducting *in vitro* tests. Hydroalcoholic extracts of *C. aurantiifolia* leaves showed antibacterial and antifungal activities against six different microorganisms (Pathan et al., 2012).

Regarding the toxicity of the plant, several tests have been conducted with the essential oil. The tested concentrations are as follows: 50, 100, and 500 mg/kg. The results showed no acute toxicity, and there were no changes in weight among the tested individuals (Adokoh et al., 2019). Another study tested the toxicity of an aqueous extract of *C. aurantiifolia* leaves at a concentration of 2000 mg/kg, and it was found that *C. aurantiifolia* leaves were not toxic at 2000 mg/kg (Shehérazade et al., 2021).

In conclusion, the leaves and fruits of *C. aurantiifolia* are widely used for cough all over the world. The antibacterial activity of the leaves and fruit has also been confirmed. It is worth noting that the World Health Organization (WHO) recommends using lemon juice with honey as a soothing remedy for cough problems (WHO, 2001).

4.3.3. *Moringa oleifera*

M. oleifera (Moringaceae) is a tree native to eastern Pakistan and northwestern India. In this study, this plant was mainly cited for treating stomachache and hypertension. The leaves are prepared either by decoction or by crushing them (dry or with water). Most of the remedies containing this plant are consumed orally.

Two ethnobotanical studies have reported that *M. oleifera* leaves were used against diarrhea in Benin, Africa, and India (Agbankpe et al., 2014; Gopalakrishnan et al., 2016). Additionally, another study has reported the use of *M. oleifera* leaves for hypertension in Madagascar (Nicolas, 2012). In Tchad, the leaves are also used to treat

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hypertension (Dongock, 2018).

A study conducted in 2019 using aqueous leaf extracts of *M. oleifera* highlighted the antihypertensive activity of the leaves (Aekthammarat et al., 2019). The plant has also been tested for its antidiarrheal activity. However, the extracts were not made from the leaves. The study relied on methanolic root extracts of *Moringa oleifera*. The extract showed significant antidiarrheal effects against castor oil induced diarrhea in tested rats (Saralaya et al., 2010).

The main families of chemical compounds found in *Moringa oleifera* leaves include vitamins, phenolic acids, flavonoids, isothiocyanates, tannins, and saponins. Compounds that are believed to have an effect against hypertension include quercetin, chlorogenic acid, and β-sitosterol (Vergara-Jimenez et al., 2017).

Regarding the toxicity of the species, this has been tested using aqueous leaf extracts. When the extracts were administered orally, they did not result in any mortality in mice at doses ranging from 400 mg/kg to 6.4 g/kg. However, between 3200 and 6400 mg/kg, a decrease in locomotion in some mice was observed after 2 hours of treatment (Awodele et al., 2012).

In conclusion, *M. oleifera* leaves present ethnobotanical and pharmacological data justifying their use against hypertension and diarrhea. However, the plant does not seem to be widely used for stomachache in general. Therefore, it would be interesting to conduct ethnomedical studies in Mayotte to better understand what individuals mean when referring to stomachache.

4.3.4. Ocimum gratissimum

O. gratissimum (Lamiaceae) is a subshrub that mainly grows during the dry season in the tropics. It is native to South Africa, the Arabian Peninsula, India, and eastern China. This plant was primarily cited for two ailments: female infertility (6 citations) and painful menstruation (6 citations). Remedies made to treat these conditions utilize the leaves of *O. gratissimum*, prepared as a decoction and administered orally.

Several ethnobotanical studies mention the use of *O. gratissimum* leaves to treat infertility. In southwestern Nigeria, the leaves are used in decoction to treat infertility (Soladoye et al., 2014). This is also the case in Cameroon, where the leaves are again prepared as a decoction and consumed orally (Fongod et al., 2014). Two articles cite *O. gratissimum* leaves as a remedy for painful menstruation, with the leaves being used in decoction in Benin (Ugbogu et al., 2021) and Ghana (Bekoe et al., 2021).

Regarding the pharmacological activities of *O. gratissimum*, a study conducted in 2018 showed that the aqueous extracts of *O. gratissimum* leaves possessed antioxidant and anti-inflammatory activity (Olamilosoye et al., 2018). To the best of our knowledge, we did not find any pharmacological studies focusing on the leaves against infertility.

Phenolic compounds and flavonoids present in the leaves are believed to be responsible for the plant's anti-inflammatory activity. Identified phenolic compounds include rosmarinic acid, sinapic acid, salvigenin, gallic acid, catechin, methyl eugenol, caffeic acid, caftaric acid, ellagic acid, trans-ferulic acid, and L-chicoric acid. Identified flavonoids include xanthomicrol, cirsimaritin, rutin, apigenin, kaempferol, vicenin-2, luteolin-5-O-glucoside, luteolin-7-O-glucoside, vitexin, isovitexin, and nepetoidine-A. Some terpenes present in the leaves may also have anesthetic activity (Ugbogu et al., 2021).

The toxicity of *O. gratissimum* leaves has also been studied using aqueous leaf extracts, with concentrations ranging from 1600 to 4500 mg/kg. The study showed that the median lethal dose of the aqueous extracts is 4240 mg/kg. This toxicity was attributed to tannins, saponins, glycosides, and alkaloids present in the leaves (Ojo et al., 2013).

Thus, *O. gratissimum* leaves present ethnobotanical data confirming their use against female infertility and painful menstruation. However, it would be interesting to conduct tests to confirm the pharmacological activity of this plant against infertility and pain. Moreover, future clinical trials could be considered to justify the anti-inflammatory and antioxidant activity of the leaves.

4.3.5. Psidium guajava

P. guajava (Myrtaceae) is a shrub native to Central and South America. This plant was primarily cited by informants for its properties in treating diarrhea. It is the leaves that are used, either in decoction or crushed in water. Remedies prepared from this plant are all consumed orally.

In Madagascar, in the Maroantsetra region, young leaves are used in decoction against diarrhea (Quansah, 1988). In Kenya, *P. guajava* leaves are also prepared in decoction to treat diarrhea (Njoroge and Bussmann, 2006). More generally, this plant has been mentioned for its antidiarrheal properties in 44 different countries including Brazil, China, Congo, Fiji, Mexico, Mozambique, Peru, Philippines, Senegal, South Africa, Trinidad and Tobago, United States (Gutiérrez et al., 2008; Liu et al., 2024).

Regarding the pharmacological activities of the plant, several *in vitro* and *in vivo* tests have been conducted. One study showed the antibacterial activity of aqueous extracts of dried leaves on *Shigella flexneri* and *Vibrio cholerae*, two bacteria responsible for infectious diarrhea. Additionally, the same study revealed that *P. guajava* had an inhibitory effect on the production of certain toxins from *Escherichia coli* (Birdi et al., 2010). These results were also confirmed by another study using ethanol extracts of the leaves, which showed antibacterial activity against *Escherichia coli* (Hirudkar et al., 2020).

Regarding the toxicity of the leaves, a study conducted at different concentrations: 1 mg/ml, 10 mg/ml, 100 mg/ml, and 1 g/ml showed no acute toxicity (Yadav and Mohite, 2020).

Regarding clinical trials, a guava leaf-based medication was administered to patients with acute diarrhea in Mexico. This treatment significantly reduced the duration of their abdominal pain (Lozoya et al., 2002). Furthermore, in India, decoction of guava leaves administered to 109 patients with diarrhea led to a reduction in stool frequency and abdominal pain (Birdi et al., 2020).

In conclusion, from an ethnobotanical perspective, *P. guajava* has been repeatedly mentioned as a remedy for diarrhea in several different countries. *In vitro* and *in vivo* tests have proven the antidiarrheal properties of the leaves. Additionally, clinical trials have also confirmed the efficacy of the plant. However, it would be interesting to further research bioactive phytochemicals due to the lack of information on the subject.

4.3.6. *Syzygium aromaticum*

S. aromaticum is a tree native to Maluku. In this study, this plant (floral buds mainly) was primarily cited for treating headache. They are usually crushed dry or scraped on a coral stone, and then applied locally.

The work of Mchangama and Salaün (2012) mentions a remedy using cloves to relieve muscle pain. Another ethnobotanical study conducted in Pakistan cites the use of cloves for headache and pains (Ahmad et al., 2018). In Madagascar, the floral buds are used against fever (Sattler and Razafindravao, 2017). Moreover, in Reunion Island, the floral buds of *S. aromaticum* are also prepared in decoction against rheumatism and flu (Vera, 1989). The use of floral buds against fever has also been mentioned in other countries such as Angola, Senegal and Sudan (Adefegha et al., 2016).

Regarding the pharmacological activities of *S. aromaticum*, a study aimed to demonstrate the antipyretic activity of the essential oil derived from the floral buds of

the plant. The test was conducted on two groups of albino mice. The first group was treated with essential oil at a concentration of 50 mg/kg, and the second group was treated with a concentration of 100 mg/kg. The study showed that the essential oil of *S. aromaticum* exhibits significant antipyretic activity. No difference was observed between the two groups of mice (Uchôa Lopes et al., 2020). Another study presented similar results by testing the essential oil of *S. aromaticum* (Taher et al., 2015).

The essential oil of clove contains numerous bioactive compounds. Indeed, a study conducted in 2021 identified more than 30 compounds within this essential oil. Its major compound, eugenol, is responsible for the antipyretic and analgesic activity (Haro Gonzàlez et al., 2021).

Regarding the toxicity of clove essential oil, it has been recognized as harmless at a concentration below 1500 mg/kg. Furthermore, the WHO has specified that the acceptable daily number of cloves per day is 2.5 mg/kg based on the individual's weight (Cortés-Rojas et al., 2014).

Overall, *S. aromaticum* is a widely used plant in traditional medicine for its activity against fever and pain. Many therapeutic applications have been developed, particularly for treating dental problems. It would be interesting to further study the combined activity of cloves and coral stone reported in this study.

4.3.7. *Cardiospermum halicacabum*

C. halicacabum is a plant species native to the tropical and subtropical zone. It is a vine that mainly grows in the tropical biome during the dry season. This plant has been cited numerous times by participants for treating fever. The leaves alone or the leaves and vine mixed are crushed in water and then administered topically.

The work of Mchangama and Salaün (2012) also reported a remedy using the vine of *C. halicacabum* to treat fever in infants. Additionally, the work of Lartigau Roussin (2002) also mentions a remedy using the vines of *C. halicacabum* to treat fever in babies. In India, the leaves are used in decoction to treat fever (Elangovan et al., 2022).

Regarding the pharmacological activities of *C. halicacabum*, a study aimed to demonstrate the antipyretic activity of the plant. For this purpose, several aqueous, ethanolic, and hexanic extracts were made from the leaves of *C. halicacabum*. The ethanolic and hexanic extracts showed strong antipyretic activity, while the aqueous extract did not show such activity (Raza et al., 2013). Other studies have shown that the leaves also possess anti-inflammatory activity (Elangovan et al., 2022).

From a chemical perspective, the compounds responsible for this anti-inflammatory activity are as follows: apigenin, luteolin 7-O glucuronide, protocatechuic acid, rutin, apigenin 7-O β-d glucuronide, gallic acid, and coniferylaldehyde (Elangovan et al., 2022).

The toxicity of ethanolic extracts of leaves has also been evaluated. The extracts were orally administered to rats, which were then observed for 72 hours. The tests showed that the extracts did not exhibit toxicity up to a dose of 2000 mg/kg (Elangovan et al., 2022).

In conclusion, the leaves of *C. halicacabum* present ethnobotanical and pharmacological data justifying its use against fever. However, it would be interesting to identify the molecules responsible for the plant's antipyretic activity.

Table 4 : Balance benefit-risk of the seven most cited plant species

Scientific name	Ethnobotanical uses in Mayotte (in this study)	Ethnobotanical uses in the Indian Ocean and in Africa	Pharmacological activities	Bioactive compounds	Toxicity
Cardiospermum halicacabum	Leaf-: chikungunya, constipation, covid-19, dengue, fever, headache, hemorrhoids Liana-: headache	Leaf-: arthritis, fever, upset stomach [Archipelagos of Comoros] (Saive et al., 2020),	Ethanolic and hexanic extracts of the leaves showed ~~strong~~ antipyretic activity (Raza et al., 2013). The leaves also possess anti-inflammatory activity (Elangovan et al., 2022)	The compounds responsible for the anti-inflammatory activity are as follows-: apigenin, luteolin-7-O-glucuronide, protocatechuic acid, rutin, apigenin-7-O-β-d-glucuronide, gallic acid, and coniferylaldehyde (Elangovan et al., 2022).	The toxicity of ethanolic extracts of leaves has been evaluated. The extracts were orally administered to rats, which were then observed for 72 hours. The tests showed that the extract did not exhibit toxicity up to a dose of 2000 mg/kg (Elangovan et al., 2022).
Citrus aurantiifolia	Fruit-: cough, covid-19, dengue, fever, influenza, stomachache, tonsilitis Leaf : cough, covid-19, dengue, feet pain, female infertility, fever, hemorrhoids, influenza, stomachache	Fruit : cough, malaria [Nigeria] (Ojimelukwe et al., 2013) Leaf : cough [Uganda] (Tabuti et al., 2003)	Tests on dry extractcs have highlighted the antibacterial activity of the fruit (Lee et al., 2018). Another study inve~~r~~stigated antibacterial activity of the leaves by conducting *in vitro* tests (Pathan et al., 2012).	The antibacterial activity is attributed to the presence of monoterpenes in the fruit like limonene and linalool (Weimer et al., 2021).	The aqueous extract of the leaves was tested at a concentration of 2000 mg/kg and the results showed that the extract was not toxic at this dose (Shchérazade et al., 2021). Another study tested the toxicity of the essential oil at 50, 100, and 500 mg/kg. The results indicated no acute toxicity (Adokoh et al., 2019).

	Coleus amboinicus	Leaf-: cough, fever, headache, hernia, high blood pressure, nasopharyngitis, tonsilitis	Leaf-: cough, dysuria, constipation [Archipelago of Comoros] (Hassani et al., 2012), influenza, nasopharyngitis, wounds [Reunion island] (Nakab, 2019)	Hydroalcoholic extracts of the leaves possess anti-inflammatory and antitumor activities (Gurgel et al., 2009) Hexanic extracts of the leaves possess antioxidant and antibacterial activities (Nizar Ahamed et al., 2023)	These compounds were identified in the essential oil of the plant: carvacrol, thymol, β-caryophyllene, α-humulene, γ-terpinene, p-cymene, α-terpineol, and β-selinene (Arumugam et al., 2016)	Methanolic extract of the leaves were tested on mice with a maximum dos 2000 mg/kg (Pillai et al 2011). After seven day treatment, no morta related to the test subs was observed (Pillai e 2011)
	Moringa oleifera	Leaf-: constipation, diabetes, diarrhea, high blood pressure, infectious conjunctivitis, intestinal pain, otitis externa, stomachache Root : high blood pressure Seed : high blood pressure Stem : high blood pressure	Leaf: liver disease, redness [Archipelagos of Comoros] (Saive et al., 2020), high blood pressure [Madagascar] (Nicolas, 2012), [Tchad] (Dongock, 2018), diarrhea [Benin] (Agbankpe et al., 2014)	A study conducted in 2019 highlighted the antihypertensive activity of the aqueous leaf extracts of the plant (Aekthammarat et al., 2019). Methanolic extracts of the roots showed significant antidiarrheal effects against castor oil-induced diarrhea in tested rats (Saralaya et al., 2010).	The main families of chemical compounds found in the leaves include vitamins, phenolic acids, flavonoids, isothiocyanates, tannins, and saponins (Vergara-Jimenez et al., 2017).	The toxicity has been t using~~gn~~ aqueous le extracts. The extracts were administred orally, an did not result in any mortality in mice at doses ranging from 400 mg/kg to 6.4 g/kg. However, between 3200 and 6400 mg/kg, a decrease in locomotio some mice was obser after 2 hours of treatment (awodele et al., 2012)

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Ocimum gratissimum	Leaf-: asthma, cough, covid-19, dengue, female infertility, fever, hernia, influenza, nosebleed, painful periods, perineal massage, stomachache	Leaf-: diarrhea, fever, gingivitis, hemorrhoids, vaginal infection [Archipelagos of Comoros] (Saive et al., 2020), cough, [Madagascar] (Rabearivony et al., 2015), infertility [Nigeria] (Soladoye et al ., 2014), [Cameroon] (Fongod et al., 2014), painfull periods [Benin] (Ugbogu et al., 2021), [Ghana] (Bekoe et al., 2021)	Aqueous extracts of the leaves were tested and showed antioxidant and anti-inflaammatory activity (Olamilosoye et al., 2018).	Phenolic compounds and flavonoids present in the leaves are believed to be responsible for the plant's anti-inflammatory activity (Ugbogu et al., 2021).	The toxicity of the leaves has been tested using aqueous extracts, with concentrations ranging from 1600 to mg/kg. The study sho that the median lethal of the aqueous extracts is 4240 mg/kg (Ojo et al., 2013).
Psidium guajava	Fruit-: diabetes Leaf-: covid-19, dengue, diabetes, diarrhea, dizziness, feet pain, hernia, high blood pressure, - intestinal pain,	Leaf-: diarrhea [Archipelagos of Comoros] (Saive et al., 2020), [Madagascar] (Quansah, 1988), [Kenya] (Njoroge and Bussmann, 2006), [Senegal] (Gutiérrez et al., 2008; Liu et al., 2024)	One study showed the antibacterial activity of aqueous extracts of dried leaves on *Shigella flexneri* and *Vibrio cholerae*, two bacteria responsible for infectious diarrhea (Birdi et al., 2010).	The ethanol extract of the leaves was found to be rich in flavonoids, phenols, tannins, alkaloids, steroids, and carbohydrates (Hirudkar et al., 2020).	The toxicity of the lea wasere tested at diffe concentrations: 1 mg/ml, 10 mg/ml, 100 mg/ml, and 1 g/ml. None of them sh no acute toxicity (Yadav and Mohite, 2020)

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	Syzygium aromaticum	Flower buds-: back pain, cough, covid-19, fibroma, headache, influenza, impotence, muscle pain, otitis externa, toothache Leaf-: cough, headache	Flower buds-: cough [Comoros] (Kaou et al., 2008), fever [Madagascar] (Sattler and Razafindravao, 2017) [Angola][Senegal][Sudan] (Adefegha et al., 2016), flu, rheumatism [Reunion Island] (Vera, 1989)	A study aimed to demonstrate the antipyretic activity of the essential oil derived from the floral buds of the plant. The test was conducted on two groups of albino mice. The first group was treated with essential oil at a concentration of 50 mg/kg, and the second group was treated with a concentration of 100 mg/kg. The study showed that the essential oil exhibits significant antipyretic activity. No difference was observed between the two groups of mice (Uchôa Lopes et al., 2020).	The essential oil of clove contains numerous bioactive compounds. Indeed, a study conducted in 2021 identified more than 30 compounds within this essential oil. Its major compound, eugenol, is responsible for the antipyretic and analgesic activity (Haro-Gonzàlez et al., 2021).	Regarding the toxicity of clove essential oil, it has been recognized as harmless concentration below 1500 mg/kg. Furthermore, the WHO has specified that the acceptable daily number of cloves per day is 2.5 mg/kg based on the individual's weight (Cortés-Rojas et al., 2014).

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It is important to specify that the survey was conducted over a relatively short period of three months, which is a limiting factor. This limited timeframe may contribute to the absence of consensus for most uses, as reflected in the results where we have only one "use-report" for many of the plants studied (Weckerle et al., 2018).

5. Conclusion

This study is the first to focus on the Mahoran pharmacopeia all over the island. It highlights the rich traditional knowledge of Mahoran people. The Mahoran pharmacopeia is mainly practiced by women as they constituted the majority of the participants. According to the informants, the transmission of this knowledge primarily occurs orally. However, this transmission is decreasing year by year, with younger generations showing less interest in traditional medicine, possibly due to the island's development and changes in social organization.

The most commonly treated diseases by traditional medicine in Mayotte are those affecting the digestive, respiratory, and genital systems. The primary ailments include stomachache, cough, headache, and fever. In the survey, two chronic diseases (diabetes and hypertension) were also highly mentioned, likely reflecting the prevalence of these conditions on the island. However, it was observed that the respondents had difficulty describing the diseases (diagnoses, symptoms, causes), which could be attributed to translation issues or a lack of understanding of the conditions in question. Ethnological and medical work could be undertaken to better understand the cited ailments.

Remedies in Mahoran traditional medicine mainly consist of fresh plants. The majority of remedies used on the island consist of a single ingredient, with leaves being the most commonly employed in remedy preparations. The most frequently used preparation method is decoction.

The traditional remedies of Mayotte also has numerous specificities due to the use of particular ingredients such as salt, coral stone and white clay.

Within the study, the benefit-risk balance of the seven most cited plants was evaluated. These seven plants are already well-known as they have been the subject of several scientific studies. Among these seven plants, six exhibited similar ethnobotanical usage data in other countries, and six possessed pharmacological activities related to the documented uses. Among the plants for which toxicological data are available, only *M. oleifera* showed acute toxicity. Furthermore, it is worth noting that only *P. guajava* had undergone clinical trials.

Finally, some species (*A. lanata*, *C. halicacabum*, *C. madagascariensis*, *P. pinnata*, *Phyllarthron comorense*, *Mimusops comorensis*, *Tragia furialis* and *W. fruticosa*) frequently cited in our study and poorly investigated from a pharmacological perspective might be interesting to further study. In addition, three of them (*A. lanata*, *C. madagascariensis*,

and *W. fruticosa*) were cited for specific ailments, making them pertinent to study for their phytochemistry and biological activities related to these ailments.

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Credit Statement

Conceptualization: FC, CB, MH, YE
Field work: TTH, YE
Formal analysis: TTH
Plant identification: AD
Funding acquisition: CB
Writing – original draft: TTH
Writing – review and editing: FC, TTH, MH, YE, AD, CB

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Unveiling the potential and specificity of the Mahoran ethnopharmacopoeia: a field survey

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List of abbreviations

HBP: High blood pressure
ICPC-3: International Classification of Primary Care
ORS: Regional health observatory
UR: Use-Reports
WHO: World Health Organization

Abstract

Ethnopharmacological relevance: A significant portion of Mahoran people relies on traditional medicine to address their healthcare needs. However, very few studies have been carried out on this subject, and few data are available on the practices, plants used, and ailments most commonly treated by their traditional medicine.

Aim of the study: Within this context, the aim of this study was to identify the diseases most commonly treated by traditional Mahoran medicine, as well as the plants most commonly used against these various ailments.

Materials and methods: From January to April 2023, a semi-structured survey was carried out in Mayotte island. A total of 103 participants were interviewed including 65 non specialists, 21 knowledgeable, and 17 specialists. A thorough literature review was performed on the most cited plant species to evaluate the benefit-risk of each remedy.

Results: Participants mentioned using 474 remedies (prepared mostly with herbal ingredients) to treat 65 diseases. These diseases belong to various health categories of which the most represented ones were digestive system, respiratory system, genital system, general, and muscular system. The two most common ailments cited by participants were stomachache (41/103) and cough (36/103). A total of 154 plant species were identified, with *Coleus amboinicus*, *Citrus aurantiifolia*, *Moringa oleifera*, and *Ocimum gratissimum* being the main plants reported. Massage therapy was the second most important traditional practices reported after the use of herbal remedies.

Conclusion: Our survey confirms the importance of traditional medical pratices in Mayotte island. The following plants: *Aerva lanata*, *Cardiospermum halicacabum*, *Coleus madagascariensis Paullinia pinnata*, and *Woodfordia fruticosa* stand out from the others in terms of their use and number of citations, and it would be interesting to study their pharmacological and toxicological properties. Traditional medicine in Mayotte also possesses specificities, notably with the use of particular ingredients such as salt, coral stone, or even white clay. Furthermore, throughout the study, we noticed that chronic diseases such as diabetes or hypertension were extensively treated. This could be linked to the fact that the prevalence of these diseases is quite high on the island.

Keywords: ethnobotany, Comoros islands, traditional medicine, medicinal plants, Africa

1. Introduction

The island of Mayotte is the 101st French departement. It is inhabited by three main ethnic groups (Hagège et al., 2022). The Mahorans represent the main ethnic group, while the two others are the Comorians and the Malagasy (Hagège et al., 2022). This diversity is also reflected in the languages spoken on the island: Shimaoré (a language of Bantu origin, close to the languages of southern Africa) is the most widely used mother tongue on the island, spoken by 71% of the population (Rombi, 2003). The second most widely spoken language is Shibushi (a language of Austronesian origin, close to the Malagasy languages), used by 23% of the population (Rombi, 2003). French is the mother tongue of just 2% of the population, but is understood and spoken by around 60% of Mayotte's inhabitants (Rombi, 2003).

Mayotte's flora includes over 1,300 vascular species, of which 49 are endemic to Mayotte, 70 are endemic to the Comoros archipelago, 145 are endemic to the western Indian Ocean region, 400 species are indigenous, and the remainder are exotic (Barthelat, 2019). The inhabitants of Mayotte have taken advantage of this biodiversity by making frequent use of traditional medicine in their health practices. In Mayotte, according to Fadul (2023), one person out of two use plants to treat themselves, although this proportion is probably much lower than the reality, since as in Reunion Island, 8 to 9 people out of 10 use phytotherapy for occasional treatment. In other words, a large proportion of the population of the island practice self-medication when they fall ill (Fadul, 2023). This is mainly due to the fact that it is easier to treat minor ailments (fever, flu, diarrhea) directly with plants, as it often takes several hours to see a doctor in a dispensary. For more serious illnesses (diabetes, high blood pressure), the Mahorans generally diagnose the condition in hospital and then use both modern and traditional medicine to treat it (Lartigau-Roussin, 2002). According to the regional health observatory (ORS), in 2019, only 53% of very low-income individuals consulted a general practitioner when they were sick, and only 11% of these individuals saw a specialist that year. In comparison, 70% of non-poor individuals consulted a general practitioner when sick, and 30% of them consulted a specialist in 2019 (Thibault et al., 2021). These figures are also justified by the fact that 77% of Mayotte's inhabitants live below the national poverty threshold (Balicchi et al., 2014).

So far, two ethnobotanical studies have been conducted on the island. The first was carried out in 2012 by Salaün. This initial study helped highlight the ethnobotanical knowledge of Maoulida Mchangama, who was the sole informant interviewed during the study. The survey identified 65 ailments and identified 127 plant species involved in the 65 remedies mentioned by Mchangama (Mchangama and Salaün, 2012). The second study was conducted in 2018 by Saive, during which 29 individuals were interviewed. The informants were distributed across the north, south, and center of the island. This survey led to the identification of 69 plant species

(Saive et al., 2018). Overall, very few ethnobotanical studies have taken place in Mayotte. Furthermore, the studies that have been conducted did not focus on the entirety of the island and involved few informants.

So, with a view to the future development of products from the Mahoran ethnopharmacopoeia, we decided to conduct an ethnobotanical survey aiming to know which ailments are predominantly treated by traditional therapeutic practices, while identifying the plants most commonly used to treat these ailments. The data collected during the survey will be used to select one or more pathologies of interest to the community, as well as to select some culturally accepted medicinal plants that demonstrate potential therapeutic efficacy and safety profiles. The ultimate goal of this project is to help the Mahoran community capitalize on its terrestrial biodiversity so that it can subsequently benefit from new economic sectors, thereby contributing to the overall development of the island.

2. Materials and methods

2.1. Study area

The island of Mayotte is part of the Comoros archipelago in the Indian Ocean. It covers an area of 374 km², divided between Grande Terre and Petite Terre (Daroueche et al., 2024). Grande-Terre is the department's main island, with a surface area of 363 km², and its highest peaks are Monts Bénara, Choungui, Mtsapéré and Combani (Goff et al., 2013). This island is home to Mayotte's capital and economic hub, Mamoudzou (Dumont, 2005). The department's second largest island, Petite Terre, covers an area of just 11 km² (Daroueche et al., 2024). With regard to the island's demographics, it should be noted that in 2019 the number of inhabitants counted was 270,372 (Hagège, 2019). Mayotte's mainland is made up of 17 communes and 13 cantons. This island has five main types of natural vegetation including mangrove, coastal forest, dry forest, high-altitude rainforest and low-altitude rainforest (Boullet, 2016), and it's inhabited by different communities (Mahoran, Malagasy, Comorian). To ensure a wide range of information, we performed our survey in all communes of mainland Mayotte, and 1 commune out of 2 from Petite Terre (**Figure 1**).

2.2. Data collection

The survey was conducted from January 31, 2023 to April 28, 2023. A semi-structured interview was designed to gather information on the diseases most commonly encountered, as well as the remedies used to treat them. A questionnaire was used to guide the investigator in conducting the survey. This questionnaire was divided into 4 main sections:

- The first section deals with socio-demographic information: age, gender, place of residence, place of birth, mother tongue, occupation, education and religion
- The second section aimed to classify the informants into different categories of expertise: type of person treated (children, family, neighbors, people from other villages or outside Mayotte), source of knowledge, type of traditional practices (herbal therapies, massage, apitherapy, others)
- The third section focuses on the illnesses treated by the informants
- The last section provides information on the remedies used

Two different methods were used to meet informants: the first consisted in going door-to-door in a village to find potential informants to interview (93 interviews). The second method consisted in setting up an appointment with an informant at his home or on his plot, in order to perform the interview (10 interviews). These informants were previously selected based on snow ball sampling or by word of mouth. Several interviews required the presence of a translator (39 informants),

given that the mother tongue of the majority of informants is shimaoré or shibushi. The majority of interviews were conducted individually (98 interviews), with only 2 interviews conducted in groups.

2.3. Botanical identification

Plants cited by participants were collected in the field by following the guidelines for collection of plant materials from Chassagne and Quave (2021). First, photographs of the plant to be collected were taken, then information on the plant characteristics, location, and habitat were recorded. Finally, three similar voucher specimens of each plant species were collected and deposited at three different herbaria. One was brought to the Herbier de l'Université de La Réunion (REU), Saint-Denis, La Réunion, another one was deposited at the herbarium from the Jardin Botanique Henri Gaussen (TL), Museum d'Histoire Naturelle, Toulouse, France and the last one was deposited at the Pôle d'Excellence Rurale, Coconi, Mayotte. Botanical identification of each plant species was realized by M. Abassi DIMASSI. All plant names have been checked and updated according to international and local databases such as Plants of the World Online (https://powo.science.kew.org/).

2.4. Ethical considerations

In France, access to traditional knowledge in French overseas territories (except for French Guiana and Wallis and Futuna) does not require specific declarations to the authorities as part of the Nagoya protocol. However, this study has been developed in close consultation with the local authorities (Department of Mayotte and the Agency for Development and Innovation of Mayotte) and is part of a larger project aiming to help Mahoran people valorize their terrestrial resources. This project is directly related to the Rural Excellence Pole of Coconi, where a scientific laboratory has been developed to help achieve this valorization, which is part of the Integrated Innovation Pole of Mayotte (PI²M).

Before each interview, a consent form was submitted to the participant. The first part of the form described the objectives of the study and how it would be carried out, in the form of an explanatory note. This first sheet was given to the informants before the start of the interview. The second part of the form contained the consent information, and was signed by the participant and the interviewer before the interview began. No personal information (last name, first name, date of birth, personal address) was collected during the survey, allowing the participants to remain anonymous.

2.5. Data analysis and visualization

A database was created, using Excel software, from the information collected during the survey. The diseases cited were classified according to the International

Classification of Primary Care (ICPC-3), which is a classification centered on the reason why a patient comes to consult a practitioner (https://flyer.icpc-3.info/). Within the database, identical remedies cited several times were grouped together, avoiding counting several times the same remedy. For the purposes of this study, two remedies are considered similar if their ingredients and the condition they treat are exactly the same.

In addition, remedy preparation and administration methods were grouped together when analyzing the data. For example, if the method is "boil the plant in water and stand under a sheet with the pot". In the database, the preparation method would be "decoction" and the route of administration "inhalation". Version 0.10.1 of the Gephi software was used to create relational graphs depicting the connections between plants and the treated diseases.

Use-reports (UR) were employed to assess the quantitative importance of each plant species and other ingredients used. We followed the definition provided by Chassagne et al. (2023).

To assess the efficacy and safety of the most frequently cited plants, we conducted a bibliographic search focusing on preclinical studies (*in vitro* and animal studies) using Google Scholar with the following keywords: “scientific name of the plant” AND [“ethnobotany” OR “pharmacology” OR “toxicology” OR “phytochemistry”]. We included only scientific articles and reviews published in journals with an impact factor above 1 and listed in the Scimago database (https://www.scimagojr.com/).

To create the map representing the study sites, we used QGIS software v. 3.30.0.

3. Results

3.1. Socio-demographic data

A total of 103 informants were interviewed (**Table 1**), the majority of whom were women (66 informants, 64.1%). The average age of all informants was 50 years, with the most represented age groups being 41-50 (27 informants, 26.2%) and 51-60 (23 informants, 22.3%). Regarding the different communities surveyed, most informants were of Mahoran origin (90 informants, 87.4%), followed by people of Comorian (9 informants, 8.7%) and Malagasy (4 informants, 3.9%) origin. The most common mother tongue among informants was shimaoré (58 informants, 56.4%), followed by shibushi (40 informants, 38.8%), malagasy (4 informants, 3.9%) and finally comorian (1 informant, 0.9%).

Table 1: Socio-demographic characteristics of participants

Characteristics		Frequency	Percent (%)
Gender			
	Female	66	64.1
	Male	37	35.9
Age			
	14-20 years	4	3.9
	21-30 years	9	8.7
	31-40 years	14	13.6
	41-50 years	27	26.2
	51-60 years	23	22.3
	61-70 years	19	18.5
	71-80 years	5	4.9
	81-90 years	2	1.9
Residence (commune)			
	Acoua	1	0.9
	Bandraboua	4	3.9
	Bandrélé	5	4.9
	Bouéni	9	8.7
	Chiconi	4	3.8
	Chirongui	17	16.6
	Dembeni	8	7.8
	Dzaoudzi	4	3.9
	Kani-Kély	12	11.6
	Koungou	5	4.9
	Mamoudzou	2	1.9

	M'tsamboro	7	6.8
	M'tsangamouji	6	5.9
	Ouangani	9	8.7
	Sada	3	2.9
	Tsingoni	7	6.8
Origin			
	Mahoran	90	87.4
	Comorian	9	8.7
	Malagasy	4	3.9
Native language			
	Shimaoré	58	56.4
	Shibushi	40	38.8
	Malagasy	4	3.9
	Comorian	1	0.9
Religion			
	Muslim	102	99.1
	None	1	0.9
Education			
	No school	36	34.9
	Primary school	8	7.8
	Secondary school	8	7.8
	High school	5	4.9
	High school diploma	8	7.8
	Vocational diploma	21	20.4
	University	16	15.5
	ND	1	0.9

Legend: ND = Not documented

3.2. Classification of the informants

The second section of the questionnaire provides information on the expertise level of informants. Based on the answers obtained from the various stakeholders, it is possible to establish a classification of the people we met. This classification is based on five different criteria, as follows:

- Reputation of the person
- Extent of people treated (family, neighbors, other villages, outside of Mayotte)
- Full-time or occasional practice of traditional medicine
- Remuneration by people treated
- Source of knowledge

Based on these criteria, it is possible to classify informants into three categories:

- The first category comprises the « experts » in traditional Mahoran medicine, known locally as "*fundi*" (21 informants, 20.4%). The average age of people in this category is 59 years old. There are more women than men in this category (14 women, 7 men). According to the results of this work, a "*fundi*" is a person who is known throughout the island of Mayotte for his or her knowledge of traditional medicine, and many "*fundi*" even provide remedies for people outside Mayotte.They are generally paid for their services (fixed price or not), and hold their knowledge from their ancestors. It is noteworthy that this status is not self-declared; it is the people of the community or neighboring villages who bestow this title upon the practitioner. Some "*fundi*" are specialized in the treatment of well-defined illnesses such as sprains, fractures or diseases affecting children. In addition, there are "*fundi*" who, from birth, have a gift for healing people that can be passed down from generation to generation. There is also a local belief that fraternal twins possess a gift for healing people with traditional Mahoran medicine. The qualification of an informant as a "*fundi*" was therefore based on their established reputation within the community, their ancestral knowledge, and their demonstrated ability in traditional medicine, rather than any formal certification or self-identification.

- The second category consists of individuals who are known within a commune in Mayotte for their knowledge of traditional medicine (17 informants, 16.5%). The average age of people in this category is 52 years old. The proportion of men and women within this class is nearly equal (9 men, 8 women). These individuals are not considered experts or "*fundi*". They give remedies to patients from other villages within the same commune, but not outside Mayotte. They may receive payment for their services. Unlike the "*fundi*", these individuals are not known throughout the entire island.

- Finally, the last category corresponds to individuals who practice traditional medicine for themselves and their close ones (family, friends, neighbors) (65 informants, 62.5%). These individuals rarely go to the hospital as they have grown up using traditional medicine. The average age of this group is 45 years, and it consists of more women than men (45 women, 21 men).

3.3. Overview of the diseases reported

A total of 65 health problems were mentioned during the interviews (**Table 2**). The categories of diseases with the highest number of conditions are those affecting the digestive system (15 diseases, 23.1%), the respiratory system (8 diseases, 12.3%), and the genital system (7 diseases, 10.7%). In terms of the number of mentions by the informants, the category of diseases affecting the digestive system is the most

frequently cited (107 mentions, 27.4%), followed by the respiratory system (65 mentions, 16.6%) and the genital system (45 mentions, 11.5%).

During the interviews, the informants mentioned an average of four different health disorders. The highest number of diseases mentioned by a single informant is 16. The five most frequently cited diseases are stomachache (41 mentions, 10.5%), cough (36 mentions, 9.2%), headache (30 mentions, 7.7%), fever (20 mentions, 5.1%), and high blood pressure (HBP) (16 mentions, 4.1%). Among all the diseases, seven were mentioned with names in shimaore, five were mentioned in shibushi and the rest were in french.

Seven diseases could not be classified according to the ICPC-3. Therefore, these seven diseases were grouped under the category of "other unclassified diseases". Among these, 4 could not be classified due to the absence of a vernacular name in french, and the other three do not appear in the ICPC-3 list.

Table 2: Categories, names and citations of the diseases

ICPC-3 classification	Disorders (english translation)	Disorders (shimaoré, shibushi and / or french name)	Number of informants	Percent (%)
Digestive system				
	Stomachache	Maux de ventre (french)	41	39.8
	Diarrhea	Diarrhée (french)	15	14.5
	Hernia	Mushipa (shimaoré), hernie (french)	12	11.6
	Hemorrhoids	Hémorroïdes (french)	8	7.8
	Intestinal pain	Douleurs intestinales (french)	8	7.8
	Toothache	Maux de dents (french)	7	6.8
	Belly cleansing for the women who have just given birth	Lavage d'estomac pour les femmes qui viennent d'accoucher (french)	3	2.9
	Jaundice	Jaunisse (french)	2	1.9
	ND	Foudzoi (shimaoré)	2	1.9
	Acid reflux	Remontée gastrique (french)	1	0.9
	Constipation	Constipation (french)	1	0.9
	Mouth ulcer	Niochy (shimaore), aphte (french)	1	0.9
	Liver pain	Douleurs au foie	1	0.9
	ND	Touhigni (shibushi)	1	0.9

	ND	Travé (shimaoré), adoua mimba (shibushi)	1	0.9
Respiratory system				
	Cough	Toux (french)	36	34.9
	Asthma	Asthme (french)	7	6.8
	Covid-19	Covid-19 (french)	6	5.8
	Tonsilitis, sore throat	Maux de gorge (french)	5	4.9
	Influenza, flu	Grippe (french)	4	3.9
	Nasopharyngitis, cold	Rhume (french)	3	2.9
	Nosebleed	Saignement du nez (french)	3	2.9
	ND	Wanatsa (shimaoré)	1	0.9
Genital system				
	Female infertility	Infertilité féminine (french)	14	13.6
	Painful periods	Règles douloureuses (french)	12	11.6
	Impotence	Impuissance (french)	11	10.7
	Fibroma	Fibrome (french)	5	4.8
	Long-lasting periods	Règles qui durent longtemps (french)	1	0.9
	Perineal massage	Massage du périnée (french)	1	0.9
	Vaginal inflammation	Inflammation vaginale (french)	1	0.9
Neurological system				
	Headache	Maux de tête (french)	30	29.1
	Dizziness	Malaises (french)	5	4.9
	Epilepsy	Épilepsie (french)	3	2.9
Musculatory system				
	Joint, muscle pain	Douleurs articulaires et musculaires (french)	16	15.5
	Sprain	Entorse (french)	8	7.8
	Back pain	Douleurs aux dos	3	2.9
	Feet pain	Douleurs aux pieds (french)	3	2.9
	Fracture	Fracture (french)	3	2.9
General				
	Fever	Fièvre (french)	20	19.4
	Rash, itching	Boutons, démangeaisons (french)	3	2.9
	Dengue	Dengue (french)	2	1.9
	Chickenpox	Varicelle (french)	1	0.9

	Chikungunya	Chikungunya (french)	1	0.9
Circulatory system				
	High blood pressure	Hypertension artérielle (french)	16	15.5
	Blood circulation problem	Problème de circulation sanguine (french)	3	2.9
Endocrine system				
	Diabetes	Diabète (french)	14	13.5
Skin				
	Wounds, injury	Plaies, blessures (french)	9	8.7
	Haematoma	Hématome (french)	2	1.9
	Skin depigmentation	Décoloration pigmentaire (french)	2	1.9
	Furuncle	Furoncle (french)	1	0.9
Ear				
	Otitis externa	Otite (french)	6	5.8
Psychological system				
	Child enuresis	Énurésie chez les enfants (french)	3	2.9
	Anaphrodisia	Anaphrodisie (french)	1	0.9
Pregnancy and child bearing				
	Facilitation of child birth	Facilitation de l'accouchement (french)	2	1.9
	Pain during child birth	Douleurs lors de l'accouchement (french)	1	0.9
Urinary system				
	Urinary tract infection	Infection urinaire (french)	2	1.9
	Difficulty urinating	Difficulté à uriner (french)	1	0.9
Eye				
	Infectious conjunctivitis	Conjonctivite (french)	2	1.9
Other unclassified diseases				
	Abscess	Abcès (french)	4	3.9
	Fontanelle	Fontanelle (french)	3	2.9
	ND	Vourgnegni (shibushi)	2	1.9
	ND	Tchéwé (shimaoré)	1	0.9
	ND	Baridi mimba (shimaoré)	1	0.9
	ND	Kadi (shibushi)	1	0.9

	People who wants to lose belly fat	Personne qui veulent perdre du ventre (français)	1	0.9

Legend: ND = Not documented

3.4. Overview of traditional medicine practices in Mayotte

3.4.1. Presentation of the practices

Based on the data collected from the informants, traditional medicine in Mayotte predominantly involves biological treatments (472 remedies, 1017 UR) and manipulation-based treatments (2 treatments, 4 UR). These manipulation-based treatments consist of massages performed using coconut oil for sprains (2 UR) and fractures (2 UR).

The most commonly used ingredients in biological treatments are plants (916 UR, 90.1%), followed by processed or food products (items that have undergone processing or purchased at the market, such as salt, coconut oil, sugar, rice) (55 UR, 5.4%), animal products (coral stone, honey, shark oil, horse excrement, egg white, milk) (43 UR, 4.3%), mineral products (white clay locally known as "tany malandy" in shibushi) (2 UR, 0.2%), and other products (sewing needle) (1 UR, 0.1%).

3.4.2. The remedies

A total of 474 remedies were mentioned during the interviews, out of which 394 remedies were unique. These unique remedies have different ingredients, use different parts of the plant when ingredients are the same, and are employed for distinct diseases. The maximum number of remedies cited by a single informant was 15, and on average, informants mentioned 5 remedies.

Among these 394 unique remedies, the majority were single-ingredient remedies (199 remedies, 246 UR). Following the single-ingredient remedies were those composed of two ingredients (102 remedies, 126 UR), followed by three-ingredients remedies (43 remedies, 46 UR), four-ingredients remedies (27 remedies, 29 UR), five-ingredients remedies (11 remedies, 11 UR), six-ingredients remedies (7 remedies, 7 UR), and seven-ingredients remedies (4 remedies, 5 UR). The most complex remedy consisted of eight ingredients (1 remedy, 1 UR).

A significant portion of these unique remedies were solely composed of plants (327 remedies, 68.9% of the total remedies, 383 UR). The remaining remedies mentioned were mixtures of plants and other ingredients (processed or food products, animal products, mineral products, other products) (66 remedies, 87 UR), with only one remedy not containing any plant ingredients (1 remedy, 1 UR). Among the other

ingredients, salt was the most cited (45 UR), followed by coral stone (27 UR) and honey (11 UR).

The diseases that had the highest number of remedies mentioned were stomachache (43 remedies, 56 UR), cough (34 remedies, 54 UR), headache (33 remedies, 38 UR), fever (25 remedies, 30 UR), HBP (19 remedies, 21 UR), and diabetes (19 remedies, 24 UR).

3.4.3. Herbal ingredients

A total of 154 plants were identified in our survey (**Table 3**). The eleven most cited species are as follows: *Coleus amboinicus* (44 UR, 5.4 %), *Citrus aurantiifolia* (32 UR, 3.9 %), *Moringa oleifera* (31 UR, 3.8 %), *Ocimum gratissimum* (31 UR, 3.8 %), *Psidium guajava* (25 UR, 3.1 %), *Syzygium aromaticum* (22 UR, 2.7 %), *Woodfordia fruticosa* (UR, 2.7 %), *Cocos nucifera* (18 UR, 2.2 %), *Curcuma longa* (18 UR, 2.2 %), *Aerva lanata* (17 UR, 2.1 %) and *Coleus madagascariensis* (17 UR, 2.1 %).

The 154 plant species considered belong to 65 distinct botanical families. Among these 154 species, 98 are exotic (63.7%), 53 are indigenous (34.4%), 1 is endemic to the Comoros islands (*Aloe alexandrei*) and 2 are endemic to Mayotte (*Aloe mayottensis*, *Croton mayottae*). The botanical families mentioned with the highest number of species are the Fabaceae (15 species, 9.7%), the Lamiaceae (12 species, 5.1%), the Asteraceae (8 species, 5.2%), the Euphorbiaceae (7 species, 4.5%), the Annonaceae (5 species, 3.2%), the Malvaceae (5 species, 3.2%), and the Rutaceae (5 species, 3.2%).

The plant parts most commonly used are the leaves (114 species, 74%), followed by the roots (25 species, 16.2%), the vines (17 species, 11.1%), the fruits (11 species, 7.1%), the bark (9 species, 5.8%), and the stems (5 species, 3.4%). In terms of citations, the leaves are still the most prevalent (558 UR, 69.1%), followed by the fruits (46 UR, 5.7%), the vines (43 UR, 5.3%), the roots (39 UR, 4.8%), the rhizomes (35 UR, 4.3%), and the bark (17 UR, 2.1%).

420 **Table 3:** Ethnobotanical data of the 154 plant species identified
421

Scientific name	Botanical family	Voucher No	Shimaoré name	Shibushi name	French name	Number of persons citing the plants	Type of disorders treated	Parts used	Method of preparation	Method of administration	Number of use-reports
Abrus precatorius L.	Fabaceae	TTH 031	M'bilimbitsi	Maso na ombygara	Œil du diable	7	Cough	Leaf	Crush in water / Cold maceration	Oral	5
							Fever	Leaf	Cold maceration	Cutaneaous	1
							Headache	Leaf	Crush, press	Cutaneaous	1
Acalypha indica L.	Euphorbiaceae	TTH 077	Chamanakora	Hayti ambandriha	Herbe chat	3	Asthma	Leaf	Crush in water	Oral	3
Adansonia digitata L.	Malvaceae	TTH 022	M'buyu	Boyo	Baobab	3	Diabetes	Bark	Decoction	Oral	1
							Female infertility	Bark	Decoction	Oral	1
							Haematoma	Fruit	Eat	Oral	1
Aerva lanata (L.) Juss. ex Schult.	Amaranthaceae	TTH 057	Shiva arya	Hanga moti	ND	12	Female infertility	Dry leaf / Leaf / Liana	Decoction / Decoction until color changes	Oral	10
							Hemorrhoids	Leaf	Decoction until color changes	Oral	2

							Belly cleansing for the women who have just given birth	Leaf	Decoction until color changes	Oral	1
							Fibroma	Leaf	Decoction until color changes	Oral	1
							Hernia	Leaf	Decoction	Oral	1
							Painful periods	Leaf	Decoction	Oral	1
							Stomachache	Dry leaf	Decoction until color changes	Oral	1
Ageratum conyzoides L.	Asteraceae	NC	Mwana be	Be mahiimbo kely	Herbe de bouc	1	Female infertility	Leaf	Decoction	Oral	1
Allium sativum L.	Amaryllidaceae	NC	ND	ND	Ail	4	Blood circulation problem	Bulb	Crush	Oral	1
							Diabetes	Bulb	Cold maceration	Oral	1
							Female infertility	Bulb	Cold maceration	Oral	1
							High blood pressure	Bulb	Cold maceration	Oral	1
							Impotence	Bulb	Crush	Oral	1
Aloe alexandrei Ellert	Asphodelaceae	TTH 013	Shizya m'lili	Sakoankankini	Aloe des Comores	1	Diabetes	Leaf	Decoction	Oral	1
Aloe mayottensis A.Berger	Asphodelaceae	NC	Shizya m'lili	Sakoankankini	Aloe de Mayotte	2	Wounds, injury	Gel	Direct application	Cutaneaous	2
Aloe vera (L.) Burm.f.	Asphodelaceae	NC	ND	ND	Aloe	2	Wounds, injury	Gel	Direct application	Cutaneaous	2

							Fever	Gel	Direct application	Cutaneaous	1
Annona muricata L.	Annonaceae	TTH 103	Konokono miba	Konokono fatsiky	Corossol	6	Dizziness	Leaf	Crush	Nasal	1
							Fever	Leaf	Decoction	Inhalation	1
							Headache	Leaf	Grate	Cutaneaous	1
							High blood pressure	Leaf	Decoction until color changes	Oral	1
							Joint, muscle pain	Leaf	Decoction	Oral	1
Annona senegalensis Pers.	Annonaceae	TTH 007	Konokono manga	Porpetraka	Annone du Sénégal	8	Sprain	Root	Scraping on coral stone	Cutaneaous	5
							Abscess	Branch / Root	Scraping on coral stone	Cutaneaous	2
							Asthma	Bark / Leaf / Root	Decoction	Oral	1
							Fracture	Root	Scraping on coral stone	Cutaneaous	1
							Intestinal pain	Fruit	Scraping on coral stone	Oral	1
							Haematoma	Branch	Scraping on coral stone	Cutaneaous	1
Annona	Annonaceae	TTH 014	Konokono	Konokono	Pomme	8	Dizziness	Dry fruit /	Crush /	Nasal / Oral	3

squamossa L.			matsu		cannelle			Leaf	Heat		
							Headache	Fruit / Leaf	Crush in water / Scraping on coral stone	Cutaneaous	2
							Nosebleed	Leaf	Crush	Cutaneaous	2
							Constipation	Fruit	Scraping on coral stone	Oral	1
							Fever	Leaf	Decoction	Inhalation	1
							Stomachache	Fruit	Scraping on coral stone	Oral	1
Apodytes dimidiata E. Mey. Ex Arn.	Metteniusaceae	TTH 045	Bako m'dzuani	Bako mdzoani mena	Peau gris	1	Joint, muscle pain	Leaf / Root	Decoction	Cutaneaous	2
Artemisia sp.	Asteraceae	TTH 079	ND	ND	ND	1	"Vourgnegni" (shibushi)	Flower / Leaf	Decoction	Oral	2
							Hernia	Leaf	Decoction	Oral	1
Averrhoa bilimbi L.	Oxalidaceae	NC	Waju	Madiro	Bilimbi	1	Asthma	Leaf	Crush, filter	Oral	1
							Cough	Leaf	Crush, filter	Oral	1
Avicennia marina (Forssk.) Vierh.	Acanthaceae	TTH 004	M'siri	Afy Afy	Palétuvier blanc	2	Impotence	Leaf	Decoction until color changes	Oral	1
							Stomachache	Leaf	Decoction	Oral	1
Ayapana triplinervis (Vahl)	Asteraceae	TTH 113	Lalapona	ND	ND	1	Hernia	Leaf	Decoction	Oral	1

R.M.King & H.Rob.											
Azadirachta indica A. Juss.	Meliaceae	TTH 005	ND	ND	Margousier	2	All diseases	Leaf / Stem	Decoction	Oral	1
							Diabetes	Leaf	Decoction	Oral	1
Barleria lupulina Lindl.	Acanthaceae	TTH 053	ND	Mamy lahy	Barbelé mahorais	1	Toothache	Leaf	Decoction	Oral	1
Bidens pilosa L.	Asteraceae	TTH 027	Tailamba	Tyalamba be	Herbe sornette	3	Dizziness	Leaf	Put the plant in a pot until it smokes	Inhalation	1
							High blood pressure	Leaf	Decoction until color changes	Oral	1
							Wounds, injury	Leaf	Crush	Cutaneaous	1
Blepharis maderaspatensis (L.) B.Heyne ex Roth	Acanthaceae	NC	Mani malilo	Tsipotiky vavy	ND	1	"Adoua mimba" (shibushi)	Leaf	Decoction	Oral	1
							Female infertility	Leaf	Decoction	Oral	1
Bruguiera gymnorhiza (L.) Lam. Ex Savigny	Rhizophoraceae	NC	M'honko n'dzishe	Honko vavy	Manglier gros poumon	1	Hernia	Root	Decoction until color changes	Oral	1
Cajanus cajan (L.) Huth	Fabaceae	TTH 084	M'tsuzi	Ambatry	Ambréva de	2	Feet pain	Root	Decoction	Cutaneaous	1
							Toothache	Root	Decoction in sea water	Oral (gargle)	1
Calophyllum inophyllum L.	Calophyllaceae	NC	M'tondro	Mtondro	Takamaka	1	Diarrhea	Leaf	Decoction until color	Oral	1

									changes		
Cannabis sativa L.	Cannabaceae		ND	ND	Chanvre	1	Jaundice	Leaf	Crush	Oral	1
							Stomachache	Leaf	Crush	Oral	1
Cardiospermum halicacabum L.	Sapindaceae	TTH 128	Kanussa	Motso hokatso	Liane poc-poc	11	Fever	Leaf	Cold maceration / Crush in water	Cutaneaous	6
							Headache	Leaf / Liana	Crush in water	Cutaneaous	3
							Cough	Leaf	Crush in water	Cutaneaous	1
							Hemorrhoids	Leaf	Decoction	Oral	1
							"Vourgnegni" (shibushi)	Leaf	Decoction, bath	Cutaneaous	1
Carica papaya L.	Caricaceae	NC	M'papaya	ND	Papayer	11	Covid-19	Leaf	Decoction	Inhalation	5
							Fever	Leaf	Decoction	Inhalation	5
							Constipation	Leaf	Decoction until color changes	Oral	2
							Dengue	Leaf	Decoction	Inhalation	2
							Chikungunya	Leaf	Decoction	Inhalation	1
							Influenza, flu	Leaf	Decoction	Inhalation	1
							Hernia	Root	Decoction until color changes	Oral	1
Carissa spinarum L.	Apocynaceae	NC	M'djanfari	Taola na omby	Bois sandal	1	Headache	Wood	Scraping on coral stone	Cutaneaous	1
Cassytha	Lauraceae	TTH 001	Shirunga	Tsihitafotrot	ND	2	Impotence	Root	Decoction	Oral	1

filiformis L.			kange tandri	a tamotamo							
							Stomachache	Liana	Decoction	Oral	1
Catharanthus roseus (L.) G.Don	Apocynaceae	NC	ND	ND	Pervenche de Madagascar	2	Diarrhea	Leaf	Decoction	Oral	2
							Diabetes	Leaf / Root	Decoction	Oral	1
Ceiba pentandra (L.) Gaertn.	Malvaceae		M'pembafuma	Pemba fuma	Kapok	1	Headache	Young leaf	Crush	Cutaneaous	1
Chamaecrista pratensis (R.Vig.) Du Puy	Fabaceae	TTH 048	Shibalabala maitso	Sary fatsiky ambili	ND	1	Wounds, injury	Leaf, stem	Burn and recover ashes	Cutaneaous	1
Cinnamomum verum J.Presl	Lauraceae	NC	M'darasini	ND	Cannelle	2	Diabetes	Bark / Leaf	Decoction	Oral	2
							Impotence	Bark	Crush, infusion / Decoction	Oral	2
Cissampelos pareira L.	Menispermaceae	TTH 102	Nya nyombe	Sala lobo	Liane blanche	2	Headache	Liana	Crush in water / Grate	Cutaneaous	2
Citrus aurantiifolia (Christm.) Swingle	Rutaceae	NC	ND	ND	Citron vert	19	Cough	Leaf / Fruit	Crush / Decoction until color changes	Oral	7
							Covid-19	Leaf / Fruit	Crush / Decoction	Inhalation / Oral	6
							Fever	Leaf / Fruit	Crush / Decoction	Cutaneaous / Inhalation / Oral	6

							Influenza, flu	Leaf / Fruit	Decoction	Inhalation / Oral	3
							Dengue	Leaf / Fruit	Crush / Decoction	Inhalation / Oral	2
							Headache	Leaf / Fruit	Decoction / Decoction until color changes	Oral	2
							Feet pain	Leaf	Decoction	Cutaneaous	1
							Female infertility	Leaf	Decoction until color changes	Oral	1
							Hemorrhoids	Leaf	Decoction	Oral	1
							Stomachache	Leaf / Fruit	Cold maceration / Decoction until color changes	Oral	2
							Tonsilitis, sore throat	Fruit	Crush	Oral	1
Citrus hystrix DC.	Rutaceae	NC	ND	ND	Combava	1	Stomachache	Dry leaf	Decoction until color changes	Oral	1
Citrus sinensis f. sekkan Hayata	Rutaceae	NC	ND	ND	Oranger	2	Anaphrodisia	Fruit	Crush	Oral	1
							Fever	Leaf	Decoction	Inhalation	1
Cleome viscosa L.	Cleomaceae	TTH 075	M'ramli	Ramli	Cléome visqueux	1	Otitis externa	Leaf	Crush	Auricular	1
Clitoria ternatea L.	Fabaceae	TTH 092	Shilepe	Femehifary	Corbeille d'or	1	Infectious conjunctivitis	Flower	Cold maceration	Ocular	1

Cocos nucifera L.	Arecaceae		M'nadzi irashi	Voanyo morashi	Cocotier	12	Headache	Fruit / Fruit (milk) / Fruit (oil)	Crush, press / Crush, heat / Decoction / Grate	Cutaneaous	4
							Cough	Fruit (milk) / Fruit (oil)	Crush / Crush in water	Cutaneaous / Oral	3
							"Foudzoi" (shimaoré)	Leaf / Fruit (oil)	Burn and recover ashes	Cutaneaous	2
							Back pain	Fruit	Grate	Cutaneaous	1
							Fever	Fruit (milk)	Crush in water	Oral	1
							Fracture	Fruit	Crush	Cutaneaous	1
							Furuncle	Fruit (oil)	Crush	Cutaneaous	1
							Haematoma	Fruit	Crush	Cutaneaous	1
							Impotence	Fruit (empty shell)	Decoction	Oral	1
							Liver pain	Fruit (milk)	Heat	Inhalation	1
							Otitis externa	Fruit (oil)	Crush	Auricular	1
							Sprain	Fruit	Grate	Cutaneaous	1
Coleus amboinicus Lour.	Lamiaceae	TTH 60	Parauvi	Paraovy lahy	Gros thym	30	Cough	Leaf	Crush / Crush, press / Decoction / Decoction until color	Cutaneaous / Oral	30

									changes / Eat		
							Headache	Leaf	Crush / Crush, press / Decoction until color changes / Eat	Cutaneaous / Oral	6
							Fever	Leaf	Crush / Crush in water	Cutaneaous / Oral	3
							Hernia	Leaf	Decoction	Oral	2
							High blood pressure	Leaf	Decoction until color changes	Oral	1
							Nasopharyngitis, cold	Leaf	Crush	Nasal	1
							Tonsilitis, sore throat	Leaf	Crush in water	Oral	1
Coleus madagascariensis (Pers.) A.Chev.	Lamiaceae	TTH 098	Parauvi doumé	ND	Parauvi de Madagascar	17	Stomachache	Leaf	Crush, infusion / Crush in water / Decoction	Oral	13
							Diarrhea	Leaf	Decoction / Decoction until color changes	Oral	2
							Painful periods	Leaf	Crush in	Oral	2

									water		
Coleus sp.	Lamiaceae	TTH 074	ND	ND	ND	1	Stomachache	Leaf	Decoction	Oral	1
Combretum micranthum G.Don	Combretaceae	NC	ND	Kinkéliba	ND	1	Stomachache	Branch	Decoction	Oral	1
							Urinary tract infection	Branch	Decoction	Oral	1
Cordia myxa L.	Boraginaceae	TTH 036	M'rovu	Salelo	La colle	3	"Baridi mimba" (shimaoré)	Leaf	Decoction	Inhalation	1
							Covid-19	Leaf	Decoction	Oral	1
							Female infertility	Leaf	Decoction	Oral	1
							Hemorrhoids	Leaf	Decoction	Oral	1
							Painful periods	Leaf	Decoction until color changes	Oral	1
							Stomachache	Leaf	Decoction until color changes	Oral	1
Corymbia citriodora (Hook.) K.D.Hill & L.A.S.Johnson	Myrtaceae	NC	ND	Kinini	Eucalyptus citronnelle	4	Fever	Leaf	Decoction / Cold maceration	Oral / Inhalation	2
							Covid-19	Leaf	Decoction	Inhalation	1
							High blood pressure	Leaf	Decoction until color changes	Oral	1
Crocus sativus L.	Iridaceae	NC	ND	ND	Safran	1	Jaundice	Leaf	Crush, bath	Cutaneaous	1
Croton mayottae P.E.Berry &	Euphorbiaceae	TTH 015	Muhuve	Sary laza laza	Croton glanduleu	1	Impotence	Root	Decoction	Oral	1

Kainul					x						
Cucumis anguria L.	Cucurbitaceae	TTH 126	Shirangu m'ba	Antsikiri vaolavo	Concombre marron	1	High blood pressure	Liana	Decoction	Oral	1
Cucumis melo L.	Cucurbitaceae	NC	ND	ND	Melon	1	Headache	Fruit	Scraping on coral stone	Oral	1
Curcuma longa L.	Zingiberaceae	NC	M'tsinzano	Tamotamo	Curcuma	14	Joint, muscle pain	Rhizome	Heat / Crush	Cutaneaous	4
							Sprain	Rhizome	Scraping on coral stone	Cutaneaous	2
							Wounds, injury	Rhizome	Crush / Scraping on coral stone	Cutaneaous	2
							Abscess	Rhizome	Crush	Cutaneaous	1
							Asthma	Rhizome	Crush, filter	Oral	1
							Diabetes	Rhizome	Crush	Oral	1
							Fever	Rhizome	Crush	Cutaneaous	1
							"Foudzoi" (shimaoré)	Rhizome	Burn and recover ashes	Cutaneaous	1
							Fracture	Rhizome	Crush	Cutaneaous	1
							Haematoma	Rhizome	Crush	Cutaneaous	1
							High blood pressure	Rhizome	Crush	Oral	1
							Jaundice	Rhizome	Crush	Oral	1
							Stomachache	Rhizome	Decoction	Oral	1

Cyanthillium albicans (DC.) H.Rob.	Asteraceae	TTH 096	ND	ND	ND	1	"Vourgnegni" (shibushi)	Whole plant	Decoction	Inhalation	1
Cymbopogon citratus (DC.) Stapf	Poaceae	TTH 058	ND	ND	Citronnelle	5	Influenza, flu	Leaf	Decoction	Inhalation	2
							Covid-19	Leaf	Decoction	Inhalation	1
							Diabetes	Leaf	Decoction	Oral	1
							Feet pain	Leaf	Decoction	Cutaneaous	1
							Fever	Leaf	Decoction	Inhalation	1
							Headache	Leaf	Crush in water	Oral	1
							Intestinal pain	Leaf	Crush in water	Oral	1
Daucus carota L.	Apiaceae	NC	ND	ND	Carotte	1	Anaphrodisia	Root	Crush	Oral	1
Decalobanthus peltatus (L.) A.R Simões & Staples	Convolvulaceae	NC	ND	Fakamboka	La liane	11	Belly cleansing for women who have just given birth	Leaf	Decoction, bath	Cutaneaous, inhalation	3
							Female infertility	Dry liana / liana / Root	Decoction / Decoction until color changes	Oral	3
							Stomachache	Leaf / Liana	Decoction / Decoction until color changes	Oral	2
							"Baridi mimba" (shimaoré)	Leaf	Decoction	Inhalation	1
							Covid-19	Leaf	Decoction	Inhalation	1

							Fever	Leaf	Decoction	Inhalation	1
							Headache	Liana	Decoction	Cutaneaous	1
							High blood pressure	Dry liana	Decoction	Oral	1
							Influenza, flu	Leaf	Decoction	Inhalation	1
Dodonaea viscosa Jacq.	Sapindaceae	TTH 037	Shihoja	Dinga dinga	Bois d'arnette	15	Cough	Leaf	Decoction	Oral	3
							Stomachache	Leaf	Decoction / Decoction until color changes	Oral	3
							Headache	Leaf	Crush, heat / Crush, press	Cutaneaous	2
							"Baridi mimba" (shimaoré)	Leaf	Decoction	Inhalation	1
							Child enuresis	Leaf	Decoction until color changes	Oral	1
							Diarrhea	Leaf	Decoction	Oral	1
							Hemorrhoids	Leaf	Decoction	Oral	1
							Impotence	Leaf	Decoction until color changes	Oral	1
							Painful periods	Leaf	Decoction	Oral	1
							Joint, muscle pain	Leaf	Decoction until color changes	Oral	1
							Urinary tract infection	Leaf	Decoction until color	Oral	1

									changes		
Dracaena canaliculata (Carrière) Byng & Christenh	Asparagaceae	TTH 030	M'kokoboa	Vitiposha	Sansevière	1	Otitis externa	Leaf	Crush	Auricular	1
Elephantopus mollis Kunth	Asteraceae	TTH 123	M'kambwi	Sary lobaka	Herbe tabac	7	Stomachache	Leaf	Crush in water / Decoction until color changes	Oral	2
							Abscess	Flower, leaf	Crush	Cutaneaous	1
							Fibroma	Stem	Decoction until color changes	Oral	1
							Hemorrhoids	Leaf	Decoction	Oral	1
							Intestinal pain	Leaf	Decoction	Oral	1
							Rash, itching	Leaf	Crush	Cutaneaous	1
Erythroxylum platyclados Bojer	Erythroxylaceae	TTH 008	M'honko wa malavuni	Tapiyaka	Érythroxylon à cladodes	3	Hernia	Wood	Decoction	Oral	1
							High blood pressure	Leaf	Decoction	Oral	1
							Impotence	Leaf	Decoction	Oral	1
							Stomachache	Leaf	Decoction	Oral	1
Euphorbia hirta L.	Euphorbiaceae	TTH 124	Dzyadziki n'drume	Kimenamena lahy	Herbe à dysenterie	7	Diarrhea	Leaf	Decoction	Oral	2
							Female infertility	Leaf	Decoction	Oral	1
							"Foudzoi"	Liana	Decoction	Oral	1

							(shimaoré)		until color changes		
							Intestinal pain	Leaf	Decoction	Oral	1
							Stomachache	Leaf	Decoction until color changes	Oral	1
							"Tchéwé" (shimaoré)	Leaf	Decoction, bath	Cutaneaous	1
Flacourtia indica (Burm.f.) Merr.	Salicaceae	TTH 006	M'tsongoma	Lamonti	Prunier de Madagascar	1	High blood pressure	Leaf	Decoction	Oral	1
							Impotence	Root	Decoction	Oral	1
Flueggea virosa (Roxb. Ex Willd.) Royle	Phyllanthaceae	TTH 021	M'homba	Koutrika	Fluegée vireuse	1	Blood circulation problem	Leaf, stem	Decoction	Oral	2
Grona triflora (L.) H.Ohashi & K.Ohashi	Fabaceae	TTH 085	Tsomouadzi	ND	ND	1	"Vourgnegni" (shibushi)	Liana	Decoction until color changes	Oral	1
Guilandina major (Medik.) Small	Fabaceae	TTH 100	M'tso	Katra	Cadoque	4	Impotence	Leaf / Root	Decoction / Decoction until color changes	Oral	3
							Hernia	Leaf	Decoction	Oral	2
Gymnema sylvestre (Retz.) R.Br. Ex Sm.	Apocynaceae	TTH 002	ND	Pamba soisoi lava raviny	ND	1	Infectious conjunctivitis	Liana	Crush	Ocular	1
Hemionitis viridis (Forssk.) Sw.	Pteridaceae	TTH 118	Moukalakatra	Kangadja	Pellée verte	1	Hemorrhoids	Leaf	Decoction until color changes	Oral	1

Hibiscus surattensis L.	Malvaceae	TTH 040	Uhaha	Rango rango balala	Oseille malbar	3	Child enuresis	Liana	Decoction	Oral	1
							Female infertility	Leaf	Decoction	Oral	1
							Hemorrhoids	Leaf	Decoction	Oral	1
Hyparrhenia rufa (Nees) Stapf	Poaceae	NC	Sandze	Hai mosy	Jarahua	2	Fever	Leaf	Decoction	Inhalation	1
							"Tchéwé" (shimaoré)	Leaf	Decoction, bath	Cutaneaous	1
Illicium verum Hook.f.	Schisandraseae		ND	ND	Anis étoilé	1	Fibroma	Fruit	Decoction	Oral	1
Indigofera hirsuta L.	Fabaceae	TTH 135	ND	Sary orova	Indigotier hirsute	1	Pain during child birth	Leaf	Decoction until color changes	Oral	1
Ipomoea fistulosa Mart. Ex Choisy	Convolvulaceae	NC	ND	Fakanboka	Ipomée fistuleuse	1	"Vourgnegni" (shibushi)	Leaf	Decoction, bath	Cutaneaous	1
Ipomoea obscura (L.) Ker Gawl.	Convolvulaceae	TTH 086	Koveani	Mohoveni malandy	Ipomée obscure	12	Headache	Leaf / Liana	Crush in water / Decoction / Scraping on coral stone	Cutaneaous / Oral	8
							Fever	Leaf / Liana	Cold maceration / Crush in water	Cutaneaous	4
							Cough	Leaf / Liana	Crush in water	Oral	2
Ipomoea pes-caprae (L.) R.Br.	Convolvulaceae	TTH 003	Pupum'tsanga	Lalandrana	Patate à Durand	5	Covid-19	Leaf	Decoction	Inhalation	2
							Feet pain	Leaf	Decoction	Cutaneaous	1

							Joint, muscle pain	Leaf	Decoction	Cutaneaous	1
							Joint, muscle pain	Leaf, stem	Decoction	Cutaneaous	1
Jasminum officinale L.	Oleaceae	NC	ND	ND	Jasmin	2	Back pain	Flower	Grate	Cutaneaous	1
							Headache	Flower	Grate	Cutaneaous	1
							Joint, muscle pain	Dry flower	Direct application	Cutaneaous	1
							Sprain	Flower	Grate	Cutaneaous	1
Jatropha curcas L.	Euphorbiaceae	TTH 016	M'tsumu	Valavelo	Médicinier	8	Toothache	Bark	Decoction	Oral (gargle)	3
							Wounds, injury	Sap	Direct application	Cutaneaous	3
							Diarrhea	Leaf	Crush in water	Oral	1
							Stomachache	Leaf	Cold maceration	Oral	1
							"Wanatsa" (shimaoré)	Leaf	Crush in water	Cutaneaous	1
Kalanchoe pinnata (Lam.) Pers.	Crassulaceae	TTH 017	Meawani	Sodifafa	Choux de fafe	11	Cough	Leaf	Crush / Crush, filter	Cutaneaous / Oral	3
							Joint, muscle pain	Leaf	Heat / Crush	Cutaneaous	3
							Headache	Leaf	Heat / Crush	Cutaneaous	2
							Asthma	Leaf	Crush, filter	Oral	1

							Diabetes	Leaf	Infusion	Oral	1
							Fracture	Leaf	Crush	Cutaneaous	1
							Haematoma	Leaf	Crush	Cutaneaous	1
							Otitis externa	Leaf	Crush	Auricular	1
							Wounds, injury	Leaf	Heat	Cutaneaous	1
Lagenaria siceraria (Molina) Standl.	Cucurbitaceae	TTH 044	Shitsuva	Kasingi	Calebasse	1	Impotence	Leaf	Decoction	Oral	1
Lantana camara L.	Verbenaceae	TTH 090	M'bwasera	Fatsiky madani	Corbeille d'or	7	Stomachache	Leaf	Crush / Crush in water / Decoction	Oral	8
							Covid-19	Leaf	Decoction	Inhalation	2
							Fever	Leaf	Crush / Decoction	Cutaneaous / Inhalation	2
							"Adoua mimba" (shibushi)	Leaf	Decoction	Oral	1
							Dengue	Leaf	Decoction	Inhalation	1
							Female infertility	Leaf	Decoction	Oral	1
							Joint, muscle pain	Leaf	Decoction	Inhalation	1
Lantana strigocamara R.W.Sanders	Verbenaceae	TTH 109	ND	ND	ND	1	High blood pressure	Leaf	Decoction	Oral	1
Lawsonia inermis L.	Lythraceae	NC	Hina	Mwina vavy	Henné	1	Feet pain	Leaf	Decoction	Cutaneaous	1
Leptadenia madagascariensis Decne.	Apocynaceae	TTH 054	ND	Pamba soisoi	Leptadenia de Madagasc	3	Asthma	Leaf	Decoction	Oral	1

					ar						
							Diabetes	Leaf	Decoction	Oral	1
							Wounds, injury	Leaf / sap	Crush / Direct application	Cutaneaous	1
							Painful periods	Leaf	Decoction	Oral	1
Leucas grandis Vatke	Lamiaceae	TTH 089	M'tsamoa	Ahody tsiheny	ND	4	Nasopharyngitis, cold	Leaf	Crush	Nasal	2
							Headache	Leaf	Crush	Cutaneaous	1
							Long-lasting periods	Leaf	Crush in water	Oral	1
Lippia alba (Mill.) N.E.Br. Ex Britton & P.Wilson	Verbenaceae	TTH 129	Nana	ND	ND	2	Diabetes	Leaf, stem	Decoction until color changes	Oral	1
							Hemorrhoids	Leaf	Decoction	Oral	1
							Stomachache	Leaf, stem	Decoction until color changes	Oral	1
Litsea glutinosa (Lour.) C.B.Rob	Lauraceae	NC	M'zavoca maro	Zavoca maro	Avocat sauvage	1	Wounds, injury	Sap	Direct application	Cutaneaous	1
Lygodium kerstenii Kuhn	Lygodiaceae	TTH 011	Tandri ya puruku	Vahy lambo	Petite liane cochon	1	Stomachache	Leaf, stem	Decoction	Oral	1
Mangifera indica L.	Anacardiaceae	NC	Manga	Manga	Manguier	14	Diabetes	Leaf	Decoction	Oral	7
							Fever	Leaf	Decoction	Inhalation	3
							Covid-19	Leaf	Decoction	Inhalation	2
							High blood	Leaf	Decoction	Oral	2

							pressure				
							Cough	Leaf	Crush	Oral	1
							Feet pain	Leaf	Decoction	Cutaneaous	1
							Stomachache	Leaf	Decoction	Oral	1
Manihot esculenta Crantz	Euphorbiaceae	NC	Muhugo	Mohogo feliky	Manioc	1	Headache	Rhizome	Grate	Cutaneaous	1
Melia azedarach L.	Meliaceae	TTH 136	M'lila	Lila	50 maladies	2	Covid-19	Leaf	Decoction	Inhalation	1
							Dengue	Leaf	Decoction	Inhalation	1
							Diabetes	Leaf	Decoction	Oral	1
Mentha suaveolens Ehrh.	Lamiaceae	NC	ND	Alicoli	Menthe	1	Cough	Leaf	Decoction until color changes	Oral	1
							Headache	Leaf	Decoction until color changes	Oral	1
							Stomachache	Leaf	Decoction	Oral	1
Miconia crenata (Vahl) Michelang.	Melastomaceae	TTH 047	M'fobo	Voa totroko lahy	Clidémie hérissé	1	Diabetes	Leaf	Decoction	Oral	1
							High blood pressure	Leaf	Decoction	Oral	1
							Liver pain	Leaf	Decoction	Oral	1
Microsorum punctatum (L.) Copel.	Polypodiaceae	NC	Many mahondra	Kangadja lavaraviny	Langue de vache	1	"Adoua mimba" (shibushi)	Leaf	Decoction	Oral	1
							Female infertility	Leaf	Decoction	Oral	1
Mimusops comorensis Engl.	Sapotaceae	TTH 034	Mavuhu	Nato	Natte des Comores	1	Fibroma	Leaf	Decoction	Oral	1

							Hemorrhoids	Leaf	Decoction	Oral	1
Momordica charantia L.	Cucurbitaceae	TTH 038	Margoz	Antsatsaka tarondro	Margose	8	Stomachache	Leaf / Liana	Decoction / Decoction until color changes	Oral	3
							Hernia	Leaf / Stem	Decoction / Decoction until color changes	Oral	2
							Child enuresis	Leaf	Decoction	Oral	1
							Diabetes	Leaf	Decoction	Oral	1
							High blood pressure	Leaf	Decoction	Oral	1
							Impotence	Liana	Decoction	Oral	1
							Intestinal pain	Fruit	Decoction until color changes	Oral	1
							Painful periods	Leaf	Decoction until color changes	Oral	1
Moringa oleifera Lam.	Moringaceae	TTH 127	Mvoungé	Morongy	Moringa	23	Stomachache	Leaf	Crush / Crush in water / Decoction / Infusion	Oral	12
							High blood pressure	Leaf / Root / Seed / Stem	Crush in water / Decoction / Decoction until color	Oral	8

									changes /		
							Diarrhea	Leaf	Crush in water	Oral	5
							Constipation	Leaf	Eat	Oral	1
							Diabetes	Leaf	Crush in water	Oral	1
							Facilitation of child birth	Leaf	Crush in water	Oral	1
							Infectious conjunctivitis	Leaf	Crush	Ocular	1
							Intestinal pain	Leaf	Crush in water	Oral	1
							Otitis externa	Leaf	Crush	Auricular	1
Murraya koenigii (L.) Spreng.	Rutaceae	TTH 024	ND	ND	Cary poulet	1	Diabetes	Leaf	Decoction	Oral	1
							High blood pressure	Leaf	Decoction	Oral	1
							Impotence	Leaf	Decoction	Oral	1
Musa paradisiaca L.	Musaceae	NC	Trovi	Hontsy	Bananier	7	Covid-19	Dry leaf / Leaf	Decoction	Inhalation	2
							Fever	Dry leaf / Leaf	Decoction	Inhalation	2
							Chikungunya	Leaf	Decoction	Inhalation	1
							Dengue	Leaf	Decoction	Inhalation	1
							Feet pain	Leaf	Decoction	Cutaneaous	1
							Influenza, flu	Dry leaf	Decoction	Inhalation	1
							Joint, muscle pain	Dry leaf	Direct application	Cutaneaous	1
Myristica	Myristicaceae	NC	Kungu mana	Kongo	Muscadie	1	Blood circulation	Seed	Scraping	Cutaneaous	1

fragrans Houtt.				manga r			problem		on coral stone		
Nigella sativa L.	Ranunculaceae	NC	ND	ND	Nigelle	1	Painful periods	Seed	Decoction until color changes	Oral	1
Ocimum americanum L.	Lamiaceae	TTH 064	Sadzani	Kanza mdzade	Petit basilic sauvage	8	Painful periods	Leaf	Decoction until color changes	Oral	3
							Stomachache	Leaf	Decoction / Decoction until color changes	Oral	3
							Cough	Leaf	Crush in water	Oral	1
							Hernia	Leaf	Decoction	Oral	1
							Intestinal pain	Leaf	Decoction	Oral	1
							Nosebleed	Leaf	Crush	Nasal	1
Ocimum basilicum L.	Lamiaceae	NC	M'kadi	Karanzany vazaha	Basilic commun	2	Back pain	Leaf	Grate	Cutaneaous	1
							Headache	Leaf	Grate	Cutaneaous	1
							Otitis externa	Leaf	Crush	Auricular	1
							Sprain	Leaf	Grate	Cutaneaous	1
Ocimum canum Sims	Lamiaceae	TTH 088	ND	ND	ND	1	Intestinal pain	Leaf	Infusion	Oral	1
Ocimum gratissimum L.	Lamiaceae	TTH 073	M'rule	Kanza mdzade	Basilic sauvage	21	Female infertility	Dry leaf / Leaf	Decoction / Decoction until color changes	Oral	6
							Painful periods	Leaf	Crush in water /	Oral	6

									Decoction		
							Stomachache	Dry leaf / Leaf	Crush in water / Decoction until color changes	Oral	4
							Covid-19	Leaf	Decoction	Inhalation	3
							Hemorrhoids	Leaf	Crush / Decoction	Cutaneaous / Oral	3
							"Adoua mimba" (shibushi)	Leaf	Decoction	Oral	1
							Asthma	Leaf	Crush in water	Oral	1
							Cough	Leaf	Crush in water	Oral	1
							Dengue	Leaf	Decoction	Inhalation	1
							Fever	Leaf	Decoction	Inhalation	1
							Hernia	Leaf	Decoction	Oral	1
							Influenza, flu	Leaf	Decoction	Inhalation	1
							Nosebleed	Leaf	Crush in water	Nasal	1
							Perineal massage	Leaf	Decoction, bath	Cutaneaous	1
Ocimum tenuiflorum L.	Lamiaceae	NC	ND	ND	Basilic tulsi	1	Cough	Leaf	Decoction	Oral	1
Oxalis corniculata L.	Oxalidaceae	TTH 122	Waju mamotsi	Madiro antany	Petit trèfle	1	Impotence	Leaf	Decoction	Oral	1
Passiflora edulis Sims	Passifloraceae	NC	ND	Grinadel	Fruit de la passion	2	Cough	Leaf	Crush in water	Oral	1

							Diabetes	Leaf	Decoction	Oral	1
Passiflora suberosa L.	Passifloraceae	TTH 029	Nyungo	Nioungou	Grain d'encre	2	Facilitation of child birth	Liana	ND	ND	1
							Painful periods	Liana	Crush in water	Oral	1
Paullinia pinnata L.	Sapindaceae	TTH 099	Mhotso-hotso	Vahy mari ranha	Liane carrée	12	Stomachache	Leaf / Liana	Decoction / Decoction until color changes	Oral	3
							Blood circulation problem	Bark / Leaf	Decoction	Oral	2
							Female infertility	Liana	Decoction	Oral	2
							Sprain	Bark	Scraping on coral stone	Cutaneaous	2
							Back pain	Liana	Direct application	Cutaneaous	1
							Facilitation of child birth	Liana	Decoction until color changes	Oral	1
							Fracture	Liana	Scraping on coral stone	Cutaneaous	1
							Furuncle	Bark	Scraping on coral stone	Cutaneaous	1
							Headache	Liana	Decoction	Cutaneaous	1
							Hernia	Leaf	Decoction until color changes	Oral	1

							Impotence	Leaf	Decoction until color changes	Oral	1
							Joint, muscle pain	Leaf	Scraping on coral stone	Cutaneaous	1
Persea americana Mill.	Lauraceae	NC	M'zavoca	Zavoca	Avocatier	4	Diabetes	Leaf	Decoction	Oral	2
							High blood pressure	Leaf	Decoction	Oral	1
							Intestinal pain	Leaf	Decoction until color changes	Oral	1
Petroselinum crispum (Mill.) Fuss	Apiaceae	NC	ND	Hanga vazaha	Persil	1	Blood circulation problem	Stem	Decoction	Oral	1
Phoenix reclinata Jacq.	Arecaceae	TTH 062	M'randra	Mihala	Dattier du Sénégal	1	Female infertility	Root	Decoction	Oral	1
							Painful periods	Root	Decoction	Oral	1
Phyllanthus niruri L.	Phyllanthaceae	NC	ND	ND	Herbe du chagrin	1	Female infertility	Leaf	Decoction	Oral	1
Phyllarthron comorense DC.	Bignoniaceae	TTH 055	Shivundze	Tahila	Phyllarthron des Comores	13	Cough	Leaf	Decoction / Decoction until color changes	Oral	5
							Impotence	Leaf	Crush / Decoction / Decoction until color	Oral	4

									changes / Infusion		
							Fracture	Wood	Scraping on coral stone	Cutaneaous	1
							Hernia	Leaf	Decoction until color changes	Oral	1
							Intestinal pain	Leaf	Decoction	Oral	1
							Joint, muscle pain	Leaf	Decoction	Oral	1
							Painful periods	Leaf	Decoction	Oral	1
							Sprain	Wood	Scraping on coral stone	Cutaneaous	1
							Tonsilitis, sore throat	Leaf	Decoction	Oral	1
Piper nigrum L.	Piperaceae	NC	Filifili	Vilivili	Poivre	1	Mouth ulcer	Bay	Crush	Oral	1
Plumeria acuminata W.T.Aiton	Apocynaceae	NC	ND	ND	Frangipanier	1	Back pain	Flower	Grate	Cutaneaous	1
							Headache	Flower	Grate	Cutaneaous	1
							Sprain	Flower	Grate	Cutaneaous	1
Polyalthia longifolia (Sonn.) Benth. & Hook.f. ex Thwaites	Annonaceae	TTH 141	ND	ND	Laurier	1	Cough	Leaf	Decoction	Oral	1
Premna serratifolia L.	Lamiaceae	TTH 009	M'vetsi	Myavivi	Bois sureau	5	Covid-19	Leaf	Decoction	Inhalation	1
							Fever	Leaf	Cold	Cutaneaous	1

									maceration		
							Hemorrhoids	Root	Decoction	Oral	1
							Nosebleed	Leaf	Crush in water	Nasal	1
							"Vourgnegni" (shibushi)	Leaf	Decoction, bath	Cutaneaous	1
Psidium guajava L.	Myrtaceae	TTH 041	Mapwera	Mapoera	Goyavier	17	Diabetes	Fruit / Young leaf	Decoction	Oral	4
							Diarrhea	Leaf	Crush in water / Decoction	Oral	4
							Stomachache	Leaf	Crush in water / Decoction	Oral	4
							High blood pressure	Leaf	Decoction	Oral	3
							Fever	Leaf	Cold maceration / Decoction /	Cutaneaous / Inhalation	2
							Headache	Leaf	Decoction	Inhalation / Oral	2
							Covid-19	Leaf	Decoction	Inhalation	1
							Dengue	Leaf	Decoction	Inhalation	1
							Dizziness	Leaf	Put the plant in a pot until it smokes	Inhalation	1
							Feet pain	Leaf	Decoction	Cutaneaous	1

							Hernia	Leaf	Decoction	Oral	1
							Intestinal pain	Leaf	Decoction	Oral	1
Psychotria calothyris (Bremek.) A.P.Davis & Govaerts	Rubiaceae	NC	ND	Moaro	Psychotrie à tiges épaisses	1	"Tchéwé" (shimaoré)	Leaf	Decoction, bath	Cutaneaous	1
Punica granatum L.	Lythraceae	NC	Tundra peponi	ND	Grenadier	1	Anaphrodisia	Fruit	Crush	Oral	1
							Stomachache	Leaf	Decoction	Oral	1
Ravenala madagascariensis Sonn.	Strelitziaceae	NC	ND	Ravinala	Arbre du voyageur	1	Diabetes	Leaf	Decoction	Oral	1
Rhynchosia sublobata (Schumach.) Meikle	Fabaceae	TTH 010	Tandri shivarya	Sary antaka makondry	Rynchosie sublobée	4	Acid reflux	Liana	Decoction	Oral	1
							Facilitation of child birth	Leaf	Decoction until color changes	Oral	1
							Female infertility	Liana	Decoction	Oral	1
							Hemorrhoids	Leaf	Decoction until color changes	Oral	1
							Painful periods	Liana	Decoction	Oral	1
Ricinus communis L.	Euphorbiaceae	TTH 083	M'ri wa katoto	Kinana ravy	Ricin	1	Covid-19	Leaf	Decoction	Inhalation	1
Rubus rosifolius Sm.	Rosaceae	TTH 051	Frambaz	Rotirotiki	Framboisier	1	Dizziness	Fruit	Crush	Oral	1
Scaevola taccada	Goodeniaceae	TTH 017	ND	Sodifafa	Veloutier	1	Joint, muscle	Leaf	Heat the	Cutaneaous	1

(Gaertn.) Roxb.				hazo	vert		pain		leaf until color changes		
Senna alata (L.) Roxb.	Fabaceae	TTH 025	Hasa n'drume	Andra be ila	Bois dartre	8	Otitis externa	Leaf	Crush	Auricular	2
							Skin depigmentation	Leaf	Direct application	Cutaneaous	2
							Constipation	Leaf	Decoction until color changes	Oral	1
							Chikungunya	Leaf	Decoction	Inhalation	1
							Fever	Leaf	Crush in water	Cutaneaous	1
							Furuncle	Leaf	Crush	Cutaneaous	1
							"Wanatsa" (shimaoré)	Leaf	Crush in water	Cutaneaous	1
Senna occidentalis (L.) Link	Fabaceae	TTH 012	Hasa n'drume	Voa tsirongoto kely	Bentamaré	4	Back pain	Leaf	Decoction	Oral	1
							Epilepsy	Leaf	Crush in water	Nasal	1
							Impotence	Root	Cold maceration	Oral	1
							Stomachache	Root	Cold maceration	Cutaneaous	1
							Toothache	Bark	Decoction	Oral (gargle)	1
Senna singueana (Delile) Lock	Fabaceae	TTH 134	M'ri m'buzi	Sambaravatsi	ND	1	Impotence	Bark	Decoction until color changes	Oral	1
Sida acuta	Malvaceae	TTH 039	Shifunga	Sandra ory	Sida aigu	1	Impotence	Root	Decoction	Oral	1

Burm.f.			n'dzya n'titi	kely							
Sieruela rutidosperma (DC.) Roalson & J.C.Hall	Cleomaceae	TTH 111	M'kssi	ND	ND	1	Hernia	Leaf	Decoction	Oral	1
Solanum melongena L.	Solanaceae	NC	ND	ND	Aubergine	1	Mouth ulcer	Leaf	Crush	Oral	1
Solanum torvum Sw.	Solanaceae	NC	M'ri n'guja	Sary angivi kely	Anghive marron	1	Intestinal pain	Fruit	Decoction	Oral	1
Spondias dulcis G.Forst.	Anarcardiaceae	NC	Sakwa	Mssakoua	Zévi	2	Toothache	Bark / Root	Decoction in sea water / Decoction until color changes	Oral (gargle)	2
Stachytarpheta urticifolia Sims	Verbenaceae	TTH 072	M'ri wagwegwe	Jakwe maitso	Epi bleu	1	Hernia	Leaf	Decoction	Oral	1
							Vaginal inflammation	Leaf	Decoction	Oral	1
Struchium sparganophorum (L.) Kuntze	Asteraceae	NC	M'lalihapana	Mlaylyhapana be	Oreille mouton	1	Intestinal pain	Leaf	Decoction	Oral	1
Strychnos spinosa Lam.	Loganiaceae	TTH 043	M'kutra	Mronga	Calebassier du pays	1	High blood pressure	Leaf	Decoction	Oral	1
Syzygium aromaticum (L.) Merr. & L.M.Perry	Myrtaceae	NC	Karafu	Karafo	Giroflier	13	Headache	Flower / Leaf	Crush / Decoction / Decoction until color changes /	Cutaneaous / Oral	7

									Direct application / Scraping on coral stone		
							Cough	Flower / Leaf	Crush / Decoction until color changes	Oral	3
							Impotence	Flower	Crush / Crush, infusion / Decoction	Oral	3
							Toothache	Flower	Crush	Oral	3
							Back pain	Flower	Direct application	Cutaneaous	1
							Covid-19	Flower	Decoction	Inhalation	1
							Fibroma	Flower	Decoction	Oral	1
							Influenza, flu	Flower	Decoction	Inhalation	1
							Joint, muscle pain	Flower	Crush	Cutaneaous	1
							Otitis externa	Flower	Crush, press	Auricular	1
Tacca leontopetaloides (L.) Kuntze	Dioscoreaceae	TTH 061	Trindri	Kabidza	Papaye songe	1	Intestinal pain	Rhizome	Crush in water	Oral	1
Tamarindus indica L.	Fabaceae	TTH 032	Waju urehagini	Madiro kakazo	Tamarinier	5	Cough	Leaf	Crush / Decoction	Oral	3
							Fracture	Leaf	Crush / Crush,	Cutaneaous / Oral	2

									decoction		
Tephrosia noctiflora Bojer ex Baker	Fabaceae	NC	Shitsudzi	Ingity be	Téphrosie nocturne	2	Female infertility	Leaf	Decoction / Decoction until color changes	Oral	2
							Fibroma	Leaf	Decoction until color changes	Oral	1
							Hemorrhoids	Leaf	Decoction until color changes	Oral	1
Teramnus labialis (L.f.) Spreng.	Fabaceae	TTH 023	Shipwa kofu n'titi	Ovyji matra	Pistache marronne	2	Child enuresis	Leaf	Decoction	Oral	1
							Female infertility	Leaf	Decoction	Oral	1
							Hemorrhoids	Leaf	Decoction	Oral	1
Theobroma cacao L.	Malvaceae	NC	Kakao	Kakao	Cacaoyer	1	Diabetes	Leaf	Decoction	Oral	1
Tephrosia pumila (Lam.) Pers.	Fabaceae	TTH 020	Chitsidza outoungou	Sary hamo	ND	4	Female infertility	Leaf	Decoction / Decoction until color changes	Oral	2
							Hemorrhoids	Leaf, stem	Decoction until color changes	Oral	2
							Child enuresis	Leaf, stem	Decoction	Oral	1
							Fibroma	Leaf	Decoction until color changes	Oral	1
							"Foudzoi"	Leaf	Decoction	Oral	1

							(shimaoré)		until color changes		
Tithonia diversifolia (Hemsl.) A.Gray	Asteraceae	TTH 050	Fu nyongo	Bostoani	Petite fleur soleil	1	Diabetes	Leaf	Decoction	Oral	1
Tragia furialis Bojer	Euphorbiaceae	TTH 046	Shileni	Ampisy	Ortie	5	Difficulty urinating	Leaf / Stem	Decoction	Oral	2
							Liver pain	Leaf / Seed	Decoction	Oral	2
							Child enuresis	Liana	Decoction	Oral	1
							Female infertility	Leaf	Decoction	Oral	1
							Headache	Leaf	Decoction	Oral	1
							Hernia	Root	Decoction until color changes	Oral	1
							Impotence	Leaf	Decoction until color changes	Oral	1
							Joint, muscle pain	Leaf	Crush	Cutaneaous	1
Trema orientale (L.) Blume	Cannabaceae	TTH 035	M'besi	Ambesy	Bois d'andrèze	2	Asthma	Bark / Leaf / Root	Decoction / Decoction until color changes	Oral	4
Tribulus cistoides L.	Zygophylaceae	TTH 026	ND	Ambiliki	Herbe pagode	1	Blood circulation problem	Leaf	Infusion	Oral	1
Turraea sericea Sm.	Meliaceae	TTH 018	N'drume n'ku	Sary mwandziwa	Turée séricée	1	Impotence	Leaf	Decoction	Oral	1
Typhonodorum lindleyanum	Araceae	NC	Bunga muri	Bonga	Via	1	"Touhigni" (shibushi)	Dead leaf	Burn and recover	Cutaneaous	1

Schott									ashes		
Vepris boiviniana (Baill.) Mziray	Rutaceae	NC	Manimararu	Sary tsoha	Vépris de Boivin	1	Diabetes	Leaf	Decoction until color changes	Oral	1
Volkameria sp.	Lamiaceae	TTH 137	ND	Gombe dumé	ND	1	Constipation	Leaf	Decoction until color changes	Oral	1
							Epilepsy	Leaf	Decoction	Inhalation	1
Woodfordia fruticosa (L.) Kurz	Lythraceae	TTH 019	M'lazi	Lamboenza	ND	14	Impotence	Leaf / Root	Decoction / Decoction until color changes	Oral	8
							Hernia	Leaf / Root / Wood	Decoction / Decoction until color changes	Oral	5
							Female infertility	Leaf	Decoction / Decoction until color changes	Oral	2
							Joint, muscle pain	Leaf / Liana	Decoction / Decoction until color changes	Oral	2
							Diabetes	Leaf	Decoction	Oral	1
							Hemorrhoids	Leaf	Decoction	Oral	1
							Intestinal pain	Leaf	Decoction	Oral	1
							Painful periods	Leaf	Decoction	Oral	1
							Stomachache	Leaf	Decoction until color	Oral	1

									changes		
Zea mays L.	Poaceae		M'rama	Tsakotsako	Maïs	2	Child enuresis	Inflorescence	Decoction	Oral	1
							High blood pressure	Inflorescence	Decoction	Oral	1
Zingiber zerumbet (L.) Roscoe ex Sm.	Zingiberaceae		Tsingizo masera	Sakai viro	Gingembre	12	Cough	Rhizome	Crush / Decoction	Oral	5
							Tonsilitis, sore throat	Rhizome	Decoction / Chew	Oral	4
							Sprain	Rhizome	Scraping on coral stone	Cutaneaous	1
							Fracture	Rhizome	Scraping on coral stone	Cutaneaous	1
							Headache	Rhizome	Decoction until color changes	Oral	1
							Impotence	Rhizome	Crush	Oral	1
							Mouth ulcer	Rhizome	Crush	Oral	1
							Nasopharyngitis, cold	Rhizome	Decoction	Oral	1
Ziziphus spina-christi (L.) Desf.	Rhamnaceae		Tsinavu n'dzishe	Mokonazi vavy	Jujubier épineux	1	Haematoma	Leaf	Crush	Cutaneaous	1

Legend: A slash ("/") corresponds to the term "or"; a comma (",") correspond to the term "and"; NC = plants not collected identified from literature (Barthelat, 2019); ND = Not documented; NI = Not identified.

Regarding the methods of plant preparation, the most commonly used method is decoction (**Figure 2A**) (119 species, 77.2%). The others most employed preparation methods involve crushing the dried plant using a mortar or in the palm of one's hand (**Figure 2B,C**) (35 species, 22.7%), crushing the plant in water (20 species, 12.8%), and scraping the plant on coral stone (11 species, 7.1%). In terms of citations, the prevalence order is the same: decoction (478 UR, 59.2%), crushing the dried plant (104 UR, 12.9%), crushing the plant in water (45 UR, 5.6%), and finally scraping the plant on coral stone (28 UR, 3.5%).

The most commonly used administration methods are as follows: oral route (128 species, 83.1%), cutaneous route (58 species, 37.7%), inhalation (25 species, 16.2%), and nasal route (8 species, 5.2%). Once again, the prevalence order is the same in terms of citation: oral route (602 UR, 65.7%), topical route (204 UR, 22.3%), inhalation (86 UR, 9.4%), and nasal route (12 UR, 1.3%).

Regarding the dosage (duration and frequency of treatment, quantity administered), it is specified for 345 out of the 393 unique plant-based remedies (72.8% of the total remedies). Among these remedies, 49 remedies have a treatment duration of seven days. Within these 49 remedies, 23 remedies are administered three times a day, 19 are administered twice a day, and seven are administered once a day. Sixteen remedies have a treatment duration of three days. Among these 16 remedies, three are administered three times a day, seven are administered twice a day, and six are administered once a day. Finally, 287 remedies have an unknown treatment duration. Among these 287 remedies, there are 110 remedies administered three times a day, 83 administered twice a day, and 94 administered once a day.

3.4.4. Other ingredients

Among the 394 unique remedies, six animal-derived ingredients are mentioned by the participants, with a total of 43 UR. Among these ingredients, the most cited one is coral stone (20 participants, 28 UR) (**Figure 3A,B,C**), followed by honey (10 participants, 11 UR), egg (1 participant, 1 UR), horse manure (1 participant, 1 UR), milk (1 participant, 1 UR), and shark oil (1 participant, 1 UR). The most referenced administration method is the cutaneous route (20 participants, 23 UR). Sprained ankle is the most treated condition with these ingredients (8 participants, 9 UR), followed by headaches (5 participants, 6 UR), and cough (5 participants, 6 UR).

Within the unique remedies, four ingredients are derived from food or processed products. Among these ingredients, salt is the most cited (33 participants, 45 UR), followed by coconut oil (6 participants, 6 UR), rice (3 participants, 3 UR), and sugar (1 participant, 1 UR). The other non-plant ingredients used are white clay locally known as "*tany malandy*" (2 participants, 2 citations) (**Figure 3D**), and a sewing needle (1 participant, 1 citation). White clay is used in remedies against evil spirits, also

known as "*djinn*" in Shimaoré. The clay is mixed with other plants in a decoction for purification rituals. One informant also mentioned the use of sewing needles as a remedy for impotence. The needles are stuck into tree bark, which is then boiled together with the bark itself. After boiling, the liquid is poured into another container without the bark (and without the needle) and drink by the afflicted person.

3.4.5. Other aspects of traditional medicine in Mayotte

During the study, some informants provided additional information regarding traditional medicine in Mayotte. Participants often mentioned that the use of certain remedies imposes dietary restrictions, but this practice is specific to women undergoing fertility treatments. Nine participants stated that when a woman takes a remedy for infertility, she should not consume chili peppers (9 out of 9 participants), limes (8 out of 9 participants), carbonated drinks (3 out of 9 participants), chives (2 out of 9 participants), turmeric (2 out of 9 participants), ice-cold water (2 out of 9 participants), garlic (1 out of 9 participants), and ginger (1 out of 9 participants). Additionally, two participants emphasized the importance of not taking conventional medications when a sick person is already treating with herbal remedies. Another restriction mentioned by one informant is to avoid going out during sunrise and sunset for the remedy to work effectively. Also, one informant highlighted the need to consume traditional remedies with food and not on an empty stomach.

Another characteristic of traditional medicine in Mayotte pertains to the harvesting of plants. According to six participants, it is important to recite a prayer before harvesting the plant to ensure the effectiveness of the remedy. This prayer is locally known as "bismillah" (a formula used by Muslims as a blessing). Regarding the timing of plant harvesting, four participants mentioned the importance of picking plants on specific days of the week, preferably on Mondays or Wednesdays.

3.4.6. Dangerous practices reported by participants

Several participants provided information on the risks associated with certain traditional practices or treatments. Four participants emphasized the importance of respecting dosage.

In fact, three informants mentioned that excessive consumption of the floral buds of *Syzygium aromaticum* can cause dizziness when used for toothaches.

Another informant highlighted the need to be cautious when using *Lantana strigocamara* and *Decalobanthus peltatus* for HBP. According to the participant, if these two plants are individually consumed in excessive quantities, they can cause low blood pressure leading to dizziness or fainting.

Lastly, one informant stated that the leaves of *Jatropha curcas* can induce vomiting when crushed in water.

3.5. Therapeutic management for the most cited health disorders

3.5.1. Stomachache

In total, 41 informants (39.4%) mentioned stomachache. Within the remedies, stomachache accounted for 63 UR (13.4%). According to the ICPC-3, this health disorder is classified under the "digestive system" category. Ten informants stated that the causes of this condition are related to poor diet. According to these ten informants, the symptoms of this health disorder include pain in the liver, intestine, and stomach. The informants did not provide information regarding the diagnosis of the disease.

A total of 42 unique remedies were mentioned to treat this disease. Among these 42 remedies, 27 were single-ingredient remedies (39 UR, 61.9%), 10 were composed of two ingredients (19 UR, 30.1%), two remedies were composed of three ingredients (2 UR, 3.2%), and three remedies consisted of four ingredients (3 UR, 4.8%).

The informants mentioned 36 plant species belonging to 20 different botanical families. The most cited plants were *Coleus madagascariensis* [leaf] (12 UR, 11.9%), *Moringa oleifera* [leaf] (11.9%), and *Lantana camara* [leaf and roots] (8 UR, 9.9%).

The most cited remedy by the informants was made of the leaves of *C. madagascariensis*. To prepare the remedy, the fresh leaves are crushed in water. Eight informants mentioned this remedy. Among these eight informants, four added a pinch of salt to the remedy. According to the eight participants, the remedy is taken orally once or twice a day. The participants did not specify the duration of the treatment.

3.5.2. Cough

A total of 36 informants treats cough (34.6%), which represent 55 UR (11.7%). According to the ICPC-3 classification, this condition falls under the "respiratory system" category. Participants did not provide information regarding the disease diagnosis. Regarding the causes, eight informants mentioned overexertion and climate. Concerning symptoms, eight informants stated that this condition causes chest pain and vomiting.

Overall, participants mentioned 35 unique remedies for treating cough, with the number of ingredients ranging from one to five. Fifteen remedies are single-ingredient (29 UR, 52.7%), 12 remedies consist of two ingredients (18 UR, 32.7%), three remedies consist of three ingredients (3 UR, 5.4%), three remedies consist of four ingredients (3 UR, 5.4%), and finally, two remedies consist of five ingredients (2 UR, 3.6%).

Informants mentioned 22 plant species belonging to 15 botanical families for treating coughs. The most mentioned plant were *Coleus amboinicus* [leaf] (30 UR, 37.1%), followed by *Citrus aurantiifolia* [leaf and fruit] (7 UR, 8.6%), and *Abrus precatorius* [leaves] (5 UR, 6.2%).

The most common remedy reported for cough consisted of chewing the fresh leaves of *C. amboinicus* directly (oral route). Ten informants mentioned this remedy, and no participant provided information regarding the dosage of the remedy. As for the quantity of leaves to use, it varies between three to five leaves.

3.5.3. Headache

A total of 30 informants mentioned headache (28.8%), representing 41 UR (8.7%). According to the ICPC-3, this disease falls under the "neurological system" category. Six informants stated overexertion and fatigue as causes of this condition. As for symptoms, four informants emphasized pain in the forehead and pulsations in the head.

In total, participants mentioned 33 unique remedies for headache with the number of ingredients ranging from one to five. Among these 33 remedies, 15 are single-ingredient remedies (21 UR, 51.2%), nine consist of two ingredients (9 UR, 21.9%), six remedies have three ingredients (6 UR, 14.6%), two remedies consist of five ingredients (2 UR, 4.9%), and finally, one remedy consists of four ingredients (3 UR, 2.4%).

Within these remedies, 33 plant species representing to 16 families were mentioned. The most mentioned species were *Ipomea obscura* [leaf and vine] (8 UR, 12.9%), followed by *Syzygium aromaticum* [leaf and fruit] (7 UR, 11.3%), and *Coleus amboinicus* [leaf] (6 UR, 9.7%).

The most cited remedy was composed of the leaves of *I. obscura* (5 informants). To prepare the remedy, the leaves of *I. obscura* are crushed in water. The liquid is then applied to the forehead (topical route). According to the five informants who mentioned the remedy, a handful of leaves is needed to make the remedy, and it should be applied once a day.

3.5.4. Fever

During the study, 20 informants mentioned fever (19.2%), representing 30 UR (6.4%). According to the ICPC-3, this ailment is classified under the "general" category. Only two informants provided information on the symptoms and diagnosis of the disease. Symptoms include an increase in body temperature and dizziness. Diagnosis

is made through touch, 20 informants who mentioned fever did not provide information regarding the causes of the disease.

In total, participants mentioned 25 unique remedies with the number of ingredients ranging from one to seven. Two-ingredients remedies were the most common ones (8 remedies, 12 UR), followed by single-ingredient remedies (7 remedies, 8 UR), four-ingredients remedies (4 remedies, 4 UR), three-ingredients remedies (3 remedies, 3 UR), six-ingredients remedies (2 remedies, 2 UR), and finally, only one remedy was composed of 7 ingredients (1 UR).

Within these 25 remedies, 33 plant species belonging to 15 different botanical families were mentioned. The two most mentioned species were *Cardiospermum halicacabum* [leaf and vine] (6 UR, 9.5%) and *Citrus aurantiifolia* [leaf and fruit] (6 UR, 9.5%).

The most cited remedy was composed of the leaves of *Coleus amboinicus*. Two informants mentioned this remedy. The fresh leaves of *C. amboinicus* is crushed dry in a mortar or in the palm of the hand, and then the leaves are applied directly to the forehead (cutaneaous). According to the two informants, the remedy is applied once a day, and participants did not provide information regarding the duration of the treatment. The other 24 unique remedies were each mentioned only once.

3.5.5. High blood pressure

In total, 16 informants mentioned HBP (15.4%), representing 30 UR (6.4%). According to the ICPC-3 classification, this disease is categorized under the "circulatory system". Regarding the causes of the disease, only one informant mentioned excess salt, fatty foods, and excessive consumption of processed products as causes of hypertension. The same informant also mentioned respiratory problems, accelerated heart rate, dizziness, vision disturbances, and headaches as symptoms of this condition. For the diagnosis, a traditional practitioner mentioned that he observes if the person has a fever, difficulty breathing, or if their eyes become reddish.

In total, participants mentioned 19 unique remedies for HBP with the number of ingredients ranging from one to three. The majority of the described remedies were single-ingredient (13 remedies, 17 UR), followed by two-ingredients remedies (4 remedies, 11 UR), and three-ingredients remedies (2 remedies, 2 UR).

Within the 19 mentioned remedies, 20 plant species belonging to 18 different botanical families were mentioned. The two most cited plants were *Moringa oleifera* [leaf, seed, root, stem] (8 UR, 26.7%) and *Psidium guajava* [leaf] (3 UR, 10%).

Among these 19 remedies, two have two citations (from two different

informants), while the other remedies were mentioned only once. The first remedy mentioned twice was composed of the leaves of *M. oleifera*. To prepare the remedy, the fresh leaves are crushed in water, and a pinch of salt is added. Then, the sick person consumes the liquid orally. A handful of *M. oleifera* leaves is needed to make the remedy, and it should be consumed twice a day. The two informants who mentioned this remedy did not provide information regarding the duration of the treatment.

3.5.6. Diarrhea

During the study, 15 informants mentioned diarrhea (14.4%), representing 20 citations (4.2%). Referring to the classification of ICPC-3, diarrhea falls under the category "digestive system". Regarding the causes of the disease, only one participant mentioned diet. Two informants cited intestinal pain and liquefaction of stools as symptoms of diarrhea. Among the 15 informants who mentioned diarrhea, none provided information on the disease's diagnosis.

In total, participants mentioned 16 unique remedies for diarrhea with the number of ingredients ranging from one to three. Single-ingredient remedies were predominant (9 remedies, 9 UR), followed by two-ingredients remedies (6 remedies, 9 UR), and three-ingredients remedies (1 remedy, 1 UR).

Among the 16 unique remedies reported, 13 plant species belonging to 8 different botanical families were mentioned. The most cited plant was *Moringa oleifera* [leaf] (5 UR, 22.7%), followed by *Psidium guajava* [leaf] (4 UR, 18.2%), *Euphorbia hirta* [leaf] (2 UR, 9.1%), and *Coleus madagascariensis* [leaf] (2 UR, 9.1%).

The most cited remedy was composed of *M. oleifera* leaves, and three participants mentioned this remedy. To prepare the remedy, three or four fresh leaves are crushed in water, and a pinch of salt is added. The remedy is then taken orally once a day. The duration of the treatment was not specified by the three informants.

3.5.7. Diabetes

In total, 14 informants mentioned diabetes (13.5%), representing 29 UR (6.2%). According to ICPC-3, diabetes falls under the category "endocrine system". As for the diagnosis, the 14 informants did not provide information. Only one informant described the causes and symptoms of the disease. According to this informant, the causes of this condition would be the excess consumption of sugar or alcohol. The symptoms include decreased vision, weight loss, constant urination, slow healing, and constant hunger.

In total, participants mentioned 19 unique remedies for diabetes with the number of ingredients ranging from one to four. The majority of remedies were single-

ingredient (12 remedies, 16 UR), followed by two-ingredients remedies (3 remedies, 9 UR), three-ingredients remedies (2 remedies, 2 UR), and four-ingredients remedies (2 remedies, 2 UR).

The 19 mentioned remedies included 28 plant species belonging to 20 different botanical families. The most cited plants were *Mangifera indica* [leaf] (6 UR, 15.4%) and *Psidium guajava* [leaf and fruit] (4 UR, 10.2%).

The most cited remedy (2 UR, 6.9%) combined *P. guajava* and *M. indica* leaves. The remedy is a decoction. According to the two informants who mentioned the remedy, the water should be boiled until it changes color. The remedy should be taken orally. Regarding the quantity, the informants specified that 3 leaves of each plant are needed to prepare the remedy. The remedy should be consumed twice a day, and the participants did not provide information on the treatment duration. The other 18 remedies are all mentioned once by different informants.

3.5.8. Female infertility

During the study, 14 informants mentioned female infertility (13.5%), representing 18 UR (3.8%). According to the ICPC-3 classification, female infertility is part of the "genital system" category. Two informants described the causes of the disease. The first informant mentioned cysts, fibroma, and menstrual cycle irregularities as causes of female infertility. The second informant cited a lack of hormones. Participants did not provide information on the symptoms and diagnosis of the disease.

Overall, informants described 17 unique remedies for infertility with the number of ingredients ranging from 1 to 8. Two-ingredients remedies were predominant (5 remedies, 6 UR), followed by single-ingredient remedies (4 remedies, 4 UR), and three-ingredients remedies (3 remedies, 3 UR). Remedies with four to eight ingredients were mentioned only once by one informant each.

Among the 17 mentioned remedies, 35 plant species belonging to 17 botanical families were reported. The plant with the highest number of citations was *Aerva lanata* [leaf and vine] (10 UR, 18.2%), followed by *Ocimum gratissimum* [leaf] (6 UR, 10.9%), and *Decalobanthus peltatus* [vine and root] (3 UR, 5.5%).

One remedy stands out from the others in terms of number of citations. This remedy combines the vines of *Decalobanthus peltatus* and *Paullinia pinnata*.

Two informants mentioned the vines of *Decalobanthus peltatus* mixed with the vines of *Paullinia pinnata* for treating infertility. The vines are prepared by decoction. One vine of each plant is used to prepare the remedy, which is taken orally three times

a day for seven days.

3.5.9. Hernia

In total, 12 participants mentioned hernia (11.5%), representing 15 UR (3.1%). In shimaoré, this condition is defined by the term "*mushipa*". According to ICPC-3, this condition is part of the "digestive system" category. Participants did not provide information regarding the causes of this condition. As for the symptoms, two informants provided information on this matter. The first informant mentioned pain, tension in the genital areas, as well as blood in the stool as symptoms of the disease. Another informant emphasized that swelling in the genital areas (testicles) is also a symptom for men. Both participants stated that the diagnosis is made by touching the organ affected.

Informants described 14 unique remedies for hernia, with the number of ingredients ranging from one to five. Three-ingredients remedies were predominant (5 remedies, 5 UR), followed by four-ingredients remedies (4 remedies, 4 UR), single-ingredient remedies (2 remedies, 2 UR), five-ingredients remedies (2 remedies, 2 UR), and two-ingredients remedies (1 remedy, 1 UR).

Among the 14 mentioned unique remedies, 20 plant species belonging to 15 different botanical families were mentioned. The most mentioned plant was *Woodfordia fruticosa* [wood and leaf] (4 UR, 14.3%).

There is no standout remedy, all 14 unique remedies were mentioned once by different informants.

3.5.10. Impotence

In total, 11 informants mentioned impotence (10.6%), and it represented 14 UR within the remedies (2.9%). According to ICPC-3, impotence is part of the "genital system" category. Two informants described the causes of this condition. The first informant emphasized drinking too much cold water and sorcery as potential causes. The second informant mentioned stress, fatigue, depression, and trauma as other causes of this condition. Symptoms were described by three informants. All three participants cited erection problems as symptoms. One informant also mentioned a decrease in strength as a symptom. The 11 informants who mentioned impotence did not provide information on the diagnosis of the disease.

In total, participants mentioned 14 unique remedies for impotence, with the number of ingredients ranging from one to five. Three-ingredients remedies were predominant (5 remedies, 5 UR), followed by four-ingredients remedies (4 remedies, 4 UR), single-ingredient remedies (2 remedies, 2 UR), five-ingredients remedies (2 remedies, 2 UR), and two-ingredients remedies (1 remedy, 1 UR).

Among the 14 unique remedies reported, 36 plant species belonging to 18 different botanical families were cited. The most mentioned plant was *Woodfordia fruticosa* [leaves and root] (8 UR, 15.4%), followed by *Phyllarthron comorense* [leaf and root] (4 UR, 7.7%), and *Syzygium aromaticum* [fruit] (3 UR, 5.8%).

There is no predominant remedy; all 14 unique remedies were mentioned once by different informants.

The data are summarized in **Figure 4**, which report the relationships between the eleven most cited plants and the diseases they treat. The thickness of the links provides information on the plants most commonly used to treat a particular condition. The diameter of the clusters helps identify the diseases with the highest number of citations. For example, **Figure 4** allows us to see that stomachache is the most commonly mentioned illness by the informants during the study. It also allows us to see that the most used plant against cough is *C. amboinicus*.

4. Discussion

4.1. Users and specificity of traditional Mahoran medicine

The users of traditional medicine have been classified into three groups: the expert or "*fundi*" (known throughout the island), the individuals known within a specific municipality only, and those who use traditional medicine to treat themselves or their relatives (part 3.2). In this survey, the majority of informants (62,5%) belong to the last category. This classification presents some similarity with the one established by Lartigau-Roussin (2002), where the category of "*fundi*" and individuals practicing self-medication is present. However, in the same article, other categories of traditional practitioners are also mentioned and include the "*mwalimu*", the "*fundi des djinn*", and locally known sorcerers referred to as "*mutsayi*" or "*mgangi*". In our survey, we did not find these categories of traditional practitioners. It might come from the fact that we focused on Mahoran pharmacopeia and not on spiritual and religious practices. Another reason could be that these traditional practitioners do not openly talk about these practices as they consider them as secrets.

The majority of individuals interviewed in this study are women. Similar results were observed in an ethnobotanical survey conducted by Saive et al. (2018) in Mayotte. In that study, 29 individuals were interviewed, among whom there was 25 women and 4 men (Saive et al., 2018). When looking at the "*fundi*" category, women are also more represented than men. In the Mahoran society, it is primarily women who take care of children when they fall ill. This might explain the high proportion of women included in our survey. During the study, the majority of remedies for treating children were mentioned by women.

Regarding the specificity of traditional Mahoran medicine, it is noteworthy that among ingredients other than plants, salt and coral stone are the most frequently mentioned by participants. In the work of Mchangama and Salaün (2012), over 60 remedies were described. Among these remedies, two use salt in combination with plants to treat bruises from blows and paronychia. Coral stone, on the other hand, is cited in the preparation of eight different remedies. Additionally, *tany malandy* (white clay) is also mentioned in the publication by Mchangama and Salaün (2012), playing a role in the formulation of four different remedies in combination with plants (Mchangama and Salaün, 2012).

Another specificity of traditional Mahoran medicine is the fact that the majority of the plants used are exotic. This can be linked to Mayotte's history as a former French colony (Blanchy, 2002). The colonial past of Mayotte played a crucial role in introducing numerous exotic plants to the island. For instance, *Cananga odorata* was introduced to the Indian Ocean during the 18th century (Benini et al., 2010). This plant, native to Indonesia, is widely used in Mayotte. Its essential oil has become one of the

island's main economic resources and is now a part of Mahoran culture. This example highlights the cultural and economical significance of exotic plants on the island. Additionally, Mayotte's geographical location fosters exchanges with the surrounding territories (Blanchy, 2002). The main exchanges have occurred with East Africa, the Middle East, and Madagascar (Blanchy, 2002). The Mahorans have progressively integrated plants from these regions into their medicinal practices (Blanchy, 2002). Furthermore, the island is subject to significant migratory movements, primarily from Madagascar and the Comoros, which likely promote the introduction and dissemination of external therapeutic knowledge (Blanchy, 2002).

Regarding the most commonly plant parts used in traditional Mahoran medicine, leaves rank first (utilized for 73% of plant species). This characteristic of Mahoran traditional medicine is also described in the works of Lartigau-Roussin (2002), affirming that leaves are indeed the most employed in the preparation of traditional Mahoran remedies. This is also echoed in the publication by Saive et al. (2018), where leaves are the most used and cited plant parts by study participants.

During the study, it was observed that the most commonly used administration route is oral (used for 78.5% of plant species), and the most employed preparation method is decoction (used for 72.6% of plant species). Once again, these results align with those stated by Lartigau-Roussin (2002), which assert that the preferred administration route for herbal treatments is oral, often in the form of a decoction-based herbal tea.

One notable specificity of traditional Mahoran pharmacopoeia is the treatment duration of remedies, which is specified for 13.7% of the total remedies. Among these 65 remedies, 49 have a treatment duration of seven days, and 16 have a treatment duration of three days. These treatment durations are also mentioned in the works of Mchangama and Salaün (2012). Indeed, in this article, six remedies have a seven-day treatment duration, and two remedies have a three-day treatment duration. It is interesting to note that there are more remedies consumed for seven days than three days, consistent with the results obtained during the study. The article by Saive et al. (2018) also mentions a remedy with a seven-day treatment duration. Additionally, the number seven holds religious significance, which may justify why most treatments last for seven days (Lartigau-Roussin, 2002).

Another characteristic of traditional Mahoran medicine relates to the harvesting of plants. Several participants (6 informants) mentioned that before harvesting a plant, it is important to recite a prayer called "*bismillah*". Other informants (4 informants) asserted that there are specific days for harvesting medicinal plants, such as Monday or Wednesday. To the best of our knowledge, no scientific article explains the use of "*bismillah*" in Mayotte. However, the work of Lartigau-Roussin (2002) mentions the

existence of "*nuhusi*" days (in Shimaoré). "*Nuhusi*" days are days during which the harvest of plants is considered impossible. The word "*nuhusi*" has Arabic origins and can be translated as misfortune or inauspicious. According to local beliefs, harvesting medicinal plants on a "*nuhusi*" day would render the remedy ineffective against the targeted illness (Mchangama and Salaün, 2012).

Compare to the surrounding islands, traditional Mahoran medicine share some similarities. First, it's noteworthy that the flora of Mayotte is very similar to that of the other Comoros islands. Indeed, 614 out of the 663 indigenous plants from Mayotte are also found in these islands. In our study, 152 out of the 154 plants identified are also present in the Comoros archipelago. Second, in a review, Saive *et al*. (2020) lists more than 207 medicinal plants used throughout the Comoros archipelago, with many plants being used in similar ways to treat the same ailments across the different islands (Saive et al., 2010). Furthermore, the use of non-plant materials, such as coral stone, is another feature shared by these islands (Daroueche, 2024). This practice is not exclusive to the Comoros, as other Indian Ocean islands, like Madagascar, also use coral stone in their traditional pharmacopoeia (Mesa et al., 2021). Because the available literature on the medicinal plants used in the Comoros islands is limited, further research is needed to document these practices and thus explore both similarities and differences in the specific practices of traditional medicine across this culturally interconnected region.

4.2. Healthcare system issues, health conditions and the use of traditional medicine in Mayotte

Based on established categories using the ICPC-3, the "digestive system" category has the highest number of diseases and is also the most cited category. Thus, it is possible to hypothesize that the most frequently encountered diseases in Mayotte affect the digestive system. The study mentioned that the main cause of these diseases affecting the digestive system is diet. According to the ORS, the diet in Mayotte is limited in variety and characterized by low intake of dairy products, calcium, fruits, and vegetables. Dietary intake revolves around staple foods such as rice (40% of dietary intake), chicken wings (18.3% of dietary intake), chicken thighs (16.2% of dietary intake), bread (10.1%), fish (8.1%), and other foods such as bananas, cassava, and breadfruit. Furthermore, new products are gradually entering consumption habits. The consumption of bread and pastries has doubled since 2005, and spending on carbonated or flavored beverages increased by 45% between 2010 and 2011 (Aboudou et al., 2019). This limited diet could therefore be responsible for numerous conditions such as stomachaches, diarrhea, obesity, or even diabetes.

Additionally, it is important to note that in Mayotte, 29% of households do not

have access to running water. Among these 29%, 9% of households use water from rivers or streams. However, these streams or rivers do not provide satisfactory conditions for food or hygiene use. Indeed, there are places where waste is dumped and are also habitats for animals. This contaminated water could therefore be a cause of stomachaches. It is also important to highlight that in the late 1990s, Mayotte saw the resurgence of diseases such as cholera. Between 1998 and 2000, 10 cases of cholera were bacteriologically confirmed and recorded in Mayotte (Deroche et al., 2022). In 2024, a new cholera epidemic was declared and 122 persons have been affected so far.

The second most cited category of diseases by informants is the "respiratory system" category. The causes, symptoms, and diagnosis of diseases in this category were very briefly described by the participants. However, it is interesting to note that in the work of Mchangama and Salaün (2012), a remedy was mentioned for treating each of the following diseases: cough, sore throat, flu, and sinusitis. Additionally, a report mentions acute respiratory infections as a major cause of infant mortality in Mayotte (Sissoko et al., 2005). According to this report, acute respiratory infections can be of bacterial or viral origin, including common infections, bronchitis, and pneumonia. Tuberculosis, on the other hand, had an incidence rate of 23 per 100,000 inhabitants in Mayotte in 2001 (Sissoko et al., 2005). The national public health agency also reported several cases of influenza. During the period 2021-2022, there were two flu epidemics. In the first epidemic, a total of 235 emergency department visits and 49 secondary hospitalizations were recorded. The second epidemic was less severe, with 124 emergency department visits and 23 secondary hospitalizations (Santé publique France, 2022). Thus, diseases affecting the respiratory system are highly prevalent in Mayotte.

The third most cited category by participants is the “genital system” category. Similar to diseases classified in the “respiratory system” category, very few informants described the causes, symptoms, and diagnosis of diseases affecting the genital system. Female infertility and impotence are among the most mentioned conditions in this category of diseases. In Mayotte, reproduction is at the core of the society. Population growth is very dynamic, primarily driven by a strong surplus of births over deaths. Fertility in Mayotte is very high, with 4.6 children per woman in 2021 (Balicchi et al., 2014). This high birth rate is due to the representation of the child in Mahoran culture which symbolizes wealth. Having a large family in Mayotte is therefore a sign of wealth. Furthermore, when the child reaches adulthood, they can provide for their family's needs. Another important aspect is that in Mahoran society, a woman only gains status once she becomes a mother (Hébert and Hébert, 2011). Additionally, according to the testimony of several informants, a woman is considered infertile if she does not become pregnant within two to three months after marriage. Therefore, it is possible to hypothesize that these reasons lead women suffering from infertility to consult a traditional healer or practice self-medication. The same applies to men

affected by impotence in Mayotte. Moreover, it is important to note that generally in Africa, sexuality plays a prevalent role in daily life. Thus, male sexual impotence is a sign of great misfortune for a family (Musabyimana, 2016). This further justifies the importance of natural remedies for impotence in Mayotte.

The results of the study have shown that chronic diseases such as diabetes and HBP were frequently mentioned by the participants. Type 2 diabetes is the most common form in Mayotte, with a prevalence of 12% in 2018, and this prevalence increases with age (Grave et al., 2021). Diabetes also affects the neighboring islands of Mayotte. In the Comoros, the prevalence of diabetes was 5.9% in 2016, and like in Mayotte, it increases with age, with a predominance of type 2 diabetes (WHO, 2016a). In Madagascar, the prevalence of diabetes was 3.9% in 2016 (WHO, 2016b). Diabetes has a higher prevalence in Mayotte than in the Comoros and Madagascar. As for HBP, its prevalence in Mayotte is higher than that of diabetes. Indeed, the prevalence of HBP was 38.4% in 2019 (Grave et al., 2021). Once again, the prevalence of HBP is higher in Mayotte than in the Comoros and Madagascar. In the Comoros, a survey conducted in 2011 revealed an HBP prevalence of 25% (Ali et al., 2020). Another study conducted in Madagascar in 2014 showed an HBP prevalence of 27.6% (Ratovoson et al., 2014). Given these figures, Mahoran traditional healers have developed, just like for diabetes, numerous remedies based on local medicinal plants to treat HBP. It is interesting to note that many remedies presented in the study use salt in combination with plants. Furthermore, among the 19 remedies mentioned against HBP, there is one remedy that uses salt in combination with *M. oleifera* leaves. Although this salt-containing remedy is a minority among those mentioned, it is important to highlight this practice, given that salt is a factor that promotes HBP (WHO, 2023).

4.3. Benefit-risk balance of the most cited plants

A table presenting the ethnobotanical uses (in Mayotte and in the surrounding regions), pharmacological activities and toxicological studies of the seven most cited plants is provided to assess the efficacy and toxicity of these plants (Table 4). Here, we provide conclusive remarks on these plants.

The leaves of *C. amboinicus* present ethnobotanical and pharmacological data justifying its use in cough treatment. However, toxicological data on the plant remains limited and further studies are necessary to demonstrate its safety and the doses to be respected.

The leaves and fruits of *C. aurantiifolia* are widely used for cough all over the world. The antibacterial activity of the leaves and fruit has also been confirmed. It is

worth noting that the World Health Organization (WHO) recommends using lemon juice with honey as a soothing remedy for cough problems (WHO, 2001).

M. oleifera leaves present ethnobotanical and pharmacological data justifying their use against hypertension and diarrhea. However, the plant does not seem to be widely used for stomachache in general. Therefore, it would be interesting to conduct ethnomedical studies in Mayotte to better understand what individuals mean when referring to stomachache.

O. gratissimum leaves present ethnobotanical data confirming their use against female infertility and painful menstruation. However, it would be interesting to conduct tests to confirm the pharmacological activity of this plant against infertility and pain. Moreover, future clinical trials could be considered to justify the anti-inflammatory and antioxidant activity of the leaves.

From an ethnobotanical perspective, *P. guajava* has been repeatedly mentioned as a remedy for diarrhea in several different countries. *In vitro* and *in vivo* tests have proven the antidiarrheal properties of the leaves. Additionally, clinical trials have also confirmed the efficacy of the plant. However, it would be interesting to further research bioactive phytochemicals due to the lack of information on the subject.

S. aromaticum is a widely used plant in traditional medicine for its activity against fever and pain. Many therapeutic applications have been developed, particularly for treating dental problems. It would be interesting to further study the combined activity of cloves and coral stone reported in this study.

The leaves of *C. halicacabum* present ethnobotanical and pharmacological data justifying its use against fever. However, it would be interesting to identify the molecules responsible for the plant's antipyretic activity.

Overall, none of these plants have shown to induce toxicity at reasonable dosage.

1017 **Table 4** : Benefit-risk assessment of the seven most cited plant species
1018

Scientific name	Ethnobotanical uses in Mayotte (in this study)	Ethnobotanical uses in the Indian Ocean and in Africa	Pharmacological activities	Bioactive compounds	Toxicity
Cardiospermum halicacabum	Leaf: chikungunya, constipation, covid-19, dengue, fever, headache, hemorrhoids Liana: headache	Leaf: arthritis, fever, upset stomach [Archipelagos of Comoros] (Saive et al., 2020),	Ethanolic and hexanic extracts of the leaves showed antipyretic activity (Raza et al., 2013). The leaves also possess anti-inflammatory activity (Elangovan et al., 2022)	The compounds responsible for the anti-inflammatory activity are as follows: apigenin, luteolin-7-O-glucuronide, protocatechuic acid, rutin, apigenin-7-O-β-d-glucuronide, gallic acid, and coniferylaldehyde (Elangovan et al., 2022).	The toxicity of ethanolic extracts of leaves has been evaluated. The extracts were orally administered to rats, which were then observed for 72 hours. The tests showed that the extracts did not exhibit toxicity up to a dose of 2000 mg/kg (Elangovan et al., 2022).
Citrus aurantiifolia	Fruit: cough, covid-19, dengue, fever, influenza, stomachache, tonsilitis Leaf : cough, covid-19, dengue, feet pain, female infertility, fever, hemorrhoids, influenza, stomachache	Fruit : cough, malaria [Nigeria] (Ojimelukwe et al., 2013) Leaf : cough [Uganda] (Tabuti et al., 2003)	Tests on dry extractcs have highlighted the antibacterial activity of the fruit (Lee et al., 2018). Another study investigated antibacterial activity of the leaves by conducting *in vitro* tests (Pathan et al., 2012).	The antibacterial activity is attributed to the presence of monoterpenes in the fruit like limonene and linalool (Weimer et al., 2021).	The aqueous extract of the leaves was tested at a concentration of 2000 mg/kg, and the results showed that the extract was not toxic at this dose (Shchérazade et al., 2021). Another study tested the toxicity of the essential oil at 50, 100, and 500 mg/kg. The results indicated no acute toxicity (Adokoh et al., 2019).

Coleus amboinicus	Leaf: cough, fever, headache, hernia, high blood pressure, nasopharyngitis, tonsilitis	Leaf: cough, dysuria, constipation [Archipelago of Comoros] (Hassani et al., 2012), influenza, nasopharyngitis, wounds [Reunion island] (Nakab, 2019)	Hydroalcoholic extracts of the leaves possess anti-inflammatory and antitumor activities (Gurgel et al., 2009) Hexanic extracts of the leaves possess antioxidant and antibacterial activities (Nizar Ahamed et al., 2023)	These compounds were identified in the essential oil of the plant: carvacrol, thymol, β-caryophyllene, α-humulene, γ-terpinene, p-cymene, α-terpineol, and β-selinene (Arumugam et al., 2016)	Methanolic extract of the leaves were tested on mice with a maximum dose of 2000 mg/kg (Pillai et al., 2011). After seven days of treatment, no mortality related to the test substance was observed (Pillai et al., 2011)
Moringa oleifera	Leaf: constipation, diabetes, diarrhea, high blood pressure, infectious conjunctivitis, intestinal pain, otitis externa, stomachache Root : high blood pressure Seed : high blood pressure Stem : high blood pressure	Leaf: liver disease, redness [Archipelagos of Comoros] (Saive et al., 2020), high blood pressure [Madagascar] (Nicolas, 2012), [Tchad] (Dongock, 2018), diarrhea [Benin] (Agbankpe et al., 2014)	A study conducted in 2019 highlighted the antihypertensive activity of the aqueous leaf extracts of the plant (Aekthammarat et al., 2019). Methanolic extracts of the roots showed significant antidiarrheal effects against castor oil-induced diarrhea in tested rats (Saralaya et al., 2010).	The main families of chemical compounds found in the leaves include vitamins, phenolic acids, flavonoids, isothiocyanates, tannins, and saponins (Vergara-Jimenez et al., 2017).	The toxicity has been tested using aqueous leaf extracts. The extracts were administred orally, and did not result in any mortality in mice at doses ranging from 400 mg/kg to 6.4 g/kg. However, between 3200 and 6400 mg/kg, a decrease in locomotion in some mice was observed after 2 hours of treatment (awodele et al., 2012)

Ocimum gratissimum	Leaf: asthma, cough, covid-19, dengue, female infertility, fever, hernia, influenza, nosebleed, painful periods, perineal massage, stomachache	Leaf: diarrhea, fever, gingivitis, hemorrhoids, vaginal infection [Archipelagos of Comoros] (Saive et al., 2020), cough, [Madagascar] (Rabearivony et al., 2015), infertility [Nigeria] (Soladoye et al ., 2014), [Cameroon] (Fongod et al., 2014), painfull periods [Benin] (Ugbogu et al., 2021), [Ghana] (Bekoe et al., 2021)	Aqueous extracts of the leaves were tested and showed antioxidant and anti-inflammatory activity (Olamilosoye et al., 2018).	Phenolic compounds and flavonoids present in the leaves are believed to be responsible for the plant's anti-inflammatory activity (Ugbogu et al., 2021).	The toxicity of the leaves has been tested using aqueous extracts, with concentrations ranging from 1600 to 4500 mg/kg. The study showed that the median lethal dose of the aqueous extracts is 4240 mg/kg (Ojo et al., 2013).
Psidium guajava	Fruit: diabetes Leaf: covid-19, dengue, diabetes, diarrhea, dizziness, feet pain, hernia, high blood pressure, intestinal pain,	Leaf: diarrhea [Archipelagos of Comoros] (Saive et al., 2020), [Madagascar] (Quansah, 1988), [Kenya] (Njoroge and Bussmann, 2006), [Senegal] (Gutiérrez et al., 2008; Liu et al., 2024)	One study showed the antibacterial activity of aqueous extracts of dried leaves on *Shigella flexneri* and *Vibrio cholerae*, two bacteria responsible for infectious diarrhea (Birdi et al., 2010).	The ethanol extract of the leaves was found to be rich in flavonoids, phenols, tannins, alkaloids, steroids, and carbohydrates (Hirudkar et al., 2020).	The toxicity of the leaves was tested at different concentrations: 1 mg/ml, 10 mg/ml, 100 mg/ml, and 1 g/ml. None of them showed acute toxicity (Yadav and Mohite, 2020)

Syzygium aromaticum	Flower buds: back pain, cough, covid-19, fibroma, headache, influenza, impotence, muscle pain, otitis externa, toothache Leaf: cough, headache	Flower buds: cough [Comoros] (Kaou et al., 2008), fever [Madagascar] (Sattler and Razafindravao, 2017) [Angola][Senegal][Sudan] (Adefegha et al., 2016), flu, rheumatism [Reunion Island] (Vera, 1989)	A study aimed to demonstrate the antipyretic activity of the essential oil derived from the floral buds of the plant. The test was conducted on two groups of albino mice. The first group was treated with essential oil at a concentration of 50 mg/kg, and the second group was treated with a concentration of 100 mg/kg. The study showed that the essential oil exhibits significant antipyretic activity. No difference was observed between the two groups of mice (Uchôa Lopes et al., 2020).	The essential oil of clove contains numerous bioactive compounds. Indeed, a study conducted in 2021 identified more than 30 compounds within this essential oil. Its major compound, eugenol, is responsible for the antipyretic and analgesic activity (Haro-Gonzàlez et al., 2021).	Regarding the toxicity of clove essential oil, it has been recognized as harmless at a concentration below 1500 mg/kg. Furthermore, the WHO has specified that the acceptable daily number of cloves per day is 2.5 mg/kg based on the individual's weight (Cortés-Rojas et al., 2014).

It is important to specify that the survey was conducted over a relatively short period of three months, which is a limiting factor. This limited timeframe may contribute to the absence of consensus for most uses, as reflected in the results where we have only one "use-report" for many of the plants studied (Weckerle et al., 2018).

5. Conclusion

This study is the first to focus on the Mahoran pharmacopeia all over the island. It highlights the rich traditional knowledge of Mahoran people. The Mahoran pharmacopeia is mainly practiced by women as they constituted the majority of the participants. According to the informants, the transmission of this knowledge primarily occurs orally. However, this transmission is decreasing year by year, with younger generations showing less interest in traditional medicine, possibly due to the island's development and changes in social organization.

The most commonly treated diseases by traditional medicine in Mayotte are those affecting the digestive, respiratory, and genital systems. The primary ailments include stomachache, cough, headache, and fever. In the survey, two chronic diseases (diabetes and hypertension) were also highly mentioned, likely reflecting the prevalence of these conditions on the island. However, it was observed that the respondents had difficulty describing the diseases (diagnoses, symptoms, causes), which could be attributed to translation issues or a lack of understanding of the conditions in question. Ethnological and medical work could be undertaken to better understand the cited ailments.

Remedies in Mahoran traditional medicine mainly consist of fresh plants. The majority of remedies used on the island consist of a single ingredient, with leaves being the most commonly employed in remedy preparations. The most frequently used preparation method is decoction.

The traditional remedies of Mayotte also has numerous specificities due to the use of particular ingredients such as salt, coral stone and white clay.

Within the study, the benefit-risk balance of the seven most cited plants was evaluated. These seven plants are already well-known as they have been the subject of several scientific studies. Among these seven plants, six exhibited similar ethnobotanical usage data in other countries, and six possessed pharmacological activities related to the documented uses. Among the plants for which toxicological data are available, only *M. oleifera* showed acute toxicity. Furthermore, it is worth noting that only *P. guajava* had undergone clinical trials.

Finally, some species (*A. lanata*, *C. halicacabum*, *C. madagascariensis*, *P. pinnata*, *Phyllarthron comorense*, *Mimusops comorensis*, *Tragia furialis* and *W. fruticosa*) frequently cited in our study and poorly investigated from a pharmacological perspective might be interesting to further study. In addition, three of them (*A. lanata*, *C. madagascariensis*,

and *W. fruticosa*) were cited for specific ailments, making them pertinent to study for their phytochemistry and biological activities related to these ailments.

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Field work: TTH, YE
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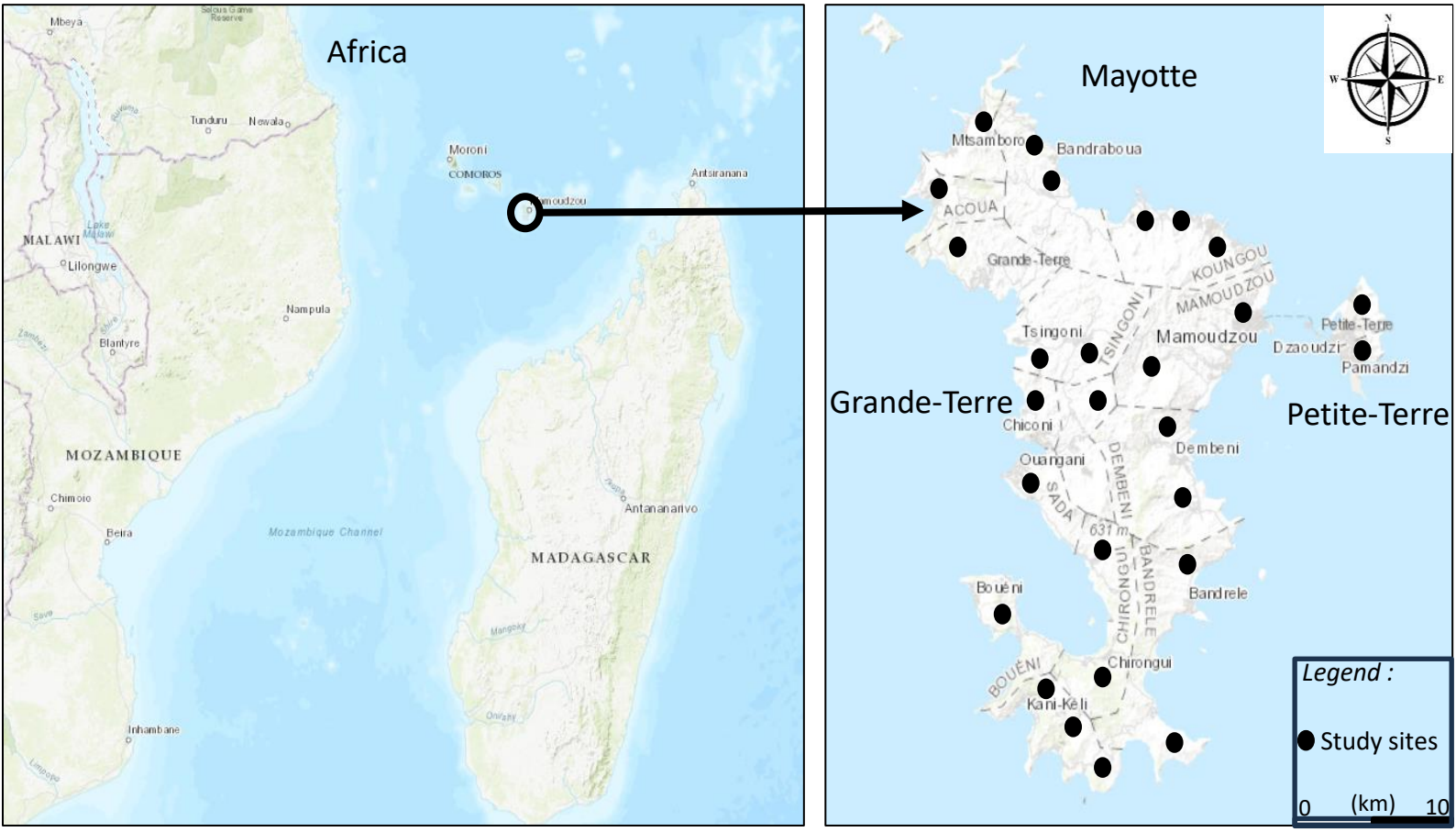
Unveiling the potential and specificity of the Mahoran ethnopharmacopoeia: a field survey

Figures

Figure 1: Map showing the locations of interviews in Mayotte island



Unveiling the potential and specificity of the Mahoran ethnopharmacopoeia: a field survey

Figures

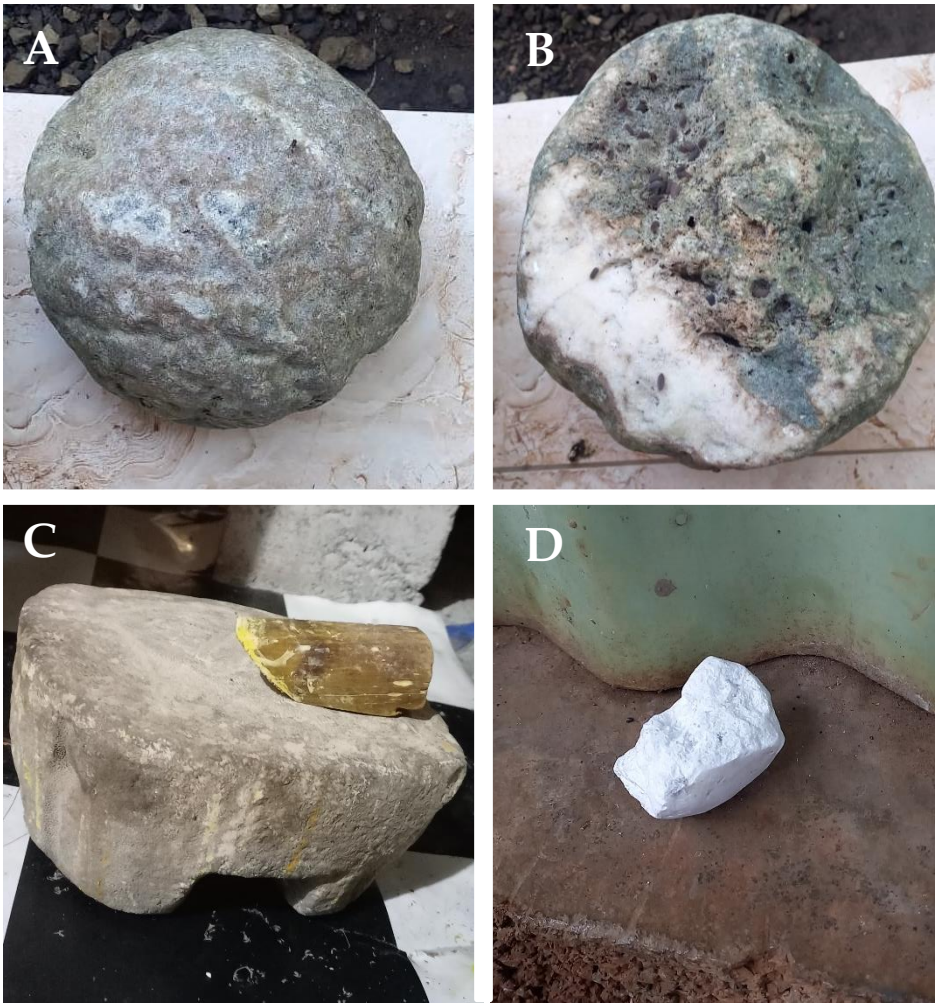
Figure 2: Main methods of preparation used in Mahoran traditional medicine

Legend: A. Decoction; B. Crushing the plant with a mortar; C. Crushing the plant in the palm of the hand

Unveiling the potential and specificity of the Mahoran ethnopharmacopoeia: a field survey

Figures

Figure 3: Other ingredients used in Mahoran traditional medicine

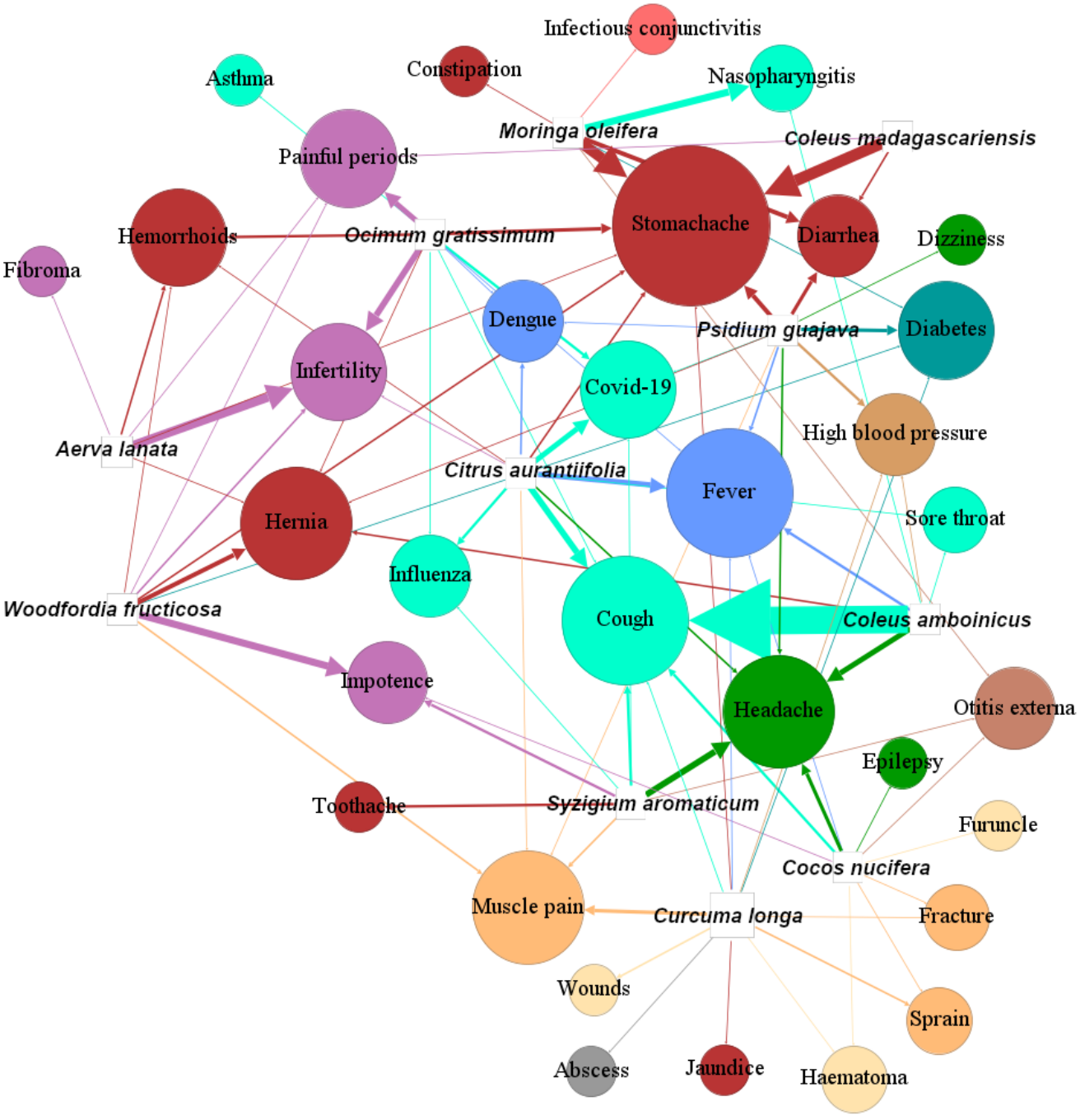


Legend: A and B. Raw coral stone; C. Cut coral stone; D. « Tany malandy » (white clay)

Unveiling the potential and specificity of the Mahoran ethnopharmacopoeia: a field survey

Figures

Figure 4: Relationship between plants and the diseases treated (for the 11 most cited plants)



Legend: The width of the link is proportional to the number of participants who mentioned the plant for the treatment of the respective disease. The same principle applies to the size of the nodes.

For the diseases, each color corresponds to a category of the ICPC-3:

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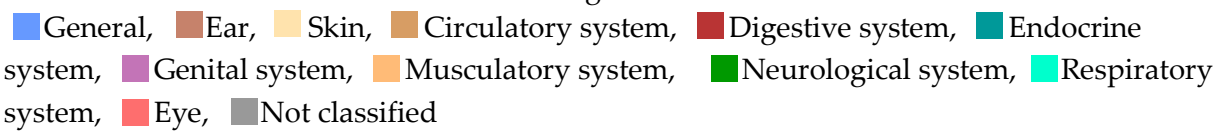
Figures



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Declaration of interests

☒ The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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