Indian Journal of Traditional Knowledge
Vol. 17(4), October 2018, pp. 645-653

Plants used in traditional medicine and cosmetics in Mayotte Island (France): An ethnobotanical study

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Received 5 March 2018, revised 13 July 2018

Mayotte is a small island located in the Mozambique canal and due to this location it has long been an important cultural and botanical crossroad. Species from Madagascar, China, India and the African continent, as well as some endemic species are found on this small island. Semi structured interviews were carried out throughout the island with 29 informants known for their knowledge of the traditional uses of plants. We based our work on the hypothesis that the more a plant was mentioned by the interviewees, the higher the chances would be to find an effective biological activity. In the end 69 species of interest were identified through the interviews. Flowers of *Jasminum nummularifolium* Baker, wood of *Carissa spinarum* L., roots of *Curcuma longa* L., leaves of *Lawsonia inermis* L., and wood of *Santalum album* L. tend to be the most known and the most used in Mayotte for traditional medicine and cosmetics. In the end those plants are used for medicine or for cosmetics, however, when it comes to medicinal uses, the traditional doctors are not looking for the cause of the disease and will orient their treatment towards the curing of the symptoms. On another hand, it is clear that the locals have a strong cultural bond with the use of traditional cosmetics in addition to traditional medicine.

Keywords: Traditional medicine, Traditional cosmetics, Mayotte, Use value, Informant agreement ratio

IPC Int. Cl.[8]: A61K 36/00, A61K 8/00, A61Q 7/00-A61Q 9/00, A61Q 11/00, A61Q 19/00- A61Q 19/08

As long as human kind can remember, plants have always been used as medicine[1]. Over the years, traditional practices have had many influences and are the sum of much empirical testing. Even though some practices have been proven to be inefficient, some traditional knowledge has had a very important role in the development of modern medicine[2-4].

The African continent is home to between 40,000 to 60,000 plant species, out of which around 35,000 are endemic, with 70 % growing in only few regions, known as biodiversity hotspots[5]. Anthropic pressure (most often linked to environmental degradation) on these hotspots has never been as strong as at present and might lead to a significant loss of biodiversity.

Ethnobotanical studies can contribute positively in the management of biodiversity, as it consists of recording the habits of local populations towards both plants and biodiversity. The results of such studies can also be used as indicator of the value of some species. Indeed, the WHO has estimated that the international market for herbal medicine products is worth US $ 62 billion, which is expected to increase to US $ 5 trillion by the year 2050[6]. When it comes to cosmetics (cosmetics, toiletries and fragrances), in 2001 the world market was estimated at US$ 124 billion and just for the skincare products, US $ 31,3 billion[7].

In addition to the economic value of cosmetics, several trends are currently being observed, the environmental impact, the ethics of production, as well as a growing interest in cosmetics intended for ageing populations and ethnic groups are important aspects for the industry[7].

The study reported here in was carried out on the island of Mayotte in the Indian Ocean for three reasons: firstly, it is known as a hotspot for its important biodiversity[8]; secondly, the women in this area of the globe are known for their traditional masks (*M'sindzano*) made out of plants harvested in the neighbourhood and thirdly, as in many regions from

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this part of the world, the population first relies on traditional medicine for cultural or financial reasons[9]. At the end of this work, we were able to identify some of the plant species used in traditional remedies and cosmetics, especially the ones used in the realisation of the traditional masks.

Methodology

Study area

Mayotte is a French department located North of the Mozambican canal in the Comoros archipelago (Fig. 1). It is constituted of two separate main islands of volcanic origin called "Grande Terre" and "Petite Terre". In addition to those two main land, 30 islets are spread in the 1100 km² lagoon. 63 % of "Grande Terre" is covered with slopes with a 15 % gradient or more. Mayotte has a maritime tropical climate. During the wet season, the temperatures can reach 34 °C, the air is very moist with up to 85 % humidity and up to 85 % of the rainfall takes place. During the dry season, the temperatures drops to around 25 °C and the rainfall tends to be scarcer. Mayotte also has a strong climatic gradient between the North and the South of the island. The annual rainfall can vary from 1000 mm in the South to 6000 mm 40 km farther to the North[10,11].

Botany

Due to its location, climate, relief, soil characteristics, distance from other islands and continents, Mayotte's flora is one of the richest per square kilometre in the world[12].

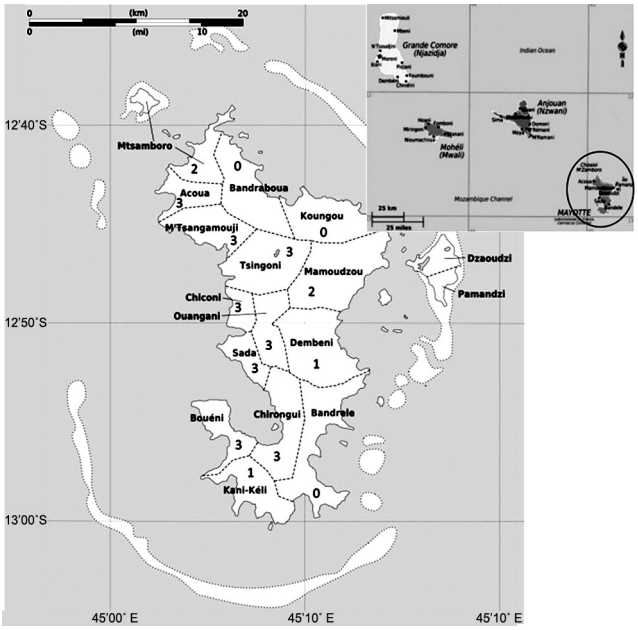

Fig. 1 — Location of the study area. The numbers represent the places and location of the interviews that took place around the island.

To date, more than 1300 vascular species and 93 mosses and allied plants have been identified. Among these species, 48 % are exotic, 34 % are indigenous, 10 % are endemic from Madagascar and the Comoros archipelago, 5 % are endemic from the Comoros archipelago and 4 % are strictly endemic. 95 % of the territory has been modified by humans; these areas contain only 48 % of the total flora of Mayotte. The 52 % of the flora which is indigenous or endemic is found in 5 % of the untouched territory[13]. Within this very rich flora, 613 species are considered to be directly useful for human kind. Those plants are mainly used for food, but some of them are used for fuel, construction, medicine, cosmetics or ornamental purposes. Most of them are exotic and grown intentionally on the islands; others are indigenous or even endemic.

Culture

Within this extensive biodiversity, many plants are used traditionally by the indigenous populations for many different practices, viz. medicine, religion, cosmetics and also as building and heating material. In Mayotte the keepers of the knowledge are called "*Fundi*"; their knowledge usually originates from an oral tradition. The people who collect and use plants are known as "*Fundi mpuamizi*" (literally, the master who collects roots). In addition to using the plants, traditional remedies are often taken following certain rituals destined to enhance the efficiency of the treatments. The most common ways to dispense the treatments are: in decoctions, as balms (grated vegetal material with sandalwood and water to form a past) or as poultice and by inhalation. Mahoran traditional medicine is linked not only to what plant remedies are required but also to what food is forbidden so that the treatment will be effective[14].

In addition to the use of plants by the "*Fundi*", they are also used by many women all over the island for cosmetic, hygienic and toiletry preparations. For instance, when preparing their "*M'sindzano*".

A previous study was carried out by Mchangama & Salaün[14] in 2012. Based on that work, 135 plant species were mentioned by a single traditional doctor. Within those 135 species, 8 were rare or endemic, leading to questions on how to allow the local people to use them for healing and at the same time to manage the risk of an eventual overexploitation of these species. This previous work was entirely based on the knowledge of one very specialized traditional

practitioner. Therefore, in a sense it cannot be considered a proper ethnobotanical study as only one informant was involved. The present study, on the other hand, has included the interventions of many informants, living in various areas around the island.

Data collection

When it comes to targeting plants that are likely to have a scientifically established effect, several approaches exist. Firstly, "*the historic depth*" which is based on: "*the assumption that if a given species was employed in the past for a specific disorder, and people today employ the same species for the same purpose, then the plant is likely to be effective"*[15]. A second approach is called the "*Cross Cultural comparison*" and relies on the fact that plants used in a similar manner in two or more populations of different areas and cultural background are likely to be effective[15].

Both approaches assume that in order to establish the potency of plants used traditionally, there must be some sort of consistency between the answers given by the concerned populations[16,17]. In this work, we have focused on the historic depth principle. In order to be valid, several conditions had to be established and respected within the study[15,18].

Condition 1: Size of the database

The target number of informants was obtained based on works by Karangawa, Lusakibanza & Frederich, Martin, Nunkoo & Mahomoodally[6,19–21]. The two main criteria for the estimation of the target number of people to interview were the island's population density, as well as the time available for research on the island. Based on the relationship between traditional knowledge and the "keeper's" knowledge[22], it seemed interesting to focus the interviews on the known "keeper's" around the island[23].

Condition 2: Interviews

The interviews were carried out in French when possible; if the informant only spoke a local language (*Shibushi* or *Shimaore*) help of an interpreter was taken. The interviews were realized using a semi-structured guide[24].

Condition 3: Taxonomic identification

The vegetal material mentioned throughout the interview had to be identified accurately. To do so, two pathways have been suggested in the literature[15]: The first is the collection of plant material in collaboration with professional botanists; the second is the linkage of the common name to its scientific name based on other ethnobotanical studies. In this work, plant identification was done as follows: As Moerman[16] suggested, plants that could not be identified with enough certainty were not supposed to enter into the ethnobotanical study. The botanical identification was carried out with the help of the "Conservatoire Botanique National du Mascarin" (CBNM) in Mayotte. During the interviews, data with different level of certainty were obtained. In order to identify the species mentioned by the informants, several approaches were used. The plant names were given in French, in *Shibushi* or in *Shimaore*. The names were translated to their botanical names with the help of the CBNM, their herbarium and database known as the "*Florevasculaire de Mayotte*"[25]. When available during the interview, the vegetal material was collected in order to be stored in the CBNM's herbarium (MAO numbers in Table 1)[a]. However, sometimes, the plant material given by the traditional practitioner did not allow for the creation of a herbarium specimen (small pieces of wood, dried seeds). When it occurred, the botanical name was established by using the previous botanical work done by the botanists from the CBNM in order to target one or several probable botanical names. Those names were then used to find plant pictures and herbarium specimen from the MNHN (Museum national d'histoirenaturelle) database (P numbers in Table 1). Those pictures were then shown to the informant in order to validate the species[b]. In some case, the pictures could not be found and we based our data only on the expertise of the botanists working at the CBNM and the available ethnobotanical data[c].

Condition 4: Data analysis

When it comes to treating the different answers given by the informants, estimating what might be biologically effective out of all the beliefs and other placebo effects linked to the use of specific species is a challenge[16]. As an ethnobotanical study, this work has several purposes, one of which is to target species that might have relevant biological activities. In order to target the plants with the highest potential, the use value (UV), and the informant agreement ratio (IAR) were used.

Search for keepers of knowledge was carried out by visiting the different villages and asking the people in the streets about who their reference within the area

[a]This data is considered as very strong and is marked by * in Table 1
[b]This data is considered less strong and needs to be confirmed by the creation of herbarium material. It is marked by ** in Table 1
[c]This data is considered as an attempt to identify the plant material and needs to be confirmed by the creation of herbarium material. It is marked by *** in Table 1

Table 1 — List of identified species mentioned during the interviews. Cit.; amount of times the specific species was mentioned by the informants.

Botanical name (Vernacular name, language)	Cit.	Parts used	Uses	Status in Mayotte [13]	UV	Herbarium reference
Abrus precatorius L. subsp. *africanus* (Vatke) Verdc. (Masonaombigara, Schibushi)	1	Leaves	Stomachache	Indigenous	0, 03	P00078910 **
Acacia farnesiana (L.) Willd. (Mugum'tsinzano, Shimaore)	3	Flowers	Perfume	Exotic, invasive	0,1	P00229214 **
Adansonia digitata L. (Mbuiu, Shimaore)	4	Fruits	Lightening, redness, acne, smoothing	Indigenous	0,31	MAO00046 *
Alangium salviifolium (L. f.) Wangerin (Mlijiliji, Shibushi)	1	Leaves	Redness	Indigenous	0,03	***
Aloe mayottensis A. Berger (Chiziamlili, Shibushi)	4	Leaves, mucilage	Redness, stomach ache, smoothing	Indigenous, endemic	0,2	MAO00055 *
Annona senegalensis Pers. (Porpetraka, Shibushi)	1	Branches, bark	Redness	Exotic	0,03	***
Aphloia theiformis (Vahl) Benn. (Mfandrabo, Shimaore)	1	Leaves	Stomachache	Indigenous	0,03	P00290489 **
Apodytes dimidiata E. Mey. ex Arn. (Mourimourou, Shimaore)	1	Leaves	Redness	Indigenous	0,03	P00273057**
Argomuellera trewioides (Baill.) Pax & K. Hoffm. (Sari kafe, Shibushi)	1	Leaves	Inflammation	Indigenous	0,03	P00273078 **
Calophyllum inophyllum L. (Mtondro, Shimaore)	1	Sap	Hair removal	Indigenous	0,03	P00229128 **
Cananga odorata (Lam.) Hook. f. & Thomson (Ilangilang, Shimaore)	4	Flowers	Perfume	Cultivated	0,14	MAO00054 *
Carissa spinarum L. (Mdjanfari, Shimaore)	8	Wood	Headache, acne, lightening, smoothing	Indigenous	0,59	P00273138 **
Carpodiptera africana Mast. (Mouhouvé, Shimaore)	1	Wood	Lightening	Indigenous	0,03	P00248732 **
Cassytha filiformis L. (Chiroungakanguetandri, Shimaore)	1	Wood	Lightening	Indigenous	0,03	P00290360 **
Cestrum nocturnum L. (Jasmin de nuit, French)	2	Flowers	Perfume	Cultivated	0,06	***
Chrysopogon zizanioides (L.) Roberty (Vetier, French)	3	Roots	Perfume	Cultivated	0,1	***
Cocos nucifera L. (Coco, French)	7	Fruits	Smoothing, lightening	Exotic	0,24	***
Cordia myxa L. (Mrovu, Shimaore)	3	Bark	Fertility	Exotic	0,1	***
Cordia subcordata Lam. (Bouaroulahi; Shimaore)	1	Roots	Allergies	Indigenous	0,03	***
Coriandrum sativum L. (Coriandre, French)	1	Seeds	Stomachache	Cultivated	0,03	***
Curcuma longa L. (Mtsindzano, Shimaore)	10	Roots	Redness, smoothing, lightening	Cultivated	0,48	P00273084 **
Erythroxylum lanceum Bojer (Loangati mena vavi, Shibushi)	1	Leaves	Pain, soreness	Endemic	0,03	MAO00045 *
Grewia cuneifolia Juss. (Ampalikeli, Shibushi)	1	Leaves	Allergies	Indigenous	0,03	P00229512 **
Guettarda speciosa L. (Fu mstanga, Shimaore)	5	Wood, flowers, leaves	Acne, allergies, perfume	Indigenous	0,24	P00248826 **
Heritiera littoralis Aiton (Moromoni, Shibushi)	2	Bark, leaves	Stomach ache, fertility	Indigenous	0,06	P00209700 **
Hibiscus tiliaceus L. (Hibiscus, French)	1	Leaves	Acne, allergies	Indigenous	0,06	***
Hymenaea verrucosa Gaertn. (Lembuku, Shibushi)	1	Leaves	Allergies	Cultivated	0,03	P00290421 **

(*Contd*.)

Table 1 — List of identified species mentioned during the interviews. Cit.; amount of times the specific species was mentioned by the informants (*Contd*.)

Botanical name (Vernacular name, language)	Cit.	Parts used	Uses	Status in Mayotte [13]	UV	Herbarium reference
Jacquemontia tamnifolia (L.) Griseb. (Sari kovehanimroutoutou, Shimaore)	1	Leaves	Head ache, fever	Indigenous	0,06	P00229351 **
Jacquemontia tamnifolia (L.) Griseb. (Sari kovehanimroutoutou, Shimaore)	1	Leaves	Head ache, fever	Indigenous	0,06	P00229351 **
Jasminum nummularifolium Baker (Enfu, Shimaore)	17	Flowers	Perfume, smoothing, lightening, acne	Indigenous	1,2	P00290466 **
Jatropha curcas L. (Pignon d'inde, French)	2	Sap	Lightening, acne, inflammations	Cultivated	0,1	***
Kalanchoe pinnata (Lam.) Pers. (Meawani, Shimaore)	3	Leaves	Inflammations	Cultivated	0,1	MAO00044 *
Lantana camara L. (Wavu n'kalaga, Shibushi)	2	Leaves	Stomachache	Exotic	0,06	MAO00057 *
Lawsonia inermis L. (Mwinavavi, Shibushi)	15	Leaves, flowers	Redness, lightening, smoothing, headache, perfume	Cultivated	0,72	MAO00042 *
Leea guineensis G. Don. f. *Comoriensis* Desc (Sadrakidrakilahi, Shibushi)	1	Wood	Acne, allergies	Indigenous	0,06	MAO00047 *
Litchi chinensis Sonn. (Litchi, French)	6	Wood, roots	Lightening, smoothing	Cultivated	0,24	MAO00051 *
Litsea glutinosa (Lour.) C. Rob. (Mzavocamaro, Shimaore)	3	Sap	Redness	Exotic, invasive	0,1	MAO00052 *
Manihot esculenta Crantz. (Manioc, French)	2	Leaves	Inflammation, abscess	Cultivated	0, 06	P00248848 **
Merremia peltata (L.) Merr. (Vahi be, Shibushi)	1	Sap	Soreness, acne	Indigenous	0,06	P00209748 **
Momordica charantia L. (Antsaskatarondro, Shibushi)	1	Leaves	Redness, fever, allergies	Exotic	0,1	P00437820 **
Moringa oleifera Lam. (Mvunge, Shibushi)	1	Leaves	Redness	Cultivated	0,03	***
Myristica fragrans Houtt. (Koukou manga, Shimaore)	4	Fruits, seeds	Redness, headache, stomachache	Cultivated	0,24	MAO00136 *
Noronhia comorensis S. Moore (Tsiletrikeli, Shibushi)	2	Leaves	Energizer	Indigenous	0,06	P00273167 **
Ocimum canum Sims (Hinsa, Shimaore)	3	Leaves	Perfume	Cryptogenic	0,1	***
Pandanus mayotteensis Martelli (Sari mluamasera, Shimaore)	7	Leaves, flowers	Perfume, smoothing, lightening, fertility	Indigenous	0,38	MAO00043 *
Paullinia pinnata L. (Vahimariranha, Shibushi)	2	Fruits	Redness, stomachache	Indigenous	0,1	MAO00056 *
Persea americana Mill. (M'zavoca, Shimaore)	5	Core	Lightening, smoothing, acne	Cultivated	0,28	MAO00050 *
Petchia erythrocarpa (Vatke) Leeuvenb. (Mrimatratamotamo, Shibushi)	1	Leaves, wood	Redness, stomachache	Indigenous	0,06	P00229384 **
Piper sarmentosum Roxb. (M'dawafilifili, Shimaore)	2	Leaves	Redness		0,06	***
Plectranthus madagascariensis (Pers.) Benth. (Paraovintiti, Shimaore)	4	Leaves	Redness, stomach ache, headache	Cultivated	0,24	P00437867 **
Plumeria rubra L. (Frangipanier, French)	2	Flowers	Perfume	Cultivated	0,06	P00646745 **
Pterocarpus indicus Willd. (Msandragon, Shimaore)	2	Wood	Smoothing, Lightening, acne	I	0,14	***
Rhynchosia viscosa (Roth) DC. (Antakamena, Shimaore)	1	Leaves	Stomachache	Indigenous	0,03	P00229495 **
Rosa chinensis Jacq. (Sari kafémafeikimawa, Shibushi)	2	Flowers, leaves	Perfume, eyeliner, fever	Cultivated	0,14	***

(*Contd*.)

Table 1 — List of identified species mentioned during the interviews. Cit.; amount of times the specific species was mentioned by the informants (*Contd*.)

Botanical name (Vernacular name, language)	Cit.	Parts used	Uses	Status in Mayotte [13]	UV	Herbarium reference
Santalum album L. (Santal, Shimaore)	9	Wood	Smoothing, lightening, acne, protection	I	0,76	***
Scoparia dulcis L. (Famafamavazaha)	1	Wood	Allergies	Cryptogenic	0,03	P00273130 **
Secamon eastephana Choux (Tendri, Shibushi)	1	Wood, leaves	Energizer, purgative	Indigenous	0,06	P00248814 **
Senna singueana (Delile) Lock (Mrimbuzi, Shimaore)	3	Leaves, wood	Bleeding, ache, allergies acne	Indigenous	0,1	P00290372 **
Sesamum indicum L. (Sésame, French)	3	Seeds	Redness, acne, lightening, smoothing	Cultivated	0,17	P00290347 **
Sida rhombifolia L. (Sanda ouri, Shimaore)	1	Leaves	Redness	Cryptogenic	0,03	***
Sida urens L. (Sari ampissi, Shibushi)	1	Leaves	Redness	Cryptogenic	0,03	P00290435 **
Stachytarpheta jamaicensis (L.)Vahl (Jakwemavo, Shimare)	1	Flowers	Redness	Exotic	0,03	***
Struchium sparganophorum (L.) Kuntze (M'lalihapana, Shimare)	1	Flowers	Perfume	Exotic	0,03	P00273049 **
Syzygium aromaticum (L.) Merr. & L.M. Perry (Karafou, Shimaore)	4	Flowers	Redness, perfume, purgative, headache	Cultivated	0,17	MAO00053 *
Tamarindus indica L. (Tamarin, French)	5	Bark, Leaves, Wood	Lightening, Redness, acne, smoothing, protection	Indigenous	0,24	MAO00041 *
Terminalia catappa L. (Antafa, Shimaore)	1	Wood	Perfume, smoothing, protection	Indigenous	0,1	***
Tragia furialis Bojer ex Prain (Ampisi, Shibushi)	1	Leaves	Redness	Indigenous	0,03	P00229157 **
Trophis montana (Leandri) C.C. Berg (Voamami, Shibushi)	1	Leaves	Fever	indigenous	0,03	P00273161 **
Vepris boiviniana (Baill.) Mziray (Manimararu, Shibushi)	1	Leaves, wood	Redness	Indigenous	0,03	P00229139 **
Zingiber zerumbet (L.) Sm. (Tsingizomasera, Shimaore)	4	Roots	Redness, smoothing	Exotic	0,14	P00248730 **

Parts used: plant organ used to create the remedy. Use: targeted ailment. Status in Mayotte: ecological interest. UV: use value. Herbarium reference: vouchers reference code, P numbers are attached to the MNHN, MAO numbers are attached to the CBNM. (* very strong identification, based on the deposition of a herbarium voucher. ** good identification, based on the vernacular names and the comparisons of specimen pictures originating from the MNHN herbarium *** attempted identification based on the vernacular names and the plant database from the CBNM.)

was, when it came to the use of plants for cosmetics and health. By doing so, the number of interviewed informants was efficiently limited. Some areas, where no informants were interviewed, were ruled out due to a massive emigration of Europeans, rendering the search for keepers of knowledge irrelevant (Fig. 1).

Interviews

The questionnaire had close and open ended questions. The close questions were of a demographic order asking the informants on their age, gender, level of education, occupation and religion. The open ended part asked for plants used traditionally in medicine and cosmetics, the name of the plants, the parts used, the preparations as well as what they were used for Nunkoo *et al.*[6]. Before each interview the project was explained thoroughly so that the informant would know to whom and for what they were giving the information.

The average age of the interviewees was 48 yrs old, with a strong majority of women (Table 2). Among the informants a few "*Fundi*" (keepers of the knowledge) could mention 15 or more different remedies; however, the average amount of remedies mentioned per informant was close to 7. The interviews were conducted all over the island (Fig. 1). Most informants were known for their knowledge of plants. That knowledge had been passed onto them by their parents. Most of them did not go to high school.

Table 2 — Informant data (n=29)

Location	Number of informants	Female proportion of informants	High school education
North	10	80%	20%
Centre	12	83%	25%
South	7	100%	28.5%

Some of them had begun secondary education, but didn't complete. Only three informants had graduated from higher education (Table 2).

Data analysis

Use value

In order to determine the relative importance of any one species, the sum of the use report of that particular plant was divided by the total number of informants based on the following formula[26]:

$$UV = \frac{\sum Ui}{n}$$

Where, *Ui*: number of use-reports cited by each informant for a given species.

n: total number of informants.

The closer the answer is to 0, the smaller the number of use-reports. It is important to point out that the use value does not distinguish if a plant is used for a specific purpose or for many purposes[6,27].

Informant agreement ratio (IAR)

The aim of this technique is to determine the variability ratio in the answers given by the informants [16]. This degree of agreement is known as the IAR[15].

$$IAR = \frac{(Total cases\ for\ ailment) - (Number\ of\ remedies\ for\ ailment)}{(Total cases\ for\ ailment) - 1}$$

The result obtained is between 0 and 1; the closer the answer is to 1, the greater the assumed consensus on the use of a given plant for a given use, whereas an answer close to 0 suggests that the plants are chosen randomly, thereby revoking the hypothesis of exchange of information among the informants[6,15,16,27].

Results and discussion

Twenty-nine informants answered the semi-structured interviews and 249 answers were obtained. These answers were given in French, *Shimaore* or *Shibushi*, therefore, translating the vernacular names into botanical names was necessary. To do so, three techniques were used depending on the quality of the information and vegetal material obtained during the interviews. Using several botanical database and with the help of the botanists from the "Conservatoire Botanique National du Mascarin", most of the vernacular names could be translated: 69 different taxa were identified.

Sixteen species were identified based on the collection and storage of plant material in the CBNM herbarium. Thirty-four species were identified using pictures from the MNHN database. Nineteen species could not be identified using the herbarium vouchers nor pictures from the MNHN originating from the Mahoran collection, their identification is an attempt based on the CBNM database.

The species were issued from 44 different families, of which the Fabaceae and the Malvaceaeare the most represented with 6 species each (worth 8, 7 % of the different species). The next most used family is the Apocynaceae with 4 species (5, 8%) (Table 1).

The fact that this work is oriented towards understanding of the traditional cosmetics in addition to traditional medicine might have influenced the answers given by the informants, leading to classification of the treatments into 4 categories; as suggested in the work of Inta *et al.* [28]. The different uses were classified into several main activities. The following answers: pain, soreness, redness, stomachache, headache, acne, allergies, fever were grouped under inflammation[29,30]. This work resulted in 76 citations linked to a supposed anti-inflammatory activity where 47 plants were used in these treatments. The number of citations and number of plants used for the whitening activity were 49 citations for 15 species. For the smoothing effect, 57 citations made use of 18 different species. As we also took into account uses for perfume, it was mentioned 47 times with 16 different species. These numbers led to the following Informant agreement ratio (IAR):

Anti-inflammatory : 0,38
Whitening: 0,71
Smoothing: 0,69
Perfume: 0,67

The very low number obtained for the anti-inflammatory activities lies in the fact that many ailments linked to an internal or an external pain, to fever, or to any kind of soreness can be linked to inflammation[29,30] and can be explained by the fact that the traditional practitioner tend to heal the symptoms prior to the disease. The informants tended to agree more on the plants to use for skin whitening, skin smoothing and as perfume; this can be explained

by the fact that these treatments are more specific and therefore, the plants used will be more specific.

The use value gives us an idea of the favoured species used in Mahoran traditional cosmetics and medicine. As these plants are used more, we can assume that, from an empirical point of view, they have more chances of being really effective. However, as this indicator doesn't take specific uses into account it cannot be used alone. In this study, many species have a very low use value as they were mentioned for one or two specific uses by only one informant out of 29. The plants with the highest use value were *Jasminum nummulariaefolium* Baker (1,20) *Lawsonia inermis* L. (0,72) and *Carissa spinarum* L. (0,59). Interestingly enough, *Carissa spinarum* L. was mentioned only 8 times but as most informants agreed on the several uses of this plant, it raised the UV higher than species that were mentioned more times but with fewer different uses (e.g. *Curcuma longa* L.)[31].

Conclusion

Plants have been used for thousands of years for all sorts of activities, such as medicine and cosmetics. These uses have had a very important role throughout the years in the development of modern medicine.

The 29 interviewed informants selected based on their reputation, gave us a total 249 plant names, however, through the process of translation and botanical name identification, this number was reduced to 69 different plant species. Those answers were analysed using the IAR and the UV in order to evaluate their potential for medicine and cosmetics. The different treatment could be categorized in 3 main classes; anti-inflammatory, skin whitening and skin smoothing. However, as some plants might be interesting for the creation of cosmetics, the use of plants as perfume was also recorded. On one hand, the more specific uses, the informants tended to agree on what plant to use as skin smoothing or skin lightening as well as for perfume (respectively IAR: 0,69, 0,71 and 0,67). On another hand, the IAR for anti-inflammatory activity is below 0,50. This can be explained by the fact that many ailments can be linked to inflammatory processes (pain, soreness, allergies, etc.). The most favoured species for use were *Jasminum nummulariaefolium* Baker (flowers) (UV: 1,20) *Lawsonia inermis* L. (leaves) (UV: 0,72) and *Carissa spinarum* L. (wood) (UV : 0,59). The ones mentioned several times and for which the informants agreed on their specific use were jasmine (*Jasminum nummulariaefolium* Baker) (flowers), henna (*Lawsonia inermis* L.) (leaves), curcuma (*Curcuma longa* L.) (rhizome) and sandal wood (*Santalum album* L.) (wood). The results obtained from this ethnobotanical work illustrate the strong cultural bond the inhabitants from Mayotte have with the traditional uses of plants. It also shows a great lack of consistency in the potential uses from an ailment point of view as well as what plant should be used. This work also illustrates the fact that informants will work toward healing the symptom first with only a little consideration to the cause of the diseases. When comparing this work, with previous work done on this island, many species are similar, however, the specific uses linked to those species tend to vary except for *Aloe mayottensis* A. Berger, *Curcuma longa* L., *Guettarda speciosa* L., and *Lawsonia inermis* L. The results originating from following studies are destined to be returned to the Mahoran population in order to help them valorise the island's flora.

Acknowledgment

The authors are grateful to all the informants in Mayotte who agreed to share their knowledge As well as to the Botanists of the CBNM (Conservatoire Botanique National du Mascarin) in Mayotte who helped with the identification of species of interest. We are also thankful for the implication of Prof Lognay (rereading), Prof. Brostaux (Statistics) and Prof. Malaisse (Ethnobotany) for their help and counsel in the completion of this work and a final thanks go to Miss Nathalie LeMeste who helped us get in contact with the population in order to identify the informants.

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