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Use of "*Pluchea bojeri* or Famonty" against Malaria, Dysentery and Influenza in the Sakalava Bemazava Ethnic Group in the Rural Commune of Antranokarany and Phytochemical Screening, Anti-Microbiology Study

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Abstract The antibacterial Pluchea bojeri was evaluated on the panel of bacteria (Enterobacter cloacae, Klebsiellaoxytoca, Escherichiacoli, Salmonella enteridis, Streptococcus pneumoniae, Psueudomonas aeruginosa, Bacillus cereus and Staphylococcus aureus) and fungi (Candida albicans). The extract of oil essentille Famonty or Pluchea bojeriest sensitive against bacteria, champignonstestés. Enterobacter cloaca (9mm), Klebsiellaoxytoca (11mm), Salmonella enteridis (15mm), Streptococcus pneumoniae (14mm), Psueudomonas aeruginosa (9mm), Bacillus cereus (10mm) and Candida albicans fungi (11mm). Euphorbia Thymoflia L contains elements of Flavonoids, Sterols and Triterpenes, Tannins and Polyphenols, but Alcaloids, Anthraquinones, Saponosides. The Sakalava Bemazava pouplation uses this plant as a medicine against malaria, influenza, dysentery, upset stomach and fatigue. In the 12 Fokontany of the rural commune of Antranokarany; the women investigated practical heat bath, decoction with boiling water cool. 35 Antranokarany, 20 Ambalamahogo, 50 Ankotika, 17 Ankoala, 32 Ampamakia, 78 Marosely, 90 Antrema, 35 Befitina, 41 Androhiba, 14 Mangabe, 80 Ampodrabe, 23 Antanimena. Traditional healers play an intermediary role between population and modern medicine. The effectiveness of this plant is due to the different molecules like Sabinene, limonene, 1.8-cineole, p-cymene linalool, β-elemene, (E) -β-caryophyllene itself 81.38% and 11.48% the items are unknown. The Famonty plant or *Pluchea bojeri* can use to discover new bioactive natural compounds that can be used as leads in the development of new pharmaceutical products with fewer side effects and risks of resistance.

Keywords Famonty or Pluchea bojeri, Ethnobotany, Phytochemical screening, Traditherapists, Moasy, phytomedicament, Dysentery, Malaria

1. Introduction

Pluchea bojeri or "Famonty" is a wild plant and very large in the district of Ambanja especially in the rural district of Antraonkrany. The traditherapeutes use as a medicine capable of curing different diseases. According to the ethnobotanical study, Sakalava Bemazava populations use leaves, roots to cure diseases inside a belly of children 1 to 12 years, even adult men.

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The use of phytotheurapie or phytomedicament has a wide range in the daily life of Sakalava Bemazava breeds. She is very familiar with the medicinal plant to treat or protect their family. The Sakalava calls the *Pluchea bojeri* "Famonty" because it is produced from oil if the leaves are rubbed by hand, so in Sakalava Bemazava Famonty is equal oil. Traditional medicine is less expensive than orthodox medicine. The cost of the latter is increased by the technology of the modern day, which in many cases is inappropriate or inapplicable to the immediate needs of people in developing countries. For the Sakalava people, medicinal plants are not the only way to provide health care, but they play an important role in protecting, maintaining and restoring people's health.

It is classified in the family Asteraceae or Compounds:

Kingdom: Plantae
Phylum: Tracheophyta
Class: Asterales
Family: Asteraceae
Genus: *Pluchea*
Species: *Pluchea bojeri*
Vernacular name: Famonty

Pluchea bojeri is a shrub (1.50 to 2 m.) With young branches covered with a deciduous pubescence. Obovate leaves cuneiform or elliptic-lanceolate, sessile, non-embracing, whole or finely toothed-mucronate in upper 2/3, 2-5 times longer than broad (3-6 X 1-2.5 cm.), Very fine pubescence, persistent (especially in the Southwest forms), or at the glabrescent end (especially in the forms of the East and North-West). Capitulums all or part sessile, tight in small glomerules arranged in terminal corymbs. Involucre (4 to 5 mm long) with lanceolate or ovate-acute outer bracts, finely pubescent and ciliate, half shorter than the internal bracts, these sublmear, acuminate, finely ciliated at the apex, scarious, matching the flowers. Many female flowers, 4-5 male flowers, purplish. Akena oblong, usually glabrous. It is very rependu in the region of Sambirano. It grows in sandy wetland stretches of rivers up to 800 m altitude. There are more than 70 species within the genus Pluchea. There are four species endemic to Madagascar (*Pluchea tomentosa, Plucheabojeri, Pluchea aphananta, Pluchea grevei*) with some varieties described [1-3].

In the chloroplast study Pluchea bojeri with PCR method, it is composed of DNA with 888 bp linear. *Pluchea bojeri* genomic DNA contains partial tRNA-Leu (trnL) gene, tRNA-Leu (trnL) -tRNA-Phe (trnF) IGS and partial tRNA-Phe (trnF) gene.

2. Material and Methods

2.1. Ethnobotanical Study

2.1.1. Presentation of the Study Area

Rural commune of Antranokarany is among the 24 districts of Ambanja District in the DIANA Region located in the north of Madagascar. In this commune is the northern part of the most mountain in Madagascar called "Tsianogna talata or Tsaratanana". It is the dances and tropical forests. Among them the endemic plants of Madgascar, in spite of that the culture on brulis very rependu in region. This commune represents 3.33% of the Ambanja district infantry. The rural municipality of Antranokarany composed 12 Fokontany (Antranokarany, Ambalamahogo, Androhibe, Befitina, Ankotika, Mangabe, Antrema, Ampamakia, Marosely, Ampondrabe, Antanimena, Ankola) [3, 4].

2.1.2. Method of Work for the Ethnobotanical Study

The investigation is done in the rural commune of Antranokarany composed 12 Fokontany. Traditional healers also called "Moasy" are people who keep the traditional customs of Sakalava Bemazava. They cure certain diseases from medicinal plant called phytomedicine. The "reni-mpianakaviana" or mothers use this plant at the level of their family to protect. "Moasy or mpanasitrana" give the modes of use, especially the preparations; dried or in the fresh state. In our study, leaves and oil are used according to the types of diseases. Populations use a lot of leaves as famonty oil because the oil treatment is in test phase. The leaves are used, either by decoction, or parbain of steam or "mievoko" in Sakalava Bemazava language. Surveys are conducted to women, mothers of children in 12 Fokontany of rural district of Antranokarany (Antranokarany, Ambalamahogo, Androhibe, Befitina, Ankotika, Mangabe, Antrema, Ampamakia, Marosely, Ampondrabe, Antanimena, Ankola).

- **Décoction:** that is to say that one uses the hot water to extract the parts of the plant which can cure, starting from leaves, roots, stems, barks or all the whole plants. They are thrown into the boiling water but it continues to heat on low heat for 15 or 20 minutes. After cooling, we drink water containing active ingredients [3-5].
- **Bath of steam:** the cut or uncut plants and essential oil are placed in a bowl or pot containing boiling water by infusion or continuous heating; immediately afterwards the limbs or treated parts from which the steam is drawn out are tilted or placed above the receptacle [3-5].

2.2. Phytochemical Screening Method

2.2.1. Preparation of the Powder of the Samples

The leaves of "Famonty or Pluchea bojeri" were dried at room temperature. Afterwards, we proceeded separately to the grinding in a wooden mortar then to sieving to obtain the powder of "Famonty or Pluchea bojeri". The fine powders obtained were well kept, in well labeled bags and placed in the desiccator [4-6].

2.2.2. Phytochemical Screening

a) Detection of alkaloids

It takes the powder from the leaves of "Famonty or *Pluchea bojeri*" and left to macerate in 10 ml of 1% HCl solution for 24 hours. The macerate is filtered and tested with a few drops of MEYER and DRAGENDORFF reagent. Alkaloids form with a white precipitate with MEYER reagent, while they form a red precipitate with DRAGENDORFF reagent [6-8].

b) Detection of flavonoids

5 to 10g of "Famonty or *Pluchea bojeri*" powders are boiled for 5 minutes in 100ml of water. After cooling and filtration, take the 5 ml of the filtrate and then add 5 ml of hydrochloric alcohol (5 ml of 95% ethyl alcohol, 2 ml of distilled water, 2 ml of 32% hydrochloric acid HCl), about 0.5 g. of magnesium chips and a few drops of iso amyl alcohol. After the appearance of the pink, orange or red

coloring in the supernatant layer of isoamyl alcohol indicates the presence of flavonoids. The same reaction carried out without adding magnesium and heating for 2 minutes in a water bath allows the characterization of leuco anthocyanin. It is positive if there is a red color [7-10].

c) Detection of anthraquinones

To detect anthraquinones, it is necessary to 5g of "Famonty or *Pluchea bojeri"* in powder soaked with a few drops of HCl at 1/5. Afterwards, they are macerated in 30 ml of the chloroform-ether mixture (1/1) in a capped vial for 24 hours. After filtration, 2 ml of filtrate are taken and added with 2 ml of the 1/10 sodium hydroxide solution. The presence of quinone is translated by the transfer of the color from red to violet of the aqueous phase [8-16].

d) Detection of sterols and Terpenes

To analyze the sterols and terpenes, it takes 1g of "Famonty or *Pluchea bojeri*" powder and they are macerated for 24 hours in a clogged flask containing 20ml of diethyl ether. 5 drops of the solution are evaporated on the watch glass. The residues are taken up and added 2 drops of acetic anhydride. The addition of the drop of concentrated sulfuric acid gives sterol or terpene compounds, which is translated by a purple coloration turning green. A negative result in these two tests indicates the absence of sterol and Terpene products [8-16].

e) Saponin detection

The saponins require 5g of "Famonty or *Pluchea bojeri*" powder decoction in 50ml of water for 15 minutes, the filtrate is collected in another 10ml test tube which is stirred vigorously and the tube is allowed to stand for 10 minutes, the persistence of foam after 10 minutes indicates the presence of saponins in the sample [8-16].

f) Detection of tannins and polyphenolics

Drop a few drops of ferric chloride 1% into the 5ml of the decoction of "Famonty or *Pluchea bojeri*". The appearance of a particular color or a precipitate indicates the presence of tannins in the powder of "Famonty or Pluchea bojeri" [10-15].

g) Detection of sterols and polyterpenes

Sterols and polyterpenes were detected in residues R1 and R5 by the Liebermann reaction. An aliquot of residue is dissolved hot in 1 ml of acetic anhydride in a capsule, then taken up in a test tube in which are poured 0.5 ml of concentrated H2SO4. The appearance of a violet color that turns blue then green indicates a positive reaction [11-14].

2.2.3. Separation of Molecules by Gas Chromatography (GPC)

Extraction of the essential oil: The essential oil of "Famonty or *Pluchea bojeri*" is obtained by steam distillation of the aerial parts of "Famonty or *Pluchea bojeri*". The density is less than 1, it is yellowish in color, liquid with a particular smell and clean.

1µl the sample (essential oil of *Pluchea bojeri*) is first introduced at the head of column via a micro syringe which will cross a soft pellet, called septum, to end up in a small chamber upstream of the column called injector. The injector is crossed by the carrier gas and brought to a temperature appropriate to the volatility of the sample. The injected quantities are split modes 51/50° with integration of 0.02% air percentage threshold. Then, once made volatile, the different compound of the sample will be carried away by the gas carrier (or carrier gas) through the column, in experiment, it is the gas hydrogen is used with constant pressure at 0.50 bar and separate from each other according to their affinity with the stationary phase. The stationary phase is a non (or slightly) volatile liquid (gas-liquid chromatography). It will cause a phenomenon of chromatographic retention with the different compounds (called solutes). The more affinity the compound has with the stationary phase, the longer it will take to get out of the column. The gross experimental size is called retention time. This is the time that elapses between the injection of the sample and the appearance of the maximum signal of the solute to the detector. To promote the transport of all compounds through the column (elution), it is necessary to determine the correct oven temperature. In the experiment, the oven temperature is 50°C to 250°C or (5°C / min). The temperature should be slightly higher than the boiling temperature of the compounds (so that the compounds do not come out too early, which would have the consequence of having their peaks combined with that of the dead time The work must be in isotherm, that is to say with a fixed temperature during all the analysis or with a program of temperature which varies [17].

At the exit of the column, the compounds meet an essential element which is called detector. The column used is UB-WAX (30m x 0.32mm x 0.5µm). This element continuously evaluates the amount of each of the separated constituents within the carrier gas by measuring different physical properties of the gas mixture. The detector sends an electronic signal to a recorder (sort of printer) which will draw the curves of each peak according to their intensity (Gaussian type curve). The set of peaks is called chromatogram. In the experiment, the detector used is FID. Currently and increasingly, the software advantageously replace the paper recorders for the interpretation of the signals sent by the detectors [17].

2.2.4. Antimicrobial Susceptibility Testing

a) Pure cultures of bacteria (Enterobacter cloacae, Klebsiellaoxytoca, Escherichiacoli, Salmonella enteridis, Streptococcus pneumoniae, Pseudomonas aeruginosa, Bacillus cereus and Staphylococcus aureus) and fungi (Candida albicans) were used for study. Bacterial strains were maintained on nutrient agar slopes at 4°C. One loop of each bacterial strain was added to a 50 ml sterile nutrient broth in a 100 ml conical solution. The requests were then incubated for 24 hours to activate the test strain. Purified fungi cultures were maintained on Sabouraud Dextrose Agar Agar (SDA) slopes at 4°C. It was transplanted onto SDA plates and incubated at room temperature for 5-8 days. The

developed spores were harvested and a spore suspension was used for the antimicrobial assays [14, 15].

b) Agar diffusion method

The antimicrobial activity of the plant extracts was evaluated by the agar diffusion method. The surface of the agar plate is inoculated by uniformly spreading the bacterial inoculum over the entire surface of the agar. For fungi, SDA was inoculated with fungal spore suspension at a tolerable temperature and transferred to sterile Petri dishes. Then, a 6 mm diameter hole is aseptically punched with a sterile cork borer and a 20 µl volume of the extract is introduced into the well. Then the bacterial plaques are incubated overnight. Similarly, the fungal plates were incubated at room temperature for 5 to 10 days. The antimicrobial agent diffuses into the agar medium and inhibits the growth of the microbial strain tested. The antimicrobial activity was determined by measuring the zone of inhibition and expressed in millimeters (mm). Five sets of plates are used for antimicrobial studies as well as control plates [14, 15].

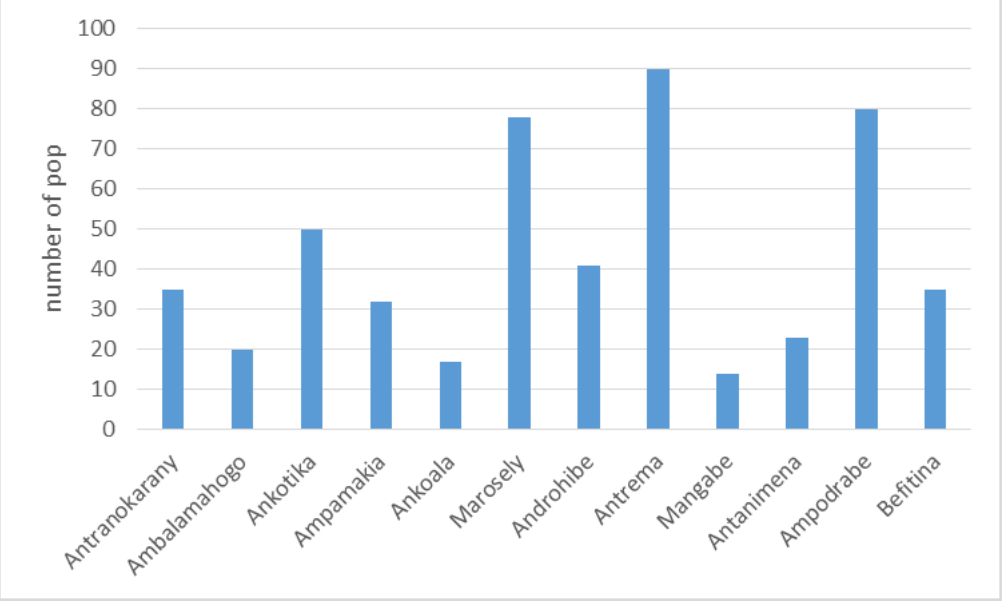
3. Results and Interpretations

3.1. Ethnobotanical Study

Table 1. Results of Ethnobotanical Surveys

Local names	Number of POPs. Female	Organs used	Preparation method	Mode of administration	Diseases
Antranokarany	35	Dried leaves and oil	-decoction -extraction of oil	-Oral voice - skin application and steam bath for oil	-dysentery -malaria -influenza -tired -massage -hematomes
Ambalamahogo	20	Dried leaves and oil	-decoction -extraction of oil	-Oral voice -skin application and steam bath for oil	-dysentery -malaria -influenza -tired -massage -hematomes
Ankotika	50	Dried leaves and oil	-decoction -extraction of oil	-Oral voice -skin application and steam bath for oil	-dysentery -malaria -influenza -tired -massage -hematomes
Ankoala	17	Dried leaves and oil	-decoction -extraction of oil	-Oral voice -skin application and steam bath for oil	-dysentery -malaria -influenza -tired -massage -hematomes
Ampamakia	32	Dried leaves and oil	-decoction -extraction of oil	-Oral voice -skin application and steam bath for oil	-dysentery -malaria -influenza -tired -massage -hematomes
Marosely	78	Dried leaves and oil	-decoction -extraction of oil	-Oral voice -skin application and steam bath for oil	-dysentery -malaria -influenza -tired -massage -hematomes
Antrema	90	Dried leaves and oil	-decoction -extraction of oil	-Oral voice -skin application and steam bath for oil	-dysentery -malaria -influenza -tired

Local names	Number of POPs. Female	Organs used	Preparation method	Mode of administration	Diseases
					-massage -hematomes
Befitina	31	Dried leaves and oil	-decoction -extraction of oil	-Oral voice -skin application and steam bath for oil	-dysentery -malaria -influenza -tired -massage -hematomes
Androhibe	41	Dried leaves and oil	-decoction -extraction of oil	-Oral voice -skin application and steam bath for oil	-dysentery -malaria -influenza -tired -massage -hematomes
Magnabe	14	Dried leaves and oil	-decoction -extraction of oil	-Oral voice -skin application and steam bath for oil	-dysentery -malaria -influenza -tired -massage -hematomes
Amponrdabe	80	Dried leaves and oil	-decoction -extraction of oil	-Oral voice -skin application and steam bath for oil	-dysentery -malaria -influenza -tired -massage -hematomes
Antanimena	23	Dried leaves and oil	-decoction -extraction of oil	-Oral voice -skin application and steam bath for oil	-dysentery -malaria -influenza -tired -massage -hematomes



According to surveys, Sakalava Bemazava women use a lot of Famonty plant to cure various diseases. It is very well known to different herbal plants. The healers called "Moasy" strongly advise the Famonty as a generic drug of Sakalava Bemezava populations. People use the dried leaves of Famonty against malaria, the flu by steam bath. In the case of dysentery or belly diseases, Sakalava women made a decoction; a drink morning, noon and an evening drink. Currently, people use against arterial hypertension, diabetes and even caner. In my study I tried to introduce in the life of the population the use of essential oil of "Famonty or *Plucheabojeri"* to treat different diseases. Because of oil extraction is very expensive here the operation being started. The populations use of Famonty are very numerous for the Fonkotany very close to the sea because the Famonty is very abundant in the earth with very high salinity, as Fokontany Antrema 90 women use the Famonty, Marosely 78, Ampondrabe 80 against 14 women for the Fokontany Mangabe, this due to the scarcity of plants in this area because it is very far from the sea.

3.2. Phytochemical Screening Results

Table 2. Results of phytochemical analyzes

Antinutritionals Factors	Results	Conclusion
Alkaloids	-	Absence of alkaloid
Flavonoids	++	Presence of Flavones
Sterols and Triterpenes	++	Presence of Steroids
Anthraquinones	-	Absence of Anthraquinones
Saponosides	-	Absences of Saponosides
Tannins and Polyphenols	++	Presencs of other types of phenolic compounds Other than pyrogallic and catechistc

The "Famonty or *Pluchea bojeri*" are widely distributed in the rural municipality of Antranokarany especially for the Fokontany close to the sea. Phytochemicals are natural substances that are modified by chemical or enzymatic reactions to develop drugs, cosmetics, plant protection products or biodegradable plastics.

a) Alkaloids

Alkaloids are organic nitrogen-containing chemical substances having a pharmacodynamic action. This name derives from the word alkaline; originally, the term was used to describe any base containing nitrogen (or amine). The alkaloids are absent in the "Famonty or *Pluchea bojeri"*.

b) Flavonoids

Flavonoids are phenolic compounds, many of which are pigments responsible for the coloring of many flowers and some fruits. Plant dyes and other natural compounds derived from the chromone have almost all skeletons of flavin more or less modified by addition or subtraction of the oxygen group and are the family of flavonoids. Flavonoids attract and guide pollinators and the reproduction of the flowering plant. They are widely distributed in the vegetable kingdom where it exists most often in soluble form of glycosides. The main activities attributed to flavonoids are a vitamin P property. Flavonoids can intervene in the intestinal or gastric mucosa to rid bad bacteria. So the flavones play a protective role inside the intestine.

c) Tannins

Tannins are complex mixtures of esters and carbohydrate ethers. They are also classified as water-soluble polyphenolic compounds derived from shikimic acid. There are classically two groups of tannins:

- the condensed tannins or proanthocymidols
- the hydrolysable tannins.

The tannins have pharmacological properties either internally, their application exerts an antidiarrheal effect and anti-dysenteries. The tannins in the "Famonty or *Pluchea bojeri*" play an antiseptic role externally, the tannins waterproof the outermost layers of the skin and mucous membranes thus protecting the underlying layers.

d) Saponins

Saponins are substances abundantly prevalent in the vegetal reign and owe their name to the fact that their aqueous solution foam abundantly. But in the "Famonty or *Pluchea bojeri*" he is absent.

e) Anthraquinones

The anthraquinones are in the form of quinones whose compounds corresponding to the oxidation of aromatic compounds and characterized by a -1,2 cyclohexadian diceto-3,5 (ortho-quinone) unit. Natural quinones belong to three main groups: Benzoquinones, Naphta quinones and Anthraquinones.

Quinones are of great technical importance (dyes) and biochemical (redox catalysts in cells). The synthesizes the quinones using different methods, according to their structures.

Benzoquinone is obtained by oxidation of aromatic amines or phenols. The oxidation of naphthalene and larger aromatic polycycles gives directly quinones. They are absent in the "Famonty or Pluchea bojeri".

f) Steroids and Terpenoids-steroids

- **Steroids** can be considered as triterpenoid having lost up to 3 methyls.

They constitute an important class of biological compounds such as: sterols per se, adrenocortical and sexual hormones, aglycones of cardiac glycosides, saponins and some alkaloids.

Steroids are a family of compounds that contain the per-1,2-cyclopentano phenanthrene backbone and are part of lipids. These compounds are frequently found in plants and animals and are among the most important natural products. The sterols have a hydroxyl group on the carbon atom 3, a double bond between the carbon atoms 5 and 6 and a side chain attached to the top 17 of the perhydrocyclopentano phenanthrene ring.

Cholesterol is the most representative of sterols; it gives birth to the majority of steroids. The presence of the steroids

of "Famonty or *Pluchea bojeri*" is marked. Our remark mentions that they stop the intestinal bleeding and stomach of a person for people with different types of food poisoning.

-Triterpènes

It is called terpene, a series of constituents of fragrant vegetable essences generally obtained by steaming. These are relatively volatile essential oils (C_{10} or C_{15}) (essence of mint, pine, eucalyptus, rose, lemongrass).

Some terpenes used as medicine were already known in antiquity. Nowadays, camphor and α-pinene are of commercial importance. Terpenoids play a role of microbial barrier and stop all bad microbial actions.

3.3. Results of Different Molecules by Gas Chromatography (GPC)

Table 3. Separation of the molecules of "Famonty or *Pluchea bojeri*"

Component Name	Retention Time (min)	Area % (%)	Area (.1*uV *sec)	RI (FAME)
sabinène	4,212	0,02	2709	622,3
limonène	5,675	0,11	17140	703,0
1.8-cinéole	5,898	0,03	4471	712,9
p-cymène	7,31	0,02	2450	775,6
	9,463	0,04	6520	864,2
	10,277	0,05	7059	896,8
	12,628	0,12	19434	983,6
	13,477	0,08	11987	1015,4
linalol	14,39	0,08	12737	1050,2
β-élémène	15,198	0,04	6660	1081,0
(*E*)-β-caryophyllène	15,303	0,08	12816	1085,0
terpinèn-4-ol	15,723	0,02	2906	1101,1
	16,498	0,08	11993	1131,4
	17,287	0,03	4546	1162,3
néral	17,725	0,03	4944	1179,5
α-terpinéol	18,113	0,04	5830	1194,6
N.D.	18,447	**81,38**	12728000	1208,0
géranial	18,948	0,04	5634	1228,4
δ-cadinène	19,287	0,09	13954	1242,2
	20,942	0,02	2437	1310,0
géraniol	21,612	0,05	7238	1338,3
	22,978	0,02	2683	1396,0
	23,252	0,05	8279	1407,8
	23,402	0,12	18983	1414,2
	23,942	0,18	28292	1437,6
méthyl eugénol	25,333	0,58	91174	1497,6
	25,475	0,51	79092	1504,1
	26,01	0,12	18997	1529,6
	26,35	0,05	7595	1545,7
N.D.	26,64	**11,48**	1795045	1559,5
	27,435	0,05	7673	1597,3
	27,518	0,19	30187	1601,3
	27,895	0,22	34335	1620,7
eugénol	28,482	0,03	5403	1651,0
	28,72	0,02	3095	1663,2
	29,575	0,05	7405	1706,8
	29,623	0,05	7449	1709,1
	29,912	0,03	4458	1723,0
	30,035	0,03	4138	1729,0
	31,043	0,04	5901	1777,6
	31,19	0,08	12617	1784,7
	31,863	0,05	7103	1818,9
	32,097	0,42	65022	1831,4
	32,95	0,16	24410	1876,8
	33,597	0,03	4874	1911,6
	34,418	0,04	6598	1956,9
	34,675	0,02	2579	1971,0
	34,865	0,04	5823	1981,5
	35,073	0,04	5723	1993,0
	36,06	0,93	145191	2047,1
	36,485	0,94	147242	2070,3
	36,66	0,01	2104	2079,9
	37,358	0,05	7574	2120,6
	37,843	0,1	14879	2150,7
	39,325	0,21	33574	2238,1
	41,565	0,58	90815	2368,6
	42,623	0,05	7874	2419,3
	43,395	0,02	3115	2446,6
			15640780	
N.D.: Not determined				

"Famonty or *Pluchea bojeri*" contains eugenol, eugenol, limonene, δ-cardinene, geraniol, α-terpineol, linalool, terpinen-4-ol and β-elemene. In the main search of the different molecules are not known in the "Famonty or *Pluchea bojeri*" as 81.38% and 11.48% of the major elements are not known and determined. To finalize and discover the secrets of the "Famonty or *Pluchea bojeri*" plants, one needs Gas Chromatography (GC) - mass spectrophotometry (MS). It is an analytical technique that combines the performance of gas chromatography, for the separation of compounds from a sample, and mass spectrometry, for the detection and identification of compounds according to their mass loading ratio. This technique makes it possible to precisely identify and quantify numerous substances present in very small quantities, even in traces. GC-MS applications include drug or narcotics dosing, environmental analysis, and the identification of all substances in the form of traces. The GC-MS is also presented as being the absolute reference of the samples of "Famonty or *Pluchea bojeri"*. But our studies show that the presence of different volatile elements such as:

- **Monoterpenes**: limonene $C_{10}H_{16}$
  Terpinen-4-ol $C_{10}H_{18}O$
  Sabinene $C_{10}H_{16}$
  1,8-Cineole $C_{10}H_{18}O$
  α-Terpineole $C_{10}H_{18}O$
- **Sesquiterpenes:** β-elemene $C_{15}H_{24}$
  β-Caryophyllene $C_{15}H_{24}$
  δ-Cardinene $C_{15}H_{24}$
- **Phenol**: methyl eugenol $C_{10}H_{12}O$
  Eugenol $C_{10}H_{12}O$
- **Alcohol**: Geraniol

3.4. Antimicrobial Susceptibility Results

Table 3. Antimicrobial test

Test Germs	*Pluchea bojeri*oil	Reference Antibiotics	
	Inhibition Halo Diameter (mm)	Nalidixic Acid (NA 30)	Fusidic Acid (FA 10)
Streptococus pneumonia (gram+)	14	-	25
Staphylococcus aureus (gram+)	9	-	23
Enterobacter cloacae (gram-)	9	20	-
Escherchia coli (gram-)	6	18	-
Klebsiellaoxytoca (gram-)	11		
Pseudomonas aeruginosa (gram+)	9	20	-
Bacillus cereus (gram+)	10	-	12
Candida albicans	11	-	14
Salmonella enteridis (gram-)	15	18	-

Diameter of the discs: 6 mm
Cell concentration: 10^6 cell/ml
Concentration of the huile/disc: 10µl
Standards: x (inhibitions halo diameter) <8mm: resistant; 9mm<x<14mm: sensitive; 15mm<x1<19mm: very sensitive; 20mm: extremely sensitive

Pluchea bojeri antimicrobials were evaluated against a panel of bacteria (Escherichia coli, Psueudomonas aeruginosa, Klebsiellaoxytoca, Streptococcuspneumoniae and Staphylococcus aureus, Bacillus cereus, Salmonella enteridis) and fungi (Candida albicans). The essential oil of Pluchea bojeri was sensitive against the bacteria and fungi tested. The essential oil of Pluchea bojeriest active or susceptible to gram + as Streptococcus pneumoniae with inhibition halo (x) 14mm and inhibitory halo Bacillus cereus (x) 10mm.

It is less active compared to the reference antibiotic fusidic acid 10µg. Regarding gram-like bacteria *Salmonella enteridis*, *Enterobacter cloacae*, *Klebsiellaoxytoca,* oil is active and very sensitive especially on *Salmonella enteridis* with 15mm halo inhibition (x); 9mm for *Enterobacter cloacae* 11mm Klebsiellaoxytocamais it is less active than the reference antibiotic Nalixidique.

Concerning the antifungal the essential oil of *Pluchea bojeri* is active with *Candida albicans*.

The Famonty plant or *Pluchea bojeri* is a drug widely used for Sakalava, it is able to cure flu, malaria, dysentery, stomach upset and muscle fatigue.

4. Discussion

The "Famonty or *Pluchea bojeri*" one of plants widely used in the rural municipality of Antranokarany. The Sakalava Bemazava ethnic group advises the "Moasy" that the plant "Famonty or *Pluchea bojeri*" is a very effective phytomedicine against diseases such as dysentery, fatigue, stomach disease. But the problem for researchers is the rates or percentages the molecules remain unknown 81.38% and 11.48% of the molecules. Concerning action on microorganisms; *Pluchea bojeri* essential oil is active whether it is gram + or gram- like *Streptococus pneumoniae* (gram +) with 14mm inhibition halo (x) and 15mm for *Salmonella enteridis* (gram-). It is very sensitive to the fungal strain like *Candida albicans*. It is interesting to diseases against skin disease, tells the mosquito with its sting. It acts as a protective and soothing skin. Oil of "Famonty or *Pluchea bojeri*" against hematomas, cuts. The presence of different molecules such as Sabinene, limonene, 1.8-cineole, p-cymene linalool, β-elemene, (E) -β-caryophyllene play an important role in the plant efficiency Famonty or Pluchea bojeri same 81.38% and 11.48% the elements are unknown. The presence of different volatile molecules grouped in different groups like monoterpenes, sesquiterpenes, phenols, alcohols. Sabinene, limonene, 1.8-cineole, p-cymene linalool, β-elemene, (E) -β-caryophyllene play an important role in the efficacy of Famonty plant or Pluchea bojeri. And also non-volatile constituents such as flavonoids, triterpenes, anthraquinones, tannins, sterols improve the antimicrobial activity of *"Famonty or Pluchea bojeri*" even 81.38% and 11.48% the elements are unknown.

5. Conclusions

The Sakalava Bemazava loves plants, that's why he uses everyday life to educate their families in difficult situations. "Famonty or *Pluchea bojeri*" is used to cure diseases such as dysentery, diarrhea, stomach pain and fatigue. Even the big percentages of the molecules are not recognized by the researchers, the Sakalava Bemazava has no doubt and confidence in the "Moasy" to protect the ethnic group. The sakalava believe the traditional practitioners of their societies. The presence of volatile and non-volatile elements in the "Famonty or Pluchea bojeri" is the basis of the effectiveness on the antimicrobial activity even the traditherapeutes, the Moasy do not know the presence of the different molecules. On 12 Fokontany in the rural commune of Antranokarany uses at least once in a year the plant "*Famonty or Pluchea bojeri*" to protect their family.

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