

Ethnobotanical study of medicinal plants used in the treatment of male erectile dysfunction in the Prefectures of N'Zérékoré, Macenta and Beyla, Republic of Guinea

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Abstract

In the Prefectures of N'Zérékoré, Macenta and Beyla in southern Guinea, people make extensive use of medicinal plants to treat a number of diseases, including erectile dysfunction. The aim of the study was to identify the medicinal plants used to treat erectile dysfunction. Ethnobotanical surveys were carried out using questionnaires and individual interviews from 15 April to 20 May 2024 in the weekly markets of the urban districts of N'Zérékoré, Macenta and Beyla. The study identified a total of 31 plants species divided into 23 families used in the recipes used by traditional healers and herbalists to eradicate the disease. 28 recipes are prepared using these species. Species from the *Leguminosae*, *Zingiberaceae* and *Liliaceae* families are the most widely represented. Tubers, roots, leaves and bark are the most commonly used parts. Bark, roots, leaves and tubers are the most commonly used parts. Ces résultats constituent une base de données pour de futures études visant à évaluer le potentiel biologique et chimique de ces plantes.

Keywords: Medicinal plants; Ethnobotany; Erectile dysfunction; Traditional practitioners; Herbalists

1. Introduction

According to the World Health Organisation, nearly 80% of the world's population relies on traditional medicine for primary health care [1].

Traditional medicine has a cultural value in Guinea and is present in all villages, where it is the first line of treatment for rural populations [2]. The widespread use of this medicine can be explained, on the one hand, by the fact that modern treatments using pharmaceutical products are very expensive and far beyond the purchasing power of the vast majority of the population. Secondly, the ineffectiveness and even side-effects of certain modern medicines justify this approach [3]. Numerous studies in Africa have identified a wide range of medicinal plants used to treat dysfunction [4-6].

Guinea, with its significant biological and cultural diversity, has a rich medicinal flora that contributes to the livelihood of rural populations. Despite ethnobotanical knowledge of medicinal plants, studies on plants used to treat erectile dysfunction are still in their infancy. The forest zone, one of Guinea's four (4) most culturally diverse natural regions, has a rich and varied flora that is still poorly understood. Many of the plants from this flora are used by the local population through traditional practitioners and herbalists to treat a number of illnesses, including erectile dysfunction. These medicinal plants, which contribute to the livelihoods of rural and urban populations, are significantly these plants are inventoried by communities, but little research has been carried out by botanists and other researchers. As a result, there is a real danger that knowledge of medicinal plants will be lost, given the pace of deforestation in Guinea, without

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their characteristics and biochemical composition being known. As a result, the study on the knowledge of plants used in the traditional treatment of erectile dysfunction in our study area is necessary and could contribute to the management of this disease but also lead to the development of a database.

2. Materials and methods

2.1. Sampling

With the support of the regional health inspectorate and the regional coordination of traditional practitioners in the administrative region of N'Zérékoré, the list and contacts of members of associations of traditional practitioners and herbalists were obtained. Only those with knowledge of the plants used in the treatment of erectile dysfunction and who had freely consented to be interviewed were included in the list. Interviewees were selected irrespective of age, gender, ethnicity or religion. Based on these criteria, 70 people were interviewed.

2.2. Ethnobotanical surveys

Ethnobotanical surveys were carried out among traditional medicine practitioners, especially traditional healers and herbalists, at medicinal plant sales markets in our areas of investigation. But first, the localities in which traditional medicine practitioners are recognised as having proven knowledge in the treatment of erectile dysfunction were identified. Contacts were therefore established with resource persons or local guides in the areas to be visited. The survey involved a sample of 70 people made up of traditional healers and herbalists. In each of the prefectures, we worked with traditional healers selected on the basis of their influence in their locality and the number of patients they received and treated. Meetings with traditional healers were always facilitated by a resource person from the area visited. Five markets were chosen on the basis of their importance in our study area, and in each of them we worked with six randomly selected women selling medicinal plants. The target localities were visited over a period of 40 days spread over two months (15 April to 25 May 2024). To ensure the quality of the data collected, the surveys were combined with the collection of botanical samples. Semi-structured interviews were conducted with traditional practitioners. Herbalists were visited at markets in the study area. The protocol for collecting samples is based on the purchase of plant recipes used in the treatment of erectile dysfunction, just like any sick person who comes to the herbalist for treatment. The botanical and ethnobotanical characteristics of the plants used, their use in single recipes or in combination, the organs used, the methods of preparation and administration and the dosage were noted, and all the specimens were collected. The vernacular names of the species were collected in the national languages (Kpèlè, Loma and Konianké). These various stages enabled herbarium samples to be taken and the species to be photographed. The plants obtained were identified at the Eco-botany Laboratory of the University of N'Zérékoré using the available flora.

2.3. Data processing

Microsoft Excel was used to process the data collected. It was used to enter the data collected, make calculations and construct histograms, diagrams and tables. The analyses focused mainly on the methods used to prepare the recipes and the contribution of each species (CPr), which makes it possible to assess the frequency of involvement of each species in the recipes. It was determined for each species using the formula: $CPr = (Nr/Nt) \times 100$ [7]. Where Nr: number of recipes involving the plant, Nt: total number of recipes.

3. Results and discussion

The ethnobotanical survey made it possible to interview 70 practitioners of traditional medicine, including herbalists and traditional practitioners (Table 1).

Table 1 Number of traditional practitioners and herbalists interviewed (n=70)

| N° | Surveys | Head count | |
|-------|---------------------|------------|-------|
| | | Men | Women |
| 1 | Traditional healers | 33 | 6 |
| 2 | Herbalists | 29 | 2 |
| Total | | 62 | 8 |

The table shows that there were 19 traditional practitioners, 9 of whom were women, and 7 herbalists, 1 of whom was a man.

3.1. List of plants used to treat male erectile dysfunction in the prefectures of N'Zérékoré, Macenta and Beyla

The ethnobotanical study in the three prefectures identified a total of 31 species belonging to 23 families (table 2).

Table 2 List of plants used to treat erectile dysfunction

| N° | Scientific name | Family | Organs used |
|----|--|------------------|-------------------------|
| 1 | <i>Cassia sieberiana</i> (Johann Friedrich Gelin 1791) | Caesalpiniaceae | Root |
| 2 | <i>Picralima nitida</i> (T. Durand et H. Durand 1910) | Apocynaceae | Fruit |
| 3 | <i>Nauclea didderichii</i> (Ernest Henri Baillon 1887) | Rubiaceae | Bark |
| 4 | <i>Adansonia digitata</i> (Michel Adanson 1753) | Bombacaceae | Bark |
| 5 | <i>Milicia excelsa</i> (George Bentham 1849) | Moraceae | Root |
| 6 | <i>Securidaca longedunculata</i> (Carl Peter Thunberg 1794) | Moraceae | Root |
| 7 | <i>Allium sativum</i> (Carl Von Linne, 1753) | Liliaceae | Root |
| 8 | <i>Allium cepa</i> (Carl Von Linne, 1753) | Liliaceae | Tubercule |
| 9 | <i>Daucus carota</i> (Carl Von Linne, 1753) | Apiaceae | Tubercule |
| 10 | <i>Zingiber officinal</i> (Carl Von Linne, 1753) | Zingiberaceae | Tuber |
| 11 | <i>Symphonia globulifera</i> (Jean baptise christophore, 1775) | Clusiaceae | Rhizomes |
| 12 | <i>Aframomum melegueta</i> (Carl Von Linne, 1763) | Zingiberaceae | Trunk bark |
| 13 | <i>Xylopia aethiopica</i> (Carl Von Linne, 1759) | Annonaceae | Seeds |
| 14 | <i>Tamarindus indica</i> (Carl Von Linne, 1753) | Fabaceae | Fruit |
| 15 | <i>Bidens pilosa</i> (Carl Von Linne, 1753) | Asteraceae | Fruit, root, bark, leaf |
| 16 | <i>Elaeis guineensis</i> (Carl Von Linne, 1763) | Arecaceae | Leaf |
| 17 | <i>Ageratum conyzoides</i> (Carl Von Linne, 1753) | Asteraceae | Bark and root |
| 18 | <i>Phyllanthus amarus</i> (Johann Muller, 1863) | Euphorbiaceae | Leaf |
| 19 | <i>Funtumia elastica</i> (Ernest Baillon, 1884) | Apocynaceae | Whole plant |
| 20 | <i>Arachis pintois</i> (Krapovicas, 1994) | Fabaceae | Bark |
| 21 | <i>Citrus limon</i> (Carl Von Linne, 1753) | Rutaceae | Leaf |
| 22 | <i>Parkia biglobosa</i> (Robert brown, 1826) | Fabaceae | Root, Leaf |
| 23 | <i>Scorparia dulcis</i> (Carl Von Linne, 1753) | Scrophulariaceae | Trunk bark |
| 24 | <i>Bombax costatum</i> (Pellegrin, 1914) | Bombacaceae | Trunk bark |
| 25 | <i>Kalanchoe blossfeldiana</i> (Remon Hamet, 1934) | Crassulaceae | Trunk bark |
| 26 | <i>Codiaeum variegatum</i> (Ludwig Blum, 1826) | Euphorbiaceae | Bark. |
| 27 | <i>Pygeum africanum</i> (John Gilbert Baker, 1863) | Rosaceae | Tubercule |
| 28 | <i>Securidaca longedunculata</i> (Thunberg, 1794) | Polygalaceae | Tubercule |
| 29 | <i>Euphorbia hirta</i> (Carl Von Linne, 1753) | Euphorbiaceae | Tuber |
| 30 | <i>Garcinia kola</i> (Gustav Adolph Engler, 1895) | Clusiaceae | Rhizomes |
| 31 | <i>Ocimum gratissimum</i> (Linne, 1753) | Lamiaceae | Trunk bark |

The survey revealed that of the 21 families, Euphorbiaceae was the most represented with 3 species, followed by Bombacaceae, Polygalaceae, Liliaceae, Zingiberaceae, Asteraceae and Moraceae.

Table 3 List of plants used against erectile dysfunction by locality and their vernacular names

| N° | Family | Scientific name | Vernacular names | | |
|----|-----------------------|---|------------------|----------------|------------------|
| | | | N'Zérékoré | Macenta | Beyla |
| | | | Kpèlè | Loma | Konianké |
| 1 | <i>Caesalpinaceae</i> | <i>Cassia sieberiana</i> (Johann Friedrich Gelin 1791) | Cassiawulu | Cassiawulii | Sidian (malinké) |
| 2 | <i>Apocynaceae</i> | <i>Picralima nitida</i> (T. Durand et H. Durand 1910) | Wolokpagaou | Golowolozè | Waro woroba |
| 3 | <i>Rubiaceae</i> | <i>Nauclea didderichii</i> (Ernest Henri Baillon 1887) | Yakounanwulu | Zié bazi | kounadjiri |
| 4 | <i>Bombacaceae</i> | <i>Adonsonia digitata</i> (Michel Adanson 1753) | Baranwulu | Cidaa wulii | Cidaa |
| 5 | <i>Moraceae</i> | <i>Milicia excelsa</i> (George Bentqm 1849) | Guéliwoulou | Kodawulii | Diaradjiri |
| 6 | <i>Moraceae</i> | <i>Securidaca longedunculata</i> (Carl Peter Thunberg 1794) | Baliamou | Bilegulugui | Denbasidjiri |
| 7 | <i>Liliaceae</i> | <i>Allium sativum</i> (Carl Von Linne, 1753) | L'ail gnagba | L'ail gnavhaye | L'aildiaba |
| 8 | <i>Liliaceae</i> | <i>Allium cepa</i> (Carl Von Linne, 1753) | Gnaba | Gnavhaye | Diaba |
| 9 | <i>Apiaceae</i> | <i>Daucus carota</i> (Carl Von Linne, 1753) | Carote wulu | Carotegui | Carotii |
| 10 | <i>Zingiberaceae</i> | <i>Zingiber officinal</i> (Carl Von Linne, 1753) | Lèmoukié | Zounhizègui | Gnamakoun |
| 11 | <i>Clusiaceae</i> | <i>Symphonia globulifera</i> (Jean baptise christophore, 1775) | Kékéné | Tègulu | Simbadjiri |
| 12 | <i>Zingiberaceae</i> | <i>Aframomum melegueta</i> (Carl Von Linne, 1763) | Kpoguien | Taakhizegui | Forotomèssè |
| 13 | <i>Annonaceae</i> | <i>Xylopiya aethiopica</i> (Carl Von Linne, 1759) | Hébbéwulu | Sèvègui | Touba |
| 14 | <i>Fabaceae</i> | <i>Tamarindus indica</i> (Carl Von linne, 1753) | Minwulu | Milingulu | Tombi |
| 15 | <i>Asteraceae</i> | <i>Bidens pilosa</i> (Carl Von Linne, 1753) | Gbagbatia | Glagol | Remèbassi |
| 16 | <i>Areaceae</i> | <i>Elaeis guineensis</i> | Towulu | Toowoului | Tindjiri |

| | | | | | |
|----|-------------------------|--|--------------|---------------------|-----------------------------|
| | | (Carl Von Linne, 1763) | | | |
| 17 | <i>Asteraceae</i> | <i>Ageratum conyzoides</i> (Carl Von Linne ,1753) | Pélékpo | Guglugui | Palubasi |
| 18 | <i>Euphorbiaceae</i> | <i>Phyllanthus amarus</i> (Johann Muller, 1863) | Polonighan | Kpakpiligui | Bissanmèssè |
| 19 | <i>Apocynaceae</i> | <i>Funtumia elastica</i> (Ernest Baillon, 1884) | Héghéléwulu | Bolo Wôlôwologui | Kèedili |
| 20 | <i>Fabaceae</i> | <i>Arachis pintois</i> (Krapovic, 1994) | Lowotihannaa | Tihangui | Singbilikedjoug bassibissan |
| 21 | <i>Rutaceae</i> | <i>Citrus limon</i> (Carl Von Linne, 1753) | Ganikpona | Nomolonkpodaye | lémounoukoumoun |
| 22 | <i>Fabaceae</i> | <i>Parkia biglobosa</i> (Robert browr, 1826) | Simananwulu | Zooumangoulii | Néré |
| 23 | <i>Scrophilariaceae</i> | <i>Scorparia dulcis</i> (Carl Von Linne, 1753) | Nalien | Magoei | Timitiminin |
| 24 | <i>Bombacaceae</i> | <i>Bombax costatum</i> (Pellegrin, 1914) | Wiyèlon | Guluiwalye | Boumou |
| 25 | <i>Crassulaceae</i> | <i>Kalanchoe blossfoldiana</i> (Remon Hamet, 1934) | Milanwulu | Dadaigui | Kalakissan |
| 26 | <i>Euphorbiaceae</i> | <i>Codiaeum variegatum</i> (Ludwig Blum, 1826) | Yakoliwulu | Kpesègului | Konkomananin |
| 27 | <i>Rosaceae</i> | <i>Pygeum africanum</i> (John Gilbert Baker, 1863) | Hinawulu | Djablongui | Safou |
| 28 | <i>Polygalaceae</i> | <i>Securidaca longedunculata</i> (thinberg, 1794) | Lakoya | Mawalaye | Bali |
| 29 | <i>Euphorbiaceae</i> | <i>Euphorbia hirta</i> (Cqrl Von Linne, 1753) | Yakowulu | Gulu | Dembasindji |
| 30 | <i>Clusiaceae</i> | <i>Garcinia kola</i> (Gustav Adolph Engler, 1895) | Touwolopèlè | Touwiliwhanaye | Woromessèni |
| 31 | <i>Lamiaceae</i> | <i>Ocimum gratissimum</i> (Linne, 1753) | Kouwhulu | Koumigui | Zoungbran |

This table shows that the herbalists and traditional practitioners surveyed belong to three language groups: Kpèlè, Loma and Konianké (table 3).

3.2. The various recipes prepared to treat erectile dysfunction

According to our surveys, 28 recipes are prepared from 31 plants (Table 4).

Table 4 Medicinal plants surveyed and how they are prepared

| N° | Scientific name | Organs used | Method of preparation | Method of administration |
|-----|--|-------------|---|--------------------------|
| R1 | <i>Cassia sieberiana</i> | Root | Decoction | By mouth |
| R2 | <i>Picralima nitida</i> | Fruit | Infusion | By mouth |
| R3 | <i>Nauclea didderichii</i> | Bark | Cut up and put in a jug of water or white wine | By mouth |
| R4 | <i>Adamsonia digitata</i> | Bark | Cut up, crush, put in a container and add water. | By mouth |
| R5 | <i>Milicia excelsa</i> + <i>Securidaca longedunculata</i> | Root | The decoction of the roots will be mixed with honey and left to rest for two (2) days before use. | By mouth |
| R6 | <i>Allium sativum</i> + <i>Allium cepa</i> + <i>Daucus carota</i> + <i>Zingiber officinal</i> | Tuber | Turn into powder and mix with honey | By mouth |
| R7 | <i>Symphonia globulifera</i> | Tuber | Powder or kaolin to be taken in hot water; soup; white wine | By mouth |
| R8 | <i>Aframomum melegueta</i> + <i>Xylopi aethiopica</i> + <i>Tamarindus indica</i> | Tuber | Powder + salt germ to be taken in soup; hot water | By mouth |
| R9 | <i>Funtumia elastica</i> | Rhizomes | Decoction | By mouth |
| R10 | <i>Arachis pintois</i> | Trunk bark | Crush leaves and prepare with meat soup | By mouth |
| R11 | <i>Citrus limon</i> | Trunk bark | Put in a container add water and honey | By mouth |
| R12 | <i>Parkia biglobosa</i> | Seeds | Powder the bark and add water | By mouth |
| R13 | <i>Scorparia dulcis</i> | Fruit | By decoction | By mouth |
| R14 | <i>Bombax costatum</i> | Bark | Powder plus rock salt mix and put in porridge to consume | By mouth |
| R15 | <i>Kalanchoe blossfeldiana</i> | Leaf | Decoction | By mouth |
| R16 | <i>Codiaeum variegatum</i> + <i>Zingiber officinal</i> | Root + | Decoction + honey | By mouth |
| R17 | <i>Pygeum africanum</i> | Leaf | Decoction | By mouth |
| R18 | <i>Securidaca longedunculata</i> | Trunk bark | Infusion | By mouth |
| R19 | <i>Euphorbia hirta</i> + <i>Aframomum melegueta</i> | Leaf | Powder + salt to be taken in hot water; juice or white wine or porridge | By mouth |
| R20 | <i>Ageratum conyzoides</i> + <i>Aframomum melegueta</i> | Trunk bark | Powder + salt in hot water, juice or white wine | By mouth |
| R21 | <i>Zingiber officinal</i> + <i>Xylopi aethiopica</i> | Bark. | Decoction + honey | By mouth |
| R22 | <i>Funtumia elastica</i> + <i>Aframomum melegueta</i> | | Powder + salt | By mouth |
| R23 | <i>Aframomum melegueta</i> + | Leaf + bark | Infusion from juice or white wine | By mouth |

| | | | | |
|-----|---|-------------------|---|------------------------------------|
| | <i>Xylopi aethiopic a</i> + <i>Elaies guineensis</i> + | | | |
| R24 | <i>Bidens pilosa</i> + <i>Aframomum melegueta</i> | Trunk bark + root | Powder + salt to be taken in hot water; juice or white wine | By mouth |
| R25 | <i>Bidens pilosa</i> + <i>Aframomum melegueta</i> + <i>Ageratum conyzoides</i> | Rhizomes | Powder to be taken in hot water; juice or white wine | Oral |
| R26 | <i>Garcinia kola</i> + <i>Ocimum gratissimum</i> + <i>Bdens pilosa</i> | Leaf | Powder to be taken in porridge; broth; or white wine | Oral route |
| R27 | <i>Garcinia kola</i> + <i>Adamsonia digitata</i> | Root | Powder + shea butter | Cutaneous (by massaging the penis) |
| R28 | <i>Garcinia kola</i> + <i>Ocimum gratissimum</i> + <i>Bdens pilosa</i> + <i>Aframomum melegueta</i> | Whole plants | Powder + salt to be taken in the porridge; broth; or white wine | Oral route |

R= recipe

The results of this table show that 28 recipes are prepared from 31 species. The most commonly used method of administration is oral. Only one recipe is administered by the cutaneous route (by massaging the penis).

3-3-Classification of plants by therapeutic potential

The contribution of each species (CPr) makes it possible to assess the frequency of involvement of this species in the recipes. It will be determined for each species by the formula: $CPr = (Nr/Nt) \times 100$, where Nr: number of recipes using the plant, Nt: total number of recipes (Table 5).

Table 5 List of plants used to treat erectile dysfunction and their contribution to recipe preparation (CPr)

| 9 | Family | Scientific name | Number of recipes involving plants (Nr) | CPr |
|---|-----------------------|---|---|-----|
| 1 | <i>Caesalpinaceae</i> | <i>Cassia sieberiana</i> (Johann Friedrich Gelin 1791) | 1 | 2% |
| 2 | <i>Apocynaceae</i> | <i>Picalima nitida</i> (T.Durand et H. Durand 1910) | 1 | 2% |
| 3 | <i>Rubiaceae</i> | <i>Nauclea didderichii</i> (Ernest Henri Baillon 1887) | 1 | 2% |
| 4 | <i>Bombacaceae</i> | <i>Adonsonia digitata</i> (Michel Adanson 1753) | 2 | 4% |
| 5 | <i>Moraceae</i> | <i>Melicia excelsa</i> (George Bentqm 1849) | 1 | 2% |
| 6 | <i>Moraceae</i> | <i>Securidaca longedunculata</i> (Carl Peter Thunberg 1794) | 1 | 2% |
| 7 | <i>Polygalaceae</i> | <i>Allium sativum</i> (Carl Von Linne, 1753) | 1 | 2% |
| 8 | <i>Liliaceae</i> | <i>Allium cepa</i> (Carl Von Linne ,1753) | 1 | 2% |
| 9 | <i>Liliaceae</i> | <i>Daucus carota</i> (Carl Von Linne ,1753) | 1 | 2% |

| | | | | |
|----|-------------------------|--|---|-----|
| 10 | <i>Apiaceae</i> | <i>Zingiber officinal</i> (Carl Von Linne, 1753) | 3 | 6% |
| 11 | <i>Zingiberaceae</i> | <i>Symphonia globulifera</i> (Jean baptise christophore ,1775) | 1 | 2% |
| 12 | <i>Clusiaceae</i> | <i>Aframomum melegueta</i> (Carl Von Linne, 1763) | 8 | 16% |
| 13 | <i>Zingiberaceae</i> | <i>Xylopia aethiopica</i> (Carl Von Linne, 1759) | 3 | 6% |
| 14 | <i>Annonaceae</i> | <i>Tamarindus indica</i> (Carl Von linne, 1753) | 1 | 2% |
| 15 | <i>Asteraceae</i> | <i>Bidens pilosa</i> (CarlVon Linne ,1753) | 4 | 8% |
| 16 | <i>Arecaceae</i> | <i>Elaeis guineensis</i> (Carl Von Linne, 1763) | 1 | 2% |
| 17 | <i>Asteraceae</i> | <i>Ageratum conyzoides</i> (Carl Von Linne ,1753) | 2 | 4% |
| 18 | <i>Euphorbiaceae</i> | <i>Phyllanthus amarus</i> (Johann Muller, 1863) | 1 | 2% |
| 19 | <i>Apocynaceae</i> | <i>Funtumia elastica</i> (Ernest Baillon, 1884) | 2 | 4% |
| 20 | <i>Fabaceae</i> | <i>Arachis pintois</i> (Krapovicas, 1994) | 1 | 2% |
| 21 | <i>Rutaceae</i> | <i>Citrus limon</i> (Carl Von Linne, 1753) | 1 | 2% |
| 22 | <i>Fabaceae</i> | <i>Parkia biglobosa</i> (Robert browr, 1826) | 1 | 2% |
| 23 | <i>Scrophilariaceae</i> | <i>Scorparia dulcis</i> (Carl Von Linne, 1753) | 1 | 2% |
| 24 | <i>Bombacaceae</i> | <i>Bombax costatum</i> (Pellegrin, 1914) | 1 | 2% |
| 25 | <i>Crassulaceae</i> | <i>Kalanchoe blossfoldiana</i> (Remon Hamet, 1934) | 1 | 2% |
| 26 | | <i>Codiaeum variegatum</i> (Ludwig Blum, 1826) | 1 | 2% |
| 27 | <i>Euphorbiaceae</i> | <i>Pygeum africanum</i> (John Gilbert Baker, 1863) | 1 | 2% |
| 28 | <i>Rosaceae</i> | <i>Securidaca longedunculata</i> (thinberg, 1794) | 1 | 2% |
| 29 | <i>Polygalaceae</i> | <i>Euphorbia hirta</i> (Cqrl Von Linne, 1753) | 1 | 2% |
| 30 | <i>Clusiaceae</i> | <i>Garcinia kola</i> (Gustav Adolph Engler, 1895) | 3 | 6% |
| 31 | <i>Lamiaceae</i> | <i>Ocimum gratissimum</i> (Linne, 1753) | 1 | 2% |

| | | | |
|-------|--|--|------|
| Total | | | 100% |
|-------|--|--|------|

CPr: Contribution of each species; **Nr:** number of recipes using the plant; **Nt:** total number of recipes.

The table shows that *Aframomum melegueta*, cited 8 times, is used most in the preparation of recipes, i.e. **CPr**=16%, followed by *Bidens pilosa*, cited 4 times (8%). Species such as *Garcinia kola*, *Xylopiya aethiopica* and *Zingiber officinal*, each cited 3 times (6%), came third. *Funtumia elastica*, *Ageratum conyzoides* and *Adamsonia digitata* were each cited 2 times, with CPr corresponding to 4%. These species may be of interest in the treatment of erectile dysfunction. In these areas, herbalists have to contend with nature conservationists in the harvesting areas; a lack of supervisory structures; a lack of technical resources for harvesting, preparing recipes and preserving them; and limited access to credit to support their activities. Another constraint is the use of pesticides by people living in harvesting areas (rural areas), most of whom are farmers. This practice, which has become both an environmental and a social problem, is an obstacle to the future of this local medicine based essentially on plants and plant diversity in general.

4. Conclusion

Very little data is available on aphrodisiac plants in Guinea. The aim of this study is to contribute to the management of erectile dysfunction by providing the Guinean population and the scientific community with medicinal plants used in the treatment of male sexual disorders.

Plants have been used for a long time and knowledge of their therapeutic effects has been passed down from generation to generation.

Medicinal plants and traditional medicine play an important role in the health of people in many countries. They are of great importance to the people of Africa. They are a very reliable source for maintaining health, due to their geographical accessibility, lower financial cost and effectiveness in treating a large number of illnesses.

Our investigations led us to discover the recipes of several plants used to treat erectile dysfunction by healers and herbalists in the prefectures of N'Zérékoré, Macenta and Beyla. Thirty-one (31) plant species belonging to twenty-three (23) families are used in the treatment of IE. Species from the *Leguminosae*, *Zingiberaceae* and *Liliaceae* families are the most dominant. Bark, roots, leaves and tubers are the most commonly used parts. Infusion (44.44%) is the preparation method most used by the healers we met, followed by decoction (38.89%). Processing into powder is used on average. The oral route is the most commonly used method of administration. Only one recipe is used dermally by massaging the penis. Today, the practitioners of traditional medicine in our study area are facing difficulties linked to the lack of supervisory structures and technical resources for harvesting, preparing recipes and preserving them. Another constraint is the use of pesticides by people living in harvesting areas (rural areas), most of whom are farmers. This practice is both an environmental and a social problem, and constitutes an obstacle to the future of this medicine and plant biodiversity in general.

To ensure better preservation of the plant species used by traditional healers, we suggest that these practitioners be supervised; that training workshops be organised on the knowledge of plants as exhaustible natural resources, their importance, herbal techniques and the consequences of their abusive use throughout the country. The organisation of door-to-door awareness-raising days among healers and herbalists.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest is to be disclosed

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