

# Phytochemical and pharmacological studies of Some Central African Medicinal plants with Anti diabetic properties

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## ABSTRACT

*Diabetes constitutes a true problem of public health in the world. It results in a sugar rate abnormally raised, measured in blood in several months of intervals. It is about a chronic metabolic disease which occurs when the pancreas does not secrete insulin: insulino-dependent diabetes (type I) which generally touches the young subject before 30 years or when the pancreas does not produce sufficient insulin and that the secretion of this one is overdrawn; form diabetes found at the adults and the obese ones: noninsulino-dependent diabetes (type II). Indeed, vis-a-vis the noted dissatisfaction of the modern remedies, the traditional phytotherapeutic tracks seem to reinforce an interesting potential, of which the process of development, plant with phytomédicament, through adequate scientific processes, could offer a credible alternative, in favor of the communities.*

**Key words** *Phytochimique, Pharmacological, Medicinal Plant, Antidiabetic plants.*

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## 1 INTRODUCTION

Nowadays, the endemic diseases like the onchocercose, hepatitis, the malaria, the diabetes or the AIDS are parmis the plagues against which, the Third World countries in general and the countries African in particular must face means, especially financier, limités. Les conséquences which result from it are inter alia: rise of certain drugs which are not accessible in the majority from the populations often far away from the centers from health; the demonstration, for socioculturelles reasons, of a certain mistrust of the people alive in particular in rural zones with regard to modern medicine, preferring to turn itself near the traditional guérisseurs who very often do not control concepts like proportioning of the remedies to be managed with their patients.

The corollary of all this is a morbidity and a mortality increasing which slow down the development of the countries concerned and by there accentuates the poverty of their populations

To solve these specific problems of public health in Central Africa, in particular, one of the ways seems to us to be the use and the valorization of the medicinal plants in which our forests abound with profusion and who already were the proof of their effectiveness.

Within the framework of our research project in order to obtain the Ph.D doctorate and to contribute our modest share to solve the problems of public health, we focused our attention on one of these plagues, the diabetes, which was recognized by the World Health Organization (WHO) as being an urgent priority on the national and international level [ 1-2 ]

Indeed, the rate of prévalence of the diabetes in the world, according to forecasts' made by experts [3] was 4% either 135 million people in 1995, this rate would reach 5,4% or 300 million people into 2025. The strongest progressions of this disease insidious and crawling will be observed in the countries in the process of development: one will have an increase of 17% indeed is a progression from 84 to 228 million patients between 1995 and 2025. During the same period in Central Africa the progression of the rate of prévalence of the diabetes will be among most significant, thus passing from 72000 to 210000 diabétiques [4 ]

In Central Africa, a good fringe the diabétiques ones is currently old between 40 to 65 years [5] which has as a by-effect to blame our policy of development, insofar as this category of patients are workers who play a significant role in the construction of the nation. They will have rather, during the many years when they are supposed to produce, to face chronic complications of their disease, which will imply the use of the resources for their constant medical follow-up, very often expensive for the State and their

family [ 6,7 ] It is finally advisable to stress that the objective of African Traditional the Pharmacopée program and Medicine of the CAMES is to place at the disposal of the African populations Traditional Drugs Improved (MTA) in order to solve the crucial problem of drugs, and to gradually create the conditions of the establishment of the future African pharmaceutical industry. Unfulfilled objectives since the development of this program, brought the 13<sup>2nd</sup> Conference on the African Traditional Pharmacopeia and Medicine (PMTA), held in Yaoundé (Cameroun) from the 06 to December 10 2004, to react to the critics of the Steering committee (Audit of the AUF), and to suggest creation inside the program, with an aim of rationalization, three geographical areas with each one of it of target pathologies in addition to the VIH/SIDA:

1. West Africa: Paludism;
2. Central Africa: Hypertensives and metabolic diseases;
3. East Africa and Madagascar: diarrheal diseases.

For the continuation of the program, it was necessary of identification of the Research projects – Development worked out in each under area and fascinating of account the targeted concerns, the Secretariat-general of the CAMS giving the responsibility itself to seek the financings necessary to the realization of the activities. Network PMTA Central Africa, creates in December 2005 and coordinated of Professor Jean-Maurille OUAMBA, takes part in work on the diarrheal diseases by gathering the data of under area on the question through thesis or research projects of which this one.

## 2 METHODOLOGY

### 2.1 Vegetable Material

In general, five (5) medicinal species were identified and inventoried with Bangui and its surroundings within the framework of the treatment of the diabetes by the tradipraticians (cf table)

**Table 1. Five different Medicinal Species.**

Scientific Family + Name	Bodies Used	Vernacular Names + Vulgar Names	Medical Use
<b>Rubiaceae</b> <i>Morinda Lucida</i> Bth.	Barks + Sheets	Moकेकेले (Issongo)	Decoction of the barks and of broken into leaf is used for the toilet of diabetic
<b>Lauraceae</b> <i>Persea americana</i> Mill.	Sheets	Avocado	Two small handles of sheets cut in small pieces, to make infuse in one liter of water into drinking during the day.
<b>Lamiaceae</b> <i>Ocimum gratissimum</i> L.	Sheets	Ngbanda (Issongo)	Macerated sheets is antidiabetic
<b>Rutaceae</b> <i>Citrus aurantifolia</i> L.	Sheets	Moguembeguembe (Issongo) Citronnier	Decoction of the fresh sheets associated honey looks after the diabetes
<b>Sapindaceae</b> <i>Paullinia pinnata</i> L.	Sheets	Gagambolo (Issongo)	The sheets crushed with slightly roasted sesame is consumed by the patient three times per day

The vegetable material is consisted the sheets, roots, barks collected in the area of Bangui and its surroundings. These plants are also used traditionally for the treatment of several diseases. Their botanical identification was carried out with the Faculty of Science at the Department of Sciences of the Matter of the University of Bangui. The samples are dried at the ordinary temperature of the laboratory to the shelter of the crushed and extracted sun then.

## 3. METHODS

Following methodology is adopted:

- **ethnobotanic Investigation**
  - identification of the tradipraticians;
  - the harvest of the botanical samples of plants indicated by the tradipraticians by team of study;
  - the information retrieval on the pharmacological properties of these collected plants and their various uses in traditional medicine in the African pharmacopeia (Congolaise, Camerounaise, Sénégalaise and Centrafricaine we have).
- **phytochimic Study:**

Several solvents will be used for the extraction of the vegetable material. The various parts of the vegetable substance will be selected starting from the therapeutic uses of the tradipraticians according to solvent used. The extraction could be done cold (Maceration) or hot (Soxhlet). Thereafter, these various extractions will be carried out at the chemistry laboratory; a chemical sifting will be carried out on the rough extracts of the various samples in order to highlight the family of alcaloïdes, triterpenes, flavonoïdes, sterols, tanins, saponosides, etc, according to the method described by Abayomi (1996). Enfin, one will arrive at insulation, purification and determination of the structures of the active ingredients: for that purpose, it is necessary for us to call upon analytical techniques of separation and / or characterization. The technique most usually used is the Liquid Chromatography High Performance (HPLC), with an aim of isolating the active ingredients from the extracts in order to split and of purifying them. The use of infra-red (I.R), the Mass Spectrometry (S.M), etc, enable us to identify the molecular structure of the compounds.

- **Evaluation of the pharmacological activities:**

This task is summarized with the evaluation of toxicity and the anti-hyperglysemic activity with the assistance of the biologists of network PMTA Africa Centrale.

- **Information retrieval:**

It will be put at contribution to compare the therapeutic uses of the species listed within the framework of our work with those of the plants studied in other pharmacopeias in particular that of Congo, of Senegal and that of the ethnobotanic forwarding carried out in Empire Central African.

#### 4. AWAITED RESULTS

- Constitution of a bank of data on the plants with potentialities antiglycémiantes (screening chemical of the extracts, evaluation of the biological activity of the fractions, insulation of the active ingredients, correlation " structure – activity);
- Confirmation or invalidation of the fields of application of these plants and their pharmaceutical interest;
- Publication of the results (reports managements, articles scientific, possibly patents and work).
- Defence of a thesis of doctorate of the University Marien Ngouabi;
- A medium term, formulation of the improved traditional drugs.

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