Plants as an Important Source of Iron for the Treatment of Anaemia : Case of *Justicia secunda*

Moswa J.L.[1], Kapanda N.[1], Mungende D.M. [1], Okitolonda W[2], Mayangi M.[1], Mihigo S.[3], Mbale K[4]

1.   Faculty of Pharmacy, University of Kinshasa P.O. Box 212, Kinshasa XI, Dem. Rep. of Congo.
2. School of Public Health, University of Kinshasa, P.O. Box 837,
Kinshasa XI, Dem. Rep. of Congo.
3. Faculty of Science, Department of Chemistry, University of Kinshasa,
P.O. Box 190, Kinshasa XI, Rep. Dem. of Congo.
4. Faculty of Science, Department of Biology, University of Kinshasa, P.O.
Box 190, Kinshasa XI, Dem. Rep. of Congo

Corresponding author : MOSWA J.L. E-mail: josmoswa@unikin.cd, josmoswa@yahoo.fr
Phone : +243815111052

Abstract

Justicia secunda is reputed to treat anaemia in Congolese folk medicine**.** Given the prevalence of anaemia in the Democratic Republic of Congo and in the frame of our program on the judicious use of plants in the healthcare, we undertook to study this plant.

Thus, a study bearing upon the level of the knowledge of this plant, the extensiveness of its use and its iron contents was conducted in our laboratory. An appropriate questionnaire was used for the survey and iron was determined by atomic absorption spectrometry with prior acid digestion.

The results indicate; on the one hand that, the plant is very well known and extensively used by the population of Kinshasa and the medical staff of medical centres of Kinshasa, and on the other hand, that it contains high iron levels. This might justify its use as antianemic plant.

Key Words: *Justicia secunda*, anaemia, iron, atomic absorption spectrometry.

INTRODUCTION

Iron deficiency causes anemia to approximately a million persons worldwide; pregnant women and children in preschool age being the most vulnerable groups (1).The anemia contributes to an increase of the perinatal mortality, decreases resistance to diseases and causes tiredness and carelessness (2).

Conscious since 1991 of the seriousness of iron deficiency, the World Health Assembly, the World Summit for Children, the International Conference on Nutrition and the African Unity organization have adopted as objective to be achieved by 2000 to reduce to less than 30 % the prevalence of anaemia due to iron deficiency .

This objective is far from being achieved, at least in the Democratic Republic of Congo , where recent data indicate that anemia, often related to the iron deficiency, constitutes the second cause of morbidity for children and affects more than 50 % of pregnant women.(3)

Owing to the fact that the Congolese population has intensively recourse to medicinal plants to treat various diseases, including anemia, (4) we undertook to study plants used in the Democratic Republic of Congo to treat anemia. The preliminary studies revealed *Justicia*

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secunda as a plant reputed to be antianaemic, so we started our research program by studying this plant.

Justicia secunda is originally from tropical America. It has been recently introduced in the Democratic Republic of Congo. Very few works were carried out on the species *Justicia secunda*. Calderon reported the presence of peptidic alkaloids, phenylalanine derivatives, indoquinoleic alkaloids and triterpenes.(5)

ORGANIZATION, MATERIALS AND METHODS

A survey bearing upon the knowledge of Justicia secunda and its use was conducted in the population of Kinshasa, divided into zones of health and in the medical staff of the centres of health and dispensaries open within these zones of health.

The zones of health were selected on the basis of the low income of their population and intensive recourse to popular medicine, especially medicine based on plants for their healthcare. The investigation had to question 589 people in the total.

On the level of the population, 450 people whose age varied between 18 and 70 years were surveyed. A card questionnaire was used as a tool of investigation.

This card showed, amongst other things, the identity of the guarantor, the knowledge he has on anaemia and on *Justicia secunda*, reasons of the use of *Justicia secunda* instead of modern drugs.

On the level of the medical staff, 139 people were surveyed. The card questionnaire included for this type of investigation, in addition to the points relating to the identity of the guarantor and the knowledge of the plant, the qualification of the guarantor, the follow-up of the patients under treatment by this plant, results observed and indicators used to appreciate these results

Material and methods

Plant material

The sample used is constituted by the leaves of *Justicia secunda* collected in a residential plot of land in Kinshasa, Democratic Republic of Congo.

The botanical identification was performed in the herbarium of the National Institute of Agronomic Studies (INERA), Faculty of Science, University of Kinshasa where a voucher sample is kept.
The leaves were washed, then dried and finally powdered before prior acid digestion (6).

Methods

Reagents

Ultra pure water was obtained by passing distilled water through a reverse Osmosis System (Milli-Q, water system, Millipore).

Nitric, perchloric and hydrochloric acids used in the digestion process were of spectral purity (Fluka, Switzerland). Iron (Fe) stock standard solution (1000mg/L) was purchased from sa ARchem, South Africa.

Instrumentation

The determination of total iron after acid digestion of dried plants leaves was performed on a Varian SpectrAA 220 FS atomic absorption spectrometer (Varian, Australia) equipped with a deuterium background correction. (7)
The experimental parameters are provided in Table 1.

Table1. FAAS instrumental parameters

Analyte	Wavelength (nm)	Lamp current (mA)	Spectral band Pass (nm)	Fuel composition
Fe	248.3	5.0	0.2	Air-acetylene

RESULTS

Table 2. Result of the investigation in the population of the selected zones of health

Parameters	Numbers out of 450	%
Knowledge of the plant	418	93 %
Use of the plant	301	67 %
Satisfactory result	283	63 %
Average result	148	33 %
Unsatisfactory result	18	4 %

Table 3. Result of the investigation in the medical staff

Parameters	Number out of 139	%
Knowledge of the plant	125	90 %
Follow-up of the patients using the plant	79	57 %
confirmation of the effectiveness of the plant	55	40 %

Table 4. Iron contents of *Justicia secunda*

Average contents (mg/g)	240,19
Standard deviation	19

Discursion.

Tables 2 and 3 give clear and interesting indications on the level of knowledge and the use of Justicia secunda by the population and the medical staff of medical centres of the city of Kinshasa.

Table 1 indicates that the majority of the surveyed people knows *Justicia secunda* . Indeed, out of 450 persons, 418 either 93 % of surveyed population know very well *Justicia secunda*; 301, either 61 % used it or saw their close relations using it for the treatment of anaemia .

Table 2 show that out of 139 medical staff members, 125 either 90 % have a good knowledge of *Justicia secunda* as a plant used to treat anaemia in popular medicine and 79 either 57 % had made the follow-up of the patients under treatment by this plant . Lastly, 55 persons either 40 % of this medical staff members, on the basis of clinical and biochemical tests, confirm the effectiveness of the treatment.

Conclusion

Justicia secunda is a very well known plant in its utilisation as antianemic by the   population of Kinshasa. Compared to many plants whose iron contents are known, Justicia secunda appears to be a very important source of iron. These high iron contents (24O,49 mg/g +_ 19) might justify its use as antianemic in the Congolese popular medicine . Toxicological studies are currently underway in order to determine the acute toxicity.

Acknowledgement

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