PHYTOCHEMICAL AND NUTRITIONAL PROPERTIES OF DRIED LEAF POWDER OF Moringa oleifera Lam. FROM MACHALA EL ORO PROVINCE OF ECUADOR

Isitua Chinwe Christy ab, Sanchez-Muros Maria Jose c, Jaramillo Jaramillo Carmita a and Dutan Fausto a

a Planta Piloto de Farmacia, Facultad de Ciencias Quimicas y Salud, Universidad Tecnica de Machala - Ecuador.

b Department of Biological Sciences, College of Sciences, Afe Babalola University Aso-Ekiti, P.M.B. 5454, Ekiti State, Nigeria.

c Facultad de Ciencias Agropecuarias, Universidad Técnica de Machala, Avd. Panamericana, KM 5.5 via Pasaje, Machala, Ecuador.

Email: chritystings@yahoo.com, isitucc@abauad.edu.ng

INTRODUCTION
Leaky vegetables are a rich source of healthy and important nutrients as well as disease fighting constituents which have raised interest among scientists, food manufacturers, producers and consumers for their roles in the maintenance of human health. Drugs obtained from plants are believed to be much safer and exhibit a remarkable efficacy in the treatment of various ailments. Nutritional deficiencies are mainly associated with poor quality and quantity of macro as well as micro nutrients from food. Thus, nutrients are essential for development and maintenance of good health; while phytochemicals are bioactive substances of plants that have been associated in the protection of human health against diseases. Native to Asia and Africa, Moringa oleifera belongs to the Moringaceae family. It is a highly valued plant distributed in many countries of the tropics and sub-tropics. It has an impressive range of medicinal uses with high nutritional value. It is known by many names, such as horseradish tree, drumstick tree and kelor tree; all its parts have been used to treat various diseases in Ecuador and in many Latin American countries. It has been suggested that Moringa oleifera may be a serious health problem and although infant mortality has decreased, the survivors manifest lasting repercussions throughout life time. Therefore, the nutritional and phytochemical properties of the dried leaf powder of M. oleifera used in herbal formulations as nutraceuticals, dietary supplements, functional foods or a source of vegetable in meal preparation were investigated in this study with the aim to scientifically provide an empirical evidence for its use and benefits.

MATERIALS AND METHODS

Material:
The M. oleifera leaves used were collected from the matured tree in an orchard within the plantation of Faculty of Agricultural Sciences of UTMACH. The leaves were carefully separated, washed, shade dried, mechanically ground, finely powdered and sieved.

Preparation of plant extracts:
The leaf powder was extracted (maceration technique) with 98% methanol for 72 hours and with distilled water for 24 hours. Extract and filtrate obtained were used for different chemical color reaction tests for the identification of different phytochemical groups.

Analytical methods:
Pharmacologically active principles identified include: alkaloids, flavonoids, saponins, reducing sugars, tannins and glycosides with water showing a better extraction spectrum than methanol (Table 1). This finding is on a par with Manjar et al., 2007. These phytochemicals contribute significantly to protection against infection and degenerative diseases. The macro nutrients and amino acids identified in this study are shown in Tables 2 & 3 and Figures 1 & 2. The finding is on a par with Makkar and Becker (1996) and Fahey (2005) review. These nutrients have been shown to have physiological benefits or provide protection against chronic diseases.

RESULTS AND DISCUSSION

Pharmacologically active principles identified include: alkaloids, flavonoids, saponins, reducing sugars, tannins and glycosides with water showing a better extraction spectrum than methanol (Table 1). This finding is on a par with Manjar et al., 2007. These phytochemicals contribute significantly to protection against infection and degenerative diseases.

CONCLUSIONS

This study can be considered as the first information on the nutritional and phytochemical composition of M. oleifera leaves from Ecuador. It indicates that the studied dry leaf powder is an excellent source of macronutrients as well as essential amino acids required for human existence in combating nutritional deficiencies like kwashioroko, cardiovascular diseases amongst others. Its fiber content provides bulk in the diet and helps to enhance gastrointestinal function, prevents constipation and may reduce cholesterol content. The phytochemical content makes the leaf pharmacochemically active and may serve as supplements for food, as they have potentials to improve the health status of its users. Therefore, M. oleifera dry leaf powder can be a cost effective, suitable functional ingredients for improving nutraceuticals, nutritional and organoleptic properties of food; its use in diets should be encouraged and sustained in Ecuador and other countries.

Table 1: Phytochemical constituents in extracts of M. oleifera leaf and their health benefits

Table 2: Nutritional composition of M. oleifera leaf powder

Table 3: Fatty acid profile of M. oleifera leaf powder

REFERENCES

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