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Phytochemical and Proximate Compositions of *Monodora myristica* Seeds

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ABSTRACT

The phytochemical and proximate compositions of *Monodora myristica* seeds were determined using the methods of Association of Official Analytical Chemists (A.O.A.C). The concentrations (mg/100g) of flavonoids, saponins, phenols, tannins and cyanides recorded 2.34±0.01, 1.56±0.01, 0.22±0.00, 0.71±0.00 and 1.12±0.00 respectively. The results indicated that *Monodora myristica* seeds relatively contained more flavonoids than other phytochemicals investigated. The proximate constituents (%) recorded moisture content, total ash, lipid, crude protein, crude fiber and carbohydrates as 11.70, 3.72, 16.42, 10.42, 20.61 and 37.13 respectively. It also indicated that *Monodora myristica* seeds had highest amount of carbohydrates and least content of ash. The high carbohydrate and flavonoid contents indicate that *Monodora myristica* seeds could be good for nutritional and medicinal purposes.

Key words: Phytochemical, Proximate composition and *Monodora myristica* Seed.

INTRODUCTION

Medicinal plants are herbal preparations produced by subjecting plant materials to extraction, fractionation, purification, concentration or other physical or biological processes which may be produced for immediate consumption as a basis for herbal products [1]. Plants are primary sources of medicine, fiber, food, shelter and other items of everyday use by humans. The roots, stems, leaves, flowers, fruits and seeds provide food for animals and human beings [2]. Plants serve as indispensable constituents of human diet supplying the body with mineral salts, vitamins and certain hormone precursors in addition to protein and energy [3]. Seeds have nutritive and calorific values which make them necessary in diets [4]. Ethno-medicine is a branch of ethno-botany that deals with the study of traditional medicine and it has to do more with medicinal plants [5].

Monodora myristica is one of the most important trees of the evergreen forest of West Africa and it is mostly prevalent in the Southern part of Nigeria [6]. Almost every part of the tree has economic importance [7], but the most economically essential part is the seed which is embedded in the white sweet-smelling pulp of the sub-spherical fruit. After harvesting, between April to September every year [8], a series of unit operations (fermentation, washing, drying and cracking) are carried out. The kernel is obtained by cracking the nuts, which is easier done by heating. The kernel, when ground to powder, is a popular condiment used to prepare pepper soup as a stimulant to relieve constipation and to control passive uterine hemorrhage in women immediately after child birth [9].

Analysis on the phytochemical constituents of *Monodora myristica* is very important as the medicinal value of plants lies on the chemical substances or compounds that produce a definite physiological action in the human body. These chemical substances are called secondary metabolites. The most important of these bioactive groups are alkaloids, steroids, flavonoids, tannins and phenolic compounds [10]. The medicinal properties of plants are based on the antimicrobial and antipyretic effects of their phytochemicals [11]. Medicinal plants have been used in many forms over the years to cure, manage or control human ailments. Any effort to further maximize the output of medicinal or natural products from the botanical flora to improve health-care delivery certainly deserves great attention. Plants have been used since antiquity for medicinal purposes by diverse peoples and cultures throughout the world. Indeed, the recorded use of natural products as a source of relief from illness dates back at least four thousand years, and it can be assumed that unrecorded practices are as old as mankind [12]. It has been estimated that 25% of prescribed medicines today are substances derived from plants [13]. These include about 119 chemical compounds of known structures which are currently used as drugs or as biodynamic agents that affect human health. They are extracted and purified directly from plants [14]. When pulverized, the seeds of *Monodora myristica* may be taken as a stimulant, stomachic or to relieve constipation; the powder may be sprinkled on sores or the powder fried and made into oily pomade and applied. Application of the pomade is used to disinfest from fleas and lice. The seeds, chewed up, are applied to the forehead for headache and migraine in Gabon and ground up for headaches, loss of voice, or eaten as an anti-emetic and tonic in Congo [15].

The proximate analysis of *Monodora myristica* is essential in order to obtain effective information on its moisture, ash, fiber and nutritive contents. Plants are considered basic nutritional sources as they contain protein, carbohydrates, fats, oils, minerals, vitamins and water which are obligatory for growth and development in humans and animals [16].

The World Health Organization (WHO) has reported that about 80% of the world's population depends mainly on traditional medicine and the traditional treatment involves mainly the use of plant extracts [17]. However, this study evaluated the powdered sample of *Monodora myristica* seeds for its phytochemical and proximate constituents.

Fig.1: *Monodora myristica* plant showing the leaves and seeds [15].

MATERIALS AND METHODS

Materials

The *Monodora myristica* seeds were gotten from Abakaliki in the month of June. All chemicals and reagents were of analytical standard.

Methods

Determination of Phytochemical and Proximate compositions

The methods of [18] were used to determine the phytochemical and proximate compositions of the seeds.

RESULTS

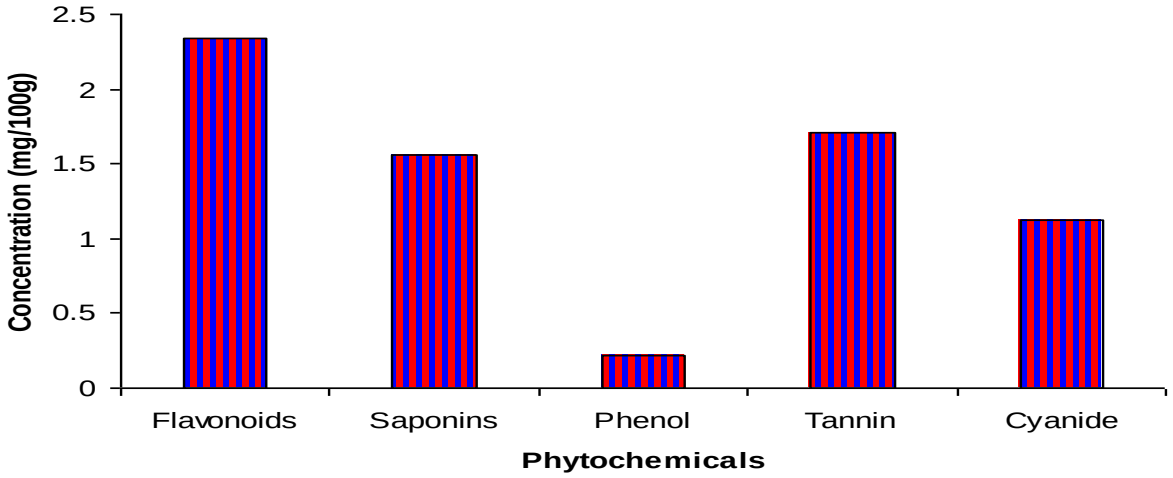

Fig. 2:Phytochemical constituents of *Monodora myristica* seeds.

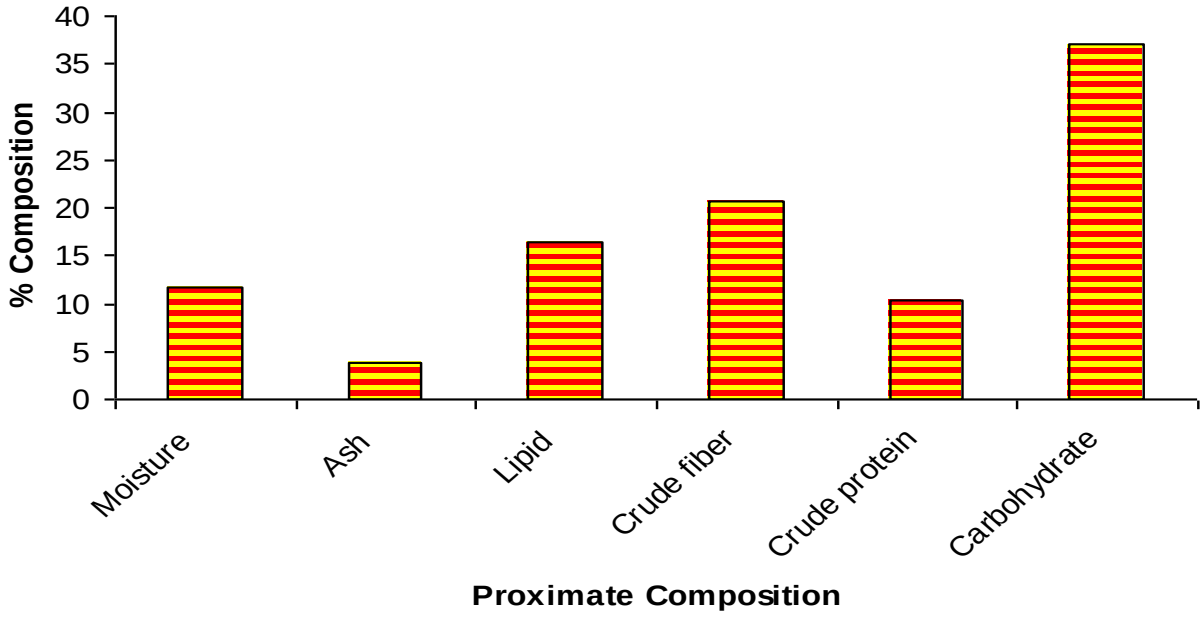

Fig. 3: Proximate composition of *Monodora myristica* seeds.

DISCUSSION AND CONCLUSION

The phytochemical screening of *Monodora myristica* seeds recorded the phytochemicals in the following order: flavonoids > tannins > saponins > cyanide > phenols as shown in fig. 2. The *Artocarpus heterophyllus* leaves recorded the phytochemicals in the order of alkaloids > flavonoids > saponins > phenols > steroids > tannins > cardiac glycosides [19]. The phytochemical constituents of *Cocos nucifera* endosperm recorded phenols (1.40±0.01mg/100g), flavonoids (3.80±0.20mg/100g), alkaloids (4.20±0.30%), saponins (0.60±0.04%), tannins (3.42±0.02mg/100g), glycosides (0.042±0.02mg/100g), steroids (3.00±0.10%) and carotenoids (5.00±0.20%) [20]. The phytochemical test of *Geranium incanum* showed that alkaloid was absent, but tannins and flavonoids were present in different concentrations [21].

The results of the proximate analysis of *Monodora myristica* seeds recorded significantly ($p<0.05$) high percentages of carbohydrate > crude fiber > lipid > moisture > protein > ash (fig. 3). The result of the proximate analysis of *Monodora myristica* was as follows: moisture content 10%, dry matter 90%, ash content 5.0%, crude fibre 8.33%, fat 25%, carbohydrate 39.6% [8]. The oil yield of both results is low compared to that of *Jatropha curcas,* which is 36%, cocoa butter (45-56%), shea butter (34-44%), [4]. The percentage carbohydrate content is much higher than that of cassava tubers (16.81%) [6]. Hence the seed is a good source of energy for animals when put in their feed and also for human beings if incorporated into diet.

In conclusion, *Monodora myristica* seeds contain varying proportions of phytochemicals. The relative high contents of flavonoids, tannins, saponins, carbohydrate, lipid and protein indicate that *Monodora myristica* could be a good source of nutrients and medicine.

REFERENCES

1. WHO, (2002). World malaria report. *Traditional Medicine Strategy*, **74**:300-318.
2. Buckingham, J. (2000). Dictionary of Natural Products on CD-ROM. *Phytochemical, Antimicrobial of African Nutmeg (Monodora Myristica),* **32**: 240-250.
3. Benoit, S.C., Kemp, C.J., Elias, C.F., Abplanalp, W. and Herman, J.P. (2009). Palmitic acid Alteration. *Journal of Clinical Investigation*, **119**: 2577-2589.
4. Adegoke, E. and Akinsanya, A. (2003). Studies of Nigeria medical plants. *West African Science Association*, **13**: 13-33.
5. Adewole, E., (2010). The chemical and anti-microbial analyses of wild yam (*Discorea villosa*). *Evaluation of Medicinal Plants*. **5**(16): 60-70.
6. Akereke, O., (2007). Medicinal plants and primary health care. *An Agenda for Action.* **59** (5): 355-363.
7. Amabeoku, G.J., (2009). Antidiarrheal activity of *Gerantum incanum*(Geraniaceae) leaf aqueous extract in mice. *Journal of Ethnopharmacology*, **123**:190-193.
8. AOAC, (2005). Official method of analysis. 15th edition, Association of Official Analytical Chemists, Washington DC. USA. 200-210.
9. Bao, J.S., Sun, M., Wang, G.Y. and Corke, H. (2005). Flavonols and free radical scavenging activity of Chinese bayberry extracts and their color properties and stability. *Agricultural Food Chemistry*, **53**: 2327–2332.
10. Bruneton, J. (2010). Pharmacognosy and phytochemistry of medicinal plants, 2nd edition. Intercept concept Ltd, Hampshire, **6**: 385-386.
11. Burkill, H.M. (2000): The useful plants of west Tropical Africa. *Journal of Agricultural Food Chemistry*, **4**(1): 270-300.
12. Christophersen, C., Larsen, C. and Dimayuga, R.E. (2003). Traditional Medicine. *A Potential Resource Exploitation of Natural Products*, **5**: 8-12.
13. Ejiofor, M.A., Onwubuke, S.N. and Okafor, J.C. (2010). Developing improved methods of processing and utilization of kernels of *Irvingiagabonensis*. *Journal of International Tree Crops*, **4**: 283-290.
14. Farnsworth, N.R. (2000). The role of ethnopharmacology in drug development. *Bioactive Compounds from Plants*, **3**: 2-21.
15. Gunstone, F.D., Harwood, J.L. and Dijkstra, A.J. (2007). The Lipid Handbook. 3rd edition. Boca Raton, Hampshire. 1390 -1472.
16. Hamburger, M. and Hostettmann, K. (2000). Bioactivity in plants. *The Link Between Phytochemistry and Medicine*, **30** (12): 3864-3874.
17. Markkar, A.O. and Goodchild, A.V. (2004). Quantification of tannins with a laboratory manual. *International Centre for Agriculture Research,* **2**:10- 25.
18. Offor C. E., Aloke, C., Ugwu Okechukwu, P.C., Ekpono E. U. , Nwobasi C. S. and Egbeji E.E. (2017). Phytochemical and proximate compositions of *Artocarpus heterophyllus* leaves. *IDOSR Journal of Applied Sciences*, **2**(1): 123-130.
19. Offor C. E., Uzuegbu, U. E., Opajobi, A.O., Ugwu Okechukwu, P.C., Uneke, F.C., Abara, P. N. and Orinya, O.F. (2017). Proximate composition and phytochemical analysis of the endosperm of *Cocos nucifera l. IDOSR Journal of Scientific Research*, **2**(1):83-90.
20. Ukam, N.U. (2008). The potentials of some lesser known vegetables. *Nigeria Journal of Nutritional Science,* **29**: 299-305.
21. WHO, (2005). World malaria report. *Traditional Medicine Strategy*, **30**: 120-130.