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RESEARCH ARTICLE

PHYTOCHEMICAL ANALYSIS AND MEDICINAL VALUE OF *MONODURA MYRISTICA* SEED

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Abstract

The purpose of the present study was to analyze the phytochemicals of *M. myristica*. The ground sample was soaked for 24 hrs with different solvents in other to extract the medicinal component. The qualitative analysis shows the positive result insaponin, glycoside, steroid, and alkaloid, while flavonoid and Tannin are negative. The quantitative analysis for *M. myristica*seed show 32% to saponins, alkaloid 8.35%, phenol 55.7%, flavonoid 0.0707 mg/ml, and glycoside 5.2% while-tannin is negative. The result shows that *M. myristica*can be used to produce vaccines because of saponin, while flavonoids were found to be the biological and pharmacological activities, including antioxidant.

Introduction:-

Traditional medicine plays an essential role in health care provision (Andrade et al., 2020; Bahmani et al., 2015; Hart et al., 2017; Matowa et al., 2020; Sile et al., 2020; Tesfahuneygn&Gebreegziabher, 2019). Medicinal plants are essential in people's lives across the globe(Malami et al., 2020), as people rely on traditional medicine for primary health care (Prinsloo et al., 2018). Folk medicine is a fertile ground source of Western Medicine, and Africa is prosperous with medicinal plants (Alaribe& Motaung, 2019).The plant serves as indispensable salts, vitamins, and specific hormone precursors in addition to protein and energy.

Nigeria is indigenously rich in plant biodiversity, commonly used as medicine to manage and treat different formsof ailments (Malami et al., 2020). Medicinal plants have assumed a vital role in the Nigerian healthcare sector (Chukwuma et al., 2015). The South-Western and North-Central parts of Nigeria are highly endowed with medicinal plants that have been used for decades (Abubakar et al., 2020). Evidence from Nigeria has shown that plants have the potential of treating health-related problems such as cancer(Fadeyi et al., 2013; Malami et al., 2020; Ngulde et al., 2019),diabetes (Ezuruike& Prieto, 2014), malaria (Ene et al., 2010; Ibrahim et al., 2012), skin disease (Ajibesin, 2012; Rehamn and Sultana, 2016), arthritis (Salihu et al., 2018), leg ulcer (Nwafor et al., 2018), anti-typhoid(Iroha et al., 2010), hypertension (Eghianruwa et al., 2016; Gbolade, 2012), mental illness (Ior et al., 2017), antifertility (Saalu, 2016), tuberculosis (Mann et al., 2007). Indeed, (Ukwubile et al., 2020) suggested that plants have the potential to cure the rampaging Covid-19 disease.

Monodura Myristica is a hardy tree with medicinal property and belongs to the Annonaceae family (Ekeanyanwu, 2013).The seed yields a colorless volatile oil with a pleasant taste and aroma similar to nutmeg and is used as a condiment for soup (Nwaozuzu, 2015). The medicinal importance of *M. myristica*has been widely documented (Akinyede et al., 2020; Feyisayo, 2013; Ibironke A. Ajayi, 2013; Koudou et al., 2007). Thus, the present study aims to examine the phytochemical contents of and the medicinal value of *M. myristica*seed.

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Materials and Method:-

Healthy seeds of *M. myristica* seed (African nutmeg) were collected/obtained from the market. The seed was botanically identified and authenticated by a plant taxonomist to ensure that the seed is actually *M. myristica* seed.The sample was weighed into the different labeled conical flask, ml of the various solvents (distilled cold water, Hot, and ethanol) was poured into the separate conical flask to extract the phytochemicals. After some time, the mixtures were filtered using filter paper into conical flasks. The filtrates were concentrated by placing the flasks into a water bath at 100^0C. The resulting filtrate was collected and set at 40C room temperature.A qualitative test was carried out on the cooling solution. The following tests, Test for alkaloids, Test for saponin, Test for flavonoids, Test for steroids, Test for tannins, Test for glycosides, were conducted using standard procedures.

Results:-

Table 1:- Table showing the result of the qualitative phytochemical analysis ofM.myristicaseed with flavonoid being absent in all the extracts.

Alkaloids	+++	-	-
Flavonoids	-	-	-
Glycosides	-	++	+
Phenol	+++	++	+
Steroid	+++	-	-
Saponin	-	++	+++

The key +++ = Highly present, ++ = Moderate present, + = slightly present - = Absent

Table 2:- Table showing the result of phytochemical determinants ofM. myristicaseed.

Phytochemical parameter

Saponins	Alkaloid	Phenol	Flavonoids	Glycosides
32%	8.35%	55.7%	.0707mg/ml	5.2%

The above table shows the plant seed's aqueous determinants, with phenol having the highest percentage composition of 55.7% and flavonoids having the lowest percentage composition of 0.0707 mg/ml.

Discussion:-

The study was conducted to examine the phytochemical properties of *M. myristica*. The qualitative analysis performed on the aqueous extract of *M. myristica*seed shows that ethanol, Hot water, and cold-water extracts of *M. myristica*seed contain phenol glycoside alkaloids, saponins, and flavonoids and more significant with phenol and saponin. The seed had low content in flavonoids,which have been implicated in anti-allergic, antioxidant, anticancer, and anti-viral activities (Udeme et al., 2013). Flavonoids usually act by chelating transition metal (Moreno et al., 2014). The antioxidant capacity could be attributed to the reducing power (Saito et al., 2008). The saponin is high in the *M. myristica*seed. The high concentration of saponins in the body can reduce certain nutrients' uptake, including glucose and cholesterol, leading to hypercholesterolemia. It is known for frothing foaming, which it produces when shaken in an aqueous solution. *M. myristica*is being promoted as adjutants in vaccines.

The phenol was found as 55.7%, carrying the highest value. It is essentiallyused as a natural antioxidant and nutraceuticals and found in *M. myristica*seed for its enormous ability to combat cancer and also thought to prevent heart diseases to a significant degree and sometimes are anti-inflammatory agents.Tannin was absent in the seed but rich in medicinal plants and is used as healing agents in severaldiseases like diarrhea.

Conclusion:-

*M. myristica*shows a significant result in constituent the seed contained higher levels of beneficial nutrients and phytochemicals. The seed contained flavor because of the phytochemicals of flavonoids and can provide precursors for the synthesis of valuable drugs. Thus, it is recommended that a healthy diet include 3-5g of *M. myristica*seed due to the high content of the phytochemical in the seed, including the phenol, glycoside saponin, flavonoid, and alkaloid. The phytochemicals component should always be used as a spice in food and baking products but most important for a healthy circulatory system.

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References:-

1. Abubakar, I. B., Ukwuani-Kwaja, A. N., Olayiwola, F. S., Malami, I., Muhammad, A., Ahmed, S. J., Nurudeen, Q. O., & Falana, M. B. (2020). An inventory of medicinal plants used for the treatment of cancer in Kwara and Lagos state, Nigeria. European Journal of Integrative Medicine, 34. https://doi.org/10.1016/j.eujim.2020.101062
2. Ajibesin, K. K. (2012). Ethnobotanical survey of plants used for skin diseases and related ailments in Akwa Ibom State, Nigeria. Ethnobotany Research and Applications, 10. https://doi.org/10.17348/era.10.0.463-522
3. Akinyede, A. I., Fagbemi, T. N., Osundahunsi, O. F., & Aluko, R. E. (2020). Amino acid composition and antioxidant properties of the enzymatic hydrolysate of calabash nutmeg (Monodoramyristica) and its membrane ultrafiltration peptide fractions. Journal of Food Biochemistry. https://doi.org/10.1111/jfbc.13437
4. Alaribe, F. N., & Motaung, K. S. C. M. (2019). Medicinal Plants in Tissue Engineering and Regenerative Medicine in the African Continent. In Tissue Engineering - Part A (Vol. 25, Issues 11–12). https://doi.org/10.1089/ten.tea.2019.0060
5. Andrade, C., Gomes, N. G. M., Duangsrisai, S., Andrade, P. B., Pereira, D. M., &Valentão, P. (2020). Medicinal plants utilized in Thai Traditional Medicine for diabetes treatment: Ethnobotanical surveys, scientific evidence, and phytochemicals. In Journal of Ethnopharmacology (Vol. 263). https://doi.org/10.1016/j.jep.2020.113177
6. Bahmani, M., Saki, K., Ezatpour, B., Shahsavari, S., Eftekhari, Z., Jelodari, M., Rafieian-Kopaei, M., &Sepahvand, R. (2015). Leishmaniosis phytotherapy: Review of plants used in Iranian traditional medicine on Leishmaniasis. In Asian Pacific Journal of Tropical Biomedicine (Vol. 5, Issue 9). https://doi.org/10.1016/j.apjtb.2015.05.018
7. Chukwuma, EC., Soladoye, MO., Feyisola, R. (2015). Traditional medicine and the future of medicinal plants in Nigeria. Journal of Medicinal …, 3(4).
8. Eghianruwa, K. I., Oridupa, O. A., & Saba, A. B. (2016). Medicinal plants used for management of hypertension in Nigeria. Annual Research and Review in Biology, 11(3). https://doi.org/10.9734/ARRB/2016/29045
9. Ekeanyanwu, R. C. (2013). Evaluation of the crude protein and amino acid composition of Nigerian Monodoramyristica (Ehuru). Pakistan Journal of Nutrition, 12(3). https://doi.org/10.3923/pjn.2013.219.223
10. Ene, A. C., Atawodi, S. E., Ameh, D. A., Kwanashie, H. O., &Agomo, P. U. (2010). Locally used plants for malaria therapy amongst the Hausa, Yoruba, and Ibo communities in Maiduguri, Northeastern Nigeria. Indian Journal of Traditional Knowledge, 9(3).
11. Ezuruike, U. F., & Prieto, J. M. (2014). The use of plants in the traditional management of diabetes in Nigeria: Pharmacological and toxicological considerations. In Journal of Ethnopharmacology (Vol. 155, Issue 2). https://doi.org/10.1016/j.jep.2014.05.055
12. Fadeyi, S. A., Fadeyi, O. O., Adejumo, A. A., Okoro, C., & Myles, E. L. (2013). In vitro anticancer screening of 24 locally used Nigerian medicinal plants. BMC Complementary and Alternative Medicine, 13. https://doi.org/10.1186/1472-6882-13-79
13. Feyisayo, K. (2013). Evaluation of antioxidant potentials of Monodoramyristica (Gaertn) dunel seeds. African Journal of Food Science, 7(9). https://doi.org/10.5897/ajfs2013.1020
14. Gbolade, A. (2012). Ethnobotanical study of plants used in treating hypertension in the Edo State of Nigeria. Journal of Ethnopharmacology, 144(1). https://doi.org/10.1016/j.jep.2012.07.018
15. Hart, G., Gaoue, O. G., de La Torre, L., Navarrete, H., Muriel, P., Macía, M. J., Balslev, H., León-Yánez, S., Jørgensen, P., & Duffy, D. C. (2017). Availability, diversification, and versatility explain the human selection of introduced plants in traditional Ecuadorian medicine. PLoS ONE, 12(9). https://doi.org/10.1371/journal.pone.0184369
16. Ibironke A. Ajayi, I. A. A. (2013). Short-term Toxicological Evaluation of Monodoramyristica Seed Oil. IOSR Journal of Environmental Science, Toxicology and Food Technology, 3(5). https://doi.org/10.9790/2402-0355358
17. Ibrahim, H. A., Imama, I. a., Bello, a. M., Umar, U., Muhammad, S., & Abdullahi, S. a. (2012). The Potential of Nigerian Medicinal Plants as Antimalarial Agent: A Review. International Journal of Science and Technology, 2,(8).
18. Ior, L. D., Otimenyin, S. O., Okwori, V. A., Umar, D. M., & Azila, J. J. (2017). Ethnobotanical survey of plants used in the management of mental illnesses in some selected local government areas of Plateau State, Nigeria. Journal of Pharmacognosy and Phytotherapy, 9(10). https://doi.org/10.5897/jpp2017.0464

19. Iroha, I. R., Ilang, D. C., Ayogu, T. E., Oji, A. E., &Ugbo, E. C. (2010). Screening for anti-typhoid activity of some medicinal plants used in traditional medicine in Ebonyi state, Nigeria. African Journal of Pharmacy and Pharmacology, 4(12).
20. Koudou, J., Etou Ossibi, A. W., Aklikokou, K., Abena, A. A., Gbeassor, M., &Bessière, J. M. (2007). Chemical composition and hypotensive effects of essential oil of MonodoramyristicaGaertn. Journal of Biological Sciences, 7(6). https://doi.org/10.3923/jbs.2007.937.942
21. Malami, I., Jagaba, N. M., Abubakar, I. B., Muhammad, A., Alhassan, A. M., Waziri, P. M., Yakubu Yahaya, I. Z., Mshelia, H. E., & Mathias, S. N. (2020). Integration of medicinal plants into the traditional system of medicine for the treatment of cancer in Sokoto State, Nigeria. Heliyon, 6(9). https://doi.org/10.1016/j.heliyon.2020.e04830
22. Mann, A., Amupitan, J. O., Oyewale, A. O., Okogun, J. I., & Ibrahim, K. (2007). An ethnobotanical survey of indigenous flora for treating tuberculosis and other respiratory diseases in Niger State, Nigeria. Journal of Phytomedicine and Therapeutics, 12. https://doi.org/10.4314/jopat.v12i1.41362
23. Matowa, P. R., Gundidza, M., Gwanzura, L., &Nhachi, C. F. B. (2020). A survey of ethnomedicinal plants used to treat cancer by traditional medicine practitioners in Zimbabwe. BMC Complementary Medicine and Therapies, 20(1). https://doi.org/10.1186/s12906-020-03046-8
24. Ngulde, S. I., Sandabe, U. K., Abounader, R., Dawson, T. K., Zhang, Y., Iliya, I., & Hussaini, I. M. (2019). Ethanol extract of securidacalongipedunculata induces apoptosis in brain tumor (U87) cells. BioMed Research International, 2019. https://doi.org/10.1155/2019/9826590
25. Nwafor, F., Tchimene, M., Onyekere, P., Nweze, N., &Orabueze, C. (2018). Ethnobiological study of traditional medicine practices for the treatment of chronic leg ulcer in Southeastern Nigeria. Indian Journal of Traditional Knowledge (IJTK), 17(1).
26. Nwaozuzu, E. E. (2015). Phytochemical analysis of the crude extracts of Monodoramyristica seed. International Journal of Pharma and Bio Sciences, 6(3), P377–P382.
27. Prinsloo, G., Nogemane, N., & Street, R. (2018). The use of plants containing genotoxic carcinogens as foods and medicine. Food and Chemical Toxicology, 116. https://doi.org/10.1016/j.fct.2018.04.009
28. Rehamn and Sultana, 2011. (2016). Ethnobotanical survey of medicinal plants used for the treatment of skin disease in keffi, Nigeria. American Journal of Phytochemistry and Clinical Therapeutics, 4(2).
29. Saalu, L. C. (2016). Nigerian folklore medicinal plants with potential antifertility activity in males: A scientific appraisal. In Research Journal of Medicinal Plant (Vol. 10, Issue 3). https://doi.org/10.3923/rjmp.2016.201.227
30. Salihu, T., Olukunle, J. O., Adenubi, O. T., Mbaoji, C., & Zarma, M. H. (2018). Ethnomedicinal plant species commonly used to manage arthritis in North-West Nigeria. South African Journal of Botany, 118. https://doi.org/10.1016/j.sajb.2018.06.004
31. Sile, I., Romane, E., Reinsone, S., Maurina, B., Tirzite, D., &Dambrova, M. (2020). Data on medicinal plants in the records of Latvian folk medicine from the 19th century. Data in Brief, 28. https://doi.org/10.1016/j.dib.2019.105024
32. Tesfahuneygn, G., &Gebreegziabher, G. (2019). Medicinal Plants Used in Traditional Medicine by Ethiopians: A Review Article OPEN ACCESS. Journal of Genetics and Genetic Engineering, 4(1).
33. Ukwubile, C. A., Malgwi, T. S., Angyu, A. E., Otalu, O., &Bingari, M. S. (2020). Review of Antiviral Medicinal Plants used in Taraba State Nigeria: A Possible Source for COVID-19 Drug Discovery. Journal of Scientific Research in Medical and Biological Sciences, 1(2). https://doi.org/10.47631/jsrmbs.v1i2.50.