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Characterization of Alkaloid and Flavonoid Bioactive Compounds in Methanolic Root Extract of *Napoleona imperialis*

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Abstract: ***Napoleona imperialis is used in folk medicine for the healing of wounds and treatment of hypertension.Due to an increasing demand for chemical diversity in screening programmes,seeking therapeutic drugs from natural products,interest particularly inedible plants has grown throughout the world.Herbal preparations for medicinal usage contain various types of bioacti ve compounds.this paper is therefore aimed at identifying the constituent alkaloids and flavonoids in methane extract of N.imperialis root.Gas chromatographic technique was used used for this assay.Result for flavonoid compounds shows Epicatechin (0.85±0.11µg/m) having significantly higher concentration than Quercetin (0.50±0.01µg/ml) with a neglible concentration of Naringerin , Rutin and Kempferol. Lunamarine (0.95±0.2µg/ml) was significantly higher than Ribalinidine(0.04±0.00µg/ml). for alkaloids.The presence of these bioactive compounds especially flavonoids that serves as antioxidants could provide a rationale for the ethnomrdical use of N.imperialis in wound healing and as an antihypertensive agent.***

Keywords: Napoleona imperialis , flavonoids , alkaloids and antioxidantt

1. Introduction

Over the past decade herbal medicine has become a topic of global importance, making an impact on both world health and international trade. Medicinal plants continue to play central roles in the healthcare system of large proportion of the world's population. This is particularly true in the developing countries, where herbal medicine has a long and uninterrupted history of use. Recognition and development of medicinal and economic benefits of these plants are on the increase in both developing and industrialized nations (Srinivas,*et al.,* 2007). Continuous usage of herbal medicine by a large proportion of the population in the developing countries is largely due to the high cost of western pharmaceuticals, health care, adverse effects that follow their use (in some case) and the cultural and spiritual point of view of the people of the countries (Srinivas,*et al.,* 2007*).*

Napoleona imperialis (P. Beavr) belongs to the family *lecythidaceae* which is an evergreen nontimer plant that grows abundantly in bush fallows, secondary bushes and marginal lands in most of the tropical humid zone of West Africa (Koppel, 1990). People consume the juice from the pods and discard the seeds. The seeds appeared to have very low human food preference, little or no industrial use as at now. The family, Lecythidaceae is a small tropical family that grows in all regions of Nigeria(Omale et al.2011). The plant, *Napoleona*, is commonly known as *nkpodu* among the Igbo tribe of Nigeria. The sweet pulp around the seeds is eaten especially by children. The genus, named in honour of Emperor Napoleon 1 comprises mostly shrubs with some species being lianes(Omale et al.2011). It has been reported to have wound healing and anti-hypertensive property (Esimone *et al*., 2005; Omale *et al*., 2011).

Napoleona Imperialis is a medicinal plant known to possess wound healing and antihypertensive capabilities .This work was therefore aimed at justifying if these possessed potentials is as a result of presence of some bioactive compounds like flavonoids and alkaloids in the root extract of *Napoleona imperialis*

2. Materials and Methods

2.1. Materials

Weighing Balance [Scout pro u401 made in China], Pasteur's pipette, water bath, muslin- cloth, and, gas chromatographic machine etc. All chemicals used were of analytical grade and purchased from SIGMA ALDRICH, USA.

2.2. Methods

2.2.1. Extraction process

Roots of *N.imperialis* gotten from Mgbirichi community in Imo State were identified at the herbarium, University of Nigeria, Nsukka. Roots were air-dried at room temperature and reduced to fine powder by milling. The powdered plant materials were subjected to extraction with 80% methanol for 48 hours. The hydromethanolic extracts were concentrated using a rotary evaporator (Büchi, Rotavapor R-200) and allowed to paste using a water bath set at 40^{o}C and stored at 4^{o}C until used.

2.2.2. Characterization Using Gas Chromatography Method

The sample solution injected into the instrument enters a gas stream which transports the sample into a separation tube known as the 'column'.(Helium or nitrogen is used as the so

called carrier gas.) The various components are separated inside the column. The detector measures the quantity of the components that exit the column. To measure a sample with an unknown concentration, a standard sample with known concentration is injected into the instrument. The standard sample peak retention time (appearance time) and area are compared to the test sample to calculate the concentration.

3. Results

3.1 Flavonoids Concentration In Methanolic Root Extract Of Napoleona Imperialis.

As shown in Figure 1, mean concentration of Epicatechin (0.85± 0.11µg/m) was significantly higher than Quercetin (0.50±0.01µg/ml) with a neglible concentration of Naringerin , Rutin and Kempferol.

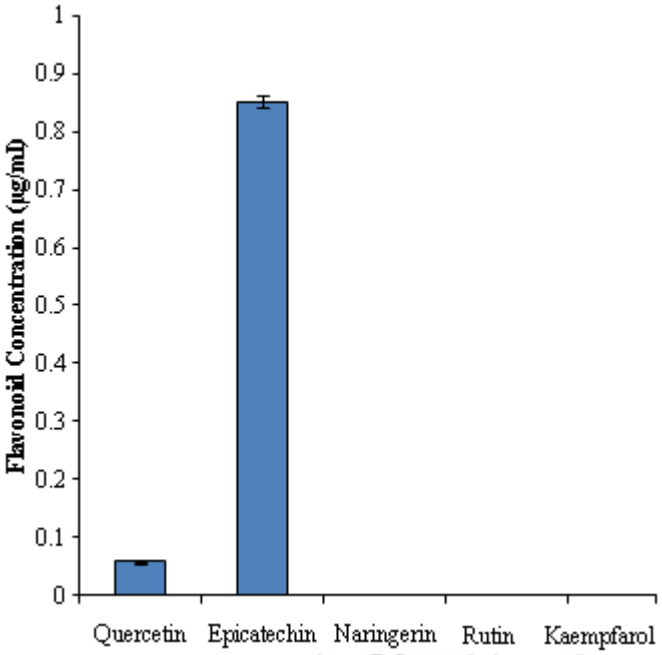

Figure 1: Flavonoid concentration of methanolic root extract of *Napoleona imperialis*

3.2 Alkaloid Concentration of Methanolic Root Extract of Napoleona Imperialis

As shown in Figure 2, mean concentration of Lunamarine (0.95±0.2µg/ml) was significantly higher than Ribalinidine (0.04±0.00µg/ml).

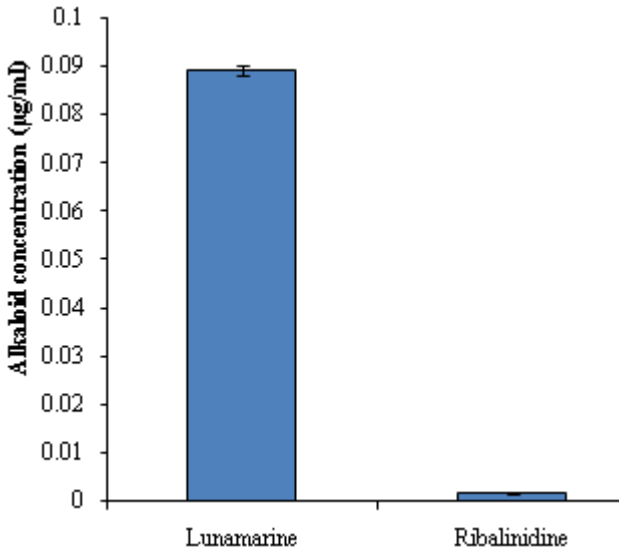

Figure 2: Alkaloid concentration of methanolic root extract of *Napoleona imperialis*

4. Discussion

As antioxidants or free radical scavengers (Kar, 2007). The compounds are derived from parent compounds known as flavans. Over four thousand flavonoids are known to exist and some of them are pigments in higher plants. Quercetin, kaempferol and quercitrin are common flavonoids present in nearly 70% of plants. According to Middleton and Kandaswami (1993), the flavonoids have long been recognized to possess antiallergic, anti-inflammatory, antiviral, anti-proliferative and anti carcinogenic activities as well as to affect some aspects of mammalian metabolism.The protective effects of flavonoids in biological systems are ascribed to their capacity to transfer electrons free radicals, chelate metal catalysts , activate antioxidant enzymes , reduce alpha-tocopherol radicals, and inhibit oxidases . Phytochemical screening showed presence of flavonoids in which mean concentration of Epicatechin (0.85±0.11µg/m) was significantly higher than Quercetin (0.50±0.01µg/ml) with a neglible concentration of Naringerin , Rutin and Kempferol as shown in figure 1.

Alkaloids are the largest group of secondary chemical constituents made largely of ammonia compounds comprising basically of nitrogen bases synthesized from amino acid building blocks with various radicals replacing one or more of the hydrogen atoms in the peptide ring, most containing oxygen.. The degree of basicity varies considerably, depending on the structure of the molecule, and presence and location of the functional groups (Sarker & Nahar, 2007). Alkaloids have analgesic, anti-spasmodic and bactericidal
effects and this is the basis for their use as basic medicinal agents (Okwu, 2004). The plant has significant amount of alkaloids in which mean concentration of Lunamarine (0.95±0.2µg/ml) was significantly higher than Ribalinidine(0.04±0.00µg/ml) as shown in figure 2.

Flavonoids are important group of polyphenols widely distributed among the plant flora. Structurally, they are made of more than one benzene ring in its structure (a range of C15 aromatic compounds) and numerous reports support

their use. The presence of these bioactive compounds possibly provides a rationale for the ethnomedicinal use of this plant for the treatment of wounds and hypertension in traditional medicine. Many flavonoids possess both antimicrobial and antioxidant activities as well as nutritional supplement as both sweetener and flvouring agent(Serage,2003).

5. Conclusion

In traditional societies nutrition and health care are strongly interconnected and many plants have been consumed both as food and for medicinal purposes. The consumption of non-cultivated botanicals plays a central role in the diet, but very few ethnopharmacological and phytopharmacological studies have dealt exhaustively with the potential health benefits of such diets. The presence of these bioactive compounds especially flavonoids that serves as antioxidants could provide a rationale for the ethnomrdical use of *N.imperialis* in wound healing and as an antihypertensive agent.

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