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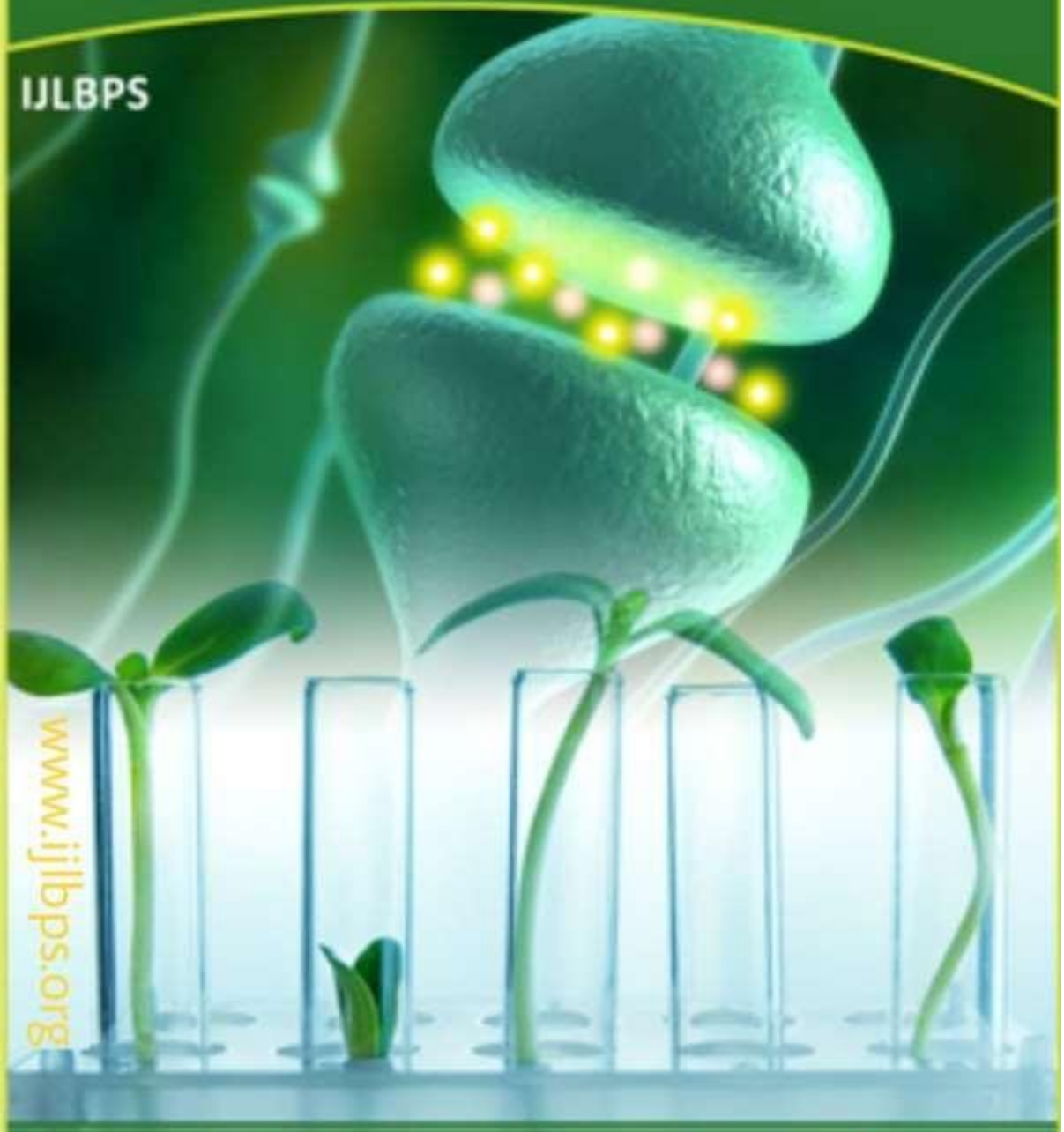

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REVIEWING THE NUTRITIONAL AND PHARMACOLOGICAL IMPORTANCE IN COMMON VEGETABLES IN NIGERIA-JOURNAL PAPER

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ABSTRACT

Green leafy vegetables (GLVs) are essential for a healthy diet. GLV use has long been ingrained in African households' cultural history, and it is a vital source of important micronutrients in sub-Saharan African nations. GLVs are used as a main course or a side dish in Nigeria and are either stewed or eaten raw. These GLVs are highly valuable both medicinally and nutritionally. It is theorized that educating consumers on the nutritional value, medical properties, and botanical description could increase consumption; however, a large portion of the body of knowledge now in existence is unavailable and inadequately documented. By gathering data on some of the foods consumed in Delta State, Nigeria, such as African jointfir (Gnetum africanum, locally known as Ukazi), jute mallow (Corchorus olitorius, locally known as Malafiya), and cassava (Manihot esculenta, Crantz), giant yellow mulberry (Myrianthus arboreus), okra (Abelmoschus esculentus), clove (Syzygium aromaticum), and bush buck (Gongronema latifolium, locally known as Utazi) leaves are some of the foods covered in this paper.

Keywords: Nigeria, malnutrition, green leafy vegetables, medicinal value, and indigenous foods

1. INTRODUCTION

The global strategy on diet recommends at least 400 g of fruit and vegetables daily to support consistent nutrition and human health. Sub-Saharan Africans are known to consume green leafy vegetables (GLVs) as part of their diets.1 These GLVs are rich in macro-and micronutrients, which significantly impacts people's nutritional statusincluding vitamins such as A, C, K, and carotene (provit A).2 They are also sources of essential minerals such as iron, potassium, zinc, iodine, and calcium.3

Commonly consumed GLVs in Nigeria include waterleaf (Talinum fruticosum), fluted pumpkin (Telifaira occidentalis), bitter leaf (Vernonia amygdalina), jute mallow (Corchorus olitorius), and clove (Syzygium aromaticum). GLVs display varied sensory attributes and may be bitter, aromatic, or bland to taste tasteless.4 The consumption of GLVs has been a part of the cultural heritage among rural African households during meal times, and are considered an essential part of their diet.5 Despite the medicinal, nutritional, and economic benefits of these vegetables, they are still underutilized by the population. This limitation may be due to the lack of awareness regarding the nutrition and health benefits of these GLVs.

It is argued that the provision of the necessary information about the nutritional and medicinal benefits of GLVs that are commonly consumed may encourage low-income populations in rural Nigeria to cultivate and consume more of these GLVs. The consumption GLVs as part of a balanced diet can contribute to the prevention of nutrient deficiencies and the consequent malnutrition among these vulnerable population groups.6 There has been limited research and documentation on the medicinal and nutritional values of GLVs consumed by the indigenous people of this Delta State, Nigeria. This paper reviews the nutritional and medicinal values of selected GLVs, including African jointfir (Gnetum africanum), jute mallow (Corchorus olitorius), cassava (Manihot esculenta), giant yellow mulberry (Myrianthus arboreus), okra (Abelmoschus esculentus), clove (Syzygium aromaticum) and bushbuck (Gongronema latifolium).

2. NUTRITIONAL AND MEDICINAL VALUE OF SELECTED GLVS CONSUMED IN DELTA STATE, NIGERIA

African jointfir (Gnetum africanum-Welw) leaves

Botanical description

African Jointfir (Gnetum africanum) is an evergreen, shade-tolerant vine, perennial with woody stems found in humid tropical forests, belonging to the family of Gnetaceae and genus Gnetum L. jointfir. It has different local names in different parts of the world. In Nigeria, common names are “wild spinach” (English name), “Afang leaves” (Ibibio), “Okazi/Ukazi” (Igbo) and “Nkani” (Northern cross Riverians).7,8 It is also cultivated in central Africa, South America, and tropical and subtropical part of Asia. During the dry season, G. africanum continues to grow new shoots and develop, especially when the side shoots or stem has been cut removed (Figure 1).

Figure 1: Leaves of Gnetum africanum. 9

Nutritional value

The fruit, leaves, root sap, and seed are the edible parts of the plant. The leaves of G. africanum can be consumed as a vegetable and cooked to prepare Afang and okazi soup.7 They are also widely used as an ingredient in stews due to their nutritional and therapeutic properties.10 The leaves of the plant are a rich source of protein, iron, calcium, and iodine, with the presence of fibre mitigates iron bioavailability and calcium, creating an essential nutritional property.

Medicinal value

Locally, G. africanum has been used as remedy for sore throats, nausea, and pain management among women during childbirth.10 G. africanum leaves contain phytochemical properties like anti-carcinogenic, antiinflammatory, and antioxidant.8,10.

Jute mallow (Corchorus olitorius L.) leaves

Botanical description

Corchorus olitorious L. is an annual, much-branched with young, tender with green leaves, belonging to the family belonging to Tiliaceae and genus Corchorus. It is commonly called jute mallow, bush okra, or West African sorrel.11 In Nigeria, it has many local names- 'ewedu' in Yoruba, 'malafiya' in Igbo, and 'rama' in Hausa.12 The plant thrives in warm conditions and grows naturally in abandoned fields, grass, and fallow lands. It is cultivated in Asia, Latin America, Australia, and Africa.13.

C. olitorious in the Africa continent includes Nigeria, Kenya, Uganda, Cameroon, Sudan, and Zimbabwe.14 The leaves have alternate, ovate, lanceolate, and dentate shapes, flowers occur as single or two to three flower cymes in the leaf axil opposite to the leaf, and their fruit are usually brown, gray, or green (Figure 2).12

Nutritional value

C. olitorius leaves are source of carbohydrates, proteins, essential amino acids, vitamin B, C, E, and β-carotene (vitamin A).15 The young fresh leaves of this plant are also high in fibre and minerals (e.g., calcium and iron) needed for good health.16,17 The leaves and tender shoots are the edible parts of the crop. The leaves either being eaten raw or be used to make a sticky sauce, which can be cooked in a stew/soup that accompanies the main dishes.18 The consumption of jute mallow provides excellent sources of antioxidants.

Medicinal value

The leaves, roots, and seeds part of the plant are also used for folk remedies and herbal medicines, to treat various disease conditions such as gonorrhoea, aches and pains, dysentery, fever, piles, tumours, and chronic cystitis and to act as a purgative (Figure 3).18.19 Moreover, the leaves' cold infusion is said to restore appetite and strength in humans.20.

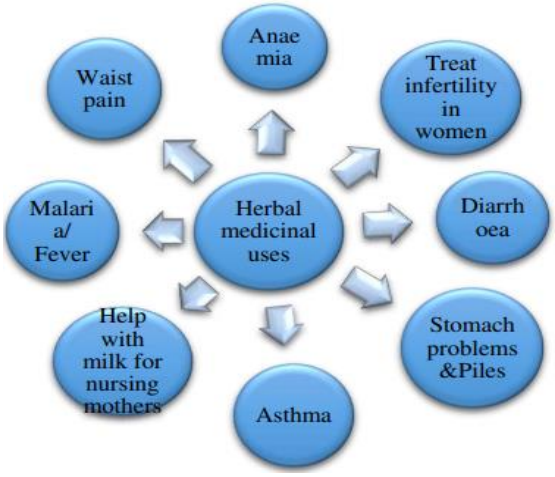

Figure 3: Herbal medicinal uses of jute mallow.

The leaves of jute are well known as a diuretic and emollient. The decoction made from these leaves is used as a tonic to support human health.21,22 Figure 3 illustrates various ways the plant can be used for curing illness, such as the leaves used as herbal pharmacopeia to prevent typhoid fever or malaria. The root scraping from C. olitorous is used for the treatment of toothache.18 The leaf part of jute mallow is consumed at cultural events such as marriages and naming ceremonies in Nigeria. Despite the significant

contribution of jute mallow to medicine, nutrition, and local economies, it is still a neglected crop within the scientific research and national agricultural development policies.23.

Cassava (Manihot esculenta, Crantz) leaves

Botanical description

Manihot esculenta, Crantz is a starch-tuber, tropical root vegetable, and a perennial woody shrub belonging to Euphorbiaceae and genus Begomovirus. In Nigeria, it is locally called "Ganyen rogo" in Hausa, "Akwukwo ji akpu" or Mpoto, ipoto in Igbo, "Ewe ege" in Yoruba, "Nfang iwa" in Ibibio, and "Ikong iwa" in Efik. It is a well-known leafy vegetable widely grown in tropical and subtropical countries such as Asia, Africa, and LatinAmerica.24 Leaves are used for both culinary purposes and in folk medicines. Cassava is one of the most edible root vegetables in some Sub-Saharan Africa countries, with the cassava tuber most commonly consumed. Cassava leaves are also consumed in Tanzania, Nigeria, Sierra Leone, Liberia, and Zaire, where they are readily available throughout the year.24 They are used for both culinary purposes and in folk medicines (Figure 4).25,26

Figure 4: Cassava leaves.

Nutritional value

Cassava leaves' nutritional value contains vitamins like B1, B2, C, and carotenoids, minerals, and protein.27 As a result, the consumption of cassava leaves can be used to combat malnutrition. For example, In Brazil, the cassava leaf powder is used as a food supplement named Multimistura to combat malnutrition among children and pregnant women.26

edicinal value

The micronutrients found in cassava leaves have several medicinal values in human health. Cassava leaves are used to help pregnant women increase breast milk production and treat diarrhoea in most sub-Saharan countries like Sierra Leone, Nigeria, and Liberia.

Nutritional value

Young leaves are mostly consumed as indigenous vegetables with a native delicacy in the South-Eastern part of Nigeria.29 The fruits of the plant can be eaten raw while the young leaves are cooked as vegetable soup. The leaves of M. arboreus plant are a source of protein, seasonally available among communities in the Southern part of Nigeria, including Delta and Edo states.31

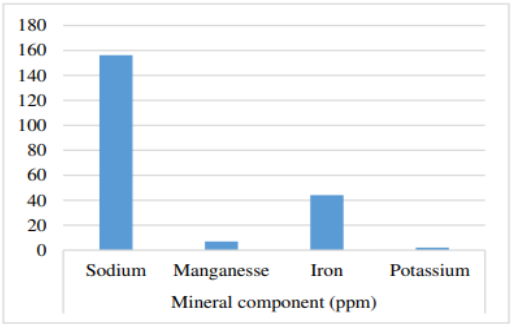

Figure 5: Some of the mineral composition of Myrianthus arboreus leaf with a high content level of sodium, iron, manganese,

and potassium, which are essential for human health.31

Medicinal value

M. arboreus is a medicinal plant used to treat various disease conditions in African countries, including Nigeria. Common ailments treated with the leaves or leafy shoots of plant extracts include malaria, wounds, dysentery, skin infections, and diarrhea.30 The leaves are also used in traditional medicine, which can be in a powdery form or consumed in liquid form when boiled to heal muscle pain and relieve back pain.32 The leaf stalks are mashed as a dressing for boils and as a medicinal ingredient to alleviate fever and treat dysentery among infants. The bark of the plant has its medicinal usage in Nigeria, mostly to expel intestinal parasites.

Okra leaves (Abelmoschus esculentus)

Botanical description

Abelmoschus esculentus, also known as ladies' fingers or gumbo, is a warm-season vegetable crop belonging to Malvaceae and genus .33 A. esculentus is cultivated in the tropical and warm temperate parts of the world. Okra is a green, finger-shaped vegetable (Figure 6) with a characteristic viscous juice.34 The okra fruit/pod is a greenish capsule and leaves grow in an alternating pattern, which has up to 4-7 lobes on each stem.

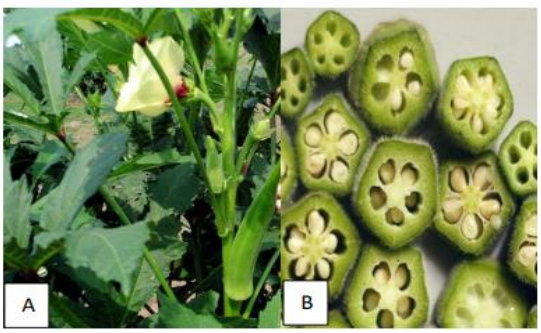

Figure 6: (A) Okra leaves, with one mature pod (Abelmoschus esculentus), (B) Cut okra fruits showing seeds. 34

Medicinal value

The consumption of okra has been associated with high fibre content, which can result in various beneficial health outcomes.38 Besides its nutritional role, its high fibre content regulates the body's sugar level and acts as a dietary medicine source. The presence of okra mucilage is assumed to impact significantly regulating the blood sugar of the human body.39 It has been proven to be linked to hypoglycemic, antimicrobial, anticancer, and anti-ulcer activities.40 The high intake of A. esculentus is related to risk reduction in chronic health diseases such as diabetes, ulcers, and haemorrhoids.41 A. esculentus helps in recovery from cardiovascular disorders due to its antioxidants component.42 The leaves provides tumour remedies and furnish an emollient poultice.42

Figure 7: (A) Clove leaves and (B) flower bud.

Medicinal value

The medicinal value of cloves includes their antimicrobial, antiviral, antifungal, and antioxidant properties.45 Cloves are used to enhance digestive health through their carminative and stimulant properties, improve blood circulation, reduce blood

pressure, and boost the body's immune system.46

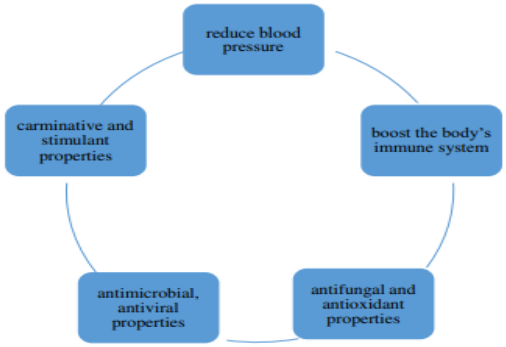

Figure 8: Herbal and medicinal uses of clove leaves.

Bushbuck (Gongronema latifolium) leaves

Botanical description

Gongronema latifolium is an annual non-woody climbing forest shrub with glabrous stems underneath reaches up to 5 m long (Figure 8), belonging to the family of Asclepiadaceae. 47 It is mostly found in the tropical rainforest regions, such as in Nigeria, where it is commonly called Bushbuck (English name), 'utazi' in Igbo, 'arokeke' or 'madumaro' in Yoruba, and 'utasi' by the Efik/Ibibio people living in South-eastern Nigeria. Gongronema latifolium is a climbing shrub. Its leaves are heart-shaped, broad, and slightly oval in appearance with a deeply cordate base (Figure 9).

Figure 9: Bushbuck leaves (G. latifolium)

Nutritional value

G. latifolium leaves are consumed popularly in the Southeastern part of Nigeria, which is used as a spice and a leafy vegetable for preparing Nsala soup, African salad (Ugba and also in accessories dishes like Abacha and Nkwobi in Delta State Nigeria. This plant's nutritional importance depends on its usefulness as a seasoning ingredient because of its aromatic flavour.48 It is also a significant source of high protein and mineral components, which are useful in controlling weight gain and crucial for digestion, organ function, bone and muscle development, and strengthening.

Medicinal value

G. latifolium leaf can be infused, chewed, or cooked for medicinal reasons. The root part of the plant cannot be chewed directly; it must subject to decoction. In Africa, the decoction is made by infusing the root and the leaves in hot water for a period, then allowed it to cool down. The liquid extracted from this decoction and the leaves themselves are used as a medicinal treatment for constipation, reduce

symptoms of colds and the flu, improve digestion, and control blood pressure for people with hypertension. Among lactating mothers, utazi has value in maintaining body weight.49 The fresh part of utazi leaves can be chewed directly; the plant stem acts like an old method of dental care and reported with medicinal values including anti-diarrheal, anti-bacterial, and antifungal activities.

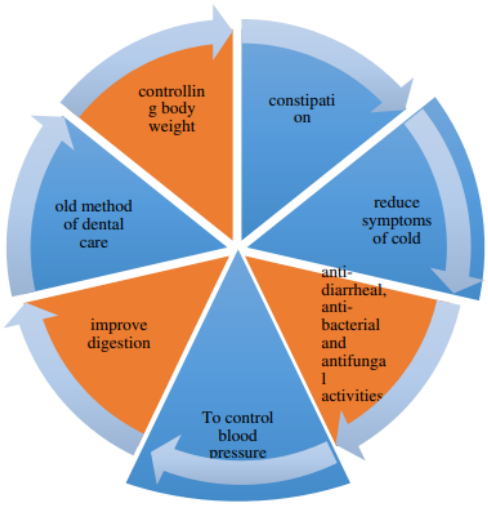

Figure 10: Herbal and medicinal uses of Bushbuck leaves.49

3. CONCLUSION

As vital providers of nutrients, green leafy vegetables can help lower the risk of malnutrition in Nigeria when included in a balanced diet. This paper describes several GLVs botanically and discusses their nutritional and therapeutic value. Notably, the information in this research may help spread awareness among the general public—particularly among residents of Delta State, Nigeria—about the advantages of including GLV in a healthy diet. Policymakers, nutritionists, food scientists, physicians, and other stakeholders must give careful consideration to encouraging consumption among Sub-Saharan Africans, particularly in Delta State, Nigeria, in order to realize the benefits of GLVs.

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