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Health Benefits, Nutrient Content of Irvingia Gabonensis

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Abstract

Irvingia gabonensis is a plant native in West Africa which has been used traditionally for centuries to treat various health conditions. Recent studies have shed light on its potential health benefits,including anti-obesity ,anti-inflammatory ,and antioxidant properties. This review aim to summarize the current state of knowledge on the health benefits of Irvingia gabonensis, with a focus on its bioactive compounds, mechanisms of action, and potential therapeutic applications. The available evidence suggests that Irvingia gabonensis may regulate body weight ,improve metabolic health ,and reduce inflammation and oxidative stress. These findings have important implications for the prevention and management of chronic diseases, such as obesity,diabetes, nd cardiovascular disease. Further research is needed to fully elucidate the health benefits of Irvingia gabonensis and to explore its potential as a natural remedy for promoting overall health and well-being. The bioactive compounds presents include flavonoids, alkaloids,and glycosides have shown to modulate various physiological pathways, leading to improved glucose and lipid metabolism, thereby enhancing insulin sensitivity ,and reduced inflammation. The antioxidant properties of Irvingia gabonensis have also been demonstrated, with its extracts exhibiting significant scavenging activity against free radicals and reactive oxygen species.

Additionally, irvingia gabonensis has been found to have potential benefits for weight management, with studies showing that its effects can suppress appetite, increase feelings of fullness, and enhance fat burning. The anti-inflammatory properties of Irvingia gabonensis may also contribute to its potential benefits for cardiovascular health, by reducing inflammation and improving lipid profiles.

In conclusion, the available evidence suggests that Irvingia gabonensis is a promising natural remedy with a range of potential health benefits, including anti-obesity,anti-inflammatory,and anti-oxidant effects.

Keywords: Irvingia gabonensis; anti-obesity; anti-inflammatory; antioxidant; health benefits.

1. Introduction

The tropical fruit tree *Irvingia gabonensis* is indigenous to West and Central Africa and is sometimes referred to as the African mango or wild mango. Due to its nutritional advantages and possible health benefits, especially with regard to weight control and metabolic health, this species has garnered a lot of interest. *Irvingia gabonensis's* fruit and seeds have long been an important part of many African societies' diets and medical practices [1].The seeds are beneficial for nutrition and health uses since they are high in vitamins, dietary fiber, and vital fatty acids [2]. Irvingia gabonensis may help treat obesity, diabetes, and other related metabolic disorders, according to recent scientific research that has started to validate these traditional usages [3].

The rising popularity of African mango in global health markets is primarily due to its reputation as a natural supplement for weight loss and blood sugar management. This interest has led to research into its phytochemical components, which include flavonoids and terpenoids known for their antioxidant and anti-inflammatory effects [4]. These bioactive compounds are believed to help combat oxidative stress and inflammation, thereby enhancing the health benefits associated with the seeds and extracts of *I. gabonensis*.

In addition to its health benefits, the cultivation of *I. gabonensis* presents economic opportunities for rural communities. The tree is well-suited to local agroecological conditions and can provide a sustainable source of income through the harvesting of its fruits and seeds [5]. However, concerns about habitat degradation and over harvesting highlight the importance of implementing sustainable management practices to safeguard this valuable species**.** ***Irvingia gabonensis*** represents a unique blend of nutritional value, traditional medicinal applications, and potential for sustainable development.

Morphological Characteristics

The leaves of *Irvingia gabonensis* are alternate and leathery, typically measuring 10 to 25 centimeters long. They display a glossy dark green color and feature a prominent midrib along with lateral veins, which enhance the tree's photosynthetic efficiency [6,7]. This tree produces small, fragrant flowers that are usually yellowish-green and arranged in panicles. The flowering period generally occurs from March to June, attracting various pollinators, including bees and butterflies [8]. The fruit of *Irvingia gabonensis* is a drupe, generally oval or round, measuring approximately 4 to 6 centimeters in diameter. The thin skin ranges from green to yellow or orange upon ripening. The sweet, fibrous flesh encases a large, hard seed. Fruits typically ripen from August to October and are consumed fresh or processed into different products [9].

Seeds and Nutritional Value

The seeds, often referred to as dika nuts, are highly prized. Each fruit generally contains a single seed that is flat, oval-shaped, and measures about 3 to 5 centimeters in length. These seeds, protected by a hard shell, are rich in essential nutrients, including fats, proteins, and carbohydrates. Their notable content of unsaturated fatty acids contributes to their reputation for health benefits [10,11]. Research indicates that *Irvingia gabonensis* seeds are abundant in dietary fiber, essential fatty acids, vitamins A and E, and various minerals. They are especially recognized for their potential in weight management and overall metabolic health. Studies suggest that extracts from these seeds may aid in reducing body fat, lowering cholesterol levels, and improving blood sugar control [12, 13].

Ethno medicinal Properties of Irvingia Gabonensis

Many African communities hold *Irvingia gabonensis* root in high regard due to its many health advantages. Because they have a thorough awareness of the plant's therapeutic qualities, traditional healers frequently employ it for a range of illnesses. The following are some of its most notable applications:

i. **Digestive Health**

The root extract is frequently employed to alleviate gastrointestinal issues, including diarrhea and dysentery. Decoctions made from the root are a common remedy for stomach discomfort, showcasing its efficacy in promoting digestive health. The anti-diarrheal properties may stem from its ability to regulate gut flora and reduce inflammation in the gastrointestinal tract [14].

ii. **Anti-inflammatory and Analgesic Applications**

In traditional practices, *Irvingia gabonensis* root has been utilized to manage inflammatory conditions such as arthritis. The preparation of poultices and infusions from the root provides topical and internal relief for pain and swelling. This anti-inflammatory action is crucial for individuals suffering from chronic pain conditions, as it can significantly improve their quality of life [15].

iii. **Antimicrobial Activity**

Because of its antibacterial qualities, Irvingia gabonensis root is used with support from research. In keeping with its traditional use in the treatment of infections, the extract has been demonstrated to prevent the growth of a variety of bacteria and fungus. Because urinary tract infections can have a negative impact on kidney health, this antibacterial activity is especially important for treating them [16].

iv. **Metabolic Regulation**

The root has historically been linked to the treatment of metabolic diseases, such as diabetes and obesity [17]. It is a desirable choice for people looking for natural methods to reduce their blood sugar and weight because of its capacity to enhance metabolic processes and regulate hunger. According to studies, elements in the root may improve insulin sensitivity, which would be advantageous for those with metabolic syndrome.

v. **Renal Health**

Emerging evidence suggests that *Irvingia gabonensis* root extract may play a role in promoting kidney health. Traditional beliefs

often attribute "blood purification" properties to the root, which aligns with its potential to support renal function. The extract's effects on detoxification and its role in reducing the burden on the kidneys warrant further investigation [18].

1.0. Phytochemical Components

The therapeutic potential of *Irvingia gabonensis* root can be attributed to its rich phytochemical profile, which includes a variety of bioactive compounds known for their health benefits. Flavonoids are a prominent group of polyphenolic compounds recognized for their numerous health benefits. The root of *Irvingia gabonensis* contains several key flavonoids, including quercetin, kaempferol, and catechins. This flavonoid is well-regarded for its powerful antioxidant and anti-inflammatory properties. It has been shown to reduce oxidative stress in renal tissues, which helps enhance kidney function and mitigate inflammation [19]. Known for its potential anti-cancer effects, kaempferol also possesses anti-inflammatory and analgesic properties, making it useful in treating conditions such as arthritis [20]. These compounds are associated with cardiovascular health and metabolic regulation, adding to the health benefits linked to *Irvingia gabonensis* root [21].

The antioxidant activity of *Irvingia gabonensis* can be largely attributed to its phenolic compounds, such as gallic acid and chlorogenic acid. This compound has strong antioxidant effects, helping to protect cells from oxidative damage. Research indicates that gallic acid may decrease inflammation and could provide protective effects against chronic diseases [22]. This phenolic acid is important for regulating glucose metabolism and has been linked to anti-diabetic effects, which is beneficial for those managing blood sugar levels [23]. Alkaloids are nitrogen-containing compounds that exhibit various biological effects. The roots of *Irvingia gabonensis* contain several alkaloids, including ibogaine. While commonly recognized for its psychoactive properties, ibogaine may also influence metabolic processes and has shown potential neuroprotective effects [24]. Terpenoids, or isoprenoids, are a diverse class of organic compounds that provide many plants with their characteristic aromas. These compounds also possess significant health benefits. This phytosterol found in *Irvingia gabonensis* is known for its ability to lower cholesterol levels and may offer protection against cardiovascular diseases. Its anti-inflammatory properties can also support kidney health [25]. Saponins are glycoside compounds recognized for their immune-boosting and cholesterol-lowering effects. They have also demonstrated antioxidant and antimicrobial activities. Saponins may help protect against kidney toxicity by decreasing lipid accumulation in renal tissues, thereby contributing to their protective effects on the kidneys.

2.0. Pharmacological Properties of Irvingia gabonensis

Antioxidant Properties

The antioxidant activity of *Irvingia gabonensis* root extract is crucial for protecting renal tissues from oxidative damage. The antioxidant activity of *Irvingia gabonensis* root extract is largely attributed to its rich phytochemical content, including flavonoids and phenolic compounds. These substances have been shown to scavenge free radicals and reduce lipid peroxidation, ultimately protecting cellular structures from oxidative damage [26]. By reducing oxidative stress, the root extract may contribute to the prevention of various diseases, including cardiovascular conditions, diabetes, and neurodegenerative disorders. Its antioxidant properties suggest a role in promoting overall health and longevity [27].

Antimicrobial Effects

The antimicrobial activity of *Irvingia gabonensis* root extract has been the subject of various studies, revealing its effectiveness against a range of pathogenic microorganisms, including bacteria and fungi. The antimicrobial effects are attributed to the presence of phenolic compounds and other bioactive constituents that can disrupt the integrity of microbial cell membranes. This disruption prevents microbial proliferation and may lead to cell death [28]. Given its antimicrobial properties, *Irvingia gabonensis* root extract can be considered for use in treating infections and developing natural preservatives or antimicrobial agents. Its traditional use in managing infections aligns with contemporary findings supporting its efficacy against microbial pathogens [29].

Anti-inflammatory Effects

Irvingia gabonensis root extract exhibits significant anti-inflammatory effects, which are essential in preventing chronic kidney disease. Inflammation is a natural immune response; however, chronic inflammation can lead to numerous health issues. The root extract of *Irvingia gabonensis* exhibits notable anti-inflammatory effects that can be beneficial in managing various inflammatory conditions. The anti-inflammatory properties of the extract are largely due to its flavonoids, such as quercetin and kaempferol, which inhibit the production of pro-inflammatory cytokines and enzymes. This inhibition can lead to reduced swelling and pain in affected tissues [30]. The ability to modulate inflammatory responses makes *Irvingia gabonensis* root extract a potential therapeutic option for conditions such as arthritis, allergies, and inflammatory bowel disease. By managing inflammation, it may enhance the quality of life for

individuals suffering from these ailments [31].

Antidiabetic Effects

Research has indicated that *Irvingia gabonensis* root extract may have significant antidiabetic effects, making it a valuable option for managing blood glucose levels. The extract is believed to enhance insulin sensitivity and reduce glucose absorption in the intestines, leading to improved glycemic control. Compounds such as chlorogenic acid contribute to these effects by regulating glucose metabolism and insulin response [32]. The antidiabetic properties of *Irvingia gabonensis* can be particularly beneficial for individuals with type 2 diabetes. By aiding in blood sugar management, the extract may help prevent diabetes-related complications, thus supporting overall metabolic health [33].

Renoprotective Effects

Recent research has demonstrated that the root extract of *Irvingia gabonensis* may provide renoprotection. Particularly noteworthy are *Irvingia gabonensis* root extract's renoprotective qualities, particularly for those with kidney diseases. The extract has been demonstrated to shield renal tissues from inflammation and oxidative damage. By preventing nephrotoxicity, saponins and other bioactive substances found in the root may promote kidney health and function. *Irvingia gabonensis's* renoprotective properties can be extremely important for those with diseases like diabetic nephropathy. In the treatment of chronic kidney illness, the extract shows potential as a supportive therapy by maintaining renal function and lowering the risk of kidney damage [34].

Conclusion

In conclusion, the available evidence suggests that *Irvingia gabonensis* is a promising natural remedy with a range of potential health benefits, including anti-obesity,anti-inflammatory,and anti-oxidant effects

Conflict of Interest

The authors declares no conflict of interest

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