IJPSR (2024), Volume 15, Issue 3 (Review Article)

INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH

Received on 13 October 2023; received in revised form, 09 January 2024; accepted, 17 January 2024; published 01 March 2024

A REVIEW ON PLANT *OPILIA CELTIDIFOLIA*: AN ASSESSMENT OF ITS BOTANY, CONVENTIONAL UTILIZATION, PHYTOCHEMISTRY AND PHARMACOLOGY

Anubhav Dubey [1], Samra [*1], Vikram Kumar Sahu [1], Sribatsa Lanchhana Dash [1] and Amit Mishra [2]

Maharana Pratap College of Pharmacy [1], Maharana Pratap College of Pharmaceutical Sciences [2], Kothi, Mandhana, Kanpur - 209217, Uttar Pradesh, India.

Keywords:

Opilia celtidifolia, Opiliaceae, Bioactive compounds, Angiosperms Eudicots, Phytochemistry, Pharmacological activities

Correspondence to Author:
Samra

Research Scholar,
Maharana Pratap College of Pharmacy, Kothi, Mandhana, Kanpur - 209217, Uttar Pradesh, India.

E-mail: Samrasiddiqui001@gmail.com

ABSTRACT: The plant *Opilia celtidifolia*, often known as ironwood or Opilia, is indigenous to many parts of Africa. It has a long history of traditional use in African herbal medicine, and its purported therapeutic benefits have attracted interest. An overview of *Opilia celtidifolia's* cultivation, the portions used, and the identification of its chemical components are given in this abstract. The savannahs, dry woods, and semi-arid regions of African nations, including Nigeria, Ghana, and Senegal, are the main habitats for *Opilia celtidifolia*. Information on its controlled cultivation for therapeutic or commercial purposes is still scarce, nevertheless. Various parts of *Opilia celtidifolia*, including the leaves, roots, stem bark, and seeds, have been traditionally employed for medicinal purposes. Each part serves specific therapeutic applications, such as the use of roots for wound healing and leaves for various conditions. *Opilia celtidifolia* contains a diverse array of chemical constituents, including alkaloids, flavonoids, polyphenols, and other bioactive compounds. *Opilia celtidifolia* is a plant with a rich history in African traditional medicine. It is believed to possess various medicinal properties, including anti-inflammatory, antioxidant, analgesic, and potential immunomodulatory effects. Moreover, the development of controlled cultivation methods and sustainable management practices is vital to ensure the availability of this valuable plant for medicinal and commercial purposes.

INTRODUCTION: *Opilia celtidifolia* is a species of flowering plant native to tropical Africa. It belongs to the family Opiliaceae and is commonly known as the "African breadfruit" or "African locust bean." The tree produces large, edible fruits that are used in various culinary dishes, and its seeds are often fermented to make a seasoning called "dawadawa" in some African countries.

QUICK RESPONSE CODE

DOI: 10.13040/IJPSR.0975-8232.15(3).690-98

This article can be accessed online on www.ijpsr.com

DOI link: https://doi.org/10.13040/IJPSR.0975-8232.15(3).690-98

The plant also has medicinal uses in traditional African medicine. *Opilia celtidifolia* is a woody climber, spreading, heavily branched shrub or tree up to 10 m high, common in fringing forest and savanna. It is widespread in West Africa from Senegal to Nigeria and dispersed over the dried parts of tropical Africa.

It is one of the plants commonly used by the population of the Far North Region of Cameroon for its many therapeutic virtues including the treatment of jaundice, chest, and abdominal pains. *Opilia celtidifolia* is a plant used widely in Africa and Benin in the treatment of various pathologies. In particular, the leaf and root are used to treat dermatological conditions, wound healing,

abdominal pain, internal worms and also as an appetizer. Flavonoid-rich fractions of *O. celtidifolia* have also been shown to exhibit potent antioxidant and antidiabetic activity by inhibiting key enzymes such as α-amylase and α-glucosidase related to type II diabetes, which has been considered an effective strategy for controlling blood sugar. The bark is used for the treatment of snakebites, and fever and the fruits are consumed by the Malayali tribes of Tamil Nadu, India. The plant is also involved in the treatment of malaria liver diseases and in the treatment of sexually transmitted diseases. In Cameroon, *Opilia celtidifolia* is used in the treatment of jaundice.

Opilia is a genus of approximately 33 species of lianas in the family Opiliaceae described as a genus in 1802.

Opilia is native to tropical and subtropical regions of Asia, Africa, Papuasia, and Australia.

Species:

1. ***Opilia afzelii*:** Sierra Leone
2. ***Opilia amentaca*:** Trop Africa, Madagascar, India, Sri Lanka, Yunnan, SE Asia, Papuasia, N Australia
3. ***Opilia campestris***: Ethiopia, Somalia, Kenya, Tanzania, Angola, Namibia
4. ***Opilia congolana*:** Cameroon, Gabon, Equatorial Guinea, Democratic Republic of the Congo
5. ***Opilia fragrans:*** Philippines

TABLE 1: SEVERAL LOCAL AND COMMON NAMES IN REGIONS OF AFRICA

Regions	Names of *Opilia celtidifolia*
Nigeria	Ogirisi and Baaka
Ghana	Nkatebubuo or Nkatekese
Senegal	Neum
Cameroon	Akusembat

Plant Profile:

History: The history of *Opilia celtidifolia*, commonly known as the African breadfruit or African locust bean, is deeply rooted in Africa, particularly in West and Central Africa, where it is native. This plant has a long history of traditional use and cultural significance:

Traditional Use: *Opilia celtidifolia* has been used for centuries by indigenous communities in Africa for various purposes. The tree's large, nutritious fruits are a valuable food source, and its seeds are used in traditional African cuisine and seasoning [1].

Culinary Uses: The seeds of *Opilia celtidifolia* are often fermented and used to make a condiment known as "dawadawa" or "iru" in different regions. This condiment is used to flavour soups, stews, and other dishes, adding a rich and savoury taste [2].

Medicinal Uses: Besides its culinary applications, *Opilia celtidifolia* also has a history of use in traditional medicine. Various parts of the plant, including the leaves and bark, have been used to treat ailments in different African cultures [3].

Cultural Significance: The tree holds cultural significance in some African societies and is associated with various rituals and ceremonies. It is sometimes planted near homes and villages for its shade and as a source of sustenance [4].

Botanical Classification: *Opilia celtidifolia* belongs to the Opiliaceae family and is part of the Opilia genus. It is characterized by its distinctive fruit and foliage.

Agricultural and Economic Importance: In addition to its cultural significance, *Opilia celtidifolia* plays a crucial role in the livelihoods of many African communities. The cultivation and sale of its fruits and products like dawadawa provide income and sustenance to local populations.

While *Opilia celtidifolia* has a rich history in Africa, it remains relatively lesser-known on the global scale. Efforts are ongoing to study and promote the plant's cultivation and sustainable use, both for its economic potential and its role in preserving traditional knowledge and practices in African communities

Cultivation: Cultivating *Opilia celtidifolia*, also known as African rosewood or African satinwood, can be a sustainable alternative to harvesting the species from the wild and can help conserve its natural populations. Here are some key points to consider if you're interested in cultivating *Opilia celtidifolia*.

Climate and Environment: *Opilia celtidifolia* is native to various countries in West and Central Africa, so it is adapted to tropical and subtropical climates. It thrives in areas with well-defined wet and dry seasons. Ensure that the climate in your region is suitable for its growth [5].

Soil Requirements: *Opilia celtidifolia* prefers well-drained soils. It can grow in a range of soil types, including sandy, loamy, and clayey soils. Conduct a soil test to assess the pH and nutrient content of your soil, and amend it if necessary to ensure it meets the plant's requirements.

Propagation: *Opilia celtidifolia* can be propagated from seeds or cuttings. Seed propagation is commonly used, and seeds can be collected from mature trees. Seeds should be planted in a well-prepared seedbed and kept moist until germination occurs.

Spacing: When planting *Opilia celtidifolia*, spacing is important to allow for proper growth and canopy development. Depending on the growth habit and desired end use (e.g., timber production), spacing can vary, but it typically ranges from 3 to 6 meters between trees [6].

Watering: Adequate water is essential for the establishment and growth of *Opilia celtidifolia*. Young plants may require regular watering until they become established. Once mature, the trees are typically drought-tolerant.

Pruning and Thinning: Pruning and thinning may be necessary to shape the trees and remove any dead or weak branches. Proper pruning can help promote healthy growth and improve timber quality.

Pest and Disease Management: Keep an eye out for common pests and diseases that can affect *Opilia celtidifolia* in your region. Implement appropriate pest and disease management strategies if needed.

Harvesting: *Opilia celtidifolia* is typically harvested for its valuable timber. Harvesting should be done selectively and sustainably to avoid overexploitation of the trees. It's important to adhere to local regulations and guidelines for timber harvesting.

Local Regulations and Conservation: Be aware of any local or national regulations regarding the cultivation and harvesting of *Opilia celtidifolia*. It's crucial to promote sustainable cultivation practices to protect the species and its natural habitat.

Long-Term Sustainability: Sustainable management practices, such as reforestation and the establishment of plantations, can help ensure the long-term sustainability of *Opilia celtidifolia* cultivation while reducing pressure on wild populations. Cultivating *Opilia celtidifolia* can provide economic benefits while contributing to conservation efforts. However, it's important to approach cultivation with sustainability and environmental stewardship in mind to protect this valuable species. Additionally, consulting with local agricultural or forestry experts can provide valuable insights specific to your region.

Parts Used: *Opilia celtidifolia*, commonly known as African rosewood or African satinwood, has various parts that are used for different purposes, primarily for their medicinal and economic value. All plant parts-mature bark, leaves, roots, and wood can be used to treat ailments [22].

Morphology: The morphology of *Opilia celtidifolia*, commonly known as African rosewood or African satinwood, can be described as follows.

Habit: *Opilia celtidifolia* is a small to medium-sized tree that can reach heights of up to 15 meters (49 feet). It typically has a rounded or spreading canopy.

Leaves: The leaves of *Opilia celtidifolia* are simple and alternate. They are typically elliptical to ovate in shape and have serrated margins. The leaves are dark green and glossy on the upper surface and paler on the lower surface.

Flowers: The plant produces small, inconspicuous flowers that are typically greenish-white to pale yellow in colour. The flowers are often arranged in clusters or panicles.

Fruits: *Opilia celtidifolia* produces small, round to oval fruits that are about 1 to 1.5 centimetres in diameter. These fruits are often red or reddish-brown when ripe.

Bark: The bark of *Opilia celtidifolia* is typically greyish-brown and can be rough or scaly in texture.

Wood: The heartwood of *Opilia celtidifolia* is highly valued for its quality and is often reddish-brown in colour. The wood is known for its beautiful grain patterns and is used for making furniture, cabinetry, musical instruments, and decorative items.

Roots: The roots of *Opilia celtidifolia* extend into the soil to provide stability and nutrient uptake for the tree.

Growth Form: *Opilia celtidifolia* generally has a well-branched growth form, with a single trunk that divides into multiple branches. The tree's shape can vary depending on its age and growing conditions.

Habitat: It is typically found in savannas, woodland areas, and open forests in tropical and subtropical regions of West and Central Africa. The morphology of *Opilia celtidifolia* can vary slightly depending on environmental factors and individual specimens.

This tree species is of both economic and ecological importance in its native range. Efforts are being made to promote sustainable management practices to ensure its long-term survival.

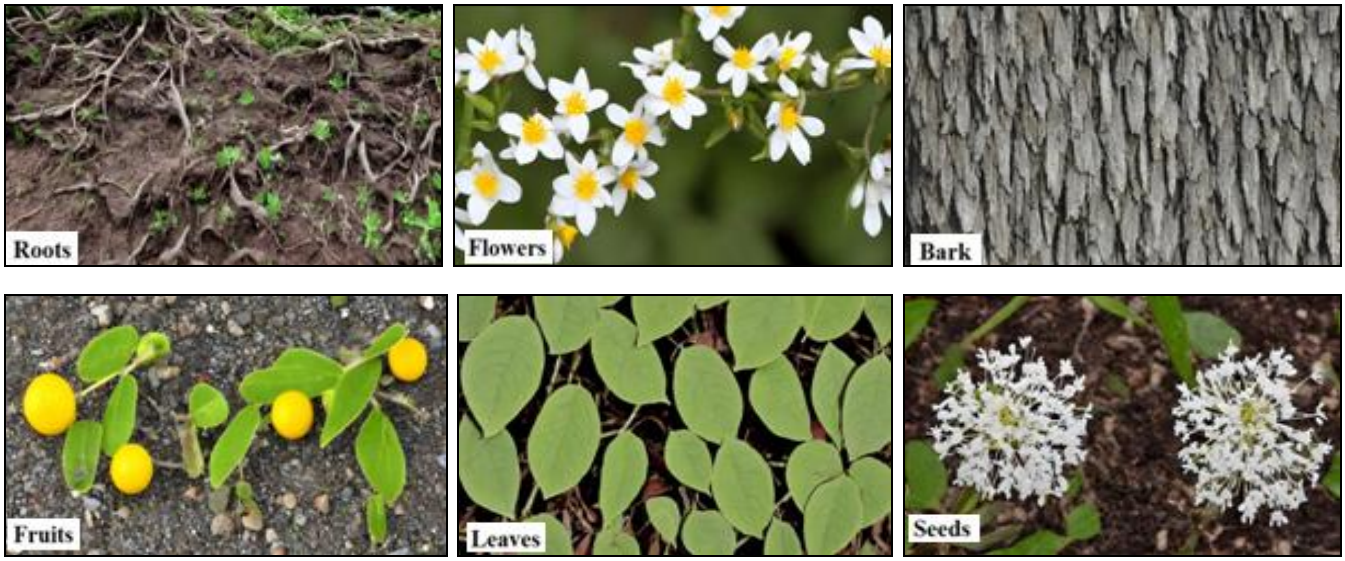

FIG. 1: MORPHOLOGICAL CHARACTERISTICS OF *OPILIA CELTIDIFOLIA*

Identification of Chemical Constituents: The phytochemical composition of *Opilia celtidifolia*, like many plant species, can vary depending on factors such as the plant's age, location, and environmental conditions.

While specific studies on the phytochemical constituents of *Opilia celtidifolia* may be limited, various phytochemicals commonly found in plants could potentially be present.

TABLE 2: TAXONOMICAL ARRANGEMENT OF *OPILIA CELTIDIFOLIA*

Kingdom	Plantae
Phylum	Angiosperms
Class	Eudicots
Order	Celastrales
Family	Opiliaceae
Genus	Opilia
Species	Celtidifolia

These phytochemicals may include Alkaloids, Flavonoids, Tannins, Terpenoids, Steroids, Saponins, Phenolic Compounds, Glycosides, Lignans, and Quinones.

Biochemical and Pharmacological Properties: *Opilia celtidifolia*, commonly known as "Ironwood" or "Opilia," is a plant found in various regions of Africa. It belongs to the family Opiliaceae. While it has been used traditionally in some African cultures for medicinal purposes, scientific research on its bioactivity and pharmacological properties is limited [8]. Here are some potential bioactive and pharmacological activities associated with *Opilia celtidifolia*.

Traditional Medicinal Uses: *Opilia celtidifolia* has a history of use in traditional African medicine.

Various parts of the plant, such as the bark, leaves, and seeds, have been used to treat various ailments. This suggests the potential for pharmacological properties. *Opilia celtidifolia* is often used to alleviate digestive problems. The plant's seeds are believed to have properties that can help treat diarrhoea, dysentery, and other gastrointestinal issues. Traditional healers use the plant in various forms to promote the healing of wounds and sores [27].

It may be applied topically as a poultice or used as a component in traditional wound dressings. Some indigenous communities use *Opilia celtidifolia* to address inflammatory conditions. It is believed to have anti-inflammatory properties that may help with conditions associated with inflammation. *Opilia celtidifolia* may be used as a natural pain reliever in traditional medicine. It is applied topically or ingested to alleviate pain, including muscle aches and joint pain. In some regions, the plant is used to reduce fevers. It is thought to have fever-reducing properties, although the exact mechanisms are not well-documented. The plant is sometimes employed to manage respiratory conditions, such as coughs and chest congestion. *Opilia celtidifolia* is occasionally used to address menstrual problems, including irregular menstruation and menstrual pain. Traditional healers may use *Opilia celtidifolia* to provide relief from haemorrhoids, a common rectal condition. In some regions, the plant is used as part of traditional remedies to manage symptoms of malaria. Its potential antipyretic and anti-inflammatory properties may play a role in this application [25].

Anti-Inflammatory Properties: Some studies have suggested that extracts from *Opilia celtidifolia* may possess anti-inflammatory properties. These properties could be valuable for treating conditions characterized by inflammation, such as arthritis and other inflammatory disorders. In many African cultures, *Opilia celtidifolia* has a history of traditional use for managing various health conditions, including those associated with inflammation. Traditional herbal remedies often involve the use of *Opilia celtidifolia* for its perceived anti-inflammatory effects. *Opilia celtidifolia* contains a variety of phytochemicals, some of which have been associated with anti-inflammatory activity. These include flavonoids, polyphenols, and other bioactive compounds. Some studies have investigated the effects of *Opilia celtidifolia* extracts on the production of inflammatory mediators, such as cytokines and prostaglandins. In these studies, the plant's extracts have shown the potential to inhibit the release of these pro-inflammatory substances. Oxidative stress can lead to inflammation, and *Opilia celtidifolia* contains antioxidants that may help counteract this stress. Antioxidants neutralize harmful free radicals and reduce inflammation by preventing oxidative damage. Animal studies have provided some evidence of the anti-inflammatory properties of *Opilia celtidifolia*. These studies have demonstrated reductions in inflammatory markers and improvements in inflammatory conditions in animals treated with the plant's extracts [9].

It's important to note that while these findings suggest anti-inflammatory potential, the scientific research on *Opilia celtidifolia* is still limited, and more rigorous studies, including clinical trials in humans, are needed to further establish its effectiveness as an anti-inflammatory agent. Additionally, the specific mechanisms of action and active compounds responsible for the anti-inflammatory effects require more investigation.

Antioxidant Activity: *Opilia celtidifolia* may contain compounds with antioxidant activity. Antioxidants help protect the body's cells from oxidative damage caused by free radicals, which are associated with various chronic diseases and ageing. *Opilia celtidifolia* contains various phytochemicals, including flavonoids, polyphenols, and other bioactive compounds. Many of these compounds are known for their antioxidant properties. Antioxidants in *Opilia celtidifolia* can neutralize free radicals, which are highly reactive molecules that can damage cells and DNA. By scavenging free radicals, these antioxidants help protect the body from oxidative damage. Oxidative stress occurs when the production of free radicals exceeds the body's ability to neutralize them. Oxidative stress is associated with various diseases and ageing. *Opilia celtidifolia's* antioxidants may help prevent or reduce oxidative stress. Antioxidants can protect cellular components, including lipids, proteins, and DNA, from damage caused by oxidation.

This is important for maintaining the health and function of cells and tissues. Antioxidants are often associated with anti-aging properties. By reducing oxidative damage, *Opilia celtidifolia's* antioxidants may help maintain youthful and healthy skin and slow the ageing process. Antioxidants have been linked to improved cardiovascular health by reducing the oxidation of LDL cholesterol and protecting blood vessels from damage. Some antioxidants can have neuroprotective properties, potentially helping to prevent or mitigate conditions like Alzheimer's disease and other neurodegenerative disorders. Antioxidants can also reduce inflammation, as oxidative stress is often a trigger for inflammation. *Opilia celtidifolia's* antioxidant activity may contribute to its anti-inflammatory effects [17].

Analgesic Effects: In traditional medicine, *Opilia celtidifolia* has been used to alleviate pain. Further research is needed to better understand its potential as an analgesic agent. *Opilia celtidifolia* has a history of traditional use in various African cultures for managing pain, including headaches, muscular pain, and other forms of discomfort. *Opilia celtidifolia* contains a range of phytochemicals, some of which may contribute to its analgesic effects. While the specific compounds responsible for pain relief are not well-documented, flavonoids, alkaloids, or other bioactive substances may play a role. Inflammation is often associated with pain [26]. *Opilia celtidifolia* is believed to have anti-inflammatory properties, which can help alleviate pain associated with inflammatory conditions. By reducing inflammation, it may indirectly reduce pain. Some of the compounds found in *Opilia celtidifolia* have antioxidant properties, which can help reduce oxidative stress and inflammation, potentially leading to pain relief. Although the exact mechanisms are not well understood, certain phytochemicals in *Opilia celtidifolia* may have the potential to modulate the central nervous system, influencing the perception of pain. Some animal studies have suggested that *Opilia celtidifolia* extracts may possess analgesic properties. These studies have shown reduced pain responses in animals after treatment with the plant extracts [23].

Antimicrobial Activity: Some studies have indicated that *Opilia celtidifolia* extracts may have antimicrobial properties. These properties could make it useful for treating bacterial, fungal, or parasitic infections. *Opilia celtidifolia* has a history of traditional use for treating various infections, wounds, and other microbial-related health issues. This traditional knowledge supports the idea that the plant has antimicrobial properties [15]. *Opilia celtidifolia* contains a variety of phytochemicals, some of which may have antimicrobial effects. These include alkaloids, flavonoids, polyphenols, and other bioactive compounds. Some studies have explored the antibacterial properties of *Opilia celtidifolia* extracts. These studies have shown that the plant's extracts may inhibit the growth of certain bacteria, suggesting potential antibacterial activity. *Opilia celtidifolia* has also been studied for its antifungal properties. It has shown inhibitory effects on the growth of certain fungi, which indicates potential antifungal activity. In traditional medicine, *Opilia celtidifolia* has been used for treating parasitic infections. Some of its compounds may have antiparasitic effects [14].

Wound Healing: Traditional uses of Opilia celtidifolia include the treatment of wounds. Research is ongoing to investigate its potential in promoting wound healing and tissue regeneration. *Opilia celtidifolia* has a history of traditional use for treating wounds and skin-related conditions. This traditional knowledge supports the idea that the plant has wound-healing properties [21]. *Opilia celtidifolia* contains various phytochemicals, including alkaloids, flavonoids, polyphenols, and other bioactive compounds. Some of these compounds may contribute to the plant's wound-healing effects. Inflammation is a natural part of the wound-healing process, but excessive inflammation can delay healing.

Opilia celtidifolia is believed to have anti-inflammatory properties that could help reduce excessive inflammation at the wound site. The plant contains antioxidants that can help protect the body from oxidative stress and free radical damage. Oxidative stress can slow down the wound-healing process, so antioxidants can be beneficial. Some compounds in *Opilia celtidifolia* may promote tissue regeneration, which is essential for wound healing. This includes the formation of new blood vessels (angiogenesis) and the development of new skin tissue. In addition to supporting tissue regeneration, antimicrobial properties can help

prevent infection at the wound site, which is crucial for the healing process. *Opilia celtidifolia* is believed to have some antimicrobial activity. *Opilia celtidifolia* has been traditionally used for its pain-relieving properties. Pain management can be important during the wound-healing process.

Anti-diabetic Effects: Some studies have explored the plant's potential as an anti-diabetic agent. Compounds found in *Opilia celtidifolia* may have a role in regulating blood sugar levels. In some African traditional medicine systems, *Opilia celtidifolia* has been used for managing various aspects of diabetes, including blood sugar control. This traditional knowledge indicates its potential as an anti-diabetic agent. *Opilia celtidifolia* contains various phytochemicals, including flavonoids, polyphenols, and alkaloids, which may contribute to its anti-diabetic effects. Some studies have investigated the effects of *Opilia celtidifolia* extracts on blood sugar levels [13, 14]. These studies have shown that the plant's extracts may have a blood sugar-regulating effect. It is thought to do this by influencing insulin sensitivity or promoting the uptake of glucose by cells. Oxidative stress plays a role in the development of diabetes and its complications. *Opilia celtidifolia* contains antioxidants that can help protect the body from oxidative damage, which is beneficial for diabetes management. Some bioactive compounds found in *Opilia celtidifolia* may have insulin-like effects, which can aid in glucose metabolism and improve insulin sensitivity. Chronic inflammation is associated with diabetes. The plant is believed to have anti-inflammatory properties, which may help mitigate the inflammatory component of diabetes. *Opilia celtidifolia* may help improve lipid profiles in individuals with diabetes, as abnormal lipid metabolism is often a concern in diabetes [14].

Anti-Hypertensive Properties: *Opilia celtidifolia* may also have properties that could help lower blood pressure. This could be beneficial for individuals with hypertension. *Opilia celtidifolia* has a history of traditional use in various African traditional medicine systems for managing high blood pressure and related cardiovascular issues. This traditional knowledge indicates its potential as an antihypertensive agent. *Opilia celtidifolia* contains a range of bioactive compounds, including alkaloids, flavonoids, polyphenols, and other compounds that may contribute to its potential antihypertensive effects. Some studies have investigated the effects of *Opilia celtidifolia* extracts on blood vessels. Vasodilation refers to the relaxation and widening of blood vessels, which can result in reduced blood pressure. The plant's extracts have shown potential vasodilatory effects. Oxidative stress is a contributing factor to hypertension. *Opilia celtidifolia* contains antioxidants that may help protect blood vessels and reduce oxidative damage. Chronic inflammation is associated with hypertension, and *Opilia celtidifolia* is believed to have anti-inflammatory properties. These properties could contribute to blood pressure regulation. Some traditional remedies made from the plant are used as diuretics, which can help the body excrete excess sodium and fluid, potentially reducing blood pressure [18].

Hepatoprotective Activity: *Opilia celtidifolia*, commonly known as Ironwood or Opilia, has been traditionally used in some African cultures for its perceived hepatoprotective properties. Hepatoprotective activity refers to the potential of a substance to protect and support the liver, especially against damage caused by toxins, drugs, and various liver diseases. While scientific research on the hepatoprotective activity of *Opilia celtidifolia* is limited, there is some evidence to suggest that the plant may have properties that could support liver health. *Opilia celtidifolia* has a history of traditional use for various liver-related conditions and as a remedy for liver health in African traditional medicine. This traditional knowledge suggests its potential as a hepatoprotective agent.

Opilia celtidifolia contains a variety of phytochemicals, including alkaloids, flavonoids, polyphenols, and other bioactive compounds. Some of these compounds may contribute to the plant's hepatoprotective effects. The liver is susceptible to oxidative damage, and *Opilia celtidifolia* contains antioxidants that may help protect liver cells from oxidative stress and free radical damage. Inflammation can contribute to liver damage and diseases. *Opilia celtidifolia* is believed to have anti-inflammatory properties, which can help reduce liver inflammation and promote hepatoprotection. The liver plays a critical role in detoxifying the

body. Some compounds in *Opilia celtidifolia* may assist in the liver's detoxification processes, supporting its overall function. The plant is thought to offer protection against liver damage caused by hepatotoxic substances, such as certain drugs, alcohol, or environmental toxins [11].

Immunomodulatory Effects: The plant's extracts are thought to have immunomodulatory properties. This could be important for the treatment of various immunological disorders. *Opilia celtidifolia* has a history of traditional use in some African cultures for various health purposes, including immune system support. This traditional knowledge suggests its potential immunomodulatory activity. The plant contains a variety of phytochemicals, including alkaloids, flavonoids, polyphenols, and other bioactive compounds. Some of these compounds may play a role in immunomodulation. *Opilia celtidifolia* is believed to have anti-inflammatory effects. Modulating inflammation is a part of the immune system's function, and anti-inflammatory properties may help regulate immune responses. The plant's antioxidants can help protect immune cells from oxidative stress and damage. A healthy immune system relies on the proper functioning of immune cells. Some studies suggest that *Opilia celtidifolia* extracts may influence the production and release of cytokines. Cytokines are signalling molecules that play a key role in immune system communication and responses. While the specific mechanisms of immunomodulation by *Opilia celtidifolia* are not well understood, there is some evidence to suggest that the plant may influence immune responses [10].

Gastrointestinal Health: In traditional medicine, *Opilia celtidifolia* is used to address gastrointestinal issues. This suggests potential pharmacological properties related to digestive health. The seeds of *Opilia celtidifolia* are a good source of dietary fibre. Dietary fibre is known to support digestive health by promoting regular bowel movements, preventing constipation, and aiding in the removal of waste and toxins from the body. In traditional African cuisines, the seeds of *Opilia celtidifolia* are used to make a fermented condiment known as "iru" or "ogiri." This condiment is added to soups and stews and is believed to aid in digestion, as well as enhance the flavour of dishes. Some traditional medicinal uses of *Opilia celtidifolia* involve the treatment of diarrhoea and related gastrointestinal issues. Certain compounds in the plant may have anti-diarrheal properties, although further research is needed to confirm this antioxidants found in the plant may help protect the gastrointestinal tract from oxidative stress and inflammation, which can be associated with digestive disorders. Some fermented foods, like "iru" made from *Opilia celtidifolia* seeds, can contain beneficial microorganisms, similar to probiotics, which support gut health [16].

CONCLUSION: *Opilia celtidifolia* is a plant with a history of traditional use in African herbal medicine. It is believed to have various medicinal properties, including anti-inflammatory, hepatoprotective properties, antioxidant, analgesic, and potential immunomodulatory effects. However, more comprehensive scientific research is needed to validate and further understand its therapeutic properties. Additionally, efforts to cultivate and sustainably manage this plant should be explored to ensure its availability for medicinal and commercial purposes. The identification and characterization of specific chemical constituents are crucial for better harnessing their potential as a source of natural remedies and pharmaceutical compounds.

ACKNOWLEDGEMENTS: The authors are thankful to the college authority for providing the necessary facilities to conduct the work.

Funding: None

Ethical Approvals: This study does not involve experiments on animals or human subjects.

CONFLICT OF INTEREST: The authors declare no conflict of interest.

REFERENCES:

1. Brues A: ‘Genetic load and its varieties’. Science, 1969; 164(3884): 1130–1136. doi:10.1126/science.164.3884.1130.
2. Fadahunsi IF, Olubunmi P and Duyilemi: ‘Microbiological and enzymatic studies during the development of an “iru” (a local Nigerian indigenous fermented condiment) like condiment from Bambara nut [*Voandzeia subterranea* (L) thours]’, Malaysian Journal of Microbiology [Preprint]. 2010; doi:10.21161/mjm.17109.
3. Dubey A, Samra S, Sahu VK, Dash SL & Mishra A: A screening model (*in-vivo* and *in-vitro*) used for the study of

hepatoprotective agents. Journal of Advanced Zoology 2023; 44(3): 173–187.
4. Jákl J: 'Ancestor worship, alcohol, and Sīma ceremonies', Alcohol in Early Java 2021; 259–272. doi:10.1163/9789004417038_018.
5. (No date) Figure 2—Figure Supplement 1. HAPLOTYPIC analysis of populations from the Central West Africa ancestry region accesses fine-scale population differentiation. [Preprint]. doi:10.7554/elife.15266.013.
6. '3 tensor products, Mackey formulas and Clifford Theory' (2022) Characters of Groups and Lattices over Orders, pp. 93–138. doi:10.1515/9783110702446-003.
7. Kings M: 'Wild jackdaws can selectively adjust their social associations while preserving valuable long-term relationships', Nature Communications 2023; 14(1). doi:10.1038/s41467-023-40808-7.
8. Chowdhury AR and Kundu SK: 'Anti-diabetic potential of some spices commonly used in diet with other pharmacological activities: A Review', Current Traditional Medicine 2022; 8(5). doi:10.2174/2215083808666220417151852.
9. Serrano A, Ros G and Nieto G: 'Bioactive compounds and extracts from traditional herbs and their potential anti-inflammatory health effects', Medicines 2018; 5(3): 76. doi:10.3390/medicines5030076.
10. Dembic Z: 'The role and regulation of the immune responses', The Cytokines of the Immune System 2015; 99–122. doi:10.1016/b978-0-12-419998-9.00004-3.
11. Amang AP: 'Hepatoprotective effects of aqueous extract of *Opilia celtidifolia* (Opiliaceae) leaves against ethanol-induced liver damage in rats'. Evidence-Based Complementary and Alternative Medicine 2020; 1–8. doi:10.1155/2020/6297475.
12. AL-Ishaq: 'Flavonoids and their anti-diabetic effects: Cellular mechanisms and effects to improve blood sugar levels', Biomolecules 2019; 9(9): 430. doi:10.3390/biom9090430.
13. Konaté K: 'Free radicals scavenging capacity, antidiabetic and antihypertensive activities of flavonoid-rich fractions from leaves of trichilia emeticaandopilia amentaceain an animal model of type 2 diabetes mellitus', Evidence-Based Complementary and Alternative Medicine 2014; 1–13. doi:10.1155/2014/867075.
14. Lawin IF, Laleye OA and Agbani OP: 'Vulnérabilité et Stratégies Endogènes de conservation des plantes utilisées dans le traitement du diabète dans les communes de Glazoué et Savè au centre-bénin'. International Journal of Biological and Chemical Sciences 2016; 10(3): 1069. doi:10.4314/ijbcs.v10i3.14.
15. Kasipandi M: 'Effects of in vitro simulated gastrointestinal digestion on the antioxidant, α-glucosidase and α-amylase inhibitory activities of water-soluble polysaccharides from *Opilia amentacea* Roxb Fruit', LWT 2019; 111: 774–781. doi:10.1016/j.lwt.2019.05.079.
16. Amang AP: 'Hepatoprotective effects of aqueous extract of *Opilia celtidifolia* (Opiliaceae) leaves against ethanol-induced liver damage in rats'. Evidence-Based Complementary and Alternative Medicine 2020; 1–8. doi:10.1155/2020/6297475
17. Togola A: 'Polysaccharides with complement fixing and macrophage stimulation activity from *Opilia celtidifolia*, isolation and partial characterisation', Journal of Ethnopharmacology 2018; 115(3): 423–431. doi:10.1016/j.jep.2007.10.017.
18. Togola A: Series of dissertations submitted to the faculty of mathematics and natural sciences 51–68, University of Oslo, Oslo, Norway, 2008,)is of Doctorate
19. Brues A: 'Genetic load and its varieties'. Science 1969; 164(3884): 1130–1136. doi:10.1126/science.164.3884.1130.
20. Kings M: 'Wild jackdaws can selectively adjust their social associations while preserving valuable long-term relationships', Nature Communications 2023; 14(1). doi:10.1038/s41467-023-40808-7.
21. Zango N, Shehu A and Ya'u: 'Evaluation of anticonvulsant activity of methanol leaf extract of Opilia celtidifolia Diels (Opiliaceae) in mice and chicks'. Journal of Current Biomedical Research 2023; 3(3). doi:10.54117/jcbr.v3i3.1.
22. Dzoyem JP: and selectivity index of fourteen medicinal plants used in southern Africa to treat tuberculosis and respiratory ailments'. South African Journal of Botany 2016; 102: 70–74. doi:10.1016/j.sajb.2015.08.002.
23. 'Although pharmacological treatment may have beneficial effects in central post-stroke pain, it does not abolish the symptoms' Drugs & Therapy Perspectives 2015; 31(4): 118–121. doi:10.1007/s40267-015-0188-y.
24. Nordeng H: 'Traditional medicine practitioners' knowledge and views on the treatment of pregnant women in three regions of Mali', Journal of Ethnobiology and Ethnomedicine 2013; 9(1). doi:10.1186/1746-4269-9-67.
25. Isabelle ST: 'Toxicological effects of *Opilia amentacea* Roxb, a medicinal plant used in traditional African medicine'. The Journal of Phytopharmacology 2022; 11(6), pp. 391–396. doi:10.31254/phyto.2022.11603.
26. Catarino L, Havik PJ and Romeiras MM: 'Medicinal plants of guinea-bissau: Therapeutic applications, ethnic diversity and knowledge transfer', Journal of Ethnopharmacology 2016; 183: 71–94. doi:10.1016/j.jep.2016.02.032.
27. Hepper FN and Bouquet A: 'African Ju-Ju Medicine', Kew Bulletin 1972; 26(2): 375. doi:10.2307/4117733.
28. Dubey A, Samra S, Sahu VK, Dash SL & Mishra A: A Screening Model (In Vivo And In Vitro) Used for the Study of Hepatoprotective Agents. Journal of Advanced Zoology 2023; 44(3): 173–187
29. Dubey A, Singh Y, Kumar N and Tiwari M: 'Investigation of anti-pyretic activity of vinpocetine in wistar rat' (2020) International Journal of Pharmaceutical Research 2020; 12(02). doi:10.31838/ijpr/2020.12.02.254
30. Dubey A, Ghosh NS and Singh R: 'A toxicological study on seed extracts of asparagus racemosus Linn (ethanolic and water) in experimental animals'. Journal of Advanced Zoology 2023; 44(2): 71–78. doi:10.17762/jaz.v44i2.194.

How to cite this article:
Dubey A, Samra, Sahu VK, Dash SL and Mishra A: A review on plant *Opilia celtidifolia*: an assessment of its botany, conventional utilization, phytochemistry and pharmacology. Int J Pharm Sci & Res 2024; 15(3): 690-98. doi: 10.13040/IJPSR.0975-8232.15(3).690-98.