Phytochemistry And Medicinal Uses of *Lonchocarpus* Species: Systematic Review of a Promising Medicinal Plant

ABSTRACT

Research on natural products is crucial to the hunt for novel drugs to treat human diseases. Over time, there has been evidence and documentation of the usage of these medicinal plants as a source of physiologically active compounds with therapeutic potential for the treatment of a wide range of illnesses. Although the plant genus *Lonchocarpus* (*Fabaceae*, *papilionadeae*) has not yet been thoroughly studied, it has been shown to contain a wide range of compounds with numerous unique uses. This article discusses the pharmacological and biological roles, uses, and phytochemical constituents of the three species of Lonchocarpus plants such as; *Lonchocarpus bussei*, *Lonchocarpus cyanescens*, and *Lonchocarpus sericeus* that are found throughout Nigeria. A wide variety of polyphenolic compounds can be found in abundance in lonschocarpus. Chalcones, flavans, aurones, dibenzoylmethane derivatives, rotenoids, pterocarpans, flavanols, flavones, isoflavones, and flavonols are some of the classes that are included in this category, according to phytochemical studies. Despite the widespread need for medicinal compounds to treat both recognized and unknown ailments worldwide, little attention has been paid to the isolation, phytochemistry, and therapeutic qualities of compounds from *Lonchocarpus* species. Thus, the purpose of this review was to address the phytochemistry of *Lonchocarpus* species and to draw attention to the plant's therapeutic benefits and phytochemistry, particularly for those studying natural products and drug synthesis.

Keywords: flavonoids, isolation, *Lonchocarpus*, pharmacological, phytochemicals.

Introduction

Because they are generally safe and have a positive effect on human health, specialists from all over the world have long been interested in plant-derived medications. In the pharmaceutical industry, plants having a long history of use in ethnomedicine can provide valuable medicines for the treatment of a wide range of illnesses and infectious diseases. It is believed that medicinal plants include most of the many kinds of bioactive compounds with a range of therapeutic properties. Over 80% of the world's developing population relies on traditional medicines as their main source of basic healthcare. According to the WHO, a range of medicinal plants can be used to make diverse medications (Chaachouay and Zidane, 2024; Fransworth *et al.*, 1985).

Throughout human history, people have utilized natural remedies to alleviate illnesses (Abdullahi et al., 2007). This is primarily because conventional medicine has shown that these natural chemicals offer health advantages, making them attractive candidates for medication development (Cassidy et al., 2011). Consequently, novel medications continue to be made from plants (Cseke et al., 2006). A study by Moronkola et al., (2009) found that active ingredients or plant extracts from higher plants are present in 25% of the medications that pharmacists prescribe. Nowadays, it is believed that 119 chemical compounds originating from 90 distinct plant species are important drugs. 74% of the medications were found by examining the active components found in plants that were traditionally utilized for medical purposes.

Furthermore, 50% of the most often prescribed drugs in the US have a connection to natural goods or were motivated by them. Therefore, either the natural compounds themselves were employed directly or the phytochemicals were used to create synthetic derivatives or

UNDER PEER REVIEW

analogs (Dorcas and Ibrahim, 2013). According to Vogler et al., (2006), 80% of people utilize medications derived from plants for medical purposes. Anticancer treatments and medications for infectious disorders are the most commonly utilized (Regnault-Roger and Calvo, 2004). There are still many higher plants that require investigation because only a small portion of those species have been examined for potential pharmacological application (Abdullahi et al., 2007).

Among these higher plants, the *Fabaceae* family's *Lonchocarpus* series is one whose thorough study is still lacking. According to Haegnauer and Grayer-Barkmaijer (1993), the *Fabaceae* family, commonly known as *Leguminosae*, is the biggest family of flowering plants. One characteristic that sets plants in this family apart is the pod, or legume as it is known in science (Schrire et al., 2005). About 20,000 species are spread among 650 genera in this family, which is rich in terpenoids, polysaccharides, nitrogen-containing compounds, flavonoids, lipids, and anthraquinones (Wojciechowski et al., 2004; Xueqin et al., 2011). It is today one of the most commercially significant families in terms of the production of medicines, dye, fodder, decorations, wood, tannins, essential oils, resins, fragrances, piscicides, insecticides, and even human food (Kokwaro, 2009). Additionally, as legumes that fix nitrogen, they have an effect on the ecology (Bentjee, 1994; Mannetje, 2002).

Many of the fundamental medications used in conventional medicine are made from plants in the Fabaceae family. Alkaloids, terpenoids, flavonoids, steroids, phenylpropanoids, glycosides, phenols, and a variety of essential oils are among its well-known constituents, according to Xueqin et al. (2011). There are about 100 species of Lonchocarpus (Fabaceae, Papilionoideae) in Madagascar, Africa, the Caribbean Islands, tropical America, and Australia (Magalhães et al., 2007; Mesía-Vela et al., 2001). According to chemical investigations, at least 35 of those species have been examined; these studies suggest that the plants contain compounds that may account for their usage in traditional medicine (Jain and Bari, 2010). Numerous Lonchocarpus species have been shown to be rich in polyphenolic compounds (Cassidy et al., 2011). Despite the widespread need for medicinal compounds to treat both recognized and unknown ailments worldwide, little attention has been paid to the isolation, phytochemistry, and therapeutic qualities of compounds from Lonchocarpus species. Thus, the purpose of this review was to address the phytochemistry of Lonchocarpus species and to draw attention to the plant's therapeutic benefits, particularly for those studying natural products and drug synthesis.

Lonchocarpus

The genus Lonchocarpus *Fabaceae*, *Papilionoideae* has over 100 species in tropical America, Africa, the Caribbean Islands, Australia, and Madagascar (Estrada-Castillón et al., 2024; Vogler et al., 2006; Mesía-Vela et al., 2001; Borges-Argáez et al., 2000; Jain and Bari, 2010; Lima et al., 2009). Chemical studies of at least 35 of those species suggest that they contain compounds that may account for their use in traditional medicine (Jain and Bari, 2010; Reyes-Chilpa et al., 2006). Among these uses include the treatment of gastrointestinal disorders, leprosy, fevers, and cataracts (Mesía-Vela et al., 2001; Reyes-Chilpa et al., 2006). Numerous Lonchocarpus species have been shown to be rich sources of polyphenolic compounds. Polyphenolic compounds are secondary metabolites that meet the demands of plants, although they are not required for normal growth, development, or reproduction (Cseke et al., 2006).

The structural roles in various supporting or protective issues, allelopathic activity, defense-related activities, UV protection, pollinator attraction, and signal molecules involved in interactions between the plant and its environment are among the functions of these secondary metabolites, according to Jaganath and Crozier (2010). Polyphenols are widely distributed in nature, particularly in Lonchocarpus plants (Regnault-Roger et al., 2004). They are found in

UNDER PEER REVIEW

cereal, tea, coffee, wine, fruits, and vegetables. Their biological properties, such as their anti-inflammatory, anti-ulcer, anti-cancer, antiviral, antifungal, and antioxidant action, make them noteworthy (Hatti et al., 2009). Interest in polyphenolic compounds has grown as a result of these initiatives.

The ability of polyphenolic substances to release electrons, which can subsequently help change the redox state of metal-containing enzymes or interact with the free radicals produced at the enzyme's active site, is the basis for their antioxidant effect. In either scenario, polyphenolic compounds may affect the enzyme activity (Monin et al., 2000). Stilbenes and flavonoids are only two examples of the many structural variants of polyphenolic compounds (Borges-Argáez et al., 2002; Magalhães et al., 2007; Fontenele et al., 2005; Borges-Argáez et al., 2007). They are composed of many families, including aurones, flavanones, pterocarpans, dibenzoylmethane derivatives, rotenoids, flavanols, flavones, flavans, chalcones, and isoflavonoids (Lima et al., 2009; Magalhães et al., 2007; Cseke et al., 2006; Cassidy et al., 2011). Williams and Grayer (2004) claim that lonchocarpus contains a large number of flavonoids with distinctive substitutions. A number of lonchocarpus species have flavanones with prenyl and dimethylpyrano group linkages, according to Ingham et al. (1988). Numerous substituents were found to be shared by several of these flavonoids. One such commonly occurring substitution is the prenyl (3-methyl-2-butenyl) group (Morante-Carrie et al., 2024).

Rotenoids with insecticidal and pesticidal properties, such as deguelin and rotenone, are commonly found in this genus (Caboni et al., 2004). Deguelin, a rotenoid, can be injected directly into tumors and is useful in the treatment of cancer (Hebert et al., 2004). Numerous insect species have been shown to be susceptible to the insecticidal effects of rotenone and certain other rotenoids, including deguelin and tephrosin (Fukami and Nakajima, 1971). The roots of Lonchocarpus and Derris species in South America and Asia, respectively, provide the majority of economically produced rotenone, according to Fukami and Nakajima (1971). The root bark of the native Central American plant Lonchocarpus guatamalensis was extracted in methanol to yield the flavanones lupinifolinol, 3-O-methyl-lupinifolinol, and lupinifolin (Magalhães et al., 2007).

Recently, two flavonoids that are novel to Lonchocarpus araipensis (Benth.) were identified: furanoflavan and benzofuran-3-ol. These flavonoids have antiallergic, anti-platelet, antioxidant, antiviral, anti-inflammatory, and antitumor effects, according to Lima et al. (2014).

Phytochemistry of *Lonchocarpus* series

Auronols and Aurones

The majority of Lonchocarpus series include aurones and auronols. These are compounds found in fruits and flowers that affect the color of the plants those chemicals are found (Mazziotti et al., (2021); Boumendjel, (2003). Both aurones and auronols, which are closely related, have a five-membered ring. The location of the carbonyl group distinguishes the two types of molecules. Simply, aurones are saturated dihydroaurones. The earliest known auronols were found in Lonchocarpus obtusus. Names were assigned to Derriobtusones A and B (Nascimento et al., 1976). Since then, Derriobtusone A, a very rare auronol, has been found in the Lonchocarpus species L. montanus. In fact, derriobtusone A was one of the substances that were most prevalent in L. montanus (Jain and Bari, 2010).

Chalcones

The lack of a pyran ring distinguishes chalcones from other flavonoids. The pyran ring found in other flavonoids is absent from chalcones (Panche et al., 2016). According to Cseke et al. (2006), they are more conjugated and frequently colored. Their chalcones exhibit antibacterial, antitumoral, anti-inflammatory, cytotoxic, and antioxidant properties against a range of pathogens, including bacteria, viruses, and protozoa, according to Fontenele et al. (2009), De-Andrade et al. (2003), and Fontenele et al. (2005). To date, 29 prenylated chalcones have been isolated from several species of Lonchocarpus.

The majority of these were isolated from the seeds and roots of the plants. Nevertheless, it was demonstrated that 3-O-methylabyssinone, the first chalcone isolated from L. nicou, is the only chalcone in the genus *Lonchocarpus* that is prenylated on the B-ring (Lawson et al., 2010). It was discovered that *Lonchocarpus* contains dihydrochalcone Erioschalcone B. It was originally documented from tetrahydroflemichapparin-A semisynthesis. Eriosema glomerata was used to create a unique natural material with antibacterial qualities that was described (Yam-Puc and Pea-Rodrguez, 2009).

Flavanones, Flavanols, and Flavans

Flavanones are a modification of chalcones. The core structure of flavanols is identical, but the middle ring has an extra hydroxyl group. Although the carbonyl oxygen is changed into a hydroxyl or methoxy group, the fundamental structural properties of flavans are still present (Rosa et al., (2019); Gomes et al., (1981). Only this particular flavanol was found in the species Lonchocarpus. The first unique 2,4-dioxygenated flavans of this sort were found in nature when they were isolated from L. muehlbergianus (Gomes et al., 1981).

2,4,5,8-tetramethoxyfurano [7,6:2",3"] flavan was found to be the highest abundant flavonoid in the extract. Research on the biosynthesis pathways to flavones and dibenzoylmethanes offers insight into the potential production of these compounds. According to Jain and Bari (2010), a 2-hydroxyflavanone derivative is changed into a 4-hydroxyflavanone derivative, which can subsequently undergo further alkylation. L. xuul was used to isolate 4-ethoxy-5-methoxy-6",6"-dimethyl-2H-pyrano-[2",3":7,6]-flavan, another distinct flavan. Since ethoxyl derivatives among flavonoids are rather rare, it is thought that this might not be a true metabolite but rather a byproduct of the isolation process (Borges-Argáez et al., 2000). Since it was the sole ethoxy chemical discovered from Lonchocarpus, it is possible that it is just an artifact (Magalhães et al., 2007).

Isoflavonoids, Flavones and Flavonols in *Lonchocarpus*

Of all the classifications, flavones and flavonols are the most common. It has been discovered that certain flavonols have antibacterial properties (Chagas et al., (2022); Cseke et al., 2006). The pharmacological effects of known flavones include anti-inflammatory, antispasmodic, antinociceptive, anti-allergic, antioxidant, anti-ulcerogenic, antiviral, and anti-tumoral properties, according to study by Braz et al. (1975). Because ring B is joined to the carbon next to the carbonyl carbon rather than the carbon next to the oxygen, isoflavonoids have a different structure than other flavonoids (Braz et al., 1975).

Previous investigations have identified a number of flavonoids with antioxidant qualities in the leaves, stems, and root barks of Lonchocarpus xuuul and Lonchocarapus yucatenesis trees on the Yucatan Peninsula (Borqes-Argaez et al., 2007). The cytotoxic and antiprotozoal properties of the flavonoids were shown to be moderately active (Borqes-Argaez et al., 2007).

These flavonoids included 5,4'-dihydroxy-3'-methoxy (6:7), 2',4-dimethoxy-6'-hydroxylonchocarpin, Carpachromene and 2,2 Dimethylpyranoflavone, together with 5,4'-Dimethoxy-(6:7) (Magalhães et al., 2007).

Several flavonoids have been found to have several functions. These include anti-cancer, anti-inflammatory, antibacterial, antiviral, antitumor, cytotoxic, and antiprotozoal qualities, as well as the potential to reduce the risk of cardiovascular disease. This range of activities may be connected in some way to the antioxidant qualities of flavonoids (Borges-Argáez et al., 2007; Jain and Bari, 2010; Blatt et al., 2002).

Cseke et al. (2006) claim that isoflavonoids have antifungal, estrogenic, insecticidal, and anticancer properties. Isoflavonoids include both isoflavones and isoflavans. In contrast to isoflavans, which are comparable to flavans in that they do not have the double bond in ring C or the carbonyl oxygen, isoflavones share these characteristics with flavones. Lonchocarpus contained a relatively high amount of flavones. Numerous isolated flavones from different species of Lonchocarpus were found. Many of the compounds were found in many species. Quercetin was the only flavonol found in the Lonchocarpus species. Numerous plants and foods contain this well-known flavonol, which has a broad spectrum of biological activities (Xueqin et al., 2011; Magalhães et al., 2007).

Pterocarpans in *Lonchocarpus*

According to Gomes et al. (1981), Perez et al., (2023), pterocarpans are made from isoflavones, where the carbonyl oxygen now forms a part of a five-membered ring. These substances have not been detected as often in Lonchocarpus species. Additionally, they were less prevalent among the various species. When they were first found, each species usually had at least two of them. Three pterocarpans were identified in Lonchocarpus montanus, but medicarpin was the only one detected in many Lonchocarpus species. Philenopteran and 9-O-Methylphilenopteran were the only two pterocarpans found in L. laxiflorus (Magalhães et al., 2007).

Rotenoids in *Lonchocarpus*

Based on the isoflavonoid skeleton, which includes rotenoids, Lonchocarpus generates a wide range of secondary polyphenolic metabolites (Magalhães et al., 2007; Lawson et al., 2010). Lonchocarpus is recognized for its high amounts of rotenoid chemicals, even though it has been proven to contain a range of flavonoids. Because they contain rotenoid compounds, many species of Lonchocarpus are toxic to fish and insects (Mesía-Vela et al., 2001; Reyes-Chilpa et al., 2006).

Although they are not as prevalent as the other flavonoids, rotenoids are found in Lonchocarpus (Magalhães et al., 2007). Interest has increased in trying to comprehend the composition and biological roles of plants that contain rotenoid. This is because, in addition to their use as agrochemicals, they may also be useful as anti-carcinogenesis agents (Fang et al., 1999). In addition to rotenone itself, many other derivatives have been found, including epoxides of particular interest. It is believed that the two rotenone epoxides found in L. nicou roots are the first to be derived from plants (Lawson et al., 2010).

Another class of rotenone and deguelin derivatives has been discovered, but this time they come from both L. nicou and L. urucu. The skeleton of these new rotenoid-like compounds is unique, featuring chromone rings on the C and D and 1,5-benzodioxepin rings on the A and B.

These specific compounds were present in a plant extract for the first time. They were proven to be authentic natural compounds rather than extraction byproducts (Fang et al., 1999).

Stilbenes in *Lonchocarpus*

Stilbenes, which are made up of two benzene rings connected by an ethene, are the most fundamental kind of polyphenolics. Stilbenes have been shown to have substituents that are similar to those found in flavonoids. These include methoxy, hydroxyl, and prenyl groups. Hydroxystilbenes have been identified in a wide variety of plants. They are usually hydroxylated at 3, 5, 3, 4', 5, 2, 3, 5, or 3, 3', 5, according to Xueqin et al. (2011). These patterns may also contain prenyl and methyl groups. Prenylated stilbenes are commonly found in *lonchocarpus* (Magalhães et al., 2007). Numerous substances include at least one prenyl group. These consist of 3,5-dimethoxy-4-prenylstilbene, 3,4',5-trimethoxy-4-prenylstilbene, longistylins A through D, and chiricanins A through E (Magalhães et al., 2007).

Coumaronochromones, 3-Phenylcoumarins and Acids in *Lonchocarpus*

Blatt et al. (2002) state that isoflavones that have undergone additional C-2 oxidation are 3-phenylcoumarins. They are less common than some of the other flavonoids because they are the only molecules in the flavonoid class that contain ester and that can undergo C-2 oxidation. Of these specific compounds, only three were found in species of Lonchocarpus. However, it may be important for these types of compounds that two were found to be from the same plant (Shah and Smith, 2020; Blatt et al., 2002).

According to Lawson et al. (2010), the B-ring of coumaronochromones, a type of rotenoid, has been compressed into a five-membered ring. The first examples of a prenylated benzoic acid were found in Lonchocarpus nicou. The asteraceae family has been found to possess prenylated phenolic acids, despite their rarity in nature (Xueqin et al., 2011).

Table 1: **Some *Lonchocarpus* Species and Their Ethnomedical Uses**

Lonchocarpus violaceus (Balche) Root bark Stem bark	Stress reduction, an alternative to alcohol and an intoxicating substance, an anticancer, a mosquito repellent, fish poison, and an insecticide.	Udeani *et al.,* 1997; Correa, 1984; Sule et al., 2022.
Lonchocarpus eriocalyx	Fever, malaria, a skin condition, thrush, and ringworms ringworm treatment, insect repellent, and headache alleviation	Kareru *et al.,* 2007 Yenesew *et al.,* 2004
Lonchocarpus costaricensis	Insecticide, Treatment of thrush	Caboni *et al.,* 2004
Lonchocarpus araripensis	Rheumatism, diabetes, skin diseases and arthritis.	Julianeli *et al.,* 2011
Lonchocarpus urucu (Barbasco) Root bark Stem bark	Anti-HIV, anti-insect, anti-pest, anti-headache, and treatment for skin conditions.	Udeani *et al.,* 1997 Correa, 1984
Lonchocarpus oliganthus	Acts as Insecticide	Xueqin *et al.,* 2011

Lonchocarpus cyanescens	Ulcers, Antioxidant, arthritis	Samwel, *et al.,* 2014
Lonchocarpus laxiflorus	Back pain, rashes, ulcers, intestinal worms, mental disease, headaches, and back discomfort.	Neuwinger, 1996 Okello and Ssegawa, 2007
Lonchocarapus Yucatenesis	Headache and Fever	Borqes- Argaez *et al.,* 2007
Lonchocarpus chiricanus	Insecticide	Jean-Robert *et al.,* 2001
Lonchocarpus xuuul	headache and fever	Borqes- Argaez *et al.,* 2007
Lonchocarpus guatamalensis	Fever, headache	Xueqin *et al.,* 2011
Lonchocarpus castilloi	Antifungal and Anti-termitic	Alavez-Solano *et al.,* 2000

Many Lonchocarpus species have been used as diuretics, laxatives, stomachics, parasiticides, and to treat tumors, eruptions, scurvy, backaches, convulsions, and wounds (Emmanuel et al., (2020); Mesía-Vela et al., (2001); Reyes-Chilpa et al., (1995). Because polyphenolic chemicals are poisonous and/or antifeedant to insects that are crop pests, several species of Lonchocarpus are protected from insect assault (Simmonds et al., 1990). Borges-Argáez et al. (2007) state that lonchocarpus is well known for its insecticidal and pesticidal qualities.

According to Dos-Santos et al. (2009), Lonchocarpus species have also been used as anthelmintics, cough suppressants, antidiarrheal, antileprosy drugs, and fish poisons. In traditional Nigerian recipes, the medicinal herb *Lonchocarpus cyanescens* (LC) is sometimes used in combination with other components to cure mental illnesses. *Lonchocarpus cyanescens* is the primary component of the Nigerian psychosis treatment formula (Sonibare et al., 2012).

***Lonchocarpus eriocalyx* (Harms)**

Lonchocarpus eriocalyx is a member of the *Fabaceae* family, which generates a wide range of flavonoids with insecticidal and other antimicrobial properties (Roy et al., (2022); Ceres et al., 1981). A previous study found that a crude extract from the root bark of *L. eriocalyx* was effective against *P. falciparum* strains that were resistant to chloroquine (D6) and susceptible to it (W2) (Tuwei, 2006). Furthermore, this extract demonstrated larvicidal activity against larvae of *A. aegypti* mosquitoes. The single molecule identified from *L. eriocalyx* was lupeol, a lupane-type triterpene with strong antiplasmodial activity (Yenesew et al., 2004; Tuwei, 2006).

***Lonchocarpus cyanescens* (LC)**

The aerial parts of *Lonchocarpus cyanescens* yield an indigo that has been used as a valuable dye for garments in West Africa from ancient times (adire/gara), according to Perkin and Thomas (1909), Dorcas and Ibrahim, (2013). For court penalties, ceremonial outfits, burial garments, bridal dowries, and gifts for important guests, chiefs typically use woven fabric known as "country cloth" dyed with "gara" (both natural and chemical dyes). This dye comes from the "gara" leaf that was recovered from LC (Dorcas and Ibrahim, 2013; Cardon, 2003; Spencer, 1996; Polakoff, 1980). "Gara" is a product that is sold extensively in the industrial sector; dried LC is exported to Europe, the United States, the United Kingdom, and many other African nations from Liberia and other West African nations (Cardon, 2003; Spencer, 1996; Polakoff, 1980).

Historically, the plant has been used for medicinal purposes. The leaves are served alongside couscous in Senegal. In Ghana, it is thought that LC roots work better than leaves for curing ulcers and other skin conditions (Boakye-Yiadom et al., 2021). The leaves and roots of this plant have also been used to treat leprosy in Guinea-Bissau and Sierra Leone. Leaf material can be used to make laxatives (Spancer, 1996). In Benin, leaf sap is used to treat gastrointestinal issues and diarrhea. In addition to being used as an aphrodisiac, a decoction of leafy twigs and roots is administered to women during or after childbirth. In Nigeria, this mixture is used to treat rheumatism, diarrhea, and venereal diseases. Ground root is used to alleviate yawns, and water with powdered root is used to wash sores (Irvine, 1961; Spencer, 1996; Jukema et al, 1991; Iwu et al., 2014). The tropical plant LC has long been used by fisherman in Nigeria's Akwa Ibom State to scare and capture fish. LC is a shrub belonging to the Dalbergiae tribe of the *Leguminosae* natural order, which provides a habitat for twining (Iwu et al., 2006).

It is listed among the medicinal plants of Akwa Ibom State (Ajibesin et al., 2008). LC is well-known since it is used to create dye. The blue indigo dye, which is used to color textiles and other materials, is fermented from the indican-containing early sprouts and leaves (Ajibesin et al., 2008). Indigotin, a component of indigo dye, is produced by indoxyl, which is present in LC leaves. Oleanane derivatives and glycyrrhetinic acid are responsible for the anti-inflammatory properties and therapy of peptic ulcers observed in LC (Cardon and Jarsen 2005; Iwu et al., 2006; Ogbeide et al., 1991; Promsattha et al., 1987). According to Cardon and Jarsen (2005), Iwu et al. (2006), and Ndukwe et al. (2004), triterpenes exhibit anti-arthritic qualities. These natural elements also contribute to the flavoring's taste effects (Ijichi and Seizo, 2005). It has been demonstrated that the bioactivity effects of *Lonchocarpus cyanescens* are ulcer-relieving, anti-inflammatory, and anti-arthritic (Iwu et al., 2006).

A phyto-constituents investigation revealed that *L. cyanescens* bark aqueous extracts contained alkaloids, flavonoids, saponins, phytates, glycosides, and oxalates. Alkaloids, flavonoids, and glycosides were just slightly present, whereas oxalates were widely distributed. Phytates and saponins were also detected in trace levels (Xueqin et al., 2011).

***Lonchocarpus sericeus* (Poir.)**

Often referred to as Senegal lilac or Cube root, *Lonchocarpus sericeus Papilionaceae* is a dry deciduous tree that grows natively in Ghana and Nigeria. It can grow up to 16 meters in height. In traditional African medicine, the bark is mostly used as a laxative and stomachic, especially for young children (Paul and Olajide, 2023). Additionally, it is frequently used to treat back pain and convulsions (Burkill, 1995). Its blossoms, which have many racemes of purple flowers dangling from them, make it ideal for presentations. The flowers have a unique, almost vanilla-like fragrance. It is commonly planted as a shade tree in communities and in gardens. Kojs et al., (2004) and Adewuyi et al., (2012) stated that the wood is translucent yellow with sporadic marbling and has an olive-green heartwood. The leaves are used for universal healing, laxatives, and fish poisons in Nigeria, while the bark is used to treat body aches, arthritis, rheumatism, cutaneous and subcutaneous parasite infections, malnourishment, debility, paralysis, and convulsions. The roots are used to treat leprosy. The seeds and berries are used as insect repellents called andarachnicides (Burkill, 1985). Additionally, it is utilized as body cream in cosmetics.

***Lonchocarpus bussei* (L. Laxiflorus)**

A plant species called *Lonchocarpus bussei*, a legume belonging to the *Fabaceae* family, is found in Nigeria. African snowdrop tree and West African snowdrop tree are common names for it (Paul and Olajide, 2023). *Lonchocarpus bussei* is a deciduous tree that can grow up to 30 meters in height. It has smooth gray bark and a straight trunk. The leaves are pinnate, compound, and arranged alternately along the stem. Numerous leaflets, often numbering five to eleven, make up each leaf. The tree produces panicles, which are small, clustered blooms that range in color from white to pale yellow. During the blossoming season, the blossoms are abundant and have a unique fragrance (Moore and Bradley, 2022). The flat, woody pods that *Lonchocarpus bussei* produces are typically 7 to 20 centimeters long. The pods are initially green, but as they mature, they turn brown. Each pod contains several seeds. *Lonchocarpus bussei* is widespread in several countries in West and Central Africa, including Nigeria, Cameroon, Gabon, and the Democratic Republic of the Congo (Afolabia et al., 2019). Strong and highly valued, *lonchocarpus bussei* wood is used in building. There are other traditional uses for the tree as well. In Nigeria, for example, the bark is sometimes used as a medicine to treat particular ailments, and the leaves are also utilized in traditional remedies (Paul and Olajide, 2023).

CONCLUSION

Polyphenolic compounds are common in *lonchocarpus* species. Numerous types of polyphenolic chemicals, including chalcones, flavans, aurones, dibenzoylmethane derivatives, rotenoids, pterocarpans, flavanones, flavanols, flavones, isoflavones, and flavonols, are abundant in Lonchocarpus, according to phytochemical research. Although a thorough examination has not yet been conducted, the plant genus Lonchocarpus has a number of chemicals with a wide range of varied properties. In Africa, *lonchocarpus sericeus* is used to promote appetite, treat stomach issues, treat epilepsy, and act as a laxative. *Lonchocarpus* has several traditional applications. Occasionally, traditional medicine uses the bark and leaves to treat a variety of ailments. Currently under discussion are three species of *Lonchocarpus*: *Lonchocarpus cyanescens*, *Lonchocarpus bussei*, and *Lonchocarpus sericeus*. *Lonchocarpus* has not gotten much study attention, even though several of its species contained tannins, flavonoids, rotenoids, and isoflavonoids. These phytochemicals support the traditional applications and therapeutic qualities of *Lonchocarpus* species in a number of indigenous medical systems. To completely understand the phytochemical profile of the *Lonchocarpus* series, as well as its unique ingredients, methods of action, and any adverse effects on people, more investigation and study are therefore required.

Disclaimer (Artificial intelligence)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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