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Original Research Paper

A COMPLETE PROFILE ON *COUROUPITA GUIANENSIS* - TRADITIONAL USES, PHARMACOLOGICAL ACTIVITIES AND PHYTOCONSTITUENTS

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ABSTRACT

Medicinal plants are used as ancient style of providing helps too many ailments. Presently, variant peoples are looking on healthful plants for his or her primary health care wishes. The current review designates the morphological, active principles and ethnopharmacological aspects of *Couroupita guianensis*. Being it's a vital healthful plant in Chinese medication this are supposed to varied medical specialty activities like antipyretic, antidepressant, antiseptic, analgesic, anti-inflammatory, antiprotozoal, anticancer, antiulcer, antimicrobial, wound healing, antidiarrheal, antioxidant and antifertility activities. Different active constituents such as steroids, glycosides, carbohydrates, couroupitone A, couroupitone B, isatin, triterpinoids, eugenol, linoleic acid, nerol, tryptanthrin linalool, phenolic resin substances and dyes are a unit to date according in *Couroupita guianesis*. Well conducted biological studies area unit still required for many indications of this species. This review is useful to make interest towards *Couroupita guianensis* and should be helpful in rising new formulations with additional therapeutic and economical worth.

Keywords: *Couroupita guianensis*, Phytoconstituents, Campesterol, Nerol, Linalool.

INTRODUCTION

In typically medicative plants characterizes an expensive supply of antibiotic, antifungal, antiseptic and analgesic qualities (Nelson and Wheeler, 1937), and that they square measure used medicinary in numerous countries (Ghillean *et al.*, 1986; Mori and Prance, 1978). *Couroupita guianensis* typically thought of to be an example of a medicative plant with a use in fashionable Chinese drugs. *Couroupita guianensis* (Aubl) belongs to family called Lecythidaceae, could be a massive deciduous tropical tree 90' tall and autochthonous to the Amazon timberland. It's full-grown in Indian gardens as a decorative tree for its enticing flowers. It's unremarkably referred to as "*cannon ball* tree" in English, "kailaspati" in Hindi (Satayavati *et al.*, 1976) and Mallikarjuna flowers in Telugu. In Tamil Naidu, it's referred to as Naglingam flower owing to Sivalingam form is visible at the center of the flower and snake designed spore is that the specialty of this flower and it's excellent essential oil. So far in depth researches are done on this plant, suggesting that *Couroupita guianensis* has varied medical specialty actions and chemical composition. In recent times there are several reports of medical specialty roles and activities of *Couroupita guianensis* and its active principals on the nervous system, antipyretic, immunomodulatory, etc. This review tries to indicate the advances in phytology, chemistry and pharmacological aspects of *Couroupita guianensis*.

Botany of *Couroupita guianensis*

Cannonball Tree is a deciduous tree. Native to tropical South America (particularly Guyana and Surinam) it has large, apricot-pink and gold

flowers with an unusual, lopsided arrangement of central stamens and a penetrating fragrance. The taxonomical classification of *Couroupita guianensis* was mentioned in Table 1. It is a really wonderful tree doesn't grow branches that reach out from the straight trunk; it bears vast, showy flowers, with 3" to 5" waxy aromatic smelling growing directly on the bark of the trunk (cauliflower). In Buddhist culture in country these flowers had a special significance. The tree additionally produces orbicular brown woody, indehiscent; double fleshy fruits of associate degree astonishing size, adequate to the scale of an individual's head. The fruit includes of little seeds in an exceedingly white, unpleasant smelling edible jelly. Size of a mature fruit is 24 cm in diameter, weight of a mature fruit-1450 gms, and weight of the shell (fruit rind) from a fruit-545 gms. It's wide planted in tropical and sub-tropical biology gardens as a decorative throughout the tropics and sub tropics, it will well below cultivations. This plant is listed as a rare tree and flower in Republic of India, by a preferred decorative in Caribbean and SE Asian biology gardens. The origin and growing conditions of *Couroupita guianensis* was illustrated in Table 2.

Traditional Uses

Fruits of *Couroupita guianensis* unit edible and sometimes eaten, however attributable to dangerous smell of white flesh, it discourages the general public. The fruit pulp, bark and flowers area unit used for varied medicative applications. The pulp of the fruit of the cannon ball tree is rubbed on the infected skin of animal disease dog (Sanz *et al.*, 2009). The within of the fruit will make clean wounds and young leaves cure odontalgia (Kumar *et al.*, 2011). Traditionally leaves as used as antiseptic and odontalgia. Juice made up of the leaves is employed to cure skin ailments, and shamans of South America have even used tree components for treating protozoal infection. Historically, the leaves of this plant are utilized in the treatment of skin diseases, stomach ache, and enteral gas formation, antithrombotic and vasodilatory actions (Golatkar *et al.*, 2001; Elumalai *et al.*, 2012). Historically, the leaves of this plant are utilized in the treatment skin diseases (Satyavathi *et al.*, 1976). Leaves and flowers of *Couroupita guianesis* unit used for healthful applications like upset, tumors, pain and inflammatory processes (Sanz *et al.*, 2009), cold, enteric gas formation and abdomen ache (Elumalai *et al.*, 2012). The trees unit accustomed cure colds and abdomen aches. The volatile oils from the flowers show antibacterial and antifungal properties. It's one in every of the ingredients within the several preparations that cure redness, hemorrhage, piles, scabies, dysentery, scorpion poison (Shah *et al.*, 2012). Different parts of *Couroupita guianensis* with ethnomedical information are stated in Table 3.

Pharmacological Activities

Different parts of *Couroupita guianensis* with pharmacological information are mentioned in Table 4. Analgesic and anti-inflammatory activity of *Couroupita guianensis* according to the Geetha *et al.*, (2004) analgesic and anti-inflammatory activities in benzene, ethyl alcohol (95%) extract of *Couroupita guianensis* flowers and barks by victimization tail flick methodology and carrageenan induced hind paw swelling methodology severally. Numerous parameters like tail flick latency (TFL) for physiological condition and reduction in carrageenan induced hind paw swelling for medicament was measured. Potent to paracetamol in its analgesic activity and to in its anti-inflammatory activity was discovered. Pinheiroa *et al.*, 2013 additionally explicit that ethanolic extract of *Couroupita guianensis* possess anti-inflammatory activity.

Antibacterial Activity of *Couroupita guianensis*

The antibacterial activity in ethyl alcohol (95%) extract of *Couroupita guianensis* fruit pulp by maceration methodology was delineated by Shah *et al.*, (2012). The antibacterial activity of *Couroupita guianensis* ethyl alcohol extract was studied against gram-positive microorganism (*Staphylococcus aureus*, *Bacillus subtilis*) and gram-negative bacteria (*Escherichia coli, Pseudomonas aeruginosa*). Compared to doxycyclin, ciprofloxacin and fluconazole, vital activity was found against *B. subtilis* at concentration 4mg as compare to further tested

organisms. This study conjointly disclosed the presence of some phytoconstituents like tannins, sugars and polyphenols. Azimi *et al*., 2012 collectively showed antibacterial property of ethanolic extract of *Couroupita guianensis* oil.

Antioxidant Activity of *Couroupita guianensis*

Ethyl acetate fraction of water extract of *Couroupita guianensis* possesses a robust in vitro antioxidant activity (Bafna *et al.*, 2011). This study was focused on invitro inhibitor activity by victimization completely different parameters like 2, 2-diphenyl-1-picrylhydrazyl (DPPH) assay, superoxide scavenging impact, reducing power and in-vitro lipid peroxidation. Results prompt that ester fraction of water extract of *Couroupita* was found to be significantly effective in scavenging DPPH (EC_{50} =24.41µg/ml) and superoxide radical (EC_{50}=10.65 µg/ml).

Antiulcer Activity of *Couroupita guianensis*

The antiulcer activity of *Couroupita guianensis* leaves in ethanolic extract was studied by Elumalai *et al.*, (2012). Numerous parameters like reduction in internal organ volume, free acidity and lesion index were lowered upon administration of ethanolic extract of *Couroupita guianensis* (150 mg/kg and 300 mg/kg).

Antioxidant and Antitumor Activities *Couroupita guianensis*

Flower extract of *Couroupita guianensis* was showing sturdy antioxidant and antitumor activities (Premanathan *et al.*, 2012). The radical scavenging activity was performed by victimization lipid peroxidation assay. Cytotoxicity against human promylocytic leukemia HL60 cells was determined by (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay. Apoptotic activity by deoxyribonucleic acid (DNA) fragmentation and flowcytometry were measured. Results disclosed that isatin is a vital compound showed solid inhibitor activity with the EC_{50} worth of 72. 80 µg/ml, toxicity against human promylocytic cancer of the blood HL60 cells in dose-dependent manner by the CC_{50} worth of 2.94 µg/ cc and eventually caspase-mediated cell death was confirmed by fluorescence-activated cell sorting (FACS) analysis.

Antidepressant Activity of *Couroupita guianensis*

Wankhede *et al.*, (2009) showed antidepressant activity in methanolic extract of *Couroupita guianensis* root. This study focused on measure of assorted parameters like tail suspension check (TST), forced swim check (FST) and antihypertensive antagonism in mice. Results of this study indicated that considerably decrease within the immobility time in TST and FST, almost like that of the imipramine (10 mg/kg). In antihypertensive antagonism exhibited deeply decline in period of hypersomnia & degree of ptosis in tested mice.

Antifertility Activity Of *Couroupita Guianensis*

Benzene, ethyl alcohol and water extracts of bark and flowers of *C. guianensis* showed antifertility activity was studied for their impact on period of assorted stages of estrus cycle in female person rats and on the number implantation sites within the pregnant rats (Geetha *et al.*, 2005). The ethyl alcohol extract of *C. guianensis* bark and every one the extracts of its flower condensed the quantity of implantations. Supported the on top of criteria *Couroupita guianensis* extract shows protective activity in a very therapeutic vary.

Antimicrobial, Antimycobacterial and Antibiofilm Properties of *Couroupita guianensis*

Al-Dhabi *et al.*, (2012) showed antimicrobial, antimycobacterial and antibiofilm properties in chloroform extract of fruit of *Couroupita guianensis*. Chloroform extract of *Couroupita guianensis* fruit showed sensible antimicrobial and antibiofilm forming activities however it showed less antimycobacterial activity. The zones of inhibition by chloroform extract ranged from zero to twenty six millimeter. Chloroform extract showed effective antibiofilm activity against gram-negative microorganism referred to as genus *Pseudomonas aeruginosa* ranging from two mg/mL biofilm repressive concentration (BIC), with 52 inhibition of biofilm formation. From the HPLC-DAD analysis, it absolutely was

established that indirubin was one amongst the key compounds during this plant (0.0918% dry weight basis). Ramalakshmi *et al.*, 2013 conjointly showed antimicrobial property of methanolic extract *Couroupita guianensis* flowers. The results of the antimicrobial activity showed effective repressing activity against *Plesiomonas Shigelloides, Cocci aureus, Vibrio mimicus,* and *Proteus vulgaris*. Moderate antimicrobial activity was recorded against *E.coli, Klebsiella pneumonia* and *Salmonella typhi*. Regina *et al.*, 2012 additionally incontestable that chloroform, hexaneane and ethanol extract of fruit rind of *Couroupita guianensis* Aubl. showed its vital antibacterial and antifungal activity at the assorted conc.(10 mg/ml) during which the fermentation ethanol extract showed sensible restrictive activity against *S. aureus, E. coli, C. diptheriae* and *Micrococcus sp.* among the alternative tested extracts whereas chloform extracts showed sensible restrictive activity against *C. albicans.*

Antipyretic Activity of *Couroupita guianensis*

Antipyretic activity of flower and bark a part of *Couroupita guianensis* in chloroform, ethanol, water, ether, petroleum ether extracts was done by victimization yeast induces febrility methodology (Usman *et al.*, 2012). This yeast induces febrility methodology suggesting that the antipyretic action of all the extracts was reflective; chloroform, ethanol, water extracts have vital onset of action on reduction of temperature (within 30 minutes) almost like that of paracetmol (30 minutes). On alternative hand petroleum ether and ether extract are showing somewhat late response.

Anxiolytic Impact of *Couroupita guianensis*

Vinod *et al.*, (2013) showed anxiolytic impact in aqueous and methanolic extract of *Couroupita guianensis* flowers. Elevated plus maze (EPM), light and dark (LD), and open field test (OFT) models were measured. From the results each the extracts (aqueous associate degreed methanolic) of *Couroupita guianensis* at a dose of 500 mg/kg showed an anxiolytic activity associated with vehicle management in LD, EPM and open field test in mice.

Immunomodulatory Activity of *Couroupita guianensis*

Immunomodulatory activity (*In vitro* polymorpho nuclear white corpuscle operate test) in acetone, benzene, petroleum ether, chloroform, methanol and water extracts of *Couroupita guianesis* flowers by victimization rat as an animal model was given by Pradhan *et al.*, 2009. Hypersensitivity, hemagglutinations reactions were calculated by victimization sheep red blood cells (SRBC) as matter. Within the in-vivo studies, the continual fuel extract was found to exhibit a dose connected increasing within the hypersensitivity, to the SRBC matter at concentration of one hundred and two hundred mg/kg in animal studies. This study conjointly according that methanolic extract was found to stimulate cell mediate and antibody mediate immune responses in rats.

Neuropharmacological Action of *Couroupita guianensis*

Methanolic extract of *Couroupita guianensis* flowers in mice showed numerous neuropharmacological actions (Vinod *et al.*, 2012). Spontaneous motor activity, rotarod performance and sodium thiopental sleeping time in mice were measured. Beside medicine actions some phytoconstituents conjointly (alkaloids, glycosides, tannins and flavonoids) known. From the results methanolic extract (100, 250 and 500 mg/kg) of *Couroupita guianesis* showed vital reduction in spontaneous motor activity however no impact had on motor coordination. It conjointly leads to reduction of the onset and period of pentobarbitone evoked psychological state. Finally this study declared that extract contained associate degree agent that has pivotal role on each central and peripheral nervous system.

Wound Healing Activity of *Couroupita guianensis*

Umachigi *et al*., (2007) showed wound healing activity in ethanolic extract of *Couroupita guianesis* whole plant (barks, leaves, flowers and fruits). Many parameters like incision wound, epithelization amount, scar area, enduringness and aminoalkanoic acid (hydroxyl proline)

measurements beside wound contraction, were accustomed assess the impact of *Couroupita guianensis* on wound healing. The results indicated that *Couroupita guianesis* hurries the wound healing method by declining the expanse of the wound and increasing the enduringness.

Antiarthritic Activity of *Couroupita guianensis*

Elumalai *et al.*, (2012) by victimization invitro technique showed antiarthritic activity of *Couroupita guianesis* leaves in methanolic extract. Protein denaturation methodology was assessed. The activity of extract was principally reckoning on concentration (dose dependent manner). Protein denaturation was found to be 87.41% at a dose of 500 µg /ml.

Antistress Activity of *Couroupita guianensis*

Couroupita guianensis possess sturdy antistress activity in methanolic extract was studied by Vinod *et al.*, (2013) by victimization cold restrain stress (RS). During this they measure parameters like levels of glyceride, sterol and glucocorticoid to live the capability of methanolic extract on antistress. Animals treated with methanolic extract of *Couroupita guianensis* 100 mg/kg and 250 mg/kg, 500 mg/kg doses considerably lowered in the least the 3 doses in a very dose dependent manner as compared to stress control. Cold restrain stress caused an increase within the weight of adrenal glands at advanced dose.

Antidiarrheal Action of *Couroupita guianesis*

Antidiarrheal action of *Couroupita guianensis* leaves on Castrol oil evoked diarrhea in unusual person rats was disclosed by Elumalai *et al.*, (2013). In Castrol oil evoked diarrhea each the methanolic and liquid extracts beside common place loperamide showed vital reduction in diarrheic episodes. 100 mg/kg of methanolic extract and 100 mg/kg of liquid extract of *Couroupita guianensis* dried leaves are used for antidiarrheal activity.

Ovicidal Activity of *Couroupita guianensis*

Baskar *et al.*, (2013) showed ovicidal activity in hexane, chloroform and ester extracts of *Couroupita guianensis* plant on the eggs of *Helicoverpa armigera*. All the extracts showed ovicidal activity, and among them alkane extract showed additional (64.28%) ovicidal activity with LC_{50} worth of two.62% and regression (r^2) worth of 83.5%.

Antinociceptive Activity of *Couroupita guianensis*

Ethanol extract of *Couroupita guianesis* leaves exhibited sturdy antinociceptive activity was illustrated by Pinheiro *et al.*, (2010) by victimization 3 analgesic models (acetic acid-induced contortions, tail flick, and hot plate). Results are clearly showed that ethyl alcohol extract of *Couroupita guianesis* all fractions showed antinociceptive activity within the tail flick model whereas within the hot plate methodology the best impact discovered was at the dose of 100 mg/kg and eventually extract considerably restrained the quantity of contortions evoked by ethanoic acid.

Antifeedent and Larvcidal Activity of *Couroupita guianensis*

Ethyl acetate extract of *Couroupita guianensis* leaves exhibited Antifeedent and larvcidal activity was studied by Baskar *et al.*, 2012 and n-Hexane extract of *Couroupita guianensis* leaves exhibited Antifeedent and larvcidal activity was illustrated by Lingathurai *et al.* 2011.

Phytoconstituents

Few chemical studies discovered to this species had proved the presence of α-amirin, β-amirin, β-sitosterol, tannins (Row *et al.*, 1966; Bergman *et al.*, 1985), ketosteroids (Anjaneyulu and Rao, 1998) and terpenoids, alkaloids, carbohydrates, proteins (Ramalakshmi *et al.*, 2013). Among the flowers, it completely was getable to recognize eugenol, volatile oil and (E, E)-farnesol whereas triterpenoid esters of fatty acids as β-amirin palmitate were categorized among the leaves of *Couroupita guianensis* (Eknat and Shivchandraji, 2002) and dyes like indigo and indirubin (Tayade, 2013). Associate in nursing compound stigmasterol and campesterol were isolated from fruit of *Couroupita guianensis* (Rastogi and Mehrotra 1995). Devaraj *et al.*, (2013) synthesized and characterized silver nano particles from leaves of *Couroupita guianesis*. Bergman *et al.*, (1985) isolated linoleic acid,

nerol, tryptanthrin etc., from flowers, seeds, fruits, and leaves of *Couroupita guianensis*. Active constituents with their IUPAC names and structures are given in Table 5 and 6.

CONCLUSION

The extensive literature survey exposed that *Couroupita guianensis* is important medicinal plant with diverse ethnomedical and pharmacological spectrum. The plant shows the occurrence of many natural constituents which are responsible for wide-ranging pharmacological and medicinal properties. The evaluation needs to be carried out on *Couroupita guianensis* in order to uses and preparation of the plant in their practical clinical applications, which can be recycled for the welfare of the mankind.

Table 1: Taxonomical classification of *Couroupita guianensis*

Kingdom	Plantae
Sub kingdom	Tracheobionta
Division	Magnoliophyta
Class	Magnoliopsida
Order	Lecythidales
Family	Lecythidaceae
Genus	*Couroupita*
Species	*Couroupita guianensis* Aubl
Synonyms	*Couratori pedicellaris, Couroupita acreensis, Couroupita antillana, Couroupita froesii, Couroupita surinamensis, Couroupita idolica, Couroupita membranacea, Couroupita peruviana, Couroupita saintcroixiana, Couroupita surinamensis, Couroupita venezuelensis, Lecythis bracteata, Pekea couroupita.*
Other names	Arbre a bombes (French), Bala de canon (Spanish), Boesi (Dutch), Carrion tree, Kanonenkugelbaum (German) and Taparon (German).

Table 2: Origin and growing conditions of *Couroupita guianensis*

Origin	Honduras to Northern South America to Peru
Zone	10a - 12b, 28°F minimum
Growth rate	Fast
Flowering month	March - September
Flowering days	Not identified
Leaf persistence	Briefly deciduous
Messiness	High
Salt tolerance	Low
Drought tolerance	Medium
Nutritional requirements	Medium
Typical dimensions	70'x45'
Uses	Park, Shade, Specimen

Flowers: 6 petals, orange-red with white central disk held on racemes.
Fruits : Capsules, globose, brown, 4-8 inches in diameter, contains up to 300 seeds.
Leaves: Simple, alternate, narrowly elliptic to 10 inches long and 4 inches wide.

Table 3: Traditional uses of *Couroupita guianensis*

Fruit	Skin infections	Sanz *et al.*, 2009
leaves	Skin infections	Satyavathi *et al.*, 1976
Fruit	odontalgia	Kumar *et al.*, 2011
leaves	Skin diseases, stomach ache, and enteral gas formation, antithrombotic and vasodilatory actions	Golatkar *et al.*, 2001; Elumalai *et al.*, 2012
Leaves and flowers	Upset, tumors, pain and inflammatory processes	Sanz *et al.*, 2009
Flowers	Hemorrhage, piles, scabies, dysentery, scorpion poison	Shah *et al.*, 2012

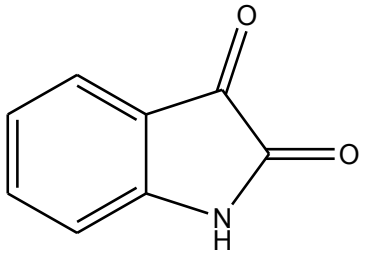
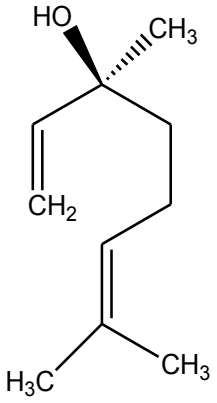
Table 4: Pharmacological activities of *Couroupita guianensis*

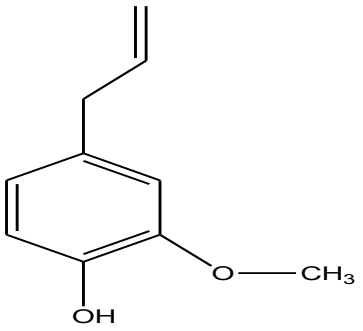
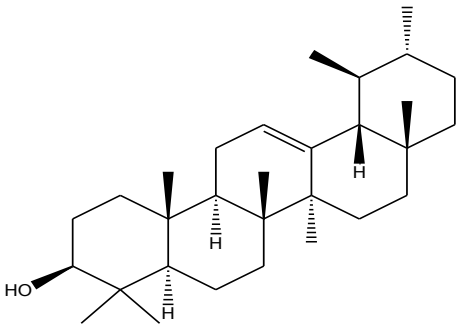
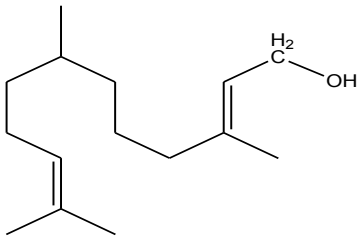
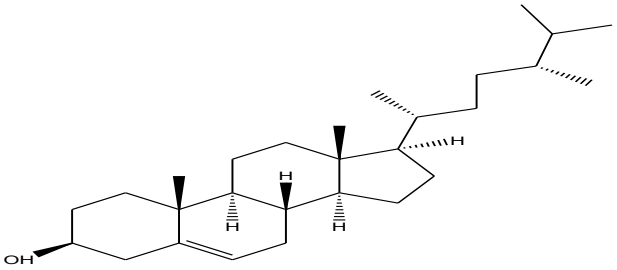
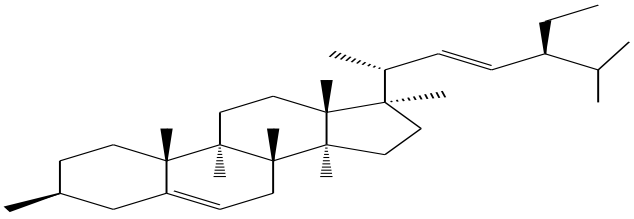
Plant Part	Solvent used for Extraction	Uses	References
Flowers and Bark	Benzene, ethanol (95%)	Analgesic & Anti-inflammatory	Geetha *et al.*, 2004
Leaves	Ethanol	Anti-inflammatory	Pinheiroa *et al.*, 2013
Fruit pulp	Alcohol (95%)	Antibacterial	Shah *et al.*, 2012
Oil	Ethanol	Antibacterial	Azimi *et al.*, 2012
Flowers	Ethyl acetate fraction of water	Antioxidant	Bafna *et al.*, 2011
Leaves	Ethanol	Antiulcer	Elumalai *et al.*, 2012
Dried flowers	Not mentioned	Anticancer & antioxidant	Premanathan *et al.*, 2010
Root	Methanol	Antidepressant	Wankhede *et al.*, 2009
Bark & flowers	Benzene, ethanol and water	Antifertility	Geetha *et al.*, 2005
Fruits	Chloroform	Antimicrobial, anti-mycobacterial, antibiofilm	Al-dhabi *et al.*, 2012
Flowers	Methanol	Antimicrobial	Ramalakshmi *et al.*, 2013
Fruit	Ethanol	Antifungal and Antimicrobial	Regina *et al.*, 2012
Flower, bark	Not mentioned	Antipyretic	Usman *et al.*, 2012
Flower	Methanol	Anxiolytic	Vinod *et al.*, 2013
Flowers	Methanol	Immunomodulatory	Pradhan 2009
Plant	Methanol	Neuropharmacological	Vinod *et al.*, 2012
Whole plant	Not mentioned	Wound healing	Umachigi *et al.*, 2007
Leaves	Methanol	Antiarthritic	Elumalai *et al.*, 2012
Plant	Methanol	Antistress	Gupta *et al.*, 2013
Leaves	Not mentioned	Antidiarrheal	Elumalai., 2013
Leaves	Hexane, ethyl acetate, chloroform	Ovicidal	Bhasker *et al.*, 2013
Leaves	Ethanol	Antinociceptive	Pinheiroa *et al.*, 2010
Leaves	Ethyl acetate	Antifeedent, larvcidal	Baskar *et al.*, 2012
Leaves	n-Hexane	Antifeedent & larvicidal	Lingathurai *et al.*, 2011

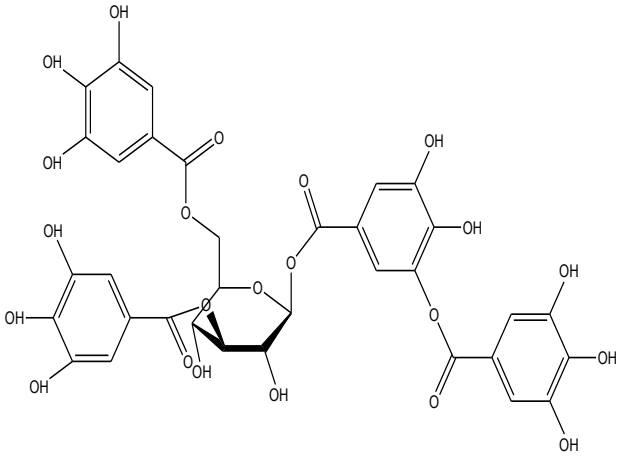
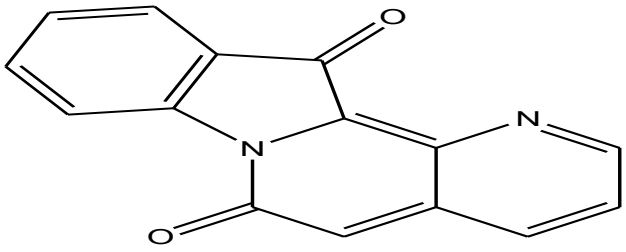
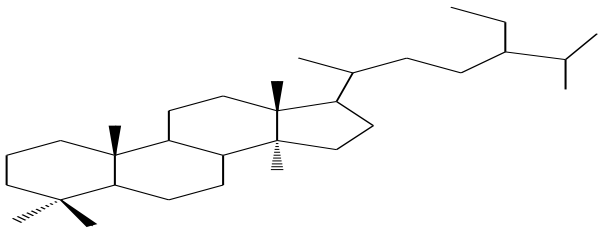
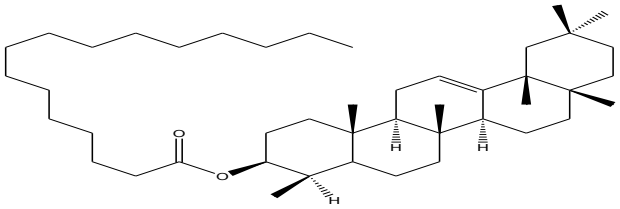
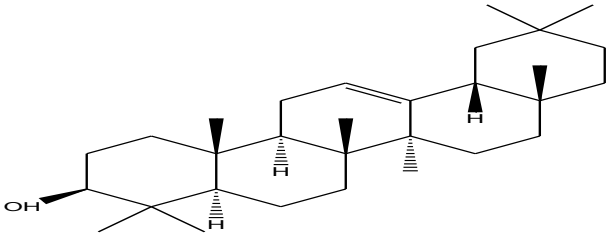
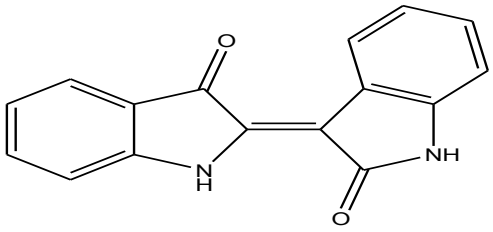
Table 5: Phytoconstituents Information of *Couroupita guianensis*

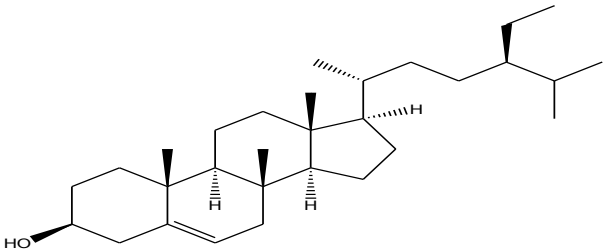
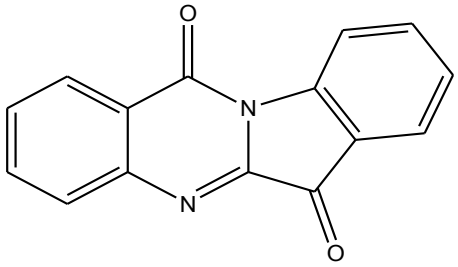
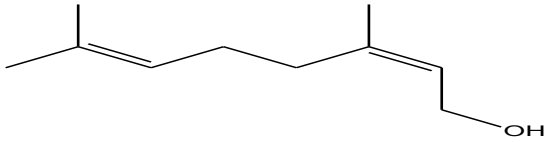
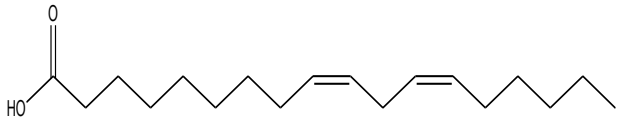
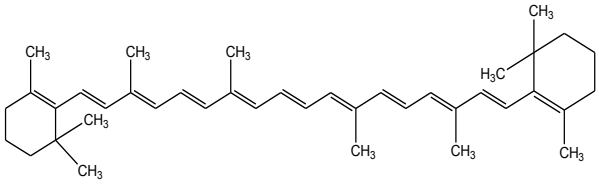
Plant part	Solvent used for Extraction	Use	Reference
Flowers	Methanol	Carbohydrates, Protein, Alkaloids, Terpenoids, Phenolic compounds, Reducing sugars and Triterpenoids.	Ramalakshmi *et al*., 2013
Leaves	Ethanol, acetone, petroleum ether and chloroform.	Silver nano particles	Devaraj *et al.*, 2013
Flowers	Not mentioned	a) α-amirin, β-amirin, β-sitosterol, tannins b) ketosteroids	Row et al., 1966; Bergman *et al.*, 1985 Anjaneyulu and Rao, 1998
Leaves	Not mentioned	Eugenol, farnesol and triterpenoid esters of fatty acids as β-amirin palmitate	Eknat and Shivchandraji, 2002
Fruit and flowers	Not mentioned	Indigo and Indirubin	Tayade 2013
Plant (flowers, seeds, fruits) and leaves	Not mentioned	Linoleic acid, nerol, tryptanthrin	Bergman *et al*., 1985
Fruit	Not mentioned	stigmasterol and campesterol	Rastogi and Mehrotra 1995

Table 6: Phytoconstituents with IUPAC names and structures

Name	**IUPAC Name**	**Structure**
Isatin	Indoline-2,3-dione	
Linalool	3,7-dimethylocta-1,6-dien-3-ol	

Eugenol	4-allyl-2-methoxyphenol	
α-amyrin	(3S,4aR,6aR,6bS,8aR,11R,12S,12aR,14aR,14bR)-1,2,3,4,4a,5,6,6a,6b,7,8,8a,9,10,11,12,12a,14,14a,14b-icosahydro-4,4,6a,6b,8a,11,12,14b-octamethylpicen-3-ol	
Farnesol	3,7,11-trimethyldodeca-2,10-dien-1-ol	
Campsterol	(3S,8S,9S,10R,13R,14S,17R)-2,3,4,7,8,9,10,11,12,13,14,15,16,17-tetradecahydro-10,13-dimethyl-17-((2R,5R)-5,6-dimethylheptan-2-yl)-1H-cyclopenta[a]phenanthren-3-ol	
Stigmasterol	(3S,8R,9R,10S,13R,14R,17R)-2,3,4,7,8,9,10,11,12,13,14,15,16,17-tetradecahydro-17-((E,2R,5S)-5-isopropylhept-3-en-2-yl)-3,8,9,10,13,14,17-heptamethyl-1H-cyclopenta[a]phenanthrene	

Tannic acid	3,5-dihydroxy-2-(3,4,5-trihydroxybenzoyl)oxy-6-[(3,4,5-trihydroxybenzoyl)oxymethyl]oxan3,4,5-trihydroxybenzoate	
Couroupitine A	Indolo[1,2-h][1,7]naphthyridine-6,12-dione	
Ketosteroid	10R,13R,14S)-17-(5-ethyl-6-methylheptan-2-yl)-hexadecahydro-4,4,10,13,14-pentamethyl-1H-cyclopenta[a]phenanthrene	
β-Amyrinpalmitate	4aS,6aS,6bR,9R,10S,12aS,12bR,14bR)-1,2,3,4,4a,5,6,6a,6b,7,8,8a,9,10,11,12,12a,12b,13,14b-icosahydro-2,2,4a,6b,9,12a,14b-heptamethylpicen-10-yl palmitate	
β-Amyrin	(3S,4aR,6aR,6bS,8aR,12aR,14aR,14bR)-1,2,3,4,4a,5,6,6a,6b,7,8,8a,9,10,11,12,12a,14,14a,14b-icosahydro-4,4,6a,6b,8a,11,11,14b-octamethylpicen-3-ol	
Indirubin	(Z)-2-(2-oxoindolin-3-ylidene)indolin-3-one	

β-Sitosterol	3S,8S,9S,10R,13R,14R,17R)-17-((2R,5R)-5-ethyl-6-methylheptan-2-yl)-2,3,4,7,8,9,10,11,12,13,14,15,16,17-tetradecahydro-8,10,13-trimethyl-1H-cyclopenta[a]phenanthren-3-ol	
Tryptarin	Indolo[2,1-b]quinazoline-6,12-dione	
Nerol	(Z)-3,7-dimethylocta-2,6-dien-1-ol	
Lineolic acid	(9Z,12Z)-octadeca-9,12-dienoic acid	
β-Carotene	(1E,3E,5E,7E,9E,11E,13E,15E,17E)-3,7,12,16-tetramethyl-1,18-bis(2,6,6-trimethylcyclohex-1-enyl)octadeca-1,3,5,7,9,11,13,15,17-nonaene	

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