

S.n	Plants	Useful parts	Parts: Drug class: Chemical /pharmaceutical name	General use	Specific use	Activity	Summary
1	Andira Inermis	Stem bark/leaf/ seeds	Stem bark, leaf and seeds: Isoflavones: biochanin A, calycosin, formononetin, genistein, pseudobaptigenin, pratensein, daidzein, 3'-methoxydaidzein, prunetin and taxifolin (1) Stem bark, leaf and seeds: phytosterols: stigmasterol Bark : alkaloids: berberine and angelin	purgative, vermifuge, and febrifuge (1) Bark: Anthelmintic; Antidote, comocladia; Emetic; Laxative; Narcotic; Piscicide; Vermifuge (2) .	calycosin and genistein: antiplasmodial activity, active against P. falciparum. Calycosin: active against protozoan Giardia intestinalis (1) Berberine: carmanitative, febrifuge, antimalarial and antibacterial for protozoan	In vitro activity (IC50) Plasmodium falciparum: Bark lipophilic extract : 52-56 µg/mL Calycosin 4.2 µg/mL (poW) Genistein 9.8 µg/mL (poW) (1)	Stem bark and seeds of Andira inermis acts as purgative, vermifuge, febrifuge or dermal irritations. Large doses of the stem bark or seeds cause vomiting and violent diarrhoea. Bark: Constipation; Eczema; Fever; Malaria; Parasite; Worm; Yaws(2) It is also used to treat psoriasis and ringworm of the scalp (3).
2	Bursera Simarouba	Leaf/ bark/fruits	Leaf: major chemical constituents of essential oil: limonene (46.7%), β-caryophyllene (14.7%), α-humulene (13.2%) and germacrene D (7.6%) (4)	used for incense, and also treatment of burns, headache, nosebleed, fever and stomach-ache (6)	Limonene, α-cadinol: anticancer effects. D-limonene induces apoptosis in gastric cancer cells. α-cadinol exhibit some selective	The concentrations of oil inhibiting human lung carcinoma cell line (A-549) and colon adenocarcinoma cell line (DLD-1)] growth by 50% (GI50) were 42 ± 2 µg/mL and 48 ± 2 µg/mL, respectively.	Tea made from the bark is a traditional remedy for urinary tract infections. The bark is used for the treatment of psoriasis, eczema, insect bites, skin fungus, inflammation, itching.

			Leaf minor chemical of essential oil: (E)-2-Hexenal, α-Pinene, Sabinene, β-Pinene, Myrcene, p-Mentha-1(7),8-diene, α-Terpinene, p-Cymene, β-Phellandrene, (E)-β-Ocimene, γ-Terpinene, Terpinolene, Terpinen-4-ol, α-Terpineol, α-Copaene, β-Bourbonene, β-Elemene, β-Copaene, γ-Muurokene, α-Muurokene, Germacrene A, δ-Amorphene, γ-Cadinene, δ-Cadinene, (E)-Nerolidol, Caryophyllene oxide, Humulene epoxide II, 1-epi-Cubenol, τ-Muurokenol, τ-Cadinol, α-Muurokenol, α-Cadinol (4)		cytotoxicity against colon cancer (4).	The GI50 values of α-humulene against A-549 and DLD-1 cell lines were $62 \pm 2 \mu\text{M}$ and $71 \pm 2 \mu\text{M}$, respectively. The α-humulene concentration in the oil was $91 \pm 1 \text{ mg/mL}$ (4).	The application of cream containing bark, twice daily for 3 weeks, showed complete remission of symptoms like chronic eczema and with dermatitis, characterised by inflammation, itching (6)
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			Essential oil of Bark: α-pinene, β-pinene, isolimonene, viridiflorol, β-caryophyllene, β-selinene, α-humulene, caryophyllene oxide, Cembrene, (Z)-3-cembrene A, (E)-3-cembrene A (5) essential oil of fruits: α-pinene, β-pinene, terpinen-4-ol, sabinene, isosylvestrene, limonene, γ-terpinolene, trans-Cadina-1(6),4-diene, (Z)-3-cembrene A (5)				
3	Cedrela Odorata	Dried leaf/ stem bark	Leaf: Tocopherol: D-α-tocopherol Terpenes: α-Pinene, 2-Pentylfuran, Limonene, Bornil acetate, α-Thujene, Sabinene, β-Pinene, p-Cymene, Acetophenone, γ-	The bark is used in folk remedies for the treatment of diarrhoea, vomiting, fever, inflammation, Atopic dermatitis (AD), haemorrhage, indigestion, fever & malaria (10). Shavings of the wood are used in	2,2-diphenyl-1-picrylhydrazyl radical (DPPH): free radical scavenging activity (antioxidant activity) Cedrelosin C, Cedrelosin D; 2α,3α,20-trihydroxy-16β-acetoxy-20(R) pregnane; 2β,3β-	Cedrodorol A IC₅₀ = 13.09 μg/mL; Cedrodorol B IC₅₀ = 3.93 μg/mL) Gedunin: 2300 ng/mL has anti-malarial activity (9)	Kaempferol glycosides isolated from <i>C. odorata</i> L. leaves have antioxidant and antiapoptotic effects <i>via</i> amelioration of oxidative stress and inhibition of Raf/MAPK pathway and reduced paracetamol-induced hepatotoxicity (10).

			Terpinene, Terpinolene, α-Terpineol, α-Humulene, Germacrene D, Germacrene A, Cedrelosin C, Cedrelosin D Steroid: ($2\alpha,3\alpha,20$-trihydroxy-16β-acetoxy-$20(R)$pregnane), ($2\beta,3\beta$-Dihydroxypregnan-16-one) Limonoids: Kihadalactone A, 7α-11β-diacetoxydihydronomilina, Delevoyin D, Cedrelosin A, Limonol, Cedrelosin B, 7-acetyldihydronomil i, Delevoyin D, Cedrelosin E bark and sapwood oil: Aliphatic acids and alcohol: stearic acid, oleic acid, linoleic acid, n-octacosanol (7) Stems: Flavonoids: Catechin, Luteolin (8)	sweat baths to treat skin eruptions (11) An oil obtained from the seed is used to cicatrize wounds(12)	Dihydroxypregnan-16-one; Kihadalactone A; 7-acetyldihydronomili, Delevoyin D, Cedrelosin E: Hsp90a Inhibitors and Anti-Cancer Activity Cedrodorol A, Cedrodorol B: antidiabetic and to reduce obesity Gedunin: antimalarial activity Limonoids isolated from <i>C. odorata</i> stem bark has antifeedant activity against the third-instar larvae of <i>Spodoptera littoralis</i> (Boisd.) (9)	Women used to use the bark of <i>Cedrela odorata</i> to treat hemorrhages and miscarriages(3)
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			Terpenes: 2-Pentylfuran, Myrcene, α-Phellandrene, p-Cymene, 1,8-Cineole, γ-Terpinene, trans-Sabinenehydrate, Linalool, Terpinolene, trans-Pinocarveol, Myrtenol, Cuminaldehyde, α-Humulene, Germacrene D, Germacrene A, Viridiflorol, Sesquisabinen, Ursolic acid, Oleanolic acid, Oleanonic acid, Odoratol, Odoratone, Cedrodorol A Steroids: β-sitosterol (9)				
4	Enterolobium Cyclocarpum	Seeds	Seeds: Amino acid: L-Isoleucine, L-leucine, Lysine, Threonine, L-valine, L-Histidine, Aspartic acid, Alanin, Arginine, Glycine, L-Serine, albizziine amino acid	Spermicidal activity, treatment of respiratory ailments such as colds and bronchitis. for skin asepsis and to heal the grains and pimples of the skin, the baths with	albizziine amino acid: Insecticidal, molluscicidal and larvicidal activities ethanol extracts of heartwood : antifungal effects against Trametes	NA	The seeds of E. cyclocarpum are extensively collected and consumed for the nutritional content rich in amino acids, carbohydrates, minerals and proteins, by the

			Seeds: minerals: Nitrogen, Calcium, Potassium, Magnesium, Sodium, Phosphorus, Copper (14) Seeds: Fatty Acids: linoleic acid, oleic acid, palmitic acid, linolenic acid Carbohydrates: alpha-Larabinofuranose and beta-L-arabinopyranose Triterpenes: glucosylgalactose, rhamnogalactoside , glucoside(15).	the extract of the bark. Also, it is used for glucose decrease in blood, diarrhoea, purifying, and for good digestion(16).	versicolor (white rot), Coniophora puteana (brown rot), Chaetomium globosum (soft rot) and the mould-fungus Trichoderma viride(15). Saponins: Spermicidal activity,		animals of the forest and man (15).
5	Handroanthus Impetiginosa and/or Handroanthus Impetiginosus or Tabebuia impetiginosa	Bark	Inner bark: fatty acid: Oleic acid, palmitic acid, linoleic acids carbohydrates: Fructose, glucose, and sucrose organic compounds: Oxalic, citric, and succinic acids	antinociceptive, anti-edematogenic, antibiotic, and antidepressant effects, anti-obesity, antifungal, anti-psoriatic, antioxidant, anti-inflammatory, and anti-cancer activities, astringent and diuretic.	Oleic acid: hypocholesterolemic effect and a high oxidative stability Palmitic acid: pro-inflammatory mechanisms linoleic acid: protective effects against cancer, obesity, diabetes, and atherosclerosis	GI50 values in human tumor cell lines: 1.21 µg/mL (MCF-7), 1.03 µg/mL (NCI-H460), 0.91 µg/mL (HeLa), 1.10 µg/mL (HepG2) and 2.29 µg/mL (PLP2). (17)	α-tocopherol reduce the risk of cardiovascular diseases (eliminating reactive oxygen species, inhibiting lipid peroxidation, and attenuating inflammatory reactions) and neurodegenerative disorders, (Alzheimer's disease). (17) 1-2 gm inner bark is used as a tea twice daily.

			Tocopherols: α-Tocopherol, γ-Tocopherol (17) Other main chemical constituents: Napthoquinones, β-lapahone, isocoumarin(18)	Bark and leaves of T. impetiginosa cure toothaches, backaches, and sexually transmitted diseases. (17)	methanolic extract: Cytotoxic Properties against breast carcinoma (MCF-7), lung carcinoma (NCI-H460), cervical carcinoma (HeLa), and hepatocellular carcinoma (HepG2) (17) Ethanol extract: osteoarthritis, anti-depressants Water extract: colitis, anti-allergic n-butanol extract: anti-obesity Methanol extract: Antiplatelets (19) β-lapahone: antibiotic and anticancer effects (20).		Higher doses are often used but increased the likelihood of toxicity. (18)
6	Hymenaea Courbaril	Bark, leaves, seeds, and roots	Seed: biscoumarins: Ipomopsin and hymenain (21) Seeds: Tocopherols: α-tocopherol, β-tocopherol phenolic compounds: Galic acid	Bark: antiviral activity against rotavirus, expectorant, wound healing, treat headache, general pain, inflammation, hematuria, diarrhoea, dysentery, general fatigue, dyspepsia, constipation, and	α-humulene, trans-caryophyllene : cytotoxic activity in concentrations of 0.5 to 5μM (24) Resin: Anti-asthmatic activity (19 μg/ml), antihypertensive with ACE inhibition	α-humulene, trans-caryophyllene : cytotoxic activity in concentrations of 0.5 to 5μM (24) Resin: Anti-asthmatic activity (19 μg/ml), antihypertensive with ACE inhibition	Tea prepared from Bark acts as an anodyne, antiseptic, and purgative, and for the treatment of diarrhoea, cystitis, laryngitis, hepatitis, prostatitis, tuberculosis, ulcers, and catarrh.

			Carotenoid: β - carotene Vitamin C Fatty acid: Palmitic acid, Stearic acid, Lauric acid, Arachidic acid, Linoleic acid, Myristic acid, Oleic acid(22) Leaf: sesquiterpene: caryophyllene, α and β-selinene, α cubebene, cadinene, humulene, and muurolene (23) Phenolic acid: 4-Hydroxybenzoic acid Essential oils: trans-caryophyllene, oxide caryophyllene, α-humulene (24). Bark: Procyanidin: 4-(Benzylthio)-epicatechin	hemoptysis, vermifuge, carminative, laxative, sedative, pectoral astringent, malaria, beriberi, arthritis, asthma, bruises, fractures, sores, spasms, and venereal diseases Powdered resin: to treat arthritis, bruises, cramps, myalgia, headache, rheumatism, sores, wounds, asthma Seed pulp: laxative Fruit pulp: antidiarrheal agent (22) Leaf: fungicide, as a tea is used to treat colds and bronchitis (25)	Ethanol extract: antiviral (50 μg/ml) against rotavirus Fisetin, Fresh xylem, Hydroethanol extract, Methanol extract: cytotoxic activity Xyloglycan: Immuno Modulatory activity (50 and 200mg/kg) (22)	Ethanol extract: antiviral (50 μg/ml) against rotavirus	
7	Leptolobium Panamense	Stem Bark, seed, root bark	Root bark: Alkaloids	syphilis and malaria (26)	Water and ethanolic extract of bark: acts	Oral application of water extracts at doses of 20 and 200 mg/kg and of	The bitter bark contains alkaloids and is used in

			sweetenine, 4α-hydroxysparteine Seeds: alkaloids: lupanine, multiflorane (26) bark: quinolizidine alkaloids: 4α-hydroxy-13β-methoxylupanine and 3β,4α-dihydroxy-13β-methoxylupanine		a hypoglycemic agent in rats (26).	butanol extracts at doses of 20 and 100 mg/kg significantly lowered the plasma glucose levels in streptozotocin-induced diabetic rats within 3 h (26).	the treatment of syphilis, scrofula and malaria
8	Maclura Tinctoria	Bark	Ethanol extract of bark: flavonoids: Orobol, steppogenin, aromadendrin, dihydromorin, orobol 7-O-b-D-glucoside, steppogenin 4'-O-b-D-glucoside and orobol 5,3'-di-O-methyl-8-C-glucoside Bark: macluraxanthone B, macluraxanthone C and dihydrocudraflavone B.	Antimicrobial activity, antifungal activity, antiviral activity	Organic and aqueous extract of leaf: antimicrobial activity against S. aureus. Flavonoids: antifungal activity against C. albicans, C. neoformans Macluraxanthone B, macluraxanthone C & dihydrocudraflavone B: moderate HIV inhibitor	MIC: Organic extract of leaf: 0.08 mg/ml aqueous extract of leaf: 1.25 mg/ml against S. aureus.	The bark is astringent, tonic and vermifuge, in large doses it is purgative

9	Manilkara Zapota	Fruits/ leaf	Fruits: prenylated coumarins: manizapotins A, manizapotins B, manizapotins C, gravelliferone, gravelliferone methyl ether, tanizin, anisocoumarin, (+)-trachypleuranin A, (+)-7-methoxy-6-(2'-methoxy-3'-hydroxy-3'-methyl butyl)coumarin and 7-methoxy-6[2'-oxo-3'-methyl butyl]coumarin (27) Leaf: Sugar: Rhamnose, glucose, Sucrose Dicarboxylic acid: Succinic acid, Malic Acid, Adipic acid, 3-Oxoadipic acid Phenolic acids: Salicylic acid, Vanillic acid, Gallic acid, Caffeic acid, Ferulic acid, Chlorogenic acid Flavonoids: Afzelechin,	To treat coughs and colds and possess diuretic, antidiarrheal, pulmonary infections, colorectal cancer, antioxiadants, antibiotic, antihyperglycemic, and hypocholesterolemic effects (29).	Prenylated coumarins: Anti-HIV Activity, Anti-inflammatory Activity (27) Phenolic compounds: antioxidant activities	All prenylated coumarins proved anti-inflammatory activity at IC₅₀ values ranging from 0.68 ± 0.06 to 8.83 ± 0.12 μM, which is comparable to hydrocortisone IC₅₀ value of 4.08 ± 0.17 μM. Manizapotins A is about 5 times higher than that of hydrocortisone. All prenylated coumarins proved anti-HIV activities at EC₅₀ values in a range of 0.12–8.69 μM (27). Antioxidant activities of <i>M. zapota</i> leaves such as 3,4-dihydroxybenzoic acid (DPPH: IC₅₀ 1.88 μg/mL, ABTS: IC₅₀ 0.89 μg/mL), gallic acid (DPPH: IC₅₀ 3.53 $\pm$ 0.24 μg/mL, ABTS^{•+}: IC₅₀ 8.85 $\pm$ 0.74 μg/mL), caffeic acid (DPPH[•]: IC₅₀ 6.34 $\pm$ 0.37 μg/mL, ABTS^{•+}: IC₅₀ 18.04 $\pm$ 0.68 μg/mL), syringic acid (DPPH[•]: IC₅₀ 5.44 $\pm$ 0.53 μg/mL, ABTS^{•+}: IC₅₀ 13.97 $\pm$ 0.59 μg/mL), ferulic acid (DPPH[•]: IC₅₀ 11.75 $\pm$ 0.45 μg/mL, ABTS^{•+}: IC₅₀ 9.47 $\pm$ 0.69 μg/mL) (28).	Manilkara zapota leaf water extract offer great potential against colorectal cancer (30), Human Hepatocellular Carcinoma (HepG2) Cells(31)
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			Epicatechin, Epigallocatechin, Myricetin, Ampelopsin, Laricitrin, Prodelphinidin B, Laricitrin-3- <i>O</i> - rhamnoside, Myricetin-3- <i>O</i> - rhamnoside (28)				
10	Bombacopsis Quinata/Pachira Quinata	Root/ stem bark	Not reported	Not reported	Not reported	stembark of Bombacopsis (= Pachira) quinata, at 18.9 mcg/ml acts an anti- oxidants (32).	The roots are used in the treatment of diarrhoea.
11	Samanea Saman	Leaf, stems, fruits, pods, seeds(33)	Bark: Alkaloid: pithecolobine Saponin: samarin Leaf: sucrose, glucose, gallic acid, fatty acids, phytosterol, octacosanoic acid, lupeol, α - spinasterol, α - spinasterone Fruits: essentials oil: α -pinene, α - terpineol, α - copaene, cperene, α -humulene, nerolidol, Seeds: α - spinasterol, β -D-	antioxidant, antibacterial, anti- diabetic potential, insecticidal, antifungal, analgesic, anti-ulcer and cytotoxic activities (33)	Methanolic leaf extract: anti-obesity, Hepatoprotective, antidiabetic, and antioxidant activities methanolic extract: potential anti-ulcer.	Antiulcer activity : methanolic extract of Samanea saman bark:400 mg/kg Antidiabetic: menthol leaf extract: 200 μ g/ml, and 250 μ g/ml.	It is used as a folk medicine for a remedy for a headache, cold, diarrhoea, stomachache intestinal ailments, sore throat, and stomach cancer. The boiled bark is used to cure constipation. The decoction of bark (inner) and leaves is used for diarrhoea. The antimicrobial activity of this plant has been reported against some pathogens that affect humans and few plants pathogenic fungi and bacteria. <i>S.saman</i> is also known to have antioxidant, anti- plasmodial, and cytotoxic properties (33).

			glucoside, palmitic, steric acid (33)				
12	Simarouba Glauca	Root/fruits/bark/seed	Root: Quassinoids: amarolide, gimarolide, chaparrinone, 2,12-didemethylquassin, holacantone Root: Alkaloids: 5-hydroxycanthin-6-one Root: Triterpenes: ocotilone, 21,20-anydromelianone, melianone Bark: Triterpenes: octanorsimaroubin A; simaroubins A, B, C, D Fruits: Quassinoids: glaucarubinone, glaucarubin, ailanthinone Fruits: Triterpenes: tirucall-7,24-dien-3-one; 3-episapelin Seeds: Quassinoids:	Anthelmintic, antitumor, anti-inflammatory, antiviral, anorectic, tonic, insecticide and amebicide Antiplasmodial (Plasmodium falciparum and P. berghei), Antiprotozoal (Trypanosoma brucei and T. cruzi, Leishmania infantum and Plasmodium falciparum) (34)	Glaucarubinone: inflammatory diseases, psoriasis, microbicidal, antineoplastic, antiviral and herbistatic activity Glaucarubolone: antineoplastic, antiviral, and herbistatic activity Canthin-6-one: inflammatory diseases, psoriasis, trypanosomiasis Fraxidin: anti leishmaniasis, urinary tract infections Triolein: post-operative chronic pain, diabetes mellitus, Raynaud's disease, acute pancreatitis, psychotic disorders Trilinolein: myocardial infarction, cardioprotection and cardio	Detailed on page 4-5: doi:10.5530/srp.2019.1.12	Simarouba glauca is of great importance for its chemical diversity due to the presence of quassinoids, alkaloids, terpenes, steroids, coumarins and saponins. Despite having potent anticancer properties, to date, no systematic research, using phytochemicals isolated from Simarouba glauca has been carried out to explore the molecular mechanisms leading to cancer cell death.

			glaucarubolone, glaucarubolol(34)		regeneration immunomodulatory agent (35)		
13	Spondias Mombin	Barks, leaf, flower, fruits	Leaf and fruits: phenolic compound: Chlorogenic acid, ellagic acid and isoquercetrin (36), Geraniin, Galloyl geraniin Leaf: Lupeol, β- Pinene α-Pinene, Caryophyllene, Humulene Bark: sterols: Stigmasta-9-en- 3,6,7-triol; 3- Hydroxy-22- epoxystigmastane (37) Seed: Alkanes: nondecane, eicosane Fatty acid: Dodecanoic acid, palmitic acid, Phenolic lipids: Capsaicin, dihydrocapasaicin(38).	Digestive tract disease, lower back pain, rheumatism, angina, sore throat, malarial fever, congestion, diarrhoea, urethritis, metrorrhagia, gonorrhoea, anti- diarrhoea, coughs and colds, haemorrhages, stomach-aches, antiseptic	ethyl acetate extract of Spondias pinnata: anti-inflammatory effects. Phenolic compound: Anti-inflammatory and anti-oxidant agents (36). Dodecanoic acid: cosmetic and soap preparations palmitic acid: antioxidant, anticancer, and anti- inflammatory activities. Capsaicin: analgesic (38). Ethanollic extract of stem and bark: anti- microbial agents.	ethyl acetate extract of Spondias pinnata had anti-inflammatory effects at doses of 200, 400 mg/kg, b.w. ($p < 0.001$) in reducing rat paw oedema induced by carrageenan assay (36).	Bark and flowers are used in folk medicine for digestive tract ailments, lower back pain, rheumatism, angina, sore throat, malarial fever, congestion, diarrhoea, urethritis, metrorrhagia, and as a contraceptive. The bark is used as a remedy for gonorrhoea, to treat diarrhoea, coughs and colds, haemorrhages. stomachaches and alleviating fatigue. Plant extracts exhibit antibacterial properties, and a decoction of the bark or root bark is considered antiseptic. Leaf decoctions are used to treat diarrhoea, dysentery, colds, fevers and gonorrhoea. The leaves are also used in an abortifacient preparation. A decoction of the leaves and young stems is used as an eyewash in ophthalmia. The flowers are cardiac and stomachic. A decoction is used in the

							treatment of laryngitis, ophthalmia and children's diarrhoea. The fruit is mildly laxative. It is stewed and eaten to cure diarrhoea.
14	Trichilia Hirta	Stem bark/fruits	Bark/fruits: nilocitin, dihydronilocitin B, melianone epimers, piscidinol A, melianone lactone, hirtin, spathulenol (39) Seeds: Limonoids: Hirtin, Deacetylhirtin Fruits: Limonoids :Hirtin, Deacetylhirtin, 23-c-hydrpxybutenolide, Curcinomarcoide and Methyl 11b-acetoxy-6-hydroxy-12a-(2-methylpropionyloxy)- 3,7-dioxo-1,5,14,20,22-meliacarpentaen-29-oate (40) Fruits: sesquiterpenes: spathulenol	Laxative, purgative, insecticidal	Ethanol extracts of root: stimulate the production of WBC.	Not available	The leaves juices are rubbed on the limbs to relieve convulsions. The root is a strong purgative. It is folk medicine in Cuba to treat asthma, cancer, and ulcers.

			Fruits: triterpenes: melianol, bourjotinolone, nilocitin, dihydronilocitin B, melianone, piscidinol (41)				
15	Dialium Guianensis						
16	Swietenia Macrophylla	Seed/ bark/leaf/t wing	Seed: Limonoid: swietenine, swietenolide; 8,30-epoxyswietenine acetate, swietenine acetate, swielenolidetiglate, swietenolidediacetate, augustineolide; 3β,6-dihydroxydihydroc arapin; 7-deacetoxy-7-oxogedunin; andirobin; proceranolide; 6-O-acetylswietenolide, khayasin T, swietemahonin E, swietemahonin F, swietemahonin G Seed: coumarin: scopoletin	antimicrobial, anti-inflammatory, antioxidant effects, antimutagenic, anticancer, antitumor, hypertension, diabetes, and relieve pain, anti-nociceptive, hypolipidemic, antidiarrheal, anti-infective, antiviral, antimalarial, acaricidal, antifeedant and heavy metal phytoremediation activity (42)	3-hydroxycaruilignan C: antiviral activity Ethanol extract of Seed: anti-inflammatory activity, Anticancer Antitumor & antimutagenic Activity Swietenine or methanol extract of seed: antidiabetic activity, Hypolipidemic Activity catechin, epicatechin, and swietemacrophyllan: Antioxidant Activity methanol and aqueous extracts:	3-hydroxycaruilignan C proved antiviral activity against hepatitis at an EC ₅₀ value of 10.5 ± 1.2 μM. Oral treatment with swietenine (25 and 50 mg/kg body weight) for 5 days reduced the fasting glucose level by 47.34 mg/dL and 55.85 mg/dL, respectively(42)	<i>S. macrophylla</i> exhibits a wide spectrum of significant biological activities

			Seed: fatty acid ester: stearic acid methyl ester Seed: steroid: β-sitosterol, stigmasterol Bark: Polyphenol: swietemacrophylla nin, catechin, epicatechin Leaf: Limonoid: swietephragmin, swietemacrophine, khayanolide E, khayalactone, khayanone Twing: limonoid: swietenitin A to swietenitin X, epoxyfebrinin B Stem: lignan: 3-hydroxycaruilignan C(42)		Antimicrobial Activity petroleum ether extract of seed: antidiarrheal effect. decoction of <i>S. macrophylla</i> seeds/bark: antimalarial activity. (42)		
17	Tabebuia Rosea	flowers, leaves and roots	Leaf: Sugar glycoside: 1,6:2,3-dianhydro-4-o-acetyl-beta-dallopyranose; Phenol :3-hydroxy phenyl acetylene;	ulcers, syphilis, gastrointestinal problems, candidiasis, cancer, diabetes, prostatitis, constipation, and allergies(43).	1,6:2,3-dianhydro-4-o-acetyl-beta-dallopyranose: Preservative; 3-hydroxy phenylacetylene: Antibacterial; 7-Quinolinol: Metal chelator, anti-fungal;	Not available	A decoction of the flowers, leaves and roots has been used to reduce fevers and pain, cause sweating, to treat tonsil inflammation and various other disorders. The bark is used to eliminate intestinal parasites, malaria, and uterine cancer. A decoction of

			Heterocycle quinoline: 7-Quinolinol; Phenolic aldehyde: Cinnamaldehyde; Fatty alcohol: 1-hexacosanol; Terpenoid: Santolina triene; Aromatic carboxylic acid: 2-methyl Benzoic acid(43)		Cinnamaldehyde: anti-cancer antimicrobial; 1-hexacosanol: Antibacterial; Santolina triene: Cytotoxic, Anti-fungal, Antibacterial, Anti-inflammatory; 2-methyl Benzoic acid: Antimicrobial (43)		the bark is recommended for anaemia and constipation.
18	Tabebuia impetiginosa	Bark/leaves	Bark: Fatty acids: oleic acid, palmitic acid, and linoleic acid. Bark: sugar: Glucose, fructose, and sucrose. Bark: Organic acids: oxalic acid. Bark: tocopherol: α-tocopherol and γ-tocopherol. Bark: cyclopentenyl esters: avallaneine A–F, avallaneine G–H(20) Others: 4-methoxybenzaldehy	Traditionally used to treat cancer, obesity, depression, viral, fungal, and bacterial infections, toothaches, backaches, and sexually transmitted diseases and inflammatory symptoms such as pain, arthritis, colitis, and prostatitis.(20) Concentrated tea of inner bark is used for treating skin inflammatory diseases, astringent, and diuretics.	Water extract 50, 100, 200, and 400 $\mu\text{g/mL}$: Immunomodulatory. Ethanol extract 0.25, 0.5, 0.75, 0.9, and 1.0, mg/mL Immunomodulatory. Water extract: 0–400 $\mu\text{g/mL}$, 100–400 mg/kg: Anti-inflammatory. Ethanol extract: 100, 200, or 400 mg/kg: Anti-inflammatory. Cyclopentene derivatives: 12.5, 25, 50 $\mu\text{g/mL}$: Anti-inflammatory. β-lapachone, water extract: Anti-cancer.	Water extract 50, 100, 200, and 400 $\mu\text{g/mL}$: Immunomodulatory. Ethanol extract 0.25, 0.5, 0.75, 0.9, and 1.0, mg/mL Immunomodulatory. Water extract: 0–400 $\mu\text{g/mL}$, 100–400 mg/kg: Anti-inflammatory. Ethanol extract: 100, 200, or 400 mg/kg: Anti-inflammatory. Cyclopentene derivatives: 12.5, 25, 50 $\mu\text{g/mL}$: Anti-inflammatory. β-lapachone, water extract: Anti-cancer. Ethanol extract: 100, 200, or 400 mg/kg: Antinociceptive.	It exhibits antibacterial, antioxidant, antifungal, antinociceptive, antidiabetic, anti-edema, anti-inflammatory, and anti-cancer activities at different concentrations or doses.

			yde, 4-methoxyphenol, 5-allyl-1,2,3-trimethoxybenzene, 1-methoxy-4-(1E)-1-propenylbenzene, and 4-methoxybenzyl alcohol		Ethanol extract: 100, 200, or 400 mg/kg: Antinociceptive. Ethanol extract: 75, 150, and 300 µg/mL: Osteoarthritis. Water extract: 100, 300, 900, and 2700 µg/mL 2 mg/day, a total of 5 days: Colitis. Methanol, butanol, water extract: antioxidants. <i>n</i>-butanol extract, Ethanol extract: anti-obesity. Methanol extract: 10, 50, 100, and 200 µg/mL: antiplatelet (20).	Ethanol extract: 75, 150, and 300 µg/mL: Osteoarthritis. Water extract: 100, 300, 900, and 2700 µg/mL 2 mg/day, a total of 5 days: Colitis. Methanol extract: 10, 50, 100, and 200 µg/mL: antiplatelets.(20)	
19	Acosmium panamense	Bark	Bark: Pyrone Glycosides: Desmethylyangonine, Desmethylyangonine-4'-glucoside, Desmethylyangonine-4'-diglucoside (44)	Anti-diabetic	water and butanolic extracts of bark: anti-diabetics by inhibiting alpha-glucosidase (44).	Antidiabetic effects: In vitro assays of alpha-glucosidase activity showed an IC(50) of 109 mcg/ml for Acosmium, which was lower than acarbose (128 mcg/ml) (44).	Acosmium panamense has mild anti-diabetic I comparison with acarbose.
20	Simarouba Amara	Leaf, bark, fruits	Bark: triterpenes: 3-oxatirucalla-7, 24-dien-23-ol; niloticin, Simaroubin A; Simaroubin B; Simaroubins C;	Antimalarial, antineoplastic, Hepatoprotective activity, antiamebic, immunomodulatory action	AiZanthinone, 2'Ace tylglaucarubinone, Holucanthone, glaucarubinone: antimalarial activity against p. falciparum (46)	Antineoplastic activity EDs0 values: 13,18-dehydroglaucarubinone (0.95(mcg/ml), glaucarubinone (0.34mcg/ml).(47)	Simarouba amara stem bark decoction has been traditionally used in Brazil to treat malaria, inflammation, fever, abdominal pain, diarrhoea, wounds and as a tonic.

			Simaroubins D; Simaroubin E (45) Fruits: Quassinoids: AiZanthinone, 2'Ace tylglaucarubinone, Holucanthone, glaucarubinone(46)		ailanthinone, glaucarubinone, and holacanthone: antiprotozoal, anti- amoebic, antimalarial, antineoplastic and leukaemia cells 13,18- dehydroglaucarubin one ; 2'Ace tylglaucarubinone ; Glaucarubinone: antineoplastic activity (lymphocytic leukemia) (47).		A decoction is taken internally in the treatment of anaemia, diarrhoea, dysentery, malaria, fevers, haemorrhages, intestinal parasites, and colitis. The leaves are used in the treatment of rheumatism or are applied in the form of a lotion for body pain, bruises, or skin itch. The fruit is a strong stimulant and effective treatment for dysentery.
21	Gliricidia Sepium	Leaf/bark/ flowers	leaf essential oil: Propylene glycol,Pr opylene glycol, Hexenol, thymol, benzyl alcohol, caryophyllene, isovanillin. Flower essential oil: maltol, myrtenol, geraniol, myrtenal, hydroquinone, decanoic acid, coumarin (48)	Used for treatment of colds and cough, fever, headache, bruises, burns, rheumatism, ulcers, and wounds. It can also be used as a rodenticide and general pesticide.	Leaf extract ointment: heals wounds (49) Leaf extract: antibacterial activity aqueous extract flowers: anti- inflammatory activity (50) essential oil: antibacterial (48)	Not available	The plant is reported to be expectorant, sedative and suppurative. Crude extracts have been shown to have antifungal activity. The plant is a folk remedy for alopecia, boils, bruises, burns, colds, cough, debility, eruptions, erysipelas, fever, fractures, gangrene, headache, itch, prickly heat, rheumatism, skin tumours, ulcers, urticaria and wounds.
22	Lonchocarpus Costarricensis	Root/ bark	Root: flavonoids: Derriobtusone A	anti-inflammatory, antiallergic, antitumor, antioxidant, and antimicrobial activities (51)	Derriobtusone A: Antibacterial and Antioxidant (51) Aqueous and ethanolic extracts	Derriobtusone A reduced the biomass and colony- forming unit (cfu) of <i>S. aureus</i> biofilm at concentrations of 250 and 500 µg/mL.	Lonchocarpus Costarricensis acts as anti-inflammatory, antiallergic, antitumor, antioxidant, and antimicrobial activities.

						Aqueous and ethanolic extracts (25-400 mg/kg): treatment for the antipsychotic disorder.	
23	Pterocarpus Michelianus/ marsupium	Bark/ root/ heartwood	Bark: phenolic compounds: pterostilbene, pterosupin, and marsupin (52) Root and heartwood: pterostilbene 4-5%, alkaloids 0.4%, tannins 5%, protein, pentosan, pterosupin, pseudobaptigenin, liquiritigenin, isoliquiritigenin, garbanzol, 5-de-oxykaempferol, Phydroxybenzaldehyde, beudesmol, erythrodiol-3-monoacetate, l-epicatechin, marsupol, carpusin, propterol, propterol B, marsupinol, irisolidone-7- O-A-L-rhamnopyranoside (53)	antidiabetic, astringent, anti-inflammatory, hypertriglyceridemia , cardiotonic, wound healing, hepatoprotective function, and as a potent COX-2 inhibitor (52)	pterostilbene, pterosupin, and marsupin, pterostilbene and (-) epicatechin: antidiabetic agents (52) Pterostilbene: anti-cancer effects against lung cancer, breast cancer, gastric cancer, colon cancer; anti-dyslipidemia, antioxidant (54). Pterostilbene: to reduce the markers of skin ageing and brighten the skin tone (55). Tannins: antioxidants, Hypocholesteremic. Antimicrobial activity against bacteria and viruses (53).	Diabetic agents work by Amylase inhibition: ZnO nanoparticles-loaded Pterocarpus marsupium extract was analyzed for alpha-amylase activity in a concentration range of 20–100 µg/ml, and the IC50 was found to be 59.38.(52) pterostilbene maintained at a relatively high dose concentrations (> 20 µmol / L) are significant anti-tumour effect, comprising inducing apoptosis in tumor cells, inhibit tumor cell proliferation, invasion and metastasis and angiogenesis, to inhibit tumor stem cell properties (54) Natural pterostilbene showed significant inhibition of melanogenesis. Pterostilbene cream (0.4%) was highly effective in reducing markers of ageing and induces even skin tone.	<i>P. marsupium</i> was used from ancient times to treat burns, psoriasis, wounds, odontalgia.

						The product was effective in reducing wrinkles and fine lines improved skin hydration elasticity and showed no adverse effects (55).	
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References

- Kraft C, Jenett-Siems K, Siems K, Gupta MP, Bienzle U, Eich E. Antiplasmodial activity of isoflavones from *Andira inermis*. J Ethnopharmacol. 2000;73(1-2):131-5.
- Duke JA. Handbook of medicinal herbs: CRC press; 2002.
- Cocker W, Dahl T, Dempsey C, McMurry T. 957. Extractives from woods. Part I. Extractives from *Andira inermis* (Wright) HBK. Journal of the Chemical Society (Resumed). 1962:4906-9.
- Sylvestre M, Longtin APA, Legault J. Volatile Leaf Constituents and Anticancer Activity of *Bursera Simaruba* (L.) Sarg. Essential Oil. Natural Product Communications. 2007;2(12):1934578X0700201217.
- Junor G-AO, Porter RBR, Yee TH. The Chemical Composition of the Essential Oils from the Leaves, Bark and Fruits of *Bursera simaruba* (L.) Sarg. from Jamaica. Journal of Essential Oil Research. 2008;20(5):426-9.
- Noguera B, Díaz E, García MV, Feliciano AS, López-Perez JL, Israel A. Anti-inflammatory activity of leaf extract and fractions of *Bursera simaruba* (L.) Sarg (Burseraceae). J Ethnopharmacol. 2004;92(1):129-33.
- Campos AM, Oliveira FS, Machado MIL, Matos FJ, Braz-Filho R. Triterpenes from *Cedrela odorata*. Phytochemistry. 1991;30(4):1225-9.
- Rashed K. Antioxidant potential of *Cedrela odorata* stems extracts and Bio active Phytoconstituents. Hygeia JD Med. 2014;6:25-30.
- Nogueira TSR, Passos MdS, Nascimento LPS, Arantes MBdS, Monteiro NO, Boeno SIdS, et al. Chemical Compounds and Biologic Activities: A Review of *Cedrela* Genus. Molecules (Basel, Switzerland). 2020;25(22):5401.
- Asaad GF, Ibrahim Abdallah HM, Mohammed HS, Nomier YA. Hepatoprotective effect of kaempferol glycosides isolated from *Cedrela odorata* L. leaves in albino mice: involvement of Raf/MAPK pathway. Res Pharm Sci. 2021;16(4):370-80.
- Smith FP. Contributions Towards the Materia Medica & Natural History of China: For the Use of Medical Missionaries & Native Medical Students: American Presbyterian Mission Press; 1871.
- Arévalo-Lopéz D, Nina N, Ticona JC, Limachi I, Salamanca E, Udaeta E, et al. Leishmanicidal and cytotoxic activity from plants used in Tacana traditional medicine (Bolivia). Journal of ethnopharmacology. 2018;216:120-33.
- Vasudeva N, Vats M, Sharma S, Sardana S. Chemistry and biological activities of the genus *Dalbergia* - A review. Pharmacognosy Reviews. 2009;3:307-19.
- Vargas-Radillo J, Ramírez R, Ramírez L. Chemical Composition of seed *Enterolobium cyclocarpum* (Jacq.) Griseb from Jalisco, México. Acta Scientific Veterinary Sciences. 2021;3:44-9.
- Gamal El-Din MI, Eldahshan OA, Singab A-NB, Ayoub NAA. Genus *Enterolobium* : traditional uses, chemistry and biological activities. Archives of Pharmaceutical Sciences Ain Shams University. 2017;1(1):16-25.
- Martinez Pacheco MM, Del Rio RE, Flores Garcia A, Martinez Muñoz RE, Ron Echeverria OA, Raya Gonzalez D. *Enterolobium cyclocarpum* (Jacq.) Griseb.: The biotechnological profile of a tropical tree. Boletín Latinoamericano y del Caribe de Plantas Medicinales y Aromáticas. 2012;11(5):385-99.
- Pires TCSP, Dias MI, Calhelha RC, Carvalho AM, Queiroz M-JRP, Barros L, et al. Bioactive Properties of *Tabebuia impetiginosa*-Based Phytopreparations and Phytoformulations: A Comparison between Extracts and Dietary Supplements. Molecules (Basel, Switzerland). 2015;20(12):22863-71.
- Edwards S, Rocha I, Williamson E, Heinrich M. Phytopharmacy: An Evidence-Based Guide to Herbal Medical Products 2015.
- Zhang J, Hunto ST, Yang Y, Lee J, Cho JY. *Tabebuia impetiginosa*: A Comprehensive Review on Traditional Uses, Phytochemistry, and Immunopharmacological Properties. Molecules. 2020;25(18).
- Zhang J, Hunto ST, Yang Y, Lee J, Cho JY. *Tabebuia impetiginosa*: A Comprehensive Review on Traditional Uses, Phytochemistry, and Immunopharmacological Properties. Molecules (Basel, Switzerland). 2020;25(18):4294.
- Simões K, Du J, Pessoni RAB, Cardoso-Lopes EM, Vivanco JM, Stermitz FR, et al. Ipomopsin and hymenain, two biscoumarins from seeds of *Hymenaea courbaril*. Phytochemistry Letters. 2009;2(2):59-62.
- Boniface PK, Baptista Ferreira S, Roland Kaiser C. Current state of knowledge on the traditional uses, phytochemistry, and pharmacology of the genus *Hymenaea*. J Ethnopharmacol. 2017;206:193-223.
- Langenheim JH, Stubblebine WH, Foster CE. Effect of moisture stress on composition and yield in leaf resin of *Hymenaea courbaril*. Biochemical Systematics and Ecology. 1979;7(1):21-8.
- Hata Viveiros MMH, Rainho CA, Silva MG, da Costa JGM, de Oliveira AG, Padovani CR, et al. Anti-inflammatory effects of *Hymenaea courbaril* essential oil compounds on pterygium fibroblasts. Investigative Ophthalmology & Visual Science. 2017;58(8):1090-.

25. Schwartz G. Jatoba—*Hymenaea courbaril*. In: Rodrigues S, de Oliveira Silva E, de Brito ES, editors. *Exotic Fruits*: Academic Press; 2018. p. 257-61.
26. Nuzillard J-M, Connolly JD, Delaude C, Richard B, Zèches-Hanrot M, Le Men-Olivier L. Computer-assisted structural elucidation. Alkaloids with a novel diaza-adamantane skeleton from the seeds of *Acosmium panamense* (Fabaceae). *Tetrahedron*. 1999;55(38):11511-8.
27. Liu YP, Yan G, Guo JM, Liu YY, Li YJ, Zhao YY, et al. Prenylated Coumarins from the Fruits of *Manilkara zapota* with Potential Anti-inflammatory Effects and Anti-HIV Activities. *Journal of agricultural and food chemistry*. 2019;67(43):11942-7.
28. Islam S, Alam MB, Ann H-J, Park J-H, Lee S-H, Kim S. Metabolite Profiling of *Manilkara zapota* L. Leaves by High-Resolution Mass Spectrometry Coupled with ESI and APCI and In Vitro Antioxidant Activity, α -Glucosidase, and Elastase Inhibition Assays. *International journal of molecular sciences*. 2020;22(1):132.
29. Barbalho SM, Bueno PC, Delazari DS, Guiguer EL, Coqueiro DP, Araújo AC, et al. Antidiabetic and antilipidemic effects of *Manilkara zapota*. *J Med Food*. 2015;18(3):385-91.
30. Tan BL, Norhaizan ME. *Manilkara zapota* (L.) P. Royen leaf water extract triggered apoptosis and activated caspase-dependent pathway in HT-29 human colorectal cancer cell line. *Biomed Pharmacother*. 2019;110:748-57.
31. Tan BL, Norhaizan ME, Chan LC. *Manilkara zapota* (L.) P. Royen Leaf Water Extract Induces Apoptosis in Human Hepatocellular Carcinoma (HepG2) Cells via ERK1/2/Akt1/JNK1 Signaling Pathways. *Evid Based Complement Alternat Med*. 2018;2018:7826576-.
32. Calderon AI, Angerhofer CK, Pezzuto JM, Farnsworth NR, Foster R, Condit R, et al. Forest plot as a tool to demonstrate the pharmaceutical potential of plants in a tropical forest of Panama. *Economic Botany*. 2000;54(3):278-94.
33. Shanmugam V, Devi Rajeswari V. Review on Ethnomedical Uses, Pharmacological Activity and Phytochemical Constituents of *Samanea Saman*(jacq.) Merr. Rain Tree. *Pharmacognosy Journal*. 2018;10(2).
34. Alves IABS, Miranda HM, Soares LAL, Randau KP. Simaroubaceae family: botany, chemical composition and biological activities. *Revista Brasileira de Farmacognosia*. 2014;24(4):481-501.
35. Hussain MS, Mohit, Khan MD. PHARMACOLOGICAL USES OF SIMAROUBA GLAUCA: A REVIEW. *Plant Archives*. 2021;21:648-55.
36. Cabral B, Siqueira EMS, Bitencourt MAO, Lima MCJS, Lima AK, Ortmann CF, et al. Phytochemical study and anti-inflammatory and antioxidant potential of *Spondias mombin* leaves. *Revista Brasileira de Farmacognosia*. 2016;26(3):304-11.
37. Sameh S, Al-Sayed E, Labib RM, Singab AN. Genus *Spondias*: A Phytochemical and Pharmacological Review. *Evidence-Based Complementary and Alternative Medicine*. 2018;2018:5382904.
38. Abiodun OO, Nnoruka ME, Tijani RO. Phytochemical Constituents, Antioxidant Activity, and Toxicity Assessment of the Seed of *Spondias mombin* L. (Anacardiaceae). *Turk J Pharm Sci*. 2020;17(3):343-8.
39. Vieira IJC, Azevedo OdA, de Souza JJ, Braz-Filho R, Gonçalves MdS, de Araújo MF. Hirtinone, a Novel cycloartane-type triterpene and other compounds from *Trichilia hirta* L. (Meliaceae). *Molecules (Basel, Switzerland)*. 2013;18(3):2589-97.
40. Souza Passos M, Nogueira T, Azevedo O, Vieira M, Terra W, Braz-Filho R, et al. Limonoids from the genus *Trichilia* and biological activities: review. *Phytochemistry Reviews*. 2021.
41. Vieira IJC, Terra WdS, Gonçalves MdS, Braz-Filho R. Secondary Metabolites of the Genus *Trichilia*: Contribution to the Chemistry of Meliaceae Family. *American Journal of Analytical Chemistry*. 2014;Vol.05No.02:31.
42. Moghadamtousi SZ, Goh BH, Chan CK, Shabab T, Kadir HA. Biological activities and phytochemicals of *Swietenia macrophylla* King. *Molecules*. 2013;18(9):10465-83.
43. Ramalakshmi S, Muthuchelian K. Analysis of bio-active constituents of the ethanolic leaf extract of *Tabebuia rosea* (Bertol.) DC by Gas Chromatography-Mass Spectrometry. *International Journal of ChemTech Research*. 2011;3:1054-59.
44. Wiedenfeld H, Andrade Cetto A. Pyrone Glycosides from *Acosmium panamense* (Benth.) Yacovlev. *Zeitschrift für Naturforschung C, Journal of biosciences*. 2003;58:637-9.
45. Grosvenor SN, Mascoli K, McLean S, Reynolds WF, Tinto WF. Tirucallane, apotirucallane, and octanorapotirucallane triterpenes of *Simarouba amara*. *J Nat Prod*. 2006;69(9):1315-8.
46. O'Neill MJ, Bray DH, Boardman P, Wright CW, Phillipson JD, Warhurst DC, et al. Plants as sources of antimalarial drugs, Part 6: Activities of *Simarouba amara* fruits. *J Ethnopharmacol*. 1988;22(2):183-90.
47. Polonsky J, Varon Z, Jacquemin H, Pettit GR. The isolation and structure of 13,18-dehydroglauucarubinone, a new antineoplastic quassinoid from *Simarouba amara*. *Experientia*. 1978;34(9):1122-3.
48. Jose, Sr. Evaluation of antibacterial activity of the leaf and flower essential oils of *Gliricidia sepium* from south India. *Intl J App Pharm*. 2010;2:20-2.
49. Aulanni'am Aa, Ora KM, Ariandini NA, Wuragil DK, Permata FS, Riawan W, et al. Wound healing properties of *Gliricidia sepium* leaves from Indonesia and the Philippines in rats (*Rattus norvegicus*). *Vet World*. 2021;14(3):820-4.
50. Mallapu P. MEDICINAL PROPERTIES OF *Gliricidia sepium*: A REVIEW. *International Journal of Current Pharmaceutical & Clinical Research*. 2017;7:35-9.
51. Vasconcelos MA, Arruda FVS, de Alencar DB, Saker-Sampaio S, Albuquerque MRJR, Dos Santos HS, et al. Antibacterial and antioxidant activities of derriobtusone A isolated from *Lonchocarpus obtusus*. *Biomed Res Int*. 2014;2014:248656-.
52. Manne AA, K VV, G AK, Mangamuri U, Podha S. *Pterocarpus marsupium* Roxb. heartwood extract synthesized chitosan nanoparticles and its biomedical applications. *J Genet Eng Biotechnol*. 2020;18(1):19-.
53. Tiwari M, Sharma M, Khare H. Chemical constituents and medicinal uses of *Pterocarpus marsupium roxb*. *Flora Fauna*. 2015;21(1):5559.
54. Zhang X, Zhang J, Xu L, Ma Z, Di S, Gao Y, et al. Emerging Actions of Pterostilbene on Cancer Research. *Zhongguo Fei Ai Za Zhi*. 2018;21(12):931-6.
55. Majeed M, Majeed S, Jain R, Mundkur L, Rajalakshmi HR, Lad PS, et al. An Open-Label Single-Arm, Monocentric Study Assessing the Efficacy and Safety of Natural Pterostilbene (*Pterocarpus marsupium*) for Skin Brightening and Antiaging Effects. *Clin Cosmet Investig Dermatol*. 2020;13:105-16.