Folk Medicine, Pharmacological and Biological Activities

Apocynaceae species have been reported to possess several activities mainly antimalarial and anticancer properties. Species with cytotoxic activity include those of *Allamanda*, *Alstonia*, *Catharanthus*, *Cerbera*, *Nerium*, *Plumeria*, *Tabernaemontana* and *Vallaris*. Species of *Alstonia*, *Calotropis*, *Dyera*, *Kopsia* and *Vallaris* are also known to have antimalarial properties (Wong *et al.*, 2013). The presence of bioactive iridoid compounds such as allamandin, plumieride, plumieride coumarate glucoside, plumiericin and isoplumiericin have demonstrated antifungal, antileukemic, anti-HIV properties and anticancer activities. They have been used as a source of herbal medicine for the treatment of malaria and jaundice (Haron *et al.*, 2013b). *Allamanda* spp. have enormous potential and possible applications in agrochemical studies which the aqueous leaf extract was found in earlier studies to possess astringent and antimicrobial properties. The presence of bioactive iridoid compounds such as allamandin, plumieride, plumieride coumarate glucoside, plumiericin, isoplumiericin have demonstrated antifungal, antileukemic, anti-HIV, and anticancer activities (Kupchan *et al.*, 1974; Haron *et al.*, 2013a). The following are examples of the traditional uses and pharmacological activities of some species:

1. *Acokanthera friesiorum* Mgf and *Acokanthera longiflora* Stapf.: Both are arrow-poison plants (Raymond, 1936).
2. *Acokanthera oblongifolia* Hochst. (Syns: *Acokanthera spectabilis*, *Carissa oblongifolia*, *Toxicophloea spectabilis*) (Bushmann's poison, Poison bush, Poison tree, Wintersweet): The chloroformic extract, of the plant growing in Egyt, showed a moderate cytotoxic activity (Hassan *et al.*, 2015).
3. *Acokanthera oppositifolia*: The leaves are used in the form of a snuff to treat headaches and in infusions for abdominal pains, convulsions and septicaemia. Powdered roots are administered orally or as snuff to treat pain and snake-bite and root decoctions are used against anthrax and tapeworm. The plant extract possesses antioxidant properties (Adedapo *et al.*, 2008). Although freshly collected plant extract demonstrated a mutagenic effect against TA1535 strain at the highest concentration tested, no such effect was observed in the stored material (Aremu *et al.*, 2013).
4. *Acokanthera schimperi* (A. DC.) Benth. *et* Hook: The plant is poisonous. Arrow poison is prepared from it (Sita, 1978; Cassels, 1985; Kingdon *et al.*, 2012). The plant extracts

possess antibacterial (Taye *et al.*, 2011), antiviral (Gebre-Mariam *et al.*, 2006) and trypanocidal (Nibret and Wink, 2011) activities.

5. *Acokanthera spectabilis* Hook f.: The plant has reputation for its cardiotonic effects. The plant extracts exhibited antibacterial and antifungal activities (Shanta *et al*., 2008). Acopieroside II, isolated from the plant is a cardiotonic (Pieri and Massiot, 1989). Friedelin, isolated from the plant, cultivated in Egypt, had an antifeedant activity similar to that of Du-Ter, for the cotton-leaf worm, *Spodoptera littoralis* larvae (Abbasy *et al.*, 1977), while the sterols exerted a phagostimulant effect on the larvae (Abbasy *et al.*, 1976).
6. *Adenium arabicum* Balf f.: The cardenolide extracts possess molluscicidal activity (Al-Sarar *et al*., 2012).
7. *Adenium coetaneum*: The glucoside of the plant had been used for the preparation of poisoned arrows (Krause, 1911).
8. *Adenium honghel*: An active principle from the plant has a pronounced sternutative action and is strongly toxic (Perrot and Leprince, 1910)
9. *Adenium obesum* Forsskal: Various parts of the plant had long been used as traditional medicines for the treatment of skin problems, wound, ear ach, rhinitis, skin lumps, gonorrhea and infectious diseases. It is also a poisonous and toxic plant, and therefore used as a pesticide (Versiani *et al*., 2014). The plant extracts and/or isolated compounds showed antioxidant (Ebrahim *et al*., 2013), piscicidal (Abalaka *et al.*, 2013), antibacterial, antiviral, antitumor, immunomodulatory, molluscicidal (Versiani *et al*., 2014), cytotoxic (Nakamura *et al.*, 2000; Arai *et al.*, 2011) activities. The consumption of roots and stem-bark extracts were found to cause hyperthermia, hyperventilation, collapse, and arony leading to death, when test against *Mus musculus* (house mouse) (Versiani *et al*., 2014). However, a study showed that the ethanol extract of the stem-bark is a safe oral medicinal plant within the extract dose (300 mg kg^{-1}, 2000 mg kg^{-1} and 5000 mg kg^{-1}) and exposure period (Abalaka *et al.*, 2014).
10. *Adenium somalense* Balf. fil.: It is an arrow-poison plant (Hartmann and Schlittler, 1940). Pharmacological properties of somalin closely resembles digitoxin and digilanid A (Muller, 1943, 1944).
11. *Aganosma calycina*: The plant is heating, tonic and is useful in bile disease (Kirtikar and Basu, 1984).
12. *Aganosma dichotoma*: The plant is emetic, anthemintic and useful in bronchitis, leprosy, skin iseases, ulcers and inflammation. The flower is good in the treatment of eye diseases and the leaves cure biliousness (Kirtikar and Basu, 1984).
13. *Alafia barteri* Oliver: Leaf infusion and root decoctions are used in Nigeria and other African countries as analgesic, a remedy for malaria and for treating rheumatic pains, toothache, eye infection and sickle-cell anaemia. It is also The plant extracts exhibited antimicrobial antimicrobial and antipasmodial activities (Lasisi *et al.*, 2012; Ishola *et al.*, 2014).
14. *Alafia multiflora* Stapf.: It is a medicinal plant widely distributed in the tropical region of Africa, for ulcerous wounds and occasionally for abdominal pain. The plant extracts showed hepatoprotective (Tsala *et al*., 2010), antibacterial, antiradical, anxiolytic and antidepressant (Foyet *et al.* 2012) activities. The latex had antibacterial activity (Balansard *et al*., 1980).
15. *Allamanda blanchetii* A. DC.: In Brazil, the latex is used as laxative, emetic, cathartic and vermifuge. It is also referred to be poisonous (Agra *et al.*, 2008). The plant extracts possessed cytostatic, cytotoxic (De F Navarro *et al*., 2006) and antifungal (Haron *et al*., 2013a,b) activities.

16. *Allamanda cathartica* L.: The bark, latex and the infusion of its leaves are cathartic. The decoction the bark isa a hydragogue. In Guyana, its latex is employed as a purgative and for relieving colics and in the treatment of malaria and jaundice (Prabhadevi *et al*., 2012). In Thai, the plant is used as laxative and for inducing vomiting (Chaveerach *et al*., 2014). Leaves are also used as an antidote, and for relieving coughs and headaches (Wong *et al.*, 2013). In Brazil, drops of the latex are used as laxative and emetic. It is also referred to be poisonous (Agra *et al*., 2008). The plant extracts and/or some isolated compounds (e.g. iridoids and flavonoids), showed antifungal, antibacterial (Jewers *et al*., 1975; Tiwari *et al*., 2002; Haron *et al*., 2013a,b; Hema and Krishnaveni, 2014), antioxidant (Conrad *et al*., 2013), wound healing (Nayak *et al*., 2006), insecticidal (Feng *et al*., 2010d) and antinematodal (Alen *et al*., 2000) antileukemic (Kupchan *et al*., 1974) and algicidal (Coppen, 1983) activities. Oral administration of the aqueous leaf extract causes reversible suppression of fertility in male mice, without causing detectable toxic effects (Singh and Singh, 2008). The isoflavone glabridin had high tyrosinase inhibitory activity (Yamauchi *et al.* 2011).
17. *Allamanda doniana*: The two iridoids, plumericin and isoplumericin, from the woods and roots showed antifugal activity of the ethyl acetate extract (Harumi *et al*., 1995).
18. *Allamanda nerifolia*: The iridoid allaneroside, possessed plant growth inhibitory activity (Shen and Chen, 1986).
19. *Allamanda oenotheraefolia*: The plant extracts possessed fungistatic or fungicidal properties on growth of *Colletotrichum gloeosporioides* (Haron *et al*., 2013a).
20. *Allamanda schottii* Pohl: The plant extracts showed antileishmanial activity (Filho *et al*., 2013).
21. *Allamanda violacea* A. DC. (Syn *Allamanda blanchetii*, Purple Allamanda, violet Allamanda): The latex, referred to be poisonous is used as laxative and emetic (Agra *et al.*, 2008). The plant extracts possess cytostatic, hypolipidemic, hypoglycemic and antioxidant activities (Sethi *et al*., 2012).
22. *Alstonia actinophylla*: Actinophyllic acid, isolated from the leaves, was found to be a potent inhibitor of the coupled enzyme assay (Carroll *et al*., 2005).
23. *Alstonia angustifolia*: Some of the isolated alkaloids e.g. villalstonine possess significant antiprotozoal activity against *Entamoeba histolytica* and *Plasmodium falciparum in vitro* (Wright *et al.*, 1992). Bipleiophylline is cytoxic (Kam *et al*., 2008). The alkaloids macrodasines B-D, isolated from the bark, showed moderate levels of activity in reversing multidrug-resistance in drug-resistant KB cells (Tan *et al.*, 2011a). *N*(4)-methyltalpinine, was found to show significant NF-κB inhibitory activity (ED_{50} = 1.2 μM) against the Hela cells. Some other alkaloids exhibited leishmaniacidal activity against promastigotes of *Leishmania mexicana* (Pan *et al*., 2014).
24. *Alstonia angustiloba* Miq.: In Malaysia, leaves of *Alstonia angustiloba* are applied externally to treat fever and headache. The latex is used to heal boils and abscesses. Pounded bark is an ingredient of febrifuges and vermifuges. In Thailand, the latex is used to soothe toothache. Stems, leaves and latex have been used for gynaecological problems and skin sores in Indonesia. Leaf extracts have been reported to possess anticancer and antiplasmodial properties (Wong *et al.*, 2013). Alstilobanines A-E showed a moderate vasorelaxant activity (Koyama *et al.*, 2008). The alkaloid angustilobine C, isolated from the leaves and stem bark, showed moderate cytotixicity towards KB cells (Ku *et al.*, 2011).
25. *Alstonia boonei* De Wild (Devil tree): The bark is used for treating malaria, dizziness, impotence, breast pains, rheumatic pains and asthma and as anti-inflammatory and antipyretic. The latex is used as a remedy for fever in children, eye infections and provides effective cure for serpentine bites and arrow poisons. The bark extract of the

plant is used for treating fever, tumors and as aphrodisiac. The leaves and latex are used for the treatment of rheumatic pains, muscular pains and hypertension. Antipsychotic and reversible male antifertility of the stem bark have been also reported (Asuzu and Anaga, 1991; Iniaghe *et al*., 2011). The extracts of the different parts and/or the isolated compounds (alkaloids, triterpenes, essential oil) possessed the following activities: sedative (Adesina, 1982), diuretic (Adebayo *et al.*, 2004), antioxidant (Akinmoladun *et al*., 2007; Obiagwu *et al*., 2014), neuroleptic, anxiolytic (Akinloye *et al*., 2013) antimalarial (Adotey *et al*., 2012; Mrie-Esther *et al*., 2013), anti-inflammatory (Okoye *et al*., 2014), analgesic, antipyretic (Olajide *et al.*, 2000), aphrodisiac, trypanocidal, sedative, anti-snake venom, antihelminthic, rheumatic pains, antidiarrhoeal, spasmolytic, hypotensive, abortifacient, astringent, antibacterial (Okwu and Ighodaro, 2010), immunostimulant (Adotey *et al*., 2012), antiarthritic, anti-inflammatory (Kweifio-Okai, 1993; Kweifio-Okai and Carroll, 1993), hypolipemic (Liu *et al*., 2012c; Enechi *et al.*, 2013), antitumor, antioxidant, antidiabetic, immunoloregulation (Liu *et al*., 2012c), hypotensive (Ojewole, 1983, 1984), depressant and aphrodisiac. (Asuzu and Anaga, 1991), anticancer activity (Saraswathi *et al*., 1998) and insecticidal (Nathaniel *et al*., 2010; Oigiangbe *et al*., 2010, 2013; Omoya *et al*., 2012; Ileke *et al*., 2014).

26. *Alstonia congensis* Engl.: The stem bark, root and leaves are used as astringent, analgesic, diuretic and for the treatment of malaria and hypertension (Ezuruike and Prieto, 2014). The plant extracts exhibited antibacterial activity (Nsaka Lumpu *et al.*, 2012) and antiprotozoal activities (Lumpu *et al*., 2013).
27. *Alstonia macrophylla* Wall ex A. DC.*:* The decoction of the leaves and bark is widely used by the tribal of India to treat stomachache, skin diseases and urinary infection. The bark of the plant also used as febrifuge, tonic, emmenagogue, antichloretic, vulnerary, antidysenteric, antiperiodic, vermifuge and antidiabetic (Parveen *et al*., 2010). The plant extracts and/or the isolated compounds (alkaloids, terpenoids and flavonoids) showed antipyretic (Chattopadhyay *et al*., 2005a), antimicrobial (Chattopadhyay *et al*., 2001; Parveen *et al*., 2010), anti-inflammatory, antioxidant (Arunachalam *et al.*, 2009), anticancer (Keawpradub *et al.*, 1997, 1999a; Changwichit *et al.*, 2011), antiplasmodial (Keawpradub *et al.*, 1999b; Cheenpracha *et al.*, 2013), contraceptive (Chattopadhyay *et al*., 2005b), vasorelaxant (Arai *et al.*, 2012), CNS (Chattopadhyay *et al*., 2004) activities. Alstiphyllanines E and F showed moderate Na(+)-glucose cotransporter (SGLT1 and SGLT2) inhibitory activity (Hirasawa *et al*., 2009a). Some isolated alkaloids were effective in reversing multidrug-resistance (MDR) in vincristine-resistant KB cells (Lim *et al.*, 2014).
28. *Alstonia pneumatophora*: The alkaloids alpneumines E and G, vincamine, and apovincamine showed anti-melanogenesis in B16 mouse melanoma cells (Koyama *et al*., 2010a). Alsmaphorazine A inhibited the NO production in the LPS-stimulated J774.1 cells dose-dependently without affecting the cell viability (Koyama *et al*., 2010b).
29. *Alstonia rupestris*: Some of the isolated alkaloids exhibited cytotoxic and antimicrobial (Zhang *et al*., 2014a).
30. *Alstonia scholaris* (L.) R. Br. (Devil tree): The bark is reported as bitter, astringent, acrid, thermogenic, digestive, laxative, anthelmintic, febrifuge, antipyretic, depurative, galactogogue, stomachic, cardiotonic and tonic. The plant is useful in fever, malaria, abdominal disorders, diarrhoea, dysentery, dyspepsia, leprosy, skin diseases, pruritus, tumours, ulcers, asthma, bronchitis, debility, arthritis, impotence, wound healing, earache, leucorrhoea, cancer, jaundice, hepatitis, malaria, helminthiasis, hypertension , swelling, as aphrodisiac, abortifacient, antidote to poison, expectorant, analgesic, anti-inflammatory, antifertility, antidiabetic, anti-epileptic (Kirtikar and Basu, 1984; Islam *et al.*, 2013).

(Salopuka *et al*., 2010). (Wang *et al*., 2009b).(Dey, 2011), (Pratap *et al*., 2013). aThe plant extracts and/or some of the isolated compounds (mainly the alkaloids) possess the following activities: antimicrobial, anthelmintic, analgesic (Shankar *et al*., 2007), antiviral (Zhang *et al*., 2014b), antioxidant, anti-inflammatory, antimutagenic, immunomodulatory (Baliga, 2010), antitussive, anti-asthmatic and expectorant (Shang *et al.*, 2010), antimalarial, antioxidant, antidiabetic, analgesic, anti-inflammatory, anticancer, antidiarrhoeal, immunomodulatory, wound healing, CNS, spasmolytic, bronchodilatory, antitussive, antiasthmatic and antifertility (Khyade *et al*., 2014), anticholinesterase, antihypertensive, aphrodisiac (Dey, 2011), anti-anxiety (Arulmozhi *et al*., 2008; Sinnathambi, 2013), cytotoxic (Jagetia and Baliga, 2005), antidepressant (Bhattacharya *et al*., 1979), antipsychotic (Jash and Chowdary, 2014), phytotoxic (Javaid *et al*., 2010), radioprotective effect (Jahan and Goyal, 2010), allelopathic (Wang *et al*., 2014a), molluscicidal, piscicidal (Singh *et al*., 2013a), insecticidal (Oigiangbe *et al*., 2007), insect repellant (Pawar *et al*., 2013) and nematicidal (Sultana *et al*., 2013a). The plant extracts were also teratogenic, allergenic, irritant (Dey, 2011), increase the antiaging function of the retinoids (Lee *et al*., 2012) and toxic (Baliga *et al*., 2004; Singh and Singh, 2010). The extracts of the leaves and flowers of the plant, growing in Egypt, possessed hypoglycemic, antioxidant, hepatoprotective and cytotoxic effects (El-Askary *et al*., 2012, 2013).

31. *Alstonia spatulata*: The alkaloids alstolucine A, alstolucine B, alstolobine A, scholaricine and others, reversed multidrug resistance in vincristine-resistant KB cells (Tan *et al*., 2010d).
32. *Alstonia venenata* R. Br. (poison devil tree): The plant is used to relief from the rheumatic complaints. The fruits are tonic, anthelmintic and are reported as a remedy for impure blood, syphilis, insanity and epilepsy (Sutha *et al*., 2012). The alkaloids of the plant showed hypertensive (dey, 1965), psychotropic (Bhattacharya *et al*., 1975, 1976), antimicrobial and insecticidal activities (Singh *et al*., 2000; Karuppusamy *et al*., 2001).
33. *Alstonia yunnanensis*: The plant is used for the treatment of fever, headaches and inflammation (Cao *et al*., 2012). Some of the isolated alkaloids exhibited weak cytoxic activitity (Feng *et al*., 2009c; Cao *et al*., 2012).
34. *Alyxia reinwardtii*: The plant is used for various intestinal diseases, diarrhea, as a stomachic and antispasmodic (Kitagawa *et al*., 1988), to reduce fever, to treat fainting, heart failure, abdominal discomforts, mental confusion and hallucination (Rattanapan *et al*., 2012). The lignan zhebeiresinol showed antioxidant activity (Rao *et al*., 2012).
35. *Alyxia schlechteri*: Alyterinate C and two other lignans, isolated from the root had antifungal activity against *Pythium insidiosum* (Sriphana *et al*., 2013).
36. *Ambelania occidentalis*: The plant is used for treating gastrointestinal disorders The hydro-alcoholic extracts had no mutagenic or cytotoxic effects (Castro *et al*., 2009).
37. *Amsonia elliptica* Roem. et Schult.: β-Yohimbine, isolated from the plant showed hypotensive (Imai and Kogiso, 1958), mild central depressive, weak antispasmodic (Ozaki, 1989) and vasodilative (Ozaki, 1990) effects.
38. *Amsonia orientalis* Decne (Blue star): The plant extracts have antibacterial, antifungal and hemolytic activities (Akyalçin *et al*., 2006; Erdem *et al*., 2013).
39. *Amsonia tabernaemontana* Walt.: The alkaloids of the plant exhibited spasmolytic (Morin *et al*., 1955) and hypotensive effects (Racz-Kotilla, 1975; Racz and Racz-Kotilla, 1977).
40. *Anodendron affine*: Some cardenolide glycosides, isolated from the plant, exhibited insect growth inhibitory activity against the silkworm, *Bombyx mori* (Fukuyama *et al*., 1993).

41. *Anodendron formicinum* (Tsiang & P. T. Li): 4-Hydroxy-3-prenylbenzoic acid, 4-(*O*-β-D-glucopyranosyl)-3-prenylbenzoic acid and anodendrosin E, isolated from the stems showed significant antibacterial activities (Qin *et al.*, 2014).
42. *Anodendron paniculatum* A. DC.: The roots possess properties similar to those of ipecacuanha (Kirtikar and Basu, 1984).
43. *Apocynum androsaemifolium*: Apobioside from the roots showed a strong sedative effect (Nasirov *et. al.*, 1966) and was used for the treatment of cardiovascular diseases (Abubakirov *et al*., 1971).
44. *Apocynum cannabinum*: The plant has a cardiotonic action. A fraction obtained from the plant extracts had a greater and faster inotropic effect than digitalin (Desruelles *et al.*, 1973).
45. *Apocynum venetum* L. (Luobuma): The leaves, commonly used in China to make tea, have been used to treat cardiac diseases, hypercholesterolemia, nephritis, neurasthenia (Zhou *et al*., 2011), as a sedative and anti-aging supplement (Xie *et al.*, 2012) and for the improvement of emotions in Asian countries (Zheng *et al.*, 2013). The plant extracts possessed antihperlipemia, antiaging, sedative, anticonvulsion, anti-atherosclerosis (Fan *et al*., 1999; Zhou *et al*., 2011), anti-inflammatory (Wu and Nie, 2013), anxiolytic (Grundmann *et al*., 2007, 2009), antihypertensive (Lau *et al.*, 2012; Li *et al*., 2012c), antioxidant (Fujita *et* al., 2005; Yan *et al*., 2012a). Apocynins A-D, and other isolated flavonoids showed hepatoprotective activity (Fan *et al*., 1999; Nanba *et al*., 2000), antidepressant-like effect (Zheng *et al*., 2012a-c, 2013) and antifouling activities against the marine fouling bacteria (Kong *et al*., 2014). Apocyanin, is an NADPH oxidase inhibitor, may have a high therapeutic potential to reduce seizure-induced neuronal dysfunction (Kim *et al*., 2013)
46. *Aspidosperma album* (Vahl) Benoist ex Pichon: The plant is used to treat malaria and/or fevers (de Paula *et al*., 2014). The total alkaloidal extract of the bark antagonize the actions of acetylcholine, histamine, and Ba, and increase the pressor response to adrenaline in the spinal cat. An *in vitro* antiamebic action is noted (Banerjee and Lewis, 1954b).
47. *Aspidosperma auriculatum* Markgr.: The plant is used to treat malaria and/or fevers (de Paula *et al*., 2014).
48. *Aspidosperma chakensis* var. *spegazzini*: The alkaloid spegazzinine produced a drop in blood pressure (Mendez *et al*., 1964).
49. *Aspidosperma cuspa* (Kunth) Blake: The plant is used in traditional medicine to treat malaria and/or fevers (de Paula *et al*., 2014) and for pain. The aqueous decoction of the bark has an antinociceptive effect (Perez *et al*., 2012).
50. *Aspidosperma cylindrocarpon* Müll. Arg.: The plant extract showed antimalarial activity (Dolabela *et al*., 2012).
51. *Aspidosperma desmanthum* Benth ex. Mull. Arg.: The plant is used to treat malaria and/or fevers (de Paula *et al*., 2014).
52. *Aspidosperma discolor* A. DC.: The plant is used to treat malaria and/or fevers (de Paula *et al*., 2014).
53. *Aspidosperma gomezianum* A. DC.: The plant is used treat malaria and/or fevers (de Paula *et al*., 2014).
54. *Aspidosperma excelsum* Muell Arg: The plant is used in the treatment of malaria (Coutinho *et al*., 2013).
55. *Aspidosperma macrocarpon* Mart.: The plant extracts possessed antiproliferative (Bannwart *et al*., 2013) and antimalarial activities (de Paula *et al*., 2014).

56. *Aspidosperma macrocarpum*: The leaves extract showed hypotensive effect (Oliveira *et al.*, 2012).
57. *Aspidosperma macgravianum* Woodson: The plant is used in traditional medicine to treat malaria and/or fevers (de Paula *et al.*, 2014).
58. *Aspidosperma megalocarpon*: The plant is used to treat rheumatism, malaria and/or fevers (Banerjee and Lewis, 1954b; de Paula *et al.*, 2014). Some of the alkaloids exhibited antimalarial activity (Mitaine *et al.*, 1998; Reina *et al*., 2011) and antagonized the actions of acetylcholine, histamine, and barium (Banerjee and Lewis, 1954b).
59. *Aspidosperma nitidum*: The bark is used in folk medicine as a contraceptive, antimalarial, anti-inflammatory, antidiabetic, anticarcenogenic, antileprosy and for stomach upsets (Pereira *et al*., 2006a). The plant extracts exhibited anti-inflammatory, antinociceptive (Pereira *et al*., 2006c) and antiplasmodial (Coutinho *et al*., 2013) activities.
60. *Aspidosperma oblongum*.: The plant is used to treat malaria and/or fevers (de Paula *et al.*, 2014). The total alkaloids antagonize the actions of acetylcholine, histamine, barium, and adrenaline and reverse the actions of the latter (Banerjee and Lewis, 1953 1954a).
61. *Aspidosperma olivaceum* Muell. Arg.: The plant is used in traditional medicine to treat malaria and/or fevers (de Paula *et al.*, 2014). The plant extract displayed antibacterial (Braz de Oliveira *et al.*, 2010) and antimalarial (Chierrito *et al.*, 2014) activities.
62. *Aspidosperma parvifolium*: The plant extract showed antimalarial activity (Dolabela *et al*., 2012). The plant is toxic causing reproductive problems in ruminants (Riet-Correa *et al*., 2012).
63. *Aspidosperma polyneuron* Muell. Arg.: The plant is used as a tonic and against fever and/or malaria (Floriani, 1930a; de Paula *et al.*, 2014). The plant extracts exhibited antifungal and antibacterial activities against (Dolabela *et al*., 2012).
64. *Aspidosperma pyricolium* Muell. Arg.: The stem bark is used against inflammation of the urinary tract. It is also reported as a poisonous plant (Agra *et al.*, 2008). The hydroethanolic extract displayed moderate antibacterial activity (Braz de Oliveira *et al.*, 2010).
65. *Aspidosperma pyrifolium* Mart.: The stem-bark is used in Brazil against inflammation of urinary tract (Agra *et al.*, 2007) and to treat malaria and/or fevers (de Paula *et al.*, 2014). Also, in Brazil, poisonous plants that promote abortions and neonatal loss include *A. pyrifolium*. The plant extract promoted hemolysis in Wistar rats and was lethal to *Artemia salina* (Lima and Soto-Blanco 2010).
66. *Aspidosperma quebracho-blanco* Schlecht: The plant is used in traditional medicine to treat malaria and/or fevers (de Paula *et al.*, 2014). The bark or root decoction is used as contraceptive and/or abortive, emmenagogue, aphrodisiac, antifebrile, cicatrizant, anticolic, depurative, hallucinogenic (in large doses) and emetic (Peletto and Del Pero, 1995). The tree is used as a prescription drug to treat erectile dysfunction in some countries. A bark extract (rich in alkaloids) was able to stimulate human receptors related to penile erection which may predominantly be caused by its yohimbine content (Sperling *et al.*, 2002). Rhazinilam, isolated from the plant, had mild analgesic activity (Benoit *et al.*, 1973). The dry alcoholic extract of *Aspidosperma quebracho blanco* Schlecht. f. *pendulae* Speg. has a curative effect in malaria (Dominguez *et al*., 1932).
67. *Aspidosperma ramiflorum* Muell. Arg.: The plant extracts showed antibacgterial (Braz de Oliveira *et al.*, 2010), weak antifungal (Dolabela *et al*., 2012) and antimalarial (Dolabela *et al*., 2012) activities. Some of the isolated alkaloids exhibited antibacterial (Tanaka *et al*., 2006) and antileishmanial (Ferreira *et al.*, 2004; Tanaka *et al.*, 2007; Cunha *et al*., 2012) activities.

68. *Aspidosperma rigidum* Standley: The plant is used to treat malaria and/or fevers (de Paula *et al.*, 2014). The alkaloids caboxines A and B showed antiparasitic effects against *Leishmania infantum* and *Trypanosama cruzi* respectively (Reina *et al.*, 2011).
69. *Aspidosperma sandwithianum* Markgr.: The plant is used to treat malaria and/or fevers (de Paula *et al.*, 2014).
70. *Aspidosperma schultesii* Woodson: The plant is used in traditional medicine to treat malaria and/or fevers (de Paula *et al.*, 2014).
71. *Aspidosperma spruceanum* Benth. ex Müll. Arg.: It is widely used in Brazilian folk medicine to treat digestive disorders (Santos *et al.*, 2009b). The plant extract showed antimalarial activity (Dolabela *et al*., 2012).
72. *Aspidosperma subincanum* Mart.: It is useful for the treatment of cardiovascular-related illnesses.The plant extract induces hypotension associated with bradycardia (Bernardes *et al.*, 2013).
73. *Aspidosperma tomentosum* Mart.: The plant is used to treat malaria and/or fevers (de Paula *et al.*, 2014). The plant extracts possess antiproliferative (Kohn *et al.*, 2006), antinociceptive and anti-inflammatory activities (Bezerra de Aquino *et al.*, 2013).
74. *Aspidosperma ulei* Markgr.: An alkaloid rich-fraction relaxes the rabbit corpus cavernosum smooth muscle (Campos *et al*., 2008). The alkaloid 20-*epi*-dasycarpidone showed antiplasmodial activity (dos Santos Torres *et al.*, 2013). Pharmacological studies revealed that the total alkaloids antagonized the stimulant action of acetylcholine on smooth muscle of gut and uterus but not at other sites. In vitro amebicidal activity was shown (Banerjee and Lewis, 1955). A pro-erectile effect was observed in mice treated with fractions derived from an ethanol extract of the bark (Campos *et al*., 2006).
75. *Aspidosperma vargasii* A. DC.: The plant is used in traditional medicine to treat malaria and/or fevers (de Paula *et al.*, 2014).
76. *Baissea axillaries* Hua: The leaves decoction is used by traditional herbalists in Nigeria for the management of people living with HIV/AIDS. The plant is also used for infertility in women, as an anti-ulcer and an anti-hypertensive. In Philippines Island, it is used as tea by diabetic natives, and apparently served as a successful substitute for the unavailable insulin. Extracts of the plant have antimicrobial activity (Abere and Agoreyo, 2006).
77. *Beaumontia brevituba* Oliv.: Cytotoxic activity of cardenolides, isolated from the plant was reported (Kaneda *et al*., 1992).
78. *Beaumontia grandiflora* (Roxb.) Wall.: The plant is used as massage for the treatment of fracture, backache and rheumatism (Singh *et al.*, 2014). The plant extracts showed antioxidant activity (Abdelshafeek *et al*., 2010).
79. *Bonafousia longituba*: The plant extract showed a significant anti-inflammatory activity (de las Heras *et al*., 1998).
80. *Bonafousia sananho*: The plant extract showed a significant anti-inflammatory activity (de las Heras *et al*., 1998).
81. *Cabucala cryptophlebia* (Baker) Pichon: The plant is used as antimalarial drug (Rasoanaivo *et al.*, 2001).
82. *Cabucala madgascariensis* Pich.: A highly antihypertensive, physiological compatible compound was isolated from the roots (Groebel and Lindner, 1972).
83. *Callichilia monopodialis*: The leaves have cardiotoxic activity (Patel and Rowson, 1964a).
84. *Cascabela thevetia* L. (*Thevetia peruviana*): The bark and/or leaves are used as an emetic and in the treatment of intermittent fevers, jaundice and amenorrhoea. The seeds are used as a purgative, abortifacient, arrow poison and its oil is applied externally to treat skin infections (Naz and Sulthana, 2013).

85. *Catharanthus lanceus*: The alkaloid pericaline is antiviral (Farnsworth *et al.*, 1968c) and the alkaloid fraction from the roots and leaves showed antineoplastic and hypotensive activities (Farnsworth *et al.*, 1967).
86. *Catharanthus pusillus* (Murray) G. Don: The crude alkaloid fractions have hypotensive activity (Fylypiw *et al.*, 1965). The alkaloids of the plant are known for their anticancer pain-relieving properties. The plant extracts possess antibacterial activity (Subbaiyan *et al.*, 2013).
87. *Catharanthus roseus* Don. (*Vinca rosea* L.) (Madagascar periwinkle): The plant is used in treatment of diabetes, hypertension, tuberculosis, cancers, heart disease, leishmaniasis, stomach problem, dyspepsia, malaria, menorrhagia, a menstrual regulator, anti-galactagogue, cholagogue, and febrifuge (Shams *et al.*, 2009; Aslam *et al.*, 2010). During a screening for plants with antidiabetic activities, neither a Canadian group nor the Eli Lilly group (USA) could substantiate the hypoglycemic activity of crude extracts, but the latter group did find anti-leukemic activity. Intensive research for the active principles led to the isolation of the active bis-indole alkaloids vinblastine and vincristine, which were developed as commercial drugs (Rizk and Al-Nowaihi, 1989; Hostettmann *et al.*, 2000). Several of the isolated alkaloids are cytotoxic e.g. vingramine and methylvingramine, displayed, *in vitro*, cytotoxic activity against nasopharynx carcinoma KB cells, IC_{50} 5 and 6 uM C4 and 5 ug/ml) (Jossang *et al.*, 1998). Vinblastine and vincristine (Neuss et al., 1964) were proved effective against blood cancer. *Vinca* alkaloids including vinblastine, vincristine, vindesine and vinorelbine, are widely used as antineoplastic drugs, either as single agents or in combination with other drugs (Zhou and Rahmani, 1992). Marty *et al.* (1992) and Soerensen (1992) reviewed the antitumour activities of vinorelbine, a semisynthetic *Vinca* alkaloid, in breast cancer and lung cancer respectively. The major use of vinblastine is in the treatment of patients with Hodgkin's disease, non-Hodgkin's lymphomas and renal, testicular, head and neck cancer. Vincristine is widely used, in combination with other anticancer agents, in the treatment of acute lymphocytic leukaemia in children and for certain lymphomas and sarcomas, small cell lung cancer and cervical and breast cancer (Hostettmann *et al.*, 2000). Pharmacological and biological studies of the plant extracts and/or the isolated compounds (mainly the alkaloids and phenolics) revealed the following activities: antibacterial (Ibrahim *et al.*, 2011; Wagay *et al.*, 2013), antifungal (Balaabirami and Patharajan, 2012; Koul *et al.*, 2013), antiviral (Farnsworth *et al.*, 1968c), antidiabetic (Islam *et al.*, 2009; Malathi *et al.*, 2010; Ibrahim *et al.*, 2011; Tiong *et al.*, 2013), antioxidant (Ferreres *et al.*, 2008; Rasool *et al.*, 2011), anthelmintic (Agarwal *et al.*, 2011; Koul *et al.*, 2013), anticancer "cytotoxic" (Zu *et al.*, 2006; Khanavi *et al*, 2010; Wang *et al.*, 2011c; Zhang *et al.*, 2013c), acetylcholinesterase in hibitor (Pereira *et al.*, 2010b; Murray *et al.*, 2013), antiulcer (Lakshmi *et al.*, 2013), antidiarrheal (Kyakulaga *et al.*, 2011), hypolipidemic (Islam *et al.*, 2009; Rasineni *et al.*, 2010), neuroprotective (Koul *et al.*, 2013), wound healing (Nayak and Pinto Pereira, 2006; Nayak *et al.*, 2007) and hypotensive (Aleshinskaya, 1971; Koul *et al.*, 2013). The petroleum ether extract has larvicidal activity and is a potential to be used as ideal eco-friendly agent for the control of *Anopheles stephensi* (Panneerselvam *et al.*, 2013).
88. *Catharanthus trichophyllus*: The crude alkaloid fraction derived from the roots had cytotoxic effects on KB carcinoma in vitro (Segelman and Farnsworth, 1974).
89. *Centella asiatica* (L.) Urban: The plant is used for the treatment of dysentry (Singh *et al.*, 2014).
90. *Cerbera manghas* L. (Sea mango): The plant is used in China as emetic and purgative (Zhang *et al.*, 2010c) The toxicity of the plant is well known. The plant is ranked as one of the deadliest of the Southern Asian countries (Carlier *et al.*, 2014). It possesses

analgesic, anti-inflammatory, anti-convulsant, cardiotonic, and hypotensive activities. The plant extracts and/or the isolated constituents (mainly the cardenolides) exhibitded anti-inflammatory (Jeong *et al.*, 2014), cytotoxic (Cheenpracha *et al.*, 2004; Laphookhieo *et al*., 2004; ; Feng *et al.*, 2009d,e, 2010e, 2012; Chen *et al.*, 2011b; Zhao *et al.*, 2011b; Wang *et al.*, 2010a ; Hoque *et al.*, 2012), antioxidant, analgesic (Hossain *et al.*, 2013; Monjur-Al-Hossain *et al.*, 2013), antifungal (Zhuang *et al.*, 2008), antiestrogenic (Chang *et al.*, 2000), hypoglycemic (Wang *et al.*, 2010c; Zhou *et al*., 2013a) activities. The essential oil of the fruit contained insecticidal active component and had better fumigation and repellent activity to *Tribolium ferrugineum* Fabricius (Zhuang and Zhu, 2009).

91. *Cerbera odallam* Gaertn.: The seeds are excessively toxic (Gaillard *et al.*, 2004; Shen *et al.*, 2007). The plant (a suicide tree) has been reported as responsible for about 50% of the plant poisoning cases and 10% of the total poisoning cases in Kerala, India. It is used for suicide and homicide (Gaillard *et al.*, 2004). The different parts of the plant are used as emetic and cathartic (Kirtikar and Basu, 1984; Laphookhieo *et al*., 2004) and for the treatment of rheumatism (Rahman *et al.*, 2011a). The plant extracts showed antibacterial, antinociceptive, diuretic (Rahman *et al.*, 2011a), antioxidant (Hasan *et al.*, 2011) and CNS (hypnotic) (Hien *et al.*, 1991) activities. Some of cardenolide glycosides, isolated from the seeds, are cytotoxic (Laphookhieo *et al*., 2004).
92. *Cerbera thevetia* (Yellow oleander): Yellow oleander poisoning with jaundice and renal failure was reported (Samal *et al*., 1989). The eqeous extract possessed hemolytic activity (Murugesh *et al.*, 1981).
93. *Cerbera venenifera*: In the Malaya, the seed oil is rubbed on the skin as a rubefacient and as a cure for itching, or applied to the hair as insecticide (Gaillard *et al.*, 2004).
94. *Chonemorpha grandiflora* (Rotyh) M. R. and S. M. Almeida: It is used for fever, stomach disorders gynaecological disorders. Callus extracts exhibited antimicrobial activity (Kulkarni *et al*., 2010, 2011). Chonemorphine, a steroidal alkaloid isolated from the plant is antimoebic (Chatterjee *et al*., 1987).
95. *Chonemorpha griffithii* Hook. f.: The plant is used as massage for the treatment of fracture, backache and rheumatism (Singh *et al.*, 2014).
96. *Conopharyngia pachysiphon*: A plant extract (Dickel *et al.*, 1959) and the steroid glycoside (20α-Amino-3β-hydroxy-5-pregnene-β-D-glucoside), from the roots (Lucas *et al.*, 1960) exhibited hypotensive activity.
97. *Craspidospermum verticillatum* Bojer ex A. DC.: The alkaloids Δ^{14}-Vincine and Δ^{14}-16-epivincine, from the leaves, increased cerebral blood flow (Potier and Kan-Fan, 1972).
98. *Crioceras longiflorus*: α-Ketoglutarate salts of 14,15-dihydro-14α- and -14β-hydroxy-(3α,16α)-eburnamenine-14-carboxylates and their 17,18-dehydro derivatives are useful for treatment of conditions related to cerebral oxygenation (Manresa Ferrero *et al.*, 1985).
99. *Diplorhynchus condylocarpon* (Miill. Arg.) Pichon.: The different parts of the plant are used against rectal prolapsed and to treat “fluidy semen” and “light blood”, gonorrhoea,. The leaves are used to treat stomach complaints, blackwater fever, haematuria, syphilis gonorrhoea, testicle inflammation, dysentery, sore eyes indigestion, cough, lactagogue and as a vermifuge, emetic, spasmolytic, against bilharzia, a snake-bite remedy and to facilitate child’s birth. Pharmacological studies showed that tombozine is sympatholytic and ganglionic blocking with a hypotensive activity (Hedberg *et al.*, 1982).
100. *Dyera costulata* Hook. f.: The bark and leaves have been used for the treatment of fever, inflammation and pain. The plant extracts exhibited antioxidant (Subhadhirasakul *et al.*, 2003) and analgesic (Reanmongkol *et al*., 2002) effects.

101. *Ecdysanthera rosea* Hook. et Arn.: The plant is used as anti-inflammatory, antibacterial, antipyretic, antihepatitis and diuretic (Zhu *et al*., 2010). The saponin, ecdysantheroside B and other compounds, from the stem bark, are cytotoxic (Zhu *et al.*, 2011b).
102. *Ecdysanthera rosea utilis*: Proanthocyanidins, from the plant are immunomodulatory agents (Lin *et al.*, 2002b).
103. *Ecdysanthera utilis:* One of the proanthocyanidins, isolated from the plant suppressed human peripheral blood mononuclear cells provilation (Lin *et al*., 2002b).
104. *Echites umbellata* Jacq.: In Jamaica, it is used for a sore leg (Ayensu, 1981).
105. *Echites vucatanensis*: The latex is used for the treatment of cancer (Bhanot *et al*., 2011).
106. *Elytropus chilensis*: The plant is toxic (Ibanez *et al.*, 1952). Injection of the HCl salts of holarrhenin and holarrhimine, produced paralysis in rats, with recovery the following day (Chavez *et al.*, 1951).
107. *Epigynum auritum*: 12β-Hydroxy-androst-4,6,8(9),13(14)-tetraene-3,11,16-trione, is immunosuppressant (Cao *et al*., 2013).
108. *Epigynum maingayi* Hook. f.: The plant promotes the secretion of milk (Wiart, 2006).
109. *Ervatamia angustifolia*: The plant extract showed c-mitotic action (Bernard, 1949).
110. *Ervatamia chinensis:* Some isolated exhibited inhibitory effects (Guo *et al.*, 2012a).
111. *Ervatamia coronaria* Stapf (syn. *Tabernaemontana divaricata*): The root is acrid, bitter, astringent to the bowels, alexipharmic, digestible, emmenagogue, aphrodisiac and tonic (Kirtikar and Basu, 1984). The plant extracts and/or isolated compounds (mainly alkaloids) possess antipyretic, vasodilator, CNS depressant, antispasmodic, cytotoxic (Melo *et al.*, 1986; Hullati *et al.*, 2013), antioxidant (Gupta *et al.*, 2004a), hypotensive, uterine relaxant (Fatima *et al*., 1990), analgesic, anti-inflammatory (Henriques *et al*., 1996), antileishmanial (Rodriguez *et al*., 2008), hepatoprotective (Philomina Mary *et al*., 2012), larvicidal (Mathivanan *et al*., 2010), proteolytic (Kundu *et al*., 2000), signicant learning and memory enhancing activities (Deepak Bharadwaj *et al*., 2013).
112. *Ervatamia coronaria* var. *plena*: Coronaridine, the principal alkaloid of the plant is cytotoxic (Sharma and Cordell, 1988).
113. *Ervatamia crispa* (syn. *Tabernaemontana crispa*): A root extract had a nicotine-like effect producing skeletal muscle contraction and ganglion stimulation in small and ganglion blockade in large doses, and another one had a muscle relaxing property, minimum muscarinic blocking effect, and negligible ganglion blocking effect and histamine-releasing property (Thirumulpad *et al.*, 1982).
114. *Ervatamia dichotoma*: The leaves, seeds and bark are purgative and the milky sap is cathartic. The seeds are narcotic and poisonous (Kirtikar and Basu, 1984).
115. *Ervatamia divaricata* (L.) Burk. (syn. *Tabernaemontana divaricata*): An indole alkaloid, isolated from the plant, inhibited HCl-induced ulcer by 48.8% in mice (Kamato *et al*., 1989). Some of the alkaloids depressed the bone marrow in rats, resulting in temporary leucopenia (Jabbar and Hasan, 1980).
116. *Ervatamia flabelliformis*: The isolated alkaloids and their salts can be used for manufacturing analgesics, or drugs for treating opioid dependence (Chen *et al*., 2007).
117. *Ervatamia hainanensis* Tsiang: Some of the isolated alkaloids showed a potent acetylcholinestrase inhibitory effect (Zhan *et al.*, 2010; Murray *et al.*, 2013). The indole alkaloids, from the plant, and their salts can be used for manufacturing analgesics, or drugs for treating opioid dependence (Huang *et al.*, 2007).
118. *Ervatamia heyneana*: The medicinal properties are the same as *E. coronaria*. The plant extracts exhibited marginal cytotoxic (Gunasekera *et al*., 1979, 1980) analgesic and anti-inflammatory (Sati *et al.*, 2010, 2011) activities.

119. *Ervatamia hirta*: In Malyasia, the plant was included in the preparation of poisoned arrows and for treatment of ulceration of the nose (Clivio *et al.*, 1991).
120. *Ervatamia microphylla*: The alkaloid conophylline is useful for the regeneration therapy of type-1 *diabetes mellitus* (Ogata *et al*., 2004; Fujii *et al.*, 2009; Kawakami *et al.*, 2010). Another alkaloid, isolated from the leaves, inhibited the growth of K-ras^{ts}-NRK cells and could be used as an oncogene function inhibitor (Umezawa *et al*., 1994, 1995).
121. *Ervatamia officinalis*: Some of the alkaloids, isolated frm the plant and *Ervatamia divaricata* showed cytoxtic activity (Zhang *et al*., 2007).
122. *Ervatamia pandacqui* Pich. (*Tabernaemontana pandacqui*): The alkaloids showed a consistent decrease in blood pressure (Venzon *et al.*, 1979).
123. *Ervatamia yunnanensis*: The plant is used in Chinese folk medicine for the treatment of stomachache, dysentery, snakebites, rheumatic arthritis, virus hepatitis and hypertension (Luo *et al*., 2007). The total plant alkaloid possessed significant antinociceptive activity (Chen *et al*., 2006b).
124. *Funtumia africana* (Benth.) Stapf: The different parts are used for constipation, assisting conception, weak bladder (Ayensu, 1978), burns and incontinence (Wagner *et al*., 1987).
125. *Funtumia elastica* (Preuss) Stapf: The stems and twigs are used for the treatment of male impotence, jaundice (Ayensu, 1978), whooping cough, asthma, painful menstruation, fungal infections, and wounds. Both ethanol leaf and bark extracts showed antimicrobial and anti-inflammatory activities (Agyare *et al*., 2013a). Polysaccharides, derived from the tree bark (used in the treatment of asthma and hay fever), showed potential for application in innate protection from disease (Graff *et al*., 2009). The decoction of the leaf is used as a cure for mouth and venereal diseases. The extracts exhibited significant antifungal activity (Adekunle and Ikumapayi, 2006). Some of the alkaloids had very strong antiplasmodial activity (Zirihi *et al*., 2005, 2009).
126. *Funtumia latifolia* Stapf.: The alkaloids, funtumine and funtumidine showed spasmolytic, antiestrogenic, hypotensive, antipyretic and local anesthetic properties (Quevauviller and Blanpin, 1958, 1960; Blanpin and Quevauviller, 1960).
127. *Geissospermum argenteum*: The plant is used as antimalarial remedy. The plant extract had activity against multidrug-resistant bacteria (Correia *et al*., 2008).
128. *Geissospermum laeve* (Vellozo) Baillon (syn. *Geissospermum vellosi* Allemão, nom, illeg.): The bark is used as febrifuge (Almeida *et al*., 2012). Pharmacological studies showed that the bark extract and some alkaloids possessed hypotensive, CNS depressent and other activities (Raymond-Hamet, 1933, 1954; Ferreira, 1949; Aurousseau, 1961).
129. *Geissospermum reticulatum* A. Gentry: The bark is used as antimalarial, antitumoral, antioxidant, antinociceptive and antibacterial. The extracts and *O*-demethyl-aspidospermine exhibited antiparasitic action (Reina *et al.*, 2012).
130. *Geissospermum vellosii* Allem : The stem bark is used to treat malaria. Herbal preparation of the plant has long been used by oncologic patients and integrative medicine practitioners in South America (Yu and Chen, 2014a). The plant extacts and/or the alkaloids exhibited antiplasmodial (Mbeunkui *et al*., 2012a), antinociceptive (Werner *et al.*, 2009), anticancer (Bemis *et al.*, 2009; Yu *et al*., 2013a), anticholinesterase activities (Lima *et al*., 2009; Murray *et al.*, 2013). The alkaloid pereirine inhibited neuromuscular transmission of stimuli in the rat (Westhues and Reiter, 1961).
131. *Gonioma kamassi* E. Mey (African boxwood): An alkaloid present in the plant was reported to be a cardiac poison in workmen employing this wood (Gibson, 1906). The plant contains an alkaloid of the curare group (Dixon, 1911). The action being neuromuscular (Lock, 1961).

132. *Gonioma malagasy*: The alkaloid goniomedine B, isolated from the stem bark, exhibited moderate activity against *Plasmodium falciparum* (Beniddir *et al.*, 2012).
133. *Hancornia speciosa* Gomes: The bark of the plant is used in Brazil to treat dermatosis, diabetes, hepatic diseases and as anti-inflammatory agent, whereas its roots and leaves are also employed as astringent, stomachic, to treat rheumatism and hypertension (Ferreira *et al.*, 2007). The latex is used in folk medicine for treatment of several diseases, such as acne, warts, diabetes, gastritis and inflammation, and exhibited cytotoxicic and genotoxic activities (Almeida *et al.*, 2014). The ethanolic extract of leaves inhibits angiotensin I-converting enzyme (ACE) (Serra *et al.*, 2005). The extract and the flavonoid rutin had a vasodilator effect (Ferreira *et al.*, 2007).
134. *Hancornia speciosa* Gomes: The bark of the plant is used in Brazil to treat dermatosis, diabetes, hepatic diseases and as anti-inflammatory agent, whereas its roots and leaves are also employed as astringent, stomachic, to treat rheumatism and hypertension (Ferreira *et al.*, 2007). The latex, used in folk medicine for treatment of several diseases, such as acne, warts, diabetes, gastritis and inflammation, and exhibited cytotoxicic and genotoxic activities (Almeida *et al.*, 2014). The ethanolic extract of leaves inhibits angiotensin I-converting enzyme (ACE) (Serra *et al.*, 2005). The extract and the flavonoid rutin had a vasodilator effect (Ferreira *et al.*, 2007).
135. *Haplophyton cimicidum*: In Mexico, the plant is used in combination with other plants as part of a folk strategy against arthropod pests of crops and cattle (Llanos-Romero *et al.*, 2014). The plant (McGovran, 1944; Roark, 1947), and some the isolated alkaloids, exhibited insecticidal activity (Rogers *et al.*, 1952; Snyder, 1954a,b).
136. *Haplophyton crooksii*: Some of the alkaloids isolated e.g. crooksiine, had anti-acetylcholinesterase activity (Mroue and Alam, 1991; Mroue *et al.*, 1996).
137. *Hazunta graciliflora*: Extraction of the plant gave a substance with spasmolytic and vasodilatory properties (Fr., 1969).
138. *Hazunta silicicola*: De(carbomethoxy)dihydrovobasine, isolated from the root bark, showed vasodilating, hypotensive and antihypertensive effects (Potier *et al.*, 1972).
139. *Hedranthera barteri* Hook. f. Pichon: In Nigeria, The different parts are used for treatement of dizziness, tumors, convulsion, gonorrhea, inflammation and to prevent miscarriage in women (Onasanwo *et al.*, 2010b; Sowemimo *et al.*, 2012). Extracts of the plant exhibited antinociceptive, anti-inflammatory, antidepressant, anxiolytic, antiulcer, antioxidant, antihistaminic (Onasanwo and Elegbe, 2006; Onasanwo and Olaleye, 2008; Onasanwo *et al.*, 2010a-c) and antinconvulsant (Sowemimo *et al.*, 2012) activities.
140. *Himatanthus articulata* (Vahl) Woodson (*Himatanthus articulatus*): The bark and/or latex are used, in Brazil, as a tonic, antisyphilitic (De Sá Barreto *et al.*, 1998), against anti-inflammation external ulcer and tumors, anticancer, syphilis and malaria. (Agra *et al.*, 2008; Reboucas *et al.*, 2011; Reboucas *et al.*, 2012). Antibacterial and antifungal activities of extracts and exudates of the latex were reported (Sequeira *et al.*, 2009).
141. *Himatanthus bracteatus* (A. DC.) Woodson: The latex is used against external ulcer and tumors and as anti-inflammation and anticancer (Agra *et al.*, 2007).
142. *Himatanthus drasticus* (Mart.) Plumel: The bark and/or latex have been used for cancer treatment, as anti-inflammatory medication, ulcers and to stimulate the immune system (Lucetti *et al.*, 2010; Mousinho *et al.*, 2011). The plant extract had antinociceptive effect (Colares *et al.*, 2008). Lupeol acetate, from the plant has anti-inflammatory activity (Lucetti *et al.*, 2010). The latex proteins had anticancer activity (Mousinho *et al.*, 2011).
143. *Himatanthus lancifolius* (Muell. Arg.) Woodson: In Brazil, it is used to treat skin diseases, asthma, syphilis, and regularizing menstruation. The alkaloids of the plant showed antitumor (Nardin *et al.*, 2010; Pires de Lima *et al.*, 2010), antimicrobial (Souza

et al., 2004, 2013), gastroprotective (Baggio *et al.*, 2005), and acetylcholin-estrase inhibitory (Seidl *et al.*, 2010) activities, and were able to alter non-vascular and vascular smooth muscle responsiveness (Rattmann *et al*., 2005).

144. *Himatanthus obovatus*: The two iridoids, plumericin and isoplumericin, from the roots showed antifugal activity (Harumi *et al*., 1995).
145. *Himatanthus phagedaenica* (Mart.) Woodson: The plant is reputed by its use as antihelminthic (Vanderlei *et al*., 1991). The latex is used, topically, against external ulcers. The green fruit is used against diabetes and inflammations (Agra *et al*., 2008).
146. *Himatanthus sucuuba* Spruce (M. Arg.) Woodson: The stem bark is used as wound-healing agent, for the treatment of gastritis, stomach ulcers, hemorrhoids, tumors, boils and swellings, against arthritis, as a vermifuge, analgesic and antitussive, laxative, antiulcer, aphrodisiac and as hallucinogen. The root is very poisonous. The latex is used as an antihelmintic, antitumor, anti-inflammation, antifungal and antiphlogistic agent (Wood *et al.*, 2001; Silva *et al.*, 2003, 2010). The root extract exhibited antibacterial and antifungal activities (Morel *et al*., 2006). The iridoids showed antileishmanial (Castillo *et al.*, 2007), teratogenic potentiality (de Oliveira Guerra and Peters, 1991) and antibacterial (Silva *et al*., 1998), anti-inflammatory (Waltenberger *et al*., 2011a; Fakhrudin *et al*., 2014) and cytotoxic effects (Silva *et al*, 2010). The latex exhibited a potent leishmanicidal activity (Soares *et al*., 2010). The two lichen depsides, from the bark are monoamine oxidase B inhibitors (Endo *et al*., 1994) and are useful as antidepressants and auxiliary drugs for parkinsonism (type B activity) (Endo *et al*., 1995).
147. *Holarrhena africana* A. DG: The bark is antidysenteric and febrifuge (Paris, 1938). The aqueous extract of young leaves exhibited good activity against *Trypanosoma brucei* spp. (Nwodo *et al.*, 2007). In dysentery, conessine hydrochloride from the root bark, seemed to be more active than emetine and less toxic (Durlex *et al.*, 1948).
148. *Holarrhena antidysentrica*: The stem bark is used for the treatment of amoebic dysentery, gastric disorders, diarrhea, asthma and malaria, as an astringent, stomachic, febrifuge, diuretic, in piles, colic, dyspepsia, skin infections and spleen (Kumar *et al.*, 2007). The seeds are astringent and styptic (Lather *et al.*, 2010). A pharmacological study provides its usefulness in gut motility disorders such as constipation, colic, and possibly diarrhea (Gilani *et al.*, 2010a). The plant extracts exhibited antibacterial (Ballal *et al*., 2001; Kavitha *et al.*, 2004; Kavitha and Niranjali, 2009; Mahato *et al*., 2013), antidiabetic, antihyperlipidemic (Ali *et al*., 2009; Mana *et al.*, 2010; Korpenwar, 2011), hepatoprotective (Babar *et al.*, 2009), diuretic (Mana *et al.*, 2010; Khan *et al.et al.*, 2012), antioxidant, phytotoxic, antiprotozoal, cytoxic (Lather *et al*., 2010; Khan *et al*., 2013; Sharma *et al.*, 2014) and antiplasmodial (Priyanka *et al*., 2013) activities. The different alkaloids showed antimicrobial (Kavitha *et al.*, 2003; Raman *et al*., 2004), amoebicidal (Vaid and Bhutani, 2013), acetylcholinesterase inhibiting (Bertho, 1944) and insecticidal (Thappa *et al.*, 1989) activities and and toxic effects (Chopra *et al.*, 1933; Lather *et al.*, 2010).
149. *Holarrhena congolensis*: The alkaloids conessine and holarrhenine possess a local anaesthetic action. Both alkaloids are cardiac poisons and in small doses produce a rise in blood-pressure (Burn, 1915). Conessine, had no antimalarial action (Stephenson, 1948).
150. *Holarrhena curtisii* King and Gamble: In India, the plant has been used for the treatment of dysentry (Cannon *et al.*, 1980; Zahari and Sayed, 2013). The alkaloids, isolated from the leaves showed significant cytoxic and leishmanicidal activities (Kam *et al.*, 1998a).

151. *Holarrhena floribunda* G. Don. (*Holarrhena africana*): The different parts have been employed as an antimalarial and for treating fever, nausea, indigestion, diarrhea, amenorrhea, diabetes, female infertility, as a febrifuge, tonic, remedy for snake bite and for the treatment of venereal diseases, dysentery (Badmus *et al*., 2010, 2013; Udoh *et al.*, 2014). The plant extracts, as well as some of the isolated alkaloids, showed antiplasmodial, analgesic (Fotie *et al.*, 2006; Udoh *et al.*, 2014), antioxidant, antimutagenic, lipid peroxidation inhibition (Badmus *et al*., 2010, 2013), hypoglycemic (Gnangoran *et al*., 2012), antibacterial (Bogne *et al.*, 2007) cytotoxic and antileishmanial (Loukaci, 2000) activities.
152. *Holarrhena mitis*: The wood and bark are used as a remedy in fevers and dysentery. The bark is valued as an antiperiodic (Kirtikar and Basu, 1984).
153. *Holarrhena pubescens* Buch. Ham (syn. *Halorrhena antidysentrica* L.): The plant is used in the treatment of asthma, leprosy, eczema, colic dyspepsia, and dysentery; and as carminative, febrifuge, antispasmodic, astringent, anithelmentic, diuretic, aphrodisiac, cardio suppressant, hypotensive, stomachic, antipyretic, antimutagenic, antibacterial, immunomodulatory, antioxidant, antihyperglycemic, antimalarial and tonic (Manika *et al.*, 2013; Saha and Subrahmanyam, 2013; Singh *et al*., 2014). The bark is used for teatment of dysentry. The total alkaloids from the stem bark showed remarkable antibacterial activity (Chakraborty and Brantner, 1999).
154. *Hoodia currori*: The plant is used to treat indigestion, hypertension, diabetes, and stomachache (Vermaak *et al*., 2011).
155. *Hoodia currori* (Hook.) Decne. subsp. *currori*: It is used for treatment of diabetes (van Herdeen *et al*., 2008).
156. *Hoodia gordonii* (Masson) Sweet ex Decne. (=*Trichocaulon pillansii*): According to van Herdeen (2008), there are more than 20 international patent applications/registrations on the plant and many *Hoodia*-containing commercial preparations available on the market, as a natural appetite-suppressant agent. In S. Africa, the plant is used as food and as a substitute for food and water when both are scare. Several other ethno-pharmacological uses have been recorded e.g. tuberculosis and the honey from the flowers could be used to treat cancer (van Herdeen *et al*., 2008; Vermaak *et al.*, 2011). A steroidal glycoside P57AS3 (P57), is known to be responsible for the appetite suppressing activity of the plant, a dietary supplement used for weight loss (Madgula *et al*., 2010). Several studies have been reprted on the *in vivo* anti-obesity activity of the plant and P57 (Vermaak *et al*., 2011). However, administration of a purified plant extract was associated with significant increase in blood pressure and pulse rate (Blom *et al*., 2011). Also, a study revealed that a *H. gordonii*-containing product has sympathomimetic activity on rat uterus mediated through β-adrenergic receptors (Roza *et al*., 2013).
157. *Hoodia officinalis* (E. Br.) Plowers subsp. *officinalis* (= *Trichocaulon rusticum*: The plant is used to treat tuberculosis (van Herdeen *et al*., 2008).
158. *Hunteria eburnea* Pichon: The alkaloid hunteriamine, isolated from the root bark, had a hypotensive activity (Renner, 1963).
159. *Hunteria umbellata* (K. Schum.) Hallier: The plant is used for the treatment of diabetes, peptic ulcers, piles, yaws, dysmenorrhoea, fever, infertility, helminthic infection, wound healing, dysentery, cholera and other bacterial infections, as an oxytocic, pain, stomach ulcers, obesity, anaemia and hypertension (Falodun *et al.*, 2006; Igbe *et al.*, 2009Adeneye *et al.*, 2010b; Adeneye *et al.*, 2012). The extracts of the different parts possessed antipyretic, analgesic, anti-inflammatory (Igbe *et al*., 2009, 2010; Adeyemi *et al.*, 2011), antioxidant (Adejuwon *et al*., 2011), hypoglycemic, antihperlipidemic and anti-obesity (Adeneye and Adeyemi, 2009a,b; Adeneye *et al.*, 2010a, 2012) and

antibacterial (Ejimadu and Falodun, 2002; Josephs *et al.*, 2011) activities. Both the iridoid segunoside, from the stem bark (Ajala and Coker, 2012) and the alkaloid erinidine, from the seeds (Adewale *et al.*, 2013), are antihyperglycemic agents. The plant was reported as nontoxic or has a relatively low oral toxicity profile but its prolonged use, particularly, at high doses should be with great caution (Ibeh *et al.*, 2007; Adeneye *et al.*, 2010b; Igbe *et al.*, 2013).

160. *Hunteria zeylanica* Gard.: The plant has been used not only as a folk medicine for treatment of yaws and to reduce boils and skin irritations (Reanmongkol *et al.*, 1995a,b). Extracts the plant and/or the isolated alkaloids possessed analgesic, antipyretic, antinociceptive, antipyretic (Reanmongkol *et al.*, 1994, 1995a,b, 2000), antiplasmodial (Nugroho *et al*., 2010), vasorelaxant (Mohamad *et al*., 2007; Hirasawa *et al*., 2010a) and cytotoxic (Nugroho *et al*., 2009) activities.
161. *Ichnocarpus frutescens* (L.) R. Br. (Black creeper): The plant is used to treat bleeding gums, convulsions, cough, delirium, dysentery, glossitis, measles, night blindness, tuberculosis and as antipyretic, demulcent, diaphoretic, diuretic, hypoglycemic, aphrodisiac and tonic and is useful in anorexia, leucorrhea, skin diseases, syphilis and urinary calculi (Kirtikar and Basu, 1984; Chaudhary *et al.*, 2012; Singh and Singh, 2012; Singh *et al.*, 2014). The extracts of the different plant parts (leaves and roots) exhibited analgesic (Pandurangan *et al.*, 2008), anti-inflammatory (Kumarappan *et al.*, 2006; Pandurangan *et al.*, 2008, 2009), anti-arthritic (Nanumala *et al.*, 2012) antioxidant (Pandurangan *et al.*, 2009; Kumarappan *et al.*, 2012a), hepatoprotective (Kumarappan *et al.*, 2011) and antitumor (Dash *et al*., 2007; Kumarappan and Mandal, 2007), antidiabetic, antihperlipidemic (Kumarappan *et al.*, 2007, 2012b; Kumarappan and Mandal, 2008a; Kumarappan *et al.*, 2008b Saravanan *et al.*, 2011; Singha *et al.*, 2013), anti-obesity (Saravanan and Ignacimuthu, 2013), antibacterial and antifungal (Malathy and Sini, 2009; Anoop *et al.*, 2011; Singha *et al.*, 2013) effects.
162. . *Kibatalia arborea* (Bl.) G. Don.: In Indonesia, small doses of the latex are ingested to expel worms from the intestines (Wiart, 2006).
163. *Kibatalia gitingensis*: Two isolated alkaloids depressed spontaneous motility of the jejunum (Estrada *et al*., 1963) and smooth muscles (Estrada and Aguilar-Santos, 1966).
164. *Kibatalia laurifolia*: The alkaloid paravallarine was cytotoxic to KB cells (IC_{50} 12.8 μM) followed by 3-3-epi-gitingensine (Phi *et al.*, 2011).
165. *Kopsia arborea* Blume: The latex is used against headaches (Sévenet *et al.*, 1994). The alkaloid valparicine showed pronounced cytotoxic effects (Lim *et al.*, 2007a). The alkaloids, from the leaves, exhibited moderate vasorelaxant activity (Zaima *et al*., 2008).
166. *Kopsia caudata*: The latex possesses purgative properties (Sévenet *et al.*, 1994).
167. *Kopsia dasyrachis* Ridl.: The reversing multidrug resistance of kopsiflorine, isolated from the plant was reported. It inhibits the efflux of antitumor agents in drug-resistant cells (Rho *et al*., 1999).
168. *Kopsia fruticosa* (Ker) A. DC.: The root has been used to poultice ulcerated nose in tertiary syphilis (Reanmongkol *et al.*, 2005). The alkaloidal extract had a tetatanus action. Kopsine has a hypotensive effect (Battersby and Gregory, 1963).
169. *Kopsia grandifolia* Merr.: The alkaloids grandilodines A and C and lapidilectine B were found to reverse multidrug resistance in vincristine-resistant KB cells (Yap *et al.*, 2011).
170. *Kopsia griffithii*: The alkaloids harmane, pleiocarpine and buchtienine, showed antileishmanial activity (Kam *et al*., 1999d). Kopsijasminine had moderate activity in reversing multidrug resistance in vincristine-resistant KB cells (Lim *et al*., 2007b).
171. *Kopsia hainanensis*: Some alkaloids (e.g. kopsinine) exhibited significant antitussive activity (Tan *et al.*, 2011b), antibacterial and antifungal activities (Chen *et al*., 2014).

172. *Kopsia larutensis* King & Gamble: The roots are used for for poulticing ulcerated noses in tertiary syphilis (Sévenet *et al.*, 1994).
173. *Kopsia macrophylla* Hk. F. K.: The root and the stem have been used for relief of fever, toxicemia (Reanmongkol *et al.*, 2005) and in tertiary syphilis (Sévenet *et al.*, 1994). The alkaloids possessed antiniciceptive activity (Reanmongkol *et al.*, 2005).
174. *Kopsia pauciflora* Hook f.: The roots are used for for poulticing ulcerated noses in tertiary syphilis (Sévenet *et al.*, 1994).
175. *Kopsia pitardii* Mirr. (*Kopsia officinalis* Tsiang & Li): It is used for the treatment of rheumatoid arthiritis, gout, dropsy and tonsillitis (Awang *et al.*, 1993a; Sévenet *et al.*, 1994).
176. *Kopsia singapurensis* Ridl.: The roots are used in tertiary syphilis (Sévenet *et al.*, 1994). The alkaloids are cytotoxicity (Subramaniam *et al*., 2007, 2008b).
177. *Kopsia tenuis*: An alkaloid, lundurine B is a melanoma inhibitor (Takahashi *et al.*, 1998).
178. *Kopsia teoi*: Kopsijasminine showed moderate activity in reversing multidrug resistance in vincristine-resistant KB cells (Lim *et al.*, 2007b). The alkaloid kopsingine is hypotensive (Mok *et al.*, 1998) and oters were found to exhibit potent inhibitory activity in melanin biosynthesis of cultured B-16 melanoma cells (Kam *et al.*, 1996e).
179. *Landolphia dawei* Stapf: Pharmacologcal investigation of the stems and leaves extracts of the plant, cultivated in Egypt, showed significant anti-inflammatory, analgesic and anticonvulsant activities. The antidiabetic activity of the isolated mucilage was also reported (Michel and Sleem, 2003).
180. *Landolphia dulcis* (Sabine) Pichon: The leafy twigs and bark decoction are used in the treatment of serious wounds, while the trunk-bark and root decoction are used as a galactogogue. The root had aphrodisiac activity (Nwachukwu *et al.*, 2010; Ilodigwe *et al*., 2013).
181. *Landolphia owariensis* O. Beauv.: The leaves are used as purgative and in the treatment of malaria, stomach pain and ulcer, sprains, dizziness, oedema, rheumatism and epilepsy. The root is used to treat gonorrhea. The stem bark is used as vermifuge and the latex as an enema for intestinal worms. The latex is used for intestinal worms and as an ingredient of arrow poison. It is also used as a natural preservative and as antimicrobial agent (Nwaogu *et al.*, 2007 2008; Olaleye *et al*., 2008; Galadima *et al.*, 2010). The extracts of the different parts (leaves, roots, seeds) posess anti-inflammatory, analgesic (Owoyele *et al.*, 2001), antimicrobial (Nwaogu *et al.*, 2007, 2008; Nwokonkwo, 2014), antiulcer (Olaleye *et al*., 2008), antioxidant and hepatoprotective (Okonkwo and Osadebe, 2013) effects.
182. *Landolphia owerrience*: The root extracts showed antibacterial and antifungal activities (Okeke *et al.*, 2001; Ubalua and Oti, 2008).
183. *Landolphia uniflora* P. Beauv.: The plant possesses potent antitrypanosomal effect (Atawodi and Alafiatayo, 2007).
184. *Leuconotis eugenifolius*: The crude alkaloidal extract showed anti-plasmodial activity (Jaafar *et al.*, 2005). The alkaloid leucophyllidine, from the bark, showed iNOS inhibitory activity and decreased the iNOS protein expression (Deguchi *et al*., 2010).
185. *Lochnera rosea*: The alkaloids possessed hypotensive, antibacterial and CNS depression effects (Chopra *et al.*, 1959).
186. *Macoubea sprucei*: The plant exract exhibited cytotoxic activity (Suffredini *et al*., 2007).
187. *Macrosiphonia longiflora* (Desf.) Mull. Arg: The plant is used as anti-inflammatory, depurative, antirheumatic, antisyphilitic and antiulcer remedy. The plant extract demonstrated a potent anti-inflammatory activity (da Silva *et al*., 2014).

188. *Macrosiphonia petraea* (A. St.-Hil.) Kuntze: The root infusion is used, in Brazil, for the treatment of inflammatory diseases (De Assis Junior *et al.*, 2013).
189. *Macrosiphonia velame* (A. St.-Hil.) M. Arg.: The plant is used for treating inflammatory conditions and skin diseases. The plant extracts had anti-inflammatory, antinociceptive, antipyretic (Ribeiro *et al.*, 2010) and antibacterial (Melim *et al.*, 2013) activities.
190. *Malouetia bequaaertiana* E. Woodson: Malouetine, from the leaves, is known for its curarizing and DNA-binding properties (Brassart *et al.*, 2007).
191. *Mandevilla illustris* Woodson: In Brazil, the latex is used against liver diseases (Agra *et al.*, 2008). The crude aqueous/alcoholic extract of rhizomes (Calixto and Yunes, 1991), and the isolated pregnane compounds were not selective towards kinin action (Calixto *et al.*, 1991a). The pregnane 2,6-dideoxy-3-*O*-methylpyranosylillustrol, isolated from the plant, markedly inhibited the rat paw edema (Niero *et al.*, 2002).
192. *Mandevilla pentlandiana*: The plant exracts are useful as bradykinin antagonists (Cupps, 1990).
193. *Mandevilla tenuifolia* (J.C. Mikan)Woodson: An infusion of the leaves and flowers is used, in Brazil, against heart diseases (Agra *et al.*, 2008).
194. *Mandevilla velutina* (Mart. ex Stadelm.) Woodson: In Brazil, the rhizomes are used treat snakebites. The plant extracts and/or the pregnane glycosides, isolated from the plant, were effective in antagonizing bradykinin responses and also exhibited analgesic, anti-inflammatory and anti-oedematogenic activities (e.g. Calixto *et al.*, 1988, 1991b; Henriques *et al.*, 1991), antigenotoxic (da Silva *et al.*, 2008), anti-inflammatory, antinociceptive (Zanini *et al.*, 1992; Neves *et al.*, 1993; Yunes *et al.*, 1993b; Mattos *et al.*, 2006a,b; Santos *et al.*, 2010), antivenoms and antitoxin (Biondo *et al.*, 2003) effects.
195. *Melodinus australis* (F. Mueller) Pierre: The bark extract produced a sharp drop in blood pressure, accompanied by an increase in the depth of respiration (Raymond-Hamet, 1956).
196. *Melodinus fusiformis* Champ. ex Benth: The plant is used for the treatment of rheumatic heart disease. Some alkaloids showed spermatocidal, antitumor (He *et al.*, 1992a) and cytotoxic, against five human tumor cell lines (Cai *et al.*, 2011b) effects.
197. *Melodinus hemsleyanus* Diels: The alkaloid 11-hydroxyvincadifformine has significant antifertility activity (Guo *et al.*, 1993).
198. *Melodinus henry*i Craib.: The plant is used for the treatment of meningitis in children, rheumatic heart diseases, hernia, infantile malnutrition, dyspepsia and testitis (Lu *et al.*, 2014). An isoated exhibited cytotoxic effect (Feng *et al.*, 2010a).
199. *Melodinus monogynus* Roxb. (*Nerium piscidium Roxb.*): The ripe fruits are eaten to relief dysentry (Singh *et al.*, 2014). In India, the plant was reported poisonous to fish, hypnotic and antimalarial (Chatterji *et al.*, 1954).
200. *Melodinus morsei* Tsiang: The alkaloid vindolinine showed significant cytotoxicity against five human tumor cell lines (Cai *et al.*, 2011b).
201. *Melodinus suaveolens* (Hance) Champ. ex Benth: The plant has been used for the treatment of meningitis in children, rheumatic heart diseases, hernia, infantile malnutrition, dyspepsia and testitis (Lu *et al.*, 2014). Some of the isolated alkaloids showed inhibitory effects against five human cancer cell lines (Liu *et al.*, 2012a, 2013b) and antibacterial activity (Au and Gray, 1969).
202. *Melodinus tenuicaudatus* Tsiang et P. T. Li: Several alkaloids, isolated from the plant e.g. melotenine and melodinines H-K are cytotoxic (Feng *et al.*, 2010b,c).
203. *Melodinus yunnanensis* Tsiang & P. T. Li: The alkaloid meloyunine B was cytotoxic against several human cancer cell lines (Cai *et al.*, 2011c, 2012).

204. *Muntafara sessilifolia* (Baker) Pichon (or *Tabernaemontana sessilifolia*): The stem-bark is used, in Madagascar, for the treatment of fevers and as tonic. Some of the isolated alkaloids exhibited cytotoxic and antiplasmodial (Girardot *et al.*, 2011, 2012a,b).
205. *Neisosperma oppositifolia (Ochrosia oppositifolia*): The bark is used to treat diabetes and to relieve sores. Parts of the plant are used as an energizer, and the fragrant flowers are used in perfumed and deodorants. The two alkaloids oppositinines A and B showed potent vasorelaxant effect (Ahmad *et al.*, 2010).
206. *Nerium indicum* Mill. (Oleander): The plant is poisonous. The leaves and flowers are cardiotonic, diaphoretic, diuretic, anticancer, antimicrobial, expectorant and are used to stimulate cardiac muscles, relieve pain and eliminate blood stasis. The bark is cathartic and febrifuge. The plant is abortive, alternative, purgative, insecticidal and used in dropsy and rheumatism (Singh and Singh, 1997; Vinayagam and Sudha, 2011 Nagargoje and Phad, 2013; Sharma *et al.*, 2013). The leaves are reported antidiabetic (Ishikawa *et al.*, 2007). The extracts of the different plant parts revealed the following activities: antibacterial (Chauhan *et al*., 2013), antioxidant (Vinayagam and Sudha, 2011, Dey *et al.*, 2012), antiviral, antidiabetic, analgesic, antiulcer, hepatoprotective (Nagargoje and Phad, 2013) and molluscicidal (e.g. Singh and Singh, 1997; Yang *et al.*, 2000; Wang *et al.*, 2006a). Polysaccharides from the plant showed antitumor, immune-stimulating, and neuroprotective effects (Ding *et al.*, 2003; Yu *et al.*, 2007a; Hu *et al.*, 2009; Lin *et al.*, 2013). The selectivity of cardenolides, on various human cancer cell lines, have been reported (Mae *et al.*, 2008) e.g. oleandrin inhibited the growth of myeloma cell line in vitro better than that of vincristine sulfate. It possessed the best cytotoxic effect on breast cancer (MCF7) (Wahyuningsih *et al.*, 2004). Some of the isolated cardenolides exhibited nematicidal and molluscicidal activities (Wang *et al.*, 2006b, 2009a).
207. *Nerium odorum*: The cardiotonic effects of the leaves extract (Hsiao, 1959), as well as of the isolated oleandrin and 16-deacetylanhydrooleandrin have been reported (Hsiao, 1959; Nuki *et al*., 1964).
208. *Nerium oleander* L. (Oleander): All parts of the plant, including the latex are poisonous and human poisoning has been reported (Rizk and El-Ghazaly, 1995). The different parts of this plant are used as cardiotonic, diuretic, antibacterial, emetic, diaphoretic, expectorant, against paralysis, snake-bites for curing different types of cancers, pain in extremities, ulcers and leprosy. The root-bark is used specifically against ring worm and the aqueous extracts of the leaves, branches, roots and flowers are toxic to certain insects (Erdemoglu *et al*., 2003; Shinde *et al.*, 2012; Ubedulla *et al.*, 2014). In addition, the leaves and flowers are used for the treatment of malaria, autoimmunity, abscesses, asthma, allergy, eczema, epilepsy, HIV, dysmenorrhea and cancers (Erdemoglu *et al*., 2003; Turan *et al*., 2006). The essential oil of the flower had significant antioxidant, antibacterial (Derwich *et al*., 2010), antimicrobial and antitumor (Ali *et al.*, 2010) activities. The plant distillate improves fat and glucose metabolism (Bas *et al.*, 2012). Extracts of the different parts possessed cardiotonic (Adome *et al.*, 2003), anticancer (Turan *et al.*, 2006; Calderón-Montaño *et al*., 2013), antibacterial (Adome *et al*., 2003; Singhal and Gupta, 2011; Shinde *et* al., 2012; Al-Obaidi, 2014; Kumar and Yadav, 2014), abortifacient (Adome *et al*., 2003), antifungal (Gupta and Mittal, 2010), antiviral (Farahani, 2014), diuretic, immunomodulating, antinociceptive (Gupta and Mittal, 2010), anti-inflammatory (Erdemoglu *et al*., 2003; Gupta and Mittal, 2010; Zibbu and Batra, 2010), CNS depressant (anticonvulsant), neuroprotective (Singhal and Gupta, 2011, 2012a; Rout *et al*., 2012), antioxidant (Namian *et al.*, 2013), hepatoprotective (Singhal and Gupta, 2012b), antihperlipidemic (Gayathri *et al.*, 2013), insecticidal (Rathi and Al-Zubaidi, 2011; Raveen *et al*., 2014), skeletal muscle relaxant (Ubedulla *et*

al., 2014) and allelopathic (Kazemi Mojarad *et al.*, 2013). Some of the cardenolides had CNS depressant (Siddiqui *et al.*, 1997; Begum *et al.*, 1999), anti-inflammatory, cytotoxic (Müller *et al.*, 1991; Smith *et al.*, 2001; Zhao *et al.*, 2007a; Kumar *et al.*, 2013c), neuroprotection (Dunn *et al.*, 2011), antibacterial (e.g. Huq *et al.*, 1999a) and molluscicidal (Dai *et al.*, 2011) activities. The cytotoxicity of some pregnanes, isolated from the plant (neridienone A and others) has been proved (Bai *et al.*, 2007, 2011a; Rashan *et al.*, 2011; Zhao *et al.*, 2011a; Siddiqui *et al.*, 2012). Some of the isolated cardiac glycosides are claimed to be used to prepare antitumor medicines for treating diseases including lung cancer, liver cancer, colorectal cancer, breast cancer (Zhang *et al.*, 2011c). PBI-05204 (a supercritical CO_2 extract of the plant) showed potent anticancer activity and is in phase I clinical trial as a treatment for patients with solid tumors (Dunn *et al.*, 2011). The two triterpenes, *cis*-karenin and *trans*-karenin, are cytotoxic (Siddiqui *et al.*, 1995a). Ursolic acid showed significant anti-inflammatory activity (Bai *et al.*, 2012). The cytotoxicity of several triterpenes from the plant has been reported (e.g. Fu *et al.*, 2005; Zhao *et al.*, 2006b, 2007b). The antimitotic action of mixtures of glycosides from the plant was also reported (Tarkowska, 1971). The toxicity of the plant extracts had been extensively studied and accidental and/or experimental oleander toxicosis have been described in several animals (e.g. Haiba *et al.*, 2003; Soto-Blanco *et al.*, 2006; Aslani *et al.*, 2007; Barbosa *et al.*, 2008; Kozikowski *et al.*, 2009; Rhaymah *et al.*, 2011; Ozmaie *et al.*, 2013; Taheri *et al.*, 2013). Cases of poisoning (including fatal cases) with oleander in several countries have been reported (e.g. Langford and Boor, 1996; Takaesu *et al.*, 1998; Bourgeois *et al.*, 2005; Wasfi *et al.*, 2008; Hugues *et al.*, 2012; Khan *et al.*, 2010b; Papi *et al.*, 2012; Boswell *et al.*, 2013). There are several reports on fatal human poisoning by the plant (Adome *et al.*, 2003; Khan *et al.*, 2010b). The plant was responsible for 27% pediatric poisoning during 1972-1978 in Australia (Turan *et al.*, 2006). Oleander sap can cause skin irritations, severe eye inflammation and irritation, and allergic reactions characterized by dermatitis (Tamilselvan *et al.*, 2014).

209. *Ochrosia acuminata* Val.: Extracts of the roots have been used to treat tumors and ectopic pregnancy (Salim *et al.*, 2004b). Ellipticine and 9-methoxyellipticine, isolated from the stems, showed antitumor activity (Lin *et al.*, 1985a).
210. *Ochrosia borbonica* J. F. Gmel.: Some of the isolated alkaloids showed cytotoxic activities against five human cancer cell lines (Zhang *et al.*, 2013b).
211. *Ochrosia elliptica* Labill.: Some alkaloids, isolated from the bark are cytotoxic constituents (Kuroda *et al.*, 1999; Kuo *et al.*, 2006).
212. *Ochrosia maculata* Jacq. (*Ochrosia borbonica* Gmel.): Screening of the appropriate extracts located both oncolytic and neurosedative activities (Svoboda *et al.*, 1968).
213. *Odontadenia macrantha*: Odontadenin A, a limonoid isolated from the plant, exhibited moderate cytotoxicity (Prakash Chaturvedula *et al.*, 2003a).
214. *Pagiantha cerifera*: The plant extract showed leishmanial activity (Billo *et al.*, 2005).
215. *Parahancornia amapa* (Huber) Ducke: Larvae of blowfly *Chrysomya megacephala*, treated with latex showed a shorter post embryonic development period (larval, pupal and newly hatched larvae to adult) (Mendonça *et al.*, 2011).
216. *Parameria barbata*: The plant showed inhibition activity against NO release from macrophages and antioxidant activity (Limpanawisut, S. and Rayanil, 2013).
217. *Parameria laerigata* Moldenke: The plant has been used as an antiulcer and antidiarrheal medicine as well as to treat wounds. Parameritannins A-2 and A-3, from the bark inhibited eukaryotic topos I, II or both activities (Murakami-Nakai *et al.*, 2005).

218. *Paravallaris microphylla* Pitard: The endocrine activity of steroids derived from the alkaloids paravallarine and paravallaridine, isolated from the plant, was reported (Emmerich and Aurousseau, 1970).
219. *Parsonia spiralis*: The plant juice is given internally in insanity (Kirtikar and Basu, 1984).
220. *Pentalinon andrieuxii* Muell. Arg. (syn. *Urechites andrieuxii*): The plant extracts have been reported to possess leishmanicidal (Lezama-Dávila *et al.*, 2007), antiatherogenic, anti-inflammatory, and antidepressant (Pan *et al.*, 2012) activities. Six sterols, isolated from the roots, exhibited leishmanicidal activity (Pan *et al.*, 2012).
221. *Peschiera affinis* (Muell. Arg.) Miers: The main alkaloid of the plant, a heyneanine isomer, had antispasmodic effects (Fonteles *et al.*, 1974).
222. *Peschiera australis* Muell. Arg.: Extracts of the different parts showed antineoplastic, anti-inflammatory (Rates *et al.*, 1993) and significant antileishmanial (Delorenzi *et al.*, 2001, 2002; Adebayo *et al.*, 2013) activities.
223. *Peschiera campestris*: The alkaloid 12-methoxy-N_b-methylvoachalotine, inhibited avian myeloblastosis virus reverse transcriptase activities (Juca and Aoyama, 1996).
224. *Peschiera fuchsiaefolia*: In Brazil, the root bark is used is used against snake-bite (De F. C. Batina *et al.*, 1997). The basic root bark extract showed antiplasmodial activity and can be used as antimalarial agent (Rossi and Bertelli, 1999; Federici *et al.*, 2000) and for the stimulation and modulation of the human immunologic system (Bertelli *et al.*, 2004). Some of the isolated alkaloids exhibited cytotoxic (Meschini *et al.*, 2003-2008), antimicrobial, antiparasitic and antiviral (Stella and Cisse, 2006) activities. The plant extract can be used for treating hypercholesterolemic, hypertriglyceridemic, hyperlipidemic and/or dyslipidemic conditions and their related complications (Stella, 2010).
225. *Peschiera laeta* (Mart. ex A. DC.) Miers (syn. *Tabernaemontana laeta* Mart.): Some of the isolated alkaloids enhanced the cytotoxic action of vinblastine on multidrug-resistant KB cells (You *et al.*, 1994).
226. *Peschiera van heurkii* (Muell. Arg.) L. Allorge (syn. *Tabernaerontana van heurkii* Muell. Arg.: Extracts of both leaves and stem bark as well as some of the alkaloids poseess antileishmanial and antibacterial activities (Muñoz *et al.*, 1994).
227. *Picralima nitida* (Stapf) Th. & H. Dur: The different parts are used as febrifuge, pain relief, antipyretic, aphrodisiac, antimalarial, vermifuge, anthelmintic, laxative, purgative and for the treatment of fever, hypertension, jaundice, dysmenorrhea, pneumonia, gastrointestinal disorders, diabetes, otitis and veneral diseases (Ayensu, 1978; Igboasoiyi *et al.*, 2007; Ubulom *et al.*, 2011; Nwakile and Okore, 2012; Erharuyi *et al.*, 2014; Ezuruike and Prieto, 2014; Igwe and Mgbemena, 2014). The plant extracts, as well as some of the isolated compounds (mainly alkaloids) exhibited several activities *viz.* analgesic (Menzies *et al.*, 1998; Duwiejua *et al.*, 2002), antimalarial (Kapadia *et al.*, 1993; Okokon *et al.*, 2007; Ezeamuzie *et al.*, 1994), antiulcer (Mathew *et al.*, 2010, 2011), antidiabetic (Okonta and Aguwa, 2007; Kazeem *et al.*, 2013; Teugwa *et al.*, 2013; Erharuyi *et al.*, 2014), antioxidant (Teugwa *et al.*, 2013), antibacterial (Fakeye *et al.*, 2000; Kouitcheu *et al.*, 2013; Igwe and Mgbemena, 2014), antifugal ((Fakeye *et al.*, 2000; Ubulom *et al.*, 2011), anti-inflammatory, antipyretic (Ezeamuzie *et al.*, 1994), trypanocidal (Wosu and Ibe, 1989), antileishmanial, cytotoxic and larvicidal (Erharuyi *et al.*, 2014). The seed oil had a hypoglycemic activity (Nwakile and Okore, 2011). The prolonged usage of the methanolic extract of fruit-rinds at 1.5-6 g kg^{-1} dose could cause liver, kidney, and lung injury, while the effect was mild at small dose levels (0.75 g kg^{-1}) (Kouitcheu *et al.*, 2008). Akuammine has a local anesthetic action almost equal to that

of cocaine and akuammidine is about 3 times as potent as cocaine (Raymond-Hamet, 1942, 1954b). The six coumestan glycosides, isolated from the roots, showed antimicrobial activities (Kouam *et al.*, 2011).

228. *Pleiocarpa bicarpellata* Stapf.: In Nigeria, The leaves and the plant exctract are used as anthelmintic (Njoku *et al*., 1996).
229. *Pleiocarpa mutica* Benth.: The plant extracts showed hypotensive (Tsao *et al.*, 1961; Hochstein, 1964), antiplasmodial (Addae-Kyereme *et al.*, 2001) and nematocidal (against *Panagrellus redivivus*) activities (Tsao *et al.*, 1961).
230. *Pleiocarpa pycnantha* (K. Schum) Stapf: In West Africa a blend of the leaves mixed with *Spondias mombin* (Anacardiaceae) and a fruit of *Aframomum melegueta* (Zingiberaceae), is used to retain good memory. Ursolic acid and other compounds, isolated from the plant, are cytotoxic (Omoyeni *et al.*, 2014).
231. *Pleiocarpa tubicina* Stapf: The aqueous extract is hypotensive (Raymond-Hamet, 1957).
232. *Plumeria acuminata* Ait: The bark and leaves are used as purgative, remedy for pain, fever, diarrhea, dysentery, to control asthma and cure for itch. The latex is used to treat arthritis, rheumatism and pruritic skin lesion. The excessive doses of the latex are poisonous and the root is a violent cathartic. The herb is used to treat tumours and rheumatic pains. The essential oil from the flowers possesses antifungal activity (Farooque *et al.*, 2012). The leaf extracts possess potent anti-inflammatory (Gupta *et al.*, 2006), antioxidant (Gupta *et al.*, 2007a), potent antipyretic, antinociceptive (Gupta *et al.*, 2007b), antibacterial and antifungal (Gupta *et al.*, 2008). Some of isolated compounds are antimutagenic (Guevara *et al.*, 1996) and cytotoxic (Susanto *et al.*, 2010). Other pharmacological studies were reported (Muir and Hoe, 1982).
233. *Plumeria acutifolia* Poir.: The root bark is carminative, laxative, purgative, useful in leprosy, itching, ulcers, rheumatic pains, ascites, gleet, urinary discharges, gonorrhea, veneral sores. The leaves are abortive and used to dispel swellings. The wood is used as an anthelmintic and purgative. The milky juice is poisonous (Kirtikar and Basu, 1984). Also, it was used in the treatment of allergies, inflammation, leprosy, ascites and as diuretic (Sudha rani *et al.*, 2012). The plant extracts and/or some of the isolated compounds exhibited anticancer (Fujimoto and Made, 1988; Hasan *et al.*, 1997), antibacterial, antifungal (Grumbach *et al.*, 1952; Sharma and Kumar, 2012), anti-anaphylactic and anti-inflammatory (Vijayalakshmi *et al.*, 2011) activities. Pharmacological studies revealed that the alcoholic extract is a strong relaxant of smooth muscles of the intestine and other effects were reported (Siddiqui and Khan, 1970).
234. *Plumeria alba* L.: The different parts of the plant are used as purgative, alterative, emmenagogue, febrifuge, cardiotonic, diuretic, hypotensive, haemostatic, antidiabetic, rubefacient, antipyretic, antifungal, stimulant and applied to inflammation, rheumatism, bronchitis, cholera, cold, cough, ulcer, wounds, herpes and scabies (Ayensu, 1981; Kirtikar and Basu, 1984; Radha *et al.*, 2008; Zaheer *et al.*, 2010b; Kumari *et al*., 2012; Tessou *et al.*, 2013; Choudhary *et al.*, 2014a). The essential oil of the flowers had antimicrobial activity (Zaheer *et al.*, 2010c; Kumari *et al*., 2012). The three iridoids, plumieride, protolplumericin A and plumieride acid, isolated from the leaves of the plant cultivated in Egypt, displayed antibacterial and antifungal actiities (Afifi *et al.*, 2006). The plant extracts possessed antitumour (Radha *et al.*, 2008), hepatoprotective (Sudheer *et al.*, 2011), anti-arthritis and antiulcer (Choudhary *et al.*, 2014a,b) activities.
235. *Plumeria bicolor*: The chloroform extract and some iridoids showed antifungal (Singh *et al.*, 2011a), antileishmanial and cytotoxic effects (Sharma *et al.*, 2011b; Kumar *et al*., 2013d). Some of te isolated iridoids and triterpenoids have algicide, antibacterial and cytotoxic activities (Gupta *et al.*, 2004b).

236. *Plumeria lancifolia*: It is used as febrifuge, emmenagogue and purgative (França *et al*., 2000). A crude extract of the plant possessed antiulcer activity (Franca *et al*., 2000).
237. *Plumeria multiflora*: The iridoid plumericin, isolated from the roots is a potent inhibitor of fungi, and somewhat less active against bacteria (Little and Johnstone, 1951).
238. *Plumeria obtusa* L.: The plant extracts exhibited antitumor, antimicrobial (Kamariah *et al*., 1999; Ali *et al.*, 2013, 2015) and antiulcer (Singh *et al*. 2012) activities.
239. *Plumeria rubra* L.: *Plumeria rubra* L. f. *rubra* [pink flowers] and *Plumeria rubra* f. *lutea* [white flowers] are the two cultivars of *P. rubra*, famous for their attractiveness and fragrant flowers. The different parts of the plants are used as in treatment of diabetes, ulcers, leprosy, rheumatism, diarrhoea, blennorrhea, inflammations, asthma, ease constipation, promote menstruation, toothache, whooping-cough, tracheitis, infective hepatitis, calculus of urethra and mastitis, venereal diseases, reduce fever and as a rubefacient and purgative (Kirtikar and Basu, 1984; Ye *et al*., 2009; Zaheer *et al.*, 2010b, Gopi *et al.*, 2011; Sirisha *et al*., 2013; Shinde *et al.*, 2014). The plant extracts exhibited antinociceptive, anti-inflammatory (Das *et al*., 2013), anthelmintic (Kumar *et al*., 2009), antimicrobial (Jarin *et al*., 2008; Baghel *et al*., 2010), anticancer (Rekha and Jayakar, 2011), antiulcer, antipyretic (Shinde *et al.*, 2013), antidiabetic (Viswanathan and Doss, 2014), analgesic, antioxidant, anti-inflammatory (Sirisha *et al.*, 2013, 2014), antifertility, abortifacient (Dabhadkar and Zade, 2012; Zade and Dabhadkar, 2012), estrogenic, contraceptive (Dabhadkar *et al.*, 2013) and anxiolytic (Chatterjee *et al.*, 2013) activities. The protein from the laticifer cells had antioxidative and proteolytic activities (de Freitas *et al.*, 2010). A flavone glycoside from the flowers exhibited antioxidant and hypolipidemic effects (Merina *et al.*, 2010). The iridoid fulvoplumierin has been reported as inhibitor of the human immunodeficiency virus type 1 (HIV- 1) reverse transcriptase (Tan *et al.*, 1991). A skin care preparation has been described, containing an extract of a plant belonging to the genus *Plumeria*, such as the flowers of *P. rubra* L. cv. *acutifolia*, *P. obtusa* L., *P. rubra* L. *tricolor*, and *P. rubra* L. *lutea*, has an inhibitory action on phospholipase A2, antiinflammatory action, active oxygen scavenging action, radical scavenging action and antioxidative action (Kiso *et al.*, 2002). A pharmaceutical composition, containing *P. rubra*, is used for treating skin cancer, mycosis, virus infection, hemorrhoid, skin burn, dermatitis, eczema, stomatitis, ulcer, wound and others (Stewart, 2006). The isolated triterpenoid, rubrinol is antibacterial (Akhtar *et al*., 1994).
240. *Poacynum hendersonii*: The aqueous extract of the leaves and the two isolated compounds, isoqercitrin and liriodendrin, have remarkable effects in reducing blood lipids (Du *et al.*, 2006b). Several constituents of the plant moderately promoted adipogenesis of 3T3-L1 cells (Morikawa *et al*., 2012). The dopaminergic neuroprotection of quercetin-3-*O*-sophoroside and total flavonoids of the plant in MPTP-induced mice model of Parkinson's disease has been reported (Ma *et al.*, 2010). Dispersible tablets, containing total flavonoids of the leaves, can be used in clinical preventing and treating neurodegenerative disease such as Alzheimer's disease (Zhou *et al.*, 2013b).
241. *Pterotaberna inconspicua* Stapf.: The leaves are used to treat hypertension, gastro-intestinal upsets and several kinds of aches. The alkaloid methuenine was characterized as a non competitive antagonist against acetylcholine and histamine in the guinea pig ileum. Its potency was comparable to that of papaverine (Bakana *et al.*, 1985).
242. *Rauvolfia caffra* Sond.: The plant is used as an astringent, purgative or emetic, to treat fever, cough, gastrointestinal disturbances, skin infections, hypertension, diarrhea, dysentery, scabies, worm infections, malaria, toothaches venereal diseases, swellings,

abscesses, hepatitis, pneumonia, measles, skin lessions or itching rashes. In South Africa, the plant as used as insecticidal and to kill maggots in wounds. The plant is rich in indole alkaloids which have various pharmacological activities including antimalarial, antitumor and antidiabetic. A study indicated that alkaloid fraction of the root and 80% ethanolic extracts of stem bark exhibited high antioxidant and antibacterial activities (Njau *et al.*, 2014).

243. *Rauwolfia cambodiana* Pierre ex. Pitard: The plant alkaloid had been used as a tranquilizer and antihypertensive agent (Pham *et al.*, 1983).
244. *Rauwolfia canescens* L.: The total alkaloids from the leaves had hypotensive effect (Koda *et al*., 1963). Both pseudoreserpine and raunescine, isolated from the plant, have reserpine-like activity, but are less potent than reserpine (Rothman and Toekes, 1957). In general, the plant contains several alkaloids which have several pharmacological activities e.g. sedative, antihypertension, antimalarial and antidiabetic, etc (Harrison *et al.*, 1955; Schneider *et al*., 1955).
245. *Rauwolfia densiflora* (Wall) Benth. ex Hook. f : The different parts of the plant are used for treatment of coughs, diabetes, fever, urinary tract infections, anaemia, psoriasis, beriberi, syphilis dysentery and as contraceptive, sedative, a remedy for snake bites, hypertension and ringworm, The plant extracts exhibited sedative (Weerakoon *et al.*, 1998), antioxidant and antibacterial (Iqbal *et al*., 2013) activities. The alkaloids, isolated from the plant and other *Rauwolfia* species, have been reported to exhibit several activities e.g. ajmaline is antidiabetic and rescinnamine inhibits angiotensin converting enzyme (ACE) and used to treat hypertension. Anticancer, antioxidant and diuretic activities are reported for the phytol (Iqbal *et al*., 2013).
246. *Rauvolfia grandiflora* Mart. ex A. DC.: It is reported as a poisonous plant (Agra *et al.*, 2008).
247. *Rauwolfia hirsuta*: The total alkaloidal extract produced persistent hypotension (Mezey and Uribe, 1954a,b).
248. *Rauwolfia lamarckii* DC.: It is reported as a poisonous plant (Agra *et al*., 2008).
249. *Rauwolfia ligustrina* Willd. ex Roem. & Schult.: All parts of the plant are poisonous (Agra *et al*., 2007). The plant extracts showed CNS depressant, anticonvulsant (Quintans-Júnior *et al.*, 2002, 2007) and anxiolytic-like properties (Netto *et al.*, 2009). A pharmacological study of the plant extract was reported (Medeiros and Calixto, 1996).
250. *Rauvolfia serpentina* (L). Benth. ex Kurz.: It is an important medicinal plant of Indian subcontinent and South East Asian countries. It has been used as an anthelmintic, as an antidote against snake bite and bites of other poisonous insects, in diarrhoea, dysentery, cholera and also as an ecbolic (Bhatia, 1942). Its roots are used as a remedy for high blood pressure, insomnia, anxiety, excitement, schizophrenia and insanity. It is also used to treat pneumonia, malarial fever, asthma, eye and spleen diseases. With small doses blood pressure can be maintained within tolerable limits. It lowers both the systolic as well as diastolic blood pressure. In small doses, it does not produce any depression of the heart. The pharmacological activities of the plant and the isolated alkaloids were reported and reviewed by several authors (e.g. De and Dey, 2010, 2011; Mittal 2012).
251. *Rauwolfia sumatrana* Jack.: The plant is believed to be a general antidote to poison and a decoction of the bark is taken to relieve malaria (Subhadhirasakul *et al.*, 1994c).
252. *Rauwolfia tetraphylla* L.: The root is used to stimulate uterine contraction, in toothache, ulcer, stomatitis, swelling, syphilis, sore throat, fever, gingivitis, malaria and nervousness, as a remedy of antihypertensive, cholera, fever, eye disease and diarrhea, as well as in dysentery and intestinal disorders. It possesses anti-inflammatory, diuretic, expectorant, narcotic and tranquilizing actions (Jyothi *et al.*, 2012). The fruit extracts

possess antibacterial activity (Alagesaboopathi, 2009). Reserpine (representing more than 50% of the alkaloids) is reported to possess various biological activities such as antiadrenergic, anticonvulsant, antidyskinetic, antileukemic, antimigraine, antipsychotic, antipyretic, antischizopherenic, antistress, antitumor, bradycardic, CNS-depressant, calcium-antagonist, catechoaminolytic, hepatoprotective, hypotensive, hypothermic, MDR-inhibitor, peristaltic, rodenticide, sedative, serotoninolytic, teratogenic, uterotonic, tranquilizer, and vasoconstrictor (Anitha and Kumari, 2013).

253. *Rauwolfia verticillata* (Lour.) Baill: The plant is used for lowering blood pressure (Hong *et al.*, 2013). Verticillatine is effective as antihypertensive (Zeng *et al.*, 1986).
254. *Rauwolfia viridis* Roem and Schultz: The cardiac cellular actions of the alkaloid, quebrachidine, isolated from the plant had been reported (Álvarezand Vassort, 2010).
255. *Rauwolfia vomitoria* Afzel.: The different parts of the plant are used for the treatment of epilepsy (Babu *et al.*, 2010), diabetes, mental disorders, insomnia, psychiatric disorders, hypertension, snake bite, skin and oral infections, rheumatism and as sedative, purgative, emetic, antiparasitic (Bisong *et al.*, 2011; Akanji *et al*., 2013; Ezuruike and Prieto, 2014), aphrodisiac (Gupta *et al.*, 2013; Eluwa *et al*., 2014), antimalarial (Adebayo and Krettli, 2011), emetic, purgative, dysenteric, abortive, and insecticidal (Eluwa *et al*., 2014) and management of infantile convulsion, jaundice and gastrointestinal troubles (Eteng *et al*., 2009). The plant extracts possess strong antiplasmodial (Zirihi *et al*., 2009), antifilarial against *Onchocerca volvulus* (Attah *et al*., 2013), antioxidant (Erasto *et al.*, 2011; Okolie *et al.*, 2011), hypolipidemic (Akanji *et al.*, 2013), hepatoprotective (Ezejindu *et al.*, 2014), analgesic, antipyretic, anticonvulsant (Amole *et al.*, 2009), antipsychotic (Bisong *et al.*, 2011), antitumor (Bemis *et al.*, 2006; Yu *et al*., 2013b) and nematicidal (Yondo *et al.*, 2013) activities. The potential toxicity of the plant was reported (Eteng *et al.*, 2009; Eluwa *et al*., 2010; Eluwa *et al*., 2014). The alkaloids, isolated from the plant and other *Rauwolfia* species, have been reported to exhibit several activities e.g. antihypertension, sedative, antimalarial and and antitumor (Bemis *et al*., 2006; Yu and Chen, 2014b). Rauvanine had negative chronotropic, antifibrillatory, and coronary-dilator actions (Quevauviller *et al.*, 1972).
256. *Roupellina boivinii* (Baill.) Pichon (*Strophanthus boivinii* Baill): The six cardenolide glycosides boivinides, isolated from the plants, showed significant antiproliferative activity against A2780 human ovarian cancer cell line (Karkare *et al.*, 2007).
257. *Schizozygia coffaeoides*: The plant extracts and/or some isolated alkaloids showed antimicrobial (Kariba *et al.*, 2001, 2002), antiplasmodial (Atilaw *et al.*, 2014), antipyretic and broncholytic (Renner, 1968) activties.
258. *Skytanthus acutus* Meyen: The toxicity, cardiovascular action, and psycho-pharmacological activity of the alkaloid skytanthine were studied. It provoked slight hyperpnea, and death, produced a transitory moderate fall in arterial pressure. It had an activity on the central nervous system similar to nicotine (Gatti and Marotta, 1966).
259. *Skytanthus hancorniifolius* (A. DC.) Miers: In Brazil, the infusion of the leaves, flowers and stem bark is used as sedative and against insomnias, hypertension, cardiac problems, asthmas and colds (Agra *et al.*, 2008).
260. *Strempeliopsis strempelioides* K. Schum.: Five of the alkaloids, isolated from the plant, were hypotensive (Rojas Martinez *et al.*, 1980).
261. *Strophanthus divaricatus*: The liposoluble compounds of the leaves possess antioxidant activity (Cheng *et al*., 2013). Divaricoside (a cardenolide from the plant), could inhibit different developmental stages of the worm *Trichobilharzia paoi* in ducks (Qiao and Zhao, 2013) and also had molluscicidal activity (Zhao *et al.*, 2008; Qi and Zhao, 2013).

262. *Strophathus gratus* (W. J. Hook.) Franch.: The plant is used to treat snake-bites and also as arrow poison (Cowan *et al*., 2001). Ouabain, a cardiac glycoside of the plant, produces hyperventilation (Sohn *et al.*, 1970).
263. *Strophanthus hispidus* DC.: It is used as antidote to the poison of the black-necked cobra, in treatment of arthritis, stroke, heart failure and rheumatism (Ayoola *et al.*, 2008), syphilis ulcers, bony syphilis, and guinea-worm sores and wounds (Agyare *et al*., 2013b). The plant extracts exhibited antioxidant, antimicrobial, wound healing , antinociceptive, anti-inflammatory and antiulcerogenic activities (Agyare *et al*., 2013b; Ishola *et al.*, 2013). The aqueous extract of the leaves has been found to prolong the time taken to clot for blood treated with a standardised dose of the venom of *Echis carinatus* (Houghton and Skari, 1994). The cardiac glycoside ouabain, isolated from the plant, is used in cases of acute cardiac insufficiency (Hostettmann *et al.*, 2000) and exerts antiproliferative effects (Pezzani *et al.*, 2014).
264. *Strophanthus kombé*: The mixture *k*-strophanthin from the plant is used for the same indications as ouabain, as mentioned above (Hostettmann *et al.*, 2000).
265. *Strophanthus sarmentosus* A. P. DC.: In Nigeria, it has been employed locally for treating quite a number of ailments, including fever, inflammation and peptic ulcers. The ethanolic extract of the roots possessed analgesic, anti-inflammatory and antipyretic effects (Agbaje and Ajidahun, 2011). The cardio active property of sarmentoside A, isolated from the plant compared favorably with digoxin (Owonubi *et al.*, 1997).
266. *Strophanthus wightianus* Wall. ex. Wight: The ethanolic extract of the leaves exhibited antibacterial activity (John *et al.*, 2012).
267. *Tabernaemontana acapulcensis*: The sap is used in Mexico to treat wounds (Van Beek *et al.*, 1984b).
268. *Tabernaemontana affinis*: The leaves are poisonous to cattle. The extracts had antitumor and spasmolytic activities and were highly toxic (Van Beek *et al.*, 1984b).
269. *Tabernaemontana alba*: The plant is used as a tonic, febrifuge purgative and anthelmintic, especially against *Taenia* (Van Beek *et al.*, 1984b).
270. *Tabernaemontana alternifolia* Roxb: (*Ervatamia heyneana* Wall, *Tabernaemontana heyneana* Wall): Traditionally a therapeutic preparation made from leaf and stem in combination with stem bark of *Ficus racemosa, Ficus benghalensis, Madhuca longifolia and Strychnos nux-vomica* is used in India to treat skin infections. The plant extracts exhibited antibacterial activity **(**Marathe *et al*., 2013; Viji *et al*., 2014).
271. *Tabernaemontana amygdalifolia*: In some countries (Colombia and Puerto Rico), the plant is considered to be very toxic. The latex or resin is used for healing warts and the leaves as a cataplasm for treating tumors and healing serious wounds. The latex is used as a purgative and the bark against fevers and syphilis (Van Beek *et al.*, 1984b).
272. *Tabernaemontana angulata* Mart. ex Müll. Arg.: The stem extract showed antibacterial activity (Suffredini *et al.*, 2002).
273. *Tabernaemontana arborea*: The trunk extract had cytotoxic activity (Kingston, 1978).
274. *Tabernaemontana arcuata*: The bark and roots are used to cure rheumatism (Van Beek *et al.*, 1984b).
275. *Tabernaemontana armeniaca* Areces: The alkaloid apodine, isolated from the leaves, reduced mobility and reaction capacity in mice and caused weak relaxation of the isolated rat trachea, weak antagonism to acetylcholine, bradykinin, histamine, nicotine and serotonin, depressed the frequency and amplitude of isolated guinea pig auricle contractions, and caused moderate arterial hypotension in cats (Rojas *et al.*, 1977).
276. *Tabernaemontana aurantiaca*: Sap of the plant is added to coconut oil and rubbed on the skin to make it blister (Van Beek *et al.*, 1984b).

277. *Tabernaemontana australis*: The latex is used for healing warts (Van Beek *et al.*, 1984b). Some of the isolated alkalois had antileishmanial (Delorenzi *et al.*, 2001) and anticholinesterasic (Andrade *et al.*, 2005) activities.
278. *Tabernaemontana borbonica*: The plant and its latex are considered to be poisonous (Van Beek *et al.*, 1984b).
279. *Tabernaemontana bovina*: The sticky latex is applied externally to soften the skin (Van Beek *et al.*, 1984b).
280. *Tabernaemontana brachyantha*: In Cameroon, the twigs mixed with *Ocimum* are used as vermifuge (Van Beek *et al.*, 1984b).
281. *Tabernaemontana bufalina*: The plant is used as emollient, laxative, against rheumatoid arthritis and to cure stomach disorders and sore throat (Van Beek *et al.*, 1984b).
282. *Tabernaemontana calcarea*: Several alkaloids, isolated from the plant, exhibited cytotoxic activity (Prakash Chaturvedula *et al.*, 2005).
283. *Tabernaemontana callosa*: The latex is poisonous and is a strong purgative (Van Beek *et al.*, 1984b).
284. *Tabernaemontana catharinensis* A. DC.: The plant has been traditionally used in Argentina for wound disinfection, against throat, eye and fingernail infections, in the treatment of gonorrhea and diarrhea, as well as against infections caused by parasites (Medeiros *et al.*, 2011). In Brazil, it is used as antidote for snake bites, to relieve toothache, vermifuge and also to eliminate warts (Piana *et al.*, 2014). The extracts showed antimicrobial (Guida *et al.*, 2003; Medeiros *et al.*, 2011), leishmanicidal (Soares *et al.*, 2007), antitumor (de Almeida *et al.*, 2004), cytotoxic (Pereira *et al.*, 2006b; Boligon and Athayde, 2012), analgesic, anti-inflammatory, antinociceptive (Gomes *et al.*, 2009), antioxidant (Boligon *et al.*, 2013b; Piana *et al.*, 2014) and anticholinesterasic (Nicola *et al.*, 2013) effects. The aqueous extract of the plant inhibited the lethal acttivity of *Crotalus durissus terrificus* snake venom and its mycotoxin corotoxin (de Almeida *et al.*, 2004), as well as myotoxic effect of *Bothrops jararacussu* snake venom and two of its myotoxins [bothropstoxin-I and II] (Veronese *et al.*, 2005). The essential oil of the plant leaves showed antioxidant activity (Boligon *et al.* 2013a). The alkaloids exhibited antibacterial, antifungal (Guida *et al.*, 2003; Medeiros *et al.*, 2011), trypanocidal against *Trypanosoma cruzi* (Pereira *et al.*, 1999) and cytotoxic (Pereira *et al.*, 2008) activities.
285. *Tabernaemontana cerifera*: The bark is a drastic purgative (Van Beek *et al.*, 1984b).
286. *Tabernaemontana chippii*: The dimeric alkaloids, isolated from the root bark, possessed antibacterial activity (Van Beek *et al.*, 1985a).
287. *Tabernaemontana citrifolia* L.: The latex is used to remove warts, to stop bleeding of wounds, to treat toothache, herps, warts and as a hemostatic. The different parts are used as febrifuge, purgative tonic, anthelmintic and as a remedy for fevers (Van Beek *et al.*, 1984b). The plant extracts exhibited anthelmintic activity (Marie-Magdeleine *et al.*, 2010; Smita *et al.*, 2011). Two alkaloids, ibogaine and voacangine, showed anti-mycobacterial activity (Rastogi *et al.*, 1998).
288. *Tabernaemontana coffeoides*: The latex, bark and roots are used to treat syphilitic ulceration. The plant is pounded and a poultice in orchitis (Van Beek *et al.*, 1984b).
289. *Tabernaemontana coronaria*: The root is acrid, digestible, aphrodisiac, tonic, anthelmintic, purgative, useful in toothache and biliousness.The milky juice is very useful in eye infections (Ratnagiriswaran and Venkatachalam, 1939; Surya *et al.*, 2011). The plant is also used to treat fever and diarrhea (Pushpa *et al.*, 2012). Fingertip dermatitis from the plant has been reported (Bajaj *et al.*, 1996). The plant extracts exhibited antioxidant (Thambi *et al.*, 2006; Surya *et al.*, 2011), antimicrobial (Pushpa *et*

al., 2012; Shaker *et al.*, 2012), anthelmintic (Pushpa *et al.*, 2011), antituberculosis (Mohamad *et al.*, 2011) and nephroprotective (Poornima and Gopalakrishnan, 2012; Uma *et al.*, 2012) effects. The latex showed anesthetic activity (Rajasekhar *et al.*, 2009).

290. *Tabernaemontana corymbosa*: The different parts of the plant are used as laxative tonic and for the treatment of gonorrhea fungal infections, ovarian trouble, anthrax, headache, constipation, hematuria, ringworm, blenorrhagia, stomach disorders, to relieve pains in the back, rheumatism, disinfections, homeostasis, abscesses, coryza, sinusitis, boils, carbuncles, diabetes, rheumatism and sinusitis. The plant is also an arrow poison. (Van Beek *et al.*, 1984b; Kuete, 2010) and as a local anaesthetic (Agwu and Akah, 1990). The methanolic extracts of the leaves and roots showed antioxidant activity (Zulkefli *et al.*, 2013). The alkaloids, jerantinines A-E (Lim *et al.*, 2008b), conodiparines A-D (Kam *et al.*, 1998b), lirofoline A (Low *et al.*, 2010) and tabercarpamine A (Ma *et al.*, 2014b) displayed pronounced cytotoxicity against human KB cells. A dose of 250 mg/kg ethanolic extract proved to be lethal within 30 minutes. It is very caustic and one drop in the eye causes blindness and a few drops in the nose helps against violent headaches (Van Beek *et al.*, 1984b). The ethanolic stem bark extract and the isolated alkaloid, ibogaine showed antibacterial activity (Van Beek *et al.*, 1985c).
291. *Tabernaemontana crispa*: An infusion of the bark or root is used, against dysentery and as an astringent. Also, the latex is used against diarrhea (Van Beek *et al.*, 1984b).
292. *Tabernaemontana cylindrocarpa*: The leaves are used against beriberi and as a poultice for skin conditions such as itch and eczema (Van Beek *et al.*, 1984b).
293. *Tabernaemontana cymosa*: The leaves and fruits are remedies against the sting of millepedes, the flowers have cardiotonic properties and the latex is employed to remove warts. Some of the isolated alkaloids showed antifungal and antibacterial activities (Achenbach *et al.*, 1997). The bark extract inhibited the *in vitro* replication of dengue virus serotype (Hernández-Castro *et al.*, 2015).
294. *Tabernaemontana dichotoma* (Eve's apple or forbidden fruit): In India, the seeds are a powerful narcotic and poisonous and give rise to delirium and other symptoms like those caused by *Datura*. In addition, the seeds act as a purgative. All parts of the plant are included in remedies for snake bite, while the bark and roots are used in combination with other drugs for treating scorpion stings. In Sri Lanka, the fruits, leaves, bark and stems are used in the treatment of ulcers and fistulae. The latex is said to be poisonous, but at the same time is applied to wounds. A preparation of the bark is placed on abraded skin as an antiseptic and astringent. Chewing the roots is said to relieve toothache. An alkaloidal fraction had hypotensive and sedative activity, while another fraction showed tumor-inhibiting activity (Van Beek *et al.*, 1984b). Extracts of the different parts showed spasmolytic (Perera *et al.*, 1983c), hypotensive, stimulant, muscle relaxant, convulsive (Kupchan *et al.*, 1963; Perera *et al.*, 1984c) and vasorelaxant (Zaima *et al.*, 2013) effects. Stemmadenine and other alkaloids e.g. perivine, showed hypotensive (Perera *et al.*, 1985b; Zaima *et al.*, 2013) and muscle relaxant (Perera *et al.*, 1985b) activities.
295. *Tabernaemontana dinhensis*: In Vietnam, an infusion of the roots is prescribed for indigestion and colic (Van Beek *et al.*, 1984b).
296. *Tabernaemontana divaricata* (L.) R. Br. ex Roem. & Schult. (syn. *Ervatamia coronaria* (Jacq.) Stapf: It is used in the treatment of coughs, abdominal tumours, rheumatism, arthralgia, asthma, diarrhoea, fevers, mania, epilepsy, paralysis, skin diseases ulceration, leprosy, hiccough, hypertension, vomiting, swellings, suppression of urine, disorders of semen and womb. It is also used in the treatment of eye conditions, boils, edema, rabies, headache, fractures, the spleen and piles and as antihelmintic, antihypertensive, neurotonic, aphrodisiac, analgesic sedative, diuretic, febrifuge, emmenagogue, hair

growth promoter, purgative, tonic, astringent, alexipharmic, digestible, remedy against convulsions, poisons and improving the memory. The sap and flowers are said to be poisonous (Van Beek *et al.*, 1984b; Yoysungnoen *et al.*, 2008; Nakdook *et al.*, 2010; Khan and Mukhram, 2011; Dantu *et al.*, 2012). The consumption of the root extract significantly improved the memory impairment (Nakdook *et al.*, 2010). The latex has the reputation of being very cooling and is applied to wounds to prevent inflammation (Gunasekera *et al.*, 1980). In Brazil, it is reported as a poisonous plant (Agra *et al.*, 2007). Crude extracts had anticancer activity (Raj *et al.*, 1974). The plant extracts (leaves, flowers) possessed several pharmacological and biological activities *viz.* antibacterial (Ashikur *et al.*, 2011a, Gopinath *et al.*, 2011; Viji *et al.*, 2014), anti-inflammatory, analgesic, peripheral and CNS depressive, hypotensive (Yoysungnoen *et al.*, 2008) antitumor (Raj *et al.*, 1974; Pratchayasakul *et al.*, 2008), cytotoxic (Rahman *et al.*, 2011b,c; Dantu *et al.*, 2012; Rumzhum *et al.*, 2012), antioxidant (Pratchayasakul *et al.*, 2008; Rumzhum *et al.*, 2012), antidiabetic (Rahman *et al.*, 2011b,c), gastroprotective (Khan, 2011; Khan *et al.*, 2011), antinociceptive (Sharker *et al.*, 2011), analgesic, anti-inflammatory (Qamruzzama *et al.*, 2012), acetyl cholinesterase (AChE) inhibitory (Basavaraj *et al.*, 2011a ; Chattipakorn *et al.*, 2007; Pratchayasakul *et al.*, 2010), anxiolytic (Basavaraj *et al.*, 2011a), anti-acne (Sawarkar *et al.*, 2010), anticonvulsant (Basavaraj *et al.*, 2011b; Khan and Murkham, 2011) and antifertility (Jain *et al.*, 2010; Mukhram *et al.*, 2012) activities. The plant extract also exhibited repellency to the nymphs and adults of painted bug, *Bagrada cruciferarum* Kirk. (Chandel *et al.*, 2011). The plant contains several pharmacologically active alkaloids, which have been shown to possess a wide range of biological activities e.g. analgesic, antifertility, cardiotonic, vasodilation, CNS stimulation, analeptic (Van Beek *et al.*, 1984b), ACHE inhibition (Andrade *et al.*, 2005; Ingkaninan *et al.*, 2006), antiviral, cytotoxic (Van Beek *et al.*, 1984b; Kam *et al.*, 2004b; Bao *et al.*, 2013; Rizo *et al.*, 2013), antidiabetic (Pratchayasakul *et al.*, 2008; Fujii *et al.*, 2009), anti-inflammatory (Taesotikul *et al.*, 2003), antimicrobial (Pratchayasakul *et al.*, 2008; Singh *et al.*, 2011b), hypotension (Taesotikul *et al.*, 1989) and anticonvulsant (Pratchayasakul *et al.*, 2008). Some of the isolated alkaloids depressed bone-marrow activity in rats, resulting in temporary leucopenia (Jabbar and Hasan, 1980) and showed significant activity in reversing multidrug resistance in vincristine-resistant KB cells (Low *et al.*, 2010).

297. *Tabernaemontana eglandulosa*: In Zaire, the root is used against snake bite (Van Beek *et al.*, 1984b).
298. *Tabernaemontana elegans*: The latex is used as a styptic and the root as a remedy for pulmonary diseases (Van Beek *et al.*, 1984b). The plant is used in African traditional medicine to treat several ailments including cancer (Mansoor *et al.*, 2013). The crude root extracts, having a high concentration of alkaloids showed antibacterial activity (Pallant *et al.*, 2012). Several of the isolated alkaloids showed cytotoxic activity (Tizzoni *et al.*, 1993; Hirasawa *et al.*, 2009c; Mansoor *et al.*, 2009a,b, , 2013).
299. *Tabernaemontana fuchsiaefolia* A. DC: In Brazil, the plant is commonly used to treat malaria (Zocoler *et al.*, 2005).
300. *Tabernaemontana cf. gentilii*: In Zaire, the plant is used as a fish poison (Van Beek *et al.*, 1984b).
301. *Tabernaemontana glandulosa*: The alkaloid tabernulosine, from the leaves, showed significant antihypertonic activity (Achenbach *et al.*, 1982a).
302. *Tabernaemontana harmandiana*: It is used for the treatment of an internal abscess (Van Beek *et al.*, 1984b).

303. *Tabernaemontana heyneana* (syn. *Ervatamia heyneana*): The bark is used against fevers, as anthelmintic and narcotic (Van Beek *et al.*, 1984b; Duraipandiyan *et al.*, 2006). The plant extracts exhibited cytotoxic, antitumor (Van Beek *et al.*, 1984b), antibacterial, antifungal (Sathishkumar *et al*., 2012), antioxidant (Sathishkumar and Baskar, 2012) and renoprotective (Sathishkumar and Baskar, 2014) effects. Also, the ethanolic extract and some of the isolated alkaloids prevented pregnancy (Meyer *et al.*, 1973; Srivastava *et al*., 2001).
304. *Tabernaemontana hilariana*: The leaves are reported poisonous (Van Beek *et al.*, 1984b).
305. *Tabernaemontana hirta*: In Malaysia, the plant is used for ulceration of the nose (Van Beek *et al.*, 1984b).
306. *Tabernaemontana holstii*: Both alkaloids, gabunine and 19-(2-oxo-propyl)conodurine, from the roots, showed significant inhibitory activity against P-388 cell culture (Kingston *et al*., 1977a).
307. *Tabernaemontana hystrix*: The leaves are used against poisonous bites and the bark is used as a bitter (Van Beek *et al.*, 1984b). Some of the isolated alkaloids (e.g. affinine**,** affinisine and hystrixnine) showed selective inhibbition of acetyl (AChE) and butyrylcholinesterase (BuChE) activities (Vieira *et al.*, 2008).
308. *Tabernaemontana johnstonii* (Stapf) Pichon (syn. *Tabernaemontana stapfiana*): The stem bark extracts showed significant cytotoxicity activity against P-388 lymphocytic leukemia and against human carcinoma of the nasopharynx (Kingston *et al.*, 1978).
309. *Tabernaemontana laeta*: The leaves or the latex are used to treat skin disorders. The bark has febrifugal properties and is also used for healing wounds.The bitter root is taken in smalI doses as a tonic, but in larger doses it is toxic (Van Beek *et al.*, 1984b). Some of the isolated alkaloids showed selective inhibbition of acetyl (AChE) and butyrylcholinesterase (BuChE) activities (Vieira *et al.*, 2008).
310. *Tabernaemontana longiflora*: The leaves are used against elephantiasis and the roots are used against headache (Van Beek *et al.*, 1984b).
311. *Tabernaemontana longipes*: The plant is used as as a cure for beef worm (Van Beek *et al.*, 1984b).
312. *Tabernaemontana macrocarpa*: The fruit is used to relieve the pain of toothache (Van Beek *et al.*, 1984b).
313. *Tabernaemontana malaccensis*: The leaves and sap or the pounded roots are applied as a poultice for boils. A decoction of the bark is used for the treatment of syphilis. The plant is considered to be poisonous. The crude alkaloids from the leaves had slight but lasting hypotensive effects (Van Beek *et al.*, 1984b).
314. *Tabernaemontana markgrafiana* (syn. *Bonafousia longituba*): It is used as a febrifuge, disinfectant, fungicide, contraceptive and against toothache and insect bites (Nielsen *et al*., 1994).
315. *Tabernaemontana mauritiana*: The very toxic latex is used as an anthelmintic and a fish poison. The different parts are employed as a vermifuge, against dysentery, blenorrhea, intestinal worms and as a fish poison (Van Beek *et al.*, 1984b).
316. *Tabernaemontana muricata*: It is used as a stimulant (Van Beek *et al.*, 1984b).
317. *Tabernaemontana nova-guineensis*: In Solomon Islands, the tree and its fruits are much feared because it is believed that they are able to distort the hands and fingers as leprosy does.The sap is rubbed on the skin to raise blister (Van Beek *et al.*, 1984b).
318. *Tabernaemontana pachysiphon*: The latex is used as a styptic and is applied to wounds for healing. It is dropped into a sore eye as a cure. A decoction of the roots is used against stomach ache, constipation, flatulence, headache and as a hypnotic. A watery

extract of the fruit is used as a galactagogue for goats. A concentrated extract of the wood is a poison (Van Beek *et al.*, 1984b). Some of the isolated alkaloids showed antibacterial (Van Beek *et al.*, 1984d) and analgesic (Ingkaninan *et al*., 1999) effects.

319. *Tabernaemontana paisavelensis*: The resin is used, in Mexico, to remove warts (Van Beek *et al.*, 1984b).
320. *Tabernaemontana pandacaqui*: The milky juice is employed for healing wounds and to reduce swellings. The different parts are used against dysentery, snakebite, to cure disorders of the stomach and intestines, pain and inflammation (Van Beek *et al.*, 1984b; Taesotikul *et al.*, 2003). The plant extracts possess anticancer, antibacterial, toxic (Van Beek *et al.*, 1984b), hypotensive (Taesotikul *et al.*, 1989) activities. Some of the isolated alkaloids exhibited hypotensive, CNS depressant, anti-inflammatory, antipyretic, antinociceptive (Taesotikul *et al.*, 1998a,b, 2003), analgesic, hypothermic and a surface anesthesia (Okuyama *et al.*, 1992) effects.
321. *Tabernaemontana pauciflora* Blume (*Ervatamia blumeana* Mark gr.): The roots have been used for treatment of toothache. The plant extract and some of the alkaloids exhibited significant analgesic and hypothermic effects and also revealed a surface anesthesia (Okuyama *et al.*, 1992).
322. *Tabernaemontana peduncularis*: A decoction of the roots is used in Malaysia against abscesses in the nose. The plant is poisonous (Van Beek *et al.*, 1984b).
323. *Tabernaemontana penduliflora*: The juice from the berries is used for the healing of wounds. The latex of the fruit is applied in colds and for the healing of wounds. A crude ethanolic extract was lethal to mice at a dose level of 176 mg/kg (Van Beek *et al.*, 1984b). The alkaloid 10-hydroxycoronaridine was found to possess estrogen agonist and is distinctly more active than genistein (Masuda *et al.*, 2000).
324. *Tabernaemontana persicariifoia*: The plant and its latex are considered poisonous (Van Beek *et al.*, 1984b).
325. *Tabernaemontana polysperma*: Eastern Malaysia Sabah: The plant is used in Malaysia for headache (Van Beek *et al.*, 1984b).
326. *Tabernaemontana retusa*: The plant is used as an emollient and against lung conditions (Van Beek *et al.*, 1984b).
327. *Tabernaemontana rimulosa*: The leaves boiled in milk induce sleep (Van Beek *et al.*, 1984b).
328. *Tabernaemontana rubro-striolata*: The latex is taken for stomach disorders, and the bitter leaves are used as a tonic (Van Beek *et al.*, 1984b).
329. *Tabernaemontana salzmannii*: Thr different parts are used as diuretic, against intestinal worms and to heal fractures (Van Beek *et al.*, 1984b). Some of the alkaloids, induce apoptosis cell death in human leukemic cells line THP-1 (Figueiredo *et al.*, 2010).
330. *Tabernaemontana sananho* Ruiz & Pav.: The plant is employed as a febrifuge, emetic, diuretic, calmative and for rheumatism and wounds (Van Beek *et al.*, 1984b). The root extract had leishmanicidal activity (Estevez *et al.*, 2007).
331. *Tabernaemontana siphilitica*: The root is usedfor rheumatism (Van Beek *et al.*, 1984b).
332. *Tabernaemontana sphaerocarpa* : The plant is considered very poisonous and is an ingredient of arrow poison. The latex is used against skin conditions. The leaves are applied externally to sprained ankles (Van Beek *et al.*, 1984b). The alkaloid biscarpamontamine B showed potent cytotoxicity (Zaima *et al.*, 2009).
333. *Tabernaemontana sralensis*: The fruits are used in treating eruptions of the skin and the roots against snake bites (Van Beek *et al.*, 1984b).

334. *Tabernaemontana stapfiana* Britten: The roots and stem barks are used in the treatment of abdominal problems, sexually transmitted infections and upper respiratory tract infections. The plant extracts showed antibacterial activity (Ruttoh *et al.*, 2009).
335. *Tabernaemontana stenosiphon*: The latex induces vomiting and is also purgative. The root is a tonic and febrifuge (Van Beek *et al.*, 1984b).
336. *Tabernaemontana undulata*: The leaves together with those of *Manihot esculenta* are useds as vermifuge. The latex is poisonous (Van Beek *et al.*, 1984b).
337. *Tabernaemontana ventricosa*: The latex is used to heal wounds and the bark for treating fevers (Van Beek *et al.*, 1984b).
338. *Tabernanthe iboga*: The plant is used in some African countries as a hallucinogen. The root in high doses greatly stimulates the central nervous system, causing hallucinations and stupefaction; in excess it may bring about death. It is much used to prevent fatigue and sleep when prolonged physical effort is required. The root also has anaesthetic properties and is employed as a febrifuge. The latex is used as an anthelmintic and the warmed leaves are rubbed on the gums in toothache. The latex of the bark is mixed with *Parquetina* and/or *Strophanthus* to give an arrow poison (Bisset, 1989). The plant contains water soluble insulinotropic compounds (Souza *et al.*, 2011). Ibogaine (the predominant alkaloid of the root) has been claimed to be effective in treating opiate (heroin) addiction, stimulant (cocaine and amphetamine), abuse, alcohol dependence, cigarette smoking (nicotine dependence) and poly-drug abuse (Alburges and Hanson, 1999; Glick *et al.*, 1999). Ibogaine has been reported to have central nervous system (CNS) stimulant, anxiogenic, and hallucinogenic properties (Kontrimavičiūtė *et al.*, 2006). A very dilute extract of the roots containing ibogaine, inhibited the action of cholinesterase of human or horse serum. Ibogaine has an anticholinesterase activity of the same order as serine (Vincent and Sero, 1942). It is also hypotensive, hyperthermic, and diuretic (Bisset, 1989). In addition to ibogaine's psychological effects, it produces various dose dependent physical effects: tremor, nausea and vomiting, ataxia, dystonia, light sensibility. At excessive levels, ibogaine causes convulsions, paralysis and death by arrested respiration (Kontrimavičiūtė *et al.*, 2006; Gallo *et al*., 2009). Human poisoning, causing in some cases the death, related to ibogaine's intake have been reported (Gallo *et al*., 2009; Papadodima *et al.*, 2013; Mazoyer *et al.* (2013).
339. *Thevetia ahouia*: The leaves and stems are used for the treatment in cancer (Bhanot *et al.*, 2011).
340. *Thevetia gaumeri*: The leaves and stems are used for the treatment in cancer (Bhanot *et al.*, 2011).
341. *Thevetia ahouia* A. DC.: The three cardenolides, isolated from the wood exhibited a a distinctive pattern of differential cytotoxicity (Jolad *et al.*, 1981; Decosterd *et al.*, 1994).
342. *Thevetia neriifolia* Juss. (Yellow oleander): The plant is bitter, acrid, cathartic, febrifuge, emetic, purgative, astringent to the bowels, useful in treatment of cardiac disorders, urethal discharges, worms, skin diseases, leucoderma, wounds, piles, eye troubles, itching, fevers, bronchitis, ringworms, wasp stings and measles (Kirtikar and Basu, 1984; Begum *et al.*, 1993a; Ayoola *et al.*, 2008). The plant is used to treat various inflammatory and cardiovascular diseases (Gangwar *et al.*, 2013). All parts of the plant are poisonous. The toxic principles in the plant are the cardiac glycosides. Ouabain had digoxin-like action on heart muscles. The cardiac glycosides, thevetin, peruvoside and neriifolin are as potent as *Digitalis* glycosides. One of them is even more potent than digoxin and has been marketed in Germany under the trade name Encordin (Gulati *et al.*, 2000). The plant extracts exhibited antibacterial (Gangwar *et al.*, 2013), antifungal, larvicidal and nematicidal activities (Gulati *et al.*, 2000). Digtoxigenin, neriifolin and

evomonoside, isolated from the roots of *T. neriifolia*, cultviated in Egypt, showed significant cytotoxicity against six cancer cell-lines (El Tanbouly *et al*., 2000).

343. *Thevetia peruviana* (Pers.) K. Schum. (Bush milk, be-still tree, lucky nut, yellow oleander): The plant contains a milky sap containing thevetin that is used as a heart stimulant but in its natural form is extremely poisonous, as are all parts of the plant, especially the seed. The toxins are cardenolides (e.g. thevetin, theveridoside, theveside, cerberin, peruvoside, perusitin and digitoxigenin). These cardenolides are not destroyed by drying or heating and they are similar to digoxin from *Digitalis purpurea*. They produce gastric and cardio toxic effects. seeds are used as abortifacient, purgative, in rheumatism and dropsy (Rajbhar and Kumar, 2014). The different parts are purgative and used for gastro-intestinal tract. The bark is febrifuge and alexiteric (Ayensu, 1981). In Brazil, it is reported as a poisonous plant (Agra *et al.*, 2007). Despite its toxicity, it has been used as an abortifacient, to treat congestive heart failure, malaria, leprosy, indigestion ring-worms, veneral diseases and even as a suicide material (Tewtrakul *et al.*, 2002). Ingestion of the seeds by either man or animal has been reported to result in severe cardiac toxicity (Oluwaniyi and Ibiyemi, 2007). The plant extracts exhibited inhibitory effects against HIV-1 reverse transcriptase and HIV-1 integrate (Tewtrakul *et al.*, 2002), antioxidant (Zibbu and Batra, 2012), antimicrobial (Patil *et al.*, 2008; Ambang *et al.*, 2010; Hammuel *et al.*, 2011; Dooh *et al.*, 2014), anti-inflammatory, molluscicidal (Kumar *et al.*, 2011b), antispermatogenic, piscicidal (Rajbhar and Kumar, 2014) and larvicidal against larvae of mosquitoes (Yadav *et al.*, 2013) activities. *T. peruviana*-based oil paint was reported as self-preserving against microbes and substantially protected wood from subterranean termite attack (Kareru *et al.*, 2010). The seed flavonoids showed anti-inflammatory property (Thilagavathi *eth al.*, 2010). Some of the isolated compounds had an anticancer and antiproliferate properties (Gata Gonçalves *et al*., 2003; Miyagawa *et al*., 2009).
344. *Thevetia thevetioides* (HBK.) K. Schum.The cardiotonic glycosides neriifolin and 2'-acetylneriifolin, isolated from the seeds exhibited both insecticidal and cytotoxic activities (McLaughlin *et al*., 1980).
345. *Trachelospermum asiaticum* Nakai: The stems and leaves of have been used in Japan as a tonic component in oriental crude drugs (Abe and Yamauchi, 1981).
346. *Trachelospermum asiaticum* var. *intermedium*: Several flavone glycosides and related phenolic compounds from the leaves showed strong inhibitory activity against xanthine oxidase (Hosoi *et al.*, 2008).
347. *Trachelospermum gracilipes*: The plnt has been used in Taiwan for treating hepatitis (Lin *et al.*, 1992a).
348. *Trachelospermum jasminoides* Lem.: The plant is used to treat inflammatory conditions, rheumatism, heal abscesses and ulcers, and sooth laryngitis (Li *et al.*, 2003). The plant extracts and/or some isolated compounds showed antiviral (Van den Berghe *et al.*, 1978), anti-inflammatory (Choi *et al.*, 2012; Li *et al.*, 2003), antifatigue (Tan *et al.*, 2010f, 2011c), xanthine oxidase inhibition (Nishibe *et al.* 1987) activities and a relaxation effect on the histamine-induced contraction of tracheal muscles (Fujimoto *et al.*, 1992).
349. *Trachelospermum lucidum*: Some of the isolated compounds from the aerial parts have inhibitory activity against lipoxygenase (Ahmad *et al.*, 2005a).
350. *Urechites andrieuxii* Muell. Arg.: The plant is used for the treatment of cutaneous leishmaniasis. The plant extracts exhibited antileishmanial, anti-inflammatory, cytotoxic, antiatherogenic and depressant activities (Chan-Bacab *et al*., 2003; Adebayo *et al.*, 2013).

351. *Urechites suberecta* Muell. Arg. (*Echites neriandra* Griseb): The plant is poisonous. The powder of the leaves applied to the nostrils causes violent sneezing (Bowrey, 1878).
352. *Vallaris glabra*: The plant extracts showed antiproliferative (Wong *et al.*, 2011a,b) and antiplasmodial (antimalarial) (Wong *et al*., 2011b, 2014b) activities. The cardenolide acoschimperoside P 2'-acetate, showed a strong cytotoxicity (Rifai *et al.*, 2011).
353. *Vallaris solanaceae* Kuntze (syn.: *Vallaris heynei*): It is used against ring worms and skin infections, for sores and wounds (Ahmed *et al.*, 2010a; Karmakar *et al.*, 2011). The milky juice is a mild irritant (Kirtikar and Basu, 1984). The plant extracts showed analgesic (Karmakar *et al.*, 2011; Punam *et al.*, 2014), anti-inflammatory (Punam *et al.*, 2014), antioxidant (Karmakar *et al.*, 2011), antibacterial, antifungal (Vagdevi *et al.*, 2011), anticancer (Karmakar *et al.*, 2011), 2014b), antidiarrhoeal (Ashikur *et al.*, 2011b) and antiulcer (Das *et al.*, 2014) activities. The mixture of glycosides extracted from the leaves possesses a powerful digitalis like activity (Vohra and De, 1961). A pharmacological study revealed that the glycosides raised the arterial blood pressure of dogs and exhibited a stimulant action on all involuntary muscles (Jamwal *et al.*, 1961). *O*-Acetyl-solanoside, isolated from the plant showed potent cardiotonic activity (Vohra *et al.*, 1966) and vallarisoside exhibited cytoxic activity (Ahmed *et al.*, 2010a).
354. *Vallesia antillana* Wood: Some of the isolated alkaloids e.g. apparicine and vallesine showed antibacterial activity (Rojas Hernandez *et al.*, 1977; Rojas Hernandez, 1979).
355. *Vallesia dichotoma* Ruiz et Pav: The plant extracts had a hypotensive action. The toxic action is low (Gutierrez-Noriega, 1938, 1950). An alkaloid, from the plant, exerts a strong histamine type of effect (Carcamo, 1936).
356. *Vallesia glabra* (Cav.) Link.: The leaves are used for the treatment of diabetes, snake bites (Bussmann *et al*.., 2008) and as a vulnerary agent (Scarpa, 2000). The bark extract exhibited antimalarial activity (Bourdy *et al.*, 2004).
357. *Vinca erecta*: The alkaloid vincamine, from the plant, caused a decrease of arterial pressure. Even at low concentration (0.08 mg/kg) it exerted an essential activity on uterus muscles of pregnant eabbits and hamsters (Kurmukov and Sultanov, 1965). The alkaloid vinervine, isolated from the plant has hypotensive effect (Kurmukov, 1967).
358. *Vinca herbacea* Waldst. Kit: The total alkaloids exhibited hypotensive effect and was able to induce a curare-like action. Similarly, a mixture of alkaloids has been shown to produce spasmolytic effects. Pharmacological studies have demonstrated that some of the alkaloids possess cardio-stimulating, antiarythmic, antibacterial, apoptotic, antioxidant and antiradical effects (Gagua *et al.*, 2011; Gülçin *et al*., 2012).
359. *Vinca major* L. (Large periwinkle): It has been used as abortifacient, astringent, and tonic. Both *V. major* and *V. minor*, alkaloids exhibit hypotensive effects. The leaves of *Vinca* species, especially those of *V. major* and *V. minor*, have been used for constipation, as a diuretic, appetizer and anti-fever agent (Boğa *et al*., 2011). The alkaloid extracts of both species were found to have high lipid peroxidation inhibitory, DPPH radical scavenging and anticholinesterase activities (Bahadori *et al.*, 2012). Perivincine, from *V. major*, exhibited hypotensive activity (Farnsworth *et al.*, 1960).
360. *Voacanga africana* Stapf. (syn. *Voacanga lutescens* Stapf., *Voacanga boehmii* K. Schum.) : The different parts are used as as cardiotonic, antimicrobial (Pegnyemb *et al*., 1999) and to treat dysmenorrhea, kidney trouble, spasms of the heart, fever, diarrhea, toothache, sores, hypertension, and to improve mental alertness (Hedberg *et al.*, 1982; Lo *et al.*, 2011). The plant extracts and/or alkaloids were found to inhibit capsaicin-induced contraction (Lo *et al.*, 2011) and showed free radical scavenging activity (Ayoola *et al.*, 2008). Some of the isolated alkaloids possess remarkable cardiotonic, cytotoxic, antimicrobial (Ramanitrahasimbola *et al*., 2001), antiplasmodial (Diavara *et*

al., 1984) and potent cannabinoid CB1 receptor antagonistic (Kitajima *et al.*, 2011) activities. Vobtusine was demonstrated to be a cardiac depressor (Hussain *et al.*, 2012).

361. *Voacanga foetida* (Bl.) Rolfe: The alkaloid lombine showed antibacterial activity (Hadi and Bremner, 2006).
362. *Voacanga globosa*: The alkaloid globospiramine exhibited high antituberculosis and acetylcholinesterase inhibition activities (Macabeo *et al.*, 2011).
363. *Voacanga thouarsii*: Some of the isolated alkaloids exhibited antituberculosis and acetylcholinesterase inhibition activities (Kunesch *et al*., 1977; Hussain *et al.*, 2012).
364. *Willughbeia edulis* Ridl. (*Ancylocladus cochinchinensis* Pierre, *Willughbeia cochinchinensis* (Pierre) K. Schum., and *Willughbeia martabanica* Wall.): The latex is used to treat sores, yaws, jaundice, heartburn, and diarrhea (Wiart, 2006).
365. *Winchia calophylla* A. DC.: The plant is used in the treatment of cough, asthma, chronic bronchitis and as expectorant. Loganin, paeonol, *N* (4)-methyl akuammicine, and cantleyine exhibited a moderate relaxation effect on isolated smooth muscles of guinea-pig tracheal spirals and lung strips and may be the bioactive components responsible for the bronchodilation produced by the plant (Zhu *et al.*, 2002, 2005). Two of the isolated alkaloids showed weak activity against A-549 cell line (Gan *et al.*, 2006).
366. *Wrightia antidysentrica* R. Br. (= *Holarrhena antidysentrica* (Roxb) Wall): The bark was a renowned medicine against dysentery, especially amoebic dysentery, diarrhea and fever (Neuwinger, 1996).
367. *Wrightia arborea* (Densst.) Mabb.: The plant is used as antidiarrhoeal, to relief from toothache, menstrual and renal complaints, snake-bite and scorpion-stings (Divakar *et al.*, 2010). The plant extracts showed antibacterial (Khyade and Vaikos, 2011), antinociceptive and anti-inflammatory (Nahar *et al.*, 2013) activities.
368. *Wrightia coccinea* (Lodd.) Simson: The aqueous exract of the bark is used for treatment of blood pressure (Singh *et al.*, 2014).
369. *Wrightia javanica* DC.: The alkaloid, wrightiamine A, isolated from the leaves, exhibited cytotoxic activity (Kawamoto *et al.*, 2003).
370. *Wrightia pubescens* R. Br. (*Anasser lanitii* Blanco, *Wrightia annamensis* Eberh. & Dubard, *Wrightia calycina* A. DC., *Wrightia candollei* S. Vidal, *Wrightia javanica* A. DC., *Wrightia lanitii* (Blanco) Merr., *Wrightia spanogheana* Miq., and *Wrightia tomentosa* var. *cochinchinensis* Pierre ex Pierre): The Javanese ingest a few drops from the seeds to stop dysentery (Wiart, 2006).
371. *Wrightia tinctoria* R. Br.: The different parts are used as antidiarrhoeal, antidysentric, galactagogue, antihaemorrhagic, aphrodisiac, anthelmintic, antipyretic, febrifuge, stomachic, laxative, toothache, tonic, analgesic, carminative, astringent, aphrodisiac and diuretic. It is employed in treatment of jaundice, seminal weakness, flatulence, leprosy, epilepsy, psoriasis, haemorrhoids, helminthiasis, piles, skin diseases, scorpion sting, snake bite and dog bite (Bigoniya *et al.*, 2008; Jain and Bari, 2010; Khayde and Vaikos, 2011, 2014; Devi and Divakar, 2014; Srivastava, 2014). Oil prepared from fresh leaves of plant with coconut oil has been assigned to be analgesic, anti-inflammatory, antipyretic, and to be effective in the treatment of psoriasis (Jose and Joji, 2014). Extracts of the different parts of the plant possess the following activities: antinociceptive (Reddy *et al*., 2002), anti-inflammatory, hypnosis, diuretic (Bigoniya *et al.*, 2008), immunomodulatory (Thabah *et al.*, 2009; Sathyanarayanan and Rajasekaran, 2012), antiviral (Selvam *et al.*, 2009), cytotoxic (Sathyanarayanan *et al.*, 2009; Selvam *et al.*, 2009), antibacterial (Khyade and Vaikos, 2011; Moorthy *et al.*, 2012), antifungal (Moorthy *et al.*, 2012; Nath *et al.*, 2014), antidiabetic (Raj *et al*, 2009; Khyade and Vaikos, 2014), analgesic (Aleykutty *et al.*, 2011), anti-inflammatory (Sethuraman *et al.*,

1984; Tharkar *et al.*, 2010; Nath *et al.*, 2014), hypolipidemic (Nath *et al.*, 2014), wound healing (Divakar and Devi, 2012), hepatoprotective (Bigoniya and Rana, 2010), diuretic (Sathianarayanan *et al.*, 2011), anthelmintic (Rajalakshmi *et. al*. 2013), antioxidant (Ramalakshmi *et al.*, 2012; Kumar *et al.*, 2014), antifertility (Keshri *et al.*, 2008), hypotensive, antiulcer, gastroprotective, antidiarrheal, central depressant, muscular relaxant, anticonvulsant, antimalarial, larvicidal (Khyade and Vaikos, 2014) and antipsoriatic (Dhanabal *et al.*, 2012).

372. *Wrightia tomentosa* Roem. & Schult.: The plant is reported as haemostatic, antipyretic, anticancer and used to treat stomachache, toothache, fever, hemorrhage, arthritis, renal complications, menstrual disorders, amoebic dysentery, snake bite and envenomation of scorpion (Chakravarti *et al.*, 2012; Srinivas *et al.*, 2013). The plant extracts exhibited antioxidant (Nagarajan *et al.*, 2008a), antimicrobial (Nagarajan *et al.*, 2006, 2008b; Srinivas *et al.*, 2013) and cytotoxic (Selvam and De Clereq, 2012) activities. Some of the isolated compounds (isatin, indirubin and indigotin) exhibited cytotoxicity and indirubin displayed marked cytostatic properties (Selvam and De Clereq, 2012). Other cytotoxic compounds have been identified from the plant. The isoflavone wrightiadione displays cytotoxic activity against the murine P388 lymphocytic leukemia cell line (Lin *et al.*,1992b). Oleanolic acid and urosolic acid inhibited cell proliferation of MCF-7 and MDA-MB-231 cells (Chakravarti *et al.*, 2012). β-Amyrin acetate and β-amyrin palmitate showed antidyslipidemic activity (Maurya *et al.*, 2012).