
ETHNOMEDICINAL USES OF PLANT MASTICATORIES IN NIGERIA: AN OVERVIEW

¹OKEKE, S.I. , ²IZUEGBUNAM, C.S. AND ³EGWUATU C.G.

^{1,2,3}DEPARTMENT OF SCIENCE LABORATORY TECHNOLOGY, FEDERAL
POLYTECHNIC, OKO, ANAMBRA STATE, NIGERIA.

Email: chineloscholastica@gmail.com

Abstract

Plants have been of immense use to man since time immemorial and have been associated with life and culture of man. Apart from being used as sources of food, some plants have been used as masticatories in different parts of the world. In Nigeria, certain plants have been used as masticatories and these plants have been reported to possess the potentials to cure different diseases. The plant parts used as masticatories include fruits, seeds, leaves, stem bark, root and rhizome. Some of these masticatories are largely used while others are in minimal use in Nigeria. In the present review, a total of 28 species belonging to 13 families of angiosperms are recorded to be utilized as masticatories in Nigeria. Moreover, the curative properties of some of these masticatories have been recorded and provided in this review.

Keywords: Ethnomedicine, Masticatory Plants, Medicinal Uses.

Introduction

Since human existence, plants have been involved in various activities and associated with life, culture and tradition of man. Plants are sources of food, fibre, shelter and medicine. Equally, plants are used as masticatories by different cultures worldwide (Borborah *et al.*, 2014). The practice of chewing plant products for pleasure or for psychological benefits is common in many parts of the globe including Nigeria. Some of the masticatory plants are grown in all parts of Nigeria while others are cultivated in particular parts of the country and distributed to other parts of the nation. The consumption of a particular plant masticatory is common among the various ethnic groups in Nigeria. The plants used as masticatories are often locally available and either cultivated or wild or even semi-domesticated and often sold in the local markets (Barukial and Sarmah, 2011) or hawked around. Some masticatories are heavily consumed in some parts of Nigeria while yet others are minimally used in other areas. In this review, the ethnomedicinal uses of some masticatory plants in Nigeria are elucidated.

Plant Masticatories in Nigeria

Nigeria is blessed with rich biodiversity of flora. Plants have been part of life and culture of man since civilization. In Nigeria, plants are used for food, clothing, shelter, medicine and other human requirements. Apart from food some plants are chewed in Nigeria for the derivation of pleasure and psychoactive benefits. These are the masticatory plants. In Nigeria, some plants used as masticatories have been claimed to have medicinal properties against certain diseases. The plant parts used as sources of masticatories include fruits, seeds, stem bark, leaves and root (Table 1). Some of these masticatories are used only in special occasions and some others are used regularly and have become part of the culture and tradition of the people so much so that they have become indispensable in their social, traditional and religious activities of the people. Some people consume masticatories as a habit and certainly oblivious of the curative properties of such plants against diseases (Ngoka *et al.*, 2000). The present discourse is the outcome of an extensive review of literature to unravel the plant masticatories used in Nigeria and their ethnomedicinal uses.

Table 1: Masticatory plants, scientific names family common names, parts used and mode of use.

S/N	Scientific Name	Family Name	Common Names (English)	Vernacular Name	Parts used	Mode of Use
1	<i>Aframomum granum-paradisi</i> K. Schum.	Zingiberaceae	Aframomum lily, Grains of paradise		Seeds	Seeds chewed fresh or dried as substitute to grains paradise, (2012)
2	<i>Aframomum melegueta</i> K. Schum.	Zingiberaceae	Alligator pepper	Ose-oji (Igbo), chitta (Hausa), Ata- ire (Yoruba)	Seeds	Seeds chewed fresh or dried with or without kolanut (Medhi, 2011)
3	<i>Areca catechu</i> L.	Arecaceae	Arecanut palm or betelnut palm		Nuts	Nuts chewed with betel leaf (Brown 1995)
4	<i>Areca triandra</i> Roxb. Ex buch- Han	Arecaceae	Arecanut palm		Nuts	Nuts chewed with betel leaf as inferior substitute of betel nut palm (Blombey and Rod, 1992).
5	<i>Artocarpus altalis</i> (park) fosberg	Moraceae	Breadfruit	Ukwa-beke (Igbo), barafutu	Fruit pulp, seeds	Ripe fruit pulp eaten, seeds chewed cooked or

6	<i>Artocarpus heterophyllus</i> Lam	Moraceae	Jack-fruit	(Hausa), Barefut (Yoruba) Ukwa-beke (Igbo), Barafutu (Hausa), barefut (Yoruba)	Fruit pulp, seeds	roasted (Facciola, 1998) Ripe fruit pulp eaten; seeds chewed cooked or roasted (Facciola, 1998)
7	<i>Calamus rotang</i> L.	Arecaceae	Rotang, calamus, sweet sedge or sweet root		Fruit	Fruit chewed raw (Gupta & Chaphalkar, 2017) as a substitute of betelnut
8	<i>Cola acuminata</i> (P.Beauv.)Schott & Endl.	Sterculiaceae	Kola, colanut or cola	Oji-igbo (Igbo). Ajuaru (Hausa), obi abata (Yoruba)	Nuts (seeds)	Nuts chewed raw with or without grains of paradise or groundnut paste
9	<i>Cola nitida</i> (Vent.) Schott & Endl.	Sterculiaceae	Kola, colanut or cola	Oji-awusa (Igbo), Goro or gworo (Hausa) Obigbanja (Yoruba)	Nuts (seeds)	Nuts chewed raw with or without grains of paradise or groundnut paste
10	<i>Cola caricifolia</i> K.Schum	Sterculiaceae	Monkey kola	Okokoro (Igbo), ogugu (Yoruba)	Nuts (seeds)	Nuts chewed infrequently
11	<i>Cola laurifolia</i> , Mast.	Sterculiaceae	Laurel-leaved kola	Ufa (Igbo), karanga (Hausa), Aworiwo (Yoruba)	Nuts (seeds)	Nuts chewed raw
12	<i>Cola millenii</i> K.Schum	Sterculiaceae	Monkey kola?	Achiokokoro (Igbo), Atewoedum of obi-edum (Yoruba)	Nuts	Nuts chewed raw
13	<i>Cyperus esculeutus</i> L.	Cyperaceae	Tiger Nut or Guinea rush	Aktawusa (Igbo), Aya-aya (Hausa), Imumu (Yoruba)	Nuts	Nuts chewed fresh

14	<i>Cyperus rotundus</i> L.	Sterculiaceae	Nut grass		Nuts	Nuts chewed fresh or dried (Kamala <i>et al.</i> , 2018).
15	<i>Dennettia tripetala</i>	Amonaceae	Pepper fruit	Nmimi (Igbo), Ala Igberi (Yoruba)	Fruits	Fruits chewed raw
16	<i>Diospyrus mespiliformis</i> Hochst. exA.DC.	Ebenaceae	West African Ebony Tree	Kauran (Yoruba), Kaiwa (Hausa)	Fruits	Fruits chewed raw or dried (Burkil, 2004)
17	<i>Erythroxylum coca</i> L.	Erythroxylac-eae	Red wood or coca		Leaves	Leaves chewed with lime (Biondich & Joslin, 2016).
18	<i>Ficus pubigera var maliformis</i> (King) Corner	Moroceae			Leaves, small fruits	Fruits and leaves chewed with betel leaves (Guillermo & Santiago 2016)
19	<i>Ficus sycamorus</i> L.	Moroceae	Mulberry fig, bush fish, strangler fig, sycamore or sycamore fig.		Fruits	Fruits chewed raw or cooked (Ruffo <i>et al.</i> , 2002)
20	<i>Garcinia afzelli</i> Engl.	Clusiaceae		Okuta (Yoruba)	Seeds	Seeds chewed raw as inferior substitute of bitter kola infrequently
21	<i>Garcinia kola</i> Heckel	Clusiaceae	Bitter kola	Ugoro or Agbainu (Igbo), orogbo (Yoruba)	Seeds	Seeds chewed raw (Facciola, 1998)
22	<i>Napoleona volgelii</i> Hook. & Planch.	Lecythidaceae	Wallia	Akbodo (Igbo), Boribori (Yoruba)	Fruits and Bark	Fruits and bark chewed with colanuts (Burkil, 2004; Aka <i>et al.</i> , 2007)
23	<i>Nauclea latifolia</i> Sm.	Rubiaceae	African peach	Nwaohua kanshi (Igbo), Igiyaa (Hausa), Egbesi (Yoruba)	Fruits	Fruits chewed raw (Facciola, 1998).

24	<i>Nicotiana tabacum</i> L.	Solanaceae	Tobacco	Utaba or Anwuru (Igbo), Taba (Hausa), Kataba (Yoruba)	Leaves	Dried leaves chewed in some localities
25	<i>Nicotiana rustica</i> L.	Solanaceae	Wild Tobacco, Aztec tobacco	Utaba Offia (Igbo)	Leaves	Dried leaves chewed as a stimulant (Moerman, 1998)
26	<i>Phoenix dactylifera</i> L.	Arecaceae	Date palm	Kijinjiri (Hausa), Elekikobi (Yoruba)	Fruits	Fruits eaten dried (Blomberg & Rodd, 1992)
27	<i>Phyllanthus muellerianus</i> (Kuntze) Exell.	Phallanthace-ae		Ogu-ozu (Igbo), mijiriyar Kurumi (Hausa), Asasa (Yoruba)	Fruits	Fruits eaten raw (Burkil, 2004)
28	<i>Piper betle</i> L.	Piperaceae	Betel pepper, Betel leaf vine or Betel		Leaves	Fresh leaves chewed with betel nuts (Medhi, 2011)

Ethnomedicinal Uses of Masticatory Plants

Plants have been associated with the life and culture of human existence since the dawn of civilization. Human beings have depended on nature for their life requirements as sources of medicines, shelters, food stuffs, fragrances, clothing, flavours, fertilizers and means of transportation. The importance of medicinal plants in traditional medicine and as raw materials in pharmaceutical industries cannot therefore be over emphasized. The use of medicinal plants is increasing worldwide due to the tremendous expansion of traditional medicine and a growing interest in herbal treatments. Plants are used in medicine to maintain and augment health-physically, mentally and spiritually as well as to treat specific conditions and ailments (Idu, 2009). For the large proportions of world’s population, medicinal plants continue to show a dominant role

in the health care system and this is mainly true in developing countries like Nigeria, where herbal medicine has continuous history of long use.

Apart from providing various needs of humans plants have also been used as masticatories by different ethnic groups through the world (Borborah *et al.*, 2014). Some of these masticatory plants have been reported to have been used in the treatment of certain human ailments. The medicinal uses of some of the major masticatory plants in Nigeria are enumerated in Table 2. The ethnomedicinal uses of these masticatory plant species include acting as stimulants, antiseptic, carminative, anthelmintic, expectorants, laxatives, galacturogogue, aphrodisiac, purgatives, anticonvulsant, sedatives etc. They are used for treatment of a large number of diseases including coughs, fevers, malaria, headache, stomachache, ulcers, cancers, tuberculosis, rheumatism, arthritis, asthma, dysentery, diarrhea, jaundice, diabetes, bronchitis, cataract, skin diseases, hemorrhoids, anemia and so on. The plant parts used for medicinal purposes include fruits, seeds, leaves, stem bark, root, root bark and tubers (rhizomes). The masticatory plant parts are often used either fresh or dried, roasted or in various preparations. The disease curative properties of these selected masticatory plants are attributable to the bioactive substances they contain. Out of 35 species, the medical values of 20 species belonging to different families are recorded in this study. The plants, plant parts used, bioactive substances in them, mode of preparation and mode of administration and specific medicinal uses are listed in Table 2.

Table 2: List of some major Masticatory Plants in Nigeria and their Ethnometicinal Uses

S/N	Scientific Names	Parts Used	Bioactive substances	Mode of preparation & Administration	Ethnomedicinal uses
1	Aframomum granum-paradisi K.Schum (Syn. Ammomum medegueta)	Seeds, rhizome	Essential oils resin, (Gill, 1992)	Seeds eaten raw or ground into powder, Rhizome made into powder (Gill, 1992)	Treatment of diarrhea, heart diseases, obesity, inflammations, convulsions and with antibacterial, anti-lipidotic properties (Ngoka

				<i>et al.</i> , 2000) and to remedy infertility, to promote conception to induce sexual stimulation, purgative, galactagogue and anthelmintic (Wiersema, 2019).
	<i>Aframomum ineleghulta</i> K. Schum	Fruits, Seeds, leaves, roots, whole plant	Volatile oil- paradol, resin, tanius, alkaloid- piperine, saponins, steroids, cardiac glycosides flavonoids, terpenoids and phenolis (Doherty and Olaniran, 2010)	Decoction of root or leaves, whole plant and pulverized seeds, seeds chewed raw, sometimes the decoction of leaves with those of lemon grass and mango (Gill, 1992)
3	<i>Areca catechu</i> L.	Nuts	Alkaloids are coline, arecaine and guvacine, tanus (Gill, 1992), saponins, phenols, reducing sugar, triterpenoids and glycosides (Rajamani <i>et al.</i> , 2016)	Ripened dried or fresh nuts chewed or fermented or after boiling, baking and washing or the dried nuts made into powder. Nut is also used wrapped in betel leaves with or without slaked lime (Burkel, 2004)
4	<i>Artocarpus heterophyllus</i> Lam	Fruits, seeds, young flowers, leaves, root, stem bark	Tannins, flavonoids, phenols, carbolic acids, coumarins, saponins, phytosterols and artostenone (Thapa <i>et al.</i> , 2016).	Ulcers diarrhea, boils, stomach ache, wounds, fever, skin diseases asthma, abscesses snake bite, glandular swellings, dysentery, diabetes, gall stones, pains, ear problems, biliousness, sprains and fractures (Sachin, 2015) as tonic, aphrodisiac, abortifacient, vermifuge and laxative, and with sedative, anti-syphilitic, cooling, anti-microbial, antioxidant, anti-inflammatory, anti-

5	<i>Cola acuminata</i> (P. Beauv.) Schott. & Endl.	Nuts (seeds), stem bark	Alkaloids caffeine, theobromine, kolatine, thoophylline), anthocyanum, polyphenols, tannins, saponins (Dewole <i>et al.</i> , 2013)	Nuts chewed or ground into powder; or used nuts can be boiled together with leaves of <i>Moringa lucida</i> and the liquid taken internally, nuts ground to a fine paste together with leaves of <i>Scoparia dulcis</i> , dissolved in a little water and a few drops and administered orally to babies; Infusion of stem bark mixed with ginger and a little pepper is taken internally (Chevallier, 1996)	cholinergic, anti-diabetic, and immuno-modulatory effects (Thepa <i>et al.</i> , 2016) Digestive tonic, a stimulant, with diuretic astringent, anti-depressant, antioxidant, anti-cholinesterase, high radicals scavenging neuroprotective properties, and increases energy and strength, dispelling drowsiness, staving off hunger and memory improvement (Oboh <i>et al.</i> , 2014), to cure diarrhea, dysentery, fevers, vomiting, headaches, migraine, piles, coughs, skin diseases, ulcers, toothaches, intestinal diseases, depression, asthma, constipation, eye problems (Burkill, 2004); neuro-degenerative diseases including Alzheimer's disease (Guillemin <i>et al.</i> , 2006).
6	<i>Cola nitida</i> (Vent.) Schott. & Endl.	Nuts, leaves, twigs, stem bark, flowers	Alkaloids caffeine, theobromine, theophylline; catechin, L. epicatechin, kolatin, taninins, saponins, flavonoids, procyanidins, proathocyanins, sterols (Adesanwo <i>et al.</i> , 2017)	Nuts chewed raw; decoction of leaves, twigs, stem bark and flowers; nuts made into paste used as poultice (Burkil, 2004)	Flu, sore-throat, wounds, inflammations, fever, dysentery, migraines, neuralgia, nausea, diarrhea, boils, gastromtestinal disorders, physical and mental exhaustion (Adeosun <i>et al.</i> , 2017); lessens fatigue, prevents hunger pangs, reduces need for sleep, thirst and hunger (Lim, 2012); as a poison antidote diuretic, stimulant, aphrodisiac, and with anti-tussive, anti- depressant, anti-oxidant antibacterial, and antifungal activities (Rhyan and Ray, 2004)
7	<i>Cola launfolia</i> Mast.	Seeds, stem	Tannins, flavonoids,	Seeds chewed raw; Decoction or infusion	Diarrhea, dysentery and typhoid fever (Kakpo <i>et al.</i> ,

		bark, twigs	glycosides, alkaloids, saponins, steroids and terpenoids (Ejikeme <i>et al.</i> , 2014)	of seeds, twigs, and stem bark (Burkil, 2004); stem bark made into powder (Gill, 1992).	2019), and toothache (Abd El-Ghani, 2016)
8	<i>Cyperus esculentus</i>	Nuts, tubers, roots	Alkaloids, flavonoids, tannins, glycosides, terpenoids and sterols (Sanchez-Zapata <i>et al.</i> , 2012).	Nuts chewed raw decoction of nuts and tubers (Burkil, 2004), tubers and roots (Omeman <i>et al.</i> , 2018)	Flatulence, indigestion, colic, diarrhea, dysentery, debility, excessive thirst; with a heating and drying effect on digestive system, promote urine production and menstruation; as aphrodisiac, analgesic, stomachic, carminative, diuretic, astringent, emmenagogue, stimulant, tonic, vermifuge and with diaphoretic, antispasmodic, and antibacterial properties (SriRanjani, 2013).
9	<i>Cyperus rotundus</i> L.	Roots, tubers	Essential oils, phenols, ascorbic acids, tannins, saponins, steroids, anthraquinones, alkaloids, and phlobannins (Omeman <i>et al.</i> , 2018).	Tuber chewed raw or dried; decoction of tubers, and roots (Omeman <i>et al.</i> , 2018).	Spasms, pains, digestive problems, menstrual complaints, cervicals cancer, epilepsy, diarrhea, diabetes, pyress, inflammation, and malaria (Peerzada <i>et al.</i> , 2015) with analgesic, antibacterial, antispasmodic, anti-tussive, aromatic, astringent, carminative, diaphoretic, diuretic, tonic, emmenagogue, sedative, stimulant, stomachic, hepatoprotective activities and as a vermifuge (Kamala <i>et al.</i> , 2018)
10	<i>Dennettia tripetala</i> Bak.f.	Fruits, seeds, leaves, roots	Alkaloids, flavonoids, terpenoids, tannins Steroids, saponins, and cardiac	Fruits and seeds chewed fresh or dried, with kolanuts or dried seeds made into powder; decoction of leaves, seeds and roots	Cough, fever, toothache, diabetes, nausea, diarrhea, gastro intestinal diseases, infantile convulsion, eye problems, and typhoid fever (Okpala, 2016); with chemotherapeutic,

			glycosides (Okwu and Morah, 2004)	(Okwu and Morah, 2004)	stimulant, antimicrobial, analgesic, anti-inflammatory, insectisidal, antihyperglycemic, antioxidant properties (Iseghohi, 2015): anti ulcer, anti-cancer, antiallergic, anthelmintic, anti-nociceptive anti-viral and anti-emetic activities (Okpala, 2016)
11	<i>Diospyros mospiliformis</i> Hochst. Ex ADC.	Fruits, leaves, roots, stem bark	Tannins, saponins, terpenoids, steroids, naphthoquinone (plumbagin), anthraquinones, and scopolamine (Ahmed and Mahmud, 2017); volatile oil, cardiac glycosides, alkaloids and glycosides (Ebbo <i>et al.</i> , 2014)	Decoction or infusion of leaves, roots and stem bark; leaves and fruits chewed fresh or dried; roots roasted and pulverized (Ahmed and Mahmud, 2017)	Fevers, dysentery, pneumonia, yaws, syphilis, leprosy, dermatomycosis, menorrhoea, diarrhea, sores, gingivitis, tooth ache, otitis, stomachaches, ulcers, bruises, furuncles, headache, arthritis, skin infections, cough, jaundice, bronchial diseases, and wound dressing for (Burkil, 2004); with antibiotic, anti-haemorrhagic, fungistatic, haemostatic, mild laxative, stimulant, astringent, vermifuge, anti-cancer, analgesic, anti-inflammatory, hypoglycemic, anti-plasmodial, antioxidant, anthelmintic, antiproliferative, and antimicrobial effects (Ahmed and Mahmud, 2017).
12	<i>Erythroxylum coca</i> Lam Erythroxylaceae	Leaves	Alkaloids Cocaine, tropacocaine and cinnamoyl cocaine: phenols: flavonoids, and tannins (Verde <i>et al.</i> , 2016)	Leaves chewed with lime; decoction or infusion or maceration of leaves; plant burnt into ashes (Burkil, 2004)	Diarrhea, asthma, cancer, snake bite ulcers, nausea, altitude sickness, gastro intestinal disorders, stomach pain, intestinal spasm, indigestion, constipation to endure/ relieve hunger, thirst and physical stress (fatigue) and with anti-rheumatic, antioxidant, anticarcinogenic and anti-

13	<i>Garcinia afzelli</i> Engl.	Seeds, stem, root barks, twigs	Flavonoids, tannins, terpenoids, anthocyanins garcinol and isogarcimol (Hemshekhori <i>et al.</i> , 2011)	Seeds eaten raw, decoction of stem, twigs and root barks (Facciola, 1998)	inflammatory (Verde <i>et al.</i> , 2016). Cough, stomach ache, cancer, obesity, oxidative stress, dysentery and with haemostatic, antiseptic, antioxidant, apoptotic, anticancer, anti- inflammatory, antibacterial, anti-viral, anti-fungal anti- ulcer, anti-protozoal, and aphrodisiac activities (Hemshakhar <i>et al.</i> , 2011)
14	<i>Garcinia kola</i> Heckel	Seeds, stem bark, root	Tannins, saponins, alkaloids, cardiac glycosides, flavonoids, apigenin, fisetin and bioflavonoids amentoflavone and kolaviron (Iwu <i>et al.</i> , 1999)	Seeds chew raw; decoctions of seeds and roots	Liver disorders, bronchitis, throat infections headache head or chest colds, cough, hepatitis, colic, toothache, dysentery maligant tumors, and respiratory ailments (Iwu <i>et al.</i> , 1999; Ekene and Erhirhie, 2014).
15	<i>Napoleon volgelii</i> Hook & Plauch	Fruits, stem bark, leaves, seeds, twigs	Flavonoids, tannins, saponins, terpenoids, resins, steroids and alkaloids (Aka <i>et al.</i> , 2007)	Fruits and bark chewed; Decoction/infusion of stem bark, leaves; twigs and fruit	Asthma cancer, cough, fever, peptic ulcer, diabetes, wounds, catarrh and with stimulant, antigenotoxic, antioxidant, tonic, analgesic, anti-inflammatory and hypoglycemic effects (Soladoye <i>et al.</i> , 2016; Ikumawoyi <i>et al.</i> , 2017).
16	<i>Naulea latifolia</i> Sim.	Fruits, root, stem bark, leaves	Alkaloid- strictosamine, tannins, flavonoids, saponins glycosides, cardiac glycosides anthraquinones phenols (Taiwe <i>et al.</i> , 2011),	Fruits and leaves eaten raw; decoction or infusion of stem bark and root; root dried and pulverized to obtain powder (Burkil, 2004)	Diabetes, fevers, indigestion, diarrhea, dental carries, malaria, dysentery, hypertension, epilepsy, wounds, sleeping sickness, gonorrhoea, heart diseases, rheumatism, vomiting (Gill, 1992; Taiwe <i>et al.</i> , 2011); with tonic analgesic, antimicrobial, anti- convulsant, sedative, and anti-

			inulin, secolridoid glycoside, didoroside, triterpene acids, quinovic acid (Gill, 1992)		pyretic, anti-nociceptive, anti-oxidant, anti-inflammatory, anti-ulcerogenic, anthelmintic, diuretic, anti-bacterial, anti-trypanosomal, anti-depressant, and anti-diabetic properties and as a fabrifuge and stomachic (Oyededeji-Amusa and Ashafa, 2019).
17	<i>Nicotiana tabacum</i> L.	Leaves, stem, root, seeds	Alkaloids- nicotine, coniine, nornicotine, anatabine and cotinine, inulin, saponin, tannins (Gill, 1992; Zhang <i>et al.</i> , 2018)	Fresh or dried leaves chewed; dried leaves ground into powder; decoction or infusion of dried leaves; fresh leaves made into poultice with oil from palm; crushed leaves made into ointment fresh root, stem and seeds taken orally	Rheumatic swelling, skin diseases, scorpion stings, painful piles, nausea, ulcers, gout, travel sickness, boils, wounds, baldness, bruises, sores, mouthlesions, stomatitis, bronchitis, pneumonia, asthma, indigestion, hoarseness, ringworms, painful tumors, convulsion, giddiness, depression, lassitude and show antispasmodic, discutient, stimulant, diuretic, emetic, expectorant, irritant, narcotic, intoxicant, sedative, sialogogue, anthelmintic and cholagogue, insect repellent activities (Gill, 1992; Binorka & Dilip, 2012).
18	<i>Phoenix dactylifera</i> L.	Fruits	Alkaloids, flavonoids, anthraquinones, steroide, saponins, terpenoids, and tannins (Adeosun and Onyedele, 2016)	Fruits chewed fresh or dried.	Malaria, fever, anema, asthma, bronchitis, cancer, catarrh, cough, diarrhea, fatigue, flu, gonorrhea, piles, sterility, stomache, thirst, toothache, tuberculosis, cold, edema, sorethroat, genito-urinary disorders, liver complaints, and with aphrodisiac, contraceptive, demulcent, diuretic, emollient, estrogenic, expectorant, laxative, and purgative

19	<i>Phyllanthus muellerianus</i> (Kuntze) Exelli.	Fruits, leaves, stem bark, roots, twigs, sap	Tannins, flavonoids, saponins, alkaloids, anthraquinones, terpenoids (Brussatti <i>et al.</i> , 2016)	Fruits eaten raw; leaves eaten together with young leaves of <i>Funtumia elastica</i> , infusion of young shoots, or leaves, decoction of leaves, or root bark or stem bark; infusion of leaves and roots, stem bark added to palm wine; leaves boiled with palm fruits; leaves pounded as poultice; leaf sap or stem sap applied; roots dried and powdered; decoction of young root and young leafy twigs (Burkil, 2004)	properties (Abdullahi <i>et al.</i> , 2012). Intestinal troubles, malaria, jaundice, urethral discharges, wounds, constipation, dysentery, chest complaints, anemia, toothache dysmenorrhea, venereal diseases, eye infections, fevers, skin eruptions, paralyses, rheumatism, diarrhea, stomachache, coughs, pneumonia, enlarged glands, gonorrhoea, sore throat, colds, sinusitis, sexually transmitted diseases (Burkil, 2004); as purgative, anemia, and febrifuge, aphrodisiac, and with antiplasmodial, antibacterial, anti-microbial, purgative, anti-emetic, cooling aperient properties (Brusotti <i>et al.</i> , 2011).
20	<i>Piper betle</i> L. Piperaceae	Leaves, essential oils	Essential oil-chavicol; tannins, alkaloids, saponins, steroids, terpenoids, alkaloids, phenolic compounds, allylpyrocatechol, hydroxyl-chavicol, piper betol, ethyl piper betol, piperol A, piperol B, chavibetol (Haslan <i>et al.</i> , 2015)	A mixture of leaves, seeds from Areca catechis and lime chewed, decoction or infusion of leaves; heated leaves or sap applied as poultice; essential oil from leaves administered (Gill, 1992).	Headache, bad breath, boils, bruises, abscesses, conjunctivitis, constipation, mastitis, leucorrhoea, wounds, ulcers, cough, asthma, nose bleeding, ulcerated noses, gums, and mucous membranes, eye infections, and with antioxidant, antiseptic, astringent, carminative, stimulant, expectorant, laxative, sialagogue, stomachic, tonic, antifungal anticaries, gastroprotective, anti-inflammatory, anti-ulcer and immunomodulatory effects (Fazal <i>et al.</i> , 2014)

Conclusion

The traditional medicine practitioners utilize medicinal plants in the treatment of various ailments. Masticatory plants equally provide important sources of drugs for treatment of diseases as revealed in the present review. These plants will provide a basis for investigation by modern scientific methods for possible discovery of novel drugs, which may be incorporated into the health care delivery system in Nigeria. This review might provide a base for further knowledge related to applications of masticatory plants in traditional medicine. The present communication therefore provides a useful source of information for practitioners of traditional medicine and medicinal plant researchers on the utilization of masticatory plants as medicinal plants. The multiple uses reported in this review indicate that scientific investigations are useful in the validation of traditional medicinal practices for the development of new therapeutic agents from masticatory plants in Nigeria.

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