

Common Herbs used as Preventives and Curatives against COVID-19 in Nigeria

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ABSTRACT

As the COVID-19 pandemic continues to ravage the world and a potent vaccine to combat the deadly virus is yet to be released, there has been a tremendous quest worldwide to find a cure through herbal medicine. In Nigeria, the pandemic situation is exacerbated by insufficient health care equipment and generally the deplorable state of the health sector. These limitations have obligated many citizens to rely on certain herbs that had been used previously for illnesses with similar symptoms to COVID-19. Thus, this review takes into cognizance; ten of such plants (herbs) touted as preventives and cures against COVID-19 with their vital botanical information and previously associated ailments.

INTRODUCTION

Towards the end of December 2019, in Wuhan China, a new RNA strain of virus responsible for the human corona virus (identified as COVID-19) officially recognized as SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus-2) by International Committee on Taxonomy of Viruses (ICTV) was discovered. Within few weeks after its discovery,

COVID-19 spread quickly across other regions of China and many countries of the world and got recognition as a pandemic by the World Health Organization (WHO).

Herbs have a long history of use as remedies against wide range of infections such as common cold, influenza, fever, and even herpes [1]. For centuries, herbs such as garlic, ginger, licorice and alligator pepper have been used to treat various respiratory infections such as the flu and pneumonia. It has been estimated that more than 70% of drugs are formulated from herbs. As an example, Artesunate and other related anti-malaria drugs are produced from artemisinin, a phytochemical extracted from *Artemisia annua* [2,3]. Different parts of plants are utilized in preparing herbal medicines and have been highly effective in nearly 80% of primary health care cases. They are believed to be more available, affordable, safe and natural; with fewer side effects compared to drugs. However, one of the problems associated with herbs in many countries of the world including Nigeria is that, more often than not, herbal and natural remedies are usually prepared under unhygienic conditions. Nigeria is one of the globally recognized countries in Africa for production of valuable herbal medicine for the treatment of various diseases affecting mankind. Countless number of herbal products currently in use for treating various global health challenges and diseases such as cancer, high blood pressure, stroke, heart diseases, diabetes and sickle cell anaemia has emerged from many regions in the country and as a result of this laudable achievement, concentration of research scientists in this field tends to increase on daily basis. During this period of COVID-19 pandemic, several organizations worldwide including government and private saddled with conducting research and formulation of herbal remedies from plants and plant products have raced into action by making efforts to join the global scientific communities in finding a cure to the deadly disease. Notable among these organizations whose products are currently undergoing evaluation at National Food and Drug Agency Commission (NAFDAC) for COVID-19 treatment is Forestry Research Institute of Nigeria in Oyo-State Nigeria.

In the emergence of the COVID-19 pandemic and with the unavailability of potent vaccines to combat this deadly virus, there has been a tremendous quest worldwide to find cures to the disease through herbal medicine as an alternative. Hence, this paper review highlights common herbs touted as preventives and cures against COVID-19 including their vital botanical information and previously associated ailments.

LITERIATURE REVIEW

COVID-19 herbs and their botanical information

Garlic: Garlic, *Allium sativum* (family Liliaceae) is a species of the genus, *Allium* popularly regarded world- wide as food supplement. It is native to Central Asia but now cultivated worldwide mainly because of its associated numerous medicinal benefits. The early men of medicine such as Hippocrates, Aristotle and Ebers Codex ascribed a lot of medicinal importance to this plant. Nowadays, it is used as condiment and traditional medicine to treat a lot of diseases. The world production of garlic ultimately comes from South Korea, Spain, India, China and United States. Garlic is one of those plants that have been widely investigated over several years and used for centuries to fight infectious diseases [4]. Most of the documented medicinal importance of garlic is associated with some of its constituent phytochemicals such as sulphur compounds, high trace mineral content, and enzymes. Allicin, S-allylcysteine sulfoxide is the dominant sulfur compound present in garlic at 10 mg/g in fresh garlic or 30 mg/g dry.

Bitter kola: Bitter kola (*Garcinia kola* Heckel) is an indigenous fruit tree of the family Guttiferae found in moist forests of western and central African countries such as Nigeria, Cameroun, Sierra Leone, Gabon and Congo

Brazzavile. It is of immense relevance in folkloric medicine and has proven to be effective against many diseases affecting mankind. Several laboratory investigations have documented information on its phytochemistry, pharmacognosy and toxicity. Virtually all parts of the plant are essential and utilized in various ways. However, the seeds are the most valued. Despite its astringent taste, it is a common snack chewed to remedy poor health conditions such as coughs, high blood pressure, erectile dysfunction and gastric problems [5]. The seed extract has been reported to have the capacity to hinder Ebola virus replications under laboratory conditions. The kernel is highly rich in essential phytochemicals such as flavonoids and tannins. One of the most important biflavonoids found in the kernel, kolaviron possesses neuroprotective, antimicrobial, anti-malaria, wound-healing and anti-inflammatory properties, which attests to its indispensability in health care. The roles of the biflavonoid complex, kolaviron in the management of benign prostatic hyperplasia, Acquired Immunodeficiency Syndrome (AIDS) and neurodegenerative disorders have also been reported.

Lemon: Lemon, *Citrus limon* (family Rutaceae) is a small evergreen flowering plant species consisting about 1300 species. The ripe fruits are ovoid, globose, berry, hesperidium, or yellow. Lemon has a lot of medicinal importance. Research has shown that crude extracts of the various plant parts possess anticancer and antibacterial property. Lemon serves as brain and nerve foods, blood purifier and regulates blood sugar [6]. They are also used for treating asthma, nausea, throat infections, travel sickness, spots, acne, pimples, rheumatism, arthritis and bone-related diseases. Lemon equally has varieties of traditional uses, a mixture of lemon juice and honey aids is used in reducing body weight. Lemon juice is rich in vitamin C; it helps to lighten the skin, stimulate the liver, control nausea and relieve heartburns and irritable bowel syndrome. Also, it is used by people suffering from urinary tract infection problem to flush out high level of uric acid. A mixture of lemon juice and olive oil helps to cure gall bladder and kidney stones.

Lemongrass: Lemongrass (*Cymbopogon citratus*) belongs to the genus *Cymbopogon* in the African, Asian, Australian, and tropical island grass family. The name *cymbopogon* has its root from the Greek words *kymbe* (boat) and *pogon* (beard), which implies that in most species, the hairy spikelets originates from boat-shaped spathes. Lemon grass is utilized in poultry and fish feeds production and an important ingredient in soup, teas, curries preparations in many countries. It is administered orally, externally, or inhaled for aromatherapy depending on the health condition. Lemongrass is highly antioxidant in nature and is very potent in the treatment of body pains and inflammations, fever, high sugar, cholesterol level in the blood and the regulation of menstrual flow [7]. The oil extract from lemon grass play a great role in stress, anxiety, and depression management through aromatherapy and is utilized by healthcare providers to treat digestive problems and high blood pressure. Also, it is an important additive in cosmetic industries for soap and other body care productions.

Ginger and Turmeric: Ginger, *Zingiber officinale* Rosc., and turmeric, *Curcuma longa* L., are subtropical and tropical perennial herbs of Asia origin with an age-long history of use as cuisines and medicinal spices in many regions of the world. Several medicinal importance have been attributed to these plants and these include their therapeutic properties against wide range of infections and health conditions such as cancer, cold, fever, coughs, nausea, arthritis, Alzheimer's disease, inflammations. Ginger and turmeric efficacies as remedies are believed to be conferred by several important phytochemicals which include the terpenoids (such as turmerones) and phenylpropanoid-polyketides (such as curcuminoids and gingerol-related compounds) compounds. Among these

chemical compounds, curcumins and gingerols have received more attention and this is due to the fact that, they have been more associated with the cures for ailments affecting the world. For example, curcumin has been reported as a potent cure for cancer, diabetes and cardiovascular diseases while gingerol has found use in treating inflammatory diseases such as arthritis and asthma. Over the years, ginger and turmeric have been highly regarded in the health and wellness product market as economically important herbs and their demands have continued to rise in many parts of the world [8].

Black seed: Black seed (*Nigella sativa*) is also known as black caraway. It is an annual flowering plant species in the family of Ranunculaceae, native to the eastern Mediterranean, Indian Subcontinent, Northern Africa, and West Asia. The fruit capsule is large and inflated and bears 3-7 united follicles, each containing numerous seeds which are used as spice. In traditional medicine, black seed is used in treating various ailments and these include, nasal congestion, conjunctivitis, headache, abscesses and toothache. Phytochemical profiling of *Nigella sativa* has revealed that, the seed contains 32%-40% oil, which is highly antioxidant in nature. The oil is an effective remedy against internal and external inflammations, skin cancers, high blood sugar, arthritis, high cholesterol, asthma and stomach ache.

Bitter leaf: Bitter leaf (*Vernonia amygdalina*) belongs to the popular daisy family and is a small shrub of tropical Africa origin. It has characteristic rough bark, reaches a height of 2 m–5 m and bears elliptical leaves which usually grow up to 20 cm in length. Although, bitter leaf is commonly found in the wild but its numerous economic importance has greatly encouraged its domestication. Bitter leaf is well valued in orthodox medicine as it offers effective treatments against myriads of ailments such as stomach ache, prostate cancer, measles, chicken pox, pneumonia and high blood pressure. In many African countries including Nigeria, it is an essential ingredient that renders a unique and delicious taste in traditional dishes and possesses immense nutritional benefits.

Cashew leaf: Cashew, *Anacardium occidentale*, is a tropical evergreen flowering tree species usually found in tropical countries including Nigeria. The leaves are oval with thick veins and midribs and are usually 10-12 centimetres in length and 7-12 centimetres in width. Research has shown that cashew leaves are rich in antioxidants and have antifungal, antiparasitic, antibacterial, antiseptic, and anti-inflammatory properties. They contain vitamin B and vitamin C, also, they are a fair source of iron and calcium, and also contain zinc, magnesium, phosphorus, manganese, sodium and potassium. Cashew leaves are very important in traditional medicine and used for treating various ailments in many parts of the world. In Africa, they are used in oral hygiene to solve tooth and gum problems. They are used to treat diabetes and malaria.

Alligator pepper: Alligator pepper (*Aframomum melegueta*) also known as grains of paradise, is a tropical perennial herb of genus *Aframomum* and family, Zingiberaceae also known as the ginger family. Alligator pepper is greatly utilized by many countries including Nigeria for diverse purposes. For instance, it is a common item used for traditional sacrifices and other religious rites [9]. Also, several uses of alligator pepper have been reported in the literature and this includes its efficacy in controlling larvae of *Spodoptera littoralis* and Egyptian cotton leaf worm and also important crop pests such as the diamond back moth *Plutella xylostella* L. Alligator pepper has immense medicinal importance. The seed extract heals wounds and invigorates the immune system against diseases. Studies have shown that seeds contain important phytochemicals namely, alkaloids, glycosides, tannins,

flavonoids, sterols, triterpenes, and oils; some of which are responsible for its pestical and antimicrobial properties. Alligator pepper is often included in anti-allergy, anti-inflammation, anti-toxin and anti-ulcer herbal remedies for liver problems and tumours and its potency can be attributed also to some of the phytochemicals such as flavonoids.

Neem: *Azadirachta indica* A. (family Meliaceae) is a tropical evergreen tree of Asia origin, that shares some characteristics with mahogany species. It is widely cultivated in many regions of the world especially in Southeast Asia and West Africa including Nigeria. In India, various parts of the plant are used in so many ways. The twigs are used for teeth whitening, the leaves eaten as salads and are effective remedies against smeared skin disorders and bugs repellent while the juice are used for making blood tonic ^[10]. The neem tree is more popular as a preventative and curative to various ailments (which includes malaria, fever, anaemia and skin infections) than being an exploitable tree for timber production in Nigeria. Research has shown that various chemical compounds of important biological functions have been isolated from various parts of the tree. These include liminoid, flavonoid and nimbosterol compounds. Quercetin, a flavonoid compound found in the leaves possess antiseptic, antifungal and antibacterial properties and thus could account for the potency of the leaf extracts in treating sore and scabies. Also the leaves are associated with antiviral properties and could confer its widely propagated virucidal potential against COVID-19.

DISCUSSION AND CONCLUSION

This review encompassed vital botanical and ethno-medicinal studies on ten common herbs commonly touted as preventive and curative herbs for COVID-19. The study has shown that, not only do these herbs possess the potential of treating COVID-19, there are myriads of other health challenges they can proffer solutions to. The information provided therein could also help in unlocking other hidden potentials of the plants, thereby enriching the ethno-botanical resources available for the management of ailments and health challenges affecting mankind. Extensive research is required however into some of these medicinal herbs, especially on their combinations in herbal preparations as the quest to combat COVID-19 continues. In many cases, combining herbs exploits the natural synergy among their constituent phytochemicals, but there are situations whereby it results in anti-synergy and production of deleterious effects.

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