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The Dietary Pattern of Antioxidant Property of Plant Growth and Sustainable Utilization of Ethno Botanical Uses of Immunity-Boosting Agents in Primary Components

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Abstract

Plants have been used in traditional herbal medicine for a long run. Several thousand plant species have been reported to possess medicinal properties. Eighty percent of world population relies on the plant-based drug resources for their primary health care needs as estimated by world health organization. The demand is due to the increased acceptance of 'Ayurveda' and traditional herbal medicines, because of having their no side effects, and as such modern people relies more on drug resources of plant origin. It is an established fact that medicinal plants play a great role in our life. A major part of the total population in developing countries still uses traditional folk medicines obtained from plant sources. People live mainly in the districts partly depends on leaves, tubers, barks and fruits of terrestrial forest plants and use plant-based drugs as medicines, thereby offering much scope for ethno botanical studies. The growing demand for plant-based medicines, health products and pharmaceuticals led to the depletion of plant resources.

***Key words*:** Medicinal-plants, Antioxidant, Ethno botanical agent, Herbal-medicine, Immunity-boosting agents

Ethno botany gives a valid information about the utility of plant species by indigenous people, thus, it is a combination of two branches, i.e., botany and anthropology. It is interdisciplinary between plant science and ethnology. The ethno botanical knowledge of an ethnic people can be useful in many aspects, so it is called a "multidisciplinary science" [1]. In recent years, several disciplines have come to be used in connection with ethnic people and their knowledge, namely ethnomedicine, ethnotaxonomy, ethnotoxicology, ethnoecology, ethnogynaecology, ethnopharmacology, ethnopadiatrics, ethnoforestry, etc.

Immediate focus on conservation and sustainable utilization of medicinal plants is required. So, studies on the ethnobotany, ethno phytopathology and ethno medicinal uses of our wild medicinal plants and investigations regarding enhanced productivity of medicinal plants is one of the frontier areas of modern research. Ethnobotany is the study of the relationship between people and plants. Ethno phytopathology might be considered as a reworking of the classic plant pathological concept of the disease triangle, i.e. the relationships between pathogens, the environment and the society [2-3]. The small size and hyphal structures allow them to act as microscopic pipelines that can transport carbon and minerals to and away from the plants.

They are well adapted to function in lower water potentials and hence can alleviate drought stress even in arid ecosystem. To provide protection to plants from attack by soil-borne pathogens and protection against heavy metals. Another impact of the host plants is to provide protection to the host against pathogenic attack, they also enhance the tolerance limit of the plants to different types of stresses like, salinity stress, drought stress etc.

Considering the growing demand of herbal medicines and the ethno medicinal importance of the plant as well as the effect on growth and augmented secondary metabolite production by the medicinal plants, the present investigation was carried out on the lines of quarries with the following objectives:

1. Studies on distribution areas considering the ecological parameters and collection of seeds and growth of seedlings and their maintenance.
2. Studies on the ethno botany and ethno phytopathological properties of plants.
3. Studies on the seed viability and seed-borne pathogen of the plant.
4. Studies on the population in the roots and rhizosphere of the plant.
5. Phytochemical assay of the leaf extract of the plant.
6. Determination of the antimicrobial property of the extracts.
7. Studies on the antioxidant property and immune-stimulating property of the leaf extract.

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MATERIALS AND METHODS

Demands of traditional herbal medicines are increasing day by day not only by the developing countries but also by the developed countries throughout the world. The demand is due to the increased acceptance of ayurveda and traditional herbal medicines, because of having their no side effects, and as such modern people relies more on resources of plant origin. So, studies on the ethnobotany, ethnophytopathology and ethnomedicinal uses of our wild medicinal plants and investigations regarding enhanced productivity of medicinal plants is one of the frontier areas of modern research. Ethnobotany is the study of the relationship between people and plants. This interdisciplinary field includes studying plants as wild foods and as agricultural crops. Ethnophytopathology might be considered as a classic plant pathological concept of the disease triangle, i.e. the relationships between pathogens, the environment, and society [6-7]. Many species possess different medicinal properties like antitumor's, laxative and emetic property, astringent, anti-pyretic and anti-oxidant properties. Candle brush having very high medicinal values like -Antimicrobial property particularly against fungal dermatophytes and traditionally being used in the treatment of skin infections in man. Leaf extract is also credited for the treatment of constipation, inguinal hernia, intestinal parasitosis, syphilis and diabetes.

Phenols are a class of low molecular weight secondary metabolites found in most land plants. These compounds are of great importance in foods and drinks because they are responsible for their organoleptic properties. Polyphenols such as anthocyanins, add colour to food which can be purple, black or red and this is desirable in red wines. Phenolic compounds are the largest group of phytochemicals and accounts for most of the antioxidant activity in plants or plant.

Phenol substances such a flavonols, naringin, apigenin, myricetin, coumarins and caffeic acids are known to possess antioxidant properties which play important roles in protecting foods, cells and organs from oxidative degeneration [8]. In model systems, antioxidants are able to scavenge free radicals and thereby prevent free radicals from causing damage. Reports indicate that diets rich in phenolic compounds play a role in the prevention of various diseases associated with oxidative stress such as cancer, cardiovascular and neurodegenerative diseases [9]. In addition, phenols constitute the active substances found in many medicinal plants with important pharmacological activities and modulate the activities of a wide range of enzymes and cell receptors.

RESULTS AND DISCUSSION

Biological activities and clinical research

This has demonstrated effective broad spectrum 11 antibacterial and antifungal activities in several laboratory studies over the years. Based on the current fading's, it can be concluded that this plant has antimicrobial activity, which is as potent as standard antimicrobial drugs against certain microorganisms [10]. Japanese researchers in 2003 reported that a leaf extract evidenced anti-inflammatory activity. In animal studies conducted in the Guajava leaves were reported to possess pain-relieving, anti-inflammatory, antimutagenic, and hypoglycemic actions. Guajava leaf extract can be reliably used as a herbal medicine to treat Pityriasis versicolor (a type of skin fungus) without side effects. Another clinical trial on human being was conducted and have been verified and validated that the plant is an effective laxative [11], [13]. In Guajava leaves was reported to have choleretic actions in a rat study. According to results obtained, the choleretic activity of the plant at 15 mg/kg was better than the control used but in higher doses, the plant tended to inhibit bile secretion (Tropical Plant Database).

Presence of significant amount of phenols, anthraquinones, flavonoids, carotenoids, Vitamin-C and Vitamin-A in the methanolic leaf extract of strong antioxidant properties of this plant, observed that preliminary phytochemical analysis of phenols, tannins, anthraquinones, saponins and flavonoids. It also confirmed that this plant also had alkaloids and cardenolides. Preliminary phytochemical screening of alcoholic extract revealed the presence of anthraquinone, phenolic compounds, saponin, glycosides and while aqueous extract showed presence of glycosides and Phenolic compounds. These anthraquinone derivatives are well known to exhibit a variety of biological activities such as antibacterial and antifungal, antitumor, antioxidant, cytotoxic and hypoglycaemic activities. Other chemicals contained in the plant include saponin which acts as a laxative and expels intestinal parasites. Rhein and chrysophanol are also known to be present in the roots in addition to two other quinone pigments [12]. Plants have been classified as an essential source of medicinal agents for centuries and a huge number of novel drug components have been isolated from natural plant source and their extract used for in traditional medicine.

The WHO defines traditional medicine as "the health practices, approaches, knowledge and beliefs incorporating plant, animal and mineral based medicines, spiritual therapies, manual techniques, diagnose and prevent illness or maintain wellbeing". Cassia alata Linn. which belongs to family Leguminosae is a medium-sized tree and its different parts are used in ayurvedic medicine as well as home remedies for common ailments [15-16]. Sequential extraction was carried out using solvents viz. petroleum ether, chloroform, ethanol, methanol and water from leaf of the plant were investigated for preliminary phytochemical and antibacterial property.

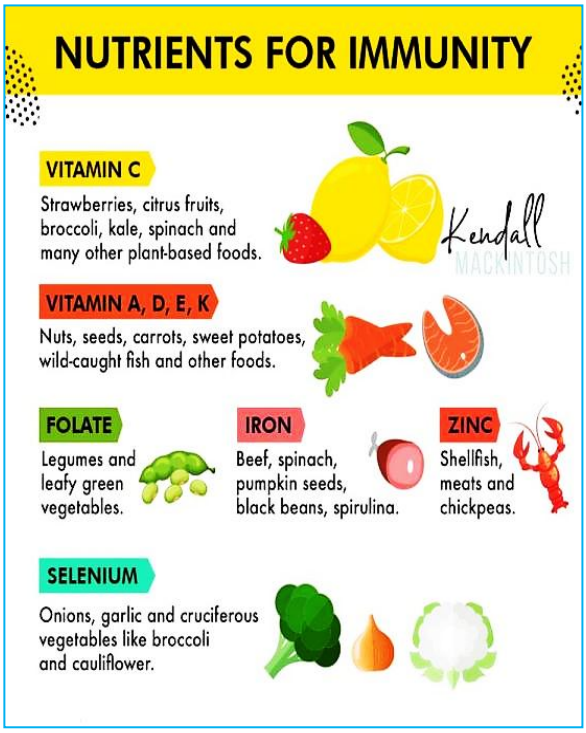
The antibacterial screening of the ethanol extracts of the selected plants was performed by the agar well diffusion method against clinical isolates of some Gram-positive bacteria (Staphylococcus aureus and Bacillus subtilis) and Gram-negative bacteria and as well as the antifungal screening of the extracts of cassia alata was performed following cup- plate assay and food poisoning technique.

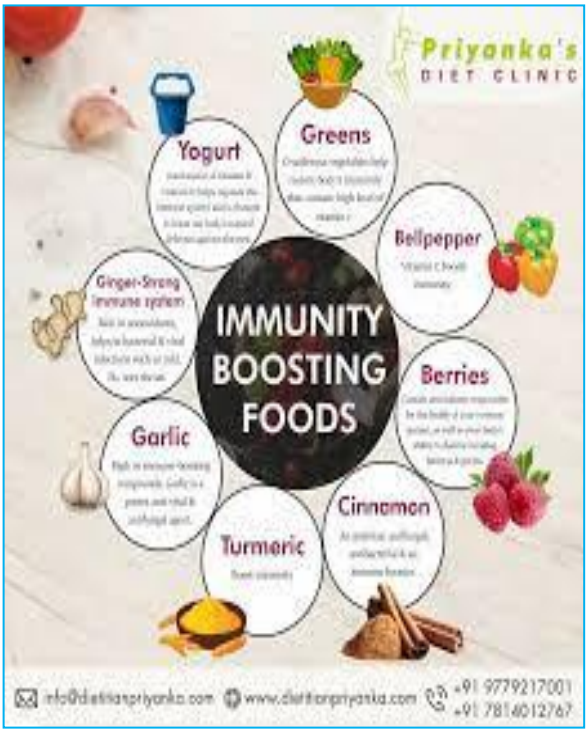
An increasing interest m the search for natural replacements of synthetic antioxidants has led to the antioxidant evaluation of a number of plant sources. The neutraceutical trend towards doubling the impact of natural antioxidants that stabilize food and maximize health impact presents distinct challenges in evaluating antioxidant activity [13], [15]. Thus, there is a renewing. This has influenced many pharmaceutical companies to produce new formulations extracted from plants or herbs. Natural products have been shown to possess a tremendous and consistent resource for the development of new drugs [17].

India is the major exporter of raw MAP'S (Medicinal Aromatic Plants) and processed plant-based drugs. About 45,000 plant species with medicinal properties have been assigned to several thousand for the turnover of herbal medicines in India as over the counter products, ethical and classical formulations. However, very few plant species have been thoroughly investigated for their medicinal properties [28], [30]. Plant species still serve as a rich source of many novel biologically active compounds. With the development of natural product chemistry, the potential of chemotaxonomy is now becoming increasingly obvious. The application of

chemical data to systematics has received serious attention of a large number of biochemists and botanists during the last three decades. Recently, the ability of phenolic substances including flavonoids and phenolic acids to act as antioxidants has been extensively investigated. Several flavonoids are reported to be responsible for the broad therapeutic effects [19]. They are important for human beings due to their antioxidative and radical scavenging effects as well as their potential estrogenic and anticancer activities.

The flavonoid family includes flavones, flavonols, flavanols, leucoanthocyanidins, anthocyanidins, aurones, chalcones, and isoflavones. Free radicals contribute to more than one hundred disorders in humans including atherosclerosis, arthritis, ischemia a reperfusion injury of many tissues central nervous system injury, gastritis, cancer and AIDS [19-20]. Free radicals due to environmental pollutants, radiation Chemicals, Toxins, deep fried and spicy foods as well as physical stress, cause depletion of immune system antioxidants, change in gene expression and induce abnormal proteins. Oxidation Process in one of the most important routs for producing free radicals in food, drugs and even living systems [21]. Catalase and hydroperoxidase to non-radical forms and function as natural antioxidants in human body. Due to depletion of immune system natural antioxidants in different maladies consuming antioxidants as free radical scavengers may be necessary.





An additional issue is whether the use of non-evidence-based approaches to boost immunity can be considered an effective alternative to vaccination [23]. This is a particularly important aspect at a time when vaccine hesitancy is becoming a major threat to global health, as indicated by the World Health Organization. A study on 9,000 US children has shown that exposure to some complementary therapies, including alternative medicine (excluding multivitamins/multi-minerals) is associated with a lower uptake if influenza vaccine, although this was not observed in adults. Similar results were obtained in a survey of over 9,000 Australian women, with those using naturopathy or herbal medicine less likely to vaccinate against influenza.

It is important to note that, in two of the cited studies, use of multivitamins / multiminerals was associated with a higher vaccination rate [24], [26]. However, when vaccine confidence was studied in a survey on attitudes to vaccination among 1,250 Australian adults, use of most CAM, including vitamins, was associated with lower levels of vaccination endorsement [27], [30]. It is therefore important to establish what type of information the lay public is exposed to as this is likely to be the basis of their knowledge of the topic and have important consequences on public health.

The present study aimed at obtaining a picture of the information the public is exposed to on this topic. In recent years, it became clear that we live in an online informational environment that Florida defined as "infosphere" [29]. Because most of the sources of information, including books, news outlets, governmental, and professional organizations, are now available online [31]. We used the Google search engine to obtain a sample of the information available on the topic, using a methodology we have successfully applied to analyze knowledge about other health-related topics.

The mean age of herbalists interviewed was 52.13 years. Forty percent of the herbalists were illiterate, and 73% referred to the experiences of their parents as knowledge of the properties and uses of medicinal plants. One hundred and eight medicinal plants belonging to 51 botanical families were recommended by herbalists in the region for treatment. According to the most used plants with the percentage of 13%, 12%, and 11%, respectively. Most plants had been involved in the treatment of digestive disorders (25%) and osteoarticular diseases (24%). Some (7.4%) of the plants mentioned in our survey were potentially toxic.

CONCLUSION

It was learned that irrational use of toxic plants and unknown compositions of recipes are recommended to consumers. As a result, particular attention should be paid to risks related to plants used in traditional treatment without scientific validation. It is envisaged that increasing awareness, by conducting educational campaigns and transferring evidence-based scientific knowledge, on traditional treatments among the local population is expected to have beneficial impacts on health and disease management.

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