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***Review Paper***

# Nutraceuticals: Promising Health Product

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## Abstract

*Nutraceuticals have received considerable interest in recent times because of their presumed safety and potential nutritional and pharmaceutical value. Nutraceuticals are substances which are not traditionally recognized nutrients but which have positive physiological effects on the human body. They are claimed to possess multiple therapeutic benefits. The medicinal plants represent one of the important fields of traditional medicine all over the world and hence an established constituents of nutraceuticals. The present article has been devoted towards better understanding of the basics about nutraceuticals and potential plant species.*

**Keywords:** Nutraceuticals, functional food, phytochemicals.

## Introduction

Due to rapid economic development, life become very fast. Ultimate sufferer is our diet and food quality. We are becoming very friendly to junk food, packaged food and hence give undue invitation to lifestyle diseases[1]. This type of diseases is due to imbalance in nutrition which leads to various health problems causing even death. The balance in nutrition is the need of the hour. Nutraceuticals are here to fill this balance.

According to Hippocrates (460-377 BC) 'Let medicine be thy food and food be thy medicine'. The concept of food and medicine being complimentary to each other is not new. The word 'nutraceutical' is new but the concept is based on our traditional knowledge. The term 'nutraceutical' was invented in 1989 by Dr Stephen DeFelice, Chairman of the Foundation for Innovation in Medicine by combining 'Nutrition' and 'Pharmaceutical'[2]. Nutraceuticals is regarded as natural bioactive chemical substances that have health promoting as well as disease preventing properties. The constituents are either of known healing activity or are chemically defined substance which is accepted to contribute considerably to the healing activity. The secondary metabolites present in them give them a specific medical benefit other than a purely nutritional. Thus nutraceuticals have dual role to play: as food and as therapeutic agent.

Natural products mainly plant products have excellent history of being used in various food preparations. Many phytoconstituents present in them are investigated for potential use as nutraceuticals. With the development of modern scientific technologies, the traditional knowledge about plant food preparations is getting scientific inputs and hence wide acceptance as nutraceuticals. Presently more than 450 nutraceutical and functional food products are available with proven health benefits[2,3].

## Nutraceuticals: General Overview

Many nutraceuticals have been investigated and reported in various studies revealed that these food products are involved in cell metabolism and often have little adverse effect[4]. There is a lot of confusion regarding the terminology and definition of this term in different countries. Canada name it as 'natural health products', USA call it 'dietary supplements' whereas Japan call it 'FOSHU' (foods for special health use)[5]. But the basic purpose remains the same to supplement the diet to provide nutrition over and above the regular food and prevent the nutritional imbalance diseases.

Nutraceuticals are marketed in different forms as pills, capsules, powders and tinctures either as a single substance or in combinations. The estimated global market for functional foods is US $100 billion[6]. The global nutraceuticals market to reach $450 billion by 2015. It is estimated that US is going to cross $90 billion mark by 2015. France and Germany is expected to have nutraceutical market share of 24.5% and 20.3% of overall Western Europe nutraceutical market in 2017. India is going to grow by 2016 to $2.73 billion[7]. At present, 55% of food, 36% of pharmaceutical and 90% of biotech firms are actively researching nutraceutical products[6].

The rapidly increasing interdisciplinary scientific information about nutrition, medicine, and plant biotechnology has dramatically changed the concepts about the application of phytochemicals in food, pharma, cosmetics and agriculture. The applications have increased because many of the prescribed plant folk medicines that are not supported by experimental or

clinical data are getting the scientific inputs. The phytochemicals and their potential benefits have been documented in literature[6,8,9]. Many monographs of specific species and books of medicinal plants are available in literature[3,10]. The number of plant species known traditionally as a food for rural and tribal people is available. It has been observed that the health condition for these people is better in comparison to the urban people who mostly depend upon fast and processed food. Hence, both the information can be combined together to get important and durable nutraceuticals. Some of the important plant species along with their family name and medicinal properties are listed in table 1.

The lack of quality control is a major area of concern for nutraceuticals. The quality of plant material and manufacturing processes are regulated by food laws, which lack the specificity required for botanical drugs. Some issues like contamination with toxins after fungal infection of raw plant material, adulterations, impurity of nutraceuticals remain undetected simply because there is an almost total absence of specific quality control. The present accumulated knowledge about nutraceuticals represents undoubtedly a great challenge for nutritionists, physicians, food technologists and food chemists. There is a need of interdisciplinary approach to overcome these issues.

## Conclusion

In conclusion, Nutraceuticals are going to stay and play an important role in future. Their success will be governed by control of purity, safety and efficacy without inhibiting their medicinal properties. The risk of toxicity or adverse effect of drugs directed us to consider safer nutraceutical and functional food. They will continue to be people friendly because they are convenient for today's lifestyle. Some of the nutraceuticals are also genuinely researched and offer novel ingredients that can bring about health benefits quicker than would normally be the case through eating conventionally healthy foods alone. This resulted in a world wide nutraceutical revolution that will lead us into a new era of medicine and health, in which the food industry will become a research oriented.

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**Table-1**
**Potential Plant Species for Nutraceuticals**

| S. No. | Plant Species | Family | Selected Pharmaceutical Activities |
|---|---|---|---|
| 1 | *Allium esculentum* | Liliaceae | Prevent age-dependent changes in the blood vessels, loss of appetite[11], to treat ulcers, wounds, scars, keloids[12] |
| 2 | *Allium sativum* | Liliaceae | Antibacterial, antifungal, antithrombotic, hypotensive anti-inflamatory[4], anti-cholesterol, antiviral, anti-HIV, to treat asthma and bronchitis, to promote hair growth[13-15] |
| 3 | *Aloe vera* | Xanthorrho-eaceae | Dilates capillaries, anti-inflammatory, emollient, wound healing properties[4], anti-tumour[16] |
| 4 | *Asparagus racemosus* | Liliaceae | Effective in diarrhoea, dysentery, possess diuretic and gastric sedative properties, used to treat urinary problems and used in rheumatic conditions.[17] Also prescribed for increasing the secretion of milk, improving appetite in lactating women and beneficial in nervous breakdown and menstrual trouble[18] |
| 5 | *Azadirachta indica* | *Meliaceae* | Used for jaundice, hepatitis, diabetes, cancer, leprosy, leucoderma, allergy, anti-fertility, anti-androgenic, Spermicidal[10] |
| 6 | *Bupleurum falcatum* | Apiaceae | Treatment of deafness, dizziness, diabetes, wounds, vomiting[19] |
| 7 | *Cassia acutifolia* | Fabaceae | Constipation[20] |
| 8 | *Centella asiatica* | Apiaceae | Therapy of albinism, anaemia, asthma, bronchitis, cellulite, cholera, measles, constipation, dermatitis, diarrhoea, dizziness, dysentery, epilepsy, haematemesis, haemorrhoids, hepatitis, hypertension, jaundice, nephritis, nervous disorders, neuralgia, rheumatism, smallpox, syphilis, toothache, urethritis, antipyretic, analgesic, anti-inflammatory and brain tonic agent[21] |
| 9 | *Chamomilla recutita* | Asteraceae | Antibacterial, antiviral, an emetic, an emmenagogue, eye strain reliever, to treat urinary infections and diarrhea[22] |
| 10 | *Cinnamomum verum* | Lauraceae | Treatment of impotence, frigidity, dyspnoea, inflammation of the eye, leukorrhoea, vaginitis, rheumatism, neuralgia, wounds, toothache[23] |
| 11 | *Commiphora wightii* | Bursera-ceae | Acts as laxative, aphrodisiac, tonic, and anthelmintic for weak and spongy gums, pyorrhoea, alveolaris, chronic tonsillitis, pharyngitis, and ulcerated throat[10] |
| 12 | *Coptis japonica* | Ranuncula-ceae | Treatment of arthritis, burns, diabetes, dysmenorrhoea, toothache, malaria, gout, renal disease[24] |
| 13 | *Curcuma longa* | Zingibera-ceae | Treatment of asthma, boils, bruises, coughs, dizziness, epilepsy, haemorrhages, insect bites, jaundice, ringworm, urinary calculi, slow lactation, epilepsy, pain, skin diseases[25] |
| 14 | *Echinacea purpurea* | Asteraceae | Treatment of yeast infections, side-effects of radiation therapy, rheumatoid arthritis, blood poisoning, food poisoning[26,27] |
| 15 | *Garcinia gummi-gutta* | Clusiaceae | Purgative, enhanced gastric mucosal defence, reduces total cholesterol, triglycerides, and nonetherified fatty acids, reducing human body weight by decreasing fat accumulation[28] |
| 16 | *Gymnema sylvestre* | Asclepiada-ceae | A destroyer of *Madhu meha* (Honey urine) and urinary disorder. Acts as astringent, acrid thermogenic, anodyne, digestive, liver tonic, emetic, diuretic, stomachic, stimulant, anthelmintic, alexipharmic, laxative, cardiotonic, expectorant, antipyretic, uterine tonic[29] |
| 17 | *Hypericum perforatum* | Hyperica-ceae | Antidepressant, bacterial infections, respiratory conditions, skin wounds, peptic ulcers and inflammation[30] |
| 18 | *Ocimum tenuiflorum* | Lamiaceae | Diverse healing properties, promote longevity[31] |
| 20 | *Rhamnus purshiana* | Rhamnaceae | Antibacteria[32] |
| 19 | *Rubia yunnanensis* | Rubiaceae | Antipsoriasis[33] |
| 21 | *Rubia cordifolia* | Rubiaceae | Hepatoprotective activity, antineoplastic properties, useful for disintegration and elimination of urinary stones[34] |
| 22 | *Rumex alveollatus* | Polygonaceae | Antibacterial activity[35] |

| | | | |
|---|---|---|---|
| 23 | *Rumex japonicas* | Polygona-ceae | Psychopharmacological, antioxidant, cytotoxic, antifertility, anti-inflammatory, antimicrobial, purgative, antidiarrhoeal, antitumor, astringent, antidermatitis, diuretic, antiviral activities[35] |
| 24 | *Syzygium cumini* | Myrtaceae | Against dysentery, haemorrhage, leucorrhoea, to treat non-insulin-dependent type II diabetes, infections from the upper respiratory tract[36] |
| 25 | *Tanacetum parthenium* | Asteraceae | Treatment of headache, fever and menstrual problem, severity and duration of migraine headaches[4] |
| 26 | *Terminalia arjuna* | Combreta-ceae | Treatment of polyuria, cardiac diseases, blood diseases, chronic fever, fractures, obesity, skin diseases, hypercholesterolemia, anginal pain[10,37] |
| 27 | *Tinospora cordifolia* | Menisperma-ceae | Treatment of general weakness, fever, dyspepsia, dysentery, syphilis, urinary diseases, impotency, gout, viral hepatitis, skin diseases, and anaemia[10], jaundice, chronic diarrhoea, bone fracture, cough, ear pain, asthma, leucorrhoea, skin disease, and snake/insect bite[38] |
| 28 | *Withania somnifera* | Solanaceae | Nerve tonic, abortifacient, astringent, deobstruent, nervine, aphrodisiac, sedative[39] |
| 29 | *Zingiber officinale* | Zingibera-ceae | Carminative, antiemetic, cholagogue, positive inotropic antipyretic, analgesic, antitussive, hypotensive effects, decrease nausea and vomiting[40] |

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