



## Review on Nutraceuticals from Plant Sources

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### ABSTRACT –

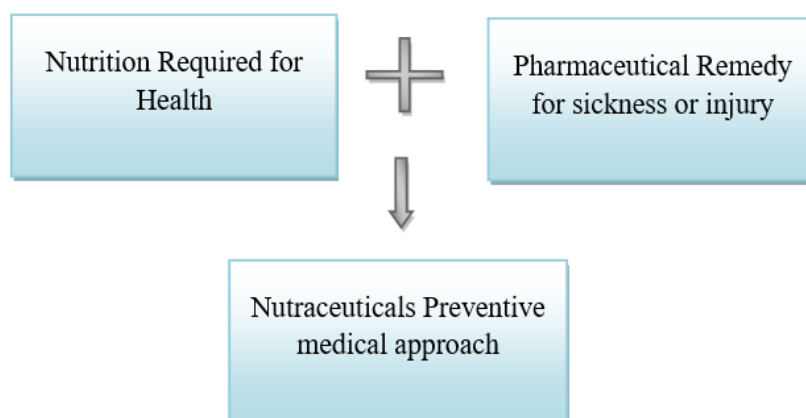
In last few decades, due to modification in way of living the risk of human exposure to new diseases has been increased. The possibility of chronic diseases is increased like heart diseases, diabetes, asthma, cancer etc. So, to avoid this the best practice is to include the food that can improve and tone up the nutritional inadequacy in our every day life. Nutraceuticals is a term derived from two words pharmaceutical and nutrition by Stephen Defelice in 1989. Nutraceuticals are food substances that confer health and medical benefits. It plays very significant role in treating and preventing many acute and chronic diseases. Due to nutrition and therapeutic potentials nutraceuticals are gaining substantial attention. The foodstuffs used as nutraceuticals can be classified as antioxidants, polyunsaturated fatty acids, fibres, probiotics, prebiotics, and other types mainly classified as natural and synthetic. Plants contains large number of bioactive compounds such as phytochemicals, lipids, flavours, pigments and fragrances. Plant extracts are extensively used in the pharmaceutical, cosmetics, and food industries. This review article presents an in sight into plants as nutraceuticals and the role in providing amino acids, other botanicals, vitamins and minerals etc; to human as functional food, dietary supplement and medicine to conquer hurry and worry leading to stress disorders.

Keywords – Nutraceuticals, Dietary Supplement, Plant Sources, Health, Medicine

### Introduction –

Consumers are deeply worried about how their health care is controlled or managed, administered and priced. They are disappointed with the high tech, and expensive, disease treatment approach predominant in modern medicine; the consumer is searching complementary or alternative useful products and the red tape of planned care makes nutraceuticals particularly appealing. Nutraceuticals are referred to as functional food or phytochemicals.<sup>1</sup> These are important dietary supplement exploit to prevent diseases, delay senescence, ameliorate health and support proper functioning of the human body. Herbal nutraceutical plays important role in maintaining health then promoting optimal health, longevity and quality of life.<sup>2</sup> According to the Dietary Supplement Health and Education Act 1994, the definition of nutraceuticals has been extended to include herbs, vitamins, minerals and other botanicals, any dietary supplement and amino acids for use by humans for improving overall dietary intake and eventually increase the utilization of nutraceuticals dramatically.<sup>3,4</sup>

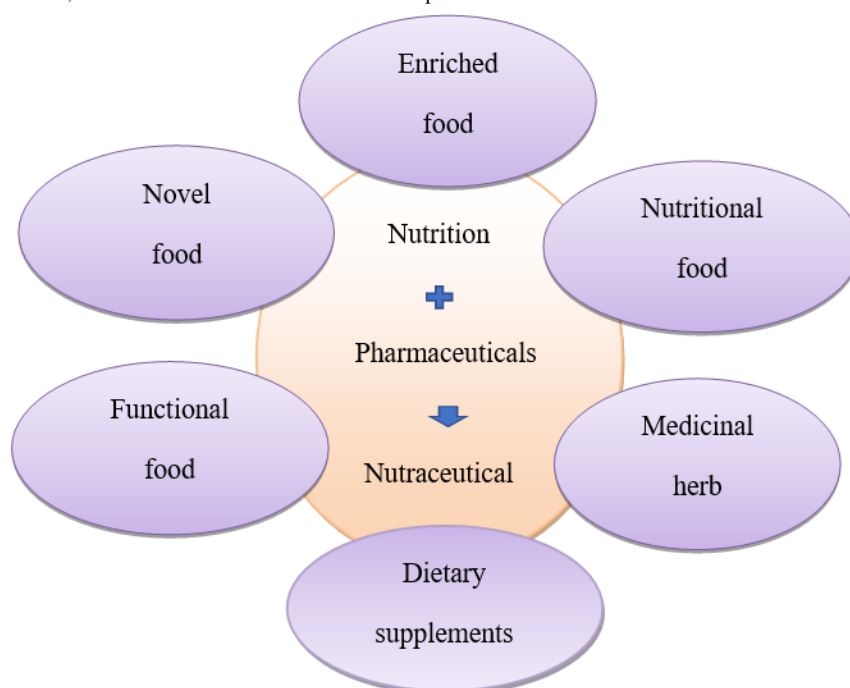
The health and fitness of human beings is largely dictated by the use or consumption of nutritious foods. There are vast numbers of frequently occurring health enhancing substances are of plant origin that be worth attention for their potential role in optimal health. So, to fight or battle against diseases like cancer, obesity, cardiovascular diseases and gastrointestinal tract disorders the consumptions of biologically active ingredients in vegetables and fruits is helpful.<sup>5</sup>



### Categories of Nutraceuticals:

Nutraceuticals are biological therapies used to prevent malignant processes, promote wellness and control symptoms. These can be arranged into following categories:

- Nutrients: These are the substances with well-known nutritional functions such as amino acids, vitamins, minerals, and fatty acids.<sup>2</sup>
- Herbs: These are the botanical products of concentrates and extracts. Herbs provide a complete warehouse of treatments to cure acute and chronic diseases.<sup>6</sup>
- Dietary supplement: These are the products that contains minerals, vitamins, proteins, other botanicals, herbs, and also includes the diet as constituents, extracts, concentrates or metabolites of these compounds.<sup>7</sup>



### *Nutraceuticals in Ayurveda*

Various elements for which nutraceuticals from plant sources available in ayurveda <sup>2,8,9</sup>

Elements	Nutraceuticals
Balya (corpulence)	Ghrita (Aloe barbadensis), Ksheera (Milk) and Gambhari (Gmelina arborea)
Vridhhi (growth)	Amalaki (emblica officinalis) and Bala (Sida cordifolia)
Chhavi (lustre)	Amalaki (Emblica officinalis) and Haridra (Curcuma longa)
Twak (skin quality)	Bhringaraja (Eclipta prostrate), Haridra (Curcuma longa)
Sukra (virility)	Ashwgandha (Withania somnifera) and Kapikachhu (M. pruriens)
Medha (intellect)	Bramhi (Bacopa monnieri) and Shankpushpi (C. pluricaulis)
Drishti (vision)	Thriphala (Amalaki Emblica officinalis), Haritaki (Terminalia chebula), Bibhitaki (Terminalia belliriaca) and Jyothishmathi (Celastrus paniculatus)
Buddhi (thinking)	Shankpushpi (Convolvulus pluricaulis) and Bramhi herb of grace (Bacopa monnieri, Indian pennywort)
Vikrama (Physical strength)	Bala (Sidha cordifolia) and Amalaki (emblica officinalis)
Karmendriyapadavumz (sensory perception)	Bala (Sidha cordifolia) and Sahachara (nilgiranthus ciliates)

### *Nutraceuticals used to battle against diseases:*

**1) Alzheimers Disease:** There are various nutraceuticals which are used in treatment of Alzheimers disease.<sup>10</sup>

Antioxidants:

A large number of studies have been found that an connection between high dietary antioxidants intake and reduced risk of Alzheimers disease which is very essential because preventing a disease is better than treating it. So, research suggest that preventing SD is usually not more complex, by using antioxidants treatment is possible.<sup>11</sup>

**Alpha - Lipolic Acid (ALA):**

ALA is a potent antioxidant, which improves glucose consumption and metabolism in the brain. Hager *et.al* gave 600 mg ALA to nine AD patients with day by day. Results reveals that those receives the ALA had a balance of cognitive function indicated by stable scores on the MMSE scale and AD assessment scale.<sup>12</sup>

**2) Cardiovascular diseases:**

Worldwide the burdens of long-term diseases such as diabetes, cancer, cardiovascular diseases, and obesity is rapidly expanding. So, nutraceuticals in the form of dietary fibers, antioxidants, vitamins, minerals and polyunsaturated fatty acids are recommended side by side with physical activities for treatment and prevention of cardiovascular disease.<sup>13,14</sup>

**3) Parkinson's disease:**

It is a brain disarray that results from nerve injury in certain locations of the brain originating muscle shaking, rigidity and difficult walking. Some researchers suggested that vitamin E in food may be protective against Parkinson's disease. Nutritional and dietary supplements have shown some promising results in initial studies.

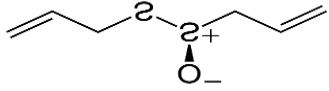

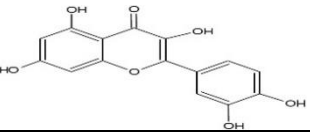
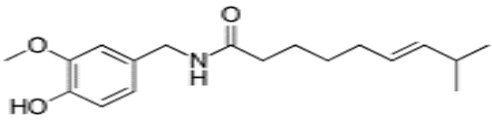
**4) Obesity:**

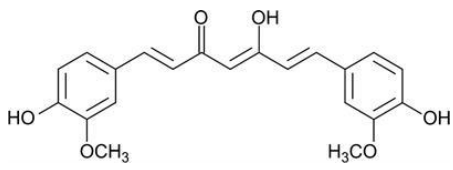
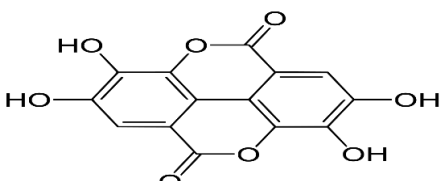
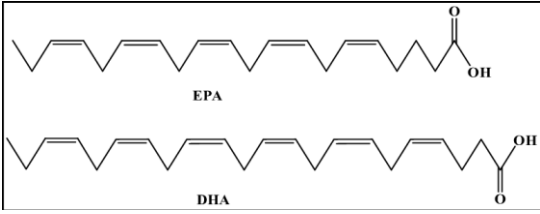
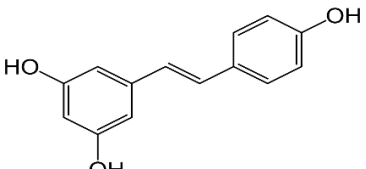
Obesity is a complicated situation, with psychological and social dimensions affecting almost all age groups and socioeconomic groups.<sup>17,18</sup> There is very high universality of obesity worldwide that is why nutrition and exercise play very important roles in its treatment and prevention. Nutraceutical like Psyllium fiber and Momordica charantia having antiobese properties. Also blend of chitosan, glucomannan, fenugreek, G sylvestre and vitamin C reduces body weight and boost fat loss in obese individuals.<sup>19,20</sup>

**5) Diabetes:**

It is a metabolic disorder and a complex phenomenon resulting in a big number of setbacks worldwide. There are two types of Diabetes mellitus type 1 and type 2. Type two is most common type o DM and most of the patients are obese with this form of DM. So various nutraceuticals like lipoic acid it is a universal antioxidant then psyllium, ephedrine, caffeine, green tea, buck wheat extract of bitter melon and cinnamon have potential to possibly prevent and cure diabetes.<sup>21,22</sup>

**List of some chemical compounds used as nutraceuticals isolated from plant source**

Sr No.	Chemical compound / Source	Properties
1.	Allicin from <i>Allium sativum</i> 	Antibacterial, Arteriosclerosis and Antioxidant. <sup>23</sup>
2.	Betaine (Trimethyl Glycine) from green leafy vegetables and germinated grains 	Homocysteine. <sup>24</sup>
3.	Bromelain from <i>Ananas sp.</i> 	Prevent heart disease, Inflammation and Arthritis. <sup>25</sup>
4.	Capsaicin from <i>Capsicum Annaum</i> 	Antioxidant. <sup>26</sup>

5.	<p>Curcumin from <i>Curcuma longa</i></p> 	Alzheimer's disease, Anti-cancer. <sup>27</sup>
6.	<p>Ellagic Acid from strawberries and raspberries</p> 	Anti-cancer. <sup>28</sup>
7.	<p>Omega 3 fatty acids from <i>Linum spp.</i></p> 	Ophthalmic disease. <sup>29</sup>
8.	<p>Resveratrol especially high in grape skin</p> 	Skin and breast cancer, Anti-inflammatory. <sup>30</sup>

### Conclusion:

From the above aforementioned discussion, it can be inferred that:

- Different forms of nutraceuticals available in excessive amount in plants.
- Supplementary diet containing essential anti-oxidants, phyto-chemicals and nutrients are very beneficial to treat lethal diseases including cancer, Parkinson's and Alzheimer's diseases. It's time to accept ancient perception including Indian Ayurveda and Greek philosophers under the light of current scientific discoveries in nutraceuticals who guides us "Let food be your medicine and medicine be your food".
- Future demand of nutraceutical depending on the public perception of the relationship between diet and disease.

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