



Centurion
UNIVERSITY

Classification of Nutraceuticals

DEFINITION

The term nutraceutical was coined by Stephen Defelice
“A NEUTRACEUTICAL is any substance that is a food or a part of food and provides medical or health benefits, including the prevention and treatment of disease”.

CLASSIFICATION

Neutraceuticals can be classified based on:

- Natural source
- Pharmacological conditions
- Chemical constitution

CLASSIFICATION BASED ON CHEMICAL GROUPS

s.no	Class	Examples
1	Inorganic mineral supplements	Minerals
2	Probiotics	Helpful bacteria
3	Prebiotics	Digestive enzymes
4	Dietary fibres	Fibres
5	Antioxidants	Natural antioxidants
6	Phytochemicals	
	Fatty acids	Omega 3 fatty acids
	Phenolics	Tea polyphenols
	Isoprenoids	carotenoids
	Lipids	Sphingolipids
	Proteins	soyaproteins
7	Herbs as functional food	-----

INORGANIC MINERAL SUPPLEMENT

- Calcium,
- Magnesium
- Manganese
- Boron
- Copper
- Zinc
- Phosphorus

PROBIOTICS

Live microorganisms which, when administered in adequate amounts, confer a health benefit on the host

- Species of *Lactobacillus*
- *Bifidobacterium*
- yeast *Saccharomyces cerevisiae*
- some *E. coli* and *Bacillus* species are also used as probiotics

PREBIOTICS

Nondigestible substances that provide a beneficial physiological effect for the host by selectively stimulating the favorable growth of a limited number of indigenous bacteria.

Commonly known prebiotics are:

- Oligofructose
- Inulin
- Galacto-oligosaccharides
- Lactulose

DIETARY FIBRES

Dietary fibers are of two types:

- Water insoluble fibers
- Water soluble fibers

Daily recommended intake is 30-40 gms.

SOURCES:

Whole grain cereals, wheat products.

Oats , dried beans, legumes.

ANTIOXIDANTS

- Antioxidants are of 3 Categories:
 1. True antioxidants
 2. Reducing agents
 3. Antioxidant synergists
- Deficiency causes diseases like cancers, rheumatoid arthritis, alzheimers disease, cardiovascular diseases.

ANTIOXIDANT	SOURCE
VITAMINS	
vitamin C	Citrus fruits, vegetables
vitamin E	Grains ,nuts, oils
CAROTENOIDS	
Lycopene	Tomatoes
Beta carotene	Carrots, sweet potato
XANTHOPHYLLS	
Beta cryptoxanthin	Mango ,papaya,oranges
FLAVANOIDS	
Rutin	Tobacco, eucalyptus species
Luteolin	Lemon, red pepper, olive
Quercitin	Onion, apple skin ,black grapes
Kaempferol	Grape fruit , tea
Liquiritin	Liquorice

HERBS AS FUNCTIONAL FOODS

FLAX SEEDS

SOURCE : *Linum usitatissimum*.

FAMILY : *Linaceae*.

CHEMICAL CONSTITUENTS :

Gamma linolenic acid

Alpha linolenic acid

Secoisolariciresinol(SDG)

Lignans, proteins.



FLAX SEEDS

USES :

- Prevents mammary, colon and rectal cancers.
- Reduces BP in hypertensive patients.
- Reduces diabetes and coronary heart diseases.

BILOBA

FAMILY : Ginkgoaceae

CHEMICAL CONSTITUENTS :

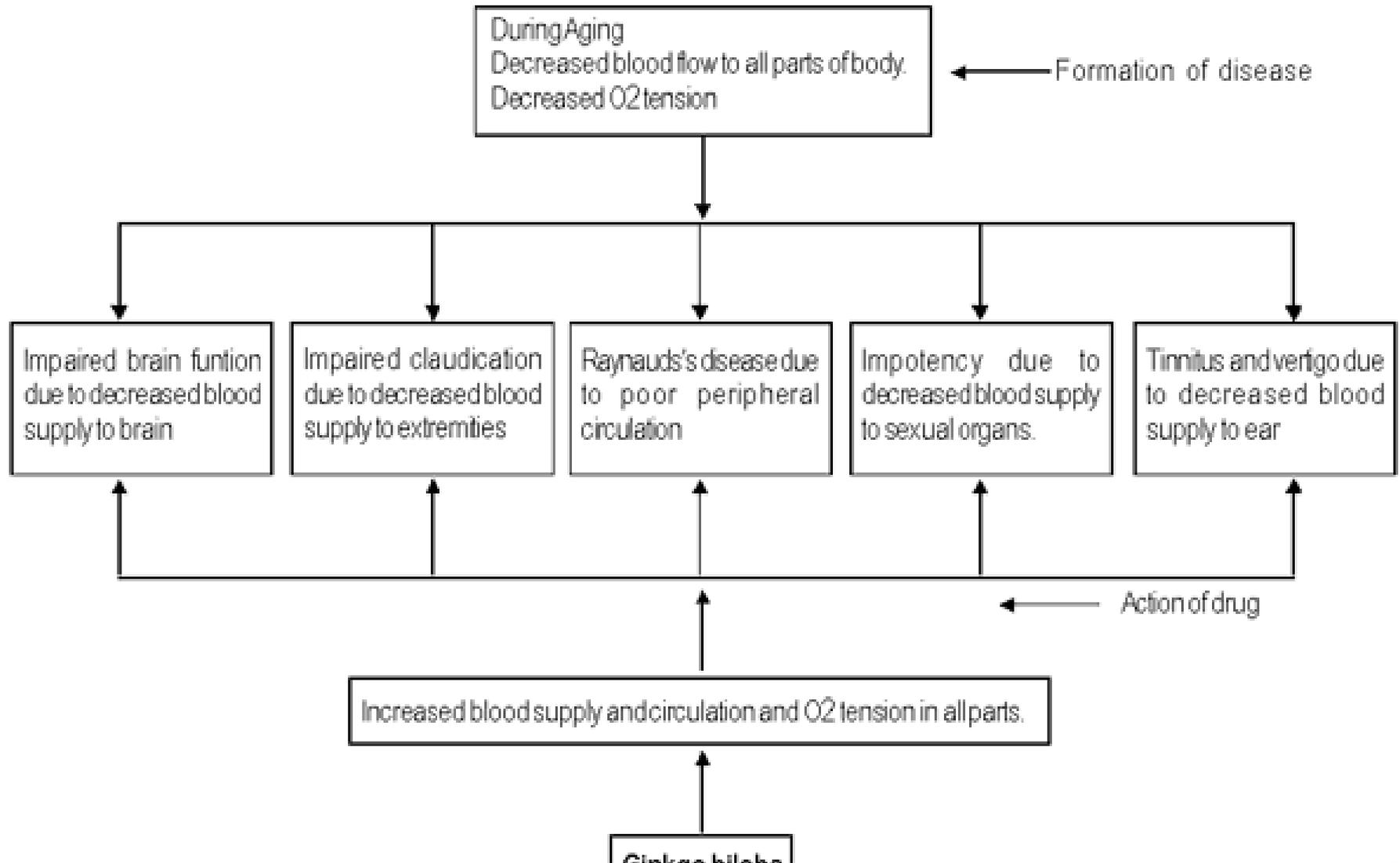
Bilobelin, ginkgetin,
isoginkgetin, flavanols,
ginkgolides A,B,C.

USES :

- In treating asthma,
impairment of memory.
- Leaves are able to alleviate the adverse effects of PAF.



MECHANISM OF ACTION



SPIRULINA

SOURCE :

Spirulina platensis or *S. maxima*

FAMILY :

Oscillatoriaceae

CHEMICAL CONSTITUENTS

Gamma linoleic acid,

Oleic acid ,

Glycolipids and sulpholipids.

Rich in vitamin B and

betacarotenes.

Phycocyanin.



SPIRULINA

- USES :
 - Immunostimulant activity.
 - Management of HIV and other viral infections such as herpes, cytomegalovirus, influenza, mumps
 - To treat arthritis, atherosclerosis, diabetes and aging process

KARELA

SOURCE :

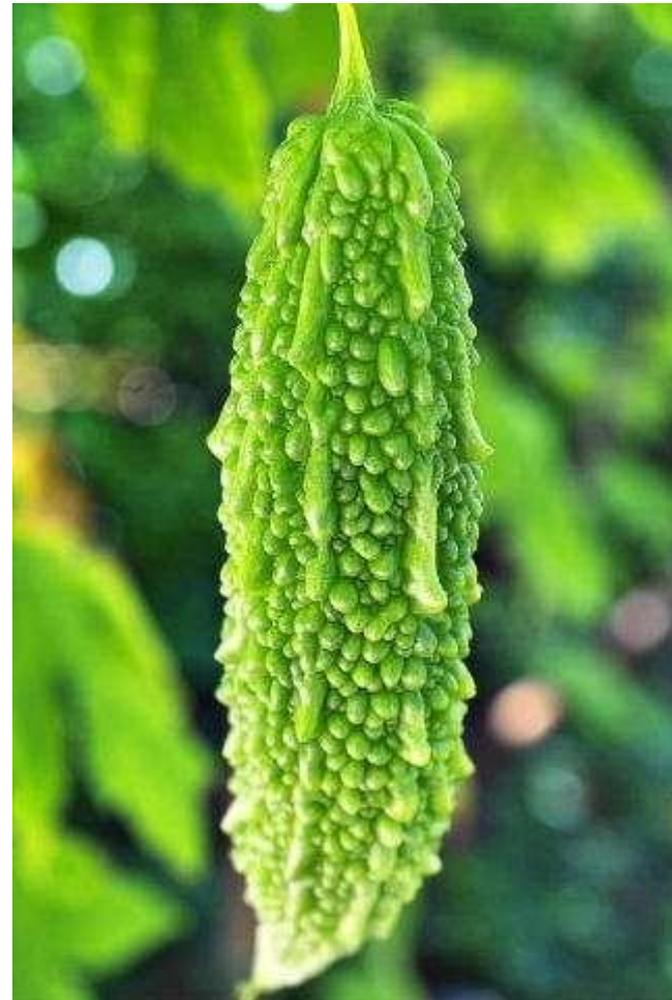
Momordica charantia

FAMILY :

Cucurbitaceae

USES :

- Hypoglycemic effect
- Extract of karela increases rate of glycogen synthesis by 4-5 fold in liver.



TURMERIC

CURCUMINOIDS

SOURCE : *Rhizomes of Curcuma longa*

FAMILY: *Zingiberaceae*

CHEMICAL CONSTITUENTS :

Curcumin, desmethoxy curcumin,
bisdesmethoxy curcumin

USES :

- Antimicrobial activity
- Recent findings indicate that it has integrase enzyme inhibitor activity



SOYA PRODUCTS

SOURCE : *Glycine
max*

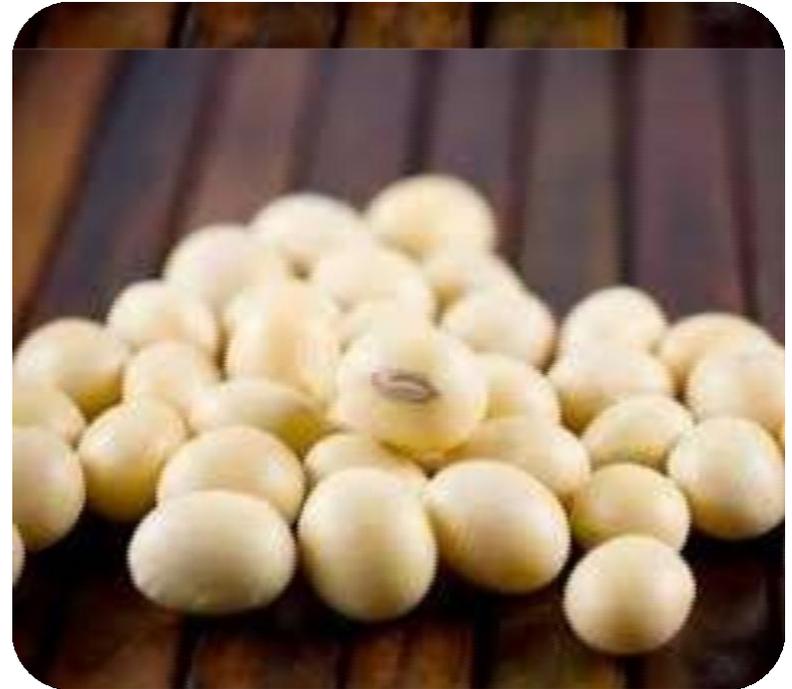
FAMILY: *Leguminoseae*

CHEMICAL CONSTITUENTS:

Daidzein,
genistein

USES :

- Prevents estrogen–dependant cancers
- Geinstein inhibits protein tyrosine kinase and DNA topoisomerase-II



GARLIC

SOURCE :

Bulbs of *Allium sativum*

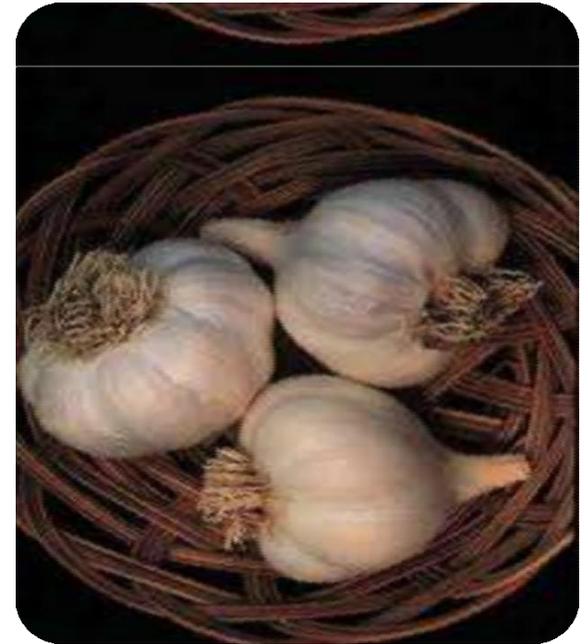
FAMILY: Liliaceae

CHEMICAL CONSTITUENTS :

Allicin , allin , ajoene

USES :

- In treatment of hyperlipidaemia.
- It shows antihypertensive, hypoglycemic, anti spasmodic activity.
- Prevents colon and lung cancers.



TOMATO LYCOPENES

SOURCE : *Lycopersicon esculentum*

FAMILY: *Solanaceae*

CHEMICAL CONSTITUENTS : Lycopene

USES :

- Prevents prostate cancer
- Reduces risk of cancers of digestive tract, pancreas, cervix, bladder and skin.



FENUGREEK

SOURCE :

Trigonella foenum-graecum

FAMILY: *Leguminosae*

CHEMICAL CONSTITUENTS :

➤ Alkaloids

(gentianine and trigonelline)

flavanoids,

coumarins,

proteins, amino acids,

steroid saponins.



FENUGREEK

USES :

- In treatment of anorexia, gastritis.
- Fenugreek possess laxative, expectorant, demulcent properties.
- Shows hypoglycemic and hypocholesterolemic properties

GINSENG

SOURCE : *Panax ginseng*

FAMILY: *Araliaceae*

CHEMICAL CONSTITUENTS:

Protopanaxadiol

Polysaccharides

Starch, sterols

Polyacetylenes, choline,

Vitamins B1,B2,B12,

Pantothenic acid, biotin.



GINSENG

USES :

- Ginseng helps the body to cope with stress and fatigue
- In treatment of hypertension and hypoglycemia
- Modifies liver function and metabolism.



EXAMPLES OF NUTRACEUTICALS CURRENTLY AVAILABLE IN MARKET

VITAMIN AND MINERAL SUPPLEMENTS :

VitaminA (Beta- Carotene)

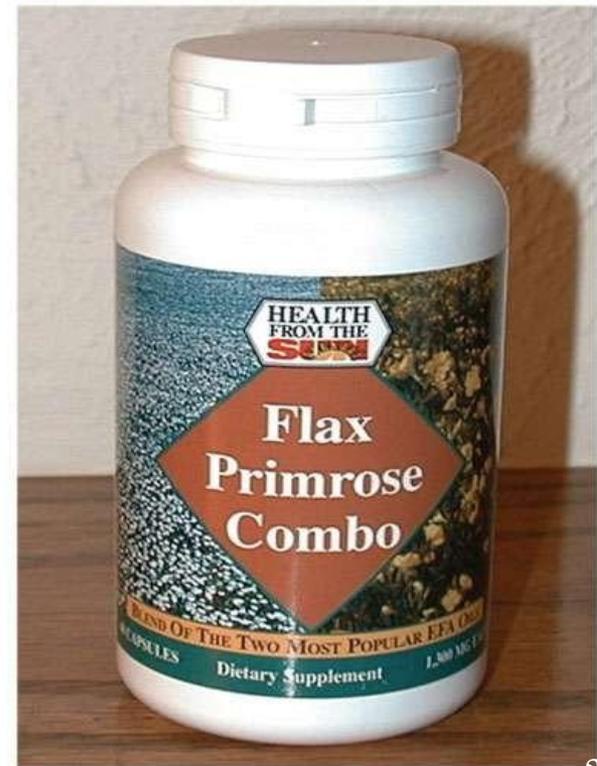
ADDITIONAL SUPPLEMENTS :

cod liver oil, primroseoil,
glucosamine, garlic etc.

SPORTS PRODUCTS-

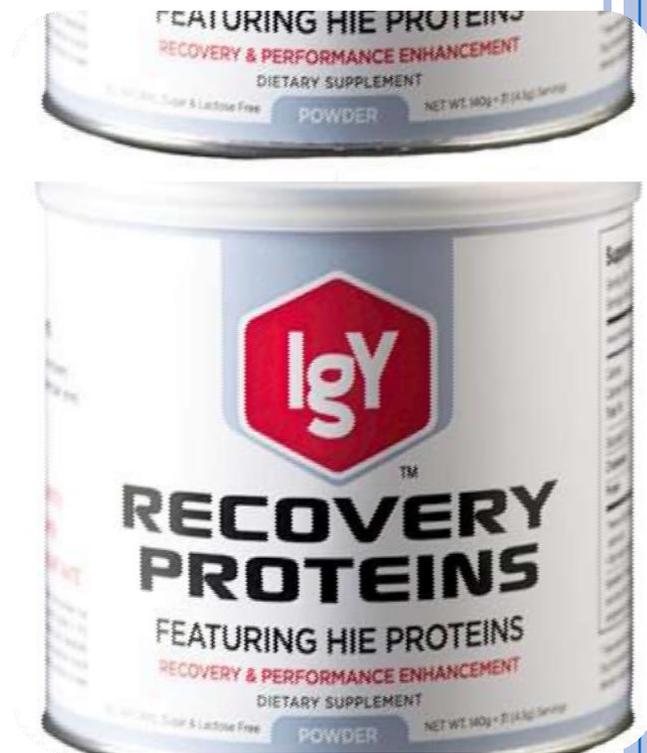
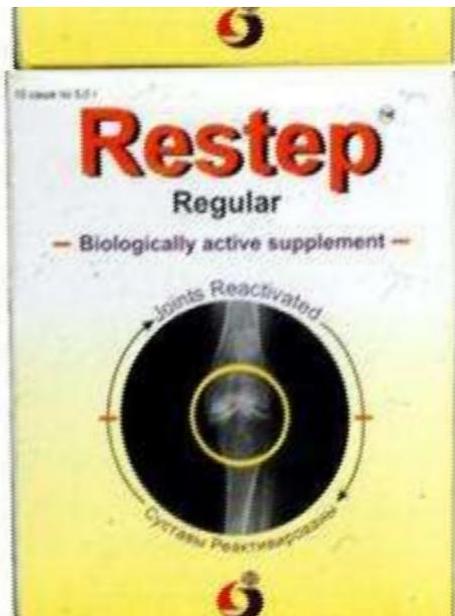
Glucon-D (Heinz),

Glucose D (Dabur)



The addition of a nutraceutical to a patient's diet will decrease or even eliminate his or her dry eye.

MARKETED PREPARATIONS



REFERENCES

- Text book of pharmacognosy and phytochemistry by Biren shah and A.K.Seth, pg.no-471-479.
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- Brower B. Nutraceuticals: poised for a healthy slice of the market. Nat Biotechnology 1998; 16: 728-33.
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Thank You