Chemical Analysis Graminex ™

Vitamins:	Carotenoids:	Minerals:
Provitamin A (carotenoids)	Alpha-carotene	Calcium
B1 Thiamine	Beta-carotene	Phosphorus
B2 Riboflavin	Xanthophyll	Potassium
Niacin	Zeaxanthin	Sulphur
B6 Pyridoxine	Lycopene	Sodium
Pantothenic Acid	Crocetin	Clorine
Biotin	Cryptoxanthin	Magnesium
B 12 (Cyanocobalamirn)		Iron
Folic Acid		Manganese
Choline		Copper
Inositol		Iodine
Vitamin C		Zinc
Vitamin D		Silicon
Vitamin E		Chromium
Vitamin K		Molybdenum
Ratin		Boron
		Titanium

Dietary Essential Amino Acids and Physiological Essential Amino Acids:

Dietary Essential:	Physiologically Essential:	
Histidine	Alanine	Glutamic Acid
Isoleucine	Alpha-amino butyric acid	Glutamine
Leucine	Arginine	Glycine
Lysine	Asparagine	Hydroxyproline
Methionine	Aspartic Acid	Proline
Phenylalanine	Cysteine	Serine
Threonine	Cystine	Tyrosine
Tryptophan		

Valine

Enzymes:

Tivial name

Class: Oxidoreductases

Alcohol dehydrogenase

D-Arabinitol dehydrogenase

Inositol aehyarogenase

UDP-Glucose dyhydrogenase

Lactate dehydrogenase

Malate dehydrogenase

Isocitrate dehydrogenase (NADP)

Phosphogluconate dehydrogenase

Glucose dehydrogenase

Glucose-6-phosphate dehydrogenase

Trosephosphate dehydrogenase

Malonate semialdehyde dehydrogenase

Succinate dehydrogenase

Glutamate dehydrogenase (NADP)

L-Amino-acid oxidase

Monoamine oxidase

Lpoamide dehydrogenase

Cytochrome oxidase

o-Diphenol oxidase, tyrosinose

Ascorbate Oxidase

Fatty acid peroxidose

Catalose

Peroxidose

Meso-inositol oxygenase

Class: Transferases

Asparate carbamoyltransferase

alphaGlucan-phosphorylase, P-enzyme

Maltose 4-glucosyltransferase, amylomaltase

UDP-Glucose-beta-glucan glucosyltransferase

Trehalosephosphate-UDP glucosyltransferase

alphaGluecanbranching glycosyltransferase

UDP-Galactose-glucose galactosyltransferase

Aspartate aminotransferase

Alanine aminotransferase

Glycine aminotransferase

Hexokinase

Glucokinase

Xylulokinase

Phosphoribulokinase

Glucuronokinase

Nucleosidediphosphate kinase

Phosphoglucomutase

DNA Nucleotidyltransferase

UDP-Glucose pyrophosphorylase

ADP-Glucose pyrophosphorylase

Ribonuclease (R Nase)

Class: Hydrolases

Carboxylesterase (B-esterase)

Arylesterase (A-esterase)

Lipase

Cultinase

Pectinesterase

Alkaline phosphatase

Acid phosphatose

Phytase

Trehalosephosphatase

Phosphodiesterase

Deoxyribonuclease (D Nase)

Arysulphatase

alpha-Amylase

beta-Amylase

Cellulase

Laminaranase (Callase)

Polygalacturonase (Pectinase)

alpha-Glucosidase

beta-Glucosidase

beta-Glucosidase

alpha-Mannosidase

beta-Fructofuranosidase, Invertase

Trenalase

beta-N-Acetyglucosaminidase

Oligo-1, 3-glucosidase

Leucine aminopeptiadase

Aminopeptidase

Pepsin, Protease

Trypsin

Aminoacylase

Inorganic phrophosphatase

ATPase

ATPase

Class: Lyases

Pyruvic decarboxylase

Oxaloacetat decarboxylase

Mesoxalic decarboxylase

Glutamic aecarboxylase

Phosphopyruvate carbonxylase

Phosphopyruvate carbonxylase

Ribulosediphosphate carboxylase

carboxydismutase

Ketose-1-phosphate aldolose

Fructosediphosphate aldolase

Citrate synthase (synthetase)

Phenylaranine ammonia-lyase

Class: Isomerases

UDP-Glucose epimerase

Arabinose isomerase

Xylose isomerase

Ribosephosphate isomerase

Glucosephosphate isomerase

Class: Ligases and Others

Carboxylases

Folic acid conjugase

D-glucose-6-P- cycloaldolase (NAD+)

Different Classes of Lipids in Flower Pollen:

Polar lipids:

The major fractions of the polar lipids in flower pollen are lecithin, lysolecithin, phosphoinositol and phosphatidylcholine.

Neutral lipids

Monoglycerides	Free fatty acids
Diglycerides	Sterols
Triglycerides	Hydrocarbons

Fatty Acid Profile:

Number of C-atoms and double bonds:

Caprylic acid (C-8)

Capric (C-10)

Lauric (C-12)
Myristic (C-14)
Myristoleic (C-14) one double bond
Pentadecanoic (C-15)
Pentadecenoic (C-15) one double bond
Palmitic (C-16)
Palmitoleic (C-16) one double bond
Heptadecanoic (C-17)
Heptadecanoic (C-17) one double bond
Stearic (C-18)
Oleic (C-18) one double bond
Linoleic (C-18) two double bonds
Linolenic (C-18) three double bonds
Arachidic (C-20)
Eicosenoic (C-20) one double bond
Eicosadienoic (C-20) two double bonds
Eicosatrienoic (C-20) three double bonds
Arachidonic (C-20) four double bonds

Prostaglandins;

A group of hormone-like compounds derived from linoleic and arachidonic acids that influence innumerable body processes.

Phytosterols:

Fucosterol

Beta-sitosterol	Campesterol
Stigmasterol	Estrone

Long Chain Hydrocarbons:

n-tricosane (C23)	myo-inositol
n-pentacosane (C25)	Pintol
n-heptacosane (C27)	Sequitol
n-nonacosane (C29)	

Strepotolysin Inhibitory Factor:

From Graminex ™ extract it was possible to isolate a streptolysin-inhibiting factor. The basic principle is a heat resistant factor (SIF) with a molecular weight of 850. In vitro, it causes irreversible inhibition of the streptococcus toxins.

Low Molecular Weight Sugars and Related Compounds:

Fructose	Maltotriose
Mannose	Glucose
Galactose	Xylose
Arabinose	Xyitole
Ribose	Xylogaracturonan
Fucose	Glucoronolactone
Hexasamine	Raffinose
Rhamnose	Stachyose
Maltotetratose	Sucrose
Maltrose	Callose
Myo-inosistol	Pinitol
Sequoyitol	

Flavinoids:

Quercetin	Apigenin	Kaempferol
Dihydroxquercetin	Sorhamnetin	Dihydrokaempferol
Naringenin	Myricetin	Luteolin
P-coumaric Acid	Isorhemnetin	

Growth Regulators:

Auxins	Gibberelins
Brassins	Kinins

Others:

Chlorophylt	Xanthine	Nucleic Acids
Hypoxalthine	Phenolic Acids	Nuclein
Tarpenes	Amines	Nucleosides
Hexodecanal	Vernine	Pentosans
Guanine	Gluthothlone	Ferulic Acid
Indoles	Superoxide Eismutase (SOD)	Adenosine Triphoephate (ATP)
Polyphenols	Pentosane	Ellagic Acid
Phenolic Acids (Catechin, Epicetoohln, Gallio)		

Unknown:

Some of the greatest values of Graminex ™ Flower Pollen Extract and Flower Pollen may stem from elements which are for the moment still unknown to science, and from the synergistic action of all the elements working together. IMPORTANT: There are established Recommended Daily Allowances for many vitamins and minerals and Graminex ™ Flower Pollen contains trace amounts of these ingredients.