



PURE NATURE

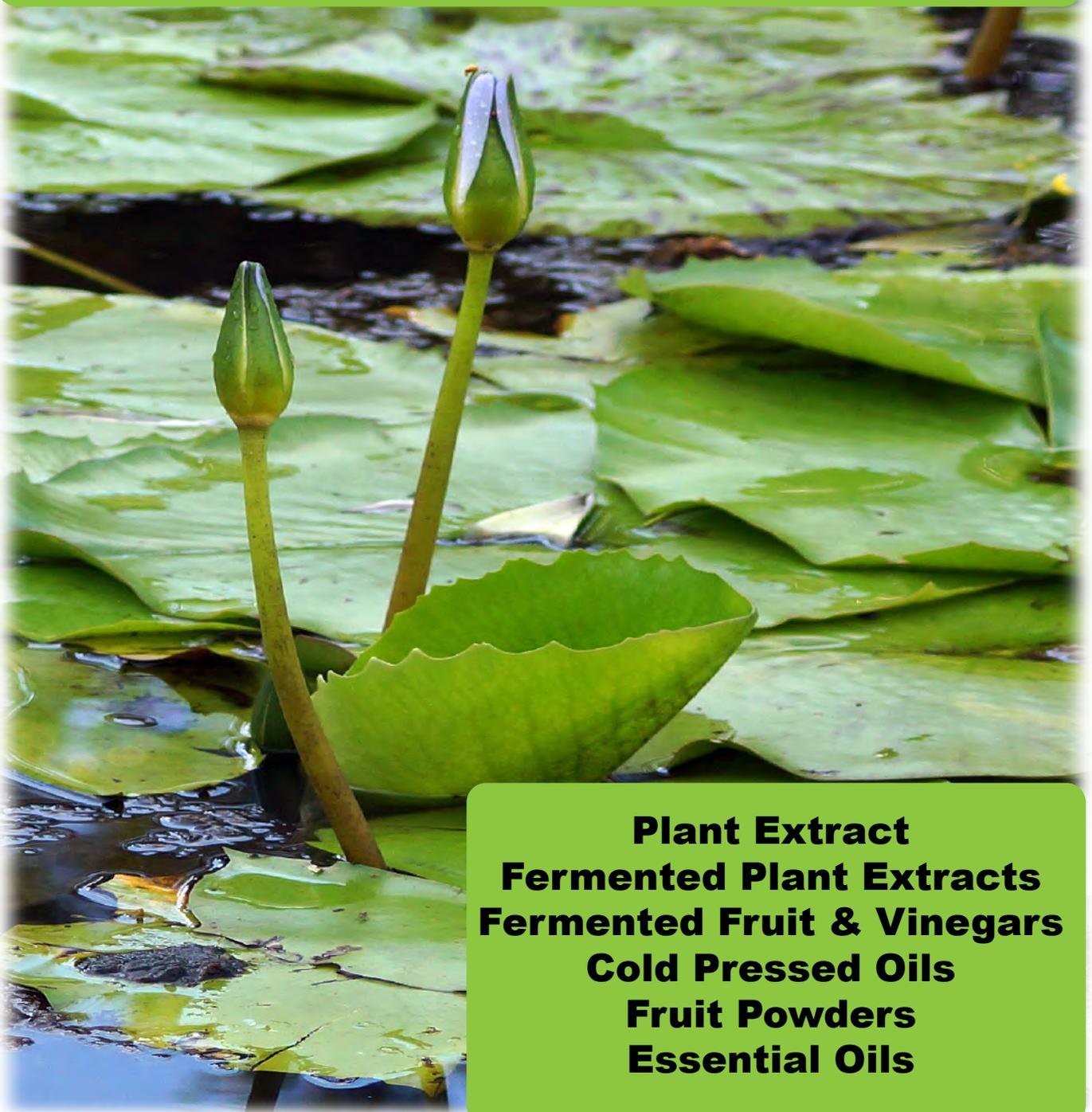
**Botanical
Innovations**

AUSTRALIAN FUNCTIONAL NUTRACEUTICAL FLAVOURS, FRAGRANCES & INGREDIENTS

**Plant Extracts-Naturally Fermented Fruits and Vinegars
Cold Pressed Oils-Essential Oils-Phenolic Rich Powders**

PHENOLIC RICH PYTHONUTRIENTS FLAVOURS, FRAGRANCES & INGREDIENTS

**PHENOLIC RICH PHYTONUTRIENTS
COSMECEUTICAL, NATURAL HEALTHCARE
FUNCTIONAL FOODS & BEVERAGES**



**Plant Extract
Fermented Plant Extracts
Fermented Fruit & Vinegars
Cold Pressed Oils
Fruit Powders
Essential Oils**

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BOTANICAL INNOVATIONS PHENOLIC RICH INGREDIENTS

Botanical Innovations has developed a range of phenolic rich flavours, fragrances & ingredients for:

- Functional Food & Beverages
- Cosmeceutical
- Natural Healthcare

Phenolic compounds are the chemicals produced by plants from photosynthesis.

A plant will produce phenolic compounds to adapt to changing environmental conditions flood, drought, heat, cold, nutritional stress and disease. In evolutionary terms phenols are believed to be responsible for plants migration from the sea to land when plants developed phenolic UV light screens and continued survival for millions of years.

Plants to adapt to changing environmental conditions and stress produce plant phenols which can produce free radicals and other oxidative compounds. Plants also have the ability to synthesize phenolic compounds which act as toxins and deterrents to insects, pathogens and other dangers as well as assist with attraction of insects for reproduction purposes.

Botanical Innovations has created a unique set of phenolic rich ingredients which contain concentrated phenolics with unique properties developed by plants over millions of years

A plants phenolic compound is divided into primary and secondary.

- Primary Phenolic Compounds (metabolites)
 - Sugars
 - Fatty Acids
 - Amino Acids
 - Nucleic Acids

Secondary Phenolic Compounds (metabolites) are more complex and believed to be responsible for the plants respiratory systems and its ability to survive in the environment.

- Secondary Phenolic Compounds include
 - Antioxidants
 - Hydroxycinnamic Acids
 - Hydroxybenzoic Acids
 - Stilbenes
 - Flavonoids
 - Flavonols
 - Flavan-3-ols

Botanical Innovations products contain both primary and secondary phenolic compounds, which provide added health and functional benefits to our products.

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BOTANICAL INNOVATIONS PRODUCTS

PHENOLIC RICH PYTONUTRIENT FLAVOURS, FRAGRANCES & INGREDIENTS

Botanical Innovations has spent 2 years undertaking research & development to create proprietary technologies to manufacture its unique range of phenolic rich phytonutrients.

PLANT EXTRACTS

- Red Grape Skin Extract
- White Grape Skin Extract
- Red Grape Seed Extract
- White Grape Seed Extract
- Australian French Oak Extract

FERMENTED PLANT EXTRACTS

- Fermented Red Grape Seed Extract
- Fermented White Grape Seed Extract
- Fermented Red Grape Skin Extract
- Fermented White Grape Skin Extract
- Fermented Apple Peel Extract

COLD PRESSED SEED OILS

- Australian Grape Seed Oil
- Australian French Oak Grape Seed Oil
- Australian Macadamia Grape Seed Oil
- Australian Apple Seed Oil
- Australian Apple Macadamia Seed Oil

FERMENTED FRUIT & VINEGAR

- Australian Apple Cider Vinegar

FRUIT POWDERS

- Apple Peel Powder
- White Grape Seed Powder
- Red Grape Seed Powder

ESSENTIAL OILS

- Buddha Wood Essential Oil

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Botanical Innovations Products Primary Phenolic Compounds (metabolites) Profile

	Plant Extracts	Fermented Plant Extracts	Fermented Fruit & Vinegar	Grape Seed Oil	Cherry Seed Oil	Fruit Powders
Fructose (Fruit Sugar)
Fatty Acid Profile						
Myristic C14:0 Omega 9				<0.1%	<0.1%	
Palmitic C16:0 Omega 9				7%	8.10%	
Palmitoleic C16:1 Omega 7				0.30%	0.70%	
Heptadecanoic C17:0 Omega 9				0.10%	0.10%	
Heptadecenoic C17:1 Omega 9				<0.1%	0.10%	
Stearic C18:1 Omega 9				3.80%	3.30%	
Oleic C18:0 Omega 9				19%	41.50%	
Linoleic C18:2 Omega 6				68.60%	42.80%	
Alpha-Linolenic C18:3 Omega 3				0.50%	1%	
Arachidic C20:0 Omega 6				0.20%	1.20%	
Elcosenoic C20:1 Omega 9				0.20%	0.50%	
Behenic C20:1 Omega 9				<0.1%	0.40%	
Erucic C22:1 Omega 9				<0.1%	0.10%	
Lignoceric C24:0 Omega 12				<0.1%	0.20%	
Tetracosenoic C24:1 Omega 9				<0.1%	<0.1%	
Polyunsaturated				69.10%	43.10%	
Monounsaturated				19.50%	42.90%	
Saturated				11.20%	13.40%	
Amino Acids
Nucleic Acids

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Primary Phenolic Compounds (metabolites) Found in Botanical Innovations Products

Fruit Sugars Fructose

Neutral fruit sugars.

Name: Fructose

Chemical Composition: C₆H₁₂O₆

Amino Acids

Amino acids are the building block for protein. Proteins are of primary importance to the continuing functioning of life on Earth. Proteins catalyze the vast majority of chemical reactions that occur in the cell. They provide many of the structural elements of a cell, and they help to bind cells together into tissues. Some proteins act as contractile elements to make movement possible. Others are responsible for the transport of vital materials from the outside of the cell ("extracellular") to its inside ("intracellular"). Proteins control the activity of genes.

Fatty Acids

A fatty acid is a carboxylic acid with a long aliphatic chain which is either saturated or unsaturated.

Botanical Innovations Products contained the following fatty acids that have beneficial and essential health properties. Each fatty acid has a corresponding Omega 3, 6, 9 or 12 with different pharmacological activities.

Two fatty acids are known to be essential for humans: alpha-linolenic acid (an omega-3 fatty acid) and linoleic acid (an omega-6 fatty acid). Some other fatty acids are sometimes classified as "conditionally essential," meaning that they can become essential under some developmental or disease conditions

including Omega 6 and Omega 3 fatty acids.

FATTY ACIDS

Myristic	C14:0	Omega 9
Palmitic	C16:0	Omega 9
Palmitoleic	C16:1	Omega 7
Heptadecanoic	C17:0	Omega 9
Heptadecenoic	C17:1	Omega 9
Stearic	C18:0	Omega 9
Oleic	C18:1	Omega 9
Linoleic	C18:2	Omega 6
Alpha -Linolenic	C18:3	Omega 3
Arachidic	C20:0	Omega 6
Elcosenoic	C20:1	Omega 9
Behenic	C22:0	Omega 9
Erucic	C22:1	Omega 9
Lignoceric	C24:0	Omega 12
Tetracosenoic	C24:1	Omega 9
Polyunsaturated		
Monounsaturated		
Saturated		

Nucleic Acids

Nucleic Acids are essential to all known forms of life. Nucleic Acids are found in all living things where they function in encoding, transmitting and expressing genetic information. Strings of nucleotides strung together in a specific sequence are the mechanism for storing and transmitting hereditary or genetic information via protein synthesis.

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BOTANICAL INNOVATIONS PRODUCTS SECONDARY PHENOLIC COMPOUNDS

	Plant Extracts	Ferment Plant Extracts	Ferment Fruit & Vinegars	Cold Pressed Oils	Fruit Powders	Essential Oils
Hydroxycinnamic Acids	▪	▪	▪	▪	▪	▪
p-coumaric	▪	▪	▪		▪	
caffeic	▪	▪	▪		▪	
ferulic	▪	▪	▪		▪	
Hydroxybenzoic Acids	▪	▪	▪	▪	▪	▪
Gallic	▪	▪	▪		▪	
Gentistic	▪	▪	▪		▪	
Salicylic	▪	▪	▪		▪	
Stilbenes	▪	▪	▪	▪	▪	▪
Resveratrol	▪	▪			▪	
Viniferins	▪	▪			▪	
Flavonols	▪	▪	▪	▪	▪	▪
Quercetin	▪	▪	▪		▪	
Kaempferol	▪	▪	▪		▪	
Myricetin	▪	▪	▪		▪	
Flavan-3-ols	▪	▪	▪		▪	
Catechin	▪	▪	▪		▪	
Eipcatechin	▪	▪	▪		▪	
Epicatechin -3-O-Galleate	▪	▪	▪		▪	
Pronthocyanidins	▪	▪			▪	
Anthocyanins	▪	▪			▪	

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**SECONDARY PHENOLIC COMPOUNDS IN BOTANCIAL
INNOVATIONS PHARMACOLOGICAL ACTIVITY**

	Antioxidant	Anti-infective Agent	Free Radical Scavenger	Anti-inflammatory	Anti-coagulant	Anti-hypertensive	Anti-fungal	Keratolytic	Anti-carcinogenic	Anti-eoplastic	Enzyme Inhibitor	Anti-mutagenic	Protease Inhibitor	Cholagogues Choloretics	Platelet Aggregation Inhibitor
Hydroxycinnamic Acids	▪	▪	▪	▪	▪	▪								▪	
p-coumaric	▪	▪	▪												
Caffeic	▪														
Ferulic	▪		▪	▪	▪	▪								▪	
Hydroxybenzoic acids	▪	▪					▪	▪							
Gallic	▪														
Castagin															
Vescalagin	▪														
Ellagic	▪														
Gentistic	▪														
Salicylic	▪	▪					▪	▪							
Stilbenes	▪			▪					▪	▪	▪	▪			▪
Resveratrol	▪			▪					▪	▪	▪	▪			▪
Viniferins	▪														
Flavonols	▪														
Quercetin	▪														
Kaempferol	▪														
Myricetin	▪														
Flavan-3-ols	▪									▪			▪		
Catechin	▪														
Eipcatechin	▪														
Epicatechin-3-O-Galleate	▪									▪			▪		
Pronthocyanidins	▪														
Anthocyanins	▪														

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KEY PHARMACOLOGICAL ACTIVITY OF PHENOLIC COMPOUNDS IN BOTANICAL INNOVATIONS PRODUCTS

This information is a general guide only. For additional literature about the possible pharmacological activity of Botanical Innovations products please refer to our secondary literature review.

Antioxidants

Antioxidants inhibit or retard oxidation reactions. May counteract the damaging effects of oxidation in animal tissues.

Anti-Infective Agents

May prevent infectious agents or organisms from spreading or kill infectious agents in order to prevent the spread of infection.

Anti-coagulants

Agents that may assist in the prevention of blood clotting.

Free Radical Scavengers

May eliminate free radicals and among other effects, they may protect pancreatic islets against damage by cytokines and may prevent myocardial and pulmonary reperfusion injury.

Anti-Inflammatory Agents, Non-Steroidal

Anti-inflammatory agents that are non-steroidal in nature. In addition to anti-inflammatory actions, they may have analgesic, antipyretic, and platelet-inhibitory actions. They may act by blocking the synthesis of prostaglandins by inhibiting cyclooxygenase, which

converts arachidonic acid to cyclic endoperoxides, precursors of prostaglandins. Inhibition of prostaglandin synthesis accounts for their analgesic, antipyretic, and platelet-inhibitory actions; other mechanisms may contribute to their anti-inflammatory effects.

Cholagogues and Choleretics

Gastrointestinal agents that may stimulate the flow of bile into the duodenum (cholagogues) or stimulate the production of bile by the liver (choleretic).

Anti-hypertensive Agents

May assist in the management of used in the treatment vascular hypertension.

Anti-Infective Agents

Substances that may prevent infectious agents or organisms from spreading or may kill infectious agents in order to prevent the spread of infection.

Anti-fungal Agents

Substances may that destroy fungi by suppressing their ability to grow or reproduce. That is a potential defence against fungi present in human or animal tissues.

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Keratolytic Agents

Agents that may soften, separate, and cause desquamation of the cornfield epithelium or horny layer of skin. They are used to expose mycelia of infecting fungi or to treat corns, warts, and certain other skin diseases.

Anti-carcinogenic Agents

Agents that may reduce the frequency or rate of spontaneous or induced tumors independently of the mechanism involved.

Anti-neoplastic Agents, Phytogenic

Agents obtained from higher plants that may have demonstrable cytostatic or antineoplastic activity.

Enzyme Inhibitors

Compounds or agents that may combine with an enzyme in such a manner as to prevent the normal substrate-enzyme combination and the catalytic reaction.

Platelet Aggregation Inhibitors

Drugs or agents, which may antagonize or impair any mechanism leading to blood platelet aggregation, whether during the phases of activation and shape change or following the dense-granule release reaction and stimulation of the prostaglandin-thromboxane system.

Anti-mutagenic Agents

Agents that may reduce the frequency or rate of spontaneous or induced mutations independently of the mechanism involved.

Protease Inhibitors

Compounds which inhibit or antagonize biosynthesis or actions of proteases



Glossary Secondary Phenolic Compounds found in Botanical Innovations Products

Hydroxycinnamic Acids

Caffeic Acid

Name: Caffeic Acid

Chemical Composition: $C_9H_8O_4$

Pharmacological Action

- Antioxidants

P-Coumaric

Name: P-Coumaric

Chemical Composition: $C_9H_8O_3$

Pharmacological Action

- Antioxidants
- Anti-Infective Agents
- Free Radical Scavengers

Ferulic Acid

Name: Ferulic Acid

Chemical Composition: $C_{10}H_{10}O_4$

Pharmacological Action

- Anti-Inflammatory Agents, Non-Steroidal
- Cholagogues and Cholaretics
- Free Radical Scavengers
- Anticoagulants
- Antihypertensive Agents

Hydroxybenzoic Acids

Gallic Acid

Name: Gallic Acid

Chemical Composition: $C_7H_6O_5$

Pharmacological Action

- Antioxidants

Castalagin Vescalagin

Name: Castalagin Vescalagin

Chemical Composition: $C_{41}H_{26}O_{26}$

Pharmacological Action

- Antioxidant
- Tannin

Ellagic Acid

Name: Ellagic Acid

Chemical Composition: $C_{14}H_6O_8$

Pharmacological Action

- Antioxidant
- Tannin

Benzaldehyde

Name: Benzaldehyde

Chemical Composition: C_7H_6O

Pharmacological Action

- Flavouring, Perfume, Pharmaceutical

Gentistate Acid

Name: Gentistate Acid

Chemical Composition: $C_7H_6O_4$

Pharmacological Action

- Antioxidants

Salicylic Acid

Name: Salicylic Acid

Chemical Composition: $C_7H_6O_3$

Pharmacological Action

- Anti-Infective Agents
- Antifungal Agents
- Keratolytic Agents



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Stilbenes

Resveratrol

Name: Resveratrol

Chemical Composition: $C_{14}H_{12}O_3$

Pharmacological Action

- Anti-Inflammatory Agents, Non-Steroidal
- Anti-carcinogenic Agents
- Antineoplastic Agents, Phytogetic
- Enzyme Inhibitors
- Platelet Aggregation Inhibitors
- Anti-mutagenic Agents
- Antioxidants

Flavonoids

Flavonols

Quercetin

Name: Quercetin

Chemical Composition: $C_{15}H_{10}O_7$

Pharmacological Action

- Antioxidants

Kaempferol

Name: Kaempferol

Chemical Composition: $C_{15}H_{10}O_6$

Pharmacological Action

- Antioxidants

Myricetin

Name: Myricetin

Chemical Composition: $C_{15}H_{10}O_8$

Pharmacological Action

- Antioxidants

Flavan-3-ols

Eipicatechin

Name: Epicatechin

Chemical Composition: $C_{15}H_{14}O_6$

Pharmacological Action

- Antioxidants

Eipicatechin 3-O-Gallate

Name: Epicatechin 3-O-gallate

Chemical Composition: $C_{22}H_{18}O_{10}$

Pharmacological Action

- Antineoplastic Agents, Phytogetic
- Antioxidants
- Protease Inhibitors

Proanthocyanidin

Name: Proanthocyanidin

Chemical Composition: $C_{31}H_{28}O_{12}$

Pharmacological Action

- Antioxidants

Anthocyanin

Name: Anthocyanin

Chemical Composition: $C_{31}H_{28}O_{12}$

Pharmacological Action

- Antioxidants



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