

# HPY Scientific Monograph

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## Ingredients

### Botanicals

[Ashwagandha Root](#)  
[Banana](#)  
[Chamomile](#)  
[Ginger Root](#)  
[Ginkgo Leaf](#)  
[Grapple Plant Root](#)  
[Hemp Seed](#)  
[Licorice Root](#)  
[Passion Flower Leaf](#)  
[Pear](#)  
[Sea Buckthorn Berry](#)  
[Turmeric Root](#)

### Other Ingredients

Molasses  
Beet Sugar  
Citric Acid  
Green Tea Natural Flavor

### [Reference](#)

## Ashwagandha Root (*Withania somnifera*)



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- Considered to be one of the most important herbs in India's healing system of Ayurveda, dating back to 6,000 BC, and used for leukorrhoea (inflammation of the vagina, abnormal discharge), boils, pimples, flatulent colic, worms and piles, and recommended for fever and painful swellings.
- Increases the body's resistance to various infections and strengthens the immune system.
- Noted in many studies for increasing sperm count due to its phytosterol content that are precursors to many hormones.
- Is an adaptogenic and anxiolytic, meaning it helps stabilize the body's physiological processes, promoting homeostasis or biochemical equilibrium, thereby decreasing cellular sensitivity to stress; sitoindosides and acylsterylglucosides are the main classes of phytochemicals attributed to *Withania's* stress reduction effects.

- The acetylsterylglycosides contained in its roots have stress-relieving properties and have both tonic and sedative effects.
- Anti-inflammatory and anti-arthritis agent; in clinical cases, *Withania* has been found useful for rheumatoid and osteoarthritis.
- Antiseptic properties.
- Studies indicate *Withania* improves energy levels by boosting the functioning of cell mitochondria, the powerhouse organelles that convert nutrients to energy-rich molecules, and therefore increases stamina while preventing the biochemicals produced under strained physical effort conditions, including lactic acid.
- Studies also indicate its capacity to protect against gastric ulcers, and that it has an anti-tumor effect on lung and ovary cancer cells.
- *Withania* has been found to help control uterine fibroids and dermatosarcoma (cancer that occurs in the deep layers of the skin).
- Has a GABA mimetic (cognition promoting) effect through supporting the formation of new dendrites or neuropathway extensions of the nerve cells, which is helpful in those with memory deficit and neurodegenerative diseases such as Alzheimer's, Huntington's and Parkinson's diseases.
- *Withania* contains many vitamins, minerals, antioxidants and beneficial alkaloids and plant steroidal lactones (Singh, et. al., 2011).

## Banana

(*Musa*)

[Top](#)



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- Bananas aid in the retention of the minerals calcium and phosphorus, essential for strong bones and teeth and heart, structural muscles, and nerve and glandular functioning.
- Also are high in the essential mineral potassium, which helps prevent muscle spasms, balance blood pressure, and helps correct fluid balance in those with sodium-potassium imbalances, which reduces risk of stroke.
- Potassium also helps suppress calcium excretion in the urine and thus helps prevent the formation of kidney stones, and helps muscles contract and relax properly, thereby reducing cramping.
- Bananas also contain the essential mineral magnesium, important in contributing to fluid and electrolyte balance in body fluids.

- Contain iron, which helps maintain healthy hemoglobin, the iron-containing oxygen transporting protein in red blood cells.
- Also aid in the retention of nitrogen, the essential component of all proteins, in order to build, regenerate and repair healthy tissues.
- Promote healing of intestinal disorders since they neutralize stomach acids; are considered to be one of the few fruits that those with ulcers can safely consume.
- Aid in constipation and diarrhea relief; have been observed to alleviate arthritis; help with anemia.
- Contain:
  - Precursors to the body's production of vitamin A, which is used for building healthy teeth, bones, and soft tissues.
  - Vitamin B6 (pyridoxine) is important for a strong immune system (aids in producing antibodies against infectious diseases), helps regulate blood glucose levels which can affect mood, plays a role in building new red blood cells, helps metabolize fats, and improves brain focus, mental energy and acuity, and is important for optimal heart functioning.
  - Contains other B complexes that help calm the nervous system without sedation.
  - Vitamin C, which aids in the healing process and new tissue growth, and maintaining strong ligaments
  - Vitamin D, which is vital in the absorption of calcium and important for the production of thousands of regulating, monitoring hormones.
- Provide the nutrient and phytochemical components to fuel the muscles for better physical energy and endurance, and improve mood, including premenstrual syndrome (PMS).
- Contain phenolic antioxidant phytochemicals that protect nerve cells (neurons) against oxidative stress-induced neurotoxicity, and therefore help reduce the risk of neurodegenerative disorders such as Alzheimer's.
- Contain a balance of natural sugars for a sustained boost of energy, and soluble fiber important in preventing heart disease.
- Contain the essential amino acid tryptophan, which the body converts to serotonin, a hormone that helps one relax, improve mood, and makes one feel happier (Kumar, et. al., 2012).
- Banana has also traditionally been used for burns, preventing various illnesses, and for depression, which is thought to be due to its carotenoids, phenolics, amine compounds and vitamins, minerals and other beneficial active compounds that influence hormonal and brain activity (Pereira, 2014).
- Used in traditional medicine in the tropics for diarrhea, diabetes, dysentery, gout, hypertension, heart disease, intestinal lesions as in ulcerative colitis, uremia, and nephritis.
- Contains abundant amounts of phytochemicals or phytonutrients that benefit various body systems, a few of which are:
  - Catecholamines – norepinephrine, serotonin, dopamine, tryptophan, indole compounds.
  - Pectin, a soluble fiber important in heart health and blood vessel strength, and in preventing colon and prostate cancer, helping to manage diabetes and improve the biological mechanisms that result in gastroesophageal reflux disease (GERD).
  - Flavonoids – leucocyanidin, quercetin, glucosides.
  - Tannins, albuminoids, mineral salts, fatty acids.
  - Glycosides – sitosterol gentiobioside, sitosterol and many other compounds.
  - Triterpenes – cyclomusalenol, cyclomusalenone and many others.
  - Lanosterol and other hypertensive agents have also been found in bananas.
- Contain beneficial insoluble fiber: cellulose, hemicelluloses.

- Contain some essential amino acids, the basis from which proteins are synthesized: arginine, leucine, valine, phenylalanine, and threonine.
- Contains other amino acids such as aspartic acid, used in the biosynthesis of the body's vast number of proteins, and glutamic acid, the most excitatory neurotransmitter in the body's nervous system.
- Animal and human studies indicate banana's effect on the life-threatening bacillary dysentery or shigellosis, an infection of the colon caused by bacterial species of the *Enterobacteriaceae Shigella* bacteria family, and in alleviating associated diarrhea.
- Has shown anti-ulcerative activity in peptic ulcers; its pectin and the flavonoid, leucocyanidin, helped strengthen and protected the mucosal phospholipid layer in the gastric cells of the stomach from erosions.
- Another study reported that banana protected the mucosal stomach tissues from clinically induced gastric and duodenal ulcers from aspirin, histamine, and prednisolone. This protective effect was attributed to an increase in mucosal thickness through increased reinforcement of thymidine, a component of DNA, resulting in the proliferation of mucosal cells and subsequent healing.
- Other studies indicate banana's acid-neutralizing capacity and antimicrobial effects of certain water and ethanolic extracts on pathogenic bacteria such as *Staphylococcus* and *Pseudomonas* species, and against *Salmonella paratyphi*, *Shigella flexnerii*, *Escherichia coli*, *Klebsiella pneumoniae*, and *Bacillus subtilis*, as well as the yeast, *Candida albicans*.
- Banana is known for its glycemic effect, associated with its potassium and sodium balance; it has shown hypoglycemic activity (the lowering of too much blood sugar) due to its effect on the stimulation of insulin production and on glucose utilization.
- The various types of fiber in banana have been found to help the liver increase glycogenesis or the formation of glycogen, the body's complex carbohydrate, in instances of fasting low blood glucose levels, with glucose being the body's basic unit of sugar and cellular energy source.
- The hemicellulose fiber in banana helps attenuate blood sugar and triglyceride levels by preventing some absorption of glucose, cholesterol and fats, important in controlling diabetes.
- Pectin in bananas has shown antihypertensive activity in hypertensive rat test subjects, with a mean arterial blood pressure and cholesterol lowering effect, and is thought to be due to its tryptophan and carbohydrate content, which increases serotonin levels in the presence of adequate amounts of calcium ions.
- *In vitro* studies indicate that compounds such as dopamine and vitamin C in banana help inhibit the formation of diet-induced atherosclerotic plaques in the blood vessels, help resist oxidative stress that leads to raised LDL cholesterol, help prevent thyroid dysfunction, and in vivo studies, show that those compounds prevent the formation of gallstones.
- Banana's antioxidant activity has been found to be due to its abundant amounts of flavonoid glycosides and monosaccharides that stimulate the body's antioxidant, superoxide dismutase (SOD) and catalase activities thought to be responsible for reducing peroxidation byproducts such as hydroperoxides, malondialdehyde, and conjugated dienes.
- Bananas help regulate body fluid levels, helping to prevent hypertension; this diuretic or urine production effect is attributed to its phytochemicals such as saponin, flavonoids, and terpenoids.
- Antioxidant properties include improved wound healing, decreased scarring, and preventing lipid peroxidation, free radicals that are present where wounds have occurred.
- Bananas have reportedly demonstrated antiallergenic activity.

- A scientific review of the above studies concluded that traditional uses of banana for cardiac diseases, diarrhea, diabetes, dysentery, hypertension and ulcer are scientifically valid (Imam, Akter, 2011).

### Chamomile, German (*Matricaria retutita*)

[Top](#)



Photos By: Jenő Szabó, James C. Congerdesign - Pixabay

- Found to have anti-inflammatory and emollient or soothing, moisturizing properties.
- Traditionally used for colds.
- Has been shown to improve liver, urinary bladder and kidney functioning, and aid the digestive system.
- Used to help regulate and balance the menstrual cycle.
- Very useful for gastric ulcers, gallstones and women's health.
- Found to be useful for people who suffer from hypertension, or insomnia.
- Anti-inflammatory, hemostatic (helps stop bleeding), antiseptic, subastringent (mildly constricts body tissues), analgesic (pain reliever), sedative, antispasmodic, diaphoretic (induces perspiration), cholagogue action (stimulates bile discharge from the liver for digesting fats).
- Studies indicate its use for general anxiety; acts as a mild sedative.
- Contains compounds known as phenolics, which are associated with increased antibacterial activity, and appears to boost immune activity and fight infections associated with colds.
- Contains the amino acid glycine, known to have nerve-relaxing actions, as has been associated with the relieving of menstrual cramps in women (Sampson, 2005).
- Commonly used for hay fever, gastrointestinal disorders, rheumatism pain, insomnia, hemorrhoids, muscle spasms, menstrual problems, ulcers, and wounds.
- Contains approximately 120 secondary metabolites, and includes 36 flavonoids and 28 terpenoids.
- Helps improve cardiovascular health, stimulates the immune system, and demonstrates anticancer properties (Srivastava, et al., 2010).
- Found to be useful for irritable bowel syndrome, insomnia and stomach ache.

- Has relaxant effects, is antibacterial.
- Found to be anxiolytic, antimutagenic, lowers cholesterol, and is anti-diabetes.
- Able to heal skin lesions in colostomies.
- Chamomile contains antioxidant phytochemicals, including: apigenin, apigenin-7-O glucoside, caffeic acid, chamazulene chlorogenic acid, coumarin, farnesene, luteolin, luteolin-7-O glucoside, and terpene bisabolol.
- Contains flavonoids, including: apigenin, luteolin, patuletin, and quercetin.
- Found to have antibacterial, anticarcinogenic, antidiabetic, antidiarrheal, antigastrointestinal, antimicrobial, antioxidant, antidepressive, anti-inflammatory, liver or hepatoprotective effects.
- Antiangiogenic activities (stopping tumors from growing their own blood vessels) were evaluated in the flavonoids luteolin and apigenin (Miraj, Alesaeidi, (2016)).

### Ginger Root (*Zingiber officinale*)

[Top](#)



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- An effective tool for the prevention of and alleviating peptic ulcer disease.
- Has positive effects on the lining of the stomach; prevents intestinal parasites.
- Helps to strengthen blood vessels, reduces the risk of blood clots.
- Contains some essential amino acids that play a major role in metabolism (the biochemical processes that occur in living organisms that are necessary to maintain life).
- Contains asparagines, one of the most common amino acid on Earth that is a component of many proteins the body produces.
- High in choline, a biochemical that supports nerve, brain and muscle movement functions, and prevents fatty liver (Linus, 2017).

- High in caprylic acid, a beneficial saturated fatty acid that has antibacterial, antiviral, antifungal and anti-inflammatory properties.
- Contains other essential minerals: calcium, chromium, iron, magnesium, manganese, germanium, potassium, phosphorus and sodium.
- Contains silica, commonly found in bones, tendons, the aorta (largest artery in the body), kidneys and liver, hair, skin and nails (Munjas, et. al., (2013).
- Contains a primary essential fatty acid, linoleic acid, from which the body makes other critical fatty acids for cell membrane maintenance, brain and nervous system health.
- Also contains oleic acid, a naturally occurring fatty acid in humans and animals, classified as a monounsaturated omega-9 fatty acid.
- Contains the B vitamin nicotinic acid (niacin), and vitamin C.
- Contains essential amino acids: tryptophan, methionine, phenylalanine, and valine.
- Analgesic (painkiller), resolves dampness and phlegm.
- Carminative (relieves flatulence), anti-inflammatory, healing, antispasmodic, aphrodisiac, diaphoretic (induces perspiration), bactericidal, cholagogue (stimulates bile flow from the liver), tonic (invigorates or strengthens), antibacterial.
- Has a strong antioxidant and soothing effect.
- Strengthens the immune system, has anti-parasitic properties and inhibits the growth of bacteria.
- Contains trace elements that have a positive effect on the digestive system.
- Effective for renal (kidney), intestinal and biliary colic (in the liver, gallbladder and bile ducts).
- Used to speed recovery from colds, cough, flu, sinusitis, pulmonary stagnation, soothes throat pain, an expectorant.
- Anti-inflammatory, used for reducing allergy symptoms as well as bronchial asthma and skin rashes.
- Helps reduce cholesterol levels.
- Used as an analgesic for diseases of joints, for arthrosis degenerative disease of the joint where the cartilage lining of the joint erodes over time, and for rheumatism (an autoimmune malfunction) and arthritis (inflammatory response to various causes).
- Used to reduce inflammation from sprains, swelling, and muscle aches.
- Contains ginsenosides, anticancer saponins, so therefore is an anticarcinogenic, chemopreventive agent, or reduces severity of symptoms from cancer treatments, inhibits proliferation of cancer cells, induces apoptosis or cancer cell self-destruction (Wee, et. al., 2011)
- A universal remedy for ridding the body of accumulated toxic waste.

## Ginkgo Leaf (*Ginkgo biloba*)

[Top](#)



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- Used to help improve memory, reduce anxiety, and normalize sleep.
- Shown to have anti-inflammatory and antiallergenic properties.
- Shown to block the formation of blood clots, clean lymph, improve blood circulation, eliminate headaches and alleviate dizziness.
- Strengthens the arteries, veins and capillaries, slows the aging process down, strengthens hair.
- A review of several studies show that ginkgo is a safe and effective botanical for improving symptoms of Alzheimer's, vascular dementia (brain damage caused by multiple strokes) or menopausal disorders such as memory, concentration, depression, dizziness, and tinnitus (ringing in the ears).
- Contains phytochemical, antioxidant and anti-inflammatory flavonoids and terpenoids:
  - Flavonoids in ginkgo are found to inactivate the effects of active oxygen toxicity in free radicals.
  - Its terpenoids are found to prevent the formation of blood clotting factors and protect nerve cells in the brain.
  - Flavonoids and terpenoids in ginkgo together help improve memory and learning ability, improve microcirculation, increase hypoxia tolerance in brain cells (ability to tolerate oxygen deficiency, such as the adaptive response in scuba diving), and improve blood viscosity or decrease blood's thickness (Hashiguchi, 2015).
- A meta-analysis review of *Ginkgo's* effectiveness for improving cognition, activities of daily living, and a global view in applying *Ginkgo* to patients concluded that ginkgo has demonstrated clinical efficacy in improving dementia (Gauthier, 2014).
- *Ginkgo* has been shown to improve working memory and working memory speed.
- The active compounds in *Ginkgo*, which include flavonol glycosides, ginkgolides, bilobalide and proanthocyanidins are potent free radical scavenging antioxidants that protect nerve cells from damage, as well as influence various nerve transmission systems considered to be critical in cognition (perception, discernment, comprehension, insight).
- Those active compounds in *Ginkgo* are thought to enhance cholinergic processes (the releasing of or responding to acetylcholine, a chemical released by nerve cells that sends signals to other cells) in the brain's hippocampus, thought to be the center of the autonomic

(involuntary or unconscious) nervous system, and which influences emotions and spatial working memory.

- Ginkgo's positive influence on cholinergic transmissions has been associated with increased brain electrical activity through improved cerebral blood flow in the brain's visual cortex, the portion of the cerebral cortex that receives and processes impulses from the optic nerves (Silberstein, et. al., 2011).

### Grapple Plant Root (*Harpagophytum procumbens*)

[Top](#)



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- Indigenous to South Africa, *H. procumbens* has traditionally been used for fevers, arthritis, and diseases of the digestive tract, skin problems, and an appetite stimulant.
- Since its introduction in Europe, *H. procumbens*'s effectiveness has been demonstrated in numerous studies for its anti-inflammatory and analgesic or pain-relieving properties when applying to degenerative joint diseases and tendonitis, and backache, headache and menstrual discomforts.
- *H. procumbens*'s properties on how it significantly halts the pain-causing and degenerative effects of pro-inflammatory biomarkers (such as C-reactive Protein or CRP present in the blood) are currently being further studied (Grant, et. al., 2007).
- In addition to common uses for pain and arthritic conditions, other ethnomedicinal uses include diseases of the blood, boils, dyspepsia, urinary tract infections, ulcers, sores, pain associated with post-partum.
- Studies show that *H. procumbens* has analgesic, antioxidant, anti-diabetic, anti-epileptic, antimicrobial and antimalarial properties, and these effects are associated with its anti-inflammatory phytochemicals known as iridoid glycosides, which include harpagoside and harpagide, and phenylpropanoid glycosides (Mncwangi, et. al., 2012).

- *Harpagophytum procumbens* has also been used to stimulate gastric enzymes to improve the digestive process, as well as for other disorders such as malaria, fever, diabetes, atherosclerosis and rheumatic diseases.
- When tested against helminthic infections (parasitic worms), *H. procumbens* clearly demonstrated the reduction of pathogenic organisms through measurements in elevated and reduced counts of eosinophils, a type of white blood cell (Oliveira, et. al., 2013).

## Hemp Seed (*Cannabis sativa L.*)

[Top](#)



D-Kuru 2008, Barbetorte 2009, Erik Fenderson 2006 - Wikimedia

- Commonly known as hemp, belongs to the *Cannabaceae* family, with an ancient history of cultivation during the Bronze age from the 22<sup>nd</sup> until the 16<sup>th</sup> century BC; most experts agree this botanical originated in central Asia.
- The domesticated form of *C. sativa L.* is now also widely cultivated in Africa, Canada, Europe, and the United States.
- Formerly recognized mostly as animal feed, increased knowledge about the seeds nutrient value and health functionality has fueled growing awareness.
- Although there is a growing awareness of the difference between “industrial hemp” and “drug hemp”, there has still been some public concern about any drug effects.
- The distinction must be made between the psychoactive, toxicant compound of the plant, tetrahydrocannabinol (THC), and the non-psychoactive cannabidiol (CBD). Both types of cannabinoids include over 100 secondary metabolites of various terpenophenolic compounds.
- While most of the psychoactive compounds are contained in the plant’s micro secretory epidermal glands particularly abundant in the female plant, present in lesser amounts are on leaves and stems, while the roots and seeds do not contain the psychoactive cannabinoids.
- Any presence of cannabinoids in hemp seed that may occur during the harvesting process through contact with the resin secreted by the plant’s glandular components can result in a contamination. The cleaning process of the seed is therefore critical.
- Hemp seed is thought to be one of the most nutritionally complete, including an optimal balance of essential fatty acids, essential amino acids, and vitamins and minerals.
- Is rich in antioxidants and bioactive peptides (short-chained proteins of amino acids), phenolic compounds, tocopherols, carotenoids, and phytosterols.
- Contains a full array of known essential fatty acids in bioactive forms: palmitic, stearic, oleic, linoleic, linolenic, stearidonic, and monounsaturated fatty acids, which are necessary for many physiological cellular processes, including maintaining cell

membrane structure, metabolic and inflammatory processes, and cardiovascular and brain functions.

- Hemp seeds contain an important ratio of 3:1 omega 3's to omega 6's of polyunsaturated fatty acids, which is critical for preventing inflammation that can lead to cardiovascular and neurodegenerative conditions, and cancer.
- The whole seed contains a complete range of vitamin E tocopherol complexes: alpha, beta, gamma, and delta tocopherols, which functions include: antioxidant, aids immune system in destroying bacteria and viruses, aids in the formation of red blood cells, prevents blood from clotting inside blood vessels, assists in the utilization of vitamin K, aid in intercell communications.
- It helps keep the immune system strong against viruses and bacteria.
- It helps form red blood cells and widen blood vessels to keep blood from clotting inside them.
- It helps the body use vitamin K.
  - Vitamin K functions as a coenzyme for carboxylase enzyme, required to synthesize proteins involved in blood clotting (as in to stop bleeding and repairing of damaged tissues), in the actions of prothrombin clotting factor, as well as bone metabolism.
  - Aids osteocalcin, a protein involved in bone mineralization and cell turnover; aids matrix gla-protein, present in the smooth muscle of the heart, and in blood vessels, cartilage, and bone.
  - Incorporated into bile and pancreatic enzyme actions, and lymphatic, capillary, brain, and heart functions,
- Human cells also use vitamin E to interact with each other, and helps use vitamin K.
- Contains phytosterols, precursors to the manufacture of hormones, reduce absorption of cholesterol, and help reduce low-density lipoprotein (LDL) cholesterol: beta-sitosterol, stigmasterol, campesterol.
- Located in the inner layer of the seed, hemp seed contains all nine essential amino acids (the body cannot manufacture these and needs to obtain them from food): histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, and valine.
- From those essential amino acids, the body then is able to manufacture what are referred to as non-essential amino acids: tyrosine, alanine, arginine, asparagine, cysteine, glutamate/glutamine, proline, serine, and tyrosine; yet, these amino acids are also contained in the seed.
- Hempseeds have been found to contain the minerals phosphorus (P), potassium (K), magnesium (Mg), calcium (Ca), and sodium (Na), as well as trace mineral elements iron (Fe), manganese (Mn), zinc (Zn), and copper (Cu).
- The relative high vitamin K to low sodium ratio may have cardioprotective effects related to reducing platelet aggregation, which occurrence is associated with incidents of stroke.
- Contains phenolic antioxidant, anti-inflammatory compounds that act against oxidative free radical damage associated with degenerative health, including cardiovascular conditions: flavonoids such as glycosides of quercetin, kaempferol, and isorhamnetin, and flavanones, flavonols, flavanols, and isoflavones such as naringenin, kaempferol-3-O-glucoside, epicatechin, and daidzein.
- Phenolics also included dihydroxybenzoic acid, caffeoyl-tartaric acid isomers, *p*-coumaric acid, *N*-caffeoyltyramine, and *N*-feruoyltyramine, which have been shown to have high free radical scavenging actions, including neutralizing the free radical

acetylcholinesterase (AChE) enzyme; other phenolic compounds were found to neutralize oxidative stress and protect cardiovascular and neuroprotective actions.

- Bioactive compounds sativamides A and B, and phenylpropionamides were found to reduce cell death by protecting the cell components endoplasmic reticulum and mitochondria, as well as the microglia immune cells of the central nervous system, in preventing neurodegenerative conditions such as Alzheimer's and Parkinson's disease (Farinon, et. al., 2020).

## Licorice Root (*Glycyrrhiza glabra*)

[Top](#)



Photos By: Gate74 - Pixabay, Lianem - Dreamstime, and Psaguer, Sti300p Gokalpiscan - Pixabay

- Used in traditional Chinese medicine for centuries, and is recorded in the Shennong's Classic of *Materia Medica* dating back to 2100 BC.
- Has been traditionally used for pain, improving spleen and stomach functioning, eliminating phlegm and relieving coughing.
- Is discovered to contain over 20 triterpenoids and nearly 300 flavonoids.
- Antioxidant, antiviral, antimicrobial.
- Has been shown to have a strong immunomodulatory effect, to significantly increase the body's resistance to infectious diseases.
- Main active components are a saponin known as glycyrrhizin (GL) and 18 $\beta$ -glycyrrhetic acid (GA), which contain antiviral properties, while liquiritigenin (LTG), licochalcone A (LCA), licochalcone E (LCE) and glabridin (GLD), contain other antimicrobial properties.
- GL has been shown to work against hepatitis C virus (HCV), human immunodeficiency virus (HIV), viral myocarditis, and have an inhibiting effect against influenza virus, enterovirus (EV71) and herpes simplex virus Type 1 (HSV1) and was found to inhibit rotavirus replication, and syncytial virus (HRSV) activity.
- The triterpene GA works similarly to GL; and in addition, inhibits viral replication and prevents viral attachment in host cells. Both GA and GL weaken virus replication and host cell integration into the DNA, along with activating T lymphocyte (a type of immune cell) proliferation while preventing destruction of the host cell.

- GA and GL have also been shown to have antitumor, anti-inflammatory, and immunoregulatory activities.
- The GA in licorice GA and four flavones tested (LCA, LCE, GLD, and LTG) were found to be effective in inhibiting proliferation of bacteria: *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa*, and *Bacillus subtilis*.
- The isoflavones in licorice that were tested (LCA, LCE, GLD, and LTG) were also found to have inhibitory effects in controlling diabetes.
- Works against the yeast *Candida albicans*.
- Has been found to be effective in destroying the antibiotic Methicillin-resistant strain of bacteria, *Staphylococcus aureus* (MRSA), which has become a main source of infections in hospitals and communities.
- Liquiritigenin (LTG), one of the most important active components in licorice, reduces the production of an exotoxin of *Staphylococcus aureus* known as  $\alpha$ -Hemolysin, which is associated with a variety of diseases, such as endocarditis (infection of the heart's inner lining, usually involving the heart valves).
- LTG also reduces toxinoses (illness caused by toxins released by a living bacteria cell even after the bacteria has been destroyed by the immune system), such as from life-threatening pneumonia and minor skin infections (Wang, et. al., (2015).

### Passion Flower Leaf (*Passiflora incarnata* L.)

[Top](#)



Photos By: Wurliburl, Mrs. Brown, Michael Gaida - Pixabay

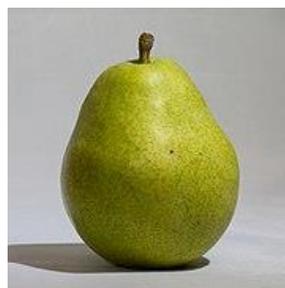
- The ancient Mayans and Aztecs used passionflower for its known calming and soothing effect on the nervous system.
- Medicinal uses among Native Americans include uses for insomnia, anxiety, and epilepsy.
- *Passiflora* is listed in the pharmacopoeias of the United States, India, Great Britain, Germany, France and Switzerland, among others.

- In clinical trials, *Passiflora* showed anxiolytic (reduced anxiety) and sedative effects (Elsas, et. al., 2010).
- Contains antioxidant flavonoids, tannins, polyphenols, terpenoids, sterols and alkaloids that have been found to be antimicrobial, and have hypoglycemic (help lower excess blood sugar) and hypotensive (help lower blood pressure) effects.
- *Passiflora* is also used throughout the world for dysentery and hypertension, relief from constipation, as a sedative, diuretic, anthelmintic (kills parasites), and for diarrhea, menopausal symptoms and infant colic (ZAS, 2017).
- Contains carotenoids, phenolic compounds and tocopherols, which prevent oxidative damage to lipids (fats), prevent cancer and heart disease, and slow aging.
- Contains substantial amounts of calcium, iron and phosphorus and other essential minerals of manganese, potassium, copper and zinc (Simmonds, 2015).
- Used traditionally for insomnia according to several studies showing the clinical relevance and benefits of *P. incarnata*, as demonstrated in a double-blind, placebo-controlled study where test subjects' sleep quality improved, and in animal studies showing its sedative effects from extracts of leaves, flowers and fruits.
- Other animal studies in mice have researched the sedation and anxiolytic or anxiety-inhibiting effects of *P. incarnata L.* In one such study, stress was applied by three hours of exercise and comparing the locomotor activity during the exercise on a positive control group given a drug sedative and a control group given caffeine. The flavonoid compound, epigenin, present in *P. incarnata L.* leaves, were associated with the dose-dependent sedative effect on anxiety and nervousness in the mice.
- In one clinical study, *P. incarnata L.* was found to relieve menopause symptoms such as headache, insomnia, depression, or anger as a result of patient interviews, and symptoms were significantly reduced in three to six weeks (Kim, et al., 2017).

## Pear

(*Gabbu gosha*) (*Pyrus communis L.*)

[Top](#)



- Ancient Greek poet Homer called pears “gifts of God”.
- Prehistoric fruit under cultivation in Native to Western Europe, North Africa, Pakistan, and cultivated in Asia for over 3,000 years.
- Indian Materia medica list pear as “amrita phalam”, or “the fruit of immortality”.
- All parts of the pear tree have been found to have many health-corrective properties:
  - Analgesic (pain-relieving)
  - Anti-age-related macular degeneration
  - Anti-aging

- Anti-birth defects
- Anti-diabetic
- Anti-diarrheal
- Anti-heart disease
- Anti-inflammatory
- Antimicrobial
- Anti-obesity
- Antioxidant (destroying free radicals): copper, quercetin, vitamin C
- Antipyretic (anti-fever)
- Anti-tussive (cough suppressive)
- Dysmenorrhea
- Hepatoprotective (liver): decreases blood alcohol through increased alcohol metabolic enzyme activities and decreases hangover symptoms
- Hypoglycemic
- Hypolipidemic
- Neuro-protective: anti Alzheimer's, Parkinson's, Huntington's; protects destruction of nerve cells; increases cognitive ability
- Sedative
- Spasmolytic (relieving muscle spasms or convulsions)
- Wound healing: promotes tissue repair
- Regulates bodily fluid levels
- Boosts immune system
- Increases metabolic rate and energy levels
- Contains antioxidant phytonutrients: arbutin, astragalin, carotenoids, flavonoids, glycosides, isoquercetrin; phenolics epicatechin, arbutin, hydroxyphenolic acids, ursolic acid, and chlorogenic acid; sorbitol, sterols, tannins;.
- Contains flavonoid glycosides having antithrombotic, antitumor, anti-inflammatory, antioxidant, anti-apoptotic (anti-cell destructing) effects:
  - Glucopyranoside, kaempferol 3-O- $\beta$ -D (6"-O- $\alpha$ -L-rhamnopyranosyl), quercetin 3-O- $\beta$ -D glucopyranoside and quercetin 3-O- $\beta$ -D-(6"-O- $\alpha$ - L-rhamnopyranosyl) glucopyranoside.
  - Triterpenes and sterols ( $\alpha$ -amyrin and  $\beta$ -sitosterol), coumarins and phenolics, and chlorogenic acid in the flowers.
- Chlorogenic acid is an antioxidant and thought to be a chemopreventive agent, supports the prevention of cardiovascular disease, cancer, decreases chemotherapy drug toxicity, and supports immunity.
- Flavonoids antioxidant properties are attributed to its anti-psychotic actions, protecting the brain from degenerative oxidative stress, found to enhance glutathione levels and therefore enhancing free radical-scavenging actions associated with preventing psychotic episodes.
- Contains choline, the precursor for the neurotransmitter acetylcholine, that ultimately helps invert cognitive dysfunctions by inhibiting the enzyme AChE (acetylcholinesterase) that disrupts nerve communications transmissions.
- Extract of pear seeds was found to be an effective antioxidant against oxidative liver damage from heavy metals exposure (such as cadmium), by aiding liver production of haptoglobin, which binds with hemoglobin to form the important protective protein complex, haptoglobin-hemoglobin.
- The haptoglobin-hemoglobin protein molecule prevents liver cell membrane ruptures and loss of cell functions caused by cadmium-induced free radicals such as reactive oxygen

species (ROS) that release intracellular contents (lipids, nucleic acids, proteins) into the circulatory system.

- The heavy metal cadmium increases levels of blood serum aspartate aminotransferase (AST) and alanine aminotransferase (ALT), indicators of serious liver degenerative conditions, while the pear seed antioxidant extracts were shown to protect liver cells from cadmium injury and restore haptoglobin actions.
- Fresh juice contains antioxidant polyphenols, flavonoids, vitamin C, and quercetin, which have been found to correct serotonin imbalances and prevent occurrences of obsessive-compulsive behavior associated with mental health problems such as recurrent, uncontrollable or absurd thoughts, obsessions, anxiety, and repetitive behavior aimed at decreasing anxiety.
- Found to reduce blood glucose levels significantly by improving nerve impulse pathways usage in communicating with pancreatic Langerhans islets beta cells and their insulin actions.
- Fruit's secondary metabolites flavonoids, saponins, triterpenoids, and phenolic compounds were found to be antihyperglycemic, decreasing the biochemical parameters of blood glucose, including decreasing low density lipoprotein (LDL), very low density lipoprotein (VLDL), triglycerides, and total cholesterol, and therefore is considered to have a role in preventing coronary heart disease and forming atherosclerosis.
- The ethanol and ethyl acetate extracts of the fruit, as well as the interaction of its flavonoid, tannin, phenolic, terpenoid, and alkaloid compounds, were found to heal wounds during all phases, reduce scar tissue, and due to the astringent and antimicrobial properties, aid in increasing the formation of fibroblasts and capillaries while preventing the scavenging actions of reactive oxygen species (ROS) and other free radicals.
- The phytoconstituents of phenolics, alkaloids, terpenoids, flavonoids, and tannins have been shown to be potent adversaries of cancer, diabetes, and neurological degenerative conditions such as Alzheimer's or other forms of dementia.
- In a rodent study, X-ray radiography analysis revealed pear extract demonstrated anti-arthritic activity through significant protection of joint and bone degeneration, such as less narrowing of joint spaces, less soft tissue swelling of ankle joints, and reversing bony erosions, showing bone reformations.
- Fresh juice exhibits antibacterial effects against *Escherichia coli* (E. coli) and *Staphylococcus* due to its arbutin content, which is converted in the body to the antimicrobial hydroquinone. Studies have found the positive correlation between antibacterial actions against many bacterial strains and the presence of hydroquinone in plants (Ibrahim, 2020), (Kaur, 2012).

**Sea Buckthorn Berry**  
(*Elaeagnus rhamnoides* L.)  
(Old name: *Hippophae rhamnoides* L.)

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- *Elaeagnus rhamnoides* L. is a deciduous shrub that grows at high altitudes of 7,000 to 15,000 feet in Northwest Himalayan regions and throughout Eurasia, it has been used in traditional Tibetan and Chinese medicine for centuries for coughs, as a digestive aid, for improving circulation, and alleviating pain.
- Traditional use of Sea Buckthorn also includes India, Nepal, Pakistan, Myanmar, Russia, Britain, Germany, Finland, Romania and France.
- Sea buckthorn berries are rich in vitamins: A, C, H (biotin or Coenzyme R), PP (niacin or nicotinic acid), E (tocopherols), B1 (thiamine), B2 (riboflavin), B3 (niacin), B6 (pyridoxine), and B9 (folic acid or folate).
- Contains tannins, pectins and beneficial organic acids.
- Contains iron, calcium, magnesium, sodium, potassium, and phosphorus.
- The bark of sea buckthorn contains serotonin –the "happiness hormone".
- Sea buckthorn is used for gastritis and peptic ulcer.
- Many studies have shown sea buckthorn's effectiveness in reducing levels of the biomarker and inflammatory C-reactive protein (CRP) in the body, with positive effects on atherosclerosis and coronary heart disease.
- Has shown to improve visceral obesity by helping to reduce the fat that forms between internal organs that swell and protrude the belly.
- Reduces inflammation, helps repair liver injury, reduces platelet aggregation and thrombosis, and helps in cases of adverse stress.
- The essential oils contained in *Elaeagnus rhamnoides* L. have been shown to be effective for sunburns, chemical burns, radiation burns and eczema or atopic dermatitis, a chronic skin condition that causes intense itching, characterized by a red, raised rash.
- Has been shown to be effective for damaged mucous membranes in the gastrointestinal tract, which includes gastric and mouth ulcers, and ulcers related to stress.
- Helps reduce cholesterol and helps prevent high blood pressure; helps regulate overall metabolism.

- Other bioactive essential nutrients and important antioxidant phytonutrients include: vitamin K, the carotenoids alpha, beta, and lycopene; flavonoids and organic acids malic and oxalic acids; sterols ergosterol, stigmasterol, lanosterol, and amyryns; various essential amino acids; and kaempferol, fatty acids, triacylglycerols, tocotrienols, phytosterols, organic acids, proanthocyanidins, procyanidins, and anti-tumor phenolic compounds.
- Also contains quercetin, catechin, epicatechin, gallic acid, and epigallocatechin, and tannins.
- The vast array of phytochemicals in *E. rhamnoides L.* contributes to its anti-inflammatory effects such as for rheumatoid arthritis, and various gastrointestinal disorders, including diarrhea and dyspepsia; it has been shown to be effective for improving gastric emptying, gastric mobility, and promoting growth and development.
- Found to protect the mitochondrial system within the cell against oxidative damage induced by radiation or toxic chemicals.
- Accelerates wound healing, used as a painkiller, helps reduce fever, alleviates exhaustion.
- Essential oils in seeds have been used for lupus, chronic wounds difficult to heal, burns, frostbite, regenerating cells in the cervix uteri, and improving eye conditions in ophthalmology such as keratitis, trachoma and conjunctivitis.
- Has been shown to help modulate reactive oxygen species (ROS) in cellular proliferation and differentiation, and repair DNA damage better than the antioxidant vitamin C (Wani, 2015).
- Antioxidant compounds found in sea buckthorn include the flavonoids kaempferol, quercetin, and isorhamnetin, which are known to protect human cells from oxidative damage that may lead to genetic mutations or cancer.
- Various *in vitro* studies have demonstrated sea buckthorn seeds' anticancer, apoptotic (self-destroying) activity in human breast carcinoma cell lines.
- Another flavonoid, isorhamnetin, was found to have cytotoxic (toxic to cells) effects *in vitro* against human hepatocellular (liver) cancer cells, and another study found this flavonoid to have anti-proliferative actions on lung cancer cell lines, also *in vitro* (in a test tube or on a culture dish). Still another study proved sea buckthorn's anticancer effects on lung cancer cells in laboratory mice when fed sea buckthorn concentrations for seven days.
- The phytochemicals procyanidins in seeds were found to inhibit the fatty acid synthase (FAS) enzyme, which is a key enzyme in synthesizing cancer cells, where it is found in high concentrations; proanthocyanidins were also found to suppress cancer cell growth and induce apoptosis by inhibiting FAS activity within cancer cells.
- Extracts of sea buckthorn berries, along with carotenoids and vitamin C concentrations, were found to have the highest inhibitory effect on the proliferative activities of breast and colon cancer cells, and antiproliferative effects against cervical, stomach adenocarcinoma, mammary gland adenocarcinoma, colorectal adenocarcinoma, mammary gland adenocarcinoma, and prostatic adenocarcinoma.
- Berries and seeds contain unsaturated fatty acids that aid the immune system, and contain anticancer phytosterols, which help lower LDL cholesterol.
- Sea buckthorn berry constituents are included in cancer therapy due to the antioxidants and biologically active compounds, which having been demonstrated in a number of studies, are able to protect against the effects of radiotherapy, such as inhibiting DNA strand breaks and helping cell nuclei resist radiation, and have also been shown to protect against lethal doses of whole body gamma irradiation (Olas et al., 2018).

## Turmeric Root (*Curcuma longa*)

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- Effective in the fight against various forms of gastritis and liver problems.
- Useful in weight loss; effectively breaks down fats and significantly simplifies the process of digestion.
- Reduces the adverse consequences of obesity such as diabetes by inhibiting the inflammatory effect of macrophages, which produce cytokines that cause inflammation in the heart and pancreas and prevent glucose absorption or uptake into the muscles and liver, resulting in hazardously high levels of blood sugar in the bloodstream.
- Increases the effectiveness of skin cancer treatment when directly applied to the damaged area.
- Used for the treatment of acne, inflammation caused by osteoarthritis, and diseases of the cardiovascular system.
- Helps the immune system deal with psychological stress.
- Supports the health of bones and joints; reduces joint pain and swelling through decreased production of cyclo-oxygenase 2 enzymes; it is a COX-2 inhibitor.
- Keeps cholesterol levels in the normal range and has a lipid-lowering effect (reduces fats in the circulatory system).
- Evidence shows that the curcumin in turmeric exhibits several cardio-protective properties: anti-inflammatory actions prevent cardiac injury; its antioxidant properties help improve circulatory pathways in the heart while destroying free radicals such as cytokines; suppresses atherosclerotic lesions in heart tissues; decreases thrombosis or abnormal clotting; may prevent strokes and lessen inflammation and blood vessel spasms after a stroke.
- Contains at least ten antioxidants that scavenge free radical molecules (foreign molecules such as synthetic chemicals from processed foods, agrichemicals, industrial chemicals); its antioxidants protect against free radical damage to cell membranes and DNA while stimulating the immune system to neutralize free radicals by producing its own antioxidant enzymes.
- Contains an important group of compounds called curcuminoids: curcumin (diferuloylmethane), demethoxycurcumin, and bisdemethoxycurcumin.
- Contains beneficial essential oils: termerone, curlone, curumene, cineole, and *p-cymene*, as well as various natural sugars, proteins and resins.
- Improves brain function through helping the brain produce more Brain-Derived-Neurotrophic Factor (BDNF), found to be effective in delaying or even reversing many brain and age-related diseases and depression, and in preventing the shrinking of the brain's hippocampus, the area of the brain that functions for learning and memory.

- Curcumin in turmeric has been shown to cross the blood-brain barrier and improve the neurodegenerative process of Alzheimer's disease by blocking B-amyloid, the substance that causes plaques that narrow circulatory passages in the brain.
- Strong anti-allergic, antibacterial, anti-carcinogenic (anti-cancer), anti-inflammatory antifungal, anti-mutagenic, anti-septic and anti-spasmodic and anti-viral.
- Found to hinder the development of chronic inflammation, tumors, and leukemia.
- Found to prevent the development of Type 2 diabetes in pre-diabetics by lessening insulin resistance.
- The curcumin and other antioxidants in turmeric have been found to destroy cancer cell cultures taken from the bloodstream, ovaries and the skin; studies show curcumin reduces new the growth of new blood vessels in tumors and prevents metastasis (spreading of cancerous cells).
- Overwhelming scientific evidence shows that turmeric can prevent cancer altogether by blocking certain enzymes needed for cancer growth; researchers have attested that there was not any type of cancer cell upon which turmeric did not work, including colon, mammary, prostate, liver cancer, esophageal, and oral cancers.
- Researchers have also found that turmeric's curcumin treatments prevent cervical cancer cell proliferation by altering their HPV-associated (Human Papillovirus) pathways.
- Turmeric has been proven to be effective in the treatments of many serious ailments, including multiple sclerosis, anemia, atherosclerosis, back pain, fibromyalgia, bloating and intestinal gas, bronchitis, conjunctivitis, bursitis, Crohn's disease, dyspepsia (heart burn), diarrhea, stomach pain, hepatitis, gallbladder infections and gallstones, genital herpes, hemorrhoids, irritable bowel syndrome, gingivitis (gum disease), kidney inflammation and infections, peptic ulcer (stomach ulcers caused by Helicobacter pylori bacteria), skin inflammatory conditions including eczema, liver disease, leprosy, food poisoning, fever, poor circulation, menstrual disorders, lung infections, edema (intercellular water retention), parasites, poor circulation, urinary tract infections (UTI), worms, ringworm.
- Used for healing wounds.
- Balances the reproductive system, lactation, purifies reproductive organs and breast milk, purifies the semen.
- Is an astringent (tightening, toning), carminative (relieves flatulence), cholagogue (promotes the flow of bile from the gall bladder to the duodenum, the first and shortest segment of the small intestine), diuretic (promotes increased production of urine), stimulant (increases alertness, attention and energy), and vulnerary (heals wounds).
- Aids digestion.
- Mosquito repellent (Vyas, 2015).

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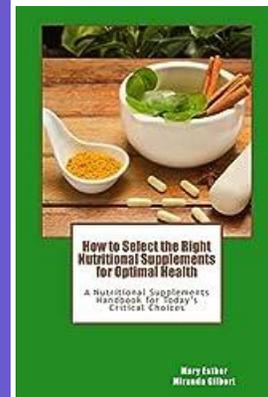
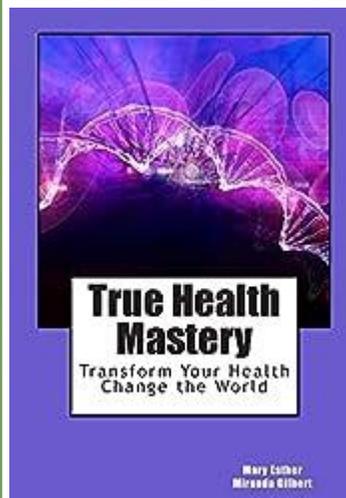
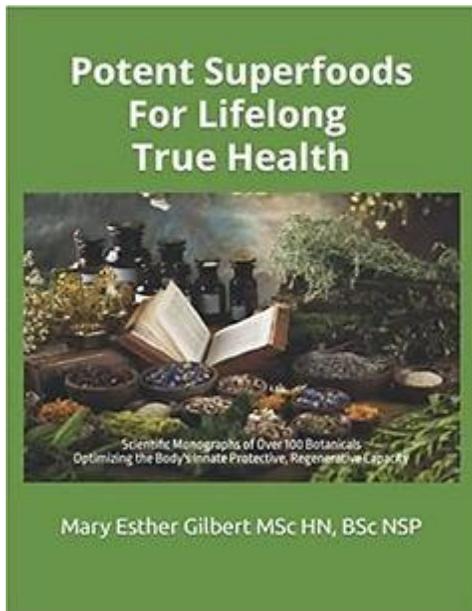
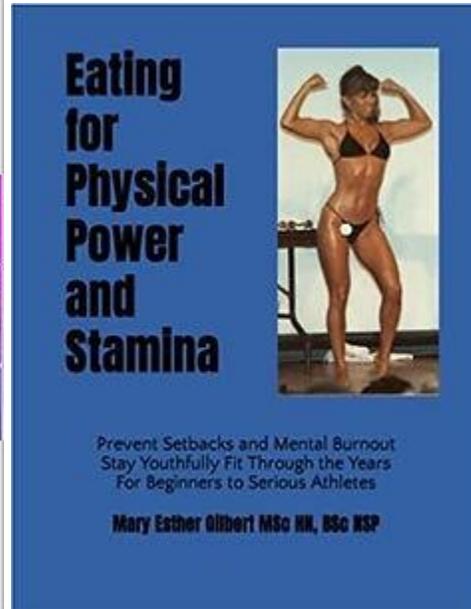
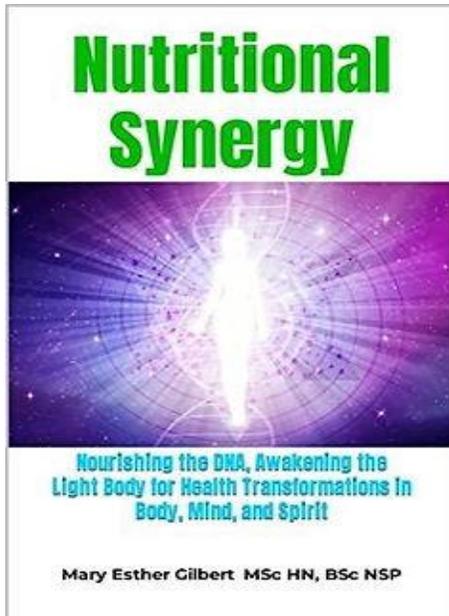
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