

MILK THISTLE

*A REMARKABLE FLAVONOID
ANTIOXIDANT AND LIVER PROTECTANT*

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MILK THISTLE

(*Silybum marianum*)

COMMON NAMES: Christ's Crown, Holy Thistle, Venus Thistle, Heal Thistle, Wand of God's Grace

PLANT PARTS: ripe seeds, or extract from the shell

ACTIVE COMPOUNDS: Seed extract contains a complex of three flavanolignans which are collectively referred to as silymarin. These flavonoid-like compounds are silibin, silychristin and silydianin.

PHARMACOLOGY: The flavonoids contained in Milk Thistle have a strong liver protective action and have been extensively used in Europe as pharmaceutical preparations for liver disorders. These include: silibin, silydianin and silychristin, which all combine to create silymarin. Clinical trials have shown that silymarin can protect the liver by counteracting a number of toxic substances including alcohol, acetaminophen, carbon tetrachloride and the Amanita mushroom poison. Apparently, silymarin actually alters liver cell membranes which prevent toxins from passing through the cell. It inhibits the release or the synthesis of certain enzymes which are toxic to liver tissue.

In addition, these compounds stimulate cellular growth and reproduction by boosting protein synthesis. Milk Thistle seeds are also high in betaine hydrochloride, which may contribute to the hepato-protective properties of the plant.

Silymarin has also exhibited significant antioxidant capabilities and can help reduce inflammation by

inhibiting certain enzymes. The seeds of the plants appear to have the highest concentration of silymarin.

VITAMIN AND MINERAL CONTENT: rich in bio-flavonoids

CHARACTER: hepato-tonic, alterative, demulcent and protective

BODY SYSTEMS TARGETED: liver, gallbladder, pancreas and stomach

HERBAL FORMS

- **Liquid Extract:** Milk Thistle is not easily dissolved in water so it is best utilized in either a dry or liquid form.
- **Powdered Extract:** The easiest way to take dried Milk Thistle is to purchase it in capsulized form.
- **Seeds:** The seeds of the plant can be used in cooking or eaten alone.

NOTE: Most health food stores stock this herb under the name of Milk Thistle, however, it may also be found as Thisilyn, Silymarin or Silybum

STORAGE: Keep in a dark container in a cool, dry environment

REGULATORY STATUS:

US:	None
UK:	None

Canada: None
France: Traditional medicine
Germany: Commission E status as over-the-counter drug

RECOMMENDED USAGE: Because Silymarin is not very water soluble, decoctions are not as effective as extracts and powder forms of Milk Thistle. The advantages of bound silymarin should be investigated. Obtaining the best results with Milk Thistle depends on taking higher dosages three times daily before meals. For bound silymarin, dosages are less. In cases where poisoning or alcoholism is severe, dosages may be increased without toxicity, side effects or allergic reactions. Alcohol based extracts are not recommended. The best forms of Milk Thistle are guaranteed to contain 80% silymarin.

NOTE: A new form of silymarin has recently become available, which may be even more absorbable than other types. It is silymarin that has been bound to phosphatidylcholine. Apparently this binding makes silymarin compounds more clinically effective in the body.

SAFETY: No contraindications are associated with this herb even in substantial dosages. Milk Thistle has been extensively used in Europe and numerous studies have shown very little if no toxicity. Taking silymarin can produce looser stools, although the effect is not that common. At high dosages, it may be desirable to add a source of fiber to the diet to prevent loose stools or digestive tract irritation. Suggested fibers include: psyllium, oat bran or pectin. Long term use of Milk Thistle poses no problem because of its non-toxicity. The long-term safety and advisability of the use of Milk Thistle extracts in pregnant or nursing women has not been established.

HISTORY

Natural substances which afford us protection from toxins and potential carcinogens have recently come to the forefront of scientific attention. Compounds known as antioxidants, which can help minimize the damaging effects of chemical structures called free radicals, are extensively used today. One of these protectant substances is not as familiar to most people as vitamin C or beta-carotene. It is an herb called Milk Thistle and it has some extraordinary protective properties.

Milk Thistle, also known as Silymarin has enjoyed a long history of use in European folk medicine. Centuries ago, Romans recognized the value of this herb for liver impairments. They routinely used the seeds and roots of the plant to restore and rejuvenate a diseased liver. Pliny the Elder, an ancient Roman, recorded how the juice of Milk Thistle, when mixed with honey was used for carrying off bile. Dioscorides extolled the virtues of Milk Thistle as an effective protectant against snake bites.

The genus *silybum* is a member of the thistle tribe of the daisy family. Two species of the plant exist and both are native to southern Europe and Eurasia. Plants which grow in the Southern United States actually have more potent seeds than their European and Asian counterparts.

Milk Thistle is a stout and sturdy looking plant, which can grow up to 12 feet tall. The flower heads can expand to six inches in diameter and are a vivid purple color. They usually bloom from June to August. Very sharp spines cover the heads. The leaves are comprised of hairless, milky bands, and when young, are quite tender.

Historically, the seed of Milk Thistle was used as a cholagogue which stimulated the flow of bile. The seed was also used to treat jaundice, dyspepsia, lack of appetite and other stomach disorders. Homeopathic uses included:

peritonitis, coughs, varicose veins and uterine congestion. While tonics were sometimes made from the leaves of Milk Thistle, the most valuable part of the plant was contained in its seeds.

Milk Thistle is also known as Marian Thistle, Wild Artichoke, Variegated Thistle or St. Mary's Thistle. Reference to Milk Thistle as "Virgin Mary" stems from its white milky veins. Legends explained that these veins were created when Mary's milk fell on the thistle. Subsequently, a connection between the herb and lactation arose, which has no scientific basis for its claims. Milk Thistle is frequently confused with Blessed Thistle, which does act to stimulate the production of mother's milk.

Gerarde, a practicing herbalist in 1597, said that Milk Thistle was one of the best remedies for melancholy (liver related) diseases. In 1650, Culpeper wrote of its ability to remove obstructions in the liver and spleen. In 1755, Von Haller recorded that he used Milk Thistle for a variety of liver disorders. Subsequently, Milk Thistle became a staple agent for the treatment of any kind of liver ailment. European physicians included it in their written *materia medica*.

Unfortunately, for an extended period during the 18th century, the herb was not stressed, however in 1848, Johannes Gottfried Rademacher rediscovered its medicinal merits. He recorded in great detail how Milk Thistle treated a number of liver ailments and spleen disorders. His research was later confirmed in medical literature.

In the early 20th century, Milk Thistle was recommended for female problems, colon disorders, liver complaints and gallstones. Almost every significant European pharmaceutical establishment listed Milk Thistle as a valuable treatment.

In recent decades, Milk Thistle has been primarily used as a liver tonic and digestive aid. Nursing women who

wanted to stimulate the production of their milk used Milk thistle as a traditional tonic. As mentioned earlier, modern day medical science now refutes this particular action of Milk Thistle, however, its benefit to the liver has been confirmed.

German herbalists have routinely used Milk Thistle for treating jaundice, mushroom poisoning and other liver disorders. This therapeutic tradition contributed to modern German research into Milk Thistle, resulting in its use as a widely prescribed phytomedicine for liver disease.

Silymarin or Thisilyn, as it is also known, is a relatively new nutrient in the United States. Since 1954, scientists have known the Milk Thistle contained flavonoids, however, it wasn't until the 1960's that they discovered the just how unique silymarin is. Silymarin was considered an entirely new class of chemical compound, and its therapeutic properties continue to impress the scientific community.

FUNCTIONS

The active ingredients in Milk Thistle consist of a complex of compounds which are referred to as silymarin. These substances can actually protect the liver against certain toxins, while simultaneously boosting the function of the liver. Milk Thistle contains some of the most potent liver-protecting substances known. For this reason, it is an invaluable herb for the treatment of hepatitis, cirrhosis, jaundice and fatty degeneration of the liver.

In addition, silybin, one of the compounds found in Milk Thistle, has been used as an antidote to the lethal deathcap mushroom whose toxin targets liver cells. Because of this action, in Germany, Milk Thistle has been used to block the action of amanita mushroom poisoning. In the

case of mushroom poisoning, the herb is administered intravenously.

Studies have indicated that Milk Thistle has valuable therapeutic merit for severe liver disorders and acts as liver restorative as well.¹ Not only does it promote new cell growth in the liver, it also prevents the formation of damaging leukotrienes.

Because the liver plays a vital role in maintaining a healthy immune system, Milk Thistle can contribute to increased disease resistance. This link may explain why it also has value for anyone suffering from psoriasis or chronic fatigue syndrome.

In addition, Milk Thistle can legitimately be called an antioxidant. It helps protect the cells from free radicals by scavenging them before they can cause cellular damage. Flavonoids have tremendous value as antioxidants and Milk Thistle is rich in them. The flavonoid-like compounds of this herb help to promote cell membrane integrity and to reduce its permeability.

Milk Thistle also acts to protect the kidneys, brain and other vital organs from toxin damage, treats allergic reactions, reduces inflammation and promotes healing. It also helps to emulsify fats and enhance bile flow, making it a good remedy for indigestion.

THE ACTION OF SILYMARIN ON THE LIVER

The liver is responsible for detoxifying the body. Anytime we ingest potentially harmful chemicals, which include drugs or alcohol, liver cells must filter out these compounds. Michael Moore, author of *Medicinal Plants of the Desert and Canyon West* says:

“When the liver is overworked, or unequal to the task our brain gives it, its blood vessels enlarge, the fluids move more slowly through it as it tries to increase its working area; it gets enlarged and congested.”

He goes on to say that Milk Thistle improves the quality of blood proteins which help move toxins out of the blood.

The chemical components of Silymarin are referred to as true hepato-protective or “liver friendly.” The capability of Milk Thistle to protect the liver and enhance its function is due largely to its ability to inhibit certain factors, which result in liver damage. The most significant of these are leukotrienes or free radicals. What makes the silymarin compounds in Milk Thistle even more impressive is that while they protect, they also stimulate liver protein synthesis.² This explains why even an injured liver can regenerate tissue more rapidly when Silymarin is present.

Leukotrienes, which harm liver tissue, are compounds which are created when oxygen transfers to a polyunsaturated fatty acid. Silybum compounds can help to inhibit the formation of these molecules.

The flavonoid-like compounds which comprise silymarin have two specific actions on the liver:

1. Silymarin binds hepatocyte (liver cell) membranes which protects them from the potential damage of environmental toxins, (such as the death cap mushroom), foreign chemicals, endogenous poisons and free radicals.
2. Silymarin enters the liver cells and promotes their ability to produce certain enzymes which are vital to liver health. This action can speed the healing of liver cells from injury or disease. By enhancing the production of these enzymes, liver cell regeneration is also stimulated.

THE DEADLY DEATHCAP MUSHROOM AND SILYMARIN

The protective action of Silymarin in the liver has been confirmed through several experimental and clinical studies. Animals who have had their livers exposed to toxic chemicals such as carbon tetrachloride, amanita toxin (deadly mushroom) and galactosamine were protected from damage by Milk Thistle.³ Animals who had their livers partially removed experienced some organ regeneration when treated with Milk Thistle.

In the 1970's, additional research on the ability of Milk Thistle to de-toxify liver cells of deadly mushroom poisoning was conducted. The poison of this mushroom is extremely toxic and usually results in death within two to five hours. Amanitine causes severe hemorrhagic liver dystrophy and inevitable death. Even when the studies were undertaken, scientists did not expect Milk Thistle to offer any significant protection against such a volatile and deadly toxin. The two peptides which comprise the poison are the most potent liver damaging substances currently known.

Sixty patients who had severe amanita poisoning in Europe were treated with Milk Thistle. The results were impressive.

In experiments where silymarin was given before the amanita toxin was ingested, it was 100 percent effective in preventing liver toxicity.⁴ If given within ten minutes, it still neutralized the poison. Even after 24 hours, it was found to prevent death and liver damage.⁵

Not only did Milk Thistle protect the liver from amanitine damage, it also helped to prevent the loss of weight normally seen in animals that have ingested the poison. The impressive results of these tests resulted in stepped up production of Milk Thistle extract, which has made it much more available now.

CARBON TETRACHLORIDE TESTING AND SILYMARIN

Carbon tetrachloride is used in laboratory tests to assess the ability of a substance to actually protect the liver from any potentially damaging compound. Increasing the dosages of carbon tetrachloride takes the liver through fatty infiltration, fibrosis and eventually cirrhosis. During these tests, administering Milk Thistle extract resulted in effective protection of liver tissue from the toxic effects of the chemical.⁶

MILK THISTLE: A VITAL COMPONENT OF LIVER REHABILITATION

In addition to the flavonoid-like components of Silymarin, Milk Thistle seeds also contain betaine, which has proven itself as a liver protectant. Additionally, essential fatty acids are found in Milk Thistle which help control chronic inflammation.⁷

Milk Thistle should be a vital part of any therapeutic program designed to treat liver disorders. It can provide liver protection after exposure to radiation, heavy metals or toxic chemicals. Anyone who has hepatitis or cirrhosis should be using this herb as part of their treatment regimen.

Concerning Milk Thistle and the liver, Christopher Hobbs wrote:

“I first learned of Milk Thistle in early 1984, when I began harvesting seeds from wild plants growing in California and taking the liquid extract I made from them. I

had sustained heavy damage to my liver as a result of having hepatitis twice, in 1963 and in 1967, and I was able to greatly restore my digestive power with the help of this herb. Since then, I have witnessed other surprising recoveries from severe liver ailments with the use of this herb.”⁸

There is no question that the Silymarin compounds of Milk Thistle have significant therapeutic value for liver diseases of various kinds including: hepatitis, fatty infiltration of the liver, cirrhosis, and inflammation of the bile duct.⁹

The tyramine and histamine content of Milk Thistle works to stimulate the production and flow of bile, which also benefits the liver.

A whole host of laboratory tests from biopsies to clinical data confirm that Silymarin is particularly effective in treating and preventing liver damage from alcohol abuse or chemical exposure. Extensive clinical trials have clearly shown that Milk Thistle can reverse the symptoms of many liver disorders.

In addition, Milk Thistle can exert a therapeutic effect on chronic hepatitis, cirrhosis, fatty infiltration of the liver, cholestasis of pregnancy, cholangitis and pericholangitis.¹⁰

While the liver has a great capacity for regeneration, when it is diseased or damaged by toxins like alcohol, it can cease to produce badly needed liver cells. Milk Thistle can stimulate this proliferation. The earlier it is taken, the quicker recovery will be.

SILYMARIN: LITTLE KNOWN ANTIOXIDANT

The antioxidant bioactivity of the silymarin compounds contained in Milk Thistle have been generally overlooked by experts who suggest taking vitamin E, C, A, beta-carotene and selenium supplements. Adding Milk Thistle to this complement of antioxidants is strongly recommended, especially for anyone who smokes, consumes alcohol or must take drugs on a continual basis. The hepato-protective properties of silymarin combined with its free scavenging action make it an invaluable defense against so many toxins which pollute our bodies.

Studies suggest that taking Milk Thistle on a daily basis may provide the liver with protection against heavy metals, environmental pollutants and dietary toxins. One study confirmed that Silymarin did indeed neutralize the damaging effects of cadmium, which can accumulate in living tissue.¹¹

The implications of clinical trials on Milk Thistle suggest that regular ingestion of silymarin can provide a significant amount of free radical protection during the course of one's inevitable encounter with air, water or food born pollutants.¹²

The protective potential of Milk Thistle has only just begun to be investigated. If it can perform so admirably against potent poisons, it most likely has a whole host of other protective actions. As an antioxidant, it should be added to the typical list of supplements we need to take for cellular defense.

THE ANTIOXIDANT ACTION OF SILYMARIN AND ALCOHOL CONSUMPTION

Certain substances can damage the liver by producing or behaving like free radicals. These volatile molecules are highly reactive and their action can destroy living tissue. Alcohol is one of these substances. Because silymarin acts as an excellent antioxidant, it should be taken by anyone who consumes alcohol or other toxic substances such as drugs etc. Studies have shown that milk Thistle can help to prevent liver damage caused by pharmacologic drugs.¹³

Studies have proven that Silymarin's antioxidant activity is up to ten times more potent than vitamin E.¹⁴ Technically speaking, Silymarin helps prevent the depletion of glutathione (GASH), which can result from an excess of alcohol consumption or from other toxin exposure. It also increases the basal GASH of the liver by 35 percent.¹⁵ GASH plays a very vital role in detoxifying the liver.

Concerning patients with chronic alcoholic liver disease, tests concluded that: "The scavenger, Silymarin is able to increase the antioxidant protection of the cells by ameliorating the deleterious effect of free radical reactions."¹⁶

Alcohol consumption, which in some individuals can be as little as one to two ounces can be enough to cause significant liver damage, which can lead to immune system suppression. For this reason, if you drink, even just occasionally, antioxidants such as Silymarin, selenium, Vitamin C and E should be taken regularly.

Silymarin prevents liver damage by acting as a powerful antioxidant more potent than vitamin E or C.

Milk Thistle should be added to the antioxidant array which is currently touted as effective free radical scavengers.

Unlike vitamin C, A or E, Milk Thistle remain relatively unknown as an effective antioxidant.

LEUKOTRIENES AND SILYMARIN

The liver can also sustain damage from the presence of compounds called leukotrienes. These are produced when an oxygen molecule is transferred to a polyunsaturated fatty acid. In order for this reaction to occur, an enzyme called lioxygenase must be present. The silymarin in Milk Thistle inhibits the action of this enzyme which results in a decrease in the formation of these leukotrienes.¹⁷

SILYMARIN'S EFFECT ON A FATTY LIVER

Frequently, when liver tissue sustains free radical damage, fatty acids are released. The presence of these fatty acids can cause inflammation and step up the production of damaging leukotrienes. This fatty infiltration of the liver can be caused by alcohol or other chemicals. Silymarin helps to neutralize this reaction by inhibiting lipid breakdown, which decreases the presence of fatty acids. Interestingly, while fatty acid production is counteracted by silymarin, protein synthesis is stimulated. This action causes an increase in the production of new liver cells, which is so vital if the liver is damaged or diseased. This stimulatory effect only applies to healthy cells and does not affect malignant ones.¹⁸

DO WE NEED EXTRA LIVER PROTECTION?

Even if you don't suffer from any liver disease or don't abuse alcohol, you may still require the therapeutic effects of Milk Thistle. Everything that enters the liver through the portal vein must be de-toxified and neutralized. Many of us eat diets that are too high in protein, take over-the-counter or prescription drugs, and routinely expose ourselves to radiation and other pollutants.

Everything we breath, eat and absorb through our skin is purified and refined in the liver. Some of the more detrimental compounds we ingest that increase the liver's work load include:

- pain killing drugs
- heavy metals
- excess hormones
- saturated and rancid fats
- metabolite waste products from biochemical reactions
- pesticides and herbicides
- nicotine
- stress
- high protein diets

Dr. Andrew Weil, M.D. author of *Natural Health, Natural Medicine* says,

“High protein diets impose a considerable work load on the digestive system and may contribute to feelings of fatigue and lack of energy.”

The problem with protein is that the liver has to work harder to detoxify the body from the nitrogen waste which

results when it is metabolized. This compound called urea has to eventually be eliminated from the body through the kidneys.

Most of us are routinely exposed to nicotine, toxins of various kinds and a whole host of synthetic drugs from ibuprofen to steroids.

Most of us overeat the wrong things and pass up what's really good for us. High fat, high sugar, high protein diets stress the liver. Overeating, especially overcooked, fatty foods puts added strain on the liver. In addition, lack of exercise has an indirect effect on the liver. When we don't exercise, an excess of toxins can build up and has to be transformed by the liver.

Typically, when we are exposed to chemicals which can injure the liver, the amount of glutathione in the liver decreases. When this substance is reduced, the liver becomes susceptible to damage. The Silymarin content of Milk Thistle keeps concentrations of glutathione in the liver elevated by up to 35%.¹⁹ The ability of the liver to detoxify the system is largely dependent on the present of glutathione.

According to the American Liver Foundation, liver diseases are the fourth leading cause of death up to the age of 65. It is not commonly known that a significant incidence of liver disease exists in this country. In the past, liver disease was only associated with chronic alcoholics. Now, however, liver disease strikes obese people, social drinkers and people who eat poorly.

Milk Thistle can help prevent the subtle kind of liver damage any of us may be susceptible to.

SILYMARIN'S EFFECT ON GALLSTONES

Because silymarin helps to promote the flow of bile by increasing its solubility, it may be very beneficial in treating or preventing gallstones. Studies have shown that taking Milk Thistle has resulted in a pronounced reduction of cholesterol in the bile.²⁰ Whenever the flow of bile is increased, the chances of developing a gallstone are decreased. Interestingly, some very low fat or even non-fat diets designed to produce quick weight loss have been known to cause gallbladder attacks. When fats are drastically reduced, bile flow is inhibited resulting in stagnant bile, which is prone to forming stones. Keeping bile flow active is necessary for good health, digestion and the prevention of gallstones.

CHRONIC FATIGUE AND LIVER FUNCTION

A poorly functioning liver can underlie chronic fatigue including CFS (Chronic Fatigue Syndrome). Even if the liver has sustained only minimal damage, the immune system can be compromised

This effect has been observed in laboratory tests. For example, in some instances, liver injury has resulted in the rampant development of yeast infections throughout the body. The liver plays an integral role in so many other body systems and organs. Anyone who suffers from compromised liver function will experience chronic fatigue in combination with other symptoms.

DIABETES AND SILYMARIN

Because Silymarin has the ability to effectively scavenge free radicals, it has value for anyone who suffers from diabetes and its complications. Apparently, Silymarin helps to inhibit aldose reductase. In so doing, it helps to prevent and treat complications which can result from diabetes. Diabetic retinopathy is one of the more common complications from free radicals caused by high blood sugar.

TREATING PSORIASIS WITH SILYMARIN

There is some evidence to suggest that abnormal liver function may play a role in the development of psoriasis. Because the liver is responsible for filtering toxins out of the blood, its connection to disease like psoriasis may be very significant. Psoriasis has been linked to certain toxic substances which circulate throughout the bloodstream. If the liver is compromised and these toxins are not properly filtered, they can cause the psoriasis to become more pronounced. The presence of leukotrienes has also been connected to psoriasis. As mentioned earlier, silymarin inhibits the production of these damaging molecules. Another added benefit of Milk Thistle for people who suffer from psoriasis is that it also helps to balance certain cellular chemicals in the skin which determine the rate in which skin cells are reproduced.²¹

THE CARDIOVASCULAR SYSTEM AND MILK THISTLE

Silymarin may also be helpful to people suffering from high blood pressure and those that have experienced heart attacks. The flavonoids in Milk Thistle act as free radical scavengers, which are important in preventing damage to artery walls.

ESTROGEN-RELATED DISEASES AND SILYMARIN

Like other bioflavonoids such as quercitin and proanthocyanidin, Silymarin helps to control the risk of estrogen-related diseases such as breast tumors. Research suggests that when the liver is functioning properly, bad forms of estrogen can be filtered from the body. If the liver is congested or damaged, these substances continue to circulate and may be responsible for the development of specific diseases such as breast cancer. Keeping the liver healthy is vital for women because they must deal with estrogen/progesterone peaks and valleys. Frequently, the role of the liver is helping the body deal with hormones is not stressed enough by standard medical practitioners.

OBESITY AND POOR LIVER FUNCTION

Unfortunately, the liver's role in weight reduction is rarely addressed. Boosting liver function is badly neglected in virtually all weight loss programs. The liver is the primary organ involved in purifying the blood of impurities and in metabolizing fat. Liver support should be an integral

part of any weight reduction strategy. Milk Thistle can help to expedite the removal of fat from the liver.

Poor liver function is usually not implicated as a causal factor for obesity in the first place. O. Nomura and Y. Satomura in the 1986 edition of *Int. J. Obesity* stated, "Liver function is disturbed in a large percentage of overweight individuals." The liver also plays a role in stabilizing blood sugar levels, which can contribute to food cravings and appetite surges.

SUMMARY OF SPECIFIC ACTIONS ASSOCIATED WITH MILK THISTLE

- Milk Thistle effectively protects the liver from the deleterious effects of alcohol and other toxic chemicals, heavy metals and poisons.
- The silymarin compounds in Milk Thistle actually accelerate protein synthesis in the liver, which stimulates the production of new, healthy liver cells.
- The flavonoids contained in Milk Thistle act as effective free radical scavengers, which also protect the liver from damage.
- Milk Thistle helps to block certain inflammatory reactions and is an anti-allergenic substance.
- Certain chemical constituents of Milk Thistle help to increase the flow and solubility of bile which is beneficial for both the liver and the gallbladder. Increased bile flow helps to prevent the formation of gallstones.
- Milk Thistle can effectively treat jaundice, cirrhosis, hepatitis, and fatty infiltration of the liver.
- Silymarin is considered a spleen, and gallbladder tonic.
- Milk Thistle may be helpful in treating psoriasis, chronic fatigue syndrome, diabetes and estrogen-related disorders.

MILK THISTLE CAN BE USED IN THE FOLLOWING COMBINATIONS FOR BIOENHANCEMENT:

Milk Thistle and Dandelion

Milk Thistle, Proanthocyanidins, and Bioflavonoids

Milk Thistle, Tumeric, Artichoke and Schisandra

PRIMARY APPLICATIONS

- **CIRRHOSIS**
- **GALLSTONES**
- **HEPATITIS**
- **JAUNDICE**
- **KIDNEY DISORDERS**
- **LIVER DISEASE**
- **PSORIASIS**

SECONDARY APPLICATIONS

- **alcoholism**
- **chemotherapy**
- **chronic fatigue**
- **fatty deposits**
- **gas**
- **heartburn**
- **hypoglycemia**
- **indigestion**
- **obesity**
- **toxin exposure**
- **varicose veins**

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¹³Mowrey, 121.

¹⁴Murray, *Encyclopedia of Natural Medicine*, 82.

¹⁵*Ibid.*

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