



Mini Review

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# The Medicinal Properties of Milk Thistle (*Silybum Marianum*) With Emphasis on Its Property in Reducing the Side Effects of Chemotherapy: A Mini-Review

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**To Cite This Article:** Sama Rahimi Devin, Mansureh Tamizgran, Khalil Rahimi Devin. *The Medicinal Properties of Milk Thistle (Silybum Marianum) With Emphasis on Its Property in Reducing the Side Effects of Chemotherapy: A Mini-Review*. *Am J Biomed Sci & Res.* 2022 - 15(6). *AJBSR.MS.ID.002165*. DOI: [10.34297/AJBSR.2022.15.002165](https://doi.org/10.34297/AJBSR.2022.15.002165)

**Received:** 📅 February 07, 2022; **Published:** 📅 March 18, 2022

## Abstract

Milk thistle is a medicinal plant with anti-inflammatory, antioxidant properties and in the treatment of chronic liver diseases. The therapeutic properties of this plant have been showed within the treatment of Alzheimer's malady, Parkinson's illness, burns, osteoporosis, cholestasis, sepsis, hypercholesterolemia, and diabetes. Milk thistle can be used to decrease the side effects of chemotherapy and radiation therapy for various types of cancer.

**Keywords:** Cancer, chemotherapy, Hepatic disorders, Alzheimer's disease, Osteoporosis, Burns, Milk thistle

## Introduction

*S. marianum* is from the Mediterranean Mountains, Asia, and North Africa, but today grows in several parts of the world [1]. Silymarin is commonly found as a standard extract, and although it is often referred to as derived from the seeds of the common thistle plant [2].

Milk thistle [*Silybum marianum* (L.) Gaernt., family Asteraceae/Compositaceae] is probably the oldest and best studied plant for the treatment of liver diseases [3]. The first information about the healing effect of milk thistle is recorded in the Old Testament [4]. Silymarin standardized dry extract is a bioflavonoid complex of at least seven flavonolignans [5].

Silymarin has antioxidant, anti-inflammatory, antifibrotic, detoxifying and regenerating properties. Stimulates protein

synthesis and liver regeneration [5]. Silymarin have many hepatoprotective effects: it inhibits lipid peroxidation by scavenging free radicals and enhances the levels of decreased glutathione levels [5]. It regulates membrane permeability and stability in xenobiotic-induced damage, regulates nuclear expression, and prevents the conversion of hepatocytes to myofibroblasts (in liver cirrhosis) [5]. As a medicinal plant, Milk thistle has anti-oxidative, anti-inflammatory, anti-fibrogenic and hypolipidemic effects of silymarin (seed extract), which can have useful therapeutic effects in the treatment of chronic liver diseases [6]. The purpose of this review is to express the important benefits of the Milk thistle plant.

## Hepatic Disorders

Known as a medicinal plant, *S. marianum* dates to ancient times and was once used to treat several liver disorders such as jaundice



and fatty liver disease [6]. According to a recent study, S. Marijuana seed extract (silimarin), when used in combination with oral anti-diabetes therapy, may reduce fasting and postprandial blood glucose levels in diabetic patients [7].

### Dosage/Toxicity

Milk thistle is usually given in encapsulated form as a homogeneous extract (70-80% silymarin), 100-300 mg three times daily, in a characteristic adult dose (Porwal et al., 2019). Human studies have shown that silymarin is nontoxic [8]. High doses (> 1500 mg per day) increase bile secretion and flow, resulting in a laxative effect. A mild allergic reaction was also observed, but it was not serious [8].

### Cancer

40% of currently approved chemotherapeutic agents are plant-derived or inspired by natural products, of which more than 70% are used to treat cancer [9]. Silymarin is a complex of bioflavonoids derived from the dried seeds of milk thistle (*Silybum marianum*) the hepatoprotective effect of which has been clinically proven [10].

Silymarin is a group of closely related flavonolignan compounds, involving silibinin, and is extracted from *Silybum marianum* species, known as milk thistle [9]. The chemoprotective effects of silymarin and silibinin (its main component) suggest that they can be applied to reduce side effects and enhance the anticancer effects of chemotherapy and radiotherapy in various types of cancer, especially gastrointestinal cancer [9]. Stomach cancer cells viability and migration were significantly reduced dose-dependently after administration of silymarin [9]. Silibinin suppressed tumor growth and metastasis of difference tumor cells [11].

### Silymarin and Lipid Metabolism

Silymarin treatment decreased lipid accumulation, restored cell viability, and reduced steatosis in animals [12].

### Silymarin and Blood Glucose

Fasting blood glucose, daily insulin requirements, daily blood glucose, daily diabetes, and average levels of fasting blood glucose were reduced in patients treated with silymarin (MacDonald-Ramos et al., 2021).

Metabolic syndrome describes

Metabolic syndrome represents complex metabolic risk factors such as dyslipidemia, hypertension, diabetes and obesity [13].

This syndrome is recognized by medical conditions as disturbed lipid profile, weight gain, high blood sugar and high blood pressure [13].

Milk thistle has been shown to have antioxidant, lipid-lowering, hepatoprotective, antihypertensive, anti-diabetic, anti-atherosclerotic and anti-obesity effects [13].

Several studies have showed the antihypertensive effect of *S. marianum* and its protection against hypertensive complications as cardiac hypertrophy, but clinical studies don't backing these reports [13].

### Silymarin and Osteoporosis

The possibility of using silymarin against the development of osteoporosis has been confirmed [10].

### Conclusion

Silymarin improves insulin resistance in liver pathologies and metabolic disorders. The high cost of disease management and treatment poses challenges for patients and public health. Silymarin appears to be a safe alternative for use alone or as an adjunct to standard treatment for patients with insulin resistance. In addition, the effectiveness of silymarin and its main component silibinin has been shown in the treatment of Alzheimer's disease, Parkinson's disease, sepsis, osteoporosis, hypercholesterolemia, burns, diabetes, and cholestasis.

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