

## Review Article

## The Biological Activity of the *Annona muricata* L Plant

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Received: 13.04.2023

Accepted: 08.05.2023

Published: 17.05.2023

**Abstract:** The custard fruit contains a high percentage of antioxidants. Cream contains antioxidants that fight free radicals in the body. As is known, high levels of free radicals can cause oxidative stress associated with many chronic diseases such as cancer. Studies have confirmed that the peel and pulp of the cream fruit are excellent sources of antioxidants, in addition to the presence of other compounds in the peel that are particularly effective in preventing oxidative damage. However, eating the crust of the cream is not recommended due to some health concerns.

**Keywords:** Antioxidants, chronic diseases, oxidative damage.

### INTRODUCTION

The fruit is known as the soursop fruit, graviola, cherimoya, butter, guanabana, or mustafil fruit, as it is also called soursop (scientific name: *Annona muricata* L.). It is a type of evergreen fruit, native to warm regions. and wet; Such as: Brazil, Mexico, the Caribbean, and Central America, and the color of the peel of this fruit varies according to its maturity, as it is dark green in color when it is unripe, while its color tends to be yellow with a soft texture when it is ripe, and the cream fruit is characterized by having fibrous membranes. , and pulp with a white color, and large seeds are distributed in it, which makes it difficult to eat it without treatment, and the weight of the cream fruit can reach approximately two kilograms, and the length of this fruit ranges between approximately 20 to 30 centimeters [1, 2]. It should be noted that the cream fruit is used for its distinctive flavor in the manufacture of desserts, ice cream, and juices, and it is one of the fruits that contain a high amount of carbohydrates. Especially fructose sugar (in English: Fructose), as it contains a high amount of vitamins; such as vitamin B1, vitamin B2, and vitamin C, in addition to a group of minerals; Such as: calcium, magnesium, zinc, potassium, and phosphorus [28] Figure 1. Its content of nutrients The cream fruit is rich in many nutrients that are beneficial to health, and we mention the most important of them:



**Figure 1: *Annona muricata* Fruit**

Source: <https://en.wikipedia.org/wiki/Annona>

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**Citation:** Sundus Hameed Ahmed (2023). The Biological Activity of the *Annona muricata* L Plant. *South Asian Res J Agri Fish*, 5(3), 23-27.

### **Antioxidants**

Most of the benefits of cream are due to being a rich source of antioxidants; They are compounds that help neutralize the harmful effect of free radicals, in addition to reducing the risk of exposure to oxidative stress, according to a laboratory study published in the Food & Function magazine in 2014, [1] A diet that contains antioxidants can be significant that it reduces the risk of many diseases, including heart disease, cancer, and diabetes, and these antioxidants may be from nutrients, such as: vitamin C, which is available in the cream fruit, in addition to plant compounds, such as: luteolin (in English: Luteolin), And quercetin (in English: Quercetin), and a compound called Tangeretin, according to what was shown by another laboratory study published in the Journal of Food Science and Technology in 2015 [2], but there is still a need for more studies on the possibility of benefiting these antioxidants for humans [3, 4] Vitamins and minerals: The cream fruit is one of the fruits rich in vitamins; especially vitamin C; As the cream fruit contains about 77% of the daily dose of vitamin C, which contributes to strengthening the immune system, it is also worth noting that the cream contains potassium, which helps regulate blood pressure.[5] Dietary fiber: The cream contains large amounts of fiber nutrients that contribute to maintain good digestion.

### **Reducing the Risk of Cancer**

Although, there are no studies that shows the effect of consuming of custard products on cancer patients that contribute to improving the effect of cancer drugs, and kill cancer cells directly because they contain some chemicals that contribute to that, and despite that it should be noted that these studies usually use a high dose of cream extract [4, 7] and we mention the following The results of some of these studies: A laboratory study published by the Asian Pacific Journal of Tropical Medicine in 2014 showed that the ethanolic extract of Soursop leaves contains phenols, flavonoids, saponins, coumarins, lactones, anthraquinones, phytosterols, and other primary metabolites that have a toxic effect on cells. Cancer, and this effect was not observed in normal cells [8]. Another laboratory study published in Nutrition and Cancer in 2011 stated that custard fruit extracts are likely to reduce the risk of breast cancer in women [9]. A laboratory study from University College found of Yaoundé I in 2014 that extracts of custard fruit can inhibit the growth and proliferation of leukemia cells, and increase their programmed death rate; or what is called apoptosis [10].

### **Reducing the Risk of Infection**

As the cream fruit contains anti-inflammatory compounds, which may contribute to the fight against parasites, and cream tea can help relieve symptoms associated with bacterial and viral infections, such as: fever and cough [5]. The results of studies related to the effect of cream extract on some types of infections, however, there is still a need for more studies on its effect on humans, and the quantities used from cream in laboratory studies are very high, and exceed those available in the followed diet [4]. The following are mentioned the results of these studies: Reducing the infection caused by sand flies: (in English: Sand fly) that transmit parasites, causing leishmaniasis (in English: Leishmaniasis) [11]. These parasites [6] Reducing herpes virus infection: According to a preliminary study published at a conference called The International Student Congress Of (bio)Medical Sciences in 2014, it is believed that the extract of cumin seeds may contribute to alleviating herpes virus infection [12], A viral infection caused by the herpes simplex virus (in English: Herpes simplex virus), and it has two types; Where the first type, which is known as HSV-1, is mainly transmitted through the mouth, while the other type, or HSV-2, may be transmitted through sexual contact [13], as a laboratory study from the University of Universidad de Antioquia in 1999 showed that the extract of One type of cream may possess anti-toxic activity against the herpes virus of the second type, [14] However, there is still a need for more studies that support these results [15]. Reducing human papilloma virus infection: (in English: Human papilloma virus); Where the high risk of infection with this virus is associated with cervical cancer, and it is believed that the consumption of custard fruit with ellagic acid for a period of 6 months is associated with properties that reduce the risk of infection with the human papilloma virus, and it has also been noted that it may help reduce the exacerbation of precancerous cells. In women who have a high risk of exposure to this virus [16].

### **Reducing Bacterial Infection**

A laboratory study conducted by the University of Manipal in 2016, which was over a period of two months, indicated that an extract of cumin leaves could be effective in combating many types of bacteria, such as; Streptococcus mutans, Streptococcus mitis, Candida albicans, and other strains of bacteria that cause tooth decay, gingivitis, and yeast infections, but it did not appear to have any effect on negative Prevotella bacteria. Gram (in English: Prevotella intermedia) [17]. Another laboratory study from Akara Valley State University in 2010 showed that the aqueous extract of cream can have antibacterial properties against Staphylococcus aureus (in English: Staphylococcus aureus), and the bacteria that cause cholera, but the effect The alcoholic extract of it did not show this effect [18].

### **Controlling Sugar Levels in Diabetics**

In one of the preliminary studies from Obafemi Awolowo University in 2008, which was conducted on a group of diabetic rats, they were injected with an extract of the fruit of custard for two weeks, and their blood sugar levels decreased more than the rats with this disease that This extract has been given, but other studies are still needed to confirm this benefit in humans [15, 19]. Possessing anti-inflammatory properties: Although inflammation represents a

normal immune response to various infections, chronic inflammation can contribute to it. In increasing the risk of disease, a laboratory study conducted by the University of Lagos in 2014 indicated that custard fruit extract can possess anti-inflammatory properties, as well as analgesic (in English: Analgesic) [20], but more is still needed. Studies have shown this [4]. Promoting relaxation: the cream fruit is characterized by its containing substances that contribute to reducing insomnia and nervous disorders, which helps to enhance the feeling of relaxation [21]. Other benefits that do not have evidence of their effectiveness: they are according to the following: [11] Cough. Maintain regular bowel movement.

**The Heart Rate:** [23] It should be noted that high blood pressure can increase the risk of many diseases; such as heart disease, diabetes, and stroke [15]. In another study published in the Journal of Human Hypertension in 2019, conducted on 143 people, some of them were given about 200 grams of cream fruit juice daily for 3 months, and this contributed to lowering blood pressure [24]. One of the preliminary studies conducted at the University of Malaya in Malaysia in 2014 on rodents indicated that the extract of the leaves of the leaves in ethyl acetate may contribute to reducing the risk of infection. Stomach ulcers by inhibiting oxidative damage, in addition to preserving the mucous membrane of the stomach wall [25]. It is worth mentioning that stomach ulcers are one of the painful sores that develop in the lining of the stomach, esophagus, or small intestine. The frequent consumption of custard fruit can cause poisoning in the liver and kidneys, and its consumption for a long period of time can lead to nerve damage, movement disorders as well, or even a serious neuropathy similar in symptoms to Parkinson's disease (in English: Parkinson's Disease), and therefore eating People suffering from Parkinson's disease, this fruit may exacerbate their symptoms, and it should be noted that some people warn against consuming this fruit and should consult a doctor before eating it, including: [15] People who suffer from high blood pressure, or who take medications discounted him, people with diabetes, pregnant and breastfeeding [26-32].

**How to eat cream fruit Why isn't cream fruit famous in the Arab world?** The cream fruit is one of the types of fruits that are not well known in the Arab world, and the reason for this is that the original home of its cultivation is the tropics, but it has begun to spread in the Arab world recently because of the health benefits it contains, and what distinguishes this fruit most is that it can be offered to children at the age of six months After its seeds are removed and boiled with water to become soft, then mashed and offered to the child to eat [2], and here comes the way to eat the cream fruit: [1] The fruits of the cream are washed well with water. The fruits are peeled and then cut into several parts. Work to remove the black seeds from the pulp, as they are not edible. The fruit is cut and ready to eat. It is possible to eat the cream fruit in the form of juice, where the pulp is placed in the electric blender - after removing the seeds - and sugar and milk are added to it according to the amount of cream [32-37].

**How to grow cream fruit with seeds What is the method of sanity?** There are several ways and methods to grow and multiply the cream fruit; In order for the farmer to ensure its growth and obtain a good crop in terms of variety, crop quality, and appropriate size of fruits, including the following: [3] Cultivation of custard seeds directly after extracting them from the fruit, as the seed's speed of growth is very high, and it is possible to accelerate the growth process by sanding the crust The external seed, or the process of soaking the fruit seeds in warm water for three days, with the need to change the water daily. Sowing the seeds in wooden boxes or within lines, with a distance between each seed of 50 cm, and the seeds are placed at a depth of approximately 2 cm, and when the seedling becomes 10 cm tall, it is transferred to a container suitable for the size of the seedling and kept until it becomes 20 cm long, then transferred to a container It is larger or transferred to the nursery in March, and it can be grafted in May if the seedling's growth is good, or in August if the seedling's growth is weak. Using the method of cuttings to grow the cream by pruning some mature and good branches and planting them directly in a sandy environment while continuing to irrigate, and their roots begin to grow approximately four weeks after planting them.

## CONCLUSIONS

*Annona muricata*, commonly known as soursop, is a tropical fruit tree native to Central and South America. The plant is also known for its medicinal properties, and various parts of the plant have been used in traditional medicine to treat a variety of ailments.

Several studies have shown that *A. muricata* possesses a wide range of biological activities, including:

- **Anti-Cancer Activity:** The plant has been shown to possess potent anti-cancer properties, with studies demonstrating its ability to inhibit the growth of various cancer cells, including breast, lung, liver, and prostate cancer cells.
- **Anti-Inflammatory Activity:** The plant has been shown to possess significant anti-inflammatory properties, which can help to alleviate pain, reduce swelling, and improve overall health.
- **Antioxidant Activity:** *A. muricata* contains high levels of antioxidants, which can help to protect cells from damage caused by free radicals and oxidative stress.

- **Antimicrobial Activity:** The plant has been shown to possess antimicrobial properties, with studies demonstrating its ability to inhibit the growth of various bacteria, fungi, and viruses.
- **Anti-Diabetic Activity:** *A. muricata* has been shown to possess anti-diabetic properties, with studies demonstrating its ability to lower blood sugar levels in animals.
- **Anti-Hypertensive Activity:** The plant has been shown to possess anti-hypertensive properties, with studies demonstrating its ability to lower blood pressure levels in animals.

## ACKNOWLEDGMENT

Great appreciation to Mustansiriyah University (<https://www.uomustansiriyah.edu.iq/>) for their help to accomplish this article.

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