



The Potential of Jamblang Root or Java Plum (*Syzygium cumini*) in Medicinal Uses: A Systematic Review

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ABSTRACT

Jamblang root has long been used in traditional medicine as a natural remedy for various health conditions. This study aimed to present a systematic review to explore the potential of jamblang roots in the health sector. This study is a systematic literature review in which exploration was carried out literature from various reputable scientific publication databases. This study follows the preferred reporting items for systematic reviews and meta-analysis (PRISMA) recommendations. Several studies have shown that jamblang root has anti-inflammatory properties that can help reduce inflammation in the body. In conclusion, jamblang root or java plum (*Syzygium cumini*) has the potential for anti-diabetic, anti-inflammatory, antioxidant, hepatoprotective, and astringent effects.

1. Introduction

Jamblang root, also known as Java plum, is a tropical fruit that grows in the Southeast Asian region, especially in India, Indonesia, and the Philippines.^{1,2} Apart from being a delicious fruit, jamblang root also has great potential in the health sector. Local people have long recognized the health benefits of jamblang roots and used them in traditional medicine. Jamblang root has long been used in traditional medicine as a natural remedy for various health conditions. One of the main benefits of jamblang root is its ability to treat diabetes. Jamblang root is known to have a hypoglycemic effect, which helps lower blood sugar levels. Several studies have shown that active compounds in jamblang roots, such as jamboline, can help regulate blood sugar levels by inhibiting the absorption of glucose in the body.^{3,4} This makes

jamblang root an attractive option for diabetics who wish to manage their blood sugar levels naturally.

In addition, jamblang roots are also rich in antioxidants. Antioxidants are compounds that protect the body from damage caused by free radicals. Free radicals can cause oxidative stress in the body, which contributes to the development of various diseases, including heart disease, cancer, and premature aging. Consuming jamblang root regularly can help increase antioxidant levels in the body and protect cells from damage. The benefits of jamblang root also extend to the digestive system. This fruit is high in fiber, which is essential for good digestive health. Fiber helps to facilitate bowel movements, prevent constipation, and maintain the health of the digestive tract in general. In addition, fiber also helps control appetite and maintain a healthy weight.

Consuming jamblang root regularly can help maintain your digestive health and prevent indigestion.^{5,6}

Apart from its fiber content, jamblang root also contains anti-inflammatory compounds that can help reduce inflammation in the body. Chronic inflammation has been linked to various health conditions, such as arthritis, heart disease, and inflammatory bowel disease. Anti-inflammatory compounds in jamblang root can help relieve inflammation and reduce the risk of developing these diseases. The benefits of jamblang root are not only limited to internal health but can also be beneficial for skin health. The antioxidants contained in jamblang root can help fight free radical damage and keep the skin healthy.^{7,8} This study aimed to present a systematic review to explore the potential of jamblang roots in the health sector.

2. Methods

The literature search process was carried out on various databases (PubMed, Web of Sciences,

EMBASE, Cochrane Libraries, and Google Scholar) regarding the potential of jamblang root in medicinal uses. The search was performed using the terms: (1) "jamblang" OR "java plum" OR "Syzygium cumini" OR "Syzygium cumini root in medicinal uses" AND (2) "Syzygium cumini" OR "jamboline." The literature is limited to preclinical studies and published in English. The literature selection criteria are articles published in the form of original articles, an experimental study about medicinal uses of *Syzygium cumini*, the control group only received liquid without therapeutic effect or no treatment, studies were conducted in a timeframe from 2013-2023, and the main outcome was medicinal uses of *Syzygium cumini*. Meanwhile, the exclusion criteria were animal models that were not related to medicinal uses, the absence of a control group, and duplication of publications. This study follows the preferred reporting items for systematic reviews and meta-analysis (PRISMA) recommendations.

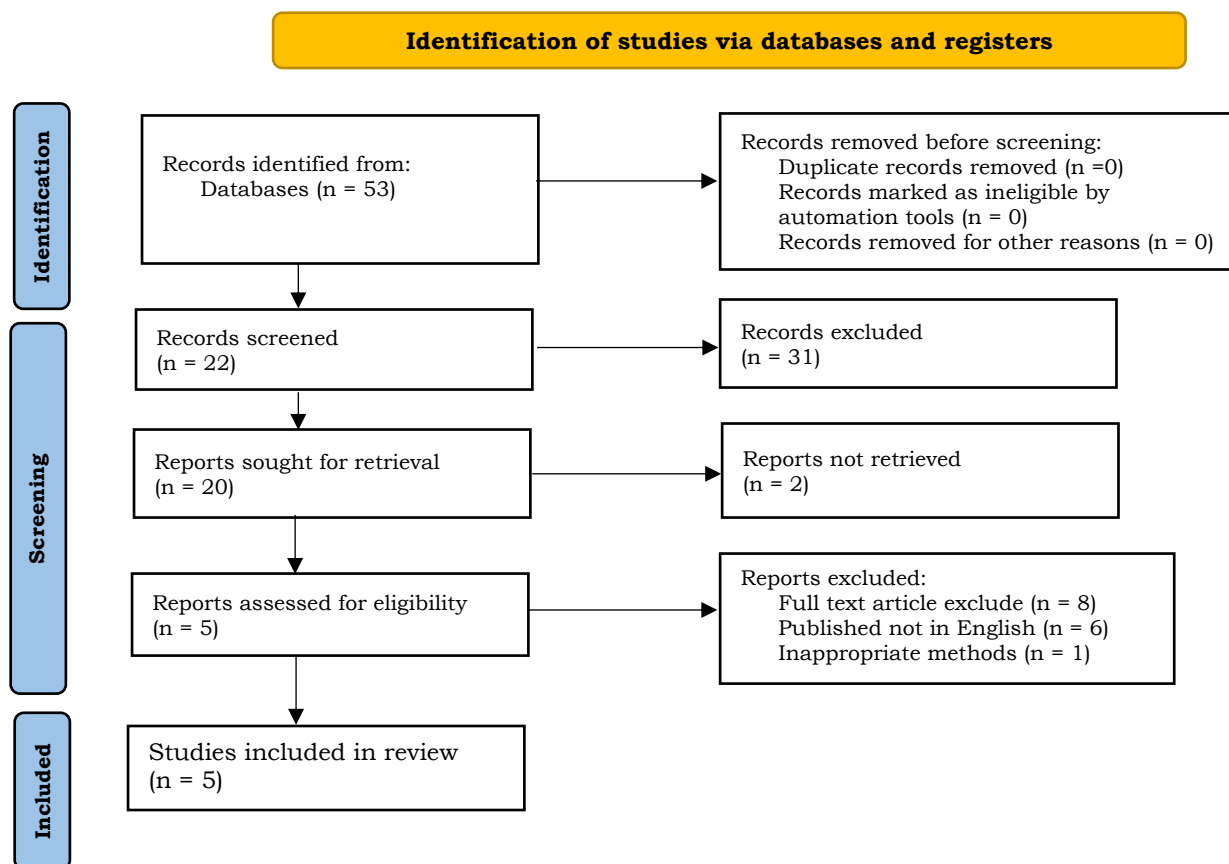


Figure 1. Research PRISMA diagram.

3. Results and Discussion

Anti-diabetes

Jamblang root (*Syzygium cumini*) has indeed been used traditionally as a herbal medicine to control diabetes. This plant originates from India and has long been used in traditional medicine in South and Southeast Asia. Jamblang root contains active compounds such as jamboline, polyphenols, flavonoids, and tannins. The jamboline compound is known to have an anti-diabetic effect, namely by inhibiting the activity of the alpha-glucosidase enzyme and affecting the absorption of glucose in the intestine, thereby helping to control blood sugar levels.⁹

There are several studies that have been conducted to evaluate the potential of jamblang root as an anti-diabetic drug. A study on rats stated that the administration of jamblang root extract could lower blood sugar levels and increase glucose tolerance in rats with diabetes. These results indicate the potential of jamblang root as an anti-diabetic drug. In a human clinical study, researchers looked at the effects of jamblang root in patients with type 2 diabetes.¹⁰ The study found that consumption of jamblang root in capsule form for eight weeks can reduce fasting and post-meal blood sugar levels, as well as improve the function of pancreatic beta cells in producing insulin, where insulin is very important in blood glucose regulation. Several studies have also shown that jamblang root has high antioxidant activity. Diabetes is often associated with high oxidative stress, so the ability of jamblang roots to fight free radicals can provide additional benefits in the treatment of diabetes.

Anti-inflammatory

Jamblang root has anti-inflammatory properties that can help reduce inflammation in the body. It can be useful in the treatment of conditions such as arthritis, arthritis, or other inflammatory diseases. Several studies have shown that jamblang root has anti-inflammatory properties that can help reduce

inflammation in the body. Inflammation is a normal response of the immune system to infection or injury, but prolonged chronic inflammation can lead to a variety of health problems, including chronic diseases such as arthritis, heart disease, and diabetes.¹¹

Several studies have shown that jamblang root extract has anti-inflammatory effects.^{12,13} A study stated that the ethanol extract of jamblang roots could inhibit the production of pro-inflammatory molecules and increase antioxidant activity in macrophage cells in in vitro experiments. These results indicate the potential of jamblang root as an anti-inflammatory agent.

Antioxidant

Jamblang root (*Syzygium cumini*) contains antioxidant compounds such as phenolics, flavonoids, and tannins. These compounds are known to have antioxidant properties that can protect body cells from oxidative damage caused by free radicals. Phenolics are a group of compounds that include phenolic acids, flavonoids, and stilbenoids. They are known to have strong antioxidant activity and can help fight oxidative stress in the body. Flavonoids, for example, have been known to have anti-inflammatory properties and protect body cells from oxidative damage. Tannins are polyphenolic compounds that also have antioxidant activity. Tannins can help protect body cells by capturing free radicals and inhibiting cell damage. In addition, tannins also have the potential to exhibit anti-inflammatory effects and protect body tissues from inflammatory damage. The presence of these antioxidant compounds in jamblang roots indicates the potential for this plant to provide antioxidant benefits.^{14,15}

There are several studies that have been conducted to evaluate the antioxidant potential of jamblang roots (*Syzygium cumini*). A study shows that the ethanol extract of jamblang roots has strong antioxidant activity.¹⁶ This study used various in vitro tests and demonstrated that jamblang root extract has

the capacity to fight free radicals and protect cells from oxidative damage. Another study showed that the administration of jamblang root water extract could increase the activity of antioxidant enzymes such as superoxide dismutase (SOD) and glutathione peroxidase (GPx) in rat livers. This shows the potential of jamblang root to increase the body's antioxidant defenses. Another study evaluated the antioxidant activity of methanol extract and jamblang root water extract. The results of this study indicate that both extracts have the capacity to inhibit free radical activity and increase total antioxidant capacity.

Hepatoprotective

Several studies have shown that jamblang root (*Syzygium cumini*) has a protective effect on the liver.^{16,17} Research on rats has been carried out to evaluate the effects of jamblang root on liver health. A study showed that the administration of jamblang root extract could protect rat livers from damage caused by the induction of hepatotoxic compounds. Jamblang roots also contain antioxidant compounds such as phenolics, flavonoids, and tannins. Antioxidants can help protect the liver by fighting oxidative stress and reducing inflammation. Several studies have shown that jamblang root has strong antioxidant activity, and this may contribute to liver protection.

Several studies have also shown that jamblang root can affect the activity of liver enzymes involved in the detoxification and metabolism of toxic substances.^{18,19} A study showed that giving jamblang root extract to rats can increase the activity of liver enzymes such as superoxide dismutase (SOD) and glutathione peroxidase (GPx), which play an important role in maintaining the balance of antioxidants in the body.

Astringent compounds

Jamblang root (*Syzygium cumini*) is known to have astringent properties that can help in treating diarrhea or other digestive problems. Several studies have shown the potential of jamblang roots in overcoming

diarrhea.^{19,20} A study on rats showed that an aqueous extract of jamblang root reduced the frequency and duration of diarrhea in experimentally induced rats. This shows the potential of jamblang root as an antidiarrheal agent.

4. Conclusion

Jamblang root or java plum (*Syzygium cumini*) has the potential as an anti-diabetic, anti-inflammatory, antioxidant, hepatoprotective, and astringent effect.

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