



Utilization of Ziziphus Mauritiana Leaves for Lowering Cholesterol Level

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Abstract: Abstract: Indonesia as a region with a tropical climate has a variety of plants spread across various regions. These plants contain many chemicals that can easily be used as traditional medicine, one of which is bidara leaves (*Ziziphus Mauritiana*). Bidara leaves are not only used by people in China, but Indonesian people also use *Ziziphus Mauritiana* as a medicine for dysentery, diarrhea and gum swelling. Wide distribution and in large quantities in Indonesia makes it easy for people to cultivate and use it. Much research has been conducted to discuss the efficacy of *Ziziphus Mauritiana*. The research aims to determine the various benefits of *Ziziphus mauritiana* leaves which have been scientifically proven through research in Indonesia. Method: Conduct a literature search using the Google Scholar application and analyze the literature that meets the inclusion criteria. Results: From the search results and research results, we concluded about the benefits of *Ziziphus mauritiana* leaves. Conclusion: The greatest benefit of *Ziziphus mauritiana* leaves is as an antimicrobial, apart from that there are many other benefits such as analgesic, antipyretic and anti-inflammatory, anticancer, and functions as a plant that can reduce cholesterol levels in the leaves.

Keywords: *Ziziphus mauritiana*; Cholesterol.

Introduction

Plants with various varieties can be found in various regions in Indonesia (Iskandar et al., 2020; Suwardi et al., 2022). The existing botanical heterogeneity can be used as a source of raw materials for both modern and traditional medicines (Bandaranayake, 2006). Many varieties of medicinal plants in Indonesia are used as raw materials for making medicines and some of these plants have been clinically studied for their phytochemical composition, efficacy and safety for use (Kunle et al., 2012). The use of *ziziphus mauritiana* has developed occasionally. The use of

ziziphus mauritiana has developed time to time. As technology develops, the use of *ziziphus mauritiana* can be found in the world of medical treatment.

Extracts from *ziziphus mauritiana* leaves can be used as a treatment for lowering cholesterol level. *Ziziphus mauritiana* leaves, scientifically known as *Ziziphus mauritiana*, are often used in Traditional Chinese Medicine to cure a number of ailments, such as urinary problems, indigestion, fever, liver complaints, weakness, anemia, obesity, diabetes, bronchitis, skin infections, loss of appetite. eating, pharyngitis, diarrhea, cancer, and insomnia. This *ziziphus mauritiana* plant can be found in the Madura region, precisely in Sumenep. The components contained in *ziziphus*

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mauritiana leaves include alkaloids, saponins, triterpenoids, flavonoids, proteins, and lipids.

Ziziphus mauritiana, known as India jujube, is native to a wide tropical region from Vietnam, India to Sahel, and domesticated in India. India jujube has been introduced to Taiwan, South China, and North Africa.

Raharjeng & Masliyah (2020) said that The *Ziziphus mauritiana*'s tree has a Latin name, namely *Ziziphus mauritiana*, also known by several regional names, namely Widara (Java, Sunda), Rangka (Bima), Kalangga (Sumba) and Bekul (Bali), Kom (Kupang). Cholesterol ($C_{27}H_{45}OH$) is a steroid alcohol, a kind of fat derived from animal fat, oil, bile, milk, egg yolk, which is mostly synthesized by the liver and a small part is absorbed from the diet. The presence in blood vessels at high levels will tend to make deposits, crystals or plates that will narrow and clog blood vessels (Salbiah & Warida, 2022).

Ziziphus mauritiana L. has chemical constituents which include Alkaloid, polyphenols, saponins, tannins and flavonoid. Reducing cholesterol levels in the body is one of the health benefits of *Ziziphus mauritiana* leaves. *Ziziphus mauritiana* leaf fiber which dissolves in water can help lower bad LDL cholesterol levels. The leaves are used as a poultice and help in liver problems, asthma, fever and cholesterol. A bitter and astringent decoction of the bark is taken to stop diarrhea and dysentery and relieve inflammation of the gums. The leaves are applied as poultices and are helpful in liver trouble, asthma, fever and cholesterol.

Lifestyle back to Nature is the current trend. So that people return to utilizing natural ingredients (herbs). Apart from being more economical, the side effects of herbal ingredients are very small. Therefore, the use of natural herbal medicines with the right formulation is very important and of course safer and more effective (Usman et al., 2021). The high price of modern medicines in the market is one of the reasons to dig back into the use of traditional medicines (Irawan et al., 2019). One of the natural ingredients (herbs) that lowers cholesterol levels is the *Ziziphus Mauritiana*. However, the use of leaves for treatment is still low when compared to several Asian countries, especially in terms of the use of medicinal plants integrated into formal health services (Jenkins et al., 2004).

The chemical content in *Ziziphus mauritiana* leaves can be used as a medicine for terol if processed into a poultice. *Ziziphus Mauritiana* has many uses, but there is still very little research that discusses specifically the use of *Ziziphus Mauritiana* leaves for lowering cholesterol levels. Therefore, researchers are interested in discussing further regarding the use of *Ziziphus mauritiana* to reduce cholesterol levels in the hope of filling the gap in this field of science.

Method

The type of research used is qualitative research. This research is library research. Sugiyono (2017) said, Library Research is the collection of library data obtained from various library information sources related to research objects such as through research abstracts, indexes, reviews, journals and reference books. In this research, researchers obtained from several sources and references related to the *Ziziphus Mauritiana* object. Andriani (2022) literature review method provides output from existing secondary data and outlines important information from certain findings. Important information from previous findings is then used as an example in reviewing research when preparing a discussion that clearly answers the problem being studied. Research using the literature review method requires the author to search for data and literature material from journals, articles and books so that it can become a strong basis for describing answers to the problems under discussion.

Literature review is carried out in several stages including: collecting secondary data through the process of reading and writing. Next, the information received is collected and analyzed to determine the concept of the problem being studied. Then, the complexity of the problems studied is described one by one based on the analysis of the information that has been collected. In line with Zed (2008) where literature review does not only consist of the process of reading and taking notes, but also processing the information received.

Result

Ziziphus Mauritiana leaves for lowering cholesterol levels *Ziziphus Mauritiana* fiber which dissolves in water can help lower bad LDL cholesterol levels (Lim & Lim, 2013; Sangeethapriya & Siddhuraju, 2014). Simply boiling bidara leaves in water can help lower cholesterol levels and bind cholesterol to the digestive system, so that the level of cholesterol levels in the body does not reach 240 mg/dl.

The classification of *Ziziphus Mauritiana* as follows (*Ziziphus jujuba* (L.) (Miri, 2018).

Kingdom: Plantae

Division: Magnoliophyta

Class: Magnoliopsida

Order: Rosales

Family: Rhamnaceae

Genus: *Ziziphus*

Species: *Z. mauritiana*

Ziziphus Mauritiana contains a secondary metabolite compound have antioxidant activity, namely

flavonoids which are widely found in leaf part (Adilah et al., 2023; Prakash et al., 2021). The largest accumulation of flavonoids is found in the cells leaves, namely trichomes, vacuoles of trichome gland cells, and chloroplasts. Most of the flavonoids are collected in the cell vacuoles, regardless of location the synthesis is outside the vacuole (Aisyah, 2021; Hastiana et al., 2022). Siregar (2020) states that *Ziziphus Mauritiana* leaves are efficacious as an antipyretic analgesic due to the working flavonoid content through two mechanisms in inhibiting inflammatory factors. Phytochemical test results, it is known that the ethanol extract contains alkaloids, flavonoids, and tannins.



Figure 1. *Ziziphus Mauritiana* leaves

The Benefits of zizhipus mauritiana leaves *Anti-Microbe*

The biggest benefit of *Ziziphus Mauritiana* leaves is as an anti-microbial agent, both against fungi, bacteria, and parasites (Idris et al., 2020). Alkaloids, phenol tannins, flavonoids, and saponins are some of the active compounds present in *Ziziphus Mauritiana* leaf extracts which show the potential to be anti-microbial genes (Akanda & Hasan, 2021). The ethanol extract of *Ziziphus Mauritiana* leaves showed inhibition zones on various bacteria, including *Streptococcus mutans*, *Salmonella thypi*, *Echerichia coli*, *Pseudomonas aeruginosa*, *Vibrio sp.*, and *Staphylococcus epidermidid* in inhibition tests (HB et al., 2022; Jain et al., 2019). Among the active ingredients contained in *Ziziphus Mauritiana* leaves are saponins which are anti-bacterial (Abdallah et al., 2016; Usman et al., 2021). Saponins are a class of complex glycosides named after the Latin word "sapo," which means "soap." Because of their water solubility (hydrophilicity) and polarity, saponins are often referred to as natural surfactants. There are a number of other chemicals that have anti-microbial properties such as tannins, alkaloids, and flavonoids, among (Mbahi et al., 2018) which the alkaloids are very effective because they can interfere with the petidoglycan component of bacteria, which causes the lining of the microbial cell

wall to be disrupted, so that the cells easily lyse. Flavonoids work to form complex compounds with extra cellular and dissolved proteins that can damage microbial cell membranes, while tannins have the ability to shrink cell walls thereby disrupting the permeability of microbial cells which interferes with the transport activity of cellular substances in bacteria.

Antidepressants

Alkaloids and flavonoids in *Ziziphus Mauritiana* leaves suppress the activity of monoamine-oxidase, an enzyme that breaks down central nervous system neurotransmitters such as serotonin and catecholamines, resulting in possible central nervous system stimulation and reduction of depressive symptoms (Raju et al., 2023).

Analgesic, Antipyretic and Anti-inflammatory

The flavonoid content of *Ziziphus Mauritiana* leaves is responsible for its antipyretic and analgesic properties (Ma'ruf et al., 2021), because it inhibits inflammatory factors in two mechanisms. The first mechanism is inhibition of cyclooxygenase, which results in the formation of prostaglandins, which are a type of mediator of pain and fever, the second mechanism is inhibition of neutrophil degranulation, which results in inhibition of the release of cytokines which play a role in the inflammatory process.

Anti-Oxidant

The concentration of flavonoids in *Ziziphus Mauritiana* leaf extract plays an important role in its significant antioxidant action (Aldhanhani et al., 2022; Koley et al., 2016). Reducing agents, such as flavonoids, can prevent many oxidation events by donating electrons to free radicals, thereby stabilizing them and preventing oxidation reactions from occurring.

Conclusion

From the results of the research and literature analysis, it can be concluded that *Ziziphus Mauritiana* leaves have benefits. The biggest benefit of *Ziziphus Mauritiana* leaves is as an antimicrobial. The active compounds contained in *Ziziphus Mauritiana* leaves are alkaloids and flavonoids. *Ziziphus Mauritiana* leaf fiber can be used to lower cholesterol levels as an alternative to traditional medicine in Indonesia. The largest accumulation of flavonoids is found in the leaf cells, namely trichomes, vacuoles of glandular trichome cells, and chloroplasts.

Author Contribution

This paper was prepared by L.R, D.M, M.M.A.A.Z.A, S.A.Z, and T.D. This paper was prepared cooperatively at each stage.

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Conflicts of Interest

The authors declare no conflict of interest.

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