

Utilization of Acacia Leaves for Patients with Diabetes Mellitus, Cancer and Coronary Heart

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Abstract: Free radicals can cause cell damage and also damage biomolecules, such as DNA, proteins, and lipoproteins in the body which can trigger degenerative diseases, such as diabetes mellitus, cancer, coronary heart disease. Acacia plant has been widely recognized as an antioxidant agent that removes free radicals which can prove a useful therapeutic tactic in controlling diabetes, cancer and coronary heart disease. This research method uses qualitative methods. This study aims to determine the use of Acacia Leaves for people with Diabetes Mellitus, Cancer and Coronary Heart. The results of this study found that acacia leaves contain lots of antioxidants which can treat diabetes mellitus, cancer and heart disease. Acacia leaves are very good for consumption by people with diabetes, cancer, and coronary heart because they contain saponins, flavonoids, polyphenols, and antimicrobials which are efficacious for reducing cholesterol and blood sugar levels.

Keywords: Acacia Leaves; Cancer; Coronary Heart; Diabetes Mellitus

Introduction

Indonesia is a country that has high potential for the discovery of new compounds as antioxidants. Antioxidants are very important in the role of neutralizing and destroying free radicals. Free radicals can arise in a complex chemical process in the body that comes from environmental pollutants, chemical radiation and toxins from fast food. Free radicals work by damaging the body's immune system, free radicals can damage the body because free radicals are foreign compounds that come from outside the body (Shahzad et al., 2021; Sundaram et al., 2021).

Free radicals can cause diseases that make the health of organs in the body deteriorate over time, such as coronary heart disease, cancer, diabetes mellitus and so on (Caiati et al., 2023). Free radicals work by damaging cell tissue and biomolecules found in the body such as DNA, protein and lipoprotein (Engwa et al., 2022; Fang et al., 2002). With the consequences of serious

damage, exogenous antioxidants from outside the body are needed in the process of healing the disease.

Most of the research states that there are several plants that are proven to have benefits in protecting the body from the dangers of free radicals. Some plants can produce antioxidants needed by the body which are usually found in seeds, fruit, roots, stems, twigs, skins and flowers. One of the plants that has benefits as an antioxidant is the Fabaceae plant (Tungmunnithum et al., 2021; Tungmunnithum et al., 2021). Fabaceae plants are plants that contain flavoid compounds that have been studied to inhibit peroxidation of linoleic acid and prevent the formation of superoxide anions, including quercetin, isorhamnetin and rhamnazin (Maroof et al., 2023). This compound has the potential to fight microsomal lipid peroxidation induced by Fe (III) ADP/NADPH (Santos & Silva, 2020). Acacia (*Acacia auriculiformis*) is a type of plant in the Fabaceae (Kodikara et al., 2023).

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Free anti-radicals from the *Acacia auriculiformis* plant have never been reported before whether they have an effect. Although other species of *Acacia* such as a confuse have been reported for their ability to inhibit chronic hepatitis virus replication with an EC₅₀ of 5 ± 0.3 $\mu\text{g/ml}$ (Lee et al., 2010). Therefore, research on *Acacia auriculiformis* needs to be carried out, bearing in mind that its utilization is still limited to fulfilling fiber needs, especially for raw material for the pulp and paper industry as well as a protective plant.

The acacia plant is widely known as a natural antioxidant agent (Oktavia & Sutoyo, 2021). Free radical scavenging products that can prove useful therapeutic tactics in the natural control of diabetes, cancer, and coronary heart disease (Sharma et al., 2022). In a study it was proven that acacia leaf decoction could be an alternative to a complementary therapy that can lower blood sugar. Utilization of acacia leaf decoction can be seen if consumed regularly which can stabilize blood sugar in the body which acts as an antidiabetic. However, the use of boiled water from acacia leaves will not be optimal if the patient continues to consume sugar excessively and continuously (Tedi, 2023).

Coronary heart disease (CHD) is the main and first cause of all deaths, which is 26.4%, this figure is four times higher than the death rate caused by cancer (6%) and is caused by narrowing and blockage of the arteries that carry blood to the heart muscle. The number of people with diabetes mellitus in the world is 415 million people and it is estimated that by 2040 it will increase to 642 million people (Pome et al., 2021). Seeing the increasing number of patients with coronary heart disease, cancer and diabetes mellitus, many studies have started to take place using natural and herbal ingredients in medicine, one of which is by using acacia leaf decoction.

In Niyodusenga et al. (2019) showed that *Acacia nilotica* can be used to treat diarrhea, leprosy, asthma, eye cancer and tuberculosis. *Acacia nilotica* is considered a drug that helps to treat premature ejaculation. *Acacia nilotica* extract has shown analgesic and antipyretic properties. *Acacia nilotica* indica leaves are rich in polyphenols that can lower blood glucose and tannins that antagonize calcium-induced smooth and cardiac muscle contractions, thereby lowering blood pressure.

In Tedi et al. (2023) showed the results that decoction of acacia leaves can be a complementary therapy which is proven to reduce blood sugar levels for healing diabetes mellitus. Although this therapy will still be useless if participants continue to consume sugar continuously and excessively. The purpose of this study was to determine the use of acacia leaves for people with diabetes mellitus, cancer and coronary heart disease.

Method

This study uses a qualitative approach. Qualitative methods are research based on philosophy, which are used to research scientific conditions (experiments) where researchers as instruments, data collection techniques and analysis are qualitative in nature which emphasize meaning.

Qualitative research is research used to examine the conditions of natural objects, where the researcher is the key instrument (Sugiyono, 2019). The design of the research process in this study is illustrated in Figure 1.

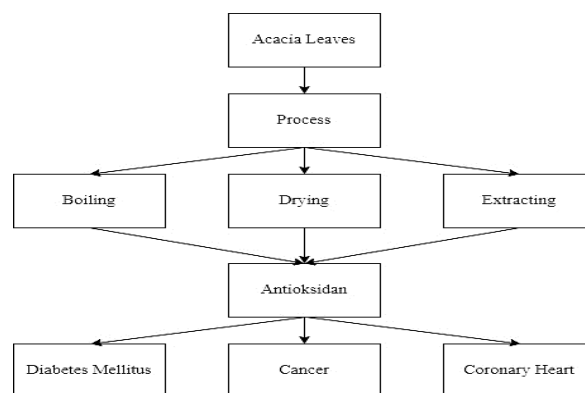


Figure 1. Research Framework

Result and Discussion

Acacia Leaves

The acacia plant has characteristics that can be observed with the eye, such as having many branches, the branches are round and straight, have a rough surface and have thick skin. Trees that have reached maturity usually have a height that can reach 30 m with a tree diameter of up to 75 m. The leaves are 4 to 10 cm wide and the length of the leaves can reach 10 to 26 cm. The second type is the chord type (*Acacia auriculiformis*). This type of chord plant requires a place to grow at an altitude of 0 to 400 m above sea level so that it can grow properly. *Acacia auriculiformis* can grow up to 15 m with a diameter of 50 cm at maturity with the characteristics of having many branches and being low.



Figure 2. Acacia Leaves

The acacia plant or *Acacia seyal* belongs to the Fabaceae (Mimosoideae) family which is widely distributed in the semi-arid zones of tropical Africa and the Red Sea and from the Nile valley in the south to Zambia (Elamin Elhasan et al., 2022; Kiso et al., 2016). *Acacia seyal*, locally known as Talha is used in traditional, or alternative, medicine and a source of gum Arabic (Singh, 2016). Gum Arabic (GA) is a mixture of polysaccharides and glycoproteins secreted from *Acacia senegal*, *Acacia seyal*, and *Acacia seyal* belonging to the Fabaceae (Mimosoideae) family. Pharmacologically, GA has been confirmed to have several therapeutic actions, such as antioxidants that can protect against diabetes mellitus, cancer and coronary heart disease (Ahmed, 2018; Jaafar, 2019; Yusoff et al., 2019). The focus of this study is the use of acacia leaf decoction in lowering blood glucose levels, besides that there has been no previous research that has examined acacia leaf decoction.

Since the 16th century, the acacia plant has been known to treat various diseases. Since then it has been made into a group of herbal medicinal plants. The person who has entered this plant into medicinal plants, namely Henry IV. Both types of magi-magi gunong (*Acacia manguim*) and chord (*Acacia auriculiformis*) leaves have the same benefits.

Acacia Leaves for People with Heart Disease, Cancer and Coronary Heart

One of the benefits of acacia leaves is that they can be used as a medicine for degenerative diseases such as diabetes mellitus, cancer and coronary heart disease. The roots, leaves and fruit of *Acacia Sieberiana* contain saponins. In addition, the leaves and fruit contain flavonoids and the fruit contains polyphenols. *Acacia* also contains an antimicrobial substance that functions against *Streptococcus faecalis* (Correia et al., 2022). *Acacia* is widely used to treat diabetes mellitus, cancer, and coronary heart disease. Not only that, acacia leaf extract (*Acacia auriculiformis*) can be used as an antifungal. Evidently, acacia leaf extract (*Acacia auriculiformis*) with a concentration of 1%, 5%, 10% has the potential as an antifungal against the growth of *Candida albicans*. *Candida albicans* itself is a fungus whose natural habitat is in the human body. This *Candida* fungus is commonly found in the digestive tract, mouth, vagina, rectum (anal canal), and other parts with warm temperatures. However, when the amount of *Candida albicans* fungus in the body exceeds reasonable limits, this can run the risk of causing dangerous infections that can spread to various organs of the body such as the bloodstream, heart, kidneys or brain which can have a very negative effect on people with diabetes mellitus, cancer or the heart (Van Doan et al., 2022).

Someone who has diabetes mellitus, cancer or coronary heart disease is very good at consuming fruits and vegetables, especially those that contain lots of antioxidants. In fruits and vegetables, there are various types of antioxidants which have good properties to help lower blood sugar levels for people with diabetes mellitus, cancer and protect the heart. For heart sufferers choose green leafy vegetables such as acacia leaves, spinach, kale, and mustard greens. These vegetables are known for their richness of vitamins, minerals, sources of vitamin K, and antioxidants which are good for the heart.

Acacia leaves which contain lots of antioxidants is a good medicine for people with diabetes mellitus, cancer and heart disease. Antioxidants protect body cells from damage caused by free radicals. Over time, free radical damage can lead to disease. Flavonoids are the main type of antioxidant contained in acacia honey. A diet high in flavonoids may reduce the risk of the chronic condition diabetes mellitus, including heart disease and cancer.

How to Process Acacia Leaves

Acacia leaves can be used as medicine for people with diabetes mellitus, cancer and coronary heart disease. *Acacia* leaves can be processed by boiling acacia leaves, drying acacia leaves and making extracts from acacia leaves.

Acacia leaves can be used as a drink that can function as a medicine for people with diabetes mellitus, cancer and coronary heart disease. The easiest and most natural way to process acacia leaves that can be done is to boil the acacia leaves, namely the steps (Tedi et al., 2023). Prepare 10 pieces of young and fresh acacia leaves; wash the prepared acacia leaves; boil the acacia leaves with 5 cups of water until it boils and the remaining 3 cups of cooking water; after three cups of acacia cooking water have become, remove the cooking water and let it cool; and after the acacia cooking water is ready to drink 3 times a day, namely in the morning after breakfast, after lunch and at night when going to bed.

Conclusion

Acacia leaves which contain lots of antioxidants is a good medicine for people with diabetes mellitus, cancer and heart disease. Antioxidants protect body cells from damage caused by free radicals. Over time, free radical damage can lead to disease. Flavonoids are the main type of antioxidant contained in acacia honey. A diet high in flavonoids may reduce the risk of the chronic condition diabetes mellitus, including heart disease and cancer. *Acacia* leaves can be used as medicine for people with diabetes mellitus, cancer and coronary heart

disease where there are antimicrobial substances that function against *Streptococcus faecalis*. Acacia is widely used to treat diabetes mellitus, cancer, and coronary heart disease. Someone who has diabetes mellitus, cancer or coronary heart disease is very good at consuming fruits and vegetables, especially those that contain lots of antioxidants. In fruits and vegetables, there are various types of antioxidants which have good properties to help lower blood sugar levels for people with diabetes mellitus, cancer and protect the heart. One of the ways to process acacia leaves to become medicine is by boiling the acacia leaves, drying the acacia leaves and also extracting the acacia leaves.

Author Contribution

The author of this article consists of a person. This article was well resolved from the research process to completion.

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Conflicts of Interest

The author declares no conflict of interest.

References

- Ahmed, A. A. (2018). Health benefits of gum arabic and medical use. In *Gum Arabic*, 183–210. <https://doi.org/10.1016/B978-0-12-812002-6.00016-6>
- Caiati, C., Stanca, A., & Lepera, M. E. (2023). Free Radicals and Obesity-Related Chronic Inflammation Contrasted by Antioxidants: A New Perspective in Coronary Artery Disease. *Metabolites*, 13(6), 712. <https://doi.org/10.3390/metabo13060712>
- Correia, R., Duarte, M. P., Maurício, E. M., Brinco, J., Quintela, J. C., da Silva, M. G., & Gonçalves, M. (2022). Chemical and Functional Characterization of Extracts from Leaves and Twigs of *Acacia dealbata*. *Processes*, 10(11), 2429. <https://doi.org/10.3390/pr10112429>
- Elamin Elhasan, L. M., Elhкотam, B., Abdelgadir, T. S., Allah Ibraheim, S. G., & Eldin Othman, O. M. I. (2022). The Effect of Ethanolic Extract of *Acacia Seyal* Bark on Induced Diabetic rats. *BioRxiv*, 2001–2022. <https://doi.org/10.1101/2022.01.21.476925>
- Engwa, G. A., Nweke, F. N., & Nkeh-Chungag, B. N. (2022). Free radicals, oxidative stress-related diseases and antioxidant supplementation. *Alternative Therapies in Health & Medicine*, 28(1). Retrieved from <https://pubmed.ncbi.nlm.nih.gov/32827401/>
- Fang, Y.-Z., Yang, S., & Wu, G. (2002). Free radicals, antioxidants, and nutrition. *Nutrition*, 18(10), 872–879. [https://doi.org/10.1016/S0899-9007\(02\)00916-4](https://doi.org/10.1016/S0899-9007(02)00916-4)
- Jaafar, N. S. (2019). Clinical effects of Arabic gum (*Acacia*): A mini review. *Iraqi Journal of Pharmaceutical Sciences*, 28(2), 9–16. Retrieved from <https://www.iasj.net/iasj/download/b784ca8410329122>
- Kisoi, G., Kinyua, J., & Wamunyokoli, F. (2016). Comparative analysis of phytoconstituents and caffeine levels of *acacia nilotica* (subalata) and *coffea arabica* varieties. *IOSR Journal of Pharmacy and Biological Sciences*, 11(2), 23–27. <https://doi.org/10.9790/3008-11212327>
- Kodikara, K. A. S., Ransara, G. B. M., Madarasinghe, S. K., Dissanayake, N. P., Abeysinghe, N. K., Prasangika, K. D., Dahdouh-Guebas, F., & Jayatissa, L. P. (2023). A Growing Threat to Tidal Forests: Incursion of Mangrove Ecosystems by Invasive Alien Species *Acacia auriculiformis* A. Cunn. ex Benth. (Fabaceae). *Russian Journal of Biological Invasions*, 14(1), 97–110. <https://doi.org/10.1134/S207511172301006X>
- Maroof, K., Jin, Y. Y., Ching, Liang, S., & Hua Gan, S. (2023). Medicinal Benefits of Propolis. *Honey: Composition and Health Benefits*, 278–301. <https://doi.org/10.1002/9781119113324.ch21>
- Niyodusenga, A., Bukachi, F. O., & Kiama, T. N. (2019). Cholesterol lowering effects of *acacia nilotica* subalata in normal and type 2 diabetic male rats. *Rwanda Medical Journal*, 76(2), 1–5. Retrieved from <http://www.bioline.org.br/abstract?rw19009>
- Oktavia, I. N., & Sutoyo, S. (2021). Article Review: Synthesis of Silver Nanoparticles Using Bioreductor From Plant Extract As an Antioxidant. *UNESA J. Chem*, 10(1). Retrieved from <https://ejournal.unesa.ac.id/index.php/unesa-journal-of-chemistry/article/download/40299/34960/>
- Pome, G., Kusumawaty, I., Septiana, L. R., & others. (2021). Overview of the Implementation of Health Care Education in Diabetes Mellitus Patients with Diet Nonconformity. *First International Conference on Health, Social Sciences and Technology (ICOHSST 2020)*, 68–72. <https://doi.org/10.2991/assehr.k.210415.016>
- Santos, C. M. M., & Silva, A. M. S. (2020). The antioxidant activity of prenylflavonoids. *Molecules*, 25(3), 696. <https://doi.org/10.3390/molecules25030696>
- Shahzad, A., Hussain, S., Anwar, N., Karim, A., Aeman, U., & Iqbal, M. J. (2021). An overview of free Radicals & antioxidants and its Deletenous actions. *FRONTIERS IN CHEMICAL SCIENCES*, 2(2), 147–164. <https://doi.org/10.52700/fcs.v2i2.32>
- Sharma, D., Verma, S., Kumar, S., Singh, J., Kumar, R., Jangra, A., & Kumar, D. (2022). Hydroethanolic leaf

- extract of *Acacia auriculiformis* exhibited antidiabetic and antioxidant activities. *Egyptian Journal of Basic and Applied Sciences*, 9(1), 372–382. <https://doi.org/10.1080/2314808X.2022.2100674>
- Singh, R. (2016). Phytochemical analysis and antibacterial activity of *Acacia nilotica* (L.) leaves against pathogenic bacteria. *International Journal of Green Pharmacy (IJGP)*, 10(2). <https://doi.org/10.22377/ijgp.v10i2.649>
- Sugiyono. (2019). *Metode Penelitian Dan Pengembangan, (Research and Development R&D)*. Alfabeta.
- Sundaram Sanjay, S., & Shukla, A. K. (2021). Free radicals versus antioxidants. In *Potential Therapeutic Applications of Nano-antioxidants*, 1–17. https://doi.org/10.1007/978-981-16-1143-8_1
- Tedi, T. (2023). Study Literature: *Acacia* Plants Lower Blood Sugar. *International Journal Scientific and Professional (IJ-ChiProf)*, 2(1), 166–171. <https://doi.org/10.56988/chiprof.v2i1.32>
- Tedi, T., Yunike, Y., Kusumawaty, I., & Suzalin, F. (2023). Air Rebusan Daun Akasia Menurunkan Kadar Glukosa Darah Penderita Diabetes Melitus. *Journal of Telenursing (JOTING)*, 5(1), 590–600. <https://doi.org/10.31539/joting.v5i1.5828>
- Tungmunnithum, D., Drouet, S., Lorenzo, J. M., & Hano, C. (2021a). Characterization of bioactive phenolics and antioxidant capacity of edible bean extracts of 50 Fabaceae populations grown in Thailand. *Foods*, 10(12), 3118. <https://doi.org/10.3390/foods10123118>
- Tungmunnithum, D., Drouet, S., Lorenzo, J. M., & Hano, C. (2021b). Effect of traditional cooking and in vitro gastrointestinal digestion of the ten most consumed beans from the fabaceae family in Thailand on their phytochemicals, antioxidant and anti-diabetic potentials. *Plants*, 11(1), 67. <https://doi.org/10.3390/plants11010067>
- Van Doan, H., Soltani, M., Leitão, A., Shafiei, S., Asadi, S., Lymbery, A. J., & Ringø, E. (2022). Streptococcosis a Re-emerging disease in aquaculture: significance and phytotherapy. *Animals*, 12(18), 2443. <https://doi.org/10.3390/ani12182443>
- Yusoff, A., Tennakoon, K. U., Jaafar, S. M., Zaman, D. N. A. N. P., & Sukri, R. S. (2019). Effects of *Acacia* invasion on leaf litter nutrient and soil properties of coastal Kerangas forests in Brunei Darussalam. *Scientia Bruneiana*, 18(1), 1–10. Retrieved from <http://scibru.fos.ubd.edu.bn/index.php/scibru/article/view/87>