

Literature Study: Potential of *Garcinia latissima* Miq. for Skin Care — a Mini Review

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ABSTRACT: *Garcinia Latissima*, genus from the Clusiaceae family. Its use as a traditional medicine has long been recognized as a source of phenolic compounds, and previous research has shown that *Garcinia Latissima* has biological activities as a phenolic, antioxidant, antibacterial, and antidiabetic agent. This literature study aims to gather adequate information regarding the potential of the *Garcinia Latissima* Miq—plant, which can play a role in skincare. The method used involves collecting international and national journals with the help of search engines such as Google Scholar, Elsevier, Springer, and online journal providers like Science Direct and ResearchGate. The research terms focus on content relevant to the topics to be studied: "*Garcinia Latissima* Miq." "Antioxidant Activity of *Garcinia*" "Antimicrobial *Garcinia*", "*Garcinia Latissima* Miq for Skin". The results obtained from the literature review indicate that *Garcinia Latissima* plays a role as an antioxidant, which can neutralize free radicals either by accepting or donating electrons. Through this process, it can prevent premature aging of the skin. *Garcinia Latissima* Miq also plays a role as an antibacterial agent that is correlated with skin care because it has the activity to inhibit or destroy bacteria. Generally, the bacteria found on the skin's surface, such as those causing acne. *Garcinia Latissima* Miq also has antielastase activity, which plays a role in anti-aging for the skin. This is due to its mechanism of clearing free radicals and inhibiting elastase. Elastase is a cause of wrinkles and skin aging. The activity is supported by the results of research from the literature review.

KEYWORDS: *Antielastase; Antioxidants; Flavonoid; Garcinia Latissima; Skincare.*

1. INTRODUCTION

Indonesia is home to 11% of the world's blooming plants, has the second-densest forest cover after the Amazon [1]. One of them is the genus *Garcinia* (family: *Clusiaceae*), consisting of about 250 species, spread across the pan-tropical region with high species richness in Southeast Asia and Africa [2]. *Garcinia* is one of 27 genera (family *Clusiaceae*) found in Indonesia, out of a total of roughly 100 general [3]. *Garcinia Latissima* Miq. is a species originating from the tropical rain forests of Southeast Asia, which are mostly found in Maluku and Papua has many potential uses [4] [5]. This plant is known for its fruit, which has a thick skin that is used as a spice in traditional cooking [2] [6]. Fresh fruit from *G. Latissima* exhibited vitamin C levels comparable to those of generally available fruits, so it can be processed into jam [7]. Low concentration HMG-CoA reductase inhibitory *Garcinia Latissima* Miq mesocarp aqueous extract has anti-cholesterol properties and can be consumed as herbal tea [8]. *Garcinia Latissima* Miq. is also used in traditional medicine [2][9]. Its use as a traditional medicine is because *Garcinia Latissima* Miq. has long been recognized as a source of phenolic compounds, and earlier research has shown that the separated chemicals have biological activity as phenolic, antioxidants, antibacterials, and antidiabetics [3][10][11][12][13].

The many biological activities of *Garcinia Latissima* Miq. that are useful for humans The anti-elastase activity of *Garcinia Latissima* Miq. methanol and ethyl acetate extracts has been studied by N. S. S. Ambarwati, B. Elya, and Y. Desmiaty in 2019 and by Neneng Siti Silfi Ambarwati, Azminah, and Islamudin Ahmad in 2022 in Molecular Docking, Physicochemical and Druglikeness Properties of Isolated Compounds from *Garcinia Latissima* Miq. on Elastase Enzyme: In Silico Analysis. Elastase is a proteinase enzyme that can cleave peptide

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bonds, potentially degrading elastin. Thus, skin elasticity can be preserved by blocking elastase activity in the dermis layer. It has been demonstrated that *Garcinia latissima* Miq. methanol and ethyl acetate extracts are potent elastase enzyme inhibitors. The extract of *Garcinia Latissima* Miq. keeps skin soft [14]. Limited information and research related *Garcinia Latissima* Miq. For skincare, it provides wider exploration opportunities for this plant.

The Purpose of research literature on the potential of *Garcinia Latissima* Miq. for skin care. Provides a literature review on the *Garcinia Latissima* Miq. plant and its potential as a skincare ingredient. Analyzing the results of literature research on the effectiveness and safety of using *Garcinia Latissima* Miq. in skin care.

2. MATERIALS AND METHODS

This scientific work is a literature review that discusses the biological activity of *Garcinia Latissima* Miq. which is carried out by searching and collecting international and national journals using the help of search engines, namely Google Scholar, Elsevier, Springer, and online journal provider sites such as Science direct and Researchgate. The search terms used to find research journals focused on content relevant to the subject of the title to be reviewed are " *Garcinia Latissima* Miq. ", "antioxidant activity of *Garcinia*", "antimicrobial of *Garcinia*", " *Garcinia Latissima* Miq. for skin" and the results found 417 related literature. Literature selection is carried out to ensure the updating of a literature review. Selection using inclusion and exclusion criteria is therefore necessary. Research journals published between 2014 and 2024 meet the inclusion criteria for the literature review. While the exclusion criteria from the literature review were research journals published in <2014 regarding the biological activity of the genus *Garcinia Latissima* Miq. Filtered literature using the year, and found 67 related literature.

A literature review study was carried out on 67 kinds of literature, the results were 30 literature that had high relevance to the research topic from 2017-2024. All reference libraries were worked on using the Mendeley application which is useful for integrating citations and organizing references.

3. RESULTS

One of the species in the *Clusiaceae* family, *Garcinia Latissima* Miq. the Maluku people also call it *Dolo magota*. [11]. *Garcinia Latissima* Miq. height can rarely reach 25-35 m with a cylindrical stem between 50-80 cm in diameter. The bark is brown or black, rough, and the bark is 7-14 mm thick. The petiole 25 mm long, attached to the base of the leaf lamina, and the largest leaf plate is 10 to 11 cm broad and 17 to 21 cm long. *Garcinia Latissima* Miq. Has several biological activities, such as antioxidant, antibacterial, and antielastase. On human skin, the potential for damage. Oxygen species. ROS can affect the epidermis and dermis by damaging the skin through the destruction of the lipid components in sebum and ceramides of the intercellular cement in the stratum corneum or by oxidizing polyunsaturated fatty acids in the phospholipids of the cell membrane. ROS can also cause skin lesions that disrupt the skin's defense mechanisms. One of the problems affected by ROS in the complexion is skin aging. Thus, antioxidants are needed as an antidote to ROS-induced changes [15]. Antioxidants are molecules capable of neutralizing free radicals by either accepting or donating electrons, thereby eliminating the unpaired radical condition [16].

The role of *Garcinia Latissima* Miq. also as an antibacterial. *Staphylococcus aureus* is a gram-positive bacterium that can cause skin infections [3]. Skin infections can be like acne, or boils can cause swollen, red, and hot skin areas. These bacteria can appear when the skin surface is injured due to friction or other bacterial infections. [17]. The ability of *Garcinia Latissima* Miq. to have antibacterial activity is also mentioned in the discussion section. Its ability to inhibit or destroy bacteria can be used as a skincare product.

The biological activity of anti elastase also has a role for the skin, namely as an antiaging [18]. Anti-elastase testing showed that PHF1 has a high ability to scavenge free radicals and inhibit elastase. PHF1 also showed good nitric oxide scavenging activity, thereby reducing nitrate and nitrite products. Elastase can cause wrinkles and aging of the skin, by degrading elastin, so inhibition of elastase is necessary to prevent skin aging. Compounds such as tannins and flavonoids support anti elastase activity [19]. Human skin color is determined by the epidermis, the outermost layer of the skin, which contains melanocyte cells that produce the pigment melanin. Upon exposure to UV radiation, melanogenesis is triggered through the activation of the enzyme tyrosinase. To reduce skin pigmentation levels, tyrosinase inhibitors can be used [20].

Table 1. Biology Activity of *Garcinia Latissima* Miq.

Biology Activity	Reference	Benefits	Plant Parts
Antioxidants	[3] [12] [21] [22] [23]	Antioxidants protect cells and tissues from free radical damage, which can cause accelerated aging and a variety of diseases.	Stem bark, leaves
Antimicrobials	[11] [24] [25]	Active ingredients that kill or block the growth of microbes such as bacteria, fungi and viruses.	Fruit, stem bark, leaves
Antibacterials	[12] [21] [23] [26] [27] [28] [29] [30] [31] [32] [33]	Antibacterials can help prevent and treat bacterial infections	Leaves, stem bark, fruit rind, fruit
Antielastase	[14] [34]	Antielastase inhibits or reduces the activity of the elastase enzyme. Elastase is an enzyme that degrades the protein elastin, which helps to preserve skin elasticity and suppleness.	Fruit, leaves, and stem bark
Flavonoid	[7][8][35]	Flavonoids have a crucial role in melanogenesis by blocking tyrosinase. As a result, it might become an agent of depigmentation through copper bonding and antioxidant processes.	Stem bark, leaves, and fruit

4. DISCUSSION

Research on *Garcinia Latissima* has been widely conducted. The results showed that *G. Latissima* has several potentials such as antioxidant activity, anti-microbial, anti-elastase, and anti-tyrosinase. The research was conducted on various parts of the plant such as leaves, stem bark, and fruit. In Ambarwati et al (2019) research, entitled Pharmacognostic and Antimicrobial Studies of *Garcinia Latissima* Miq. Leaves (Clusiaceae) [33]. The study extracted the leaves using maceration with hexane, ethyl acetate and methanol solvents. The results of the study provide data, that 2% ethyl acetate extract and 2% methanol extract have an inhibition zone of 7.68 ± 0.076 (ethyl acetate extract) which means moderate antimicrobial strength, and 9.9 ± 0.786 mm (methanol extract) which means moderate antimicrobial strength. The strength of the standard antibiotic used is still higher, erythromycin with an inhibition zone of 21.08 ± 1.928 mm, which is very strong.

The next research, namely Raunsai et al in 2021, regarding Bioactivities of Plant Extracts Collected In Halmahera Island, Indonesia: A Bioprospection Study of Underexplored Plant Species [21]. Testing on leaves produces an IC_{50} DPPH value of 372,701 $\mu\text{g/ml}$ and the AAI DPPH value is 0.26. The interpretation of the results obtained in the study is that the IC_{50} DPPH and AAI values on the leaves are weak. So, it can be concluded that microbial activity and antioxidant activity in leaves, are moderate and weak. However, in the research of Raunsai et al in 2021, the IC_{50} DPPH test results on stem bark obtained a value of 12,483 $\mu\text{g/ml}$. This means that the antioxidant activity in the stem bark is stronger than in the leaves.

Looking at Thoyyibah and ersam's research in 2020, his research entitled Monitoring of Antioxidant and Antidiabetic Activity of Fractions from Ethyl Acetate Extract in *Garcinia Latissima* Miq. Stem Bark. Extraction of *G.Latissima* [3] was carried out by maceration method, and the solvent used was ethyl acetate. Then fractionation was carried out, with the mobile phase 100% N-hexane (Fraction A), n-hexane: dichloromethane (9:1; 8:2; 7:3; 1:1; 1:9, v/v) (Fraction B-E), n-hexane: ethyl acetate (1:0 to 0:1, v/v) (Fraction F-H), 100% methanol (Fraction I). Antioxidant activity using the DPPH method, namely the percent of inhibition and IC_{50} values sequentially in ethyl acetate extracts, namely 90.06% and 17.38 $\mu\text{g/ml}$. Antioxidant activity possessed in stem bark in ethyl acetate extract is very strong. Then, the best fraction results were in fraction G with percent inhibition and IC_{50} values of 94.36% and 24.55 $\mu\text{g/ml}$, respectively. The best antioxidant activity is in fraction G, using mobile phase N- hexana: ethyl acetate (1:0 to 0:1, v/v). The results showed that the activity of the fraction increases with the increasing polarity.

Based on Ambarwati's research, et al 2019, entitled Antibacterial and Antioxidant Activities of Fractions from *Garcinia Latissima* miq. Stem Bark Methanol Extract [23]. The fractionation was performed by using column chromatography. The mobile phase used was a 1:1 mixture of N- hexana: ethyl acetate. The best

fraction in fraction G showed 93.39% antioxidant inhibition using the DPPH method and an antioxidant value of 1,189.65 $\mu\text{mol/g}$ determined by the FRAP method with a FeEAc value. Additionally, antimicrobial activity testing revealed that the fraction G produced the largest inhibition zones, 7.83 ± 0.46 mm against *B. Subtilis* and 7.43 ± 0.15 mm against *S. Aureus*, both indicating moderate strength. The minimum inhibitory concentration (MIC) values were 2500 ppm for *B/subtilis* (fractions C, D, G, and H) and 1250 ppm for *S. Aureus* (fraction G).

It can be concluded that, in Thooyibah's research, the percent inhibition on antioxidant activity of the fraction in ethyl acetate extract with mobile phase N-hexana: ethyl acetate (1:0 to 0:1, v/v) is 94.36% and in ambarwati's research with the fraction in methanol extract with mobile phase N-hexana: ethyl acetate (1:1), which is 93.39%. The higher the %inhibition value indicates the higher the antioxidant activity. Thus, good DPPH antioxidant activity is possessed by ethyl acetate extract. Furthermore, there is research by Purbowati and ersam, 2019 entitled Exploration of Phenolic Compound from The Stem Bark of *Garcinia Latissima* Miq. [10] Extraction was carried out using the maceration method with ethanol solvent. Fractionation was carried out using the mobile phase n-hexane, CH_2Cl_2 , EtOAc, MeOH. Obtained 6 fractions (a-f) which were then carried out column chromatography again to obtain subfractions (d1-d7) to obtain d6a-d6b. d6a was fractionated to CC to yield subfractions G1-G5. G4 was separated to obtain G41-G47. The compound was known as kaempferol. Compound 7 which was known as kampferol. Compound 8 was known as 1, 3 1,3,6,7-Tetrahydroxy2-(3-methyl-but-2-enyl)-xanthen-9-one. Compound 9 was known as 1,3,7- Trihydroxyxanthone.

Isolation results on the stem bark of *G. Latissima* Miq. revealed that it contains kaempferol, 1,3,6,7-Tetrahydroxy-2-(3-methyl-but-2-enyl)-xanthen-9-one, and 1,3,7-Trihydroxyxanthone. As for kaempferol, it can control the activity of superoxide dismutase (SOD) and reactive oxygen species (ROS), which plays a role in maintaining the balance between antioxidant and oxidation systems in ARPE-19 cells exposed to H_2O_2 . In addition, kaempferol also can inhibit microbial growth and prevent bacterial biofilm formation [36]. The isolate results support previous research. The antioxidant activity is very strong in the stem bark of *G.Latissima* Miq, because it has kaempferol content.

Furthermore, activity testing was carried out on the fruit of *G. Latissima* Miq. In the research of Ambarwati et al, 2017. Regarding Antibacterial Activity of Fractions of Ethyl Acetate Extract of *Garcinia Lattissima* Miq. Fruits [28]. Fractionation was carried out on ethyl acetate extract using n-hexane, ethyl acetate, and methanol mobile phases. The disc diffusion test results indicated that the ethyl acetate extract fractions of *G.Latissima* Miq. Fruits exhibited strong growth inhibition against *B. Subtilis*, with inhibition zone diameters of 12.283 ± 2.2420 mm and 11.108 ± 0.3800 mm for fractions E and D, respectively. Fraction K also demonstrated strong activity against *P. aeruginosa*, with an inhibition zone diameter of 16.100 ± 7.6254 mm. MIC test results revealed that the ethyl acetate extract fractions of *G. latissima* Miq. showed moderate activity against *B. subtilis*, with the lowest MIC value of 312.5 ppm for Fractions H and J.

Besides being conducted on ethyl acetate extracts, research by Ambarwati, et al. 2017 also conducted Profile Of Antibacterial Activity Of Fractions From Methanol Extracts Of *Garcinia Latissima* Miq. Fruit Rind [27]. The mobile phase in fractionation uses N-hexane, ethyl acetate, and methanol. The fraction D of methanol extract from the fruit rind of *G. Latissima* Miq had moderate activity against *B. subtilis*, *S. aureus*, and *P. aeruginosa*, with MIC values of 312.5 ppm. The diameter of the bacterial inhibition zone obtained in fraction D is *B.subtilis* (8.243 ± 0.645), *P.Aeregiosa* (6.933 ± 0.058), and *S. Aureus* (6.800 ± 0.200).

In conclusion, the ethyl acetate extract fraction produced a larger inhibition zone compared to the methanol extract fraction. The size of the inhibition zone reflects the sensitivity of the tested bacteria, indicating that a larger inhibition zone corresponds to stronger antibacterial activity. Isolation has been carried out on *G.Latissima* Miq fruit extract. In Ambarwati's research, 2019, in a journal entitled Isolation and Antibacterial Activity by in vitro and in silico Approach of 6-Deoxyjacareubin Compound from *Garcinia Latissima* Miq. Fruit [26]. The isolation yielded the compound deoxyjacareubin from the ethyl acetate extract of *G.Latissima* Miq.fruit, which demonstrated antibacterial activity against *B.subtilis* with a MIC value of 156.25 ppm. Docking studies revealed that 6-deoxyjacareubin formed similar hydrophobic interactions with several amino acid residues as native ligands. These isolation results confirm the antibacterial activity reported in previous studies, which highlighted the antibacterial properties of *G.Latissima*.

In addition, *G.Latissima* was tested on tyrosinase and elastase inhibitory activity. In Ambarwati's research, Tyrosinase Inhibitory Activity of *Garcinia Latissima* Miq. Extracts [14][35]. Tyrosinase inhibitory activity testing was carried out on ethyl acetate extract of bark samples, which obtained results of 15.61%, then on

methanol extract of bark obtained 28.94%, on n-hexane extract of fruit obtained 25.16%, on methanol extract of fruit obtained 23.26%, on methanol extract of leaf 30.59%. Tyrosinase Inhibitory Activity of *Garcinia Latissima* Miq. Extracts. Tyrosinase is an enzyme that catalyzes the rate-controlling step in melanin synthesis. Thus, the downregulation of tyrosinase is one of the main approaches in the development of melanogenesis inhibitors [37]. The mechanism of this skin-lightening agent is to reduce the main source of skin color, melanin. Melanin, responsible for skin pigmentation, is produced from epidermal melanocytes [37].

In Ambarwati's research, 2019 entitled Anti-elastase activity of methanolic and ethyl acetate extract from *Garcinia Latissima* Miq [38]. Testing was conducted using the maceration method. The percent inhibition results at 100 ppm was as follows 23.98% for the methanol extract of leaves, 33.06% for the methanol extract of fruits, 66.42% for the methanol extract of stem bark, and 64.34% for the ethyl acetate extract of stem bark. The *G.Latissima* Miq. Stem bark methanol extract showed the highest inhibitory effect with $66.42 \pm 5.23\%$ inhibition on elastase activity. The elastase inhibition test is applied as skin protection against aging, which is prone to elastic fiber damage due to the secretion and activation of elastase by UV light and reactive oxygen species [39].

Based on the findings of this research, it can be concluded that *G.Latissima* has properties such as anti-elastase, anti-tyrosinase, antibacterial, and antioxidant. The isolate results on the bark of *G.Latissima* are kaempferol, 1,3,6,7-Tetrahydroxy-2-(3-methyl-but-2-enyl)-xanthen-9-one, and 1,3,7-Trihydroxyxanthone. The fruit of *G.Latissima* Miq. contains 6-Deoxyjacareubin. Based on these properties, it has a role for the skin. The flavonoid and phenolic content contained in *G.Latissima* is also one of the supporting components. In the research of Monalissa, et al. 2018 [8]. Extraction was carried out using the infusion method at intervals of 5 minutes, 10 minutes, and 15 minutes. The results obtained on flavonoid content are 17.61 mgQE / g extract; 31.24 mgQE / g extract; 29.85 mgQE / g extract, and phenolic content owned is 12.04 mgGAE / g extract; 4.64 mgGAE / g extract; 21.61 mgGAE / g extract. Flavonoid and phenolic compounds are promising natural antioxidants, owing to their functional group arrangements, configurations, substitution and the number of hydroxyl groups [40]. *G.Latissima* Miq. also has a very strong antioxidant content. The skin needs antioxidants, because skin cells always produce, them through cellular respiration, and other metabolic processes. So, it can damage the balance of cellular structures such as cell membranes, or mitochondria to trigger or worsen skin diseases. The role of antioxidants is to neutralize reactive oxygen species to prevent oxidative damage to cells and tissues [20].

5. CONCLUSION

Garcinia Latissima has properties such as antioxidant, antibacterial, anti-elastase, and anti-tyrosinase. As for each use has benefits to the skin. The very strong antioxidant activity of *Garcinia Latissima* has been proven through several studies. Good antioxidant activity can prevent oxidative reactions. Has a good anti-elastase effect on methanol stem bark extract. Anti-elastase can delay the aging process of the skin. good anti-tyrosinase in methanol extract of *Garcinia Latissima* leaves. anti-tyrosinase has a role in skin lightening.

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