Science and Clinical Pharmacy Research Journal Vol: 2, No 4, 2026, Page: 1-12

Literature Review: Karamunting (Rhodomyrtus Tomentosa Hask.) As A Cosmetic Agent

Risqika Yuliatantri Paramawidhita

Universitas Muhammadiyah Palangkaraya

DOI:
https://doi.org/10.47134/scpr.v2i4.5135
*Correspondence: Risqika Yuliatantri Paramawidhita
Email:
risqikayuliatantriparamawidhit@gmail.com

Received: 22-11-2025
Accepted: 22-12-2025
Published: 22-01-2026

Abstract: This study aims to explore the potential of Rhodomyrtus tomentosa (Hask.), commonly known as karamunting, as a natural cosmetic agent through a qualitative-descriptive literature review. The research focuses on identifying the plant's bioactive compounds, understanding their pharmacological activities, and evaluating their cosmetic relevance. Data were collected through an extensive review of peer-reviewed journals, scientific reports, and academic documents published between 2012 and 2025. The analysis involved thematic categorization and inductive interpretation of findings to derive meaningful insights into the plant's functional roles in cosmetics. Results indicate that R. tomentosa contains diverse bioactive constituents—such as rhodomyrtone, flavonoids, phenolics, and triterpenoids—that exhibit strong antioxidant, antibacterial, anti-inflammatory, and skin-brightening properties. Advanced extraction methods, such as ultrasound-assisted extraction using eco-friendly solvents, have enhanced the yield and stability of active compounds, supporting sustainable cosmetic development. Clinical studies confirm its efficacy in acne treatment, comparable to conventional antibiotics, without adverse side effects. The findings reinforce theoretical models in phytocosmetics that emphasize the significance of natural plant-derived compounds in promoting skin health and sustainability. Overall, this study contributes to the advancement of natural cosmetology by integrating ethnobotanical knowledge with modern scientific validation and offers practical implications for future research and cosmetic formulation innovation.

Keywords: Rhodomyrtus Tomentosa, Natural Cosmetics, Antioxidant, Antibacterial, Phytocosmetics.

Introduction

The growing consumer demand for natural and sustainable cosmetic ingredients has driven significant interest in the exploration of plant-based bioactive compounds with multifunctional properties. Among the various botanical species investigated, Rhodomyrtus tomentosa (Hask.), commonly known as karamunting, has emerged as a promising candidate for cosmetic applications due to its rich phytochemical composition and potent biological activities (Zhao et al, 2020). In recent years, the cosmetic industry has been undergoing a paradigm shift toward the use of safer, eco-friendly, and biologically active natural ingredients that not only enhance aesthetic appeal but also promote skin

health. This transition is motivated by increasing awareness of the adverse effects of synthetic chemicals and the growing preference for natural formulations among consumers worldwide (Jesumani et al, 2019).

Karamunting possesses more than 100 bioactive constituents, predominantly triterpenoids, flavonoids, phenolic compounds, and meroterpenoids, which contribute to its diverse pharmacological properties (Zhao et al, 2020). Among these compounds, rhodomyrtone and piceatannol have been identified as key molecules with strong antioxidant, anti-inflammatory, and antibacterial activities. These biological properties are particularly relevant for cosmetic applications focused on anti-aging, skin protection, and acne prevention (Ghosh et al, 2021). The integration of such compounds into cosmetic formulations represents an innovative approach to combining therapeutic and aesthetic benefits.

Historically, R. tomentosa has been used in traditional medicine across Southeast Asia for treating various ailments, including skin infections, inflammation, and wounds. The leaves were traditionally applied as topical treatments to improve skin conditions, while the wood tar was used for enhancing the appearance of eyebrows (Zhao et al., 2020). This ethnobotanical evidence underscores the longstanding recognition of karamunting's dermatological benefits and provides a valuable foundation for its modern cosmetic applications.

From a pharmacological standpoint, studies have demonstrated that R. tomentosa extracts can inhibit bacterial adhesion and invasion in skin tissues, as well as suppress biofilm formation by Propionibacterium acnes, a major causative agent of acne (Zhao et al., 2020). Such antibacterial potential positions karamunting as a natural alternative to synthetic antimicrobials commonly used in acne-treatment products, which often cause irritation or bacterial resistance (Bui, 2023). Furthermore, its anti-inflammatory properties can help alleviate skin redness and swelling, contributing to improved skin tone and texture.

In addition to its antimicrobial and anti-inflammatory potential, karamunting exhibits strong antioxidant capacity, which plays a crucial role in neutralizing free radicals that contribute to premature skin aging. Free radicals can damage collagen and elastin fibers, leading to loss of skin elasticity and the appearance of wrinkles (Zhao et al, 2020). By scavenging these reactive species, the phenolic and flavonoid constituents of R. tomentosa help preserve skin integrity and prevent oxidative stress-induced damage.

The global cosmetic industry has recognized the potential of natural antioxidants as protective agents against photoaging and environmental stressors. For instance, the bioactive compounds in seaweeds and chitosan-based materials have been widely studied and applied in cosmetic formulations for their skin-protective functions (Jesumani et al, 2019) (Kulka & Sionkowska, 2023). However, despite the proven bioactivity of R. tomentosa, its application in cosmetic formulations remains limited compared to these other natural sources. This disparity indicates a significant research gap that warrants deeper investigation into the optimization and standardization of karamunting-based cosmetic ingredients.

One of the major challenges in advancing karamunting research lies in the limited number of applied studies focusing on formulation stability, bioavailability, and safety

assessment. While the pharmacological effects of its extracts have been well documented, translational studies evaluating its performance in topical cosmetic systems are still scarce (Zhao et al, 2020). This knowledge gap hinders the commercial utilization of karamunting in skincare and personal care products, despite its evident therapeutic promise.

Furthermore, industrial application requires consistent extraction protocols and standardized active compounds to ensure reproducibility and efficacy. The variability in phytochemical composition due to geographical, seasonal, or extraction method differences can significantly impact the biological performance of the extract (Zhao et al, 2020). Addressing these standardization issues is essential for promoting karamunting as a reliable and effective natural cosmetic agent.

In recent years, interdisciplinary research combining pharmacognosy, dermatology, and formulation science has become increasingly vital in developing novel natural cosmetic ingredients. Karamunting represents an ideal model for such integrated research, as it bridges traditional medicinal knowledge with modern biotechnological approaches. Through advanced analytical techniques, such as LC-MS and metabolomics, the characterization of its bioactive profile can provide insights into the mechanisms underlying its skin-beneficial effects (Ghosh et al, 2021).

The growing interest in plant-based antimicrobials and antioxidants also aligns with the broader movement toward sustainable beauty, emphasizing environmental responsibility and ethical sourcing. As consumers increasingly demand transparency and ecological integrity, plant-derived ingredients like R. tomentosa offer both functional efficacy and marketing appeal (Kulka & Sionkowska, 2023). Hence, exploring karamunting's cosmetic potential contributes not only to scientific innovation but also to sustainable development in the cosmetic sector.

Moreover, the potential synergistic interactions between karamunting's various phytochemicals could yield enhanced skin protection compared to single-compound formulations. Such synergy has been observed in other plant-based systems, where combinations of phenolics and terpenoids result in superior antioxidant and antimicrobial performance (Zhao et al, 2020). Investigating these interactions may reveal novel formulation strategies that maximize bioactivity and consumer benefits.

The exploration of karamunting as a cosmetic agent also holds socioeconomic significance, particularly in regions where the plant is native. Promoting its cultivation and industrial use can support local economies, stimulate rural development, and preserve traditional botanical knowledge. These aspects underline the broader impact of karamunting research beyond its biochemical and cosmetic relevance.

In conclusion, Rhodomyrtus tomentosa represents a scientifically and industrially promising natural resource for the development of next-generation cosmetic products. Its diverse phytochemical composition and proven biological activities make it an attractive candidate for applications in anti-aging, anti-acne, and skin-protective formulations. However, despite its immense potential, research and industrial applications remain underdeveloped compared to other natural bioactives. Therefore, the primary objective of this article is to comprehensively review the phytochemical constituents, biological activities, and cosmetic potential of karamunting, while identifying research gaps and

future directions for its development. The findings are expected to contribute theoretically by enriching the understanding of plant-based cosmetic agents and practically by providing a scientific foundation for its integration into modern cosmetic formulations.

Methodology

This article employs a qualitative research design with a descriptive approach through a literature review (library research) method. The qualitative-descriptive design was chosen to provide an in-depth understanding of the potential of Rhodomyrtus tomentosa (Hask.) as a cosmetic agent by synthesizing relevant academic sources. Qualitative research emphasizes the exploration of meanings, patterns, and interpretations of a phenomenon, rather than measurement or quantification (Bingham, 2023; Pratt, 2025). Through this approach, the study systematically collects, reviews, and interprets existing literature to identify patterns, trends, and gaps in research concerning the phytochemical properties, pharmacological activities, and cosmetic applications of R. tomentosa. The descriptive orientation allows for a detailed depiction of findings without manipulation or intervention, ensuring that the conclusions reflect the existing state of knowledge objectively (Baillie, 2019) (Doyle et al, 2019).

The data sources in this study consist of secondary materials obtained from reputable and peer-reviewed academic databases. These include scientific journals, books, official reports, and institutional publications that discuss the phytochemical composition, biological properties, and cosmetic relevance of R. tomentosa. The selection of literature was guided by the inclusion of studies published between 2015 and 2025 to ensure relevance and currency. The primary references were drawn from internationally recognized publishers such as Elsevier, Springer, Sage, and Wiley, covering both pharmacological and methodological perspectives (Jimenez et al, 2024) (Togia & Malliari, 2017). Literature from earlier periods was considered only when foundational theories or methods were discussed, ensuring comprehensive coverage of the topic.

The data collection technique relied on systematic literature searching and document analysis. Relevant publications were identified through keyword combinations such as “Rhodomyrtus tomentosa,” “cosmetic potential,” “antioxidant,” and “bioactive compounds.” The process followed a structured inclusion and exclusion protocol: studies focusing on unrelated species, non-peer-reviewed sources, or non-English materials were excluded to maintain academic rigor (Bandaranayake, 2024) (Granikov et al, 2020). In addition, the study adhered to principles of transparency and traceability in data collection, ensuring that every source used could be verified and referenced appropriately.

The data analysis process followed an inductive qualitative framework consisting of several phases: data identification, data reduction, categorization, and thematic synthesis (Belotto, 2018) (Bingham, 2023). Initially, the selected literature was screened and coded to identify recurring themes such as antioxidant activity, antibacterial potential, and anti-inflammatory properties of R. tomentosa. These codes were subsequently organized into conceptual categories aligned with the study’s objectives. The next phase involved synthesizing the categorized data into coherent themes that described the potential of karamunting as a cosmetic ingredient. This iterative process allowed for a dynamic

interpretation of the findings, refining the understanding of the plant's role within the context of modern cosmetic science (Kalpokaite & Radivojevic, 2018) (Vila-Henninger et al, 2022).

To ensure data validity and reliability, the study employed triangulation and conceptual peer review. Triangulation was conducted by comparing findings from different sources and theoretical perspectives, enhancing the credibility of interpretations (Fife & Gossner, 2024). Peer validation was achieved through cross-referencing with previous systematic reviews and meta-analyses on related botanical compounds, ensuring that interpretations were consistent with current scientific consensus. The application of an audit trail further strengthened the transparency and trustworthiness of the analysis, allowing replication and verification of methodological decisions (Bingham, 2023).

Overall, this qualitative-descriptive library research method effectively captures the complex and multidimensional nature of Rhodomyrtus tomentosa as a cosmetic agent. The systematic synthesis of literature enables the identification of patterns and knowledge gaps, while the inductive analytic process provides a comprehensive understanding of the phenomenon under study. By combining methodological rigor, thematic categorization, and source triangulation, this study ensures the validity, reliability, and academic accountability of its findings (Abraham & P, 2024) (Pratt, 2025). Therefore, the chosen methodology aligns with the article's primary objective—to provide an integrative review that elucidates the cosmetic potential of R. tomentosa and informs future empirical research.

Result and Discussion

The present literature review consolidates recent findings on Rhodomyrtus tomentosa (Hask.), commonly known as karamunting, emphasizing its phytochemical richness and bioactivities that substantiate its potential as a natural cosmetic agent. The analysis encompasses data derived from peer-reviewed studies focusing on its antioxidant, antibacterial, anti-inflammatory, and skin-lightening properties. Overall, the findings indicate that R. tomentosa is a highly promising botanical resource for the development of multifunctional cosmetic products that align with current consumer demand for sustainable, plant-based, and safe skincare ingredients (Oktaviyanti et al., 2025; Zhao et al., 2020).

1. Bioactive Components and Pharmacological Activity

Karamunting contains over 100 bioactive compounds, including flavonoids, triterpenoids, phenols, tannins, and phloroglucinols such as rhodomyrtone, which contribute significantly to its pharmacological properties (Vo & Ngo, 2019; Zhao et al., 2020). Among these, rhodomyrtone has received particular attention for its potent antibacterial and anti-inflammatory effects, making it suitable for treating acne and inflammatory skin conditions (Wunnoo et al., 2021). The antioxidant potential of R. tomentosa is attributed mainly to its flavonoid and phenolic constituents, which effectively neutralize free radicals, thereby preventing oxidative damage to skin cells (Oktaviyanti et al., 2025; Syafiq, 2021). This antioxidant capacity underpins its potential use in anti-aging cosmetic formulations aimed at preserving skin elasticity and radiance.

2. Cosmetic Potential and Mechanistic Insights

Recent studies have explored the diverse cosmetic applications of R. tomentosa. In particular, ultrasound-assisted extraction (UAE) with eco-friendly solvents such as propylene glycol has been shown to optimize the yield of active compounds while maintaining their biological integrity (Oktaviyanti et al., 2025). This technique enhances extraction efficiency and supports the production of sustainable natural ingredients for the cosmetic industry. The resulting extracts exhibit strong antioxidant and skin-lightening properties due to their inhibitory effects on the enzyme tyrosinase, a key catalyst in melanin biosynthesis (Oktaviyanti et al., 2025; Syafiq, 2021). Consequently, karamunting extract presents significant potential as an anti-hyperpigmentation or brightening agent in skincare formulations.

3. Functional Activities: Antioxidant, Anti-Acne, and Anti-Inflammatory Effects

A synthesis of findings from in vitro, in vivo, and clinical studies reveals multiple functional benefits of R

Table 1. Summarizes Its Principal Cosmetic Bioactivities, Corresponding Compounds, And Levels Of Scientific Validation

Activity	Main Bioactive Compounds	Experimental Evidence	References
Antioxidant	Flavonoids, phenols	*In vitro* & *in vivo* assays showing high radical scavenging activity	(Lavanya et al., 2012; Oktaviyanti et al., 2025; Syafiq, 2021)
Skin Brightening	Piceatannol, flavonoids	Tyrosinase inhibition in skin cell models	(Oktaviyanti et al., 2025; Syafiq, 2021)
Anti-Acne	Rhodomyrtone	Human clinical trials demonstrating acne lesion reduction comparable to clindamycin	(Gervason et al., 2020; Wunnoo et al., 2021)
Antibacterial	Rhodomyrtone, tannins	Laboratory and clinical validation of antibacterial activity against skin pathogens	(Ramadhan et al., 2023; Zhao et al., 2020)
Anti-Inflammatory	Flavonoids, rhodomyrtone	*In vitro* & *in vivo* reduction of inflammatory markers	(Vo & Ngo, 2019; Zhao et al., 2020)

These results highlight the multifunctionality of R. tomentosa extract as a holistic skincare agent with overlapping protective, reparative, and aesthetic functions.

4. Comparison with Previous Studies

Comparative analysis with earlier research indicates that recent studies have significantly advanced the understanding of karamunting's chemical profile and bioactivity. While earlier investigations primarily established its antioxidant capacity (Lavanya et al, 2012), newer studies such as those by (Oktaviyanti et al, 2025) and (Wunnoo et al, 2021) have introduced novel extraction techniques and clinical trials that validate its real-world cosmetic efficacy. Additionally, modern studies emphasize the synergistic effects among its

compounds—such as between rhodomyrtone and flavonoids—which result in enhanced skin protection and microbial balance (Gervason et al, 2020) (Ramadhan et al, 2023).

5. Clinical and Industrial Relevance

Clinical evidence strongly supports the cosmetic efficacy and safety of R. tomentosa extracts. Rhodomyrtone-based formulations have demonstrated equivalent acne-reducing effects to clindamycin without causing irritation or dryness, a common drawback of synthetic antibiotics (Wunnoo et al, 2021). Furthermore, its extract helps maintain a balanced skin microbiota, particularly by modulating Cutibacterium acnes phylotypes in acne-prone individuals (Gervason et al., 2020). Such findings underscore its dual potential as both a therapeutic and preventive skincare component. The demonstrated anti-inflammatory and antioxidant effects further enhance its application in formulations targeting sensitive or mature skin.

6. Summary of Key Findings

Overall, the reviewed literature reveals that Rhodomyrtus tomentosa is a multifunctional botanical agent with applications in anti-aging, brightening, and anti-acne cosmetics. The development of green extraction technologies has improved its efficiency and eco-sustainability, while clinical studies validate its dermatological benefits. The combination of strong scientific evidence, environmental compatibility, and cultural heritage makes karamunting a highly valuable candidate for integration into modern cosmetic formulations. These findings collectively support the hypothesis that R. tomentosa holds significant potential for commercialization within the natural cosmetic industry.

Discussion

The recent literature review on Rhodomyrtus tomentosa (Hask.) presents a compelling synthesis of evidence that underscores its strong potential as a multifunctional cosmetic agent. This plant, widely known as karamunting, is increasingly recognized for its rich phytochemical profile, which includes flavonoids, triterpenoids, phenolics, tannins, and the unique phloroglucinol compound rhodomyrtone. These bioactive constituents form the biochemical foundation for its antioxidant, antibacterial, anti-inflammatory, and skin-brightening activities (Vo & Ngo, 2019) (Zhao et al, 2020). Such characteristics position R. tomentosa as an ideal candidate for natural-based cosmetic formulations that align with current industry trends emphasizing sustainability, safety, and multifunctionality.

From a theoretical perspective, the findings are consistent with the principles of phytocosmetic science, which suggest that plant-derived antioxidants are crucial in combating oxidative stress, one of the primary causes of premature skin aging. The high flavonoid and phenolic content in R. tomentosa provides significant free radical scavenging activity that helps protect skin cells from damage caused by reactive oxygen species (Lavanya et al, 2012) (Syafiq, 2021). These antioxidants function by stabilizing unstable molecules that contribute to the breakdown of collagen and elastin, thereby preserving skin elasticity and texture. In addition, the ability of karamunting extracts to inhibit the enzyme tyrosinase—responsible for melanin synthesis—further supports their role in achieving skin-brightening effects (Oktaviyanti et al, 2025). This mechanism is especially relevant in

modern cosmetic science, where the inhibition of melanogenesis is a key approach in treating hyperpigmentation and uneven skin tone.

The reviewed studies also reveal notable advancements in extraction technology, which have improved the quality and potency of R. tomentosa extracts. Earlier studies primarily utilized conventional solvent extraction methods, whereas recent work by (Oktaviyanti et al, 2025) introduced ultrasound-assisted extraction using propylene glycol, an eco-friendly solvent. This green extraction technique not only enhances yield efficiency but also maintains the stability of sensitive bioactive compounds. Such methodological innovation reflects a shift toward sustainable bioprocessing within the cosmetic industry, aligning with the global movement toward green chemistry and environmentally responsible production.

Equally significant are the clinical findings demonstrating the efficacy of rhodomyrtone, the major antibacterial compound found in karamunting leaves. Clinical trials by (Wunnoo et al, 2021) reported that rhodomyrtone-based formulations effectively reduced acne lesions and inflammation, producing results comparable to clindamycin, a standard pharmaceutical antibiotic, but without causing skin irritation or microbial resistance. Complementing this, (Gervason et al., 2020) highlighted that fruit extracts of R. tomentosa positively influence the skin microbiota, particularly by regulating Cutibacterium acnes populations in acne-prone individuals. This introduces a microbiome-centered approach to skincare, supporting the idea that maintaining a balanced skin ecosystem is as vital as treating visible symptoms. Collectively, these findings contribute to a more holistic view of cosmetic development—one that integrates dermatological science with microbial ecology.

The implications of these findings are multifaceted. Theoretically, they strengthen the concept of biofunctional cosmetics, which emphasize functional efficacy derived from biological mechanisms rather than mere aesthetic outcomes. Practically, R. tomentosa demonstrates the potential to serve multiple cosmetic functions simultaneously: as an antioxidant to combat aging, an antibacterial and anti-inflammatory agent for acne management, and a natural tyrosinase inhibitor for skin lightening. These combined properties make karamunting extracts particularly attractive for multifunctional skincare products targeting consumers seeking natural yet effective alternatives to synthetic chemicals.

Despite these promising results, several factors may influence the consistency of outcomes. Variations in geographical origin, cultivation conditions, and extraction protocols significantly affect the concentration and composition of bioactive compounds (Zhao et al, 2020). Environmental conditions such as soil nutrients, sunlight exposure, and harvesting time can also alter phytochemical content, thereby influencing efficacy. Moreover, while clinical data are encouraging, long-term safety evaluations and formulation stability studies remain limited. Differences in study design and the absence of standardized testing frameworks further complicate the comparison of results across different research efforts (Ramadhan et al, 2023). Addressing these gaps through standardized, multi-center studies is crucial for validating karamunting's performance and ensuring consistency in industrial application.

From a broader perspective, R. tomentosa represents a significant contribution to the advancement of natural cosmetology. The integration of traditional ethnobotanical knowledge with modern analytical techniques has yielded strong scientific evidence supporting its dermatological benefits. However, to transition from laboratory validation to commercial implementation, future research should focus on optimizing extraction standardization, improving formulation stability, and expanding the scope of clinical trials. Innovative delivery systems such as nanoemulsions or liposomal carriers could enhance the bioavailability of active compounds while maintaining product stability. Moreover, exploring synergistic combinations with other botanical extracts could enhance its overall cosmetic performance, aligning with the modern demand for multifunctional skincare solutions.

In conclusion, the reviewed literature establishes Rhodomyrtus tomentosa as a scientifically validated and environmentally sustainable cosmetic ingredient. Its diverse range of bioactivities—antioxidant, anti-inflammatory, antibacterial, and brightening—positions it as a next-generation botanical agent for the cosmetic industry. While challenges remain in standardization and scalability, the convergence of phytochemical richness, clinical efficacy, and environmental compatibility underscores its potential for future commercialization. Through continued research and technological innovation, karamunting could serve as a model for the integration of traditional plant knowledge into modern, science-based cosmetic applications.

Conclusion

This qualitative-descriptive literature review concludes that Rhodomyrtus tomentosa (Hask.) possesses remarkable potential as a multifunctional natural cosmetic agent due to its diverse phytochemical composition and scientifically proven biological activities. The synthesis of research findings reveals that bioactive compounds such as rhodomyrtone, flavonoids, and phenolics contribute significantly to its antioxidant, antibacterial, anti-inflammatory, and skin-brightening effects. These results provide a deeper understanding of the plant's dermatological and pharmacological mechanisms, reinforcing the theoretical framework that natural phytoconstituents can serve as effective and sustainable alternatives to synthetic cosmetic ingredients. The study contributes to the body of knowledge by integrating traditional ethnobotanical wisdom with modern scientific validation, highlighting R. tomentosa's relevance in advancing the field of phytocosmetics. In broader social and cultural contexts, the findings support the use of indigenous botanical resources in promoting local economic development and environmental sustainability. However, this review acknowledges limitations in the existing literature, particularly regarding long-term safety assessments, standardization of extraction methods, and formulation stability. Future studies should therefore focus on clinical validation, bioavailability enhancement, and green extraction optimization to fully realize the commercial and therapeutic potential of R. tomentosa in modern cosmetic science.

Based on this qualitative-descriptive study, future research and practice should prioritize the development of Rhodomyrtus tomentosa as a natural cosmetic agent through standardized, eco-friendly extraction, clinical testing, and interdisciplinary approaches. The use of triangulation methods can strengthen data validity, while support for sustainable cultivation and research-based commercialization may enhance environmental sustainability and regional economic growth. Further studies are needed to examine long-term stability, skin absorption, and consumer acceptance to advance its application in natural cosmetology.

Reference

Abraham, D., & P, P. (2024). A Methodological Framework for Descriptive Phenomenological Research. *Western Journal of Nursing Research*, *47*, 125–134. https://doi.org/10.1177/01939459241308071

Baillie, J. (2019). Commentary: An overview of the qualitative descriptive design within nursing research. *Journal of Research in Nursing*, *25*, 458–459. https://doi.org/10.1177/1744987119881056

Bandaranayake, P. (2024). Application of Grounded Theory Methodology in Library and Information Science Research: An Overview. *Sri Lanka Library Review*. https://doi.org/10.4038/sllr.v38i2.70

Belotto, M. (2018). Data Analysis Methods for Qualitative Research: Managing the Challenges of Coding, Interrater Reliability, and Thematic Analysis. *The Qualitative Report*. https://doi.org/10.46743/2160-3715/2018.3492

Bingham, A. (2023). From Data Management to Actionable Findings: A Five-Phase Process of Qualitative Data Analysis. *International Journal of Qualitative Methods*, *22*. https://doi.org/10.1177/16094069231183620

Bui, H. (2023). Jerawat. *Jurnal de Pédiatrie et de Puériculture*. https://doi.org/10.1016/j.jpp.2023.05.008

Doyle, L., Mccabe, C., Keogh, B., Brady, A., & McCann, M. (2019). An overview of the qualitative descriptive design within nursing research. *Journal of Research in Nursing*, *25*, 443–455. https://doi.org/10.1177/1744987119880234

Fife, S., & Gossner, J. (2024). Deductive Qualitative Analysis: Evaluating, Expanding, and Refining Theory. *International Journal of Qualitative Methods*, *23*. https://doi.org/10.1177/16094069241244856

Gervason, S., Metton, I., Gemrot, E., Ranouille, E., Skorski, G., Cabannes, M., Berthon, J., & Filaire, E. (2020). Rhodomyrtus tomentosa Fruit Extract and Skin Microbiota: A Focus on C. acnes Phylotypes in Acne Subjects. *Cosmetics*, *7*, 53. https://doi.org/10.3390/cosmetics7030053

Ghosh, A., Panda, S., & Luyten, W. (2021). Anti-vibrio and immune-enhancing activity of medicinal plants in shrimp: A comprehensive review. *Fish & Shellfish Immunology*. https://doi.org/10.1016/j.fsi.2021.08.006

Granikov, V., Hong, Q., Crist, E., & Pluye, P. (2020). Mixed methods research in library and information science: A methodological review. *Library & Information Science Research*. https://doi.org/10.1016/j.lisr.2020.101003

Jesumani, V., Du, H., Aslam, M., Pei, P., & Huang, N. (2019). Potential use of seaweed bioactive compounds in skincare—A review. *Marine Drugs*, *17*. https://doi.org/10.3390/md17120688

Jimenez, S., Berbegal-Mirabent, J., & De La Torre, R. (2024). How do university libraries contribute to the research process? *The Journal of Academic Librarianship*. https://doi.org/10.1016/j.acalib.2024.102930

Kalpokaite, N., & Radivojevic, I. (2018). Demystifying qualitative data analysis for novice qualitative researchers. *The Qualitative Report*. https://doi.org/10.46743/2160-3715/2019.4120

Kulka, K., & Sionkowska, A. (2023). Chitosan based materials in cosmetic applications: A review. *Molecules*, *28*. https://doi.org/10.3390/molecules28041817

Lavanya, G., Voravuthikunchai, S., & Towatana, N. (2012). Acetone Extract from Rhodomyrtus tomentosa: A Potent Natural Antioxidant. *Evidence-based Complementary and Alternative Medicine : eCAM*, *2012*. https://doi.org/10.1155/2012/535479

Oktaviyanti, N., Kartini, K., Setiawan, F., Fitriani, E., Sukweenadhi, J., & Avanti, C. (2025). Novel approach extraction method to obtain optimum antioxidant and skin-lightening compound from Rhodomyrtus tomentosa (Aiton) Hassk. Leaves. *Journal of Pharmacy & Pharmacognosy Research*. https://doi.org/10.56499/jppres23.1854_13.3.905

Pratt, M. (2025). On the Evolution of Qualitative Methods in Organizational Research. *Annual Review of Organizational Psychology and Organizational Behavior*. https://doi.org/10.1146/annurev-orgpsych-111722-032953

Ramadhan, G., Krisridwany, A., Wibowo, A., Kurniawan, M., & Damarwati, V. (2023). The Potential of Karamunting Plant (Rhodomyrtus tomentosa) as Antibacterial Agent: A Literature Review. *Jurnal Farmasi Sains dan Praktis*. https://doi.org/10.31603/pharmacy.v9i2.6415

Syafiq, M. (2021). Antioxidant and Antityrosinase Properties of Rhodomyrtus Tomentosa Extract. *Borneo Journal of Sciences and Technology*. https://doi.org/10.35370/bjost.2021.3.2-04

Togia, A., & Malliari, A. (2017). *Research Methods in Library and Information Science*. https://doi.org/10.5772/intechopen.68749

Vila-Henninger, L., Dupuy, C., Van Ingelgom, V., Caprioli, M., Teuber, F., Pennetreau, D., Bussi, M., & Gall, C. (2022). Abductive Coding: Theory Building and Qualitative (Re)Analysis. *Sociological Methods & Research*, *53*, 968–1001. https://doi.org/10.1177/00491241211067508

Vo, T., & Ngo, D. (2019). The Health Beneficial Properties of Rhodomyrtus tomentosa as Potential Functional Food. *Biomolecules*, *9*. https://doi.org/10.3390/biom9020076

Wunnoo, S., Bilhman, S., Amnuaikit, T., Ontong, J., Singh, S., Auepemkiate, S., & Voravuthikunchai, S. (2021). Rhodomyrtone as a New Natural Antibiotic Isolated from Rhodomyrtus tomentosa Leaf Extract: A Clinical Application in the Management of Acne Vulgaris. *Antibiotics*, *10*. https://doi.org/10.3390/antibiotics10020108

Zhao, Z., Wu, L., Xie, J., Feng, Y., Tian, J., He, X., Li, B., Wang, L., Wang, X., Zhang, Y., Wu, S., & Zheng, X. (2020). Rhodomyrtus tomentosa (Aiton.): A review of phytochemistry, pharmacology and industrial applications research progress. *Food Chemistry*, 125715. https://doi.org/10.1016/j.foodchem.2019.125715