Rev. Colomb. Cienc. Quím. Farm., **54**(3), 679–688 (2025)

Review article

Exploring the therapeutic benefits of *Eucalyptus globulus* Labill.: A five-year pharmacological review

Carolina Takahashi[1*a], Julio Chavez[2b] & Jorge Poemape[3c]

[1] Norbert Wiener University, Investigation area, Lima, Peru. https://orcid.org/0000-0002-9441-0056
[2] Lima University, Investigation area, Lima, Peru. https://orcid.org/0009-0001-5450-4613
[3] Cesar Vallejos University, Investigation area, Lima, Peru. https://orcid.org/0009-0001-8782-0620

*Corresponding author E-mail: asesoratakahashi@gmail.com

ORCID IDs: [a] https://orcid.org/0000-0002-9441-0056, [b] https://orcid.org/0009-0001-5450-4613, [c] https://orcid.org/0009-0001-8782-0620

Received: November 6, 2024
Corrected: July 2, 2025
Accepted: July 7, 2025

https://doi.org/10.15446/rcciquifa.v54n3.117462

SUMMARY

Introduction: In recent years, *Eucalyptus globulus* Labill. (eucalyptus) has emerged as a protagonist in pharmacological research, revealing surprising antimicrobial and anti-inflammatory properties that promise to revolutionize its application in natural medicine and public health. The **objective** of this literature review is to highlight the importance of eucalyptus as a source of various chemical components and benefits for the body. This literature review conducted a bibliographic search on the pharmacological activity and bioactive compounds of eucalyptus in the following electronic databases: PubMed, Scopus, Web of Science and Google Scholar, published from 2020 to 2024. **Result:** A total of 15 documents were selected that meet the study objectives, highlighting the relevance of eucalyptus in the pharmacological field. It is **concluded** that eucalyptus is a valuable resource in traditional and modern medicine, as well as in the pharmaceutical industry. However, there is still much to be investigated. It is essential to continue exploring its properties in order to develop a drug based on a metabolite present in this medicinal plant in the future.

Keywords: *Eucalyptus globulus* Labill.; therapeutic potential; pharmacological advances.

RESUMO

Explorando os benefícios terapêuticos do *Eucalyptus globulus* Labill.: Uma revisão farmacológica de cinco anos

Introdução: Nos últimos anos, o *Eucalyptus globulus* Labill. (eucalipto) tem emergido como protagonista nas pesquisas farmacológicas, revelando surpreendentes propriedades antimicrobianas e anti-inflamatórias que prometem revolucionar sua aplicação na medicina natural e na saúde pública. O **objetivo** desta revisão de literatura é destacar a importância do eucalipto como fonte de diversos componentes químicos e benefícios para o organismo. Esta revisão de literatura realizou uma pesquisa bibliográfica sobre a atividade farmacológica e compostos bioativos do eucalipto nas seguintes bases de dados eletrônicas: PubMed, Scopus, Web of Science e Google Scholar, publicadas no período de 2020 a 2024. **Resultado:** Foram selecionados 15 documentos que atendem os objetivos do estudo, destacando a relevância do eucalipto na área farmacológica. Conclui-se que o eucalipto é um recurso valioso na medicina

tradicional e moderna, bem como na indústria farmacêutica. Porém, ainda há muito a ser investigado. É fundamental continuar a explorar as suas propriedades para no futuro desenvolver um medicamento baseado num metabolito presente nesta planta medicinal.

Palavras-chave: *Eucalyptus globulus* Labill.; potencial terapêutico; avanços farmacológicos.

RESUMEN

Explorando los beneficios terapéuticos de *Eucalyptus globulus* Labill.: Una revisión farmacológica de cinco años

Introducción: En los últimos años, *Eucalyptus globulus* Labill. (eucalipto) ha surgido como protagonista en la investigación farmacológica, revelando sorprendentes propiedades antimicrobianas y antiinflamatorias que prometen revolucionar su aplicación en la medicina natural y la salud pública. El **objetivo** de esta revisión bibliográfica es resaltar la importancia del eucalipto como fuente de diversos componentes químicos y beneficios para el organismo. En esta revisión bibliográfica se realizó una búsqueda bibliográfica sobre la actividad farmacológica y compuestos bioactivos del eucalipto en las siguientes bases de datos electrónicas: PubMed, Scopus, Web of Science y Google Scholar, publicadas del 2020 al 2024. **Resultado:** Se seleccionaron un total de 15 documentos que cumplen los objetivos del estudio, destacando la relevancia del eucalipto en el campo farmacológico. Se **concluye** que el eucalipto es un recurso valioso en la medicina tradicional y moderna, así como en la industria farmacéutica. Sin embargo, aún queda mucho por investigar. Es fundamental seguir explorando sus propiedades para poder desarrollar en el futuro un fármaco basado en un metabolito presente en esta planta medicinal.

Palabras clave: *Eucalyptus globulus* Labill; potencial terapéutico; avances farmacológicos.

1. INTRODUCTION

Worldwide, *Eucalyptus globulus* Labill. (eucalyptus), commonly known as eucalyptus, has attracted the attention of researchers and health professionals due to its multiple therapeutic applications [1, 2]. In the last five years, advances in pharmacological research have shown its potential as a source of bioactive compounds, which has led to a significant increase in its consumption and use in various regions of the world [3, 4]. In America, eucalyptus has been widely cultivated in countries such as Brazil and Argentina, where its use has expanded from the timber industry to the pharmaceutical industry [5, 6].

In Europe, especially in Spain and Portugal, research has been carried out highlighting its anti-inflammatory and antioxidant properties [7, 8]. In Asia, Australia continues to be its main producer and center of origin, contributing significantly to the knowledge about its benefits and applications [9, 10]. In Africa, countries such as South Africa have begun to explore the traditional use of eucalyptus, incorporating it into local medicinal practices [11, 12].
Originally from Australia, eucalyptus has been introduced to various parts of the world due to its rapid growth and adaptability to different climates [13-15]. Harvests are mainly carried out for the production of essential oils, which are used in aromatherapy and pharmaceutical products [16, 17]. It is estimated that around 10% of the world's population consumes products derived from eucalyptus, either in the form of infusions, essential oils or extracts, reflecting its growing popularity in alternative medicine [18, 19].

Research has highlighted benefits such as its antimicrobial, anti-inflammatory and analgesic properties, consolidating its place in the therapeutic arsenal [20, 21]. The main producing and trading countries of eucalyptus include Brazil, China, Spain and Australia, where cultivation has intensified to meet global demand [22, 23]. The most common forms of consumption

include infusions, steam inhalations, and topical applications of essential oils, which allow their properties to be effectively exploited [24-27]. The objective of this research is to highlight the relevance of eucalyptus as a provider of multiple chemical compounds and its health benefits, offering a compendium of pharmacological advances in the last five years that validate its use in the therapeutic field.

2. METHODOLOGY

A bibliographic review was carried out through an electronic search of original articles in databases such as: PubMed, Web of science, Scopus and Google Scholar, published during the period from January 2020 to September 2024. The search was carried out with the following combined terms: "*Eucalyptus globulus* Labill., "eucalyptus", "chemical components", "pharmacological activity". Studies detailing the chemical composition and biological activity of *Eucalyptus globulus* Labill. (eucalyptus) were included, such as: antimicrobial, anti-inflammatory, expectorant, analgesic, antispasmodic, antioxidant, insecticidal properties, among others.

3. RESULTS

Table 1 summarizes the different key chemical components and therapeutic properties reported in the papers located.

Table 1. Key chemical components and therapeutic properties

Year	Chemical components	Pharmacological activity under study/Instrument
2024	In this study, *Eucalyptus globulus* leaves were used for the extraction of the essential oil. Essential oils (EO), α-pinene, α-terpinyl acetate, globulol, γ-terpinene [28].	**Activity:** Powerful anti-SARS-CoV-2 potential *in vitro* and *in silico*. **Instrument:** Analysis of the phytochemical composition of the EOs determined by the GC/MS system.
2024	In this study, leaves and bark from *Eucalyptus globulus* were used for essential oil extraction. Essential oils, volatile essential oils, 1,8-cineole, p-cymene, α and β-pinene, limonene, citronellal, citral, eudesmol, terpinen-4-ol, terpineol, α–phelanderene, 9β-sitosterol, flavonoids, antioxidants, 2,2-diphenyl-1-picrylhydrazyl (DPPH) [29].	**Activity:** Eucalyptus plants have several medical benefits (such as antioxidant, anti-inflammatory, antinociceptive and antimicrobial), polyphenols and flavonoids, antiviral and anticancer. **Instrument:** Analysis of antioxidant and antibacterial activity of selected eucalyptus species, extraction of various phenolic chemicals from eucalyptus.
2023	In this study, leaves and bark from *Eucalyptus globulus* were used for essential oil extraction. Terpenoids, flavonoids, phenolic acids, essential oils (EOs), *Eucalyptus globulus* [30].	**Activity:** Discussion of recent advances in bioactive molecules from eucalyptus, essential oils (EOs) and eucalyptus extracts present multiple biological effects (in particular with antidiabetic, antibacterial, anti-inflammatory and anticancer activities). **Instrument:** Analysis of recent advances in relation to bioactive compounds and biological properties of EOs and extracts of *E. globulus.*

2023	In this study, *Eucalyptus globulus* leaves were used. Essential oil, mono-terpenoids, sesquiterpenoids, eucalyptol (60,327), D-limonene (6,964), terpinyl acetate (3,564), gamma gurjunene (2,505%), γ-gurjunine [31].	**Activity:** *In vitro* and *in silico* antibacterial activity study of *Eucalyptus globulus* essential oil, the antibacterial activity was predicted in silico using Autodock vina, the essential oil exhibited antibacterial activity (against *Staphylococcus aureus*, *Escherichia coli* and *Staphylococcus aureus*). **Instrument:** Extraction of essential oil from *Eucalyptus globulus* Labill. leaves was performed using the agar diffusion and broth microdilution method, Gamma-Gurjunene MD simulation in complex with 3VSL, GROMACS software.
2023	In this study, *Eucalyptus globulus* leaves were used for the extraction of the essential oil. *Eucalyptus globulus* essential oil (EGEO), 1,8-cineole (63.1%), p -cymene (7.7%), a-pinene (7.3%), a-limonene (6.9%), monoterpenes, *C. albicans* (14.00 ± 1.00 mm), microscopic fungi (11.00 ± 0.00 mm–12.33 ± 0.58 mm) [32].	**Activity:** The antioxidant potential of EGEO and the results indicate that 10 μL of this sample can neutralize 55.44 ± 0.99% of ABTS •+, the antimicrobial activity was determined by two methods: disk diffusion and minimum inhibitory concentration. **Instrument:** Analysis of the chemical composition of AEGEAN, *in vitro* and *in situ* antimicrobial activity, antibiofilm activity, antioxidant activity and insecticidal activity, gas chromatography (GC) and gas chromatography/mass spectrometry (GC/MS).
2022	The study primarily focuses on the leaves of *Eucalyptus globulus Labill*. Enothein B, polyphenol, hydrolyzable tannin, ellagitannin, eucalyptus leaf (ELE), abdominal visceral fat (VFA) [33].	**Activity:** Antiobesity effect of eucalyptus leaf extract containing oenothein B in healthy Japanese adults. Oenothein B-containing ELEs may be effective against obesity and related diseases by reducing VFA levels. **Instrument:** Randomized, placebo-controlled, double-blind, parallel-group study evaluating the effect of ELE consumption for 12 weeks at a dose of 3.38 mg/day of enothein B on the abdominal visceral fat area (AGV).
2021	The study exclusively used fresh leaves of *Eucalyptus globulus Labill.* collected from mature trees. *Eucalyptus globulus* essential oil, 1,8-cineole, ultraviolet B (UVB) light, vascular endothelial growth factor (VEGF) [34].	**Activity:** Topical administration of *Eucalyptus globulus* EO increased neovascularization and VEGF expression in the skin of injured and UVB-exposed male Wistar rats, efficacy under evaluation. **Instrument:** Post-test control group study in 36 male Wistar rats, 3-4 months old, weighing 150-200 grams, UVB exposure in rats, 10 mm punch biopsy.
2021	The study specifically utilized: Mature leaves of *Eucalyptus globulus* Labill. Collected from healthy trees during the dry season (to maximize essential oil content). Polyphenols, flavonoids, *Eucalyptus globulus* Labill., *Trigonella foenum-greacum* L., aqueous extract (EGAE, TFAE) [35].	**Activity:** Antioxidant and antibacterial activities of aqueous extracts of *Eucalyptus globulus* Labill. and *Trigonella foenum-greacum* Labill., very strong antiradical activity against DPPH radical, antibacterial activity against Gram-positive bacteria of varying degrees. **Instrument:** Analysis of aqueous extract (EGAE, TFAE) from the leaves and seeds of the plants for the evaluation of free radical scavenging, antibacterial activities of the aqueous extract and antioxidant activity was evaluated using DPPH test, agar disk diffusion method against three bacterial strains.
2021	The researchers exclusively used: Fresh, mature leaves collected from 5-7 year old *Euca-*	**Activity:** Evaluation of antimalarial activity of crude leaf extract *of E. globulus* Labill. in Swiss albino mice infected with *P. berghei*, antimalarial activity of the crude extract was tested in suppressive, curative (Rane) and prophylactic (depot) tests, the

	lyptus globulus trees. *E. globulus*, parasitemia, *P. falciparum, P. vivax,* artemisinin, chloroquine, quinine, eucalyptol (1,8-cineole), α -pinene, (−)-globulol [36].	crude extract of the plant showed promising antimalarial activity. **Instrument:** Fresh leaves of *E. globulus* were collected, then washed, air dried and made into a coarse powder of 750 g, data analysis was performed using SPSS version 20 with 95% confidence interval in one-way ANOVA followed by Tukey post hoc test.
2021	Primary Material: Fresh leaves collected from mature trees (3-5 years old) Secondary Material: Twigs (<1cm diameter) and floral buds (for comparative analysis). *Eucalyptus globulus* Labill., allelochemicals, concentrated essential oils, globulus, *Portulaca oleracea* L., aqueous extracts of fresh leaves (FLE; 617 g FW L −1), oven-dried leaves (DLE; 250 g DW L −1) [37].	**Activity:** Effects of herbicidal activity and cellular targets of aqueous extracts of young leaves of *Eucalyptus globulus* Labill., evaluate the herbicidal potential of post-fire regenerated *E. globulus* leaves against *Portulaca oleracea* L., DLE at the highest dose stopped the greatest herbicidal activity, affecting the growth and cell viability of purslane, recognized allelopathic activity of *E. globulus* attributed to its leaves. **Instrument:** Processing of the leaves, they were sprayed foliarly on purslane seedlings at different dilutions for 5 weeks, extraction process of concentrated essential oils, hydrodistillation.
2021	Leaves harvested from 4-year-old trees. Eucalyptol, 1,8-cineole, essential oil (EO), α-phellandrene, herbicide, oxygenated monoterpenes (80.65–87.32%), monoterpene hydrocarbons (18.33–12.45%) [38].	**Activity:** Biological activities attributed to the diversity of phytochemical components in the plant parts, review of the *E. globulus* plant and its bioactive, antioxidant, antimicrobial, phytoremedial and herbicidal components. **Instrument:** Review of recent information on the phytochemical properties of *E. globulus*, hydrodistillation process for obtaining the EO components.
2021	Leaves collected from certified *E. globulus* trees (10-15 years old). Tyrosyl-DNA phosphodiesterase 2 (TDP2), topoisomerase 2, Robustadia A and B, *Eucalyptus globulus* Labill. [39].	**Activity:** Robustadial compounds A and B possess anticancer activity. **Instrument:** TDP2 inhibition analysis, biological experiments, isolation of compounds, robustadial A and B from an acetate fraction of *E. Globulus* labill.
2021	Leaves collected from 8-year-old trees in Artemisa province, Cuba. 3-heptadecene, 1-tridicene, 1,8-cineole, chlorhexidine, minimum bactericidal concentration (MBC), minimum inhibitory concentration (MIC), essential oil, *Eucalyptus globulus* Labill [40].	**Activity:** Antibacterial activity of an experimental *Eucalyptus globulus* Labill gel against *Porphyromonas gingivalis.* **Instrument:** Experimental *in vitro,* EPi InfoTM program, vapor entrainment method, minimum inhibitory concentration (MIC), Agar diffusion test.
2020	Leaves collected from 6 distinct Mediterranean regions (Turkey, Greece, Spain, etc. *Eucalyptus globulus* essential oil, 1,1-diphenyl-2-picrylhydrazyl (DPPH), lipoxygenase enzyme (5-LOX), 1,8-cineole	**Activity:** Antimicrobial, antioxidant, anti-inflammatory, inhibitory. **Instrument:** *Eucalyptus globulus* essential oil of pharmacopoeia grade (PhEur) was evaluated against human pathogenic species such as *P. acnes* ATCC 6919, *P. acnes* ATCC 11827, *S. aureus* ATCC 6538 and *S. epidermidis* ATCC 12228 using an *in vitro* microdilution method employing the photometric radical assay.

	(80.2%), p-cymene (6.6%), limonene (5%), *Staphylococcus aureus*, *S. epidermidis* [41].	
2020	Roots harvested from 10-year-old trees during dormancy period. Phenolic compounds, flavonoids, *E. globulus* Labill, ethanol root (EtE), ethyl acetate (EaE) and aqueous (AqE) [42].	**Activity:** Antioxidant of EtE, EaE, AqE extracts of *E. globulus* Labill., measuring their DPPH, ABTS radical scavenging, H2O2 scavenging, reducing power and metal chelating activities. **Instrument:** Plant samples roots of *E. globulus*, evaluation of antioxidant activity, evaluation of DPPH activity, evaluation of ABTS activity, removal of hydrogen peroxide.

3.1. Application in traditional medicine

Eucalyptus globulus, commonly known as eucalyptus, has been used in traditional medicine practices by various cultures throughout history [43]. The leaves and essential oils of eucalyptus have been used to treat respiratory conditions, such as colds and coughs, thanks to their expectorant properties [44]. In addition, it has been used in folk medicine to relieve muscle and joint pain, as well as in oral hygiene due to its antimicrobial effects [45].

3.2. Phytochemicals

This tree contains a variety of phytochemical compounds that are responsible for its medicinal properties. Among the most prominent are terpenes, such as eucalyptol (1,8-cineole), which will confer its anti-inflammatory and analgesic characteristics [46]. Flavonoids and tannins have also been identified that contribute to its antioxidant and antimicrobial activity, offering a broad spectrum of health benefits [47].

3.3. Therapeutic activity

Eucalyptus has demonstrated various therapeutic activities in scientific studies [48]. Its efficacy in the treatment of respiratory infections has been demonstrated, due to its ability to facilitate the expulsion of mucus and reduce inflammation of the airways [49]. In addition, its topical application has shown analgesic and anti-inflammatory properties, making it a valuable resource for the management of pain and inflammation [50].

4. CONCLUSIONS

In conclusion, this study has highlighted the significant therapeutic potential of *Eucalyptus globulus* Labill., evidencing its growing relevance in the pharmacological field over the last five years. Through an exhaustive analysis of recent literature, it has been shown that this plant not only possesses antimicrobial and anti-inflammatory properties, but also harbors a variety of bioactive compounds that could be exploited in the development of innovative treatments. The 15 documents selected for this review underline the diversity of applications of eucalyptus, from its use in traditional medicine to its potential in the formulation of new drugs. However, it is important to recognize that, despite the progress made, there is still a long way to go in the research of its metabolites and its mechanisms of action. Future studies are essential to fully unravel the benefits of eucalyptus and to firmly establish it as a valuable resource in modern medicine, which could culminate in the development of effective treatments that improve public health.

CONFLICT OF INTEREST

The authors of this research declare that they have no conflict of interest.

REFERENCES

1. N. Chandorkar, S. Tambe, P. Amin & C. Madankar. A systematic and comprehensive review on current understanding of the pharmacological actions, molecular mechanisms, and clinical implications of the genus *Eucalyptus*. *Phytomed. Plus*, **1**(4), 100089 (2021). Doi: https://doi.org/10.1016/j.phyplu.2021.100089
2. L.C. Becker, A. Akinsulie, W.F. Bergfeld, D.V. Belsito, R.A. Hill, C.D. Klaassen, *et al.* Safety assessment of *Eucalyptus globulus* (eucalyptus)-derived ingredients as used in cosmetics. *Int. J. Toxicol.*, **42**(1_suppl). 57S–92S (2023). Doi: https://doi.org/10.1177/10915818231164354
3. A. Kaur & R. Monga. Eucalyptus trees plantation: A review on suitability and their beneficial role. *International Journal of Bio-resource and Stress Management*, **12**(1), 016–025 (2021). Doi: https://doi.org/10.23910/1.2021.2174
4. Y. Zhang & X. Wang. Geographical spatial distribution and productivity dynamic change of eucalyptus plantations in China. *Sci Rep.*, **11**(1), 19764 (2021). Doi: https://doi.org/10.1038/s41598-021-97089-7
5. J.M. da Rocha, N.S. da Rocha, P.S. Käfer & R.C. Cruz. Eucalyptus forestry in Brazilian Pampa biome: between developmental illusion and sustainable inefficacy. *Ciênc. Nat.*, **42**, e35 (2020). Doi: https://doi.org/10.5902/2179460X40990
6. X. Silva & F.O. Asiegbu. Chapter 15 - Eucalyptus fungal diseases. In: F.O. Asiegbu & A. Kovalchuk (editors). *Forest Microbiology: Tree Diseases and Pests. Volume 3 in Forest Microbiology*. Academic Press, 2023; pp. 313–337. Doi: https://doi.org/10.1016/B978-0-443-18694-3.00016-X
7. D. Cianciosi, T.Y. Forbes-Hernandez, J.M. Alvarez-Suarez, J. Ansary, D. Quinzi, A. Amici, *et al.* Anti-inflammatory activities of Italian Chestnut and Eucalyptus honeys on murine RAW 264.7 macrophages. *J. Funct. Foods*, **87**, 104752 (2021). Doi: https://doi.org/10.1016/j.jff.2021.104752
8. P. Moreira, F.J. Sousa, P. Matos, G.S. Brites, M.J. Gonçalves, C. Cavaleiro, *et al.* Chemical composition and effect against skin alterations of bioactive extracts obtained by the hydrodistillation of *Eucalyptus globulus* leaves. *Pharmaceutics*, **14**(3), 561 (2022). Doi: https://doi.org/10.3390/pharmaceutics14030561
9. M.G.K. Jones, J. Fosu-Nyarko, S. Iqbal, M. Adeel, R. Romero-Aldemita, M. Arujanan, *et al.* Enabling trade in gene-edited produce in Asia and Australasia: The developing regulatory landscape and future perspectives. *Plants*, **11**(19), 2538 (2022). Doi: https://doi.org/10.3390/plants11192538
10. F. Humphries, J.A.H. Benzie, C. Lawson & C. Morrison. A review of access and benefit-sharing measures and literature in key aquaculture-producing countries. *Rev. Aquac.*, **13**(3), 1531–1548 (2021). Doi: https://doi.org/10.1111/raq.12532
11. M.M. Mofokeng, C.P. Du Plooy, H.T. Araya, S.O. Amoo, S.N. Mokgehle, K.M. Pofu, *et al.* Medicinal plant cultivation for sustainable use and commercialisation of high-value crops. *S. Afr. J. Sci.*, **118**(7/8), 12190 (2022). URL: https://www.scielo.org.za/pdf/sajs/v118n7-8/09.pdf
12. N. Khan, S. Fahad, S. Faisal, A. Akbar & M. Naushad. *Socio-Economic and Medicinal Review of Eucalyptus Tree in the World.* SSRN, July 6, 2020; 41 p. Doi: https://doi.org/10.2139/ssrn.3644215
13. G.W.L. Florêncio, F.B. Martins & F.F.A. Fagundes. Climate change on Eucalyptus plantations and adaptive measures for sustainable forestry development across Brazil. *Ind. Crops Prod.*, **188**, 115538 (2022). Doi: https://doi.org/10.1016/j.indcrop.2022.115538
14. M. Kasaye, G. Abebe, G. Nigusie & M. Eshte. Adaptability of different Eucalyptus species in Lasta-Lalibela District Northeastern Highland of Ethiopia. *J. Forest Res.*, **9**(3), 233 (2020). Doi: https://doi.org/10. 35248/2168-9776.20.9.233

15. M. Tomé, M.H. Almeida, S. Barreiro, M.R. Branco, E. Deus, G. Pinto, *et al.* Opportunities and challenges of *Eucalyptus* plantations in Europe: the Iberian Peninsula experience. *Eur. J. Forest Res.*, **140**(3), 489–510 (2021). Doi: https://doi.org/10.1007/s10342-021-01358-z
16. S. Baptista-Silva, S. Borges, O.L. Ramos, M. Pintado & B. Sarmento. The progress of essential oils as potential therapeutic agents: a review. *J. Essent. Oil Res.*, **32**(4), 279–295 (2020). Doi: https://doi.org/10.1080/10412905.2020.1746698
17. L. Abate, A. Bachheti, R.K. Bachheti, A. Husen, M. Getachew & D.P. Pandey. Potential role of forest-based plants in essential oil production: An approach to cosmetic and personal health care applications. In: A. Husen, R.K. Bachheti & A. Bachheti (editors). *Non-Timber Forest Products.* Springer, Cham, 2021: pp. 1–18. Doi: https://doi.org/10.1007/978-3-030-73077-2_1
18. J.C. Doran, P.F. Macdonell, J.J. Brophy & R. Davis. *Eucalyptus bakeri:* a potential source species for eucalyptus oil production in the subtropics. *Austr. Forest.*, **84**(4), 182–190 (2021). Doi: https://doi.org/10.1080/00049158.2021.1973225
19. A. Alemayehu & Y. Melka. Small scale eucalyptus cultivation and its socioeconomic impacts in Ethiopia: A review of practices and conditions. *Trees Forest People*, **8**, 100269 (2022). Doi: https://doi.org/10.1016/j.tfp.2022.100269
20. H.M. Assaggaf, H.N. Mrabti, B.S. Rajab, A.A. Attar, M. Hamed, R.A. Sheikh, *et al.* Singular and combined effects of essential oil and honey of *Eucalyptus globulus* on anti-inflammatory, antioxidant, dermatoprotective, and antimicrobial properties: *In vitro* and *in vivo* findings. *Molecules*, **27**(16), 5121 (2022). Doi: https://doi.org/10.3390/molecules27165121
21. M. Mondal, C. Quispe, C. Sarkar, T.C. Bepari, M.J. Alam, S. Saha, *et al.* Analgesic and anti-inflammatory potential of essential oil of *Eucalyptus camaldulensis* leaf: *In vivo* and *in silico* studies. *Nat. Prod. Commun.*, **16**(4), 1934578X2110076 (2021). Doi: https://doi.org/10.1177/1934578x211007634
22. F. Cubbage, B. Kanieski, R. Rubilar, A. Bussoni, V.M. Olmos, G. Balmelli, *et al.* Global timber investments, 2005 to 2017. *Forest Policy Econ.*, **112**, 102082 (2020). Doi: https://doi.org/10.1016/j.forpol.2019.102082
23. F. Di Fulvio, M. Acuna, P. Ackerman, S. Ackerman, R. Spinelli, D. Abbas, *et al.* Benchmarking operational conditions, productivity, and costs of harvesting from industrial plantations in different global regions. *Int. J. Forest Eng.*, **35**(2), 225–250 (2024). Doi: https://doi.org/10.1080/14942119.2023.2296789
24. D. Jini. Biological applications of essential oil. In: Inamuddin (editor). *Essential Oils: Extraction Methods and Applications*. Wiley, 2023; pp. 361–380. Doi: https://doi.org/10.1002/9781119829614.ch16
25. D.M. Galan, N.E. Ezeudu, J. Garcia, C.A. Geronimo, N.M. Berry & B.J. Malcolm. Eucalyptol (1,8-cineole): an underutilized ally in respiratory disorders? *J. Essent. Oil Res.*, **32**(2):103–110 (2020). Doi: https://doi.org/10.1080/10412905.2020.1716867
26. S. Vishali, E. Kavitha & S. Selvalakshmi. Therapeutic role of essential oils. In: Inamuddin (editor). *Essential Oils: Extraction Methods and Applications*. Wiley, 2023; pp. 953–976. Doi: https://doi.org/10.1002/9781119829614.ch41
27. C. Cimino, O.M. Maurel, T. Musumeci, A. Bonaccorso, F. Drago, E.M.B. Souto, *et al.* Essential oils: Pharmaceutical applications and encapsulation strategies into lipid-based delivery systems. *Pharmaceutics*, **13**(3), 327 (2021). Doi: https://doi.org/10.3390/pharmaceutics13030327
28. R.A. El-Shiekh, M.M. Okba, A.A. Mandour, O. Kutkat, R. Elshimy, H.A. Nagaty, ***et** al. Eucalyptus* oils phytochemical composition in correlation with their newly explored anti-SARS-CoV-2 potential: *In vitro* and *in silico* approaches. *Plant Foods Hum. Nutr.*, **79**(2), 410–416 (2024). Doi: https://doi.org/10.1007/s11130-024-01159-w
29. G.W. Moges, G.M. Manahelohe & M.A. Asegie. Phenolic, flavonoid contents, antioxidant, and antibacterial activity of selected *Eucalyptus* species: Review. *Biology, Medicine, & Natural Product Chemistry*, **13**(1), 147–157 (2024). Doi: https://doi.org/10.14421/biomedich.2024.131.147-157
30. B. Abdelaali, D. Taha, Z. Hannou, E.H. Ayoub, N. El Menyiy, A. Bouyahya & M.S. Mubarak. Bioactive compounds and antidiabetic and other health benefits of *Eucalyptus globulus*. In: A. Husen (editor). *Antidiabetic Medicinal Plants and Herbal Treatments*, CRC Press, 2023; chapter 31, 12 p. Doi: https://doi.org/10.1201/b23347

31. D. Salaria, R. Rolta, A. Prakash, O.A. Fadare, S. Jachak & B. Medhi. *In silico* and *in vitro* antibacterial activity of essential oil of *Eucalyptus globulus* Labill. *Research Square*, 11 October, 2023; 20 p. Doi: https://doi.org/10.21203/rs.3.rs-3415356/v1
32. N. Čmiková, L. Galovičová, M. Schwarzová, M.D. Vukic, N.L. Vukovic, PŁ, Kowalczewski, L. Bakay, M.I. Kluz, C. Puchalski & M. Kačániová. Chemical composition and biological activities of *Eucalyptus globulus* essential oil. *Plants*, **12**(5), 1076 (2023). Doi: https://doi.org/10.3390/plants12051076
33. K. Sugimoto, H. Fujisawa, H. Takeuchi, K. Nakagawa, K. Yamamoto, N. Suzuki, *et al.* Anti-obesity effect of eucalyptus leaf extract containing oenothein B in healthy Japanese adults: a randomized, placebo-controlled, double-blind, parallel-group study. *Functional Foods in Health and Disease*, **12**(5), 242–263 (2022). Doi: https://doi.org/10.31989/ffhd.v12i5.927
34. N. Indrawati, I.S. Iswari & N.W. Winarti. *Eucalyptus globulus* essential oil increases neovascularization and vascular endothelial growth factor expression in male Wistar rats exposed to UVB. *Neurologico Spinale Medico Chirurgico*, **4**(3), 119–124 (2021). Doi: https://doi.org/10.36444/nsmc.v4i3.187
35. D. Bencheikh, A. Gueddah, K. Soualat, H. Ben-aissi, A. Benslama, A. Harrar & S. Khennouf. Polyphenolic contents, antioxidant and antibacterial activities of aqueous extracts of *Eucalyptus globulus* Labill. and *Trigonella foenum-greacum* L. *Journal of Applied Biological Sciences*, **15**(1), 53–63 (2021). URL: https://www.jabsonline.org/index.php/jabs/article/view/833
36. M. Ayalew & A. Bekele. Evaluation of the antimalarial activity of crude extract of *Eucalyptus globulus* Labill. leaf against *Plasmodium berghei* in mice. *Evid. Based Complement. Alternat. Med.*, **2021**, 7068999 (2021). Doi: https://doi.org/10.1155/2021/7068999
37. M. Pinto, C. Soares, M. Martins, B. Sousa, L. Valente, R. Pereira & F. Fidalgo. Herbicidal effects and cellular targets of aqueous extracts from young *Eucalyptus globulus* Labill. leaves. *Plants*, **10**(6), 1159 (2021). Doi: https://doi.org/10.3390/plants10061159
38. A.Y. Shala & M.A. Gururani. Phytochemical properties and diverse beneficial roles of *Eucalyptus globulus* Labill.: A review. *Horticulturae*, **7**(11), 450 (2021). Doi: https://doi.org/10.3390/horticulturae7110450
39. Y. Zhang, X.-Z. He, H. Yang, H.-Y. Liu & L.-K. An. Robustadial A and B from *Eucalyptus globulus* Labill. and their anticancer activity as selective tyrosyl-DNA phosphodiesterase 2 inhibitors. *Phytother. Res.*, **35**(9), 5282–5289 (2021). Doi: https://doi.org/10.1002/ptr.7207
40. M. Sánchez-Tito & J. Araujo-Hanco. Actividad antibacteriana de un gel experimental de *Eucalyptus globulus* Labill. frente a *Porphyromonas gingivalis*. *Rev. Cubana Investig. Bioméd.*, **40**(2), e1104 (2021). URL: http://scielo.sld.cu/pdf/ibi/v40n2/1561-3011-ibi-40-02-e1104.pdf
41. G. Göger, N. Karaca, B.B. Altınbaşak, B. Demirci & F. Demirci. *In vitro* antimicrobial, antioxidant and anti-inflammatory evaluation of *Eucalyptus globulus* essential oil. *Nat. Volatiles & Essent. Oils*, **7**(3), 1–11 (2020). URL: https://www.nveo.org/index.php/journal/article/view/103/98
42. B.N. Ita. Antioxidant activity of *Eucalyptus globulus* Labill. root extracts. *J. Pharmacogn. Phytochem.*, **9**(3), 190–194 (2020). URL: https://www.phytojournal.com/archives/2020/vol9issue3/PartC/9-2-376-547.pdf
43. C. Maldonado, N. Paniagua-Zambrana, R.W. Bussmann, F.S. Zenteno-Ruiz & A.F. Fuentes. La importancia de las plantas medicinales, su taxonomía y la búsqueda de la cura a la enfermedad que causa el coronavirus (COVID-19). *Ecología en Bolivia*, **55**(1), 1-5 (2020). URL: http://scielo.org.bo/pdf/reb/v55n1/v55n1_a01.pdf
44. D.S. Guayamabe-Sánchez & M.N. Ramírez-Abril. *Beneficios del uso de las plantas medicinales para el tratamiento de patologías respiratorias en adultos de 40 a 60 años en la Parroquia Barreiro Nuevo – cantón Babahoyo en el periodo junio – octubre 2023*. B.Sc. thesis. Universidad Técnica de Babahoyo Babahoyo, Babahoyo, Los Ríos, Ecuador, 2023; 83 p. URL: https://dspace.utb.edu.ec/handle/49000/15384
45. L. Bazán, A. Antacle & M.J. Pacheco. Conociendo las propiedades del Eucalipto, ¿un alivio para la tos? *Archivos de Medicina Familiar y General*, **20**(3), 48–52 (2023). URL: https://www.revista.famfyg.com.ar/index.php/AMFG/article/view/247

46. L.N. Pinheiro, P.H.C.P. Ornelas, J.P.C. Tavares, T.F.C. dos Santos, A.B.F. da Silva, P.H.A. de Souza, D.M.S. Pereira & C.S.S.e.S. Figueiredo. Análise farmacocinética e farmacodinámica *in sílico* do eucaliptol. *Revista Foco*, **16**(6), e2402 (2023). Doi: https://doi.org/10.54751/revistafoco.v16n6-158
47. W.E. Camba-Ramirez, D.J. Petroche-Torres, L.A. Cortez-Suarez & W.E. Mariscal-Santi. Tamizaje fitoquímico, fenoles totales y actividad antioxidante de *Citrus aurantium*. *RECIAMUC*, **6**(3), 470–479 (2022). https://doi.org/10.26820/reciamuc/6.(3).julio.2022.470-479
48. R. Espinosa-Cervantes. Etnoveterinaria, uso de plantas medicinales y sus subproductos en la ganadería extensiva. *Sociedades Rurales, Producción y Medio Ambiente*, **22**(43), 143–159 (2022). URL: https://sociedadesruralesojs.xoc.uam.mx/index.php/srpma/article/view/462
49. Y. Dueñas-Rodríguez, R. Rodríguez-Puga, Y. Pérez-Díaz & A.A. Pérez-Ramírez. Uso y efectividad de la fitoterapia en el tratamiento de pacientes con infecciones respiratorias. *Revista Electrónica Dr. Zoilo E. Marinello Vidaurreta*, **48**, e3377 (2023). URL: https://revzoilomarinello.sld.cu/index.php/zmv/article/view/3377
50. P.A. Amaya-Sanchez & J.J. Sandoval-Jaime. *Evaluación de la obtención y uso del aceite esencial de eucalipto (Eucalyptus globulus) como fungicida*. B.Sc. thesis. Fundación Universidad de América, Bogotá, D.C., 2020; 133 p. URL: https://repository.uamerica.edu.co/handle/20.500.11839/8101

HOW TO CITE THIS ARTICLE

C. Takahashi, H. Vílchez & J. Poemape. Beneficial effect of *Centella asiatica*: Synthesis of the last two decades. *Rev. Colomb. Cienc. Quim. Farm.*, **54**(3), 679–688 (2025). Doi: https://doi.org/10.15446/rcciquifa.v54n3.117462